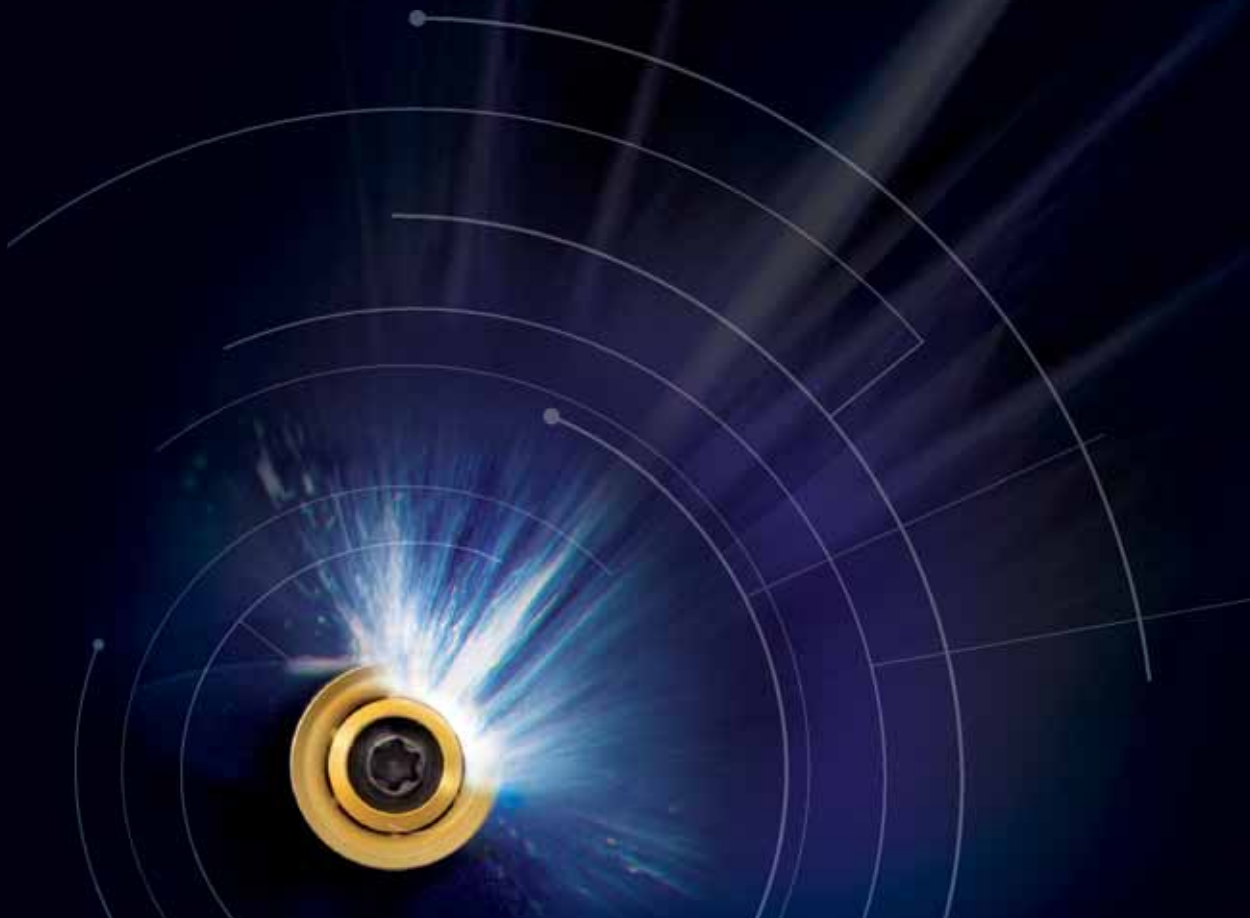


INNOVATIONS
MASTER CATALOG

CUTTING TOOLS
2013



www.kennametal.com

 **KENNAMETAL®**

GENERAL ENGINEERING


TRANSPORTATION



AEROSPACE & DEFENSE

EARTHWORKS

ENERGY



Since its inception in 1938, Kennametal has understood precisely how to improve manufacturing performance and profitability — by introducing unparalleled products and services to reduce operating costs and lead times.

These 2000+ pages bring you the latest in milling, holemaking, turning, and tooling systems products and superior services — all specifically engineered to enhance overall productivity, even in the most challenging metalworking applications. Rely on Kennametal to significantly boost manufacturing competitiveness. To learn more, contact your Kennametal Representative or Authorized Kennametal Distributor.

Visit us at www.kennametal.com.

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Less Environmental Impact

To learn more about our sustainable solutions for your industry,
please contact your Kennametal Representative or
Authorized Kennametal Distributor, or visit www.kennametal.com.

Environment

Kennametal's intimate understanding of the energy marketplace — including customer processes and applications — allows us to proactively address production and sustainability concerns with solutions tailored to your needs. We deliver superior value because we listen closely to you, our customer, and innovate based on your feedback. Our goal is to help you be more competitive — both at home and on a global scale.



Best Practices in Productivity

As your trusted partner for optimized production, Kennametal offers customers a unique commitment to research and development excellence, continually delivering highly innovative ways to enhance productivity. Certification to ISO 9001, QS 9000 TES, and VDA 6.4 provides the highest possible quality standards.

Best Performance, Less Environmental impact

With technology, we can do both. Kennametal helps customers focus on the root causes of unsustainable behavior in highly complex manufacturing systems, while at the same time improving cost structure, quality, and performance. In addition to offering the latest in metalcutting tools and technology, our Advanced Engineering team will analyze your existing production processes and help identify new methods to improve your overall performance.

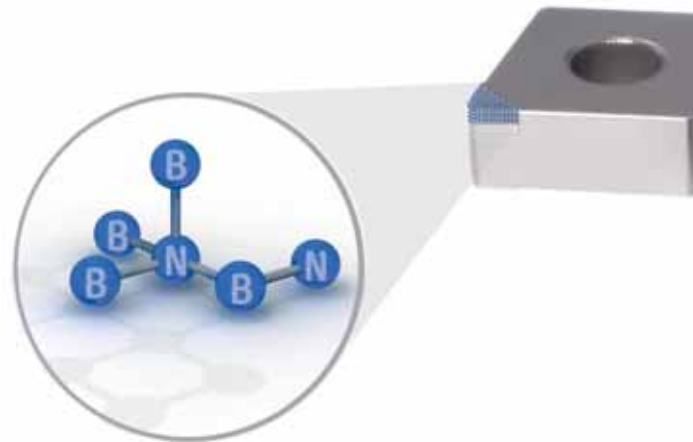
Turning

Product Highlights

Superhard Materials • PCBN and PCD

Abrasion resistance and toughness are the two most important properties in assessing the efficiency of cutting tool materials. Abrasion resistance is primarily a function of hardness, and, in this respect, diamond (PCD) and cubic boron nitride (CBN) are superior to all other known materials.

For more information, see pages B132–B197.



Beyond BLAST™

An entirely different approach to machining high-temperature alloys. We determined that the most effective way to deliver coolant would be to channel it through the insert — ensuring that it hits exactly where it does the most good. That means, more efficient coolant delivery at a fraction of the cost of high-pressure coolant systems. By precisely controlling coolant application, Beyond BLAST enables you to lower your energy consumption, saving you even more money and reducing your impact on the environment.

For more information, see pages F2–F12.

beyond™ BLAST™



Beyond™ PVD Grades

Advanced PVD coatings using Beyond technology are well suited to resist the high temperatures associated with machining tough alloys. By offering increased tool life (by 30–40%), the general engineering, transportation, aerospace, energy, and earthworks markets can experience benefits in their profitability. They can also realize benefits by utilizing the strength of the new PVD coating in combination with the broad product offering to perform turning, grooving, and cut-off operations in a wide array of materials and applications while maintaining consistent chip control and minimizing insert edge wear.

For more information, see pages B2–B115.



beyond



Grooving and Cut-Off : -CL and -GUP Geometries

The A2™ CL geometry maximizes your cut-off productivity. The A2-CL geometry offers tighter chipbreaker capabilities when machining low-carbon steel, excellent chip evacuation in low-feed applications, and improved stability and rigidity. The A4-GUP geometry, available in molded and precision-ground styles, provides a positive rake angle, enhanced chip control, and lower cutting forces. The -GUP geometry offers up to 180% longer tool life and higher productivity in steel, stainless steel, and high-temperature alloy materials.

For more information, see pages A2-CL: D14
A4-GUP: D78, D82.

Kennametal Select

Kennametal Select products make it simple to get the most out of your inserts — and your money. Every insert is gold, which exposes wear as the tool continues to be used. This makes it easy to detect when an insert is ready to be changed — maximizing the product's value and protecting the workpiece. Also, because Kennametal Select inserts can be used in most applications, a single insert can take on any number of tasks, thus reducing your inventory. Kennametal Select products are also reliable enough to cut steel, stainless steel, cast iron, and high-temperature alloys, enabling quick changes in workpiece materials without the need to swap inserts, saving time and money.

For more information, see pages F110–F134.



KENNAMETAL
SELECT

Holemaking

Product Highlights



Hole Finishing with Kennametal

Only Kennametal is capable of offering you the best, customized solution for your application. Kennametal owns the entire process chain, from raw material, insert pressing, tool body design, brazing, sintering, grinding, coating, and so on, up to reconditioning. Kennametal is the only source in the metalworking industry from where you can get all types of hole finishing tooling, from reaming and fine boring to motion tooling, directly from one hand. Therefore, Kennametal can offer you the best-fitting solution for your machining challenge, giving you the choice of tooling without any limitations in regard to portfolio or capability.

For more information, see pages K1–K211.

Drill Fix™ DFS™

Drill Fix DFS combines the economical squared-outboard insert with the superior centering capabilities of the trigon inboard insert. The DFS indexable drills offer increased metal removal rates combined with high surface quality and hole straightness.

For more information, see pages J19–J35.

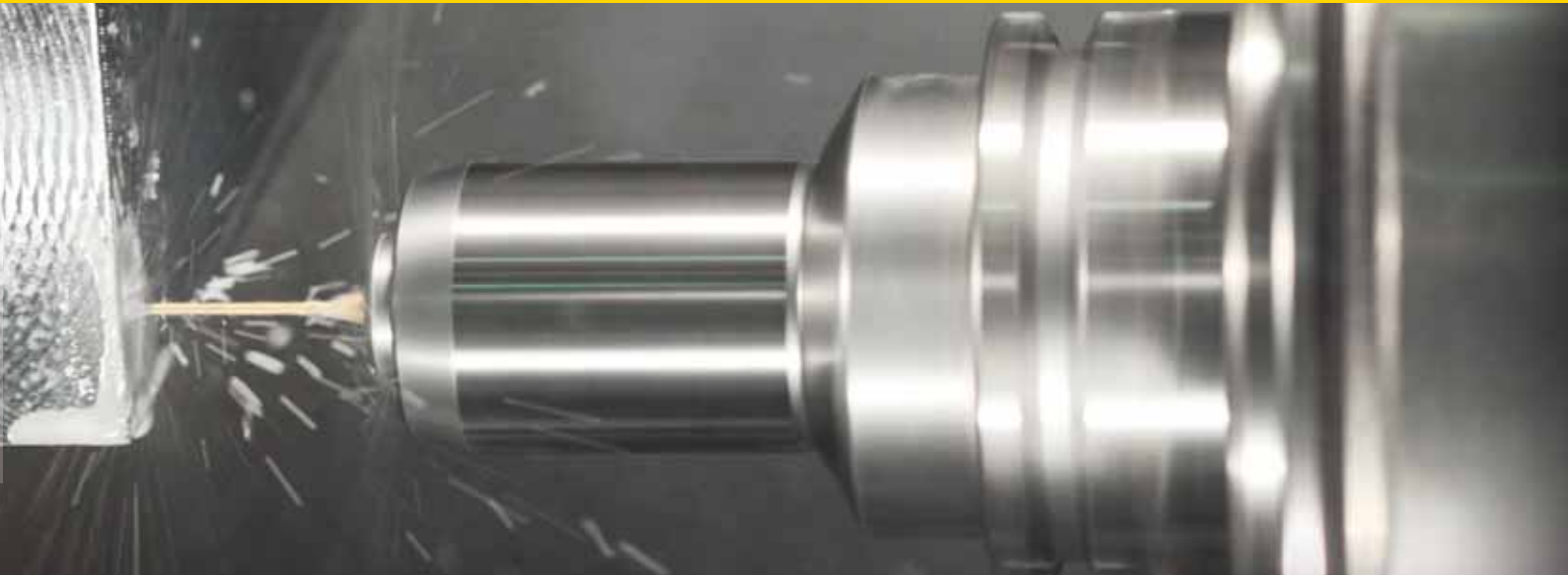


GOdrill™ • Kennametal's First Microdrill

The all new GOdrill addresses drilling operations in a diameter range of .0394–.5" (1–12,7mm) in a broad variety of materials and applications, such as fuel systems or medical components. Due to its very unique design, the GOdrill expands the advantages of modular drills into the small diameter range: high-end grades, wear-indicator coating, and new, patented geometries enable full utilization of the drill's tool life capacity.

For more information, see pages G5–G15.





HP Beyond™ Drills for Steel and Stainless Steel

HP Beyond Series Solid Carbide Drills are designed specifically for stainless steel and steel applications, offering high performance and long tool life in regular steel, titanium, and iron materials. By combining unique Kennametal technologies, such as the HP point, flute geometry, and a new Beyond grade technology into one tool, the B2_HP Beyond is the ultimate high-volume production tool.

For more information, see pages G25–G43.

KSEM PLUS™ Modular Drill System

The KSEM PLUS drill concept is simple but effective. It combines the benefits of the KSEM™ modular drill (high feeds and length-to-diameter [L/D] ratios) with the benefits of an indexable drill (high speeds and low consumable costs).

For more information, see pages H46–H59.



Beyond™ High-Performance Solid Carbide Taps

Solid carbide taps offer higher productivity and outstanding performance in a wider range of materials than formerly possible. Get more production from a single tool and superior accuracy of product thread that surpasses the competition. Kennametal High-Performance Solid Carbide Taps are available in various specifications with enhanced precision and design, which translates into longer tool life, excellent performance, and exceptional wear resistance.

For more information, see pages L2–L33.

Solid End Milling

Product Highlights



HARVI™ High-Performance End Mills for Roughing and Finishing with One Tool

HARVI takes high-performance roughing, semi-finishing, slotting, and profiling to the next level. The line is designed to provide maximum metal removal rates by achieving supreme surface conditions. A wide range of diameters and corner radii are available from stock.

For more information, see pages M8–M30.

KenFeed™ End Mills for High-Feed Milling

A unique tool with new, 6-flute style for high productivity, the KenFeed end mill is specifically engineered to machine hardened steel up to 67 HRC at extreme speeds and feeds. Necked shanks provide extended reach in deep cavities and high feed rates up to .0230" per tooth on a 3/4" tool. Machine hardened materials at 2–3x the metal removal rate of competitive end mills. Wide range of cutting diameters, down to 6mm for small- and medium-pocket work. Innovative new geometry maximizes metal removal rates and lowers manufacturing costs.

For more information, see pages M31–M34.



KCN05™ Diamond Coated Carbide Routers

Kennametal has the correct milling solutions engineered for machining difficult CFRP (Carbon-Fiber Reinforced Polymer) and non-ferrous components. KCN05 solid carbide router products provide excellent tool life and produce smooth finishes with improved edge quality. The unique geometries are free cutting, reduce heat generation, and provide high-quality machined surfaces.

For more information, see pages M62–M68.





GOmill™ • The Economical Milling Cutter Line

The GOmill line is specifically engineered to work on short length-of-cut applications in multiple workpiece materials, like soft and hard steels up to 48 HRC, stainless steels, high-temperature alloys, and cast iron. With the very short overall length and soft cutting geometries, the line is made to conform to the growing market of mill-turn machines. The 3-flute sharp and 4-flute chamfer versions support roughing, semi-finishing, and finishing applications; the 3-flute ball nose tool supports roughing and semi-finishing applications; and the 2-flute ball nose version supports finishing applications. All three geometries work in slotting as well as side milling applications up to 1 x D depth of cut.

For more information, see pages M85, M87, M92, M95.



MaxiMet™ Carbide End Mills for High Metal Removal Rates and Superior Surface Finishes

Designed to significantly reduce machining time in aluminum! The innovative geometry designs include a wiper facet for superior surface finish on aluminum parts. MaxiMet takes roughing and finishing cuts with one tool. Slotting is effective up to full 1 x D axial depth. Side milling is effective up to 0.5 x D radial and 1.5 x D axial depth. The 3-flute series uses unequal flute spacing for chatter-free performance. Effective in a full range of machine speeds. Multiple corner radii and extended neck configurations are available as standard.

For more information, see pages M41–M61.

Indexable Milling

Product Highlights

Dodeka™ Series • Leader in Advanced Face Milling Applications

Dodeka Mini and Dodeka MAX™ are the most comprehensive face milling boosters on the market today. Twelve true cutting edges per insert mean low cost per edge and high productivity. With Beyond™ premium milling grades, you will see up to 30% higher Metal Removal Rates (MRR), 25% lower cutting forces due to real soft cutting action, and up to 35% better tool life in light to heavy machining.

For more information, see pages O2–O26.



MEGA Series • Superior Heavy-Duty Milling

With four true cutting edges per heavy-duty MEGA insert, you know you are getting the low cost per edge and high productivity you need and have come to expect from Kennametal. The soft cutting edge design enables 30% lower cutting forces, and the carbide shim provides protection to the cutter body. Choose MEGA inserts for all of your steel and cast iron indexable milling needs.

For more information, see pages O28–O43.



Beyond BLAST™ • More Than Just the Right Tool — The Ultimate Solution

The Beyond BLAST KSSM™ 45° and KSRM™ platforms utilize Precision Coolant Technology (PCT) to aggressively apply coolant directly to the cutting area. Not only does this reduce heat at the cutting edge, but it also assists with reducing tool and chip friction, increasing chip evacuation, and relieving shear stress.

For more information, see pages O44–O48, R60–R69.



Rodeka™ • The New Round Insert Generation

Kennametal introduces a new and revolutionary double-sided round milling insert capable to run in multiple types of milling operations and workpiece materials, providing the latest double-sided insert technology to boost your productivity with the most efficient cost per edge.

For more information, see pages R12–R19.

Mill 1™ • High-Performance Shoulder Milling Platform

The multifunctional Mill 1 platform works with all tool materials in shoulder, ramp, slot, plunge, and helical milling with one insert style to improve productivity and reduce inventory and machining costs. The super positive cutting rake, soft cutting action, and low cutting forces enable higher feed rates and spindle protection. Innovative insert and cutter body designs offer improved ramping capabilities.

For more information, see pages P2–P64.



Tooling Systems

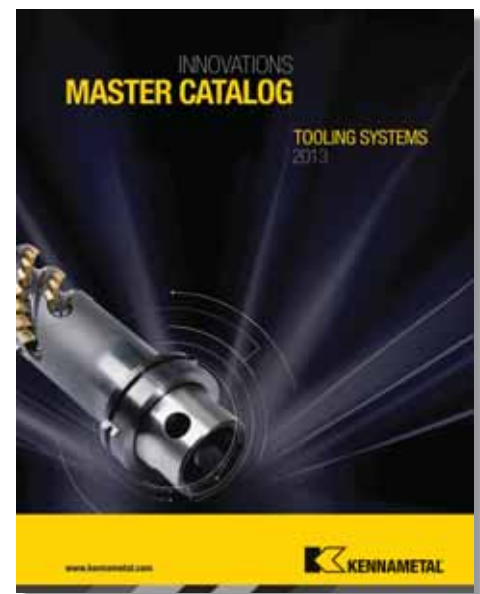
Product Highlights

New Catalog

New Comprehensive Tooling Systems Catalog

Kennametal is proud to present the latest Kennametal Tooling Systems catalog with innovative products on more than 1,100 pages! In this catalog, you will find information about KM Micro™, KM Mini™, KM™ Quick Change, KM4X™, HSK shank tools, BTKV and CVKV shank tools, BT shank tools, CV shank tools, DV shank tools, QC and R8 shank tools, straight shanks, collets and sleeves, and thermo shrinking machines.

To view the PDF, please go to www.kennametal.com





KM4X™ • The New Choice for Heavy-Duty Milling

KM4X is the latest version of the KM™ spindle interface targeted at heavy-duty machining operations and is a top choice for machining large, structural, tough-to-machine materials, like titanium, for the aerospace industry. The portfolio consists of rotating adapters and static tooling to support the tough and heavy machining markets. Additional products include spindle component packages as well as static clamping units to support turning and mill-turn opportunities.



KM™ Quick Change

KM Quick Change Tooling is a central component in achieving dramatic improvement in machine and cutting tool use. It's the choice of manufacturers requiring maximum machine output. The necessary tasks of changing, setting up, and gaging tools create an excess of machine downtime. For small batch manufacturing operations requiring these frequent setups, KM Quick Change Tooling is the most efficient method for reducing lost time and improving the overall quality of the machining process by generating greater productivity and increasing profits.

HSK Shank Tools

ERICKSON™ HSK Face Contact short taper tooling is manufactured from premium materials and to the latest DIN/ISO specification standards. Form A versions are generally used in machining centers and milling machines with automatic tool changers.





Engineered Solutions

Coordinated global resources with world-class manufacturing process development and implementation capabilities.

Whether it's a single tailored tool required to address a specific part feature or the development of a comprehensive manufacturing process for use on existing or newly acquired production equipment, Kennametal's team can manage the development, personnel training, and successful implementation of the complete solution.

Global implies just that. Globally coordinated manufacturing process development, implementation, and optimization support at machine tool builders, end user engineering or corporate offices, and end user production facilities, regardless of their respective geographies. Well-organized, highly linked staff reside in the Americas, Europe, and Asia/Pacific regions. Globally standardized design and manufacturing systems enable highly coordinated project management and implementation results.

Key alliances with machine tool builders and other leading manufacturing technology enablers ensure a complete solution, optimizing the entire process — not just portions of it. This results in the most effective and efficient manufacturing process possible, leading to low implementation time and cost and rapid return on investment.

For more information, please contact us at 1.866.646.7113.





Energy

Energy Engineered Solutions

Kennametal is more than a supplier of tooling solutions. With a thorough understanding of the energy segment's process and application challenges, we proactively address production concerns to deliver productivity to customers seeking peak performance in demanding environments. Kennametal's success is based on our capabilities — our ability to work with you on customized solutions to optimize your results and our willingness to engage with a broad spectrum of materials, metalworking solutions, application and custom component manufacturing, and supply expertise. Our drive for success, enabled through our advanced materials sciences, application knowledge, and commitment to a sustainable environment, results in a broad portfolio of innovative, custom, wear-resistant solutions.



Please also see the new Kennametal Energy catalog (B-11-02786).



Engineered Solutions

Automotive

Automotive Engineered Solutions

Traditionally, Kennametal has been a strong player in the transportation field, pioneering innovative solutions with automotive, shipbuilding, and railroad customers. We deliver global services and products that exceed our customers' expectations and continually push the boundaries of science. In today's competitive world, no one can support our customers better, and in turn, deliver the continued service and quality that has become Kennametal's trademark.

Kennametal's global reach has helped our customers standardize processes and products to improve both cost and quality. We offer an intimate understanding of the economics of the automotive value chain and unparalleled customized solutions tailored to your needs. We can deliver superior value by listening closely and innovating based on what our customers say. Our goal is to help you be more competitive, at home and on a global scale.



If it rolls, floats, or flies,



Aerospace

Aerospace Engineered Solutions

From lightweight composite materials to exotic alloys, Kennametal is committed to reducing risks and costs in the manufacture of aerospace and defense programs. We partner with customers to implement standard and customized solutions with minimum cost per part and high repeatability in mind. Kennametal has unique capabilities and resources to cover the total manufacturing equation from roughing to automated deburring and finishing. Kennametal's best-in-class technologies and services deliver up to 30% cost reduction and 60% cycle time reduction.

Aerospace component surfaces are one of the key battlegrounds in environmentally friendly manufacturing. Surface treatments not only improve appearance of the part but also enhance wear resistance, provide corrosion protection, and improve friction control. These subtle manufacturing enhancements provide big dividends in the form of fuel efficiency, reliability, performance, and longer part life.



Kennametal has a solution that delivers innovation and productivity.



Service and Support

Kennametal Extrude Hone™

Precision Surface Management

- Fuel efficiency through fine flow tuning — Diesel Fuel System (DFS) and Gasoline Direct Injection (GDI).
- Emission reduction due to better spray shaping.
- Noise, friction, and wear reduction for automatic gearbox components.
- Air flow path enhancement to improve jet or helicopter turbine performance.
- Energy savings with centrifugal impeller pump increased efficiency.
- Surface stress relief on high-pressured thin wall component for extreme safety.

Core Technologies Offer

- **Electrochemical Machining (ECM):** Generator, fixture, and cathodes
RADIUSING, SHAPING, POLISHING, SURFACE STRESS RELIEF.
- **Abrasive Flow Machining (AFM):** Media and fixture design
RADIUSING, POLISHING, SURFACE STRESS RELIEF.
- **Thermal Energy Method (TEM):** Controlled combustion
MINIMIZING RISK OF HIDDEN BURRS AND CONTAMINATION.

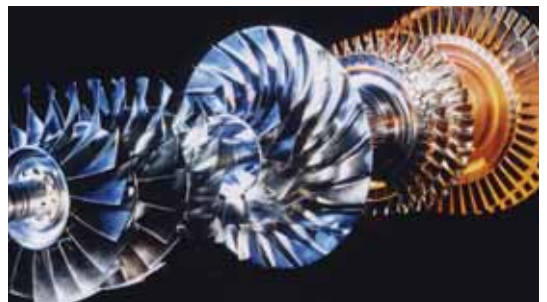




Proven Solutions

Easy Access to Service and Support

- Engineering and Feasibility departments.
- Capital equipment solutions.
- Contract Shop activities (ramp up and production).
- Spare parts availability program.
- Metalcutting tooling combined with Precision Surface Management.
- Benefits of worldwide Kennametal logistics.
- Lean expertise to conduct global projects with customers.
- Cost per part solutions/Clic model for equipment.
- Parameters, cathodes, fixtures designs.
- Media design to part.
- Global Full Circle Program increases productivity resulting in less downtime of your equipment.





Service and Support

Kennametal Extrude Hone™

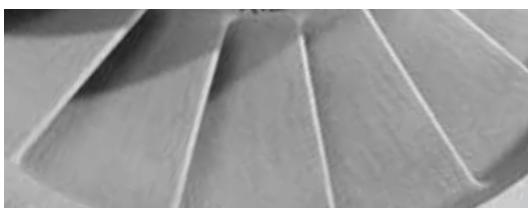
Proven Solution: Save Energy, Save Money

- Improving closed pump impellers inner flow passage roughness to increase up to 11% peak efficiency and lower energy consumption.
- A coal-powered plant equipped with six boiler feed pumps can reduce parasitic loss, representing at least \$500,000 annual savings (driving the pumps) by 1% of the power generated.
- This process and savings can also be applied to natural gas centrifugal closed pump impellers.

Precision Surface Management Matters

Kennametal Extrude Hone Abrasive Flow Machining (AFM) surface and flow enhancement solutions provide the energy segment with significant savings in pump efficiency improvements.

- The AFM process is the method of choice for material removal at the area of greatest restriction and surface improvement of passages not accessible by other methods.
- AFM has documented efficiency proven solutions in the automotive and aerospace industries.
- Two-way flow AFM process is a natural fit for closed impellers and diffusers.
- Inner flow passages of the impellers and diffusers benefit from AFM's selective material removal as well as surface finish improvement — both contributing to improved pump efficiency.



Before



After



Proven Solutions

Delivering Results throughout the Value Chain

Working with You

We have a strong focus on customer solutions, which helps develop an accurate understanding of industry needs. This is achieved through collaborative work with key players throughout the value chain:

Original Equipment Manufacturer (OEM)

Our business expertise is providing OEMs with key components, such as pumps, that deliver greater efficiency.

Foundry

Kennametal Extrude Hone™ specialists can bring added value early in the manufacturing chain, so you can deliver more than just a key component and exceed expectations every time.

End User

Currently in the best position to measure efficiency improvements, end users understand the direct impact of savings — anywhere along the value chain. They help us measure performance of the processed component against non-processed, providing a better understanding of efficiency improvement related to the Kennametal Extrude Hone AFM operation. The AFM Center of Excellence, in Irwin, PA, can perform feasibility testing with customer-specific parts to provide the optimal media needed for each process.



Media Is the Edge

The Kennametal Extrude Hone lab provides the energy industry with specific, engineered medias that deliver the highest performance for closed impeller polishing. We also have specific media with dedicated characteristics to enhance productivity and quality when polishing a closed impeller.



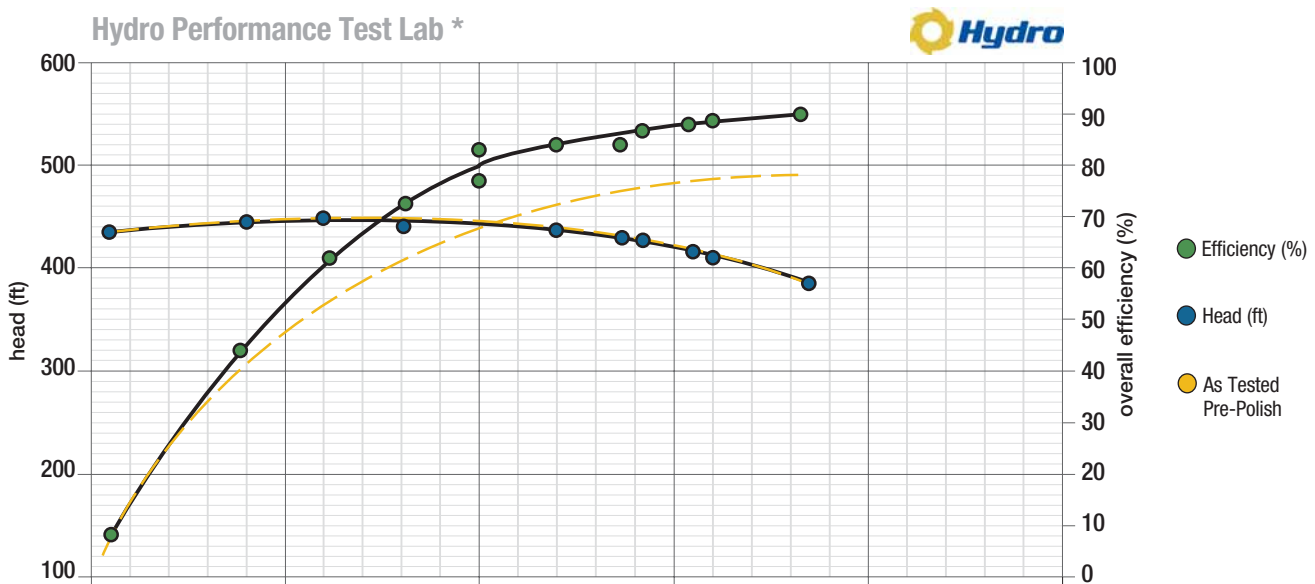


Service and Support

Kennametal Extrude Hone™

Abrasive Flow Machining for Pump Market Validation Testing

Formed in 1969 by a small group of pump engineers in Chicago, Hydro Aire is now the largest independent pump rebuilder with service centers throughout the world. A complete 5000 hp, 42,000 GPM pump test stand, designed in compliance with Hydraulic Institute standard and API 610, is located in Chicago. This is the ONLY independent non-OEM facility with this capability able to generate pump efficiency curves using LabView software.



* Testing by Hydro Aire in Chicago



Proven Solutions

The Energy Story

Proving the Pump Efficiency Improvement from the AFM Process

We have selected a 100 hp 1,200 GPM, single impeller overhung process pump as an example to validate the potential efficiency improvement able to be achieved with the AFM process.

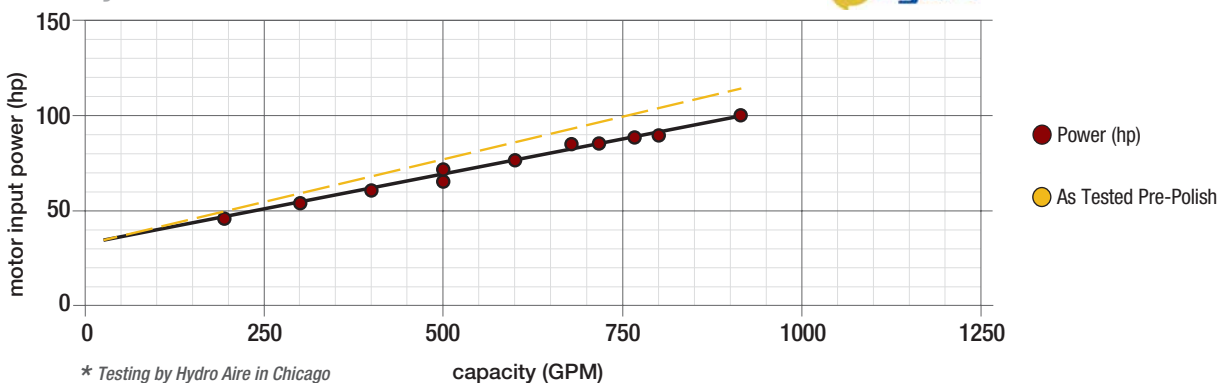
- 1) New PACO™ pump purchased, which is about 79% efficient according to the manufacturer's data.
- 2) Pump tested and performance curve generated to confirm initial efficiency pre-AFM. Manufacturer data confirmed by our "before AFM" testing.
- 3) Pump was disassembled and impeller removed to AFM process. Pump was then reassembled.
- 4) Re-tested pump and generated performance curve.

Results: **Peak efficiency gain of +11%**, bringing the pump to 90% total efficiency! Gains were realized over the full usable range of the pump with **significant power savings** at given pressure and flow rate.

Test Component

Pump Type:	ITT Goulds 12BF
Pump Size:	3 x 4-10
Serial No.:	G1162372
Stages:	1
SG:	1.00
NPSHr:	n/a
Speed:	3600 RPM

Hydro Performance Test Lab *



* Testing by Hydro Aire in Chicago

Service and Support

Kennametal ToolBOSS™

Kennametal ToolBOSS™

Secure, High-Capacity Solutions

ToolBOSS™ quickly and consistently delivers quantifiable savings in hundreds of metalworking companies worldwide. Much more than a vending unit, the Kennametal ToolBOSS system is a secure, electronically locked tool storage cabinet that can establish 24-hour tool control for high-value items. It issues tools, returns tools, sends to re-work, supports EDI ordering, and provides for multi-vendor security.

Efficiency

Multiple drawers can be selected in one transaction, minimizing the time required to manage large stock volumes.

Future-Port

USB interface, as well as a DCS expansion port, for use with RFID and other ancillary equipment.

High-Speed Access

Rapid search and selection of an item is enhanced with LED identification system, guiding users to the correct drawer.

Traceability

Software provides a complete audit trail, tracking component usage details.

Expandability

Expandable up to 10 units per system, providing up to 1,121 secure locations.



To learn more about ToolBOSS, contact your local Authorized Distributor or visit www.kennametal.com

Reconditioning Services

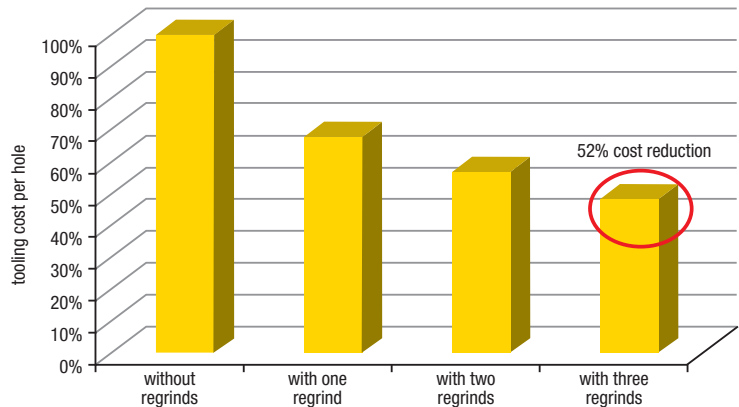
Reconditioning Services

Our Reconditioning Services help optimize the total value of your metalcutting tools throughout their entire life cycle by giving the “like-new” performance characteristics – with rapid turnaround time – so the tools you need are always on-hand and perform just like new.



Reduce Tooling Cost by More than 50%

Example: 4" (10,5mm) HP-Drill B225A10500 KC7315 Material: Alloy steel 30 RC



Using Kennametal’s Reconditioning Services provides considerable savings throughout the life of your cutting tools and can reduce your overall tooling costs more than 50%.

For more information or to find the nearest reconditioning location, contact your local Authorized Distributor or visit www.kennametal.com

Service and Support



Carbide Recycling

Help Preserve and Protect Our Planet!

It's easy for your company to be environmentally conscious with the Kennametal Carbide Recycling Program.

By sending us your used carbide tools, you help preserve and protect the environment and ensure that these products are recycled responsibly. Kennametal accepts any coated or non-coated carbide items, including inserts, drills, reamers, and taps.

By using the Kennametal Carbide Recycling Program, you will receive:

- A partner who cares about a sustainable environment.
- Easy-to-use web portal to value your used carbide.
- Access to our popular Green Box™ options for carbide collection.
- Systematic and efficient disposal of carbide materials.
- Improved profitability.

Program is not currently available in all geographical areas. For more information, please visit www.kennametal.com/carbiderecycling



Service and Support

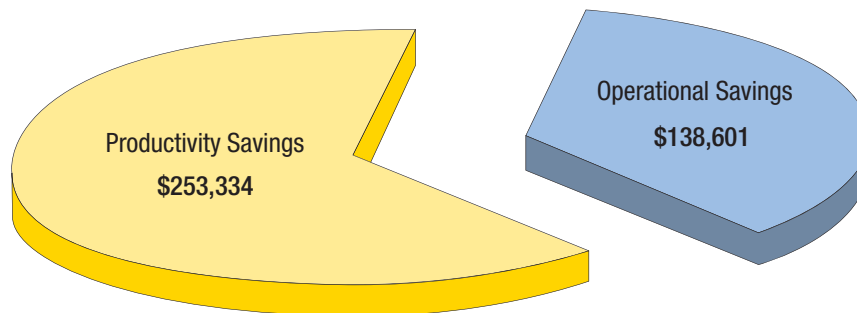
Cost per Part Services Program (CPP)

Build a Long-Term Relationship with the Leader in Metalworking Solutions that Provides:

- Monthly cost savings documented and captured in standardized KPI reports.
- Availability of Kennametal's latest technology to increase productivity and lower cost of operations.
- Onsite technical support available on a constant basis.
- Billing based on the output of your plant that eliminates inventory risk.

YTD Cost Savings Tracker

Site GOAL — \$300,000



Cost per Part Services Programs Are Designed to Take Advantage of Our Wear Solutions Expertise by Outsourcing Your Metalworking Requirements that:

- Improve productivity.
- Reduce risk.
- Manage inventory.
- Lower operational costs.

For more information, contact your local Authorized Distributor or visit www.kennametal.com

Service and Support

Customer Application Support (CAS)

Customer Application Support

Get Fast and Reliable Answers to Your Toughest Metalcutting Problems

Our Customer Application Support (CAS) Team is the metalworking industry's leading help desk resource for tooling application solutions and problem resolution.

Easy Access to Proven Metalworking Expertise!

Kennametal Customer Application Engineers assist customers and engineering groups throughout the world with expert tool selection and application recommendations for the entire range of Kennametal tooling.

Service Level Excellence

- Fast telephone response.
- Quick technical solutions.
- Efficient case management.

Services

- Operating parameters.
- Process optimization.
- Hardware support.
- Tooling selection.
- Troubleshooting.

Best-in-Class Support Tools and Technology

- Materials database.
- Application calculators.
- Tooling performance experts.

Convenient Access Options:

Originating Country	Language	Phone	Fax	E-mail
Australia	English	1800 674037	724-539-6830	ap-kmt.techsupport@kennametal.com
Austria	German	0800 202873 *	0800 202874	eu-kmt.techsupport@kennametal.com
Belgium	English/French	0800 80850 *	80080868	eu-kmt.techsupport@kennametal.com
China	Chinese	440-889-2238	21-5834-2200	k-cn.techsupport@kennametal.com
Denmark	English	80889298	80889296	na-kmt.techsupport@kennametal.com
Finland	English	0800919412 *	0800919414	na-kmt.techsupport@kennametal.com
France	French	805540367	805540028	eu-kmt.techsupport@kennametal.com
Germany	German	0800 0006651 *	0800 0006649	eu-kmt.techsupport@kennametal.com
India	English	724-539-8862	724-539-6830	ap-kmt.techsupport@kennametal.com
Israel	English	1809 449889	1809 449918	na-kmt.techsupport@kennametal.com
Italy	Italian	800 916561 *	800 917505	eu-kmt.techsupport@kennametal.com
Japan	English	0120 225429	724-539-6830	ap-kmt.techsupport@kennametal.com
Korea (South)	English	080 728 0880	724-539-6830	ap-kmt.techsupport@kennametal.com
Malaysia	English	1800 812 990 *	724-539-6830	ap-kmt.techsupport@kennametal.com
Netherlands	English	0800 0201130 *	0800 0201132	eu-kmt.techsupport@kennametal.com
New Zealand	English	0800 450941 *	0800 450921	ap-kmt.techsupport@kennametal.com
Norway	English	80010080 *	80010082	na-kmt.techsupport@kennametal.com
Poland	Polish	00800 4411887 *	00800 4411888	eu-kmt.techsupport@kennametal.com
Singapore	English	1800 6221031	724-539-6830	ap-kmt.techsupport@kennametal.com
South Africa	English	0800 981643 *	0800 981946 *	na-kmt.techsupport@kennametal.com
Sweden	English	020799246	020795474	na-kmt.techsupport@kennametal.com
Taiwan	English	0800 666 197 *	724-539-6830	ap-kmt.techsupport@kennametal.com
Thailand	English	1800 4417820 *	724-539-6830	ap-kmt.techsupport@kennametal.com
United Kingdom	English	0800 032 8339 *	0800 028 5803 *	na-kmt.techsupport@kennametal.com
USA	English	800-835-3668 *	724-539-6830	na-kmt.techsupport@kennametal.com

* Toll-free number.

QR Codes

Kennametal QR Codes

Looking for More Products or Product Information?

Use your smartphone or tablet to scan the QR codes throughout this catalog.

Throughout the Kennametal Innovations Master Catalog, you will find codes like the one shown here that will activate links containing more information about various products and services offered.

The QR codes that you will find within this catalog are designed to relate to the products or product families on the page where they are found. These codes will link you to expanded product information, such as application videos, informative drawings and animations, extra product charts and graphs, or simply to an expanded online catalog of products offered by Kennametal for all your drilling, turning, and milling needs.

Helpful Information to Get You Scanning

QR codes are activated when scanned with a dedicated QR scanning application using the onboard camera of your smartphone or tablet.

If you currently have a QR scanner on your smartphone or tablet, look for codes to learn more information about our products. Don't have a QR scanner on your device? It's simple to get one. Just go to your device's application store, and search for a "QR code scanner". Follow your application store's directions on downloading an application, and then launch your QR scanner.

- With your scanner, center the QR code in the camera window of your application.
- When the scanner locks onto the image, you will be on your way to the embedded information in the QR code.
- Once the webpage, video, or other information linked to the QR code opens or loads, you can freely interact.

When you need information quickly on a product or an extended product catalog, skip the web search and long website URLs and scan the provided QR codes in this catalog.

Scan the code at the top of the page to visit our website and online product catalog.



Service and Support

Merchandise

Merchandise

New Merchandise Available! Place Your Order Today!

Introducing a new line of Kennametal merchandise. Place an order for any of the following quality products with your Authorized Kennametal Distributor or visit www.kennametal.com.



Solid Performance Polo

100% polyester. No curl/rib-knit jacquard collar. Antimicrobial.

- Color: charcoal



Windbreaker Jacket

Comfortable fit with a water-repellent shell and mesh lining, lower front pockets for added convenience. 100% polyester. Features elasticized cuffs and an open bottom with a drawstring cord.

- Color: black



Extreme Colorblock Polo

100% polyester. Moisture wicking, antimicrobial, and raglan sleeves.

- Color: black/gold



Extreme Cap

Extreme Cap is a classic unstructured cap made of soft laundered cotton for a casual, comfortable feel. Pre-curved visor and six sewn eyelets give this cap the look of a traditional baseball cap. Fabric strap with slide buckle.

- Color: black and camo



Titleist® DT SoLo® Golf Balls

The new DT SoLo golf ball will appeal to a broad range of golfers seeking the combination of long distance, exceptional feel, responsive short game control, and cut-proof cover durability.

- Color: white



Hanes® TAGLESS® T-Shirt

100% cotton. Pre-shrunk.

- Color: black



12 oz. Ceramic Tumbler

Silicone lid. Double-wall ceramic tumbler. 5.5" tall without the lid. Fits in most corporate coffee machines. Includes 1-piece gift box. 11 oz.

- Color: black with black lid



Majestic Ballpoint Pen

Majestic metal ballpoint pen with chrome trim and colored center band.

- Color: black metal with chrome trim



Dakota Multi-Tool

4" closed. Silver anodized aluminum handles. Features spring-action needle nose and regular pliers, serrated knife blade, straight-edge knife blade, can/bottle opener, file, 2 screwdrivers, Phillips head screwdriver, and more. Comes with nylon belt pouch. Boxed.

- Color: gray



Jupiter Flashlight

Metal, 17" white LED flashlight. Push button power switch. Wrist strap. Three AAA batteries included (not inserted).

- Color: black



Bottle Opener

Contemporary design, aluminum bottle opener/ key tag. Ergonomic, curved construction improves handling and safely opens metal bottle caps.

- Color: black



Collapsible Koozie

Fits 16 oz. water bottles and longnecks.

- Color: black



Notebook Combo

6-1/4" x 8-1/2". Double spiral binding, elastic pen loop on cover. 80 white-lined sheets (non-refillable).

- Color: yellow



Aluminum Bottle

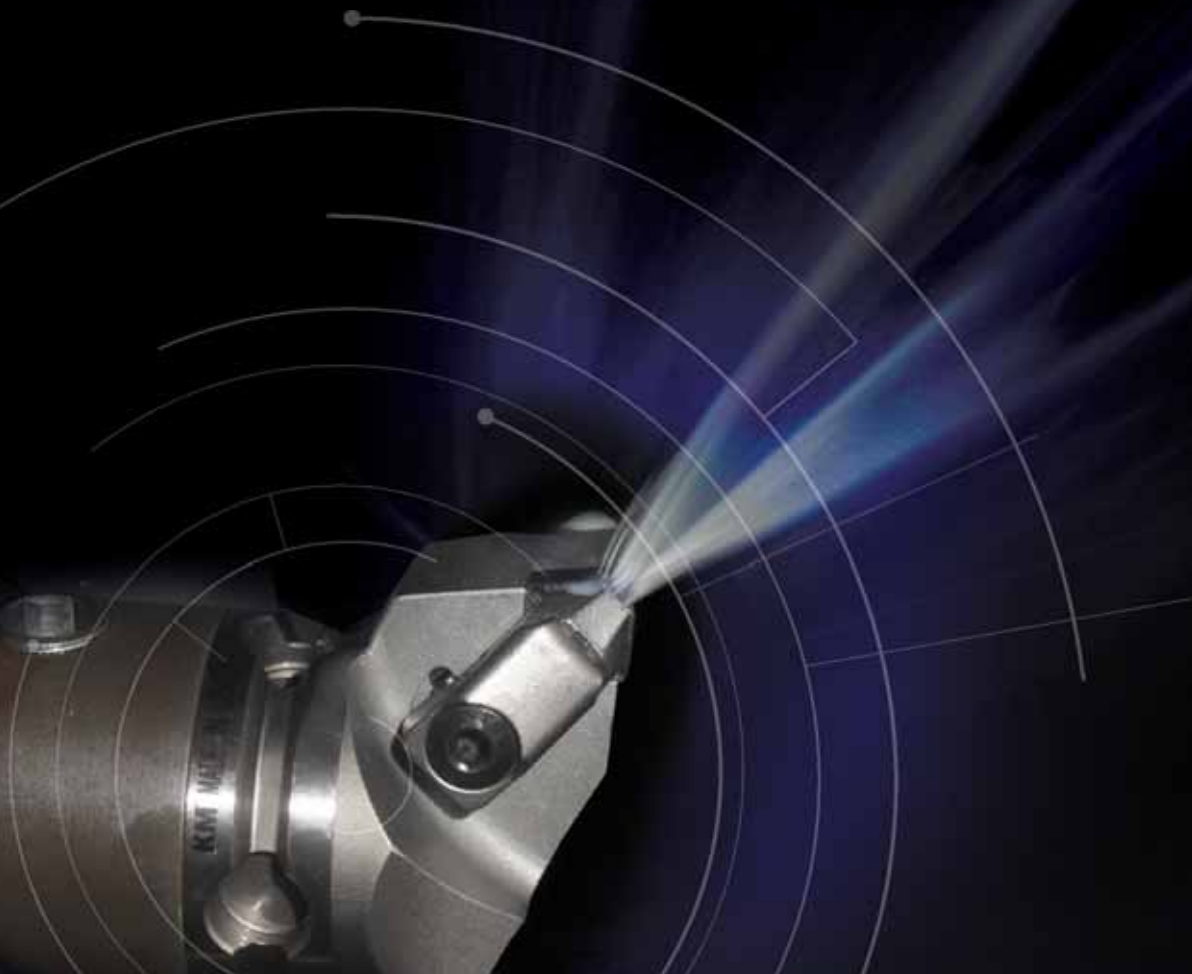
The ribbed aluminum bottle is BPA free and has a silicone color band with a matching drinking spout and lid.

- Color: metal/black/yellow

Visit www.kennametal.com to see all available merchandise and for ordering details.



STATIONARY TOOLS



TURNING

www.kennametal.com





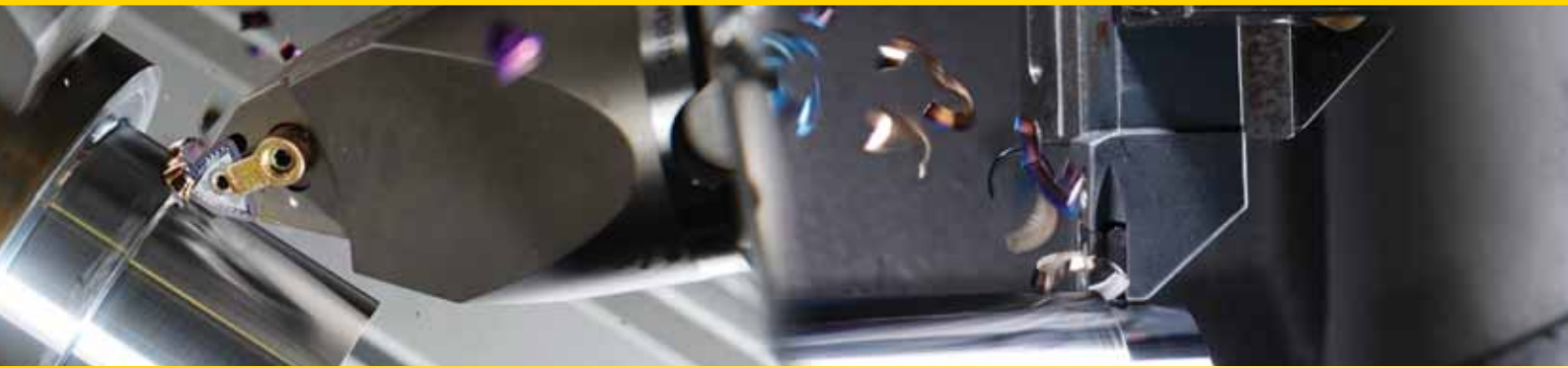
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Turning Introduction	A0-A3
ISO/ANSI Inserts	B0-B130
PCD/PCBN Inserts	B132-B197
O.D./I.D. Toolholders	C0-C161
Grooving and Cut-Off	D0-D161
Threading	E0-E107
Application Specific	F0-F135



Turning Products

Our latest Metalcutting Innovations are designed to deliver higher productivity, longer tool life, and increased application versatility.



ANSI/ISO INSERTS

See Section B for more details.

Carbide Inserts

NEW!

Beyond™ Technology

- PVD Grades KCU10™/KCU25™
- CVD Grades

Ceramic Inserts

NEW!

Beyond Technology

- KYK10 and KYK25 Ceramic Grades for CI
- KYS25 and KYS30 Ceramic Grades for High-Temp

Superhard Inserts

- CBN Inserts with Chipbreaker

Kennametal Select Insert Line

TOOLHOLDERS

See Section C for more details.

Toolholders

- Kenclamp™
- Kenloc™
- Kenlever™
- Kendex™

Boring Bars

- Kenclamp
- Kenloc
- Kenlever
- Kendex



For more information about the latest products and services from Kennametal, please contact your Kennametal Representative or Authorized Kennametal Distributor, or visit www.kennametal.com.



THREADING, GROOVING, AND CUT-OFF (TG&C)

See Sections D and E for more details.

A2™, A3™, and A4™

NEW!

Beyond™ Technology
• KCU25™ PVD Grade

- CBN Inserts
- A4 Clubhead Toolholders

Top Notch™ Grooving and Threading

NEW!

Beyond Technology
• KCU25 PVD Grade

- CBN Inserts

LT Threading

APPLICATION SPECIFIC

See Section F for more details.

Beyond BLAST™

Fix-Perfect™

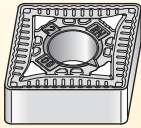
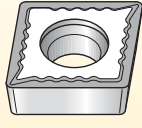
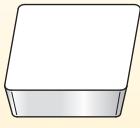
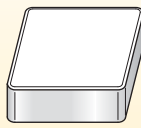







Top Notch Profiling

Tooling for Railroad

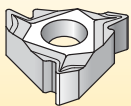
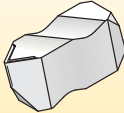
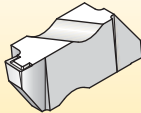
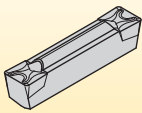
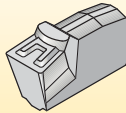
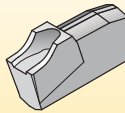


■ ANSI/ISO Turning Inserts

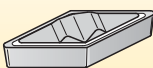
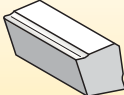
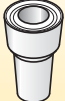
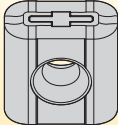
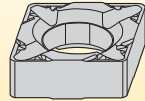
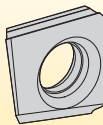
Step 1 • Select Insert Style

				
	Kenloc™	Screw-On	Kendex™ Positive	Kendex Negative
C 	Carbide: B38-B47 Ceramic: B116 Superhard: B172-B174	Carbide: B86-B93 Superhard: B185-B188	Carbide: B82 Superhard: B183	Ceramic: B120 Superhard: B180-B181
D 	Carbide: B47-B56 Ceramic: B117 Superhard: B174-B176	Carbide: B93-B98 Superhard: B189-B192	—	Ceramic: B121 Superhard: B181
R 	Carbide: B56-B57 Ceramic: B117	Carbide: B98-B100	Carbide: B82-B83 Ceramic: B126-B127	Ceramic: B122 Superhard: B180
S 	Carbide: B57-B64 Ceramic: B118 Superhard: B176-B177	Carbide: B101-B104	Carbide: B83-B84 Ceramic: B127-B128	Ceramic: B123-B124 Superhard: B180, B182
T 	Carbide: B64-B71 Ceramic: B118 Superhard: B177-B179	Carbide: B104-B110 Superhard: B192-B194	Carbide: B84-B85 Ceramic: B128 Superhard: B183-B184	Ceramic: B124 Superhard: B182
V 	Carbide: B72-B76 Ceramic: B118 Superhard: B178-B179	Carbide: B111-B112 Superhard: B194-B195	—	Ceramic: B124
W 	Carbide: B76-B81 Ceramic: B119 Superhard: B179	Carbide: B112-B113	—	Ceramic: B125

■ Threading, Grooving, and Cut-Off

						
	LT	Top Notch™ Threading	Top Notch Profiling	A4™	A3™	A2™
inserts	E44-E67	E10-E21	D126-D142	D78-D87	D30-D33	D12-D17
toolholders	E68-E80	E22-E39	D143-D154	D88-D117	D34-D58	D18-D24

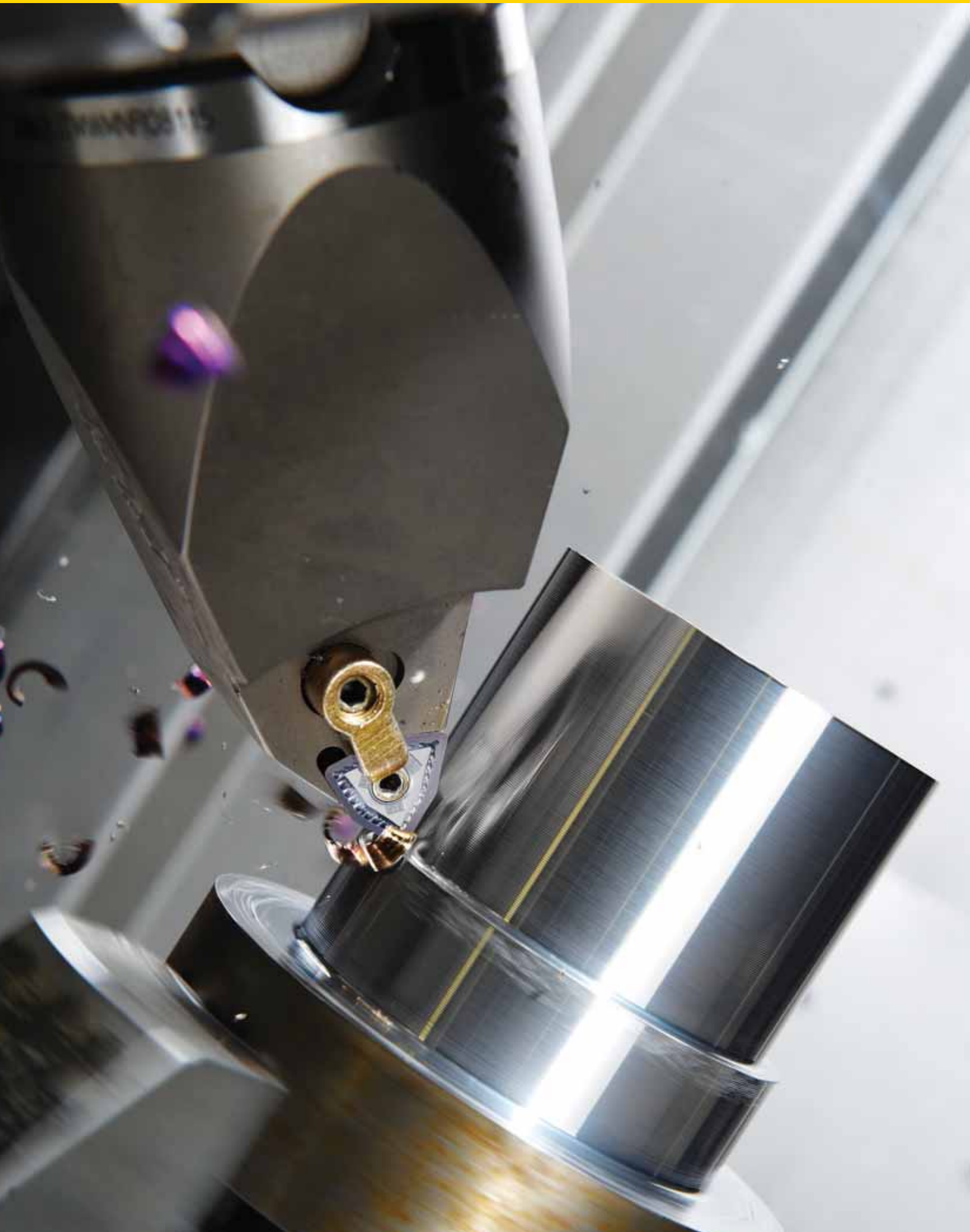
■ Application Specific

						
	Top Notch Profiling	Kendex Mini	K-Lock™	Railroad/Bar Peeling	Beyond BLAST™	Fix-Perfect™
inserts	F43-F48	F67	F61	F84-F87, F95-F97, F107-F109	F6-F9	F16-F30
toolholders	F49-F59	F68-F69	F62-F64	F72-F83, F89-F94, F99-F106	F10-F12	F32-F41

Step 2 • Select Application and Clamping System

External Machining								
		Kenclamp™	Kenloc™	Kenlever™	Kendex™ Negative	Screw-On	Kendex Positive	
C		conventional	C6-C7	C15-C19	–	C36, C38	C50-C56	C43
D		conventional	C8-C9	C20-C21	–	C36	C56-C58	–
R		conventional	C9	C22	–	C39	C59-C61	–
S		conventional	C10-C11	C22-C24	–	C37, C40-C41	–	C44-C45
T		conventional	C11-C12	C25-C30	–	C42-C43	C61-C63	C46-C49
V		conventional	C13-C14	C30-C31	–	–	C64-C66	–
W		conventional	C14	C32	–	C37	C66-C67	–

Internal Machining								
		Kenclamp	Kenloc	Kenlever	Kendex Negative	Screw-On	Kendex Positive	
C		conventional	C76-C77	C80-C81	–	C87	C94-C104	C90
D		conventional	C77-C78	C82-C83	–	–	C105-C107	–
R		conventional	–	–	–	C87-C88	–	–
S		conventional	C79	C83	–	–	–	C90
T		conventional	C79	C84	–	C89	C108-C113	C91-C93
V		conventional	–	C85	–	–	C114-C115	–
W		conventional	–	C85-C86	–	C87	C115-C118	–



ISO/ANSI Inserts

Kennametal Inserts .....	.B2-B23
Grades and Grade Descriptions .....	.B24-B31
Chip Control Geometries .....	.B32-B37
ISO/ANSI Carbide Inserts .....	.B38-B115
ISO/ANSI Ceramic Inserts .....	.B116-B130
Superhard Materials • PCBN/PCD Inserts .....	.B132-B197





Inserts for Every Turning Operation



Kennametal, the trusted innovator in metalcutting technology, offers a complete range of indexable inserts for general turning operations. From roughing to finishing, Kennametal has the correct insert.

Plus, Kennametal offers the next generation in tooling with Beyond™. Harnessing advanced science and exceptional experience, our Beyond inserts deliver unparalleled levels of productivity, efficiency, dependability, and profitability.

Features and Benefits

Up to 30% Higher Productivity and Profitability

- Achieve higher metal removal rates (speed, feed, and depth of cut).
- Gain longer tool life.

Versatility

- Products can be applied across a wide range of applications.
- Can be used in low- to high-speed applications.

Reliability

- Deliver uniform wear for predictable tool life.
- Achieve reduced depth-of-cut notching.
- Virtually eliminate chip flow damage.

Complete Portfolio

- The Beyond product portfolio can be used in a complete range of steel, cast iron, and stainless steel ISO turning workpieces.

Technical Details • Features

Post-Coat Treatment

- Improves edge toughness.
- Long predictable tool life.
- Reduces depth-of-cut notching.
- Wide range of applications.
- Reduces stresses.
- Reduces microchipping.
- Improves coating adhesion.

Fine-Grained Alumina Layer

- Provides coating integrity at elevated speeds.
- Higher productivity and dependability at high cutting temperatures.

Micro-Polished Edges

- Improves edge toughness.
- Provides smooth outer surface to reduce forces, friction, and workpiece sticking.

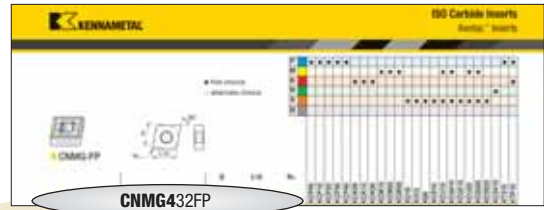
Post-Coat Grinding — Bottom

- Provides secure seating surface.



How Do Catalog Numbers Work?

Each character in our catalog number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.



C Insert Shape

- H** Hexagon 120°
- O** Octagon 135°
- P** Pentagon 108°
- R** Round
- S** Square 90°
- T** Triangular 60°
- C** Rhomboid 80°
- D** 55°
- E** 75°
- M** 86°
- V** 35°
- W** Trigon 80° with enlarged corner angles
- L** Rectangular 90°
- A** Parallelogram 85°
- B** 82°
- N/K** 55°

N Insert Clearance Angle

- A** 3°
- B** 5°
- C** 7°
- D** 15°
- E** 20°
- F** 25°
- G** 30°
- N** 0°
- P** 11°
- O** Indicated for other clearance angles requiring descriptions.

M Tolerance Class

Tolerances apply prior to edge prep and coating

D = Theoretical diameter of the insert inscribed circle
S = Thickness
B = See figures below

G Insert Features

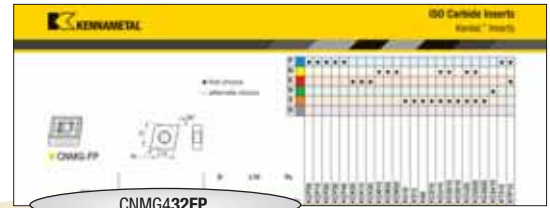
- N**
- R**
- F**
- A**
- M**
- G**
- W**
- T**
- Q**
- U**
- B**
- H**
- C**
- J**
- X** Special Design

4 Size

		Code for inch cutting edge length "L10"							
	"D"	C	D	R	S	T	V	W	
1.2 (5)	5/32	S4	04	03	03	06	-	-	
1.5 (6)	3/16	04	05	04	04	08	08	S3	
1.8 (7)	7/32	05	06	05	05	09	09	03	
-	.236	-	-	06	-	-	-	-	
2	1/4	06	07	06	06	11	11	04	
2.5	5/16	08	09	07	07	13	13	05	
-	.315	-	-	08	-	-	-	-	
3	3/8	09	11	09	09	16	16	06	
-	.394	-	-	10	-	-	-	-	
3.5	7/16	11	13	11	11	19	19	07	
-	.472	-	-	12	-	-	-	-	
4	1/2	12	15	12	12	22	22	08	
4.5	9/16	14	17	14	14	24	24	09	
5	5/8	16	19	15	15	27	27	10	
-	.630	-	-	16	-	-	-	-	
5.5	11/16	17	21	17	17	30	30	11	
6	3/4	19	23	19	19	33	33	13	
-	.787	-	-	20	-	-	-	-	
7	7/8	22	27	22	22	38	38	15	
-	.984	-	-	25	-	-	-	-	
8	1	25	31	25	25	44	44	17	
10	1-1/4	32	38	31	31	54	54	21	
-	1.260	-	-	32	-	-	-	-	

tolerance class	tolerance on "D"	tolerance on "B"	tolerance on "S"
C	±.0010"	±.0005"	±.001"
H	±.0005"	±.0005"	±.001"
E	±.0010"	±.0010"	±.001"
G	±.0010"	±.0010"	±.005"
M	See tables on the next page		±.005"
U	See tables on the next page		±.005"

By referencing this easy-to-use guide, you can identify the correct product to meet your needs.



CNMG432FP

3

Thickness
S

symbol inch	thickness inch
.5 (1)	1/32
.6	.040
1 (2)	1/16
1.2	5.64
1.5 (3)	3/32
2	1/8
2.5	5/32
3	3/16
3.5	7/32
4	1/4
5	5/16
6	3/8
7	7/16
18	1/2

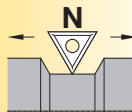
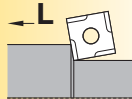
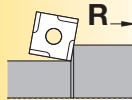
2

Corner Radius "Rε"

symbol inch	corner radius inch
X0	.0015
0	.004
.5	.008
1	1/64
2	1/32
3	3/64
4	1/16
5	5/64
6	3/32
7	7/64
8	1/8
-	round insert

Hand of Insert
(optional)

R = Right hand
L = Left hand
N = Neutral



Cutting Edge
(optional)

- F** Sharp
- E** Rounded
- T** Chamfered
- S** Chamfered and Rounded
- K** Double-Chamfered
- P** Double-Chamfered and Rounded

FP

Chipbreaker
(optional)

- F** = Sharp
- FF** = Fine Finishing
- FN** = Finishing Negative
- MN** = Medium Negative
- RN** = Roughing Negative
- UN** = Universal Medium
- FP** = Finishing Positive
- MP** = Medium Positive
- RP** = Roughing Positive
- RM** = Roughing Medium
- RH** = Roughing Heavy
- FW** = Finishing Wiper
- MW** = Medium Wiper
- FS** = Finishing Sharp
- MS** = Medium Sharp
- RW** = Roughing Wiper
- HP** = High Positive
- UP** = Universal Positive
- K** = Light-Feed Chip Control
- UF** = Ultra-Fine Finishing
- LF** = Light Finishing
- MF** = Medium Finishing
- E** = Hone Only
- T** = Negative Land
- S** = Negative Land Plus Hone
- MP-K** = Medium Positive
- MG-P** = Medium Positive

"D"	± Tolerance on "D"			
	Class M Tolerance		Class U Tolerance	
	Shapes S, T, C, R, & W	Shape D	Shape V	Shapes S, T, & C
inch	inch	inch	inch	inch
5/32	.002	-	-	-
3/16	.002	-	-	.003
7/32	.002	.002	.002	.003
1/4	.002	.002	.002	.003
5/16	.002	.002	.002	.003
3/8	.002	.002	.002	.003
7/16	.003	.003	.003	.005
1/2	.003	.003	.003	.005
9/16	.003	.003	.003	.005
5/8	.004	.004	.004	.007
11/16	.004	.004	.004	.007
3/4	.004	.004	.004	.007
7/8	.005	-	-	.010
1	.005	-	-	.010
1 1/4	.006	-	-	.010

"D"	± Tolerance on "B"			
	Class M Tolerance		Class U Tolerance	
	Shapes S, T, C, R, & W	Shape D	Shape V	Shapes S, T, & C
inch	inch	inch	inch	inch
5/32	.003	-	-	-
3/16	.003	-	-	.005
7/32	.003	.004	-	.005
1/4	.003	.004	-	.005
5/16	.003	.004	-	.005
3/8	.003	.004	.007	.005
7/16	.005	.006	-	-
1/2	.005	.006	.010	.008
9/16	.005	.006	-	-
5/8	.006	.007	-	.011
11/16	.006	.007	-	.011
3/4	.006	.007	-	.011
7/8	.006	-	-	.015
1	.007	-	-	.015
1 1/4	.008	-	-	.015

A system of grades, geometries, and application guidelines to provide optimal solutions for your metalcutting needs. It's easy to determine which Kennametal chip-control cutting tool will work best in your specific workpiece materials and applications!

■ **Grade • Beyond™**



K Brand	C Insert Material	P Primary Workpiece Material (ISO 513)	M Secondary Workpiece Material (optional)	25 Application Range	A Future Upgrades (optional)													
<p>K = Kennametal</p>	<p>Blank = Carbide, uncoated</p> <p>C = Carbide, coated</p> <p>T = Cermet</p> <p>Y = Ceramic</p> <p>D = PCD</p> <p>B = PCBN</p> <p>S = Steel</p>	<table border="1"> <tr><td>P</td><td>Steel</td></tr> <tr><td>M</td><td>Stainless Steel</td></tr> <tr><td>K</td><td>Cast Iron</td></tr> <tr><td>N</td><td>Non-Ferrous Materials</td></tr> <tr><td>S</td><td>High-Temp Alloys</td></tr> <tr><td>H</td><td>Hardened Materials</td></tr> <tr><td>U</td><td>Universal Machining</td></tr> </table>	P	Steel	M	Stainless Steel	K	Cast Iron	N	Non-Ferrous Materials	S	High-Temp Alloys	H	Hardened Materials	U	Universal Machining	<p>Hardest</p> <p>↑</p> <p>5 fine finishing</p> <p>10 finishing</p> <p>15 medium to roughing</p> <p>20</p> <p>25</p> <p>30 roughing</p> <p>35</p> <p>40</p> <p>45 heaviest roughing</p> <p>50</p> <p>↓</p> <p>Toughest</p>	<p>A = Generation 1</p> <p>B = Generation 2</p> <p>C = Generation 3</p> <p>etc.</p>
P	Steel																	
M	Stainless Steel																	
K	Cast Iron																	
N	Non-Ferrous Materials																	
S	High-Temp Alloys																	
H	Hardened Materials																	
U	Universal Machining																	

NOTE: Application range does not apply to PCBN grades.

■ **Grade • Kenna Perfect™**



K	C	9 Coating Type	2 Material Group	25 Wear Application Range/Toughness Range														
		<p>9 = CVD (Chemical Vapor Deposition)</p> <p>5 = PVD (Physical Vapor Deposition)</p>	<table border="1"> <tr><td>1 = P</td><td>Steel</td></tr> <tr><td>2 = M</td><td>Stainless Steel</td></tr> <tr><td>3 = K</td><td>Cast Iron</td></tr> <tr><td>4 = N</td><td>Non-Ferrous Materials</td></tr> <tr><td>5 = S</td><td>High-Temp Alloys</td></tr> <tr><td>6 = H</td><td>Hardened Materials</td></tr> <tr><td>0</td><td>Universal Machining</td></tr> </table>	1 = P	Steel	2 = M	Stainless Steel	3 = K	Cast Iron	4 = N	Non-Ferrous Materials	5 = S	High-Temp Alloys	6 = H	Hardened Materials	0	Universal Machining	<p>Hardest</p> <p>↑</p> <p>10 highly wear resistant</p> <p>to</p> <p>50 extremely tough</p> <p>↓</p> <p>Toughest</p>
1 = P	Steel																	
2 = M	Stainless Steel																	
3 = K	Cast Iron																	
4 = N	Non-Ferrous Materials																	
5 = S	High-Temp Alloys																	
6 = H	Hardened Materials																	
0	Universal Machining																	

NOTE: Application range does not apply to PCBN grades.

Positive Inserts



Screw-On Inserts

- Screw-On inserts are your first choice for I.D. turning of all materials and O.D. turning on small to medium lathes.
- Available in flat-top and chip-control geometries with both molded and ground peripheries. Suitable for all workpiece materials.

See pages:
Carbide: B88–B115
Superhard: B187–B197



Kendex™ and V-Bottom Inserts

- Kendex positive and V-bottom inserts are your first choice for productive machining of high-temperature alloys on medium to large lathes.
- Available in flat-top geometries with ground periphery.

See pages:
Carbide: B84–B87
Ceramic: B128–B130
Superhard: B185–B186

See pages B128–B129 for V-bottom product listing.



Top Notch™ Profiling Inserts

- First choice for high-production profiling.
- Unique insert clamping design offers superior rigidity.
- Available in chip-control geometries with both molded and ground peripheries. Suitable for all workpiece materials.

See pages F43–F48 for product listing.

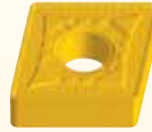


K-Lock™ Inserts

- K-Lock inserts are ideal for deep grooving and profiling.
- A unique insert clamping system allows for unimpeded chip flow.
- Available in molded and ground peripheries.

See page F61 for product listing.

Negative Inserts



Kenloc™ Inserts

- Kenloc inserts are your first choice for general machining of all materials on medium to large lathes.
- Kenloc inserts offer the best economy for high metal removal rates.
- Available in flat-top and chip-control geometries with both molded and ground peripheries. Suitable for all workpiece materials.

See pages:
Carbide: B40–B83
Ceramic: B118–B121
Superhard: B187–B197



Kendex Inserts

- Ceramic Kendex inserts are a great choice for productive machining of high-temp alloys.
- Kendex negative rake inserts are also recommended for the machining of hardened materials and cast irons.
- Available in flat-top geometries with molded and ground peripheries.
- Wide selection of standard toolholders are offered.

See pages B122–B127 for product listing.



Top Notch Turning Inserts

- Ceramic Top Notch Turning inserts are your first choice for high-speed roughing and finishing of cast iron parts.
- Available in flat-top geometries with molded and ground peripheries.

See pages B122–B127 for product listing.

Insert Selection System

How to Use


Kennametal's three-step insert selection system makes choosing and applying the most productive tool as easy as 1, 2, 3. Tool recommendations are based on six workpiece material groups, optimizing selection accuracy.

Example: Six workpiece material groups



■ Step 1 • Select the insert geometry

Given: depths of cut = .040" (1mm)
feed = .016 IPR (0,4mm)
Unknown: insert geometry
Solution: -MN

■ Step 2 • Select the grade

Given: cutting conditions:
lightly interrupted cut 
Geometry: -MN
Unknown: grade
Solution: KCP25

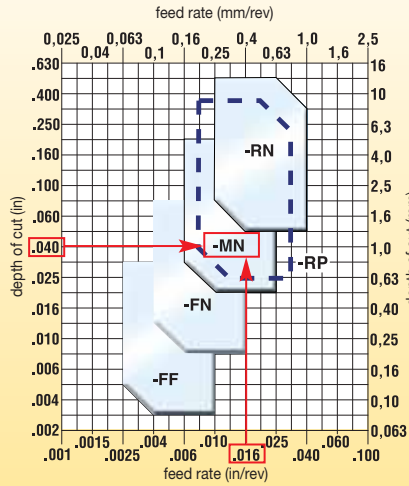
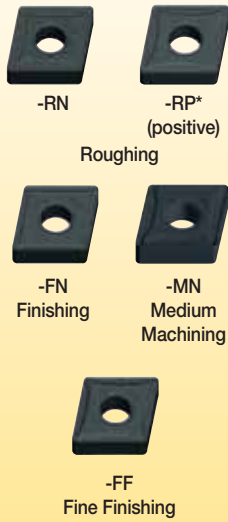
■ Step 3 • Select the cutting speed

Given: grade KCP25 
cutting conditions
AISI 1010 
Unknown: cutting speed
Solution: 925 SFM (280 m/min)

Need help in selecting a product?
Additional information can be obtained by contacting
Kennametal's Customer Application Support Team.
Go to www.kennametal.com for your country's phone number.

Step 1 • Select the insert geometry

Negative Inserts



*-RP – Supplemental geometry for high-strength materials

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous Materials
S	High-Temp Alloys
H	Hardened Materials



Step 2 • Select the grade

cutting condition	-FF	-FN	-MN	-RN	-RP	-11	-UF	-LF	-FP	-MF	-MP
heavily interrupted cut	KCP10	KCP25	KCP30	KCP30/KCP40	KCP30/KCP40	—	KC5010/KCP25	KCP25	KCU25/KCP25	KCP40	KCM25
lightly interrupted cut	KCP10	KCP25	KCP25	KCP30/KCP40	KCP30/KCP40	—	KC5010/KCP25	KCP25	KCP25	KCP25	KCP25
varying depth of cut, casting, or forging skin	KCP05/KT315	KCP10	KCP10	KCP30/KCP40	KCP30/KCP40	KT315	KCP10	KCP10	KCP10	KCP10	KCP10

Step 3 • Selecting the cutting speed

Low-Carbon (<0,3% C) and Free-Machining Steel		speed — m/min (SFM)									starting conditions	
material group	grade	135 (450)	180 (600)	225 (800)	275 (900)	320 (1050)	360 (1200)	410 (1350)	455 (1500)	495 (1650)	m/min	SFM
P1	KCP05/KTP10										435	1450
	KCP10										395	1320
	KCP25										275	925
	KCP30/KCP40										210	700

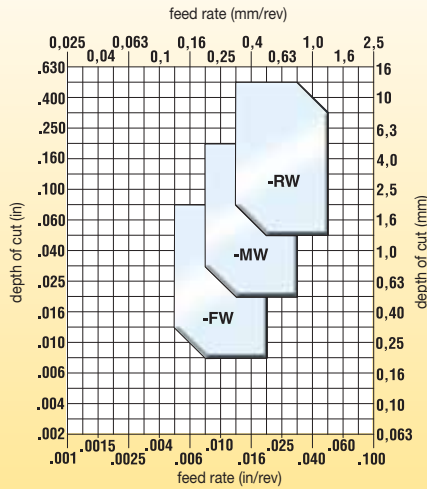
New Beyond™ Material Group Selection Guide:

To optimize speed recommendations, Beyond material subgroups have been added to each of the six workpiece material groups.

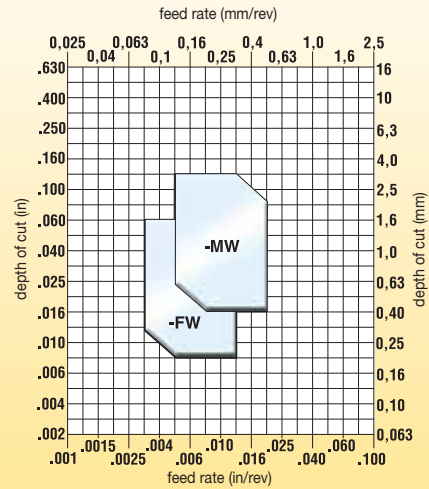
material	material group ISO code	number of material subgroups
steel	P	1-6
stainless steel	M	1-3
cast iron	K	1-3
non-ferrous materials	N	1-8
high-temp alloys	S	1-4
hardened materials	H	1

Step 1 • Select the insert geometry

Negative Wiper Inserts



Positive Wiper Inserts

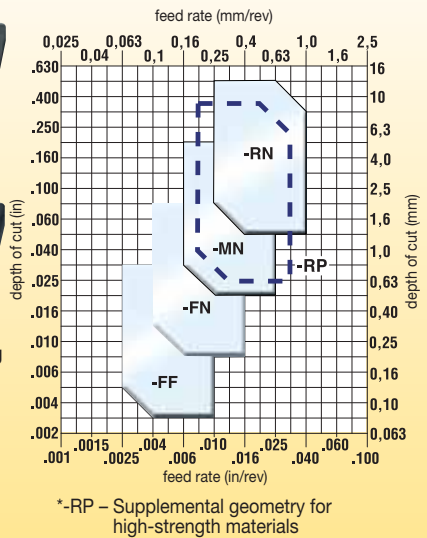
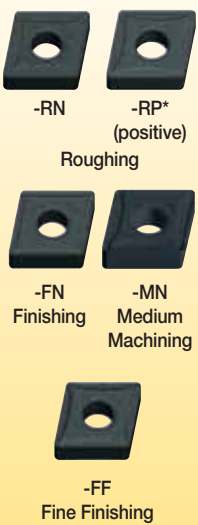


Step 2 • Select the grade

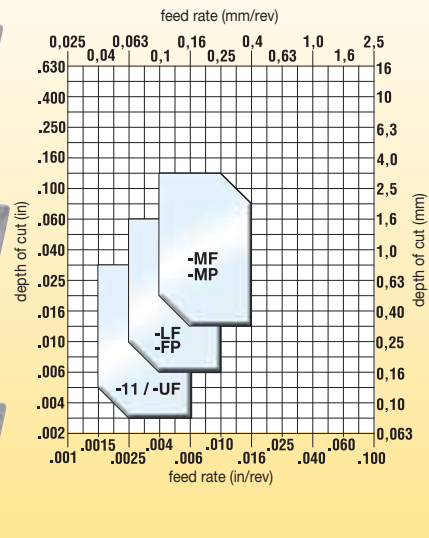
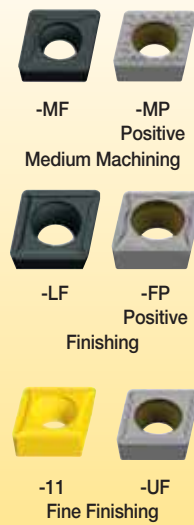
cutting condition	Negative Insert Geometry			Positive Insert Geometry	
	-FW	-MW	-RW	-FW	-MW
heavily interrupted cut	-	-	KCP25	-	KCP25
lightly interrupted cut	KCP10	KCP25	KCP25	KCP25	KCP25
varying depth of cut, casting, or forging skin	KCP05/KT315	KCP10	KCP10	KCP10/KCK20	KCP10/KCK20
smooth cut, pre-turned surface	KCP05/KT315	KCP05	KCP10	KCP10/KT315	KT315/KT315

Step 1 • Select the insert geometry

Negative Inserts



Positive Inserts



*-RP – Supplemental geometry for high-strength materials

Step 2 • Select the grade

cutting condition	-FF	-FN	-MN	-RN	-RP	-11	-UF	-LF	-FP	-MF	-MP
heavily interrupted cut	KCP10	KCP25	KCP30	KCP30/KCP40	KCP30/KCP40	—	KC5010/KCP25	KCP25	KCU25/KCP25	KCP40	KCM25
lightly interrupted cut	KCP10	KCP25	KCP25	KCP30/KCP40	KCP30/KCP40	—	KC5010/KCP25	KCP25	KCP25	KCP25	KCP25
varying depth of cut, casting, or forging skin	KCP05/KT315	KCP10	KCP10	KCP30/KCP40	KCP30/KCP40	KT315	KCP10	KCP10	KCP10	KCP10	KCP10
smooth cut, pre-turned surface	KCP05/KT315	KCP05	KCP05	KCP30/KCP40	KCP30/KCP40	KT315	KCP05	KCP05/KT315	KCP05/KTP10	KCP05	KCP05

Step 3 • Select the cutting speed
Low-Carbon (<0.3% C) and Free-Machining Steel

		speed — m/min (SFM)									starting conditions	
material group	grade	135 (450)	180 (600)	225 (800)	275 (900)	320 (1050)	360 (1200)	410 (1350)	455 (1500)	495 (1650)	m/min	SFM
P0/P1	KCP05/KTP10									◇	435	1450
	KCP10								◇		395	1320
	KCP25				◇						275	925
	KCP30/KCP40	◇									210	700
	KT315									◇	440	1450
	KCU10/KC5010			◇							280	925

Medium- and High-Carbon Steels (>0.3% C)

		speed — m/min (SFM)									starting conditions	
material group	grade	135 (450)	180 (600)	225 (800)	275 (900)	320 (1050)	360 (1200)	410 (1350)	455 (1500)	495 (1650)	m/min	SFM
P2	KCP05/KTP10				◇						240	800
	KCP10				◇						265	880
	KCP25		◇								195	650
	KCP30/KCP40	◇									150	500
	KT315				◇						270	880
	KCU10/KC5010		◇								200	650

Alloy Steels and Tool Steels (≤330 HB) (≤35 HRC)

		speed — m/min (SFM)									starting conditions	
material group	grade	135 (450)	180 (600)	225 (800)	275 (900)	320 (1050)	360 (1200)	410 (1350)	455 (1500)	495 (1650)	m/min	SFM
P3	KCP05/KTP10			◇							205	680
	KCP10		◇								190	630
	KCP25		◇								155	510
	KCP30/KCP40	◇									120	400
	KT315			◇							210	680
	KCU10/KC5010		◇								155	510

Alloy Steels and Tool Steels (340–450 HB) (36–48 HRC)

		speed — m/min (SFM)									starting conditions	
material group	grade	60 (200)	90 (300)	120 (400)	150 (500)	180 (600)	210 (700)	240 (800)	270 (900)	300 (1000)	m/min	SFM
P4	KCP05/KTP10				◇						160	530
	KCP10				◇						145	480
	KCP25			◇							105	360
	KCP30/KCP40	◇									95	325
	KT315				◇						210	530
	KCU10/KC5010			◇							110	360

Ferritic, Martensitic, and PH Stainless Steels (≤330 HB) (≤35 HRC)

		speed — m/min (SFM)									starting conditions	
material group	grade	120 (400)	150 (500)	180 (600)	210 (700)	240 (800)	270 (900)	300 (1000)	330 (1100)	360 (1200)	m/min	SFM
P5	KCP05/KTP10					◇					240	800
	KCP10					◇					215	720
	KCP25			◇							195	650
	KCP30/KCP40	◇									135	450
	KT315					◇					250	800
	KCU10/KC5010				◇						200	660

Ferritic, Martensitic, and PH Stainless Steels (340–450 HB) (36–48 HRC)

		speed — m/min (SFM)									starting conditions	
material group	grade	105 (350)	135 (450)	165 (550)	195 (650)	225 (750)	255 (850)	285 (950)	315 (1050)	345 (1150)	m/min	SFM
P6	KCP05/KTP10					◇					200	660
	KCP10				◇						180	600
	KCP25			◇							150	500
	KCP30/KCP40	◇									105	350
	KT315					◇					200	660
	KCU10/KC5010			◇							150	500

Step 1 • Select the insert geometry



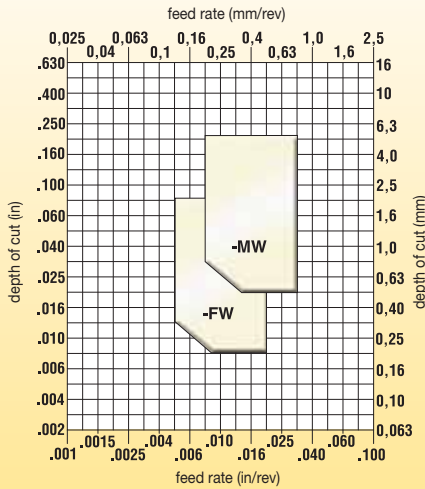
Negative Wiper Inserts



-MW
Medium Wiper



-FW
Finishing Wiper



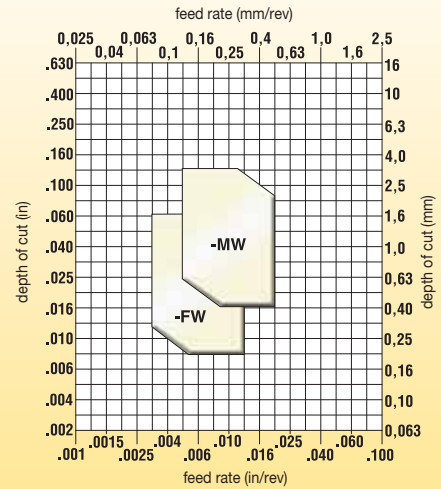
Positive Wiper Inserts



-MW
Medium Wiper



-FW
Finishing Wiper



Step 2 • Select the grade

cutting condition	Negative Insert Geometry		Positive Insert Geometry	
	-FW	-MW	-FW	-MW
heavily interrupted cut	—	—	—	—
lightly interrupted cut	KCM15	KCM25	KCM15	KCM15
varying depth of cut, casting, or forging skin	KCM15/KCU10/KC5010	KCM15	KCU10/KC5010	KCU10/KC5010
smooth cut, pre-turned surface	KCM15/KT315	KCM15	KT315	KT315

Step 1 • Select the insert geometry



Negative Inserts



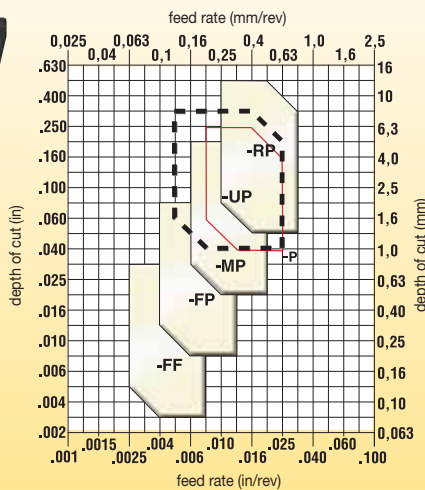
-RP **-P**
Roughing



-MP **-UP**
Medium Machining



-FP **-FF**
Finishing



Positive Inserts



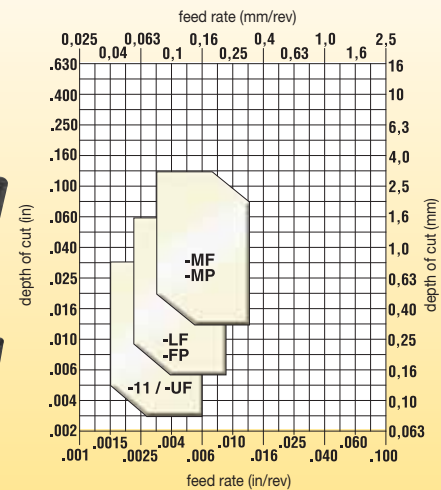
-MP
Medium Machining



-LF **-GT-LF**
Finishing



-11 **-UF**
Fine Finishing



Step 2 • Select the grade

cutting condition	Negative Insert Geometry			
	-FF	-FP	-MP/-UP	-P/-RP
heavily interrupted cut	KCU10/KC5010	KCM15	KCM35	KCM35
lightly interrupted cut	KCU10/KC5010	KCM15	KCM25	KCM25
varying depth of cut, casting, or forging skin	KT315	KCM15/KC5010	KCM15	KCM15/KCM25
smooth cut, pre-turned surface	KT315	KCM15/KT315	KCM15/KU10	KCU10

(continued)

Step 2 • Select the grade *(continued)*

cutting condition	Positive Insert Geometry					
	-11	-UF	-LF	-MP/-MF	-FP	
heavily interrupted cut	⚙️	—	KCU25/KC5025	KCM35	KCM25	KCU25/KCM25
lightly interrupted cut	⚙️	—	KCU10/KC5010	KCM25	KCM25	KCM15
varying depth of cut, casting, or forging skin	⊙	KT315	—	KCM15/KCU10	KCM15	KCU10
smooth cut, pre-turned surface	⊙	KT315	—	KCM15/KT315	KCM15	KTP10

Step 3 • Select the cutting speed

Austenitic Stainless Steel speed — m/min (SFM) ▶◀ starting conditions ▶◀

material group	grade	90 (300)	135 (450)	180 (600)	225 (800)	270 (900)	315 (1050)	360 (1200)	405 (1350)	450 (1500)	m/min	SFM
M1	KCM15			▶◀							180	600
	KCM25		▶◀								150	500
	KCM35		▶◀								120	400
	KT315				▶◀						230	750
	KCU10/KC5010				▶◀						215	700
	KCU25/KC5025			▶◀							180	550

Austenitic Stainless Steel speed — m/min (SFM) ▶◀ starting conditions ▶◀

material group	grade	90 (300)	135 (450)	180 (600)	225 (800)	270 (900)	315 (1050)	360 (1200)	405 (1350)	450 (1500)	m/min	SFM
M2	KCM15			▶◀							165	550
	KCM25		▶◀								140	450
	KCM35		▶◀								105	350
	KT315				▶◀						215	700
	KCU10/KC5010				▶◀						200	650
	KCU25/KC5025			▶◀							165	500

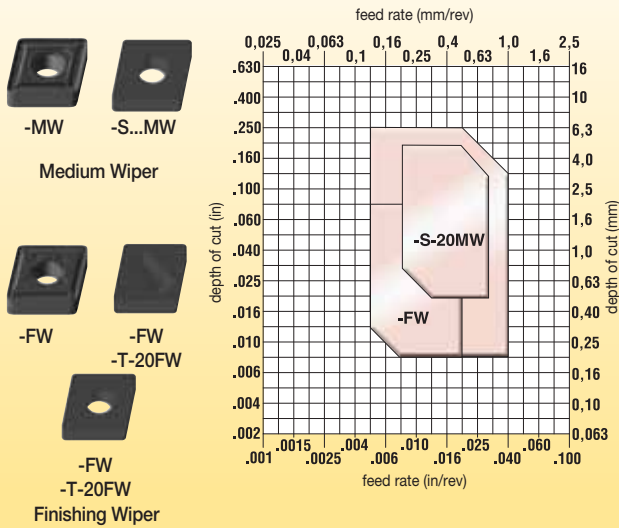
Austenitic Stainless Steel: Duplex (Ferritic and Austenitic Mixture) speed — m/min (SFM) ▶◀ starting conditions ▶◀

material group	grade	90 (300)	135 (450)	180 (600)	225 (800)	270 (900)	315 (1050)	360 (1200)	405 (1350)	450 (1500)	m/min	SFM
M3	KCM15			▶◀							150	500
	KCM25		▶◀								120	400
	KCM35		▶◀								90	300
	KT315				▶◀						200	650
	KCU10/KC5010				▶◀						185	600
	KCU25/KC5025			▶◀							150	450

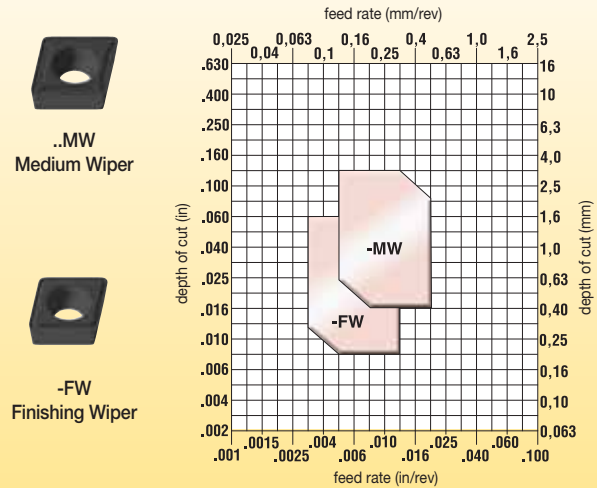
Step 1 • Select the insert geometry



Negative Wiper Inserts



Positive Wiper Inserts



Step 2 • Select the grade

Gray Iron

cutting condition	Negative Insert Geometry			Positive Insert Geometry	
	-FW	-T-20FW	-S...MW...	-FW	-MW
heavily interrupted cut	⊖	KY3500	KB1345	—	KCK20
lightly interrupted cut	⊕	KY3500	KB1345	KCK20	KCK20
varying depth of cut, casting, or forging skin	⊙	KYK10	KB1345	KCK20	KCK20
smooth cut, pre-turned surface	⊗	KYK25	KB1345	KCK20/KT315	KT315/KCK20

Ductile Iron

cutting condition	Negative Insert Geometry		Positive Insert Geometry	
	-FW	-T-20FW-	-FW	-MW
heavily interrupted cut	⊖	—	—	—
lightly interrupted cut	⊕	KY3500	KCK20	KCK20
varying depth of cut casting, or forging skin	⊙	KYK10	KCK20	KCK20
smooth cut, pre-turned surface	⊗	KYK25	KCK20/KT315	KCK20/KT315

■ Step 3 • Select the cutting speed

Gray Cast Iron

		speed — m/min (SFM)									starting conditions ◀	
material group	grade	60 (200)	150 (500)	240 (800)	330 (1100)	420 (1400)	510 (1700)	600 (2000)	690 (2300)	780 (2600)	m/min	SFM
K1	KCK05										450	1500
	KCK15										360	1200
	KCK20										300	1000
	KT315										275	900

Ductile, Compacted Graphite, and Malleable Cast Irons (<80 KSI tensile strength)

		speed — m/min (SFM)									starting conditions ◀	
material group	grade	60 (200)	150 (500)	240 (800)	330 (1100)	420 (1400)	510 (1700)	600 (2000)	690 (2300)	780 (2600)	m/min	SFM
K2	KCK05										360	1200
	KCK15										270	900
	KCK20										240	800
	KT315										275	900

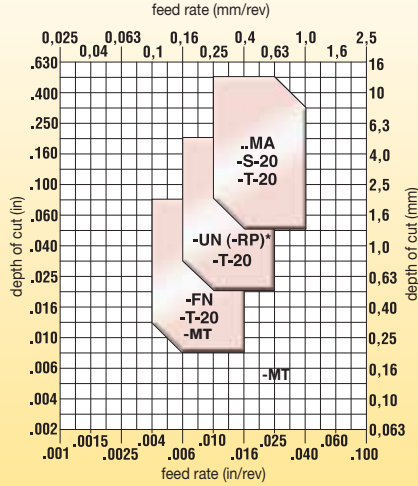
Ductile, Compacted Graphite, and Malleable Cast Irons (>80 KSI tensile strength)

		speed — m/min (SFM)									starting conditions ◀	
material group	grade	60 (200)	150 (500)	240 (800)	330 (1100)	420 (1400)	510 (1700)	600 (2000)	690 (2300)	780 (2600)	m/min	SFM
K3	KCK05										240	800
	KCK15										215	725
	KCK20										210	700
	KT315										230	750

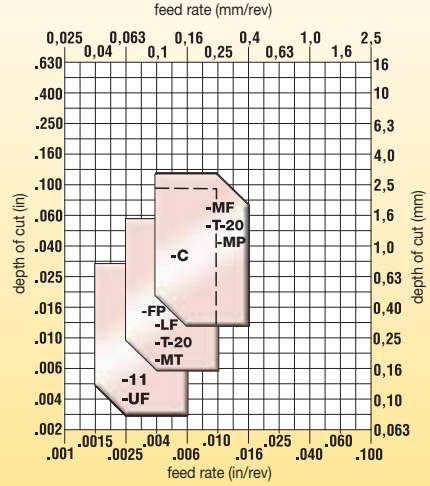
Step 1 • Select the insert geometry



Negative Inserts



Positive Inserts



* Geometry can be used in medium machining operations to reduce tool pressure in high-strength metals.

Step 2 • Select the grade

Carbide Grades

Gray Iron

cutting condition	Negative Insert Geometry			Positive Insert Geometry				
	-FN	-UN(-RP)	-MA	-LF	-FP	-MF	-MP	-MW
heavily interrupted cut	⚙️ KCK15	KCK20	KCK20	KCK20	KCK20	KCK20	KCK20	KCK20
lightly interrupted cut	⚙️ KCK15	KCK20	KCK20	KCK20	KCK20	KCK20	KCK20	KCK20
varying depth of cut, casting, or forging skin	⊙ KCK05/KT315	KCK15	KCK15	KCK15	KCK20	KCK15	KCK20	KCK20
smooth cut, pre-turned surface	⊙ KCK05/KT315	KCK05	KCK05	KCK05	KCK20	KCK15	KCK20	KCK20

Ductile Iron

cutting condition	Negative Insert Geometry			Positive Insert Geometry					
	-FN	-UN(-RP)	-MA	-11/-UF	-LF	-MF	-FP	-MP	-MW
heavily interrupted cut	⚙️ KCK15	KCK20	KCK20	—	KCK20	KCK20	KCK20	KCK20	KCK20
lightly interrupted cut	⚙️ KCK15	KCK20	KCK20	⊙ KCU10/KC5010	KCK20	KCK20	KCK20	KCK20	KCK20
varying depth of cut, casting, or forging skin	⊙ KCK05/KT315	KCK15	KCK15	⊙ KCU10/KC5010	KCK15	KCK15	KCK20	KCK20	KCK20
smooth cut, pre-turned surface	⊙ KCK05/KT315	KCK05	KCK05	⊙ KT315	KCU10/KC5010	KCK15	KCK20	KCK20	KCK20

(continued)

■ Step 2 • Select the grade *(continued)*
Ceramic and PCBN Grades
Gray Iron
Negative Insert Geometry

cutting condition	-T-20		-T-20		-T-20
	Finishing	MT	Medium	Roughing	-S20
heavily interrupted cut	KY3500	KCK20	KY3500	KY3500	KB1340
lightly interrupted cut	KY3500	KB1345	KYK10	KY3500	KB1340
varying depth of cut, casting, or forging skin	KYK10	KB1345	KYK10	KYK10	KB1340
smooth cut, pre-turned surface	KYK25	KB1345	KYK25	KYK25	KB1340

Positive Insert Geometry

cutting condition	-T-20		-T-20	C	
	Fine Finishing	Medium	MT	C	
heavily interrupted cut	—	KY3500	KB1630/KB1345	KB1630/KB1345	
lightly interrupted cut	—	KY3500	KB1630/KB1345	KB1630/KB1345	
varying depth of cut, casting, or forging skin	KY3500	KY3500	KB1630/KB1345	KB1630/KB1345	
smooth cut, pre-turned surface	KY3500	KY3500	KB1630/KB1345	KB1630/KB1345	

Ductile Iron
Negative Insert Geometry
Positive Insert Geometry

cutting condition	-T-20			-T-20		
	Finishing	Medium	Roughing	Fine Finishing	Finishing	Medium
heavily interrupted cut	—	KY3500	KY3500	—	KY3500	KY3500
lightly interrupted cut	—	KYK25	KYK25	—	KYK25	KYK25
varying depth of cut, casting, or forging skin	KYK25	KYK25	KYK25	KYK25	KYK25	KYK25
smooth cut, pre-turned surface	KYK25	KYK25	KYK25	KYK25	KYK25	KYK25

■ Step 3 • Select the cutting speed *(Optimal speed depends on casting quality and disposition.)*
Gray Cast Iron

material group	grade	speed — m/min (SFM)											starting conditions		
		60 (200)	180 (600)	305 (1000)	430 (1400)	550 (1800)	675 (2200)	800 (2600)	920 (3000)	1040 (3400)	1160 (3800)	m/min	SFM		
K1	KT315													275	900
	KB1340/KB1345													760	2500
	KYK25													760	2500
	KY3500													760	2500
	KYK10													760	2500
	KCK05													450	1500
	KCK15													360	1200
	KCK20													300	1000

Ductile, Compacted Graphite, and Malleable Cast Irons (<600 MPa tensile strength)

material group	grade	speed — m/min (SFM)												starting conditions	
		90 (300)	135 (450)	180 (600)	225 (750)	275 (900)	320 (1050)	360 (1200)	410 (1350)	460 (1500)	500 (1650)	550 (1800)	600 (1950)	m/min	SFM
K2	KT315													275	900
	KCU10/KC5010													200	650
	KYK25													430	1400
	KY3500													365	1200
	KYK10													365	1200
	KCK05													360	1200
	KCK15													270	900
	KCK20													240	800

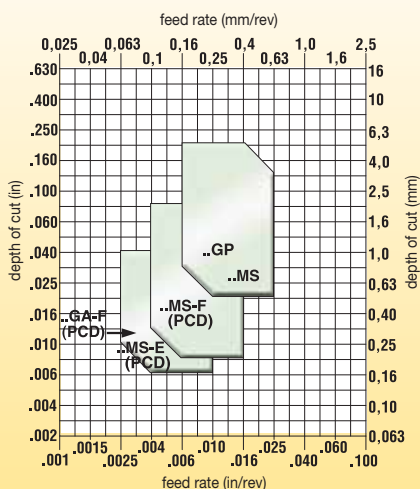
Ductile, Malleable, and Austempered Cast Irons (>600 MPa tensile strength)

material group	grade	speed — m/min (SFM)												starting conditions	
		90 (300)	135 (450)	180 (600)	225 (750)	275 (900)	320 (1050)	360 (1200)	410 (1350)	460 (1500)	500 (1650)	550 (1800)	600 (1950)	m/min	SFM
K3	KT315													230	750
	KCU10/KC5010													150	500
	KYK25													365	1200
	KCK05													240	800
	KCK15													215	725
	KCK20													210	700

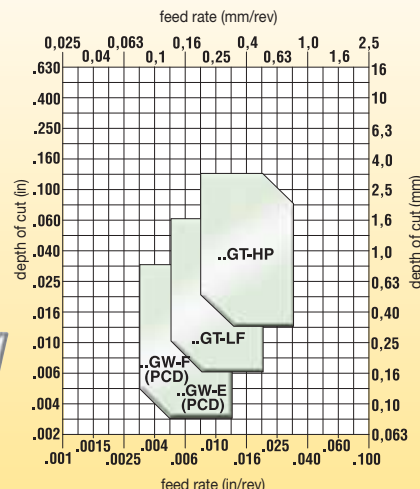
Step 1 • Select the insert geometry



Negative Wiper Inserts



Positive Wiper Inserts



Step 2 • Select the grade

cutting condition	Negative Insert Geometry				Positive Insert Geometry				
	..GA-E (PCD)	..MS-E (PCD)	..GA-F (PCD)	..GP	..MS	..GW-E (PCD)	..GW-F (PCD)	..GT-LF	..GT-HP
heavily interrupted cut	—	—	KD1400	KC5410/K313	KC5410	—	KD1400	—	KC5410
lightly interrupted cut	KD1405	KD1405	KD1400	KC5410/K313	KC5410	KD1405	KD1400	KC5410	KC5410
varying depth of cut, casting, or forging skin	KD1405	KD1405	KD1425	KC5410/K313	KC5410	KD1405	KD1425	KC5410	KC5410
smooth cut, pre-turned surface	KD1405	KD1405	KD1425	KC5410/K313	KC5410	KD1405	KD1425	KC5410	KC5410

Step 3 • Select the cutting speed

Low-Silicon Aluminum Alloys

(hypoeutectic <12.2% Si) and Magnesium Alloys

material group	grade	speed — m/min (SFM)									starting conditions	
		250 (800)	500 (1600)	750 (2400)	1000 (3200)	1250 (4000)	1500 (4800)	1750 (5600)	2000 (6400)	2250 (7200)	2500 (8000)	m/min	SFM
N2	KC5410	◀▶									550	1800
	KD1400	◀▶									765	2500

High-Silicon Aluminum Alloys

(hypereutectic >12.2% Si) and Magnesium Alloys

material group	grade	speed — m/min (SFM)				starting conditions	
		250 (800)	500 (1600)	750 (2400)	1000 (3200)	m/min	SFM
N3	KD1405	◀▶				580	2000
	KD1425	◀▶				520	1700

■ Additional Cutting Speed Recommendations for Miscellaneous Workpiece Materials

Copper-, Brass-, Zinc-Based on a Machinability Index Range of 70–100

speed — m/min (SFM)

starting conditions ◊

material group	grade	250 (800)	500 (1600)	750 (2400)	1000 (3200)	m/min	SFM
N4	KD1400/ KD1405		◊			520	1700
	KD1425	◊				500	1600
	KC5410	◊				275	900
	K313	◊				260	850

Nylon, Plastics, Rubbers, Phenolics, Resins, Fiberglass, and Glass

speed — m/min (SFM)

starting conditions ◊

material group	grade	250 (800)	500 (1600)	750 (2400)	1000 (3200)	m/min	SFM
N5	KD1400/ KD1405		◊			400	1300
	KD1425	◊				365	1200
	KC5410	◊				170	550

Carbon and Graphite Composites:

Brush Alloys, Kevlar, and Graphite (280–400 HB) (30–43 HRC)

speed — m/min (SFM)

starting conditions ◊

material group	grade	250 (800)	500 (1600)	750 (2400)	1000 (3200)	m/min	SFM
N6	KD1400/ KD1405			◊		760	2500
	KC5410	◊				200	650

MMCs (Aluminum-Based Metal Matrix Composites)

speed — m/min (SFM)

starting conditions ◊

material group	grade	250 (800)	500 (1600)	750 (2400)	1000 (3200)	m/min	SFM
N7	KD1405		◊			460	1500
	KD1400		◊			365	1200

Tin Alloys, Cast: ASTM 823, Alloys 1, 2, 3, 11

speed — m/min (SFM)

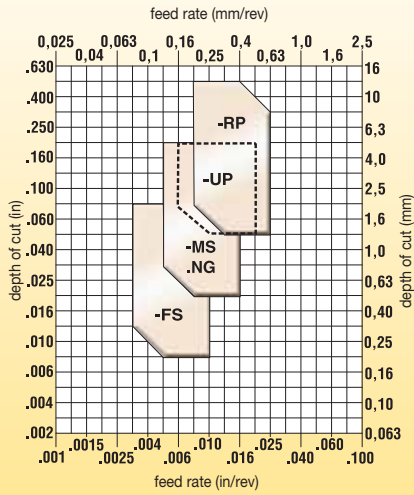
starting conditions ◊

material group	grade	250 (800)	500 (1600)	750 (2400)	1000 (3200)	m/min	SFM
N	KC5410	◊				215	700
	K313	◊				180	600

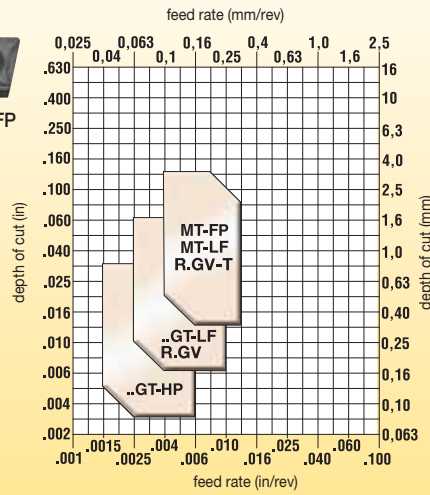
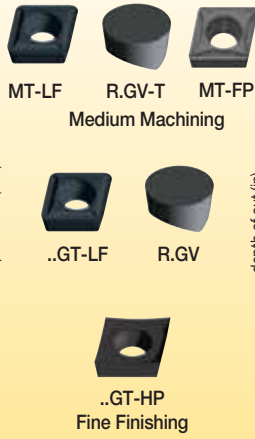
Step 1 • Select the insert geometry



Negative Inserts



Positive Inserts



Step 2 • Select the grade

Negative Insert Geometry

cutting condition	-FS	.NG	-MS	-UP	-RP
heavily interrupted cut	⚙️ KCU25/KC5525	—	KCU25/KC5525	KCM35	KCM25/KCM35
lightly interrupted cut	⦿ KCU10/KC5510	KYS30/KY1540	KCU25/KC5525	KCM25	KCM15KC5525
varying depth of cut, casting, or forging skin	⦿ KCU10/KC5510	KYS30/KY1540/ KYS25/KY4300	KCU10/KC5510	KCM15	KCU25/KC5525
smooth cut, pre-turned surface	⦿ KCU10/KC5510/ K313	KYS25/KY4300	KCU10/KC5510 K313	KCU10/KC5510	KCU10/KC5510

Positive Insert Geometry

cutting condition	-FP	..GT-HP	MT-LF	R.GV-T	..GT-LF	R.GV
heavily interrupted cut	⚙️ KCU25	—	KCU25/KC5025	—	KCU25/KC5025	—
lightly interrupted cut	⦿ KCU25	KCU25/KC5025	KCU25/KC5025	KYS30/KY1540	KCU25/KC5025	KYS30/KY1540
varying depth of cut, casting, or forging skin	⦿ KCU10/KU10	KCU10/KC5510	KCU10/KC5510	KYS30/KY1540/ KYS25/KY4300	KCU10/KC5510	KYS30/KY1540/ KYS25/KY4300
smooth cut, pre-turned surface	⦿ KCU10/KU10	KCU10/KC5510 K313	KCU10/KC5510 K313	KYS25/KY4300	KCU10/KC5510 K313	KYS25/KY4300

■ Step 3 • Select the cutting speed

Iron-Based, Heat-Resistant Alloys (135–320 HB) (≤34 HRC) speed — m/min (SFM) starting conditions

material group	grade	15 (50)	45 (150)	75 (250)	105 (350)	140 (450)	170 (550)	200 (650)	230 (750)	260 (850)	290 (950)	310 (1050)	350 (1150)	380 (1250)	m/min	SFM
S1	K313/KU10	◀▶													30	100
	KCU10/KC5510/KC5010	◀▶													55	180
	KCU25/KC5525/KC5025	◀▶													40	125
	KYS25/KY4300							◀▶							200	650
	KYS30/KY1540						◀▶								170	550
	KCM15		◀▶												55	180
	KCM25/KCM35	◀▶													40	125

Cobalt-Based, Heat-Resistant Alloys (150–425 HB) (≤45 HRC) speed — m/min (SFM) starting conditions

material group	grade	15 (50)	45 (150)	75 (250)	105 (350)	140 (450)	170 (550)	200 (650)	230 (750)	260 (850)	290 (950)	310 (1050)	350 (1150)	380 (1250)	m/min	SFM
S2	K313/KU10	◀▶													35	110
	KC5510/KC5010	◀▶													60	195
	KC5525/KC5025	◀▶													30	100
	KYS25/KY4300							◀▶							220	720
	KYS30/KY1540						◀▶								185	600
	KCM15		◀▶												60	195
	KCM25/KCM35	◀▶													30	100

Nickel-Based, Heat-Resistant Alloys (140–475 HB) (≤48 HRC) speed — m/min (SFM) starting conditions

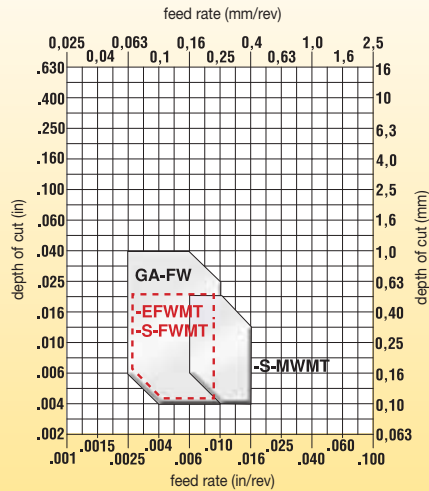
material group	grade	15 (50)	45 (150)	75 (250)	105 (350)	140 (450)	170 (550)	200 (650)	230 (750)	260 (850)	290 (950)	310 (1050)	350 (1150)	380 (1250)	m/min	SFM
S3	K313/KU10	◀▶													40	125
	KCU10/KC5510/KC5010	◀▶													70	225
	KCU25/KC5525/KC5025	◀▶													40	125
	KYS25/KY4300							◀▶							250	820
	KYS30/KY1540						◀▶								215	700
	KCM15		◀▶												70	225
	KCM25/KCM35	◀▶													40	125

Titanium and Titanium Alloys (110–450 HB) (≤48 HRC) speed — m/min (SFM) starting conditions

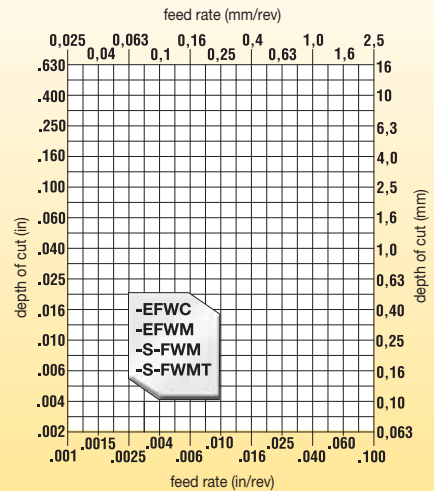
material group	grade	15 (50)	45 (150)	75 (250)	105 (350)	140 (450)	170 (550)	200 (650)	230 (750)	260 (850)	290 (950)	310 (1050)	350 (1150)	380 (1250)	m/min	SFM
S4	K313/KU10	◀▶													45	150
	KC5510/KC5010/KC9225	◀▶													70	225
	KC5525/KC50225/KC9240	◀▶													55	175
	KCM15		◀▶												70	225
	KCM25/KCM35	◀▶													55	175

Step 1 • Select the insert geometry

Negative Wiper Inserts



Positive Wiper Inserts

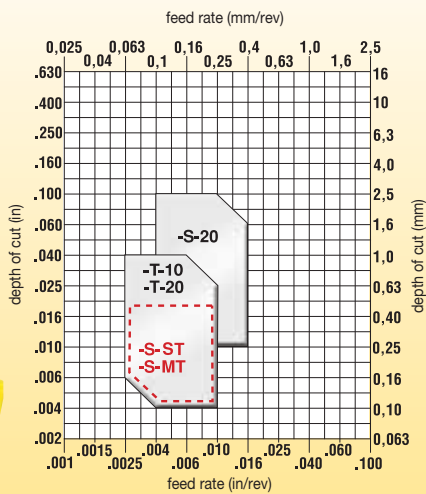
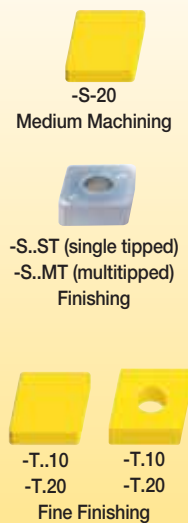


Step 2 • Select the grade

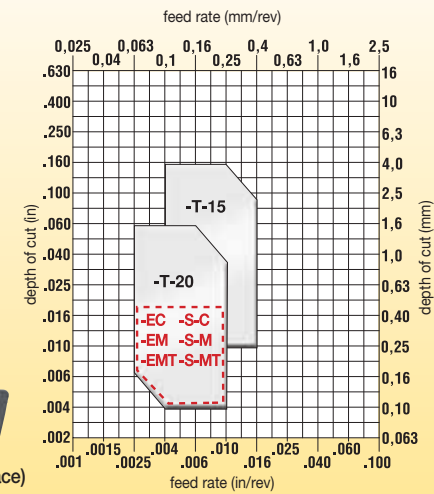
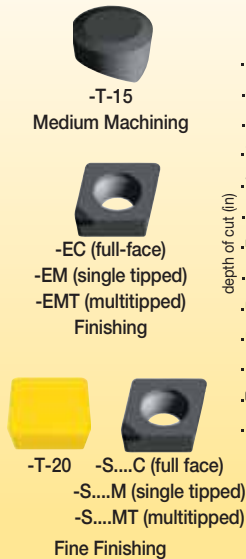
cutting condition	Negative Insert Geometry			Positive Insert Geometry		
	GA-FW	-S..FWMT	-EFWMT	-S..FWMT	-S..FWM	-EFWC
heavily interrupted cut	—	KB5630	KB1625	—	—	—
lightly interrupted cut	—	KB1610/KB5610	KB5625	KB5610	KB1610	KB5610
varying depth of cut, casting, or forging skin	KY4400	KB1610/KB5610	KB1610/KB5610	KB5610	KB1610	KB5610
smooth cut, pre-turned surface	KY4400	KB5610	KB5610	KB5610	KB5610	KB5610

Step 1 • Select the insert geometry

Negative Inserts



Positive Inserts



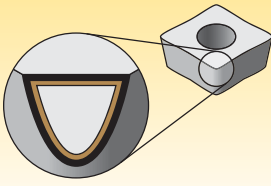
Step 2 • Select the grade

cutting condition	Negative Insert Geometry				Positive Insert Geometry		
	-T-10	-S..ST	-S..MT	-S-20	-S..C/-S..M	-EC/-EM	-T-15
heavily interrupted cut	—	KB1630/KB5630	KB1340	KB1630/KB5630	—	KB1630/KB5630	—
lightly interrupted cut	—	KB1625/KB5625	KB1340	KB1625/KB5625	KY4400	KB1625/KB5625	KY1615
varying depth of cut, casting, or forging skin	KY1615/KY4400	KB1625/KB5625	—	KB1625/KB5625	KY4400	KB1625/KB5625	KY1615
smooth cut, pre-turned surface	KY1615/KY4400	KB1610/KB5610	—	KB1610/KB5610	KY4400	KB1610/KB5610	KY1615

■ Step 3 • Select the cutting speed

material group	grade	speed — m/min (SFM)									starting conditions		
		15 (50)	45 (150)	75 (250)	110 (350)	140 (450)	170 (550)	200 (650)	230 (750)	260 (850)	m/min	SFM	
H1	KY4400					◇						135	450
	KY1615				◇							100	325
	KB1610					◇						140	460
	KB1625				◇							110	360
	KB1630			◇								90	295
	KB5610					◇						150	490
	KB5625				◇							120	400
	KB5630				◇							105	345

Inserts

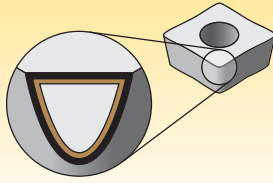


Coatings provide high-speed capability and are engineered for finishing to heavy roughing.

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous Materials
S	High-Temp Alloys
H	Hardened Materials

wear resistance ← → toughness

Coating		Grade Description	05	10	15	20	25	30	35	40	45	
Uncoated Carbide Grades	KU10 C3	Composition: A hard, low binder content, WC/Co fine-grain grade. Application: The KU10 grade has excellent abrasion resistance for machining cast irons, austenitic stainless steels, non-ferrous metals, non-metals, and most high-temperature alloys. Use as a general-purpose grade for non-ferrous materials.	M									
			K									
	N											
	S											
			beyond									
	K313 C3-C4	Composition: A hard, low binder content, unalloyed WC/Co fine-grain grade. Application: Exceptional edge wear resistance combined with very high strength for machining titanium, cast irons, austenitic stainless steels, non-ferrous metals, non-metals, and most high-temp alloys. Superior thermal deformation and depth-of-cut notch resistance. The grain structure is well controlled for minimal pits and flaws, which contributes to long, reliable service.	M									
K												
N												
S												
		beyond										
K68 C3	Composition: A hard, low binder content, alloyed grade WC/Co fine-grain grade. Application: The K68 grade has excellent abrasion resistance for machining cast irons, austenitic stainless steels, non-ferrous metals, non-metals, and as an alternative to the K313 grade on most high-temperature alloys. Use as a general-purpose grade for non-ferrous materials.	M										
		K										
N												
S												
		beyond										
PVD-Coated Carbide Grades	KCU10 C3-C4	Composition: An advanced multilayer PVD coating over a very deformation-resistant unalloyed carbide substrate. The new and improved coating improves edge stability with wide range speed and feed capabilities. Application: The KCU10 grade is ideal for finishing to general machining of most workpiece materials at a wide range of speed and feed capabilities. Excellent for machining most steels, stainless steels, cast irons, non-ferrous materials, and super alloys with improved edge toughness and higher cutting speed/feed capability.	P									
			M									
	K											
	N											
	S											
			beyond									
	KCU25 C2, C6	Composition: An advanced PVD grade with hard AlTiN coating and fine-grain unalloyed substrate. The new and improved coating improves edge stability with wide range speed and feed capabilities. Application: The KCU25 grade is ideal for general machining of most steels, stainless steels, high-temp alloys, titanium, irons, and non-ferrous materials in a wide range of speeds and feeds with improved edge toughness for interrupted cut and high feed rates.	P									
M												
K												
N												
S												
		beyond										
KC5010 C3-C4	Composition: An advanced PVD AlTiN coating over a very deformation-resistant unalloyed carbide substrate. The new and improved coating enables speeds to be increased by 50–100%. Application: The KC5010 grade is ideal for finishing to general machining of most workpiece materials at higher speeds. Excellent for machining most steels, stainless steels, cast irons, non-ferrous materials, and super alloys under stable conditions. It also performs well machining hardened and short chipping materials.	P										
		M										
K												
N												
S												
		beyond										
		H										



Coatings provide high-speed capability and are engineered for finishing to heavy roughing.

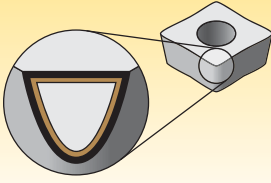
P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous Materials
S	High-Temp Alloys
H	Hardened Materials

wear resistance ← → toughness

Coating	Grade Description	Performance Matrix												
		05	10	15	20	25	30	35	40	45				
PVD-Coated Carbide Grades KC5025 C2, C6	Composition: An advanced PVD-AlTiN-coated grade with a tough, fine-grain unalloyed substrate. Application: For general-purpose machining of most steels, stainless steels, high-temp alloys, titanium, irons, and non-ferrous materials. Speeds may vary from low to medium and will handle interruptions and high feed rates.	P												
		M												
		K												
		N												
		S												
 KC5410 C3-C4	Composition: A PVD TiB ₂ coating over a very deformation-resistant unalloyed substrate. Application: Designed for roughing, semi-finishing, and finishing of free machining (hypoeutectic <12.2% Si) aluminum, aluminum alloys, and magnesium alloys. The TiB ₂ coating is harder than TiN and TiAlN coatings and has an extremely smooth surface, resulting in reduced surface friction, speedy chip flow, and outstanding wear resistance. Built-up edge is prevented because this coating has a very low affinity for aluminum. The substrate is unalloyed and fine grained and offers sharp edges, smooth surfaces, and excellent thermal deformation resistance and edge integrity. Inserts with a ground periphery are polished before coating and have a sharp edge. Molded inserts have a light hone.													
		N												
 KC5510 C3-C4	Composition: An advanced PVD AlTiN-coated fine-grain tungsten carbide grade. Application: The KC5510 grade is specifically engineered for the productive machining of high-temp alloys. The fine-grain tungsten carbide 6% cobalt substrate has excellent toughness and deformation resistance while the advanced PVD coating enables metalcutting speeds double those of conventional PVD-coated cutting tools.	P												
		M												
		K												
		N												
		S												
		H												
 KC5525 C2-C6	Composition: Advanced PVD AlTiN-coated fine-grain high-cobalt carbide grade. Application: The KC5525 grade utilizes the same advanced PVD coating as the KC5510 grade in conjunction with a fine-grained tungsten carbide 10% cobalt substrate. The higher cobalt enables added security in interrupted cuts while the fine-grained WC maintains hardness-resisting deformation at higher speeds. Designed for medium to heavy interruptions in high-temp alloys.	P												
		M												
		K												
		N												
		S												
CVD-Coated Carbide Grades KCP05 C3-C4	Composition: An innovative, highly deformation-resistant, cobalt-enriched substrate with a specially designed, adherent MTCVD-TiCN-Al ₂ O ₃ coating. Application: For finishing to semi-finishing of most steels, ferritic, martensitic, and PH stainless steels and cast irons. Provides excellent combination of deformation resistance and insert edge strength. The new coating combined with a state-of-the-art post-coat treatment provides high-productivity with long predictable tool life and superior workpiece surface finish.	P												
		K												
 KCP10 C3, C7	Composition: A specially engineered cobalt-enriched carbide grade with thick MTCVD-TiCN-Al ₂ O ₃ coating for maximum wear resistance. Application: An excellent finishing to medium machining grade for a variety of workpiece materials, including most steels, ferritic, martensitic, and PH stainless steels, and cast irons. The cobalt-enriched substrate offers a balanced combination of deformation resistance and edge toughness, while the thick coating layers offer outstanding abrasion resistance and crater wear resistance for high-speed machining. Smooth coating provides resistance to edge build-up and microchipping and produces excellent surface finishes.	P												
		K												



Inserts



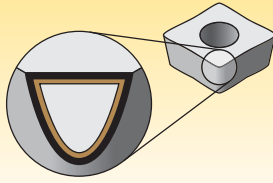
Coatings provide high-speed capability and are engineered for finishing to heavy roughing.

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous Materials
S	High-Temp Alloys
H	Hardened Materials

wear resistance ← → toughness

CVD-Coated Carbide Grades

Coating	Grade Description	05	10	15	20	25	30	35	40	45
 KCP25 C2-C3, C6-C7	<p>Composition: A tough cobalt-enriched carbide grade with a newly designed multilayer MTCVD-TiCN-Al₂O₃ coating with superior interlayer adhesion.</p> <p>Application: Best general-purpose turning grade for most steels and ferritic and martensitic stainless steels. The substrate design ensures adequate deformation resistance with excellent insert edge strength. Coating layers offer good wear resistance over a wide range of machining conditions and the post-coat treatment minimizes microchipping and improves coating adhesion to substrate leading to long tool life and improved workpiece finishes.</p>	P								
		K								
 KCP30 C5-C6	<p>Composition: A newly engineered, tough cobalt-enriched carbide grade with an advanced multilayer TiN-MT-TiCN-Al₂O₃ coating.</p> <p>Application: For medium to rough machining of all carbon, alloy, and stainless steels. The substrate design provides superior insert strength that is required for this application, and the multilayer coating adds wear resistance to the insert resulting in long tool life.</p>	P								
		K								
 KCP40 C5-C6	<p>Composition: A tough carbide grade with a moderately thick TiN-MT-TiCN-Al₂O₃ coating.</p> <p>Application: For heavy roughing of carbon, alloy, and stainless steels. The substrate-coating combination provides unbelievable toughness and operational security allowing high metal removal rates even in most demanding interrupted cuts.</p>	P								
		M								
 KCK05 C3-C4	<p>Composition: A multilayered coating with moderately thick MTCVD TiCN-Al₂O₃ layers over a highly deformation-resistant carbide substrate.</p> <p>Application: Designed for high-speed machining of gray and ductile irons. The substrate and coating architecture together with CW5 post-coat treatment ensure a tremendous tool life advantage, especially when cutting higher tensile strength ductile and gray irons where workpiece size consistency and reliability of tool life are critical. Excellent both in straight and varied depths of cut.</p>	P								
		K								
 KCK15 C3-C4	<p>Composition: A multilayered coating with thick MTCVD TiCN-Al₂O₃ layers applied over a carbide substrate specifically engineered for cast irons.</p> <p>Application: Delivers consistent performance in high-speed machining of gray and ductile irons. The substrate design permits the insert to stay in the cut for a long time at high speeds with minimum deformation. The thick CVD coating and post-coat treatment provide superior wear resistance ensuring long and consistent tool life. Can be applied both in straight and lightly interrupted cuts.</p>	P								
		K								
 KCK20 C2-C3	<p>Composition: A specially toughened MTCVD-TiCN-Al₂O₃ coating over a wear-resistant substrate.</p> <p>Application: The KCK20 grade is specifically engineered to maximize coating adhesion and edge strength making this grade ideal in wet interrupted cutting of gray and ductile irons. It can be used in a wide range of applications from finishing to roughing to maximize productivity wherever strength and reliability are needed.</p>	P								
		K								



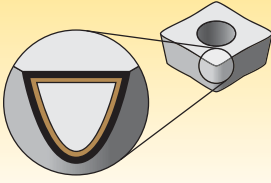
Coatings provide high-speed capability and are engineered for finishing to heavy roughing.

- P Steel
- M Stainless Steel
- K Cast Iron
- N Non-Ferrous Materials
- S High-Temp Alloys
- H Hardened Materials

wear resistance ← → toughness

Coating	Grade Description	Performance Chart									
		05	10	15	20	25	30	35	40	45	
CVD-Coated Carbide Grades	KCM15 C2-C3 Composition: A multilayer MTCVD-TiCN-Al ₂ O ₃ coated carbide grade. Application: An excellent finishing to medium machining grade for austenitic stainless steels at higher speeds and covers a broad range of steel applications in the P20-25 range. KCM15 grade in combination with unique geometries have been designed to resist depth-of-cut notching and minimize burr formation. The post-coat treatment reduces coating stresses, improves coating adhesion, minimizes microchipping and edge build-up, and improves workpiece finish. beyond	P									
		M									
		K									
CVD-Coated Carbide Grades	KCM25 C1-C2 Composition: A multilayer CVD coating comprised of TiN-MT-TiCN-Al ₂ O ₃ layers over a tough, cobalt-enriched carbide substrate. Application: This CVD-coated grade is designed for general-purpose machining of austenitic stainless steels at moderate speeds and feeds. KCM25 inserts offer an extraordinary combination of toughness, built-up edge resistance, and wear resistance in stainless steel applications. beyond	P									
		M									
		K									
CVD-Coated Carbide Grades	KCM35 C1-C2 Composition: A multilayer TiN-MT-TiCN-Al ₂ O ₃ CVD coating over a super-tough substrate. Application: The KCM35 grade is engineered to take on the most brutal cast stainless steel machining applications. The substrate withstands heavy interruptions, while the coating provides the wear resistance needed for long tool life. The polished surface resists edge build-up, even at slow cutting speeds. KCM35 grade is available in insert sizes and geometries appropriate for heavy feeds and large depths of cut. beyond	P									
		M									
		K									
PVD-Coated Cermet Grades	KT315 C3, C7 Composition: A multilayer PVD-TiN/TiCN/TiN-coated cermet turning grade. Application: Ideal for high-speed finishing to medium machining of most carbon and alloy steels and stainless steels. Performs very well in cast and ductile iron applications, too. Provides long and consistent tool life and will produce excellent workpiece finishes.	P									
		M									
		K									
PVD-Coated Cermet Grades	KTP10 C3, C7 Composition: A multilayer, PVD-TiN/TiCN/TiN-coated cermet turning grade. Application: Ideal for high-speed finishing to medium machining of most carbon and alloy steels and stainless steels. Performs very well in cast and ductile iron applications, too. Provides long and consistent tool life and will produce excellent workpiece finishes.	P									
		M									
		K									

Inserts



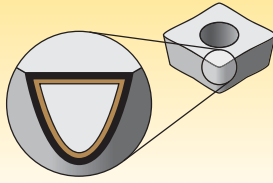
Coatings provide high-speed capability and are engineered for finishing to heavy roughing.

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous Materials
S	High-Temp Alloys
H	Hardened Materials

wear resistance ← → toughness

Ceramic Grades

Coating	Grade Description	05	10	15	20	25	30	35	40	45
KYS25 C4	<p>Composition: SiAlON ceramic with a multi-layered alumina-TiCN CVD coating. Application: Compliments the KYS30 grade when machining high-temp and nickel-based alloys and cast materials with high Brinell hardness. This advanced CVD coating provides excellent chemical and depth-of-cut notch resistance compared to whisker ceramics.</p> <p>beyond</p>									
		S								
KYS30 C4	<p>Composition: Latest and most advanced sialon material developed. Application: Combines excellent wear properties, fracture toughness, and thermal shock resistance for general-purpose to finish machining of high-temp alloys. Provides superior depth-of-cut notch resistance compared to whisker ceramics.</p> <p>beyond</p>									
		S								
KYK10 -	<p>Composition: An advanced sialon ceramic grade. Application: Provides maximum wear resistance. Use for high-speed continuous turning of gray cast iron, including through scale.</p> <p>beyond</p>									
		K								
KYK25 C3	<p>Composition: Pure silicon nitride ceramic with an alumina CVD coating. Application: Excellent combination of toughness and edge wear resistance. Used for general-purpose machining of gray, ductile, or nodular cast irons.</p> <p>beyond</p>									
		K								



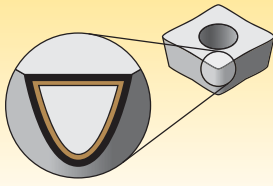
Coatings provide high-speed capability and are engineered for finishing to heavy roughing.

- P** Steel
- M** Stainless Steel
- K** Cast Iron
- N** Non-Ferrous Materials
- S** High-Temp Alloys
- H** Hardened Materials

wear resistance ← → toughness

Coating	Grade Description	wear resistance ← → toughness										
		05	10	15	20	25	30	35	40	45		
Ceramic Grades KY4300 C4 Composition: Whisker ceramic with a matrix of Al ₂ O ₃ + SiC. Application: The SiC whiskers embedded in the micro structure give this ceramic excellent toughness for cutting high-temp alloys and cast materials with high Brinell hardness.	 KY3500 C2 Composition: Pure silicon nitride grade. Application: Maximum toughness. Used at high-feed rates for rough machining of gray cast iron, including machining through interruptions.	 KY4400 C4, C8 Composition: A PVD TiN coating over an aluminum oxide and titanium carbonitride composite ceramic (Al ₂ O ₃ /TiCN). Application: Used for finish turning of hardened steels and irons (greater than 45 HRC). Where possible, use under dry conditions in smooth or varied depths of cut. Can also be applied in finish turning of nickel alloys, cobalt alloys, and powder metals.										
			M									
			S									
PCBN – Polycrystalline Cubic Born Nitride Grades KB1340 — Composition: A high CBN content, solid PCBN insert having multiple cutting edges. Application: Applied in roughing to finishing of fully pearlitic gray cast iron, chilled irons, high-chrome alloyed steels, sintered powdered metals, and heavy cuts in hardened steels (>45 HRC). Also use for finishing chilled cast iron and fully pearlitic cast iron. The solid PCBN insert offers better security and shock resistance compared to tipped PCBN inserts, while also enabling deeper depth-of-cut capabilities.	 KB1345 — Composition: A high CBN content, PCBN tip brazed onto a carbide insert. Application: Applied in roughing to finishing of fully pearlitic gray cast iron, chilled irons, high-chrome alloyed steels, sintered powdered metals, and heavy cuts in hardened steels (>45 HRC). Also use for finishing chilled cast iron and fully pearlitic cast iron. The tipped PCBN insert is available in a wide range of insert styles including positive rake geometries that are ideally suited for boring applications.	 KB1610 — Composition: A low CBN content, PCBN tip brazed onto a carbide insert. Application: Designed for precision finishing in smooth cuts on hardened steels (>45 HRC) where optimal surface finish is needed. Use on bearing steel, hot and cold work tool steels, high-speed steels, die steels, case hardened steels, carburized and nitrided irons, and some hard coatings. Do not apply on soft steel.										
			K									
			H									

Inserts



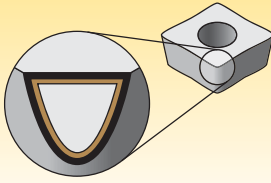
Coatings provide high-speed capability and are engineered for finishing to heavy roughing.

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous Materials
S	High-Temp Alloys
H	Hardened Materials

wear resistance ← → toughness

PCBN – Polycrystalline Cubic Born Nitride Grades

Coating	Grade Description	05	10	15	20	25	30	35	40	45
KB1625 —	Composition: A medium CBN content, PCBN tip brazed onto a carbide insert. Application: Designed for roughing to finishing of hardened steels (>45 HRC) where optimal surface finish is needed. It can be used in continuous to interrupted cutting of bearing steel, hot and cold work tool steels, high-speed steels, die steels, case-hardened steels, carburized and nitrided irons, and some hard coatings.									
		H								
KB1630 —	Composition: A high CBN content, PCBN tip brazed onto a carbide insert. Application: Designed for roughing to finishing in interrupted cuts on hardened steels (>45 HRC). It can also be applied on gray cast iron, chilled irons, high-chrome alloyed steels and sintered powdered metals. The tipped PCBN insert is available in a wide range of insert styles, including positive rake geometries, that are ideally suited for boring applications.									
		K								
		S								
		H								
KB5610 C4, C8	Composition: A low content PCBN grade with a PVD TiAlN coating for added wear resistance. Application: Designed for the precision machining of hardened steels (>45 HRC). The PVD coating offers improved wear resistance and excellent surface finish capabilities. It can be very effectively applied on bearing steels, hot and cold work tool steels, high-speed steels, die steels, case-hardened steels, carburized and nitrided irons, and some hard coatings. Available in a multitip format with a tremendous breadth of edge preps, insert styles, and wiper geometries.									
		H								
KB5625 C4, C8	Composition: A PVD TiAlN coating over a medium content, PCBN tip brazed onto a carbide insert. Application: Designed for roughing to finishing of hardened steels (>45 HRC). Use on bearing steel, hot and cold work tool steels, high-speed steels, die steels, case-hardened steels, carburized and nitrided irons, and some hard coatings.									
		H								
KB5630 C4, C8	Composition: A high content PCBN grade with a PVD AlTiN coating for added wear resistance. Application: Designed for roughing to finishing in hardened steels (>45 HRC), abrasive workpiece materials such as sintered valve seat materials, powder metallurgy tool steels, and hard high-alloy cast irons. The PVD coating provides resistance to crater wear and increased resistance to chipping. The tipped PCBN insert is available in a wide range of insert styles, including positive rake geometries, that are ideally suited for boring applications.									
		K								
		S								
		H								



Coatings provide high-speed capability and are engineered for finishing to heavy roughing.

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous Materials
S	High-Temp Alloys
H	Hardened Materials

wear resistance ← → toughness

PCD – Polycrystalline Diamond Grades

Coating	Grade Description	05	10	15	20	25	30	35	40	45
KD1400 —	Composition: An ultra-fine-grain, polycrystalline diamond (PCD) tip brazed onto a carbide substrate. Application: Designed for general-purpose turning of primarily non-ferrous materials. It can be applied over a wide range of continuous to interrupted cuts where superior surface finish is needed. Use on low to medium silicon-content aluminum alloys, non-metallics, copper, and brass- and zinc-based alloys. The ultra-fine-grain diamond particle size enables superior surface finishes while ensuring the best mechanical shock resistance of any PCD cutting tool.									
KD1405 —	Composition: A pure CVD-deposited diamond-sheet tool brazed directly to a carbide substrate. Application: KD1405 is Kennametal's most abrasion-resistant tool material for non-ferrous and non-metallic materials. Best applied when abrasion resistance is the desired benefit.									
KD1425 —	Composition: A multimodal PCD grade with a range of grain sizes brazed onto a carbide substrate. Application: Engineered for extreme abrasion resistance, combined with good edge strength for demanding applications. An ideal choice for high-silicon aluminum alloys, bi-metallic (AL/GCI) materials, MMC, carbon-fiber reinforced plastics, and other abrasive non-metallic materials.									

■ Select the geometry — based on feed rate and depth of cut

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous Materials
S	High-Temp Alloys
H	Hardened Materials

operation	insert style application	insert geometry	profile	feed rate — in (mm)											
				.0015 (0,04)	.0025 (0,063)	.004 (0,01)	.006 (0,16)	.010 (0,25)	.016 (0,4)	.025 (0,63)	.040 (1,0)	.060 (1,6)	.100 (2,5)	.200 (5,0)	
medium machining	MG-MP			depth of cut — in (mm)											
				.004 (0,1)	.006 (0,16)	.010 (0,25)	.016 (0,4)	.025 (0,63)	.040 (1,0)	.060 (1,6)	.100 (2,5)	.160 (4,0)	.250 (6,3)	.500 (10,0)	

Pictorial View of Insert

Depth-of-Cut Range —

for all inserts in the program, select smaller inserts for lighter cuts and larger inserts for heavy cuts

Feed Rate Range —
for best results, use the center 60% of the range

Chipbreaker Geometry —

section is through nose radius of insert

Primary Workpiece Material Group

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous Materials
S	High-Temp Alloys
H	Hardened Materials

Chip Control Geometry Designation —

example: MG-MP = CNMG-432MP

Machining Operation —

for what the insert geometry is designed

NOTE: For detailed grade and geometry recommendations, reference the Kennametal Beyond™ Selection System on pages B8–B23.



■ Select the geometry — based on feed rate and depth of cut

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous Materials
S	High-Temp Alloys
H	Hardened Materials

operation	insert style application	insert geometry	profile	feed rate — in (mm)											
				.0015 (0,04)	.0025 (0,063)	.004 (0,01)	.006 (0,16)	.010 (0,25)	.016 (0,4)	.025 (0,63)	.040 (1,0)	.060 (1,6)	.100 (2,5)	.200 (5,0)	
				depth of cut — in (mm)											
finishing	MG-FP							.004–.012 (0,1–0,3)							
								.010–.100 (0,3–2,5)							
	MG-FH							.002–.010 (0,05–0,25)							
								.010–.040 (0,25–1)							
	MG-FN							.005–.012 (0,1–0,3)							
								.010–.100 (0,3–2,5)							
	MG-FX							.003–.009 (0,07–0,22)							
								.008–.040 (0,2–1)							
	MP-K							.004–.012 (0,1–0,3)							
								.008–.100 (0,2–2,5)							
medium machining	MG-MH							.006–.020 (0,15–0,5)							
								.012–.079 (0,3–2)							
	MG-MX							.006–.014 (0,15–0,35)							
								.020–.060 (0,5–1,5)							
medium sharp	MG-MS							.005–.014 (0,12–0,35)							
								.030–.200 (0,76–5,0)							

■ Select the geometry — based on feed rate and depth of cut

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous Materials
S	High-Temp Alloys
H	Hardened Materials

operation	insert style application	insert geometry	profile	feed rate — in (mm)										
				.0015 (0,04)	.0025 (0,063)	.004 (0,01)	.006 (0,16)	.010 (0,25)	.016 (0,4)	.025 (0,63)	.040 (1,0)	.060 (1,6)	.100 (2,5)	.200 (5,0)
				depth of cut — in (mm)										
				.004 (0,1)	.006 (0,16)	.010 (0,25)	.016 (0,4)	.025 (0,63)	.040 (1,0)	.060 (1,6)	.100 (2,5)	.160 (4,0)	.250 (6,3)	.500 (10,0)
roughing	MG-RP								.008-.025 (0,2-0,6)			.045-.250 (1,1-6,4)		
	MG-RN					.010-.025 (0,3-0,63)						.045-.250 (1,1-5,7)		
heavy roughing	MG						.012-.030 (0,3-0,8)					.045-.225 (1,1-5,7)		
	MM-RM single sided								.010-.040 (0,3-1,0)			.050-.500 (1,3-12,7)		
	MM-RP								.008-.030 (0,2-1,0)			.050-.400 (1,3-10,0)		
	MM-RH single sided						.015-.050 (0,4-1,3)					.050-.500 (1,3-12,7)		
wiper finishing	MT-FW					.003-.013 (0,1-0,3)				.008-.060 (0,2-1,5)				
wiper, medium finishing	MT-MW					.005-.020 (0,1-0,5)						.016-.130 (0,4-3,3)		

■ Select the geometry — based on feed rate and depth of cut

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous Materials
S	High-Temp Alloys
H	Hardened Materials

operation	insert style application	insert geometry	profile	feed rate — in (mm)											
				.0015 (0,04)	.0025 (0,063)	.004 (0,01)	.006 (0,16)	.010 (0,25)	.016 (0,4)	.025 (0,63)	.040 (1,0)	.060 (1,6)	.100 (2,5)	.200 (5,0)	
				depth of cut — in (mm)											
fine finishing	_GM precision ground			.002-.008 (0,1-0,2)											
	MT-11			.008-.040 (0,2-1,0)											
				.003-.010 (0,1-0,3)											
finishing	.MT-UF			.002-.010 (0,1-0,3)											
	GT-HP precision ground			.005-.050 (0,1-1,3)											
				.007-.015 (0,2-0,4)											
finishing	GT-LF precision ground			.025-.090 (0,6-2,3)											
	MT-FP			.007-.015 (0,2-0,4)											
				.0025-.010 (0,063-0,25)											
	MT-LF			.006-.060 (0,16-1,6)											
medium machining	MT-MP			.007-.015 (0,2-0,4)											
				.004-.016 (0,01-0,4)											
	MT-MF			.016-.130 (0,4-2,3)											
				.009-.017 (0,2-0,4)											
				.045-.090 (1,1-2,3)											



Carbide Inserts

Primary Application

Kennametal offers a complete portfolio of ISO-/ANSI-style inserts. Positive, negative, CVD, PVD, or uncoated, we have the insert to help increase productivity and achieve greater savings.

Plus, our carbide insert line contains Beyond™ technology. Beyond inserts offer you greater versatility, reliability, and up to 30% higher productivity.

Beyond™ CVD Grades

- Higher productivity and profitability — up to 300% higher.
- Lower cutting forces — Increase speeds and reduce cycle time.
- Extended tool life.
- Predictable tool life / Uniform wear.
- Resists chip flow damage.
- Consistent surface finish.
- Products can be applied across a wide range of applications.
- Use it in low speed to high speed applications.
- For finish to rough turning of steel, cast iron, stainless steel, and high temp alloy turning.

Beyond™ PVD Grades

KCU10™

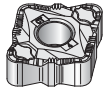
- PVD-coated grade with superior wear resistance at elevated temperatures, allowing higher metal cutting speeds.
- For use in all materials, especially stainless steels and high-temp alloys.
- Improved depth-of-cut notch resistance
- Increase speed by 20–30% or feed by 10–15%.
- Use in finishing to medium applications.

KCU25™

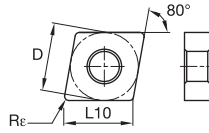
- PVD-coated grade with superior edge toughness and excellent wear resistance. Medium to roughing applications.
- Use in all materials.
- Increase speed, feed, and depth of cut by 10–20%.



Inserts

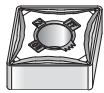


■ CNMG-CT

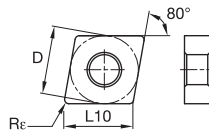


● first choice
○ alternate choice

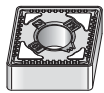
ISO catalog number	ANSI catalog number	D		L10		Re	
		mm	in	mm	in	mm	in
CNMG120408CT	CNMG432CT	12,70	1/2	12,90	.508	0,8	1/32
CNMG120412CT	CNMG433CT	12,70	1/2	12,90	.508	1,2	3/64
CNMG120416CT	CNMG434CT	12,70	1/2	12,90	.508	1,6	1/16



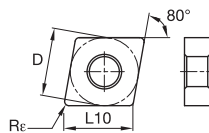
■ CNMG-FF



ISO catalog number	ANSI catalog number	D		L10		Re	
		mm	in	mm	in	mm	in
CNMG090304FF	CNMG321FF	9,53	3/8	9,67	.381	0,4	1/64
CNMG090308FF	CNMG322FF	9,53	3/8	9,67	.381	0,8	1/32
CNMG120404FF	CNMG431FF	12,70	1/2	12,90	.508	0,4	1/64
CNMG120408FF	CNMG432FF	12,70	1/2	12,90	.508	0,8	1/32



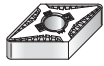
■ CNMG-FN



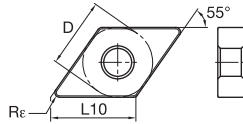
ISO catalog number	ANSI catalog number	D		L10		Re	
		mm	in	mm	in	mm	in
CNMG090304FN	CNMG321FN	9,53	3/8	9,67	.381	0,4	1/64
CNMG090308FN	CNMG322FN	9,53	3/8	9,67	.381	0,8	1/32
CNMG120402FN	CNMG4305FN	12,70	1/2	12,90	.508	0,2	.008
CNMG120404FN	CNMG431FN	12,70	1/2	12,90	.508	0,4	1/64
CNMG120408FN	CNMG432FN	12,70	1/2	12,90	.508	0,8	1/32
CNMG120412FN	CNMG433FN	12,70	1/2	12,90	.508	1,2	3/64
CNMG120416FN	CNMG434FN	12,70	1/2	12,90	.508	1,6	1/16

P	M	K	N	S	H	KCP05	KCP10	KCP25	KCP30	KCP40	KCK05	KCK15	KCK20	KCM15	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KC5010	KC5510	KCU25	KC5025	KC5525	KC5410	KT315	KTP10
●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Inserts



DNGG-FS

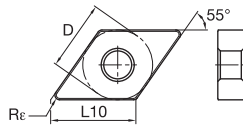


● first choice
○ alternate choice

ISO catalog number	ANSI catalog number	D		L10		Rε																										
		mm	in	mm	in	mm	in	KCP05	KCP10	KCP25	KCP30	KCP40	KCK05	KCK15	KCK20	KCM15	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KC5010	KC5510	KCU25	KC5025	KC5525	KC5410	KT315	KTP10	
DNGG110402FS	DNGG3305FS	9,52	3/8	11,63	.458	0,2	.008																									
DNGG110404FS	DNGG331FS	9,52	3/8	11,63	.458	0,4	1/64																	●	●	●	●	●				
DNGG110408FS	DNGG332FS	9,52	3/8	11,63	.458	0,8	1/32																	●	●	●	●	●				
DNGG150401FS	DNGG430FS	12,70	1/2	15,50	.610	0,1	.004																	●	●	●	●	●				
DNGG150402FS	DNGG4305FS	12,70	1/2	15,50	.610	0,2	.008																	●	●	●	●	●				
DNGG150604FS	DNGG441FS	12,70	1/2	15,50	.610	0,4	1/64																	●	●	●	●	●				
DNGG150404FS	DNGG431FS	12,70	1/2	15,50	.610	0,4	1/64																	●	●	●	●	●				
DNGG150608FS	DNGG442FS	12,70	1/2	15,50	.610	0,8	1/32																	●	●	●	●	●				
DNGG150408FS	DNGG432FS	12,70	1/2	15,50	.610	0,8	1/32																	●	●	●	●	●				
DNGG150412FS	DNGG433FS	12,70	1/2	15,50	.610	1,2	3/64																	●	●	●	●	●				
DNGG150416FS	DNGG434FS	12,70	1/2	15,50	.610	1,6	1/16																	●	●	●	●	●				



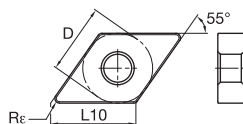
DNGG-LF



ISO catalog number	ANSI catalog number	D		L10		Rε																										
		mm	in	mm	in	mm	in	KCP05	KCP10	KCP25	KCP30	KCP40	KCK05	KCK15	KCK20	KCM15	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KC5010	KC5510	KCU25	KC5025	KC5525	KC5410	KT315	KTP10	
DNGG150402LF	DNGG4305LF	12,70	1/2	15,50	.610	0,2	.008																	●	●							
DNGG150404LF	DNGG431LF	12,70	1/2	15,50	.610	0,4	1/64																●	●	●	●	●					
DNGG150408LF	DNGG432LF	12,70	1/2	15,50	.610	0,8	1/32																	●	●	●	●	●				

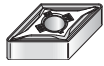


DNGP

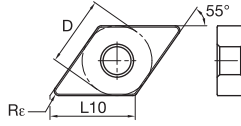


ISO catalog number	ANSI catalog number	D		L10		Rε																										
		mm	in	mm	in	mm	in	KCP05	KCP10	KCP25	KCP30	KCP40	KCK05	KCK15	KCK20	KCM15	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KC5010	KC5510	KCU25	KC5025	KC5525	KC5410	KT315	KTP10	
DNGP150401	DNGP430	12,70	1/2	15,50	.610	0,1	.004																	●	●							
DNGP150402	DNGP4305	12,70	1/2	15,50	.610	0,2	.008																	●	●							
DNGP150404	DNGP431	12,70	1/2	15,50	.610	0,4	1/64																	●	●	●	●	●				
DNGP150408	DNGP432	12,70	1/2	15,50	.610	0,8	1/32																	●	●	●	●	●				
DNGP150604	DNGP441	12,70	1/2	15,50	.610	0,4	1/64																	●	●	●	●	●				
DNGP150608	DNGP442	12,70	1/2	15,50	.610	0,8	1/32																	●	●	●	●	●				
DNGP150612	DNGP443	12,70	1/2	15,50	.610	1,2	3/64																	●	●	●	●	●				

Inserts

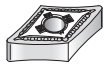


■ DNMG-MP

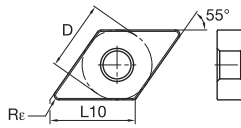


- first choice
- alternate choice

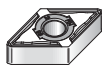
ISO catalog number	ANSI catalog number	D		L10		Re		KCP05	KCP10	KCP25	KCP30	KCP40	KCK05	KCK15	KCK20	KCM15	KCM25	KCM35	KUT0	K313	K68	KCS10	KCU10	KCS010	KCS510	KCU25	KCS025	KCS525	KCS410	KT315	KTP10
		mm	in	mm	in	mm	in																								
DNMG110408MP	DNMG332MP	9,53	3/8	11,63	.458	0,8	1/32									●	●														
DNMG110412MP	DNMG333MP	9,53	3/8	11,63	.458	1,2	3/64									●	●														
DNMG150404MP	DNMG431MP	12,70	1/2	15,50	.610	0,4	1/64									●	●	●													
DNMG150408MP	DNMG432MP	12,70	1/2	15,50	.610	0,8	1/32	●	●							●	●	●													
DNMG150412MP	DNMG433MP	12,70	1/2	15,50	.610	1,2	3/64									●	●	●													
DNMG150604MP	DNMG441MP	12,70	1/2	15,50	.610	0,4	1/64									●	●	●													
DNMG150608MP	DNMG442MP	12,70	1/2	15,50	.610	0,8	1/32	●	●							●	●	●								●	●				
DNMG150612MP	DNMG443MP	12,70	1/2	15,50	.610	1,2	3/64	●								●	●	●								●	●				



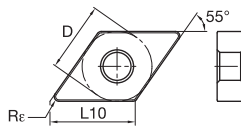
■ DNMG-MS



ISO catalog number	ANSI catalog number	D		L10		Re		KCP05	KCP10	KCP25	KCP30	KCP40	KCK05	KCK15	KCK20	KCM15	KCM25	KCM35	KUT0	K313	K68	KCS10	KCU10	KCS010	KCS510	KCU25	KCS025	KCS525	KCS410	KT315	KTP10	
		mm	in	mm	in	mm	in																									
DNMG110408MS	DNMG332MS	9,53	3/8	11,63	.458	0,8	1/32															●										
DNMG150401MS	DNMG430MS	12,70	1/2	15,50	.610	0,1	.004																									
DNMG150402MS	DNMG4305MS	12,70	1/2	15,50	.610	0,2	.008																									
DNMG150404MS	DNMG431MS	12,70	1/2	15,50	.610	0,4	1/64															●										
DNMG150604MS	DNMG441MS	12,70	1/2	15,50	.610	0,4	1/64															●										
DNMG150608MS	DNMG442MS	12,70	1/2	15,50	.610	0,8	1/32															●										
DNMG150408MS	DNMG432MS	12,70	1/2	15,50	.610	0,8	1/32															●										
DNMG150412MS	DNMG433MS	12,70	1/2	15,50	.610	1,2	3/64															●										
DNMG150612MS	DNMG443MS	12,70	1/2	15,50	.610	1,2	3/64															●										



■ DNMG-MW

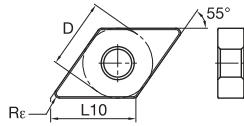


ISO catalog number	ANSI catalog number	D		L10		Re		KCP05	KCP10	KCP25	KCP30	KCP40	KCK05	KCK15	KCK20	KCM15	KCM25	KCM35	KUT0	K313	K68	KCS10	KCU10	KCS010	KCS510	KCU25	KCS025	KCS525	KCS410	KT315	KTP10	
		mm	in	mm	in	mm	in																									
DNMG150408MW	DNMG432MW	12,70	1/2	15,50	.610	0,4	1/64	●	●	●																						
DNMG150412MW	DNMG433MW	12,70	1/2	15,50	.610	1,2	3/64	●	●	●																						
DNMG150608MW	DNMG442MW	12,70	1/2	15,50	.610	0,4	1/64	●	●	●																						
DNMG150612MW	DNMG443MW	12,70	1/2	15,50	.610	1,2	3/64	●	●	●																						

Inserts



■ DNMG-RP

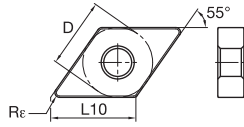


● first choice
○ alternate choice

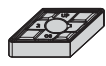
ISO catalog number	ANSI catalog number	D		L10		Rε		KCP05	KCP10	KCP25	KCP30	KCP40	KCK05	KCK15	KCK20	KCM15	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KC5010	KC5510	KCU25	KC5025	KC5525	KC5410	KT315	KTP10
		mm	in	mm	in	mm	in																								
DNMG110408RP	DNMG332RP	9,53	3/8	11,63	.458	0,8	1/32	●	●	●					●	●															
DNMG110412RP	DNMG333RP	9,53	3/8	11,63	.458	1,2	3/64	●	●	●					●	●															
DNMG150408RP	DNMG432RP	12,70	1/2	15,50	.610	0,8	1/32	●	●	●	●	●	●	●	●	●	●						●	●	●	●	●	●	●	●	
DNMG150412RP	DNMG433RP	12,70	1/2	15,50	.610	1,2	3/64	●	●	●	●	●	●	●	●	●	●						●	●	●	●	●	●	●	●	
DNMG150416RP	DNMG434RP	12,70	1/2	15,50	.610	1,6	1/16	●	●	●	●	●	●	●	●	●	●						●	●	●	●	●	●	●	●	
DNMG150608RP	DNMG442RP	12,70	1/2	15,50	.610	0,8	1/32	●	●	●	●	●	●	●	●	●	●						●	●	●	●	●	●	●	●	
DNMG150612RP	DNMG443RP	12,70	1/2	15,50	.610	1,2	3/64	●	●	●	●	●	●	●	●	●	●						●	●	●	●	●	●	●	●	
DNMG150616RP	DNMG444RP	12,70	1/2	15,50	.610	1,6	1/16	●	●	●	●	●	●	●	●	●	●						●	●	●	●	●	●	●	●	



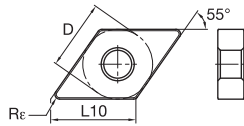
■ DNMG-UN



ISO catalog number	ANSI catalog number	D		L10		Rε		KCP05	KCP10	KCP25	KCP30	KCP40	KCK05	KCK15	KCK20	KCM15	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KC5010	KC5510	KCU25	KC5025	KC5525	KC5410	KT315	KTP10
		mm	in	mm	in	mm	in																								
DNMG110408UN	DNMG332UN	9,53	3/8	11,63	.458	0,8	1/32								●	●															
DNMG110412UN	DNMG333UN	9,53	3/8	11,63	.458	1,2	3/64								●	●															
DNMG150408UN	DNMG432UN	12,70	1/2	15,50	.610	0,8	1/32								●	●															
DNMG150412UN	DNMG433UN	12,70	1/2	15,50	.610	1,2	3/64								●	●															
DNMG150416UN	DNMG434UN	12,70	1/2	15,50	.610	1,6	1/16								●	●															
DNMG150608UN	DNMG442UN	12,70	1/2	15,50	.610	0,8	1/32								●	●															
DNMG150612UN	DNMG443UN	12,70	1/2	15,50	.610	1,2	3/64								●	●															
DNMG150616UN	DNMG444UN	12,70	1/2	15,50	.610	1,6	1/16								●	●															



■ DNMG-UP

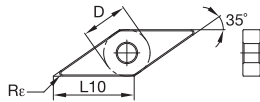


ISO catalog number	ANSI catalog number	D		L10		Rε		KCP05	KCP10	KCP25	KCP30	KCP40	KCK05	KCK15	KCK20	KCM15	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KC5010	KC5510	KCU25	KC5025	KC5525	KC5410	KT315	KTP10
		mm	in	mm	in	mm	in																								
DNMG110408UP	DNMG332UP	9,53	3/8	11,63	.458	0,8	1/32								●	●															
DNMG110412UP	DNMG333UP	9,53	3/8	11,63	.458	1,2	3/64								●	●															
DNMG150404UP	DNMG431UP	12,70	1/2	15,50	.610	0,4	1/64								●	●															
DNMG150408UP	DNMG432UP	12,70	1/2	15,50	.610	0,8	1/32								●	●	●														
DNMG150412UP	DNMG433UP	12,70	1/2	15,50	.610	1,2	3/64								●	●	●														
DNMG150604UP	DNMG441UP	12,70	1/2	15,50	.610	0,4	1/64								●	●															
DNMG150608UP	DNMG442UP	12,70	1/2	15,50	.610	0,8	1/32								●	●	●														
DNMG150612UP	DNMG443UP	12,70	1/2	15,50	.610	1,2	3/64								●	●	●														

Inserts

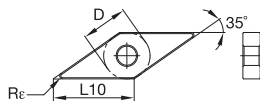
● first choice
○ alternate choice

VNMG-FN



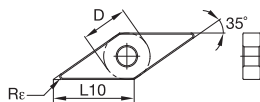
ISO catalog number	ANSI catalog number	D		L10		Re																										
		mm	in	mm	in	mm	in	KCP05	KCP10	KCP25	KCP30	KCP40	KCK05	KCK15	KCK20	KCM15	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KC5010	KC5510	KCU25	KC5025	KC5525	KC5410	KT315	KTP10	
VNMG160404FN	VNMG331FN	9,53	3/8	16,61	.654	0,4	1/64	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
VNMG160408FN	VNMG332FN	9,53	3/8	16,61	.654	0,8	1/32	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

VNMG-FP



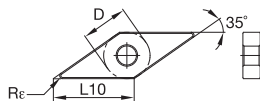
ISO catalog number	ANSI catalog number	D		L10		Re																											
		mm	in	mm	in	mm	in	KCP05	KCP10	KCP25	KCP30	KCP40	KCK05	KCK15	KCK20	KCM15	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KC5010	KC5510	KCU25	KC5025	KC5525	KC5410	KT315	KTP10		
VNMG160404FP	VNMG331FP	9,53	3/8	16,61	.654	0,4	1/64	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
VNMG160408FP	VNMG332FP	9,53	3/8	16,61	.654	0,8	1/32	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

VNMG-MN



ISO catalog number	ANSI catalog number	D		L10		Re																											
		mm	in	mm	in	mm	in	KCP05	KCP10	KCP25	KCP30	KCP40	KCK05	KCK15	KCK20	KCM15	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KC5010	KC5510	KCU25	KC5025	KC5525	KC5410	KT315	KTP10		
VNMG160404MN	VNMG331MN	9,53	3/8	16,61	.654	0,4	1/64	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
VNMG160408MN	VNMG332MN	9,53	3/8	16,61	.654	0,8	1/32	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
VNMG160412MN	VNMG333MN	9,53	3/8	16,61	.654	1,2	3/64	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

VNMG-MP

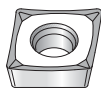


ISO catalog number	ANSI catalog number	D		L10		Re																												
		mm	in	mm	in	mm	in	KCP05	KCP10	KCP25	KCP30	KCP40	KCK05	KCK15	KCK20	KCM15	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KC5010	KC5510	KCU25	KC5025	KC5525	KC5410	KT315	KTP10			
VNMG160404MP	VNMG331MP	9,53	3/8	16,61	.654	0,4	1/64	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
VNMG160408MP	VNMG332MP	9,53	3/8	16,61	.654	0,8	1/32	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
VNMG160412MP	VNMG333MP	9,53	3/8	16,61	.654	1,2	3/64	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

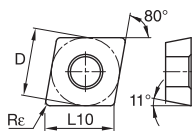


Inserts

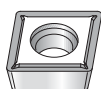
● first choice
○ alternate choice



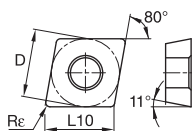
■ CPGT-HP



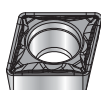
ISO catalog number	ANSI catalog number	D		L10		Re																										
		mm	in	mm	in	mm	in	KCP05	KCP10	KCP25	KCP30	KCP40	KCK05	KCK15	KCK20	KCM15	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KC5010	KCU25	KCU510	KC5025	KC5525	KC5410	KT315	KTP10	
CPGT060202HP	CPGT21505HP	6,35	1/4	6,45	.254	0,2	.008																									
CPGT060204HP	CPGT2151HP	6,35	1/4	6,45	.254	0,4	1/64																									
CPGT060208HP	CPGT2152HP	6,35	1/4	6,45	.254	0,8	1/32																									
CPGT09T302HP	CPGT32505HP	9,53	3/8	9,67	.381	0,2	.008																									
CPGT09T304HP	CPGT3251HP	9,53	3/8	9,67	.381	0,4	1/64																									
CPGT09T308HP	CPGT3252HP	9,53	3/8	9,67	.381	0,8	1/32																									



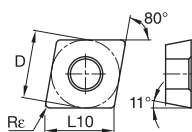
■ CPGT-LF



ISO catalog number	ANSI catalog number	D		L10		Re																											
		mm	in	mm	in	mm	in	KCP05	KCP10	KCP25	KCP30	KCP40	KCK05	KCK15	KCK20	KCM15	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KC5010	KCU25	KCU510	KC5025	KC5525	KC5410	KT315	KTP10		
CPGT060201LF	CPGT2150LF	6,35	1/4	6,45	.254	0,1	.004																										
CPGT060202LF	CPGT21505LF	6,35	1/4	6,45	.254	0,2	.008																										
CPGT060204LF	CPGT2151LF	6,35	1/4	6,45	.254	0,4	1/64																										
CPGT060208LF	CPGT2152LF	6,35	1/4	6,45	.254	0,8	1/32																										
CPGT09T302LF	CPGT32505LF	9,53	3/8	9,67	.381	0,2	.008																										
CPGT09T304LF	CPGT3251LF	9,53	3/8	9,67	.381	0,4	1/64																										
CPGT09T308LF	CPGT3252LF	9,53	3/8	9,67	.381	0,8	1/32																										



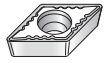
■ CPMT-FP



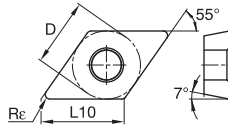
ISO catalog number	ANSI catalog number	D		L10		Re																											
		mm	in	mm	in	mm	in	KCP05	KCP10	KCP25	KCP30	KCP40	KCK05	KCK15	KCK20	KCM15	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KC5010	KCU25	KCU510	KC5025	KC5525	KC5410	KT315	KTP10		
CPMT050202FP	CPMT181505FP	5,56	7/32	5,65	.222	0,2	.008																										
CPMT050204FP	CPMT18151FP	5,56	7/32	5,65	.222	0,4	1/64																										
CPMT060202FP	CPMT21505FP	6,35	1/4	6,45	.254	0,2	.008																										
CPMT060204FP	CPMT2151FP	6,35	1/4	6,45	.254	0,4	1/64																										
CPMT060208FP	CPMT2152FP	6,35	1/4	6,45	.254	0,8	1/32																										
CPMT09T302FP	CPMT32505FP	9,53	3/8	9,67	.381	0,2	.008																										
CPMT09T304FP	CPMT3251FP	9,53	3/8	9,67	.381	0,4	1/64																										
CPMT09T308FP	CPMT3252FP	9,53	3/8	9,67	.381	0,8	1/32																										



Inserts



■ DCMT-UF

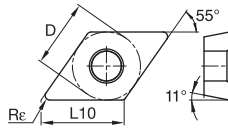


● first choice
○ alternate choice

ISO catalog number	ANSI catalog number	D		L10		Re																													
		mm	in	mm	in	mm	in	KCP05	KCP10	KCP25	KCP30	KCP40	KCK05	KCK15	KCK20	KCM15	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KC5010	KC5510	KCU25	KC5025	KC5525	KC5410	KT315	KTP10				
DCMT070204UF	DCMT2151UF	6,35	1/4	7,75	.305	0,4	1/64	●	●	●																									
DCMT11T302UF	DCMT32505UF	9,53	3/8	11,63	.458	0,2	.008	●	●	●																									
DCMT11T304UF	DCMT3251UF	9,53	3/8	11,63	.458	0,4	1/64	●	●	●																									
DCMT11T308UF	DCMT3252UF	9,53	3/8	11,63	.458	0,8	1/32	●	●	●																									



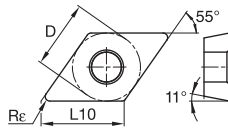
■ DPGT-HP



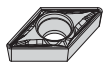
ISO catalog number	ANSI catalog number	D		L10		Re																														
		mm	in	mm	in	mm	in	KCP05	KCP10	KCP25	KCP30	KCP40	KCK05	KCK15	KCK20	KCM15	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KC5010	KC5510	KCU25	KC5025	KC5525	KC5410	KT315	KTP10					
DPGT070202HP	DPGT2150HP	6,35	1/4	7,75	.305	0,2	.008																													
DPGT070204HP	DPGT2151HP	6,35	1/4	7,75	.305	0,4	1/64																													
DPGT070208HP	DPGT2152HP	6,35	1/4	7,75	.305	0,8	1/32																													
DPGT11T304HP	DPGT3251HP	9,53	3/8	11,63	.458	0,4	1/64																													
DPGT11T308HP	DPGT3252HP	9,53	3/8	11,63	.458	0,8	1/32																													



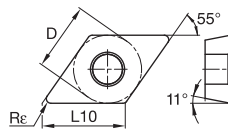
■ DPGT-LF



ISO catalog number	ANSI catalog number	D		L10		Re																														
		mm	in	mm	in	mm	in	KCP05	KCP10	KCP25	KCP30	KCP40	KCK05	KCK15	KCK20	KCM15	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KC5010	KC5510	KCU25	KC5025	KC5525	KC5410	KT315	KTP10					
DPGT070201LF	DPGT2150LF	6,35	1/4	7,75	.305	0,1	.004																													
DPGT070202LF	DPGT21505LF	6,35	1/4	7,75	.305	0,2	.008																													
DPGT070204LF	DPGT2151LF	6,35	1/4	7,75	.305	0,4	1/64																													
DPGT11T301LF	DPGT3250LF	9,53	3/8	11,63	.458	0,1	.004																													
DPGT11T302LF	DPGT32505LF	9,53	3/8	11,63	.458	0,2	.008																													
DPGT11T304LF	DPGT3251LF	9,53	3/8	11,63	.458	0,4	1/64																													
DPGT11T308LF	DPGT3252LF	9,53	3/8	11,63	.458	0,8	1/32																													

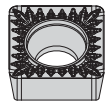


■ DPMT-FP

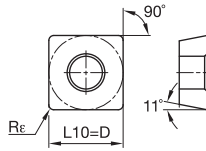


ISO catalog number	ANSI catalog number	D		L10		Re																														
		mm	in	mm	in	mm	in	KCP05	KCP10	KCP25	KCP30	KCP40	KCK05	KCK15	KCK20	KCM15	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KC5010	KC5510	KCU25	KC5025	KC5525	KC5410	KT315	KTP10					
DPMT070202FP	DPMT21505FP	6,35	1/4	7,75	.305	0,2	.008																													
DPMT070204FP	DPMT2151FP	6,35	1/4	7,75	.305	0,4	1/64	●	●																											
DPMT070208FP	DPMT2152FP	6,35	1/4	7,75	.305	0,8	1/32																													
DPMT11T302FP	DPMT32505FP	9,53	3/8	11,63	.458	0,2	.008																													
DPMT11T304FP	DPMT3251FP	9,53	3/8	11,63	.458	0,4	1/64	●	●																											
DPMT11T308FP	DPMT3252FP	9,53	3/8	11,63	.458	0,8	1/32	●	●																											

Inserts



■ SPMT-MP

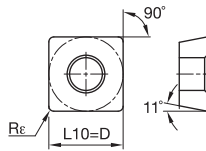


● first choice
○ alternate choice

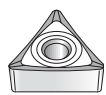
ISO catalog number	ANSI catalog number	D		L10		Re		KCP05	KCP10	KCP25	KCP30	KCP40	KCK05	KCK15	KCK20	KCM15	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KC5010	KC510	KCU25	KC5025	KC5525	KC5410	KT315	KTP10
		mm	in	mm	in	mm	in																								
SPMT09T308MP	SPMT3252MP	9,53	3/8	9,53	.375	0,8	1/32			●																					
SPMT120408MP	SPMT432MP	12,70	1/2	12,70	.500	0,8	1/32			●					●	●															



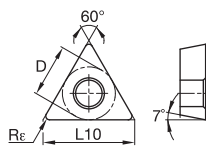
■ SPMT-UF



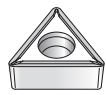
ISO catalog number	ANSI catalog number	D		L10		Re		KCP05	KCP10	KCP25	KCP30	KCP40	KCK05	KCK15	KCK20	KCM15	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KC5010	KC510	KCU25	KC5025	KC5525	KC5410	KT315	KTP10
		mm	in	mm	in	mm	in																								
SPMT09T304UF	SPMT3251UF	9,53	3/8	9,53	.375	0,4	1/64	●																●							



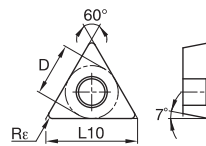
■ TCGT-HP



ISO catalog number	ANSI catalog number	D		L10		Re		KCP05	KCP10	KCP25	KCP30	KCP40	KCK05	KCK15	KCK20	KCM15	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KC5010	KC510	KCU25	KC5025	KC5525	KC5410	KT315	KTP10	
		mm	in	mm	in	mm	in																									
TCGT110202HP	TCGT21505HP	6,35	1/4	11,00	.433	0,2	.008																	●	●		●	●				
TCGT110204HP	TCGT2151HP	6,35	1/4	11,00	.433	0,4	1/64																●	●	●	●	●	●				
TCGT110208HP	TCGT2152HP	6,35	1/4	11,00	.433	0,8	1/32																	●	●	●	●	●	●			
TCGT16T302HP	TCGT32505HP	9,53	3/8	16,50	.650	0,2	.008																		●	●	●	●	●			
TCGT16T304HP	TCGT3251HP	9,53	3/8	16,50	.650	0,4	1/64																	●	●	●	●	●	●			
TCGT16T308HP	TCGT3252HP	9,53	3/8	16,50	.650	0,8	1/32																	●	●	●	●	●	●			

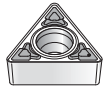


■ TCGT-LF

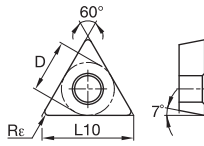


ISO catalog number	ANSI catalog number	D		L10		Re		KCP05	KCP10	KCP25	KCP30	KCP40	KCK05	KCK15	KCK20	KCM15	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KC5010	KC510	KCU25	KC5025	KC5525	KC5410	KT315	KTP10	
		mm	in	mm	in	mm	in																									
TCGT1102X0LF	TCGT215X0LF	6,35	1/4	11,00	.433	0,0	.0015																									
TCGT110201LF	TCGT2150LF	6,35	1/4	11,00	.433	0,1	.004																	●	●		●	●				
TCGT110204LF	TCGT2151LF	6,35	1/4	11,00	.433	0,4	1/64																	●	●	●	●	●	●			
TCGT16T301LF	TCGT3250LF	9,53	3/8	16,50	.650	0,1	.004																		●	●	●	●	●			
TCGT16T302LF	TCGT32505LF	9,53	3/8	16,50	.650	0,2	.008																		●	●	●	●	●			
TCGT16T304LF	TCGT3251LF	9,53	3/8	16,50	.650	0,4	1/64																		●	●	●	●	●			
TCGT16T308LF	TCGT3252LF	9,53	3/8	16,50	.650	0,8	1/32																		●	●	●	●	●			

Inserts



TCMT-MF

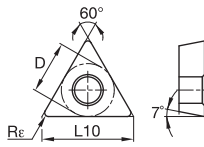


● first choice
○ alternate choice

ISO catalog number	ANSI catalog number	D		L10		Rε	
		mm	in	mm	in	mm	in
TCMT110208MF	TCMT2152MF	6,35	1/4	11,00	.433	0,8	1/32
TCMT16T308MF	TCMT3252MF	9,53	3/8	16,50	.650	0,8	1/32
TCMT16T312MF	TCMT3253MF	9,53	3/8	16,50	.650	1,2	3/64



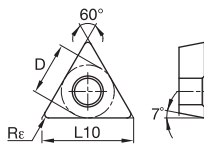
TCMT-MP



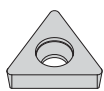
ISO catalog number	ANSI catalog number	D		L10		Rε	
		mm	in	mm	in	mm	in
TCMT110208MP	TCMT2152MP	6,35	1/4	11,00	.433	0,8	1/32
TCMT16T304MP	TCMT3251MP	9,53	3/8	16,50	.650	0,4	1/64
TCMT16T308MP	TCMT3252MP	9,53	3/8	16,50	.650	0,8	1/32
TCMT16T312MP	TCMT3253MP	9,53	3/8	16,50	.650	1,2	3/64



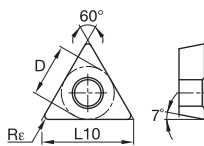
TCMT-UF



ISO catalog number	ANSI catalog number	D		L10		Rε	
		mm	in	mm	in	mm	in
TCMT110204UF	TCMT2151UF	6,35	1/4	11,00	.433	0,4	1/64
TCMT110208UF	TCMT2152UF	6,35	1/4	11,00	.433	0,8	1/32
TCMT16T308UF	TCMT3252UF	9,53	3/8	16,50	.650	0,8	1/32



TCMW



ISO catalog number	ANSI catalog number	D		L10		Rε	
		mm	in	mm	in	mm	in
TCMW16T304	TCMW3251	9,53	3/8	16,50	.650	0,4	1/64
TCMW16T308	TCMW3252	9,53	3/8	16,50	.650	0,8	1/32

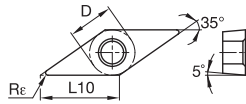
P	M	K	N	S	H	KCP05	KCP10	KCP25	KCP30	KCP40	KCK05	KCK15	KCK20	KCM15	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KC5010	KC5510	KCU25	KC5025	KC5525	KC5410	KT315	KTP10
●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Inserts

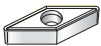
● first choice
○ alternate choice



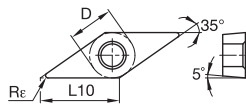
■ VBMT-FP



ISO catalog number	ANSI catalog number	D		L10		Re		KCP05	KCP10	KCP25	KCP30	KCP40	KCK05	KCK15	KCK20	KCM15	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KC5010	KC5510	KCU25	KC5025	KC5525	KC5410	KT315	KTP10
		mm	in	mm	in	mm	in																								
VBMT110302FP	VBMT2205FP	6,35	1/4	11,07	.436	0,2	.008																								
VBMT110304FP	VBMT221FP	6,35	1/4	11,07	.436	0,4	1/64	●	●						●	●									●						●
VBMT110308FP	VBMT222FP	6,35	1/4	11,07	.436	0,8	1/32			●					●	●									●						
VBMT160402FP	VBMT3305FP	9,53	3/8	16,61	.654	0,2	.008			●					●	●									●						
VBMT160404FP	VBMT331FP	9,53	3/8	16,61	.654	0,4	1/64	●	●	●					●	●	●							●							●
VBMT160408FP	VBMT332FP	9,53	3/8	16,61	.654	0,8	1/32	●	●	●					●	●	●							●							●
VBMT160412FP	VBMT333FP	9,53	3/8	16,61	.654	1,2	3/64			●																					



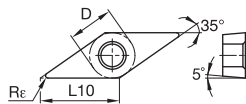
■ VBMT-LF



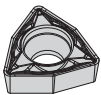
ISO catalog number	ANSI catalog number	D		L10		Re		KCP05	KCP10	KCP25	KCP30	KCP40	KCK05	KCK15	KCK20	KCM15	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KC5010	KC5510	KCU25	KC5025	KC5525	KC5410	KT315	KTP10
		mm	in	mm	in	mm	in																								
VBMT110302LF	VBMT2205LF	6,35	1/4	11,07	.436	0,2	.008																								
VBMT110304LF	VBMT221LF	6,35	1/4	11,07	.436	0,4	1/64	●	●	●					●	●	●							●							●
VBMT110308LF	VBMT222LF	6,35	1/4	11,07	.436	0,8	1/32	●	●	●					●	●	●							●							●
VBMT160402LF	VBMT3305LF	9,53	3/8	16,61	.654	0,2	.008			●					●	●									●						
VBMT160404LF	VBMT331LF	9,53	3/8	16,61	.654	0,4	1/64	●	●	●					●	●	●							●							●
VBMT160408LF	VBMT332LF	9,53	3/8	16,61	.654	0,8	1/32	●	●	●					●	●	●							●							●
VBMT160412LF	VBMT333LF	9,53	3/8	16,61	.654	1,2	3/64							●	●																



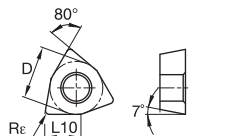
■ VBMT-MP



ISO catalog number	ANSI catalog number	D		L10		Re		KCP05	KCP10	KCP25	KCP30	KCP40	KCK05	KCK15	KCK20	KCM15	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KC5010	KC5510	KCU25	KC5025	KC5525	KC5410	KT315	KTP10
		mm	in	mm	in	mm	in																								
VBMT160404MP	VBMT331MP	9,53	3/8	16,61	.654	0,4	1/64			●					●	●															
VBMT160408MP	VBMT332MP	9,53	3/8	16,61	.654	0,8	1/32			●					●	●															



■ WCMT-FP



ISO catalog number	ANSI catalog number	D		L10		Re		KCP05	KCP10	KCP25	KCP30	KCP40	KCK05	KCK15	KCK20	KCM15	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KC5010	KC5510	KCU25	KC5025	KC5525	KC5410	KT315	KTP10
		mm	in	mm	in	mm	in																								
WCMT040204FP	WCMT2151FP	6,35	1/4	4,34	.171	0,4	1/64																								
WCMT06T308FP	WCMT3252FP	9,53	3/8	6,52	.257	0,8	1/32			●																					



Ceramic Inserts



Primary Application

Kennametal's advanced materials, utilizing Beyond™ technology, offer greater wear resistance and toughness, depending on the job.

KYK ceramic inserts are the first choice for high speed, continuous, and lightly interrupted turning applications in cast iron materials. Benefits include improved fracture toughness, better wear resistance, and extended application range. Combining KYK10™ and CVD-coated KYK25™ with our other ceramic grades for cast iron, Kennametal provides a complete, high-performance ceramic portfolio that can reduce machining cycle times and lower manufacturing costs.

KYS ceramic inserts are the first choice for high-speed applications in high-temp alloys. The multilayer coating offers enhanced chemical wear resistance versus uncoated grades. A superior sialon ceramic substrate provides excellent depth of cut notching resistance versus whisker-reinforced ceramics.

Features and Benefits

KYK10

- Improved wear resistance and toughness with 20% longer tool life than current KY1310™.
- Best suited for continuous turning of cast iron materials and in lightly interrupted cuts.
- Available in Kenloc™, Kendex™, and Top Notch™ turning insert styles.

KYK25

- 12 micron thick coating provides excellent wear resistance and pre-coat treatment allows for very consistent tool life and performance in cast iron applications.
- Up to 30% longer tool life vs. competitors' CVD-coated ceramic grades.
- Available in Kenloc, Kendex, and Top Notch turning insert styles.

KY3500™

- The industry standard for high-speed turning.
- Excellent for roughing to finishing operations in wet or dry cuts with speeds up to 3,400 SFM.
- Performs well in difficult interrupted cuts in ductile or malleable cast iron (<70 KSI tensile strength) at speeds of 900–1,600 SFM.



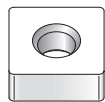
KYS25™

- Excellent surface finish, lower cutting forces, higher speeds.
- Advanced CVD coating provides excellent chemical and depth-of-cut notch resistance.

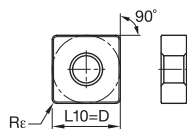
KYS30™

- Long, consistent tool life.
- Excellent toughness and depth-of-cut notch resistance.
- Performs in a wide variety of machining conditions, including interrupted cuts and applications involving scale.

Inserts



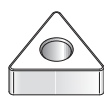
■ SNGA



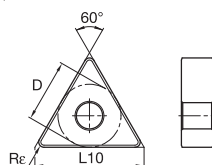
● first choice
○ alternate choice

P																				
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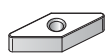
ISO catalog number	ANSI catalog number	D		L10		Re		KYS25	KYS30	KY4300	KYK10	KYK25	KY3500	KY4400
		mm	in	mm	in	mm	in							
SNGA120408T01020	SNGA432T0420	12,70	1/2	12,70	.500	0,8	1/32							
SNGA120408T02020	SNGA432T0820	12,70	1/2	12,70	.500	0,8	1/32							
SNGA120412T01020	SNGA433T0420	12,70	1/2	12,70	.500	1,2	3/64	●	●					
SNGA120412T02020	SNGA433T0820	12,70	1/2	12,70	.500	1,2	3/64							
SNGA120416T01020	SNGA434T0420	12,70	1/2	12,70	.500	1,6	1/16							
SNGA120416T02020	SNGA434T0820	12,70	1/2	12,70	.500	1,6	1/16							
SNGA150612T02020	SNGA543T	15,88	5/8	15,88	.625	1,2	3/64							
SNGA150612T02020	SNGA543T0820	15,88	5/8	15,88	.625	1,2	3/64							
SNGA150616T02020	SNGA544T	15,88	5/8	15,88	.625	1,6	1/16							
SNGA190612T02020	SNGA643T0820	19,05	3/4	19,05	.750	1,2	3/64							
SNGA190616T02020	SNGA644T0820	19,05	3/4	19,05	.750	1,6	1/16							



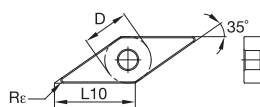
■ TNGA



ISO catalog number	ANSI catalog number	D		L10		Re		KYS25	KYS30	KY4300	KYK10	KYK25	KY3500	KY4400
		mm	in	mm	in	mm	in							
TNGA160404E	TNGA331	9,53	3/8	16,50	.650	0,4	1/64							
TNGA160404T01020	TNGA331T0420	9,53	3/8	16,50	.650	0,4	1/64							
TNGA160408E	TNGA332	9,53	3/8	16,50	.650	0,8	1/32							
TNGA160408T01020	TNGA332T0420	9,53	3/8	16,50	.650	0,8	1/32							
TNGA160408T02020	TNGA332T0820	9,53	3/8	16,50	.650	0,8	1/32							
TNGA160412T01020	TNGA333T0420	9,53	3/8	16,50	.650	1,2	3/64							
TNGA160412T02020	TNGA333T0820	9,53	3/8	16,50	.650	1,2	3/64							
TNGA160416T02020	TNGA334T0820	9,53	3/8	16,50	.650	1,6	1/16							
TNGA220408T01020	TNGA432T0420	12,70	1/2	22,00	.866	0,8	1/32							
TNGA220412T01020	TNGA433T0420	12,70	1/2	22,00	.866	1,2	3/64							
TNGA220412T02020	TNGA433T0820	12,70	1/2	22,00	.866	1,2	3/64							
TNGA220416T02020	TNGA434T	12,70	1/2	22,00	.866	1,6	1/16							



■ VNGA

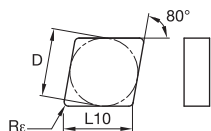


ISO catalog number	ANSI catalog number	D		L10		Re		KYS25	KYS30	KY4300	KYK10	KYK25	KY3500	KY4400
		mm	in	mm	in	mm	in							
VNGA160404T01020	VNGA331T0420	9,53	3/8	16,61	.654	0,4	1/64							
VNGA160408T01020	VNGA332T0420	9,53	3/8	16,61	.654	0,8	1/32							
VNGA160408T02020	VNGA332T0820	9,53	3/8	16,61	.654	0,8	1/32							
VNGA220408T02020	VNGA432T0820	12,70	1/2	22,14	.872	0,8	1/32							

Inserts



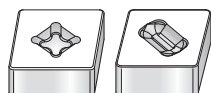
■ CNG



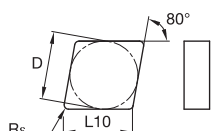
● first choice
○ alternate choice

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K																				
N																				
S																				
H																				

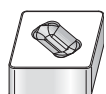
ISO catalog number	ANSI catalog number	D		L10		Re		KYS25	KYS30	KY4300	KYK10	KYK25	KY3500	KY4400	
		mm	in	mm	in	mm	in								
CNGN120404T01020	CNG431T0420	12,70	1/2	12,90	.508	0,4	1/64								
CNGN120408T01020	CNG432T0420	12,70	1/2	12,90	.508	0,8	1/32	●	●						●
CNGN120408T02020	CNG432T0820	12,70	1/2	12,90	.508	0,8	1/32								
CNGN120412E	CNG433E	12,70	1/2	12,90	.508	1,2	3/64	●	●						
CNGN120412T01020	CNG433T0420	12,70	1/2	12,90	.508	1,2	3/64	●	●						●
CNGN120412T02020	CNG433T0820	12,70	1/2	12,90	.508	1,2	3/64								
CNGN120416E	CNG434E	12,70	1/2	12,90	.508	1,6	1/16	●	●						
CNGN120416T01020	CNG434T0420	12,70	1/2	12,90	.508	1,6	1/16	●	●						
CNGN120416T02020	CNG434T0820	12,70	1/2	12,90	.508	1,6	1/16								
CNGN120708T01020	CNG452T0420	12,70	1/2	12,90	.508	0,8	1/32								●
CNGN120712T01020	CNG453T0420	12,70	1/2	12,90	.508	1,2	3/64	●	●						●
CNGN120712T02020	CNG453T0820	12,70	1/2	12,90	.508	1,2	3/64								
CNGN120716T01020	CNG454T0420	12,70	1/2	12,90	.508	1,6	1/16	●	●						●
CNGN120716T02020	CNG454T0820	12,70	1/2	12,90	.508	1,6	1/16								
CNGN160412T02020	CNG533T0820	15,88	5/8	16,12	.635	1,2	3/64								●
CNGN160716T02020	CNG554T0820	15,88	5/8	16,12	.635	1,6	1/16								●



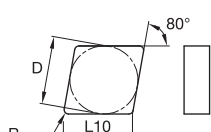
■ CNGX



ISO catalog number	ANSI catalog number	D		L10		Re		KYS25	KYS30	KY4300	KYK10	KYK25	KY3500	KY4400	
		mm	in	mm	in	mm	in								
CNGX120708T01020	CNGX452T0420	12,70	1/2	12,90	.508	0,8	1/32	●	●						
CNGX120708T02020	CNGX452T0820	12,70	1/2	12,90	.508	0,8	1/32								
CNGX120712E	CNGX453E	12,70	1/2	12,90	.508	1,2	3/64		●						
CNGX120712T01020	CNGX453T0420	12,70	1/2	12,90	.508	1,2	3/64	●	●						
CNGX120712T02020	CNGX453T0820	12,70	1/2	12,90	.508	1,2	3/64								
CNGX120716E	CNGX454E	12,70	1/2	12,90	.508	1,6	1/16		●						
CNGX120716T02020	CNGX454T0820	12,70	1/2	12,90	.508	1,6	1/16								●
CNGX160716T02020	CNGX554T0820	15,88	5/8	16,12	.635	1,6	1/16								●

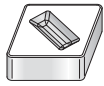


■ CNGX-FW

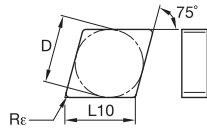


ISO catalog number	ANSI catalog number	D		L10		Re		KYS25	KYS30	KY4300	KYK10	KYK25	KY3500	KY4400	
		mm	in	mm	in	mm	in								
CNGX120708T01020FW	CNGX452T0420FW	12,70	1/2	12,90	.508	0,8	1/32								●
CNGX120712T01020FW	CNGX453T0420FW	12,70	1/2	12,90	.508	1,2	3/64								●
CNGX120716T01020FW	CNGX454T0420FW	12,70	1/2	12,90	.508	1,6	1/16								●

Inserts



■ ENGX



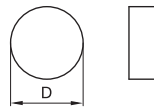
● first choice
○ alternate choice

P																				
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K																				
N																				
S																				
H																				

ISO catalog number	ANSI catalog number	D		L10		Re		KYS25	KYS30	KY4300	KYK10	KYK25	KY3500	KY4400	
		mm	in	mm	in	mm	in								
ENGX130716T02020	ENGX454T0820	12,70	1/2	13,15	.518	1,6	1/16								



■ RNGN

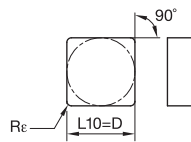


ISO catalog number	ANSI catalog number	D		L10		Re		KYS25	KYS30	KY4300	KYK10	KYK25	KY3500	KY4400
		mm	in	mm	in	mm	in							
RNGN090300T01020	RNG32T0420	9,53	3/8	—	—	—	—							
RNGN090400T00520	RNG33T0220	9,53	3/8	—	—	—	—							
RNGN120300T01020	RNG42T0420	12,70	1/2	—	—	—	—							
RNGN120400E	RNG43E	12,70	1/2	—	—	—	—							
RNGN120400T01020	RNG43T0420	12,70	1/2	—	—	—	—							
RNGN120400T02020	RNG43T0820	12,70	1/2	—	—	—	—							
RNGN120700E	RNG45E	12,70	1/2	—	—	—	—							
RNGN120700T00520	RNG45T0220	12,70	1/2	—	—	—	—							
RNGN120700T00525	RNG45T0225	12,70	1/2	—	—	—	—							
RNGN120700T01020	RNG45T0420	12,70	1/2	—	—	—	—							
RNGN120700T01025	RNG45T0425	12,70	1/2	—	—	—	—							
RNGN120700T02020	RNG45T0820	12,70	1/2	—	—	—	—							
RNGN120700T10015	RNG45T4015	12,70	1/2	—	—	—	—							
RNGN120700T15015	RNG45T6015	12,70	1/2	—	—	—	—							
RNGN150700T02020	RNG55T0820	15,88	5/8	—	—	—	—							
RNGN150700T20015	RNG55T8015	15,88	5/8	—	—	—	—							
RNGN190700E	RNG65E	19,05	3/4	—	—	—	—							
RNGN190700T01020	RNG65T0420	19,05	3/4	—	—	—	—							
RNGN190700T20015	RNG65T8015	19,05	3/4	—	—	—	—							
RNGN250700T01020	RNG85T0420	25,40	1	—	—	—	—							
RNGN250700T20015	RNG85T8015	25,40	1	—	—	—	—							
RNGN250900E	RNG86E	25,40	1	—	—	—	—							

Inserts



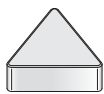
■ SNGX-FW



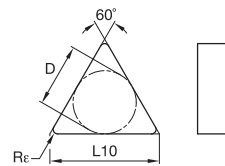
● first choice
○ alternate choice

P																				
M																				
K																				
N																				
S																				
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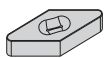
ISO catalog number	ANSI catalog number	D		L10		Re		KYS25	KYS30	KY4300	KYK10	KYK25	KY3500	KY4400
		mm	in	mm	in	mm	in							
SNGX120712T01020FW	SNGX453T0420FW	12,70	1/2	12,70	.500	1,2	3/64					●	●	



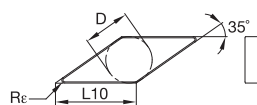
■ TNG



ISO catalog number	ANSI catalog number	D		L10		Re		KYS25	KYS30	KY4300	KYK10	KYK25	KY3500	KY4400
		mm	in	mm	in	mm	in							
TNGN110308T01020	TNG222T0420	6,35	1/4	11,00	.433	0,8	1/32							●
TNGN160408T01020	TNG332T0420	9,53	3/8	16,50	.650	0,8	1/32			●				●
TNGN160408T02020	TNG332T0820	9,53	3/8	16,50	.650	0,8	1/32							●
TNGN160708T01020	TNG352T0420	9,53	3/8	16,50	.650	0,8	1/32			●				●
TNGN160412T01020	TNG333T0420	9,53	3/8	16,50	.650	1,2	3/64			●				●
TNGN160412T02020	TNG333T0820	9,53	3/8	16,50	.650	1,2	3/64							●
TNGN160712T01020	TNG353T0420	9,53	3/8	16,50	.650	1,2	3/64							●
TNGN220408T01020	TNG432T0420	12,70	1/2	22,00	.866	0,8	1/32							●
TNGN220408T02020	TNG432T0820	12,70	1/2	22,00	.866	0,8	1/32	●	●					●
TNGN220412T01020	TNG433T0420	12,70	1/2	22,00	.866	1,2	3/64							●
TNGN220412T02020	TNG433T0820	12,70	1/2	22,00	.866	1,2	3/64	●	●					●
TNGN220416T01020	TNG434T0420	12,70	1/2	22,00	.866	1,6	1/16	●	●					●
TNGN220416T02020	TNG434T0820	12,70	1/2	22,00	.866	1,6	1/16					●	●	



■ VNGX

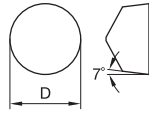


ISO catalog number	ANSI catalog number	D		L10		Re		KYS25	KYS30	KY4300	KYK10	KYK25	KY3500	KY4400
		mm	in	mm	in	mm	in							
VNGX160712T02020	VNGX353T0820	9,53	3/8	16,61	.654	1,2	3/64							●
VNGX160716T02020	VNGX354T0820	9,53	3/8	16,61	.654	1,6	1/16							●

Inserts



■ RCG



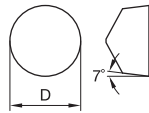
● first choice
○ alternate choice

P																				
M																				
K																				
N																				
S																				
H																				

ISO catalog number	ANSI catalog number	D		L10		R _ε		KYS25	KYS30	KY4300	KYK10	KYK25	KY3500	KY4400
		mm	in	mm	in	mm	in							
RCGX060400E	RCGV23E	6,35	1/4	—	—	—	—	●	●					
RCGX060400T01020	RCGV23T0420	6,35	1/4	—	—	—	—			●				
RCGX090700E	RCGV35E	9,53	3/8	—	—	—	—	●	●					
RCGX090700T00525	RCGV35T0225	9,53	3/8	—	—	—	—	●						
RCGX090700T01020	RCGV35T0420	9,53	3/8	—	—	—	—	●	●					●
RCGX120700E	RCGV45	12,70	1/2	—	—	—	—							●
RCGX120700E	RCGV45E	12,70	1/2	—	—	—	—	●	●					
RCGX120700S20015	RCGV45S8015	12,70	1/2	—	—	—	—							●
RCGX120700T01020	RCGV45T0420	12,70	1/2	—	—	—	—	●	●	●				●
RCGX120700T01025	RCGV45T0425	12,70	1/2	—	—	—	—	●	●	●				
RCGX151000T20015	RCGV565T8015	15,88	5/8	—	—	—	—							●
RCGX191000T20015	RCGV665T8015	19,05	3/4	—	—	—	—							●
RCGX251200T20015	RCGV88T8015	25,40	1	—	—	—	—			●				



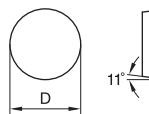
■ RCGV-T



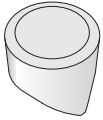
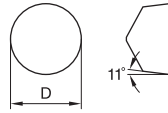
ISO catalog number	ANSI catalog number	D		L10		R _ε		KYS25	KYS30	KY4300	KYK10	KYK25	KY3500	KY4400
		mm	in	mm	in	mm	in							
RCGX060600T00520	RCGV24T0220	6,35	1/4	—	—	—	—			●				



■ RPGN

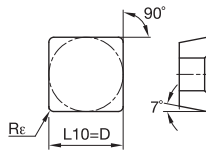


ISO catalog number	ANSI catalog number	D		L10		R _ε		KYS25	KYS30	KY4300	KYK10	KYK25	KY3500	KY4400
		mm	in	mm	in	mm	in							
RPGN060200E	RPG2150E	6,35	1/4	—	—	—	—		●					
RPGN090300E	RPG32E	9,53	3/8	—	—	—	—	●	●					
RPGN090300T00520	RPG32T0220	9,53	3/8	—	—	—	—							●
RPGN090300T01020	RPG32T0420	9,53	3/8	—	—	—	—			●				
RPGN120400E	RPG43E	12,70	1/2	—	—	—	—	●	●					
RPGN120400T01020	RPG43T0420	12,70	1/2	—	—	—	—	●						


RPGX

 ● first choice
 ○ alternate choice

P																				
M																				
K																				
N																				
S																				
H																				

ISO catalog number	ANSI catalog number	D		L10		Re		KYS25	KYS30	KY4300	KYK10	KYK25	KY3500	KY4400
		mm	in	mm	in	mm	in							
RPGX060400T00520	RPGV23T0220	6,35	1/4	—	—	—	—			●				
RPGX060400T01020	RPGV23T0420	6,35	1/4	—	—	—	—			●				
RPGX090700E	RPGV35E	9,53	3/8	—	—	—	—	●	●					
RPGX090700T00520	RPGV35T0220	9,53	3/8	—	—	—	—			●				
RPGX090700T01020	RPGV35T0420	9,53	3/8	—	—	—	—	●	●	●				
RPGX120700E	RPGV45E	12,70	1/2	—	—	—	—	●	●					
RPGX120700T00520	RPGV45T0220	12,70	1/2	—	—	—	—			●				
RPGX120700T01020	RPGV45T0420	12,70	1/2	—	—	—	—	●	●	●				


SCG-FW


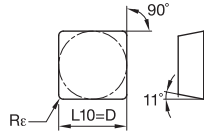
ISO catalog number	ANSI catalog number	D		L10		Re		KYS25	KYS30	KY4300	KYK10	KYK25	KY3500	KY4400
		mm	in	mm	in	mm	in							
SCGN090408EFW	SCG332EFW	9,53	3/8	9,53	.375	0,8	1/32					●		
SCGN090408EFW	SCG332FW	9,53	3/8	9,53	.375	0,8	1/32						●	



Inserts



■ S PGN



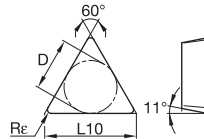
● first choice
○ alternate choice

P																				
M																				
K																				
N																				
S																				
H																				

ISO catalog number	ANSI catalog number	D		L10		Re		KYS25	KYS30	KY4300	KYK10	KYK25	KY3500	KY4400	
		mm	in	mm	in	mm	in								
SPGN090308T01020	SPG322T0420	9,53	3/8	9,53	.375	0,8	1/32								●
SPGN120308T01020	SPG422T0420	12,70	1/2	12,70	.500	0,8	1/32								●



■ T PGN



ISO catalog number	ANSI catalog number	D		L10		Re		KYS25	KYS30	KY4300	KYK10	KYK25	KY3500	KY4400	
		mm	in	mm	in	mm	in								
TPGN110304T01020	TPG221T0420	6,35	1/4	11,00	.433	0,4	1/64								●
TPGN110308T00520	TPG222T0220	6,35	1/4	11,00	.433	0,8	1/32			●					
TPGN110308T01020	TPG222T0420	6,35	1/4	11,00	.433	0,8	1/32								●
TPGN160304T01020	TPG321T0420	9,53	3/8	16,50	.650	0,4	1/64								●
TPGN160308T00520	TPG322T0220	9,53	3/8	16,50	.650	0,8	1/32			●					●
TPGN160308T01020	TPG322T0420	9,53	3/8	16,50	.650	0,8	1/32								●
TPGN160308T02020	TPG322T0820	9,53	3/8	16,50	.650	0,8	1/32					●			●
TPGN160312T01020	TPG323T0420	9,53	3/8	16,50	.650	1,2	3/64								●
TPGN160312T02020	TPG323T0820	9,53	3/8	16,50	.650	1,2	3/64					●			●
TPGN220408T02020	TPG432T0820	12,70	1/2	22,00	.866	0,8	1/32					●			●
TPGN220412T02020	TPG433T0820	12,70	1/2	22,00	.866	1,2	3/64								●



Beyond™ ISO

Ceramic Insert Expansion

KYK10™, KYK25™, KYS25™, and KYS30™

The new Beyond ISO KYK Ceramic Inserts are the first choice for high speed, continuous, and lightly interrupted turning applications in grey cast iron. These premium ceramic solutions for continuous cast iron turning applications offer improved fracture toughness, better wear resistance, and extended application range. By combining KYK10 and CVD-coated KYK25 with Kennametal's other ceramic grades for cast iron materials, Kennametal provides a complete, high-performance ceramic portfolio that can be optimised to reduce machining cycle times and lower overall manufacturing costs.

KYK10:

- Best suited for continuous turning of cast iron materials and in lightly interrupted cuts.

KYK25:

- Excellent wear resistance and pre-coat treatment allows for very consistent tool life and performance in a multitude of cast iron applications.

KYS25:

- Excellent surface finish, lower cutting forces, higher speeds.

KYS30:

- Excellent toughness and depth-of-cut notch resistance.

Experience the advantages at your Authorized Kennametal Distributor or at www.kennametal.com.

www.kennametal.com



Superhard Materials • PCBN and PCD

Superhard Tool Materials	B132–B173
Application Areas	B134–B135
PCBN	B137–B163
PCD	B165–B173
Superhard Inserts	B174–B197

■ Properties of PCD and PCBN cutting tool materials

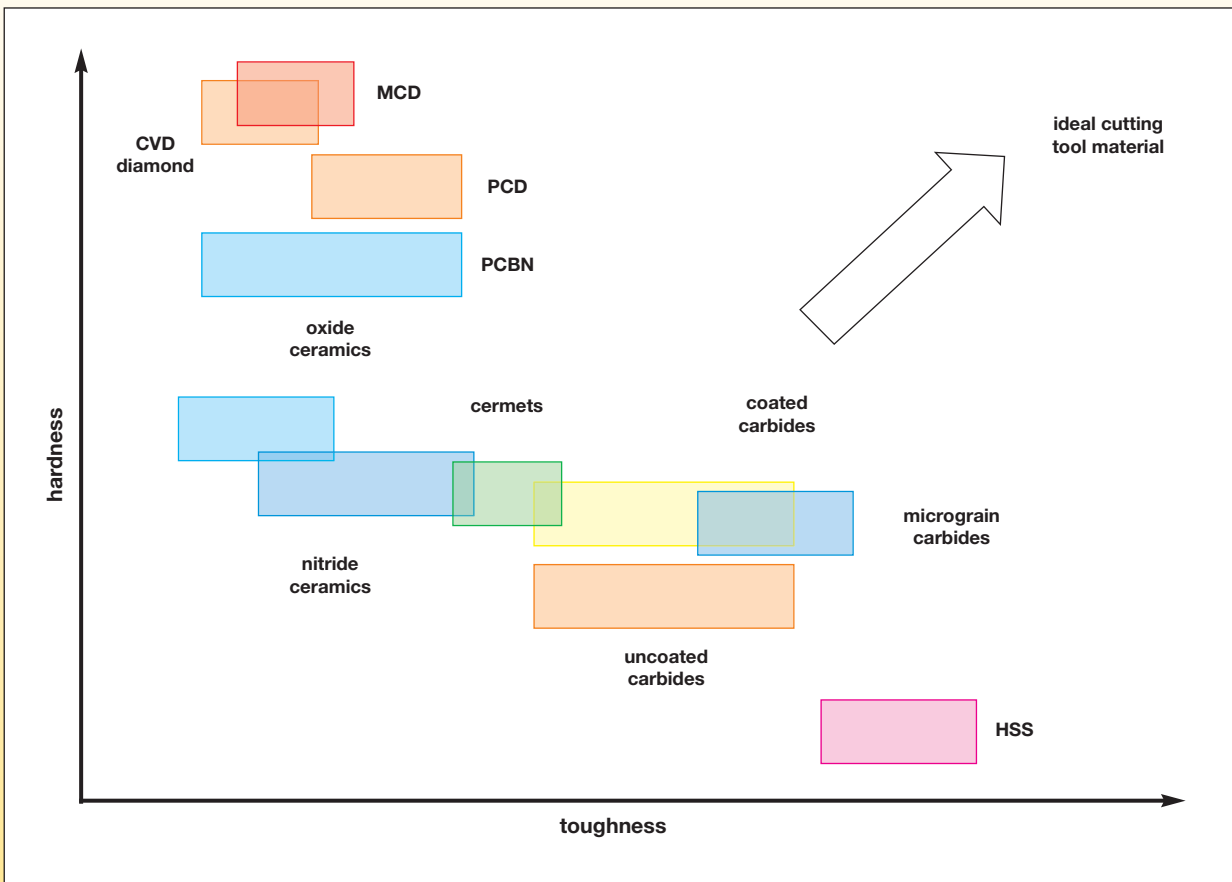
The current global metalcutting climate has put increased focus on high productivity and cost reductions coming from cutting tools. These requirements lead to the rapid growth and implementation of cutting tools using superhard materials. As the name implies, these materials have a significant advantage in hardness over conventional tool materials, which from the end user point of view, translates into increased productivity (higher cutting speeds, longer tool life, etc.), lower tooling cost per part, and also, the ability to process materials previously un-machinable with conventional tooling.

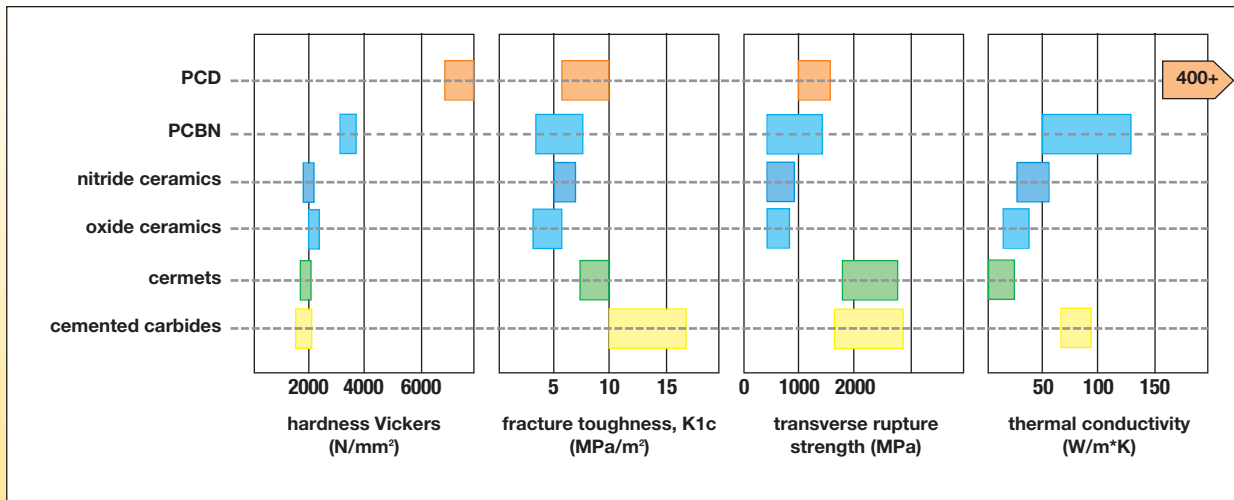
The most widely known superhard materials are diamond and cubic boron nitride. Our industry uses the polycrystalline forms of these materials, i.e., polycrystalline diamond (PCD) and polycrystalline boron nitride (PCBN). PCD tooling is mainly targeted at the machining of non-ferrous materials (e.g., aluminum alloys, plastics, CFRPs, composites, titanium alloys, ceramics, carbides, etc.) whereas PCBN targets iron-based alloys (e.g., cast irons, hard steels, iron-based composites, etc.)

Kennametal is at the forefront of developing and implementing superhard materials in our standard and special tooling solutions across all our product lines. Kennametal's approach to superhard tooling starts with customer needs and constraints. We then use fundamental research to develop the best superhard solutions that would make available the best value for the customer and respond to their specific demands.

■ Where to use PCD and PCBN

Diamond and cubic boron nitride (CBN) are the most commonly known superhard materials. For cutting tools, they are used in their polycrystalline form, i.e., PCD and PCBN.





PCBN/PCD Inserts

■ Choosing between PCD and PCBN

It is primarily their thermochemical stability that determines the suitability of the two materials for specific areas of application. For standard PCD, this means that it is restricted to workpiece materials where the cutting temperature does not exceed 700 °C and has no affinity with carbon if diffusion wear of the cutting edge is to be avoided at elevated temperatures. Operations that satisfy these conditions are, for example, the machining of non-ferrous metals, wood, plastics, and minerals where PCD mainly competes against tungsten carbide and, to some extent, high-speed steel.

By contrast, PCBN is thermally stable up to approximately 1200 °C and has high resistance to chemical attack. As a result, extreme temperatures, such as occur when machining hard ferrous metals, do not pose difficulties and can be used to promote self-induced hot cutting. Therefore, technical and economic benefits can be achieved, particularly in comparison with grinding, and in most cases, performance is significantly better than that attainable with conventional tool materials, such as tungsten carbides and ceramics.

There are limitations for PCBN, however, in the machining of austenitic steels and ferritic cast irons, where more reactive phases result in increased PCBN edge wear.



■ PCBN

Increased productivity can be achieved with PCBN tools through:

- Higher cutting speeds.
- Higher feed rates.
- Longer tool life.
- Less machine downtime.

- More parts per machine means direct tool costs can be reduced.

- Very tight workpiece surface finish tolerances can be achieved on difficult-to-machine materials.

- PCBN can be used to machine ferrous materials in the hardened condition as an alternative to grinding, making it possible to substantially reduce component machining times.

- PCBN offers environmental benefits — the generation of grinding sludge is eliminated and the chips can be recycled.

- Improved surface integrity of critical components.



B Boron

N Nitrogen

■ Grinding vs. Hard Turning



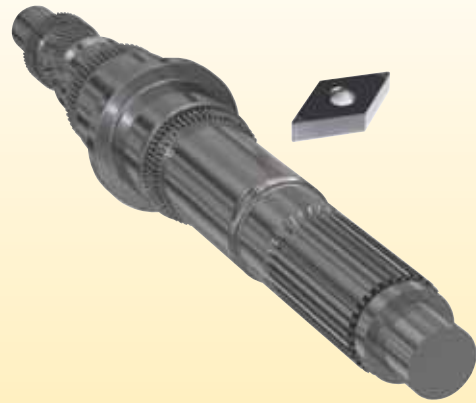
Grinding

- Size tolerance specifications beyond the capability of turning.
- Surface finish requirements too tight for hard turning.

vs.

Hard Turning

- Size tolerance specifications beyond the capability of turning.
- Complex geometry that makes single-point turning more practical.
- Relatively high metal removal rates.
- Dry machining.
- Faster machine setup.
- Faster cycle times.
- I.D. and O.D. machining on one machine.



■ Where does PCBN work?

PCBN is suitable for machining a wide variety of workpiece materials, mainly ferrous alloys.

The application areas may be broadly categorized as follows:

Hardened Steels	Cast Irons	Superalloys	Powder Metallurgy Steels
-----------------	------------	-------------	--------------------------

Certain classes of PCBN materials are associated with each particular application.

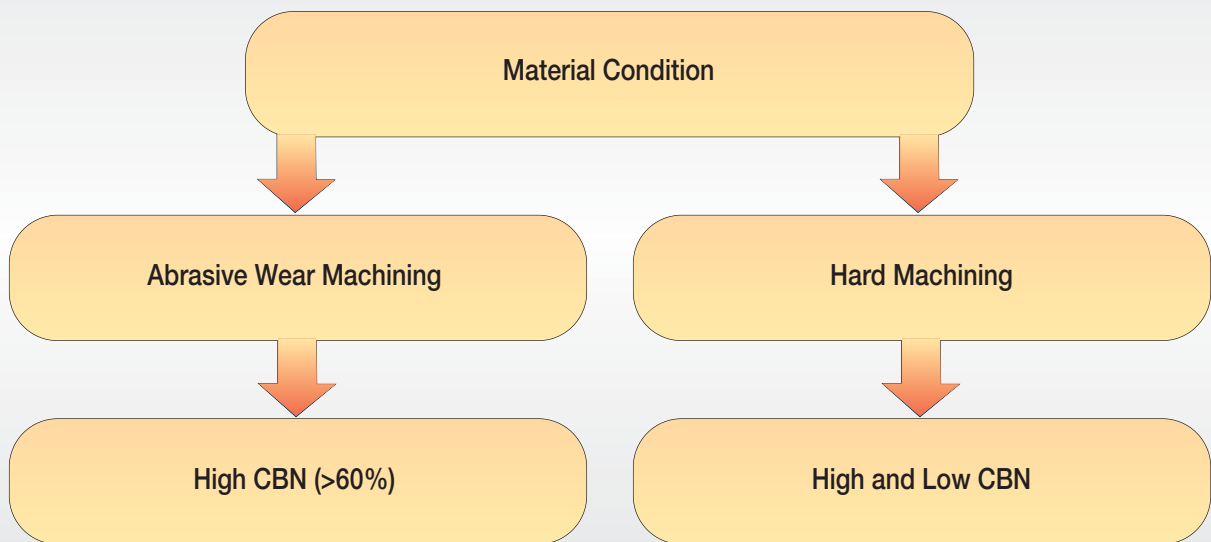
For best cost performance, proper selection of the following is essential:

- Format of the insert.
- Grade.
- Edge prep.
- Application data.

PCBN/PCD Inserts

■ PCBN is known as the second hardest material

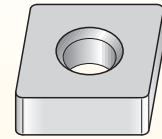
There are two principal material conditions where PCBN is used.



■ PCBN insert formats

Solid Inserts

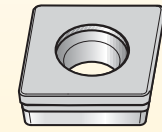
- Inserts are made only from PCBN.
- No material joint.
- Best heat absorption capacity.
- Can work at highest temperatures.



solid

Full-Face Inserts

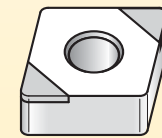
- Inserts are made from a presintered carbide/PCD or PCBN joint.
- Elimination of the brazing joint. Less delamination.
- Better heat absorption capacity.
- Can work at higher temperatures than tipped tools.
- Facilitate larger depth of cut compared to the same size tipped insert.
- The blanks are available with “A” and “W” ISO-style pin-lock holes.



full-face

Tipped Inserts

- Require a carrier and substrate for the insert.
- The tips are brazed to the substrate. Various brazing methods are applied.
- The substrate has to have a pocket that will accommodate and support the tip.
- In these types of tools, the braze joint represents the weak link, so the brazing operation is very important and should be carefully controlled and executed.
- The main advantage of tipped tools over full-faced inserts is the lower cost.



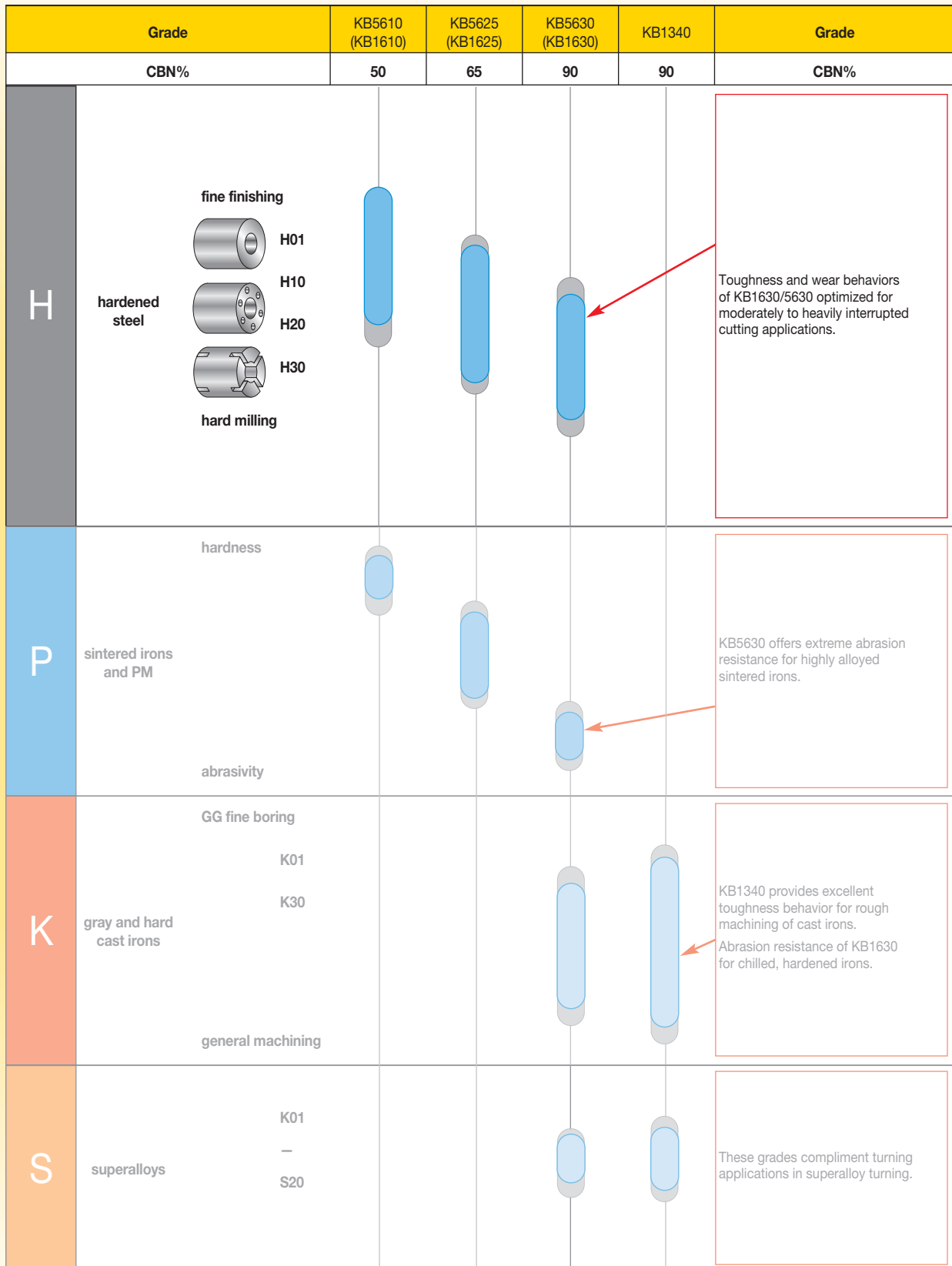
tipped

■ Kennametal inserts

This table shows approximate tip sizes of Kennametal CBN inserts depending on style and corner radius. Please note that the maximum cutting depth is not more than 80% of the tip length.

radius	insert shape				
	S	C, W	T	D, K	V
R 0,2mm					
R 0,4mm					
R 0,8mm					
R 1,2mm					
R 1,6mm					

■ PCBN portfolio



PCBN/PCD Inserts



PCBN Hard Turning Selection System

Introduction

This guide will help you choose the PCBN grade, edge preparations, nose radius, feed, and recommended speed range for your hard turning applications. These recommendations will establish a starting point for optimization of the application. Where possible, this guide will lead you to standard line items. If this is not the case, the items can still be obtained through the QTSP (Quick-Turn Solutions Program) or ordered as specials.

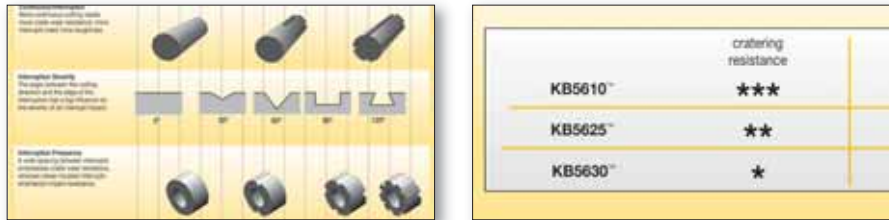
We will classify hard turning operations as any turning or boring of ferrous-based workpiece materials with a hardness (HRC) higher than 45. For workpieces with lower hardness values, PCBN is not recommended.

To use the guide, you will need this application information:

- Workpiece design: interruptions, shape, and frequency.
- Workpiece material specifications: hardness, superficial or through treatment, and carbide forming alloying elements (that increase the abrasivity of the material).
- Depth of cut.
- Surface finish requirements.
- Preset conditions, such as specific nose radius, limited feed, etc.
- Setup limitations related to machine tool, fixturing, etc.
- Tool life criteria, e.g., surface finish, dimensional tolerance, cutting force, etc.

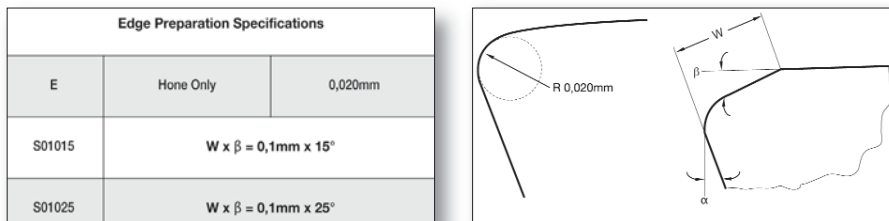
PCBN Hard Turning • Selection System Overview

Step 1 • Choosing the PCBN Grade



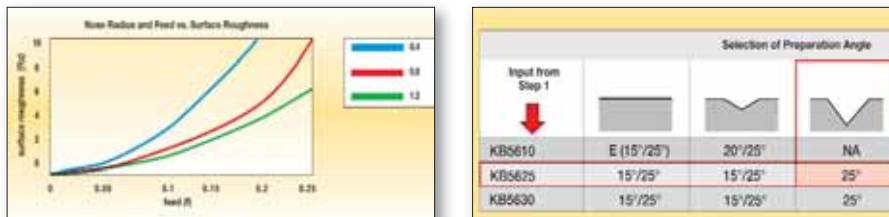
Step 1, reference pages B144–B145.

Step 2 • PCBN Edge Preparation Features



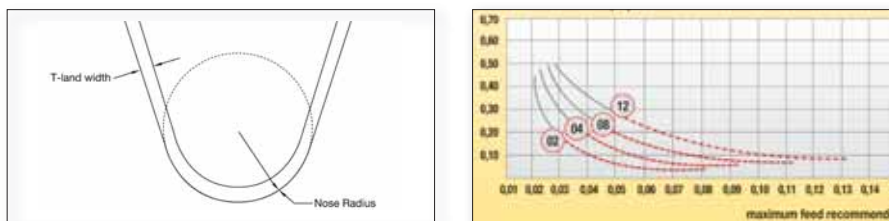
Step 2, reference page B145.

Step 3 • Selection of T-Land Angle



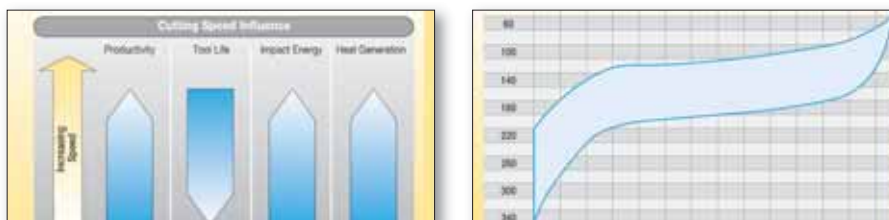
Step 3, reference page B145.

Step 4 • Selection of T-Land Width



Step 4, reference page B146.

Step 5 • Choosing the Speed Range



Step 5, reference page B147.

Grade Selection for Hard Turning

How to Use

Identify your application conditions. The most far right parameter will then determine the recommended grade(s). If more than one grade is intersected, it is recommended to first select the grade with the highest toughness (page B139) before optimizing using the Troubleshooting Guide (pages B142–B143).

Step 1 • Choosing the PCBN grade

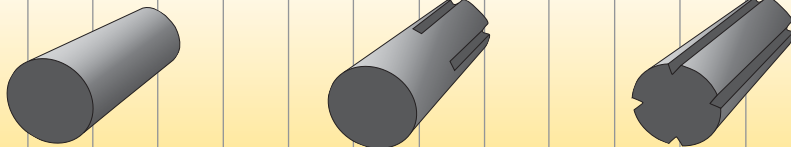
Depth of Cut (mm)

Larger depths of cut need stronger grades.

0.10 0.20 0.30 0.40 0.50 0.60 0.70

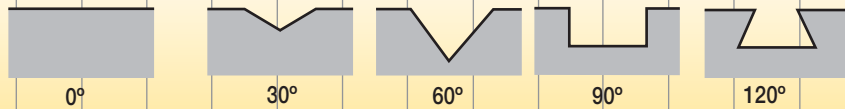
Continuous/Interrupted

More continuous cutting needs more crater wear resistance; more interrupts need more toughness.



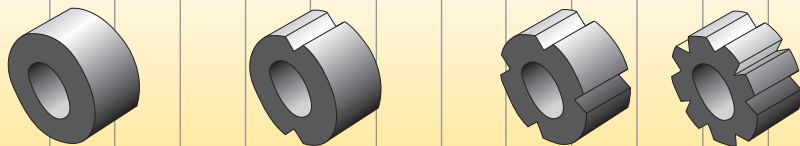
Interruption Severity

The angle between the cutting direction and the edge of the interruption has a big influence on the severity of an interrupt impact.



Interruption Frequency

A wide spacing between interrupts emphasises crater wear resistance, whereas closer-located interrupts emphasise impact resistance.



KB5610™

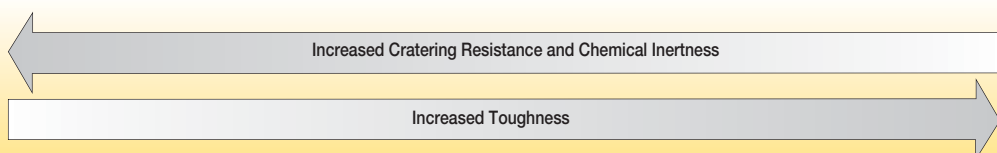
KB5625™

KB5630™

H10 H15 H20 H25 H30

ISO Class
Hard Turning

Tool Wear Type



(continued)

Step 1 • Choosing the PCBN grade (continued)

	cratering resistance	abrasive resistance	impact resistance	surface finish
KB5610™	***	*	*	***
KB5625™	**	**	**	**
KB5630™	*	***	***	**

*** = Best

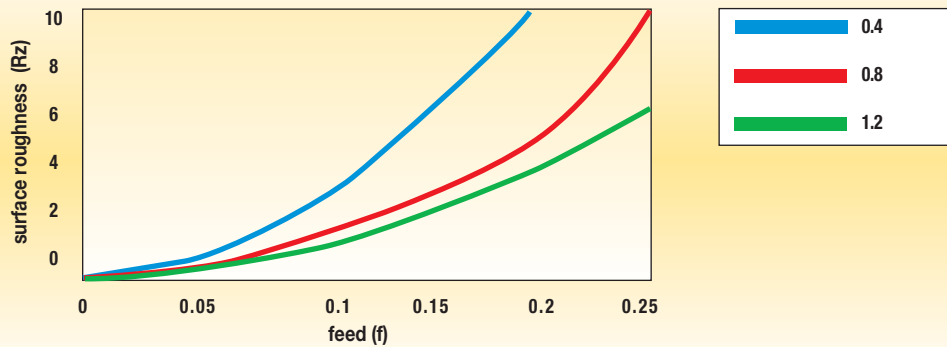
Step 2 • PCBN edge preparation features

Edge Preparation Specifications		
E	hone only	0,020mm
S01015	$W \times \beta = 0,1\text{mm} \times 15^\circ$	
S01025	$W \times \beta = 0,1\text{mm} \times 25^\circ$	

R 0,020mm

W — Edge Prep Width
 α — Clearance Angle
 β — T-Land Angle

Nose Radius and Feed vs. Surface Roughness



Step 3 • Selection of T-land angle

How to Use

Using the grade selection and the Interruption Severity from Step 1, select edge preparation angle or hone only, E, from the table below. Solutions in parenthesis are second options.

Selection of Preparation Angle					
input from Step 1 ↓					
KB5610	E (15°/25°)	20°/25°	NA	NA	NA
KB5625	15°/25°	15°/25°	20°/25°	25°	NA
KB5630	15°/25°	15°/25°	20°/25°	25°	25°/35°

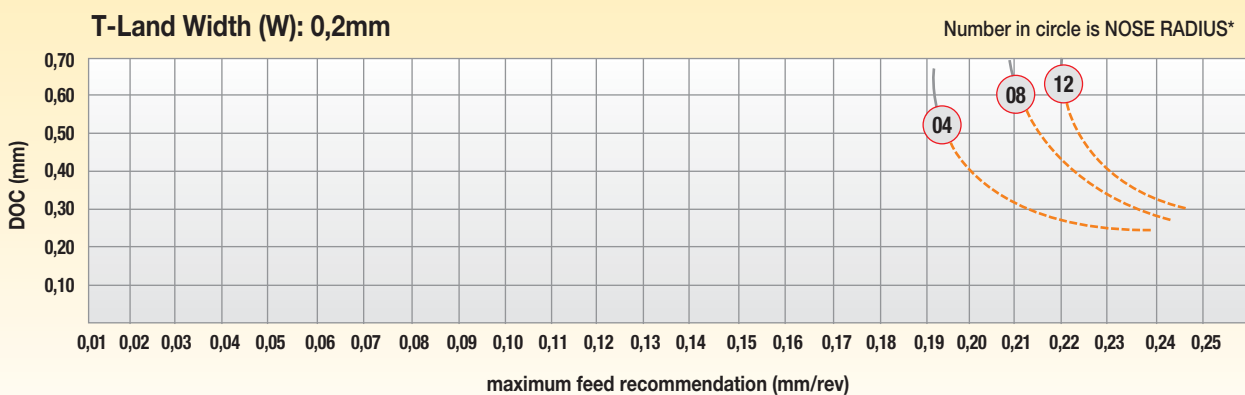
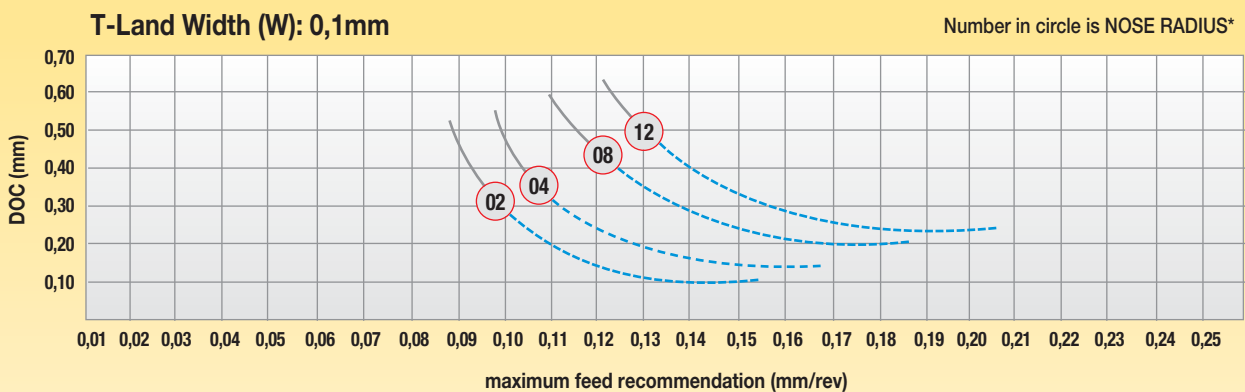
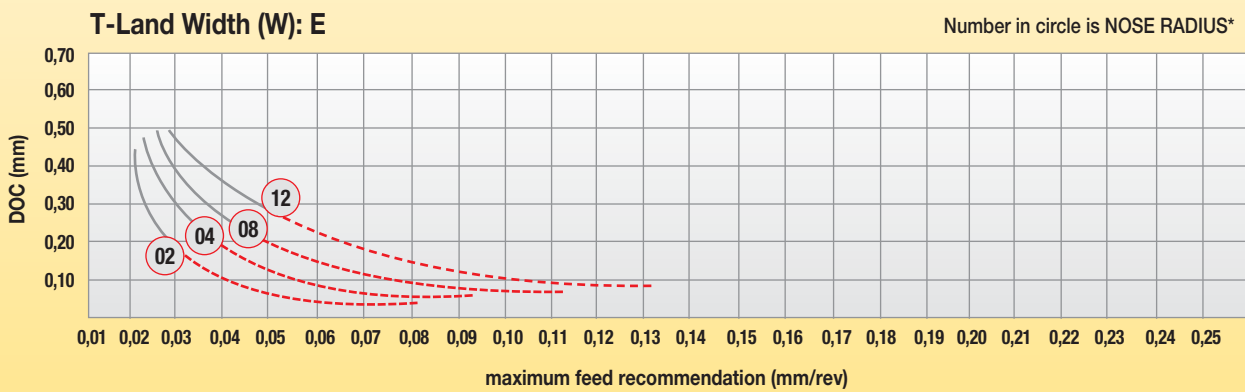
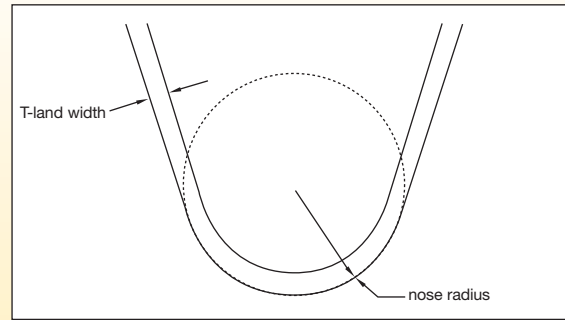
PCBN/PCD Inserts

Step 4 • Selection of T-land width

How to Use

Example 1: If the feed, depth of cut, and the tool nose radius are fixed, use these values to see what T-land width should be used.

Example 2: If you want to use a specific T-land width or hone only edge, use the chart below to see what maximum feeds and depths of cut are recommended for different nose radii.



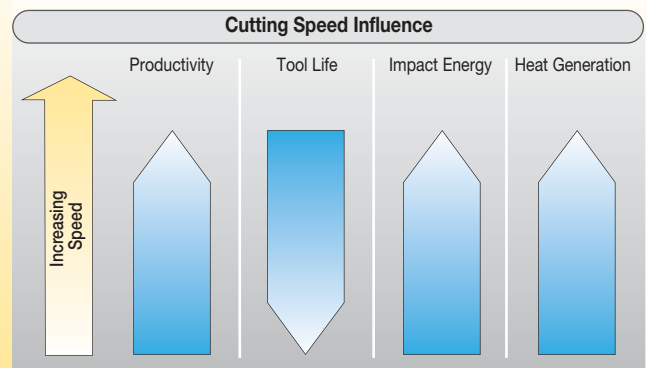
*NOTE: Colored lines represent proven solutions; gray lines represent theoretically possible solutions.

Step 5 • Choosing the speed range

How to Use

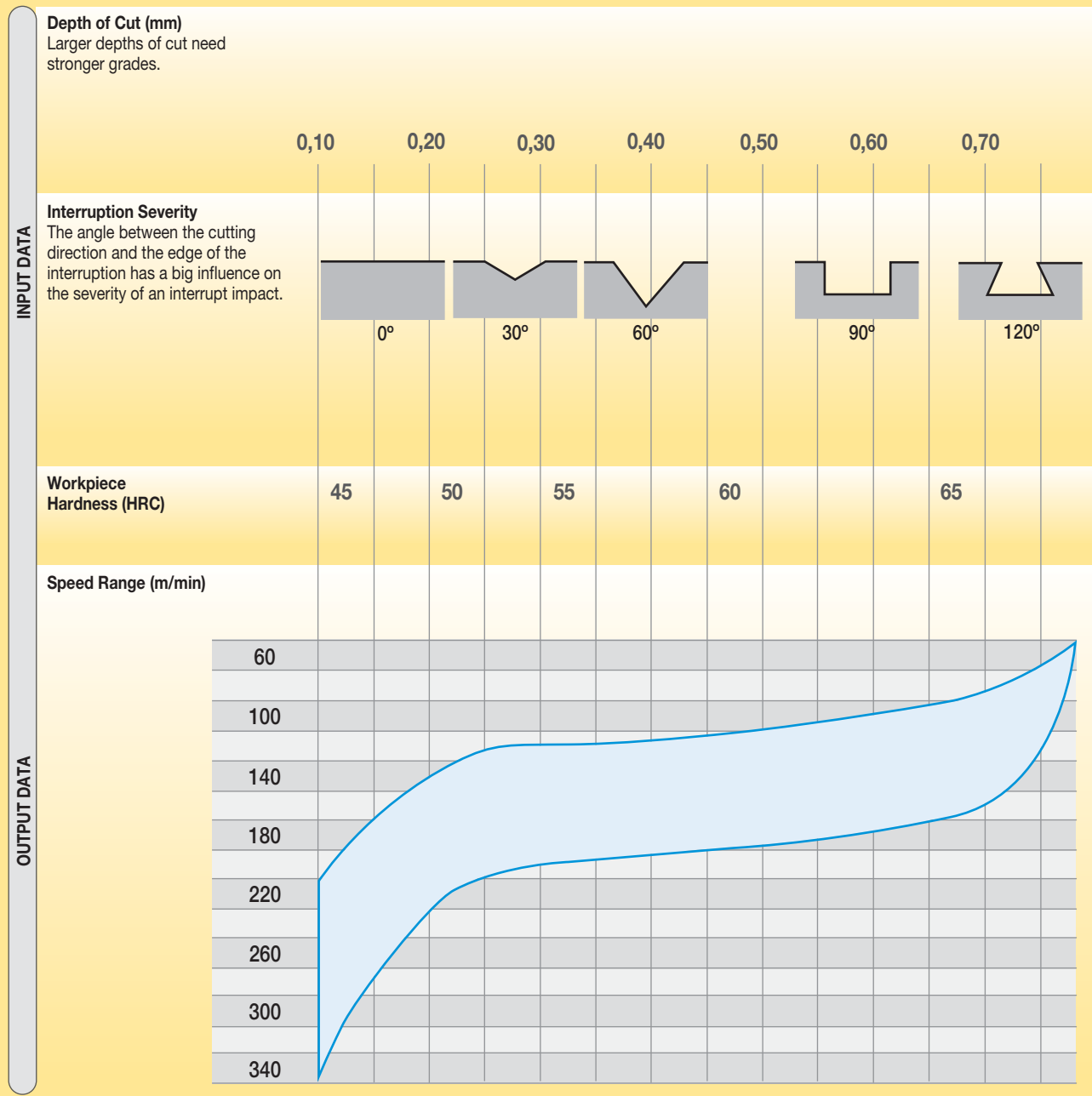
Using the application information, determine your position in the INPUT DATA table below and select the speed range area with which it intersects for each input parameter. If different speed ranges result, choose the lowest speed range.

The shaded area extends to the minimum and maximum speeds for the application. The suggested starting speeds can be taken as the minimum line of this range.



PCBN/PCD Inserts

Speed Range Selection for Hard Turning





CBN Inserts with Chipbreaker

For hardened steels, grinding is no longer the preferred method in finish turning operations because hard turning now drastically reduces cost per part. With high metal removal rates, faster machine setup, quicker cycle times, and greater flexibility, it is obviously the preferred method.

Despite these advantages, hard turning has sometimes had issues with poor chip control causing surface scratching and bird-nest formations. Kennametal solved these problems by integrating special chipbreaking geometries into two high-performance PCBN grades, giving customers total control of their hard machining.

Ideally, hardened steels are machined with a low or medium CBN content grade where the workpiece encounters few interruptions. However, because of CBN's structure, the industry had not been able to add chipbreaking technology to low content CBN inserts. KB5610™ with chipbreaker is, therefore, the first product of its type to deliver chipbreaking where it's most needed. KB5625™ with chipbreaker provides a chipbreaking solution for applications requiring more toughness.

Together, these tools give Kennametal customers industry-leading flexibility in choosing the right tool for the job.

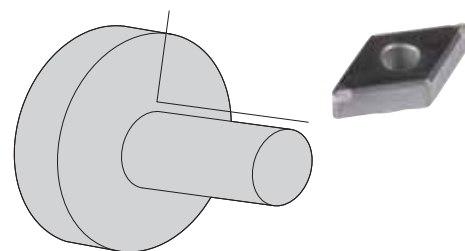
Features

- Chipbreaker for improved chip control.
- KB5610 ideal grade for continuous operations.
- KB5625 ideal grade for continuous and interrupted operations.

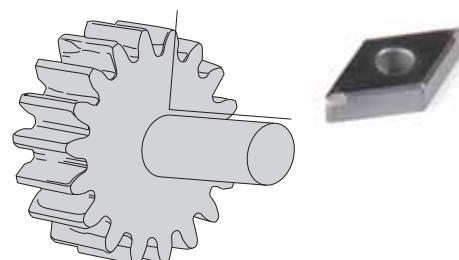
Benefits

- Improved surface quality to reduce scrap rates.
- Reduction of machine stops due to swarf issues to improve machine availability.
- Reduction of bird-nest formation to reduce clean up time.
- Two grades to choose from for best performance.

KB5610



KB5625



CBN Inserts

Insert without Chipbreaker



- Long chips.
- Bird-nest formation.

Insert with Chipbreaker



- Chips are broken.

■ Reverse gear face turning and chamfering

Workpiece: Reverse gear
Hardness: 58–62 HRC

	Competitor	Kennametal
Insert:	DNGG150412N-SV	DNGM159412S0125MT CB1
Grade:	—	KB5625
vc:	235 m/min (775 SFM)	235 m/min (775 SFM)
f:	0,25 mm/rev (.0098 in/rev)	0,35 mm/rev (.014 in/rev)
ap:	0,26mm (.0098")	0,26mm (.0098")
Pieces/edge:	600	900
Chip shape:	Snarling or infinite helix	Coiled with 3 turns

Result: Better chip control, high productivity (by increased feed), and 1.5x tool life

■ Hard material turning by using PCBN with chipbreaker

Workpiece: Tube
Hardness: 52–58 HRC

	Competitor	Kennametal
Insert:	DNGA442S0420MT	DNGM432S0525MTCB1
Grade:	—	KB5625
vc:	120 m/min (400 SFM)	120 m/min (400 SFM)
f:	0,15 mm/rev (.0059 in/rev)	0,15 mm/rev (.0059 in/rev)
ap:	0,3mm (.012")	0,3mm (.012")
Pieces/edge:	2	4
Chip shape:	Snarling or infinite helix	Discontinuous

Result: Better chip control and double tool life

■ PCBN portfolio

Grade	KB5630 (KB1630)	KB1340	Grade
CBN%	90	90	CBN%
<div style="background-color: red; color: white; padding: 10px; display: flex; align-items: center; justify-content: center;"> K </div> <p>GG fine boring</p> <p>gray and hard cast irons</p>	K01		<p>KB1340 provides excellent toughness behaviour for rough machining of cast irons.</p> <p>Abrasion resistance of KB1630 for chilled, hardened irons.</p>
	K30		

■ High content PCBN grades: KB1340™, KB1630™, and KB5630™

General Application Area

Continuous and interrupted machining of ferrous alloys where the main wear mode is abrasive and a strong edge is required.

Primary Target Workpiece Materials

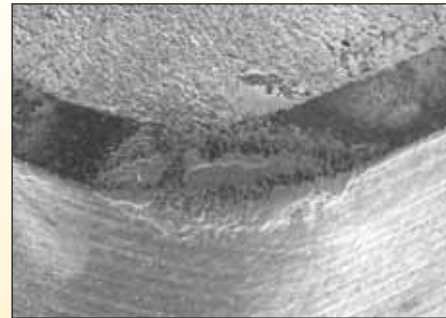
- Gray cast irons.
- High Cr content irons.
- Chilled and hardened irons.
- Co-, Ni-, and Fe-based hard facing alloys.
- Other alloys in which there is a high concentration of carbide forming elements, and the primary wear is abrasive.



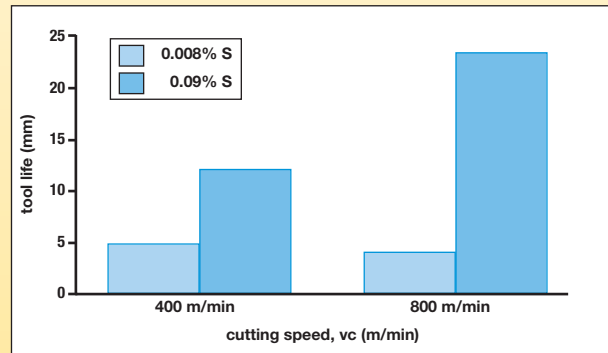
■ Machining gray cast iron

The largest application area for KB1340™ is machining of gray cast irons. Following are a few particulars of this application:

- GCI have to be machined dry. The application needs to generate high levels of heat in order to create a protective oxide layer on the tool.
- It is important to confirm with the customer that the GCI has been properly aged, and it has a sulphur content over 0.05%.
- The starting point for edge preparation should be .004" (0,10mm) x 20° for finishing (DOC <0,5mm) and .008" (0,20mm) x 20° for roughing.
- The edge preparation angle should increase if any interruptions are present, up to 35°.
- Lack of aging and/or low sulphur content can lead to a decrease in tool life of up to 10 times!
- A slow feed approach/engagement of the tool is recommended to minimize chipping and notching.



Proper application of KB1340 – formation of protective layer, tool life should exceed 70 km sliding distance.



Comparison of the life of PCBN cutting tools in machining two different gray cast irons, primarily differing in sulphur content.

■ Application recommendations

workpiece material	speed				feed				depth of cut			
	m/min		SFM		mm		in		mm		in	
	min	max	min	max	min	max	min	max	min	max	min	max
hot-work tool steels – roughing	50	150	165	495	0,2	0,5	0,008	0,020	0,8	3,0	0,031	0,118
cold-work tool steels – roughing	50	150	165	495	0,2	0,5	0,008	0,020	0,8	3,0	0,031	0,118
gray cast iron – roughing	700	1200	2310	3960	0,2	0,6	0,008	0,024	0,5	3,0	0,020	0,118
gray cast iron – finishing	750	1500	2475	4950	0,1	0,3	0,004	0,012	–	0,5	0,000	0,020
CGI and NCI – roughing	50	300	165	990	0,2	0,5	0,008	0,020	0,5	2,0	0,020	0,079
chilled cast iron – roughing	30	150	99	495	0,2	0,6	0,008	0,024	0,5	3,0	0,020	0,118
chilled cast iron – finishing	30	150	99	495	0,1	0,3	0,004	0,012	–	0,5	0,000	0,020
hard facings – as per bearing steel	60	200	198	660	0,1	0,5	0,004	0,020	0,2	3,0	0,008	0,118
high Cr irons	80	250	264	825	0,1	0,6	0,004	0,024	0,2	3,0	0,008	0,118

High-content PCBN grades are intended for use in negative rake clamp-type toolholders, boring, recessing tools, and milling heads. Due to the dynamic loads that occur in the machining of hard ferrous materials and the conditions under which these grades operate, frequently involving shocks from interrupted cutting, it is advisable to strengthen the tool system as much as possible and use dimpled inserts where possible.



Dimple Clamps for Added Stability

Typical Application

Continuous cost pressures force manufacturers of gray cast iron brake disks to look for cost-cutting solutions. CBN inserts deliver high productivity and long tool life. Kennametal has developed the solid, high-content grade KB1340™, which provides superior performance when machining gray cast iron components, such as brake disks or fly wheels. To ensure secure seating in the toolholder, the inserts are available with dimple-design clamping. The clamps fit Ceramtec holders, which makes the conversion to Kennametal tooling easier.



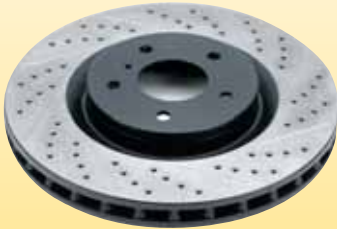
Higher Productivity and Profitability

- Ensures tight and rigid clamping.
- Dimpled insert with special clamping provides increased stability in the pocket.
- Ideal for use in heavy-duty machining applications.
- Cladded clamps for improved resistance against chip wash are available upon request.
- The shallow dimple design enables the use of less expensive 3/16" (4,76mm) inserts.
- Round dimple design works with custom tooling where clamping direction must be offset due to space limitations.

Featured Applications: Brake Disk Machining

■ Proven solutions

Workpiece: Brake disk
Material: GGG 60



	Competitor CBN	Kennametal KB1340
Insert:	N/A	SNMN120416502020
vc:	1100 m/min (3600 SFM)	1100 m/min (3600 SFM)
f:	0,4 mm/rev (.016 in/rev)	0,4 mm/rev (.016 in/rev)
ap:	2mm (.079")	2mm (.079")
Performance:	1500 pieces	1700 pieces

	Competitor Ceramic	Kennametal CBN KB1340
Insert:	N/A	CNGX433S0415FW
vc:	800 m/min (2600 SFM)	1500 m/min (5000 SFM)
f:	0,5 mm/rev (.02 in/rev)	0,5 mm/rev (.02 in/rev)
ap:	1,5mm (.059")	1,5mm (.059")
Performance:	120 pieces	4200 pieces

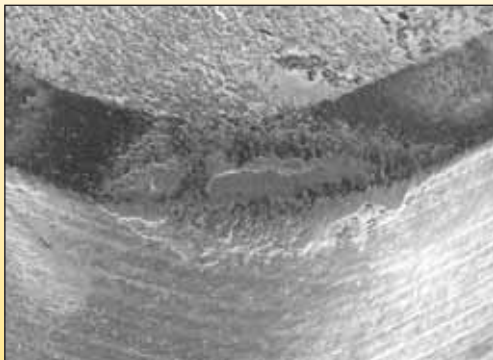
■ Clamp selection chart

insert		clamp	
ANSI catalog number	ISO catalog number	catalog number	MM
CNGX433S0415	CNGX120412S01015	551.718 - 100° Corner	3968904
CNGX433S0415FW	CNGX120412S01015FW	551.718 - 100° Corner	3968904
CNGX434S0820	CNGX120416S02020	551.718 - 100° Corner	3968904
CNGF432	CNGF120408	551.718 - 100° Corner	3968904
DNGX434S0820	DNGX150416S02020	551.720	4094234
SNGX434S0820	SNGX120416S02020	551.718	3968904
SNGX534S0820	SNGX150416S02020	551.718	3968904
VNGX333S0820	VNGX160412S02020	551.721	4094236
TNGX333EFW	TNGX160412EFW	551.733	4094235

■ Application recommendation

vc: 800–1500 m/min

Certain melts of gray cast iron can exhibit poor machinability — by as much as two orders of magnitude — **related to either insufficient aging or composition.**

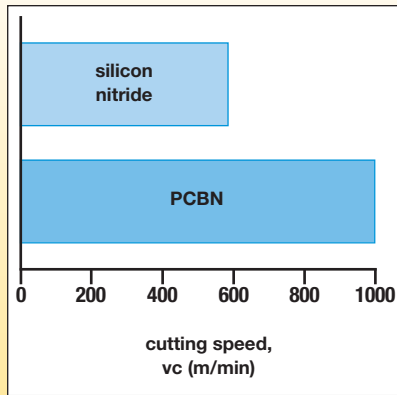


Good GG25 (0.05 S)
62 km sliding distance @ 1500 m/min

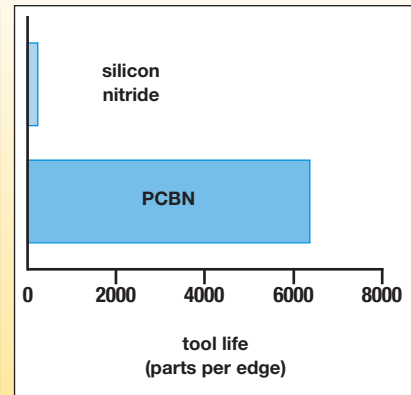
■ Gray cast iron brake disk machining • Ceramic vs. PCBN



(a)



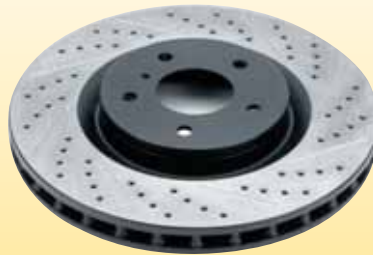
(b)



(c)

PCBN increases productivity when machining gray iron brake disks (a) in terms of cutting speed (b) and tool life (c) compared to silicon nitride ceramic.

■ Brake disk machining example

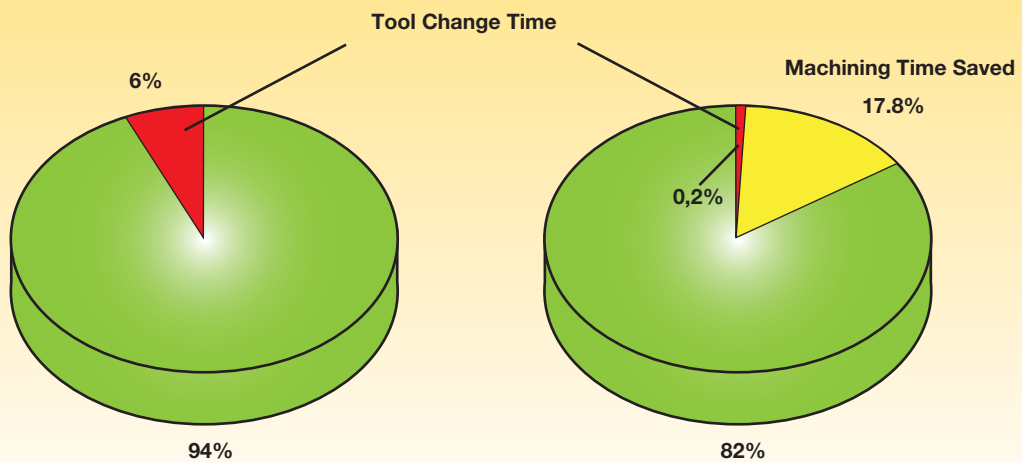


Optimized Process

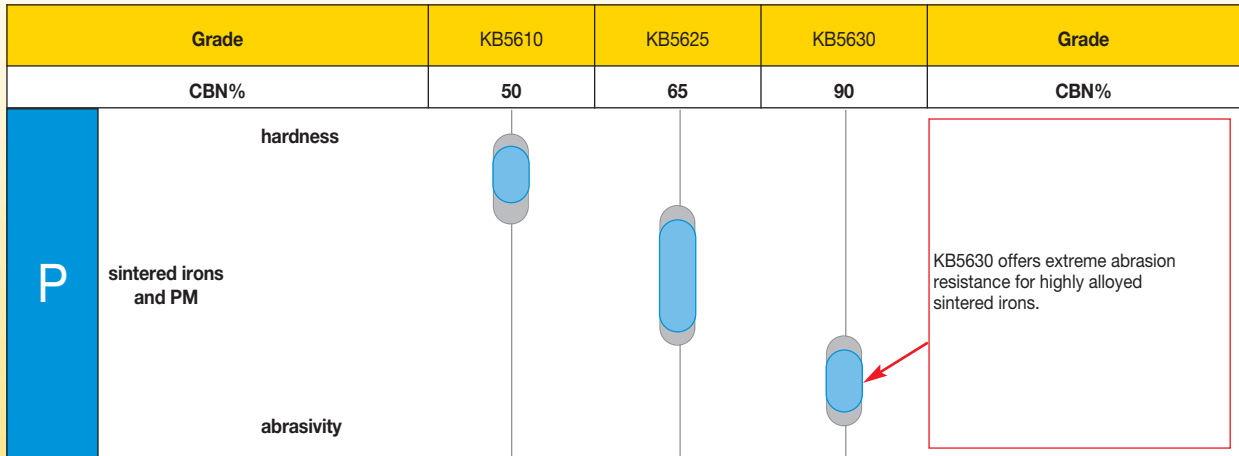
Tool Material: PCBN
Tool Life: 2000 brake disks

Starting Situation

Tool Material: black ceramic
Tool Life: 40 brake disks

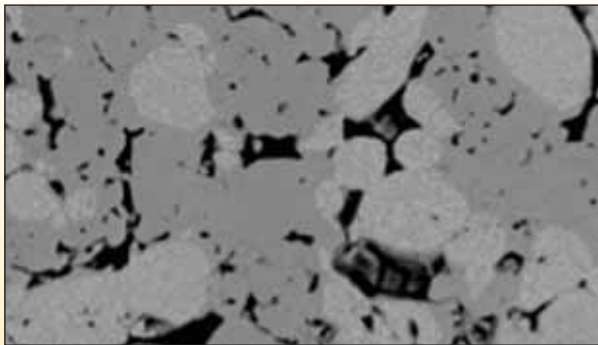


■ PCBN portfolio



PCBN/PCD Inserts

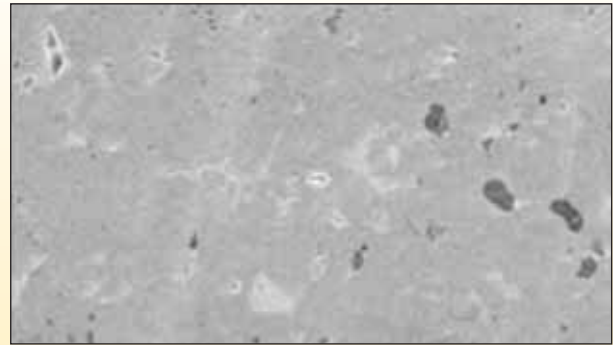
■ PM machining • Inlet/outlet valve



50 μm

Exhaust

- Abrasive with hard particle content:
 - Martensite — 800 HK
 - WMoC — 1600 HK
 - VC — 2800 HK
- High porosity/Cu infiltrated.
- Co increases hot hardness.
- Macro-hardness <400 HV (<41 HRC).
- Derives wear resistance from hard particles.

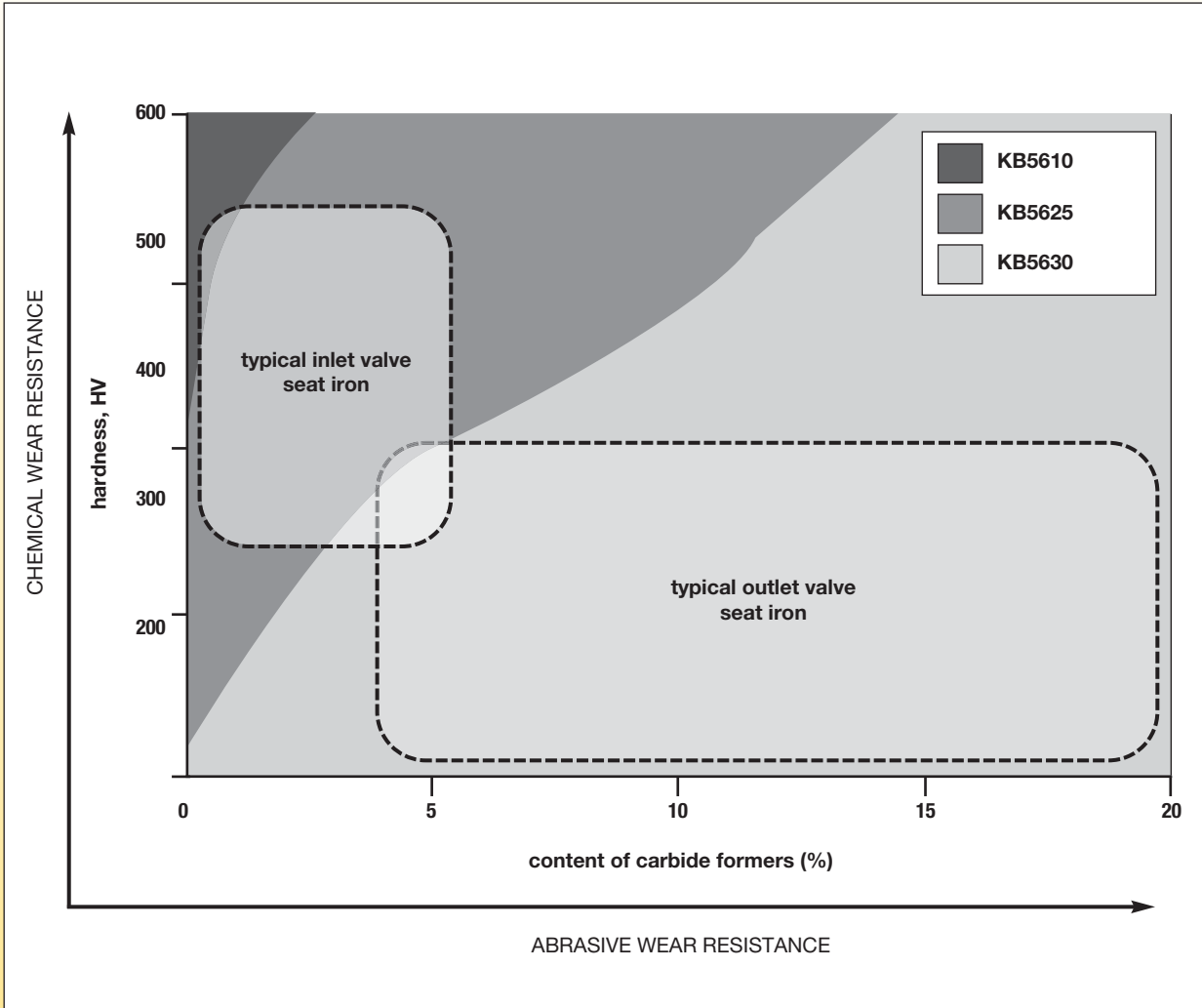


50 μm

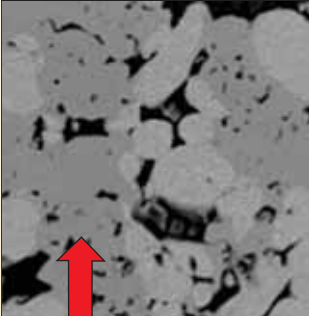
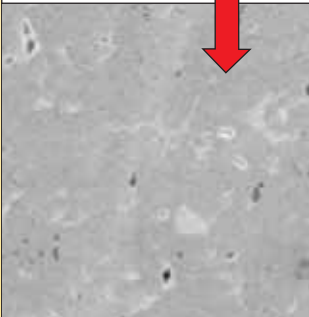
Intake

- Principally, structure is hard steel.
- Minimal porosity on well sintered.
- Low/medium alloy content.
- Macro-hardness >400 HV (>41 HRC).
- Derives wear resistance from hardened matrix structure.

■ PCBN grade selection for valve seat machining



■ PCBN grade selection for valve seat machining

	material to be machined	short engagement (e.g., plunging)	long engagement (e.g., generating)
	Soft matrix (≤ 300 HV), hard carbides, high porosity	1. Abrasion resistance 2. Strength #1 Choice: KB5630™	1. Abrasion resistance 2. Strength 3. Chemical wear resistance #1 Choice: KB5630
<p>Highly Abrasive</p> <p>High Hardness</p>	Both material types with single insert	1. Abrasion resistance 2. Chemical wear resistance 3. Strength #1 Choice: KB5630 #2 Choice: KB5625™	1. Abrasion and chemical wear resistance 2. Strength #1 Choice: KB5625 #2 Choice: KB5630
	Hard matrix (≥ 400 HV), few carbides, low porosity	1. Chemical wear resistance 2. Strength 3. Abrasion resistance #1 Choice: KB5625 #2 Choice: KB5610™	1. Chemical wear resistance 2. Abrasion resistance 3. Strength #1 Choice: KB5625 #2 Choice: KB5610



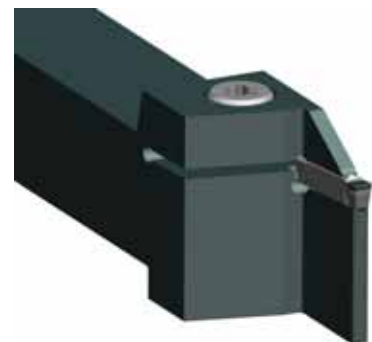
PCBN/PCD Inserts



A4™ Grooving and Turning System

- One tool for turning, facing, grooving, and face grooving in O.D. and I.D. applications — that means exceptionally fast cycle times and no turret indexes.
- Extra-long clamping area, ground 120° bottom prism seating surface, and an exclusive top guide rail combine to deliver unsurpassed grooving and side-turning stability!
- Precise insert positioning is ensured for accurate cuts!

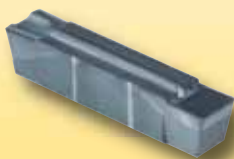
Clamping Design



Applications

■ Test result • A4

Tool: A4R0400M04800E KB1630
Material: INCONEL® 718
Diameter: 983mm



Cutting Data	Competitor	Kennametal
Speed:	180 m/min (600 SFM)	180 m/min (600 SFM)
Feed:	0,3mm/rev (.0051 in/rev)	0,3mm/rev (.0051 in/rev)
DOC:	8mm (.31")	8mm (.31")
Diameter:	30mm (1.18")	30mm (1.18")
Performance:	70–140 pieces	160–200 pieces



Top Notch™ Grooving System

Our rigid clamping design prevents insert movement. This benefit ensures excellent surface finish, improved productivity, and superior tool life and promotes perfect concentricity. The rugged bridge clamp generates locking forces in three directions to provide superior resistance to side thrust and tangential forces.

Clamping Design



Applications

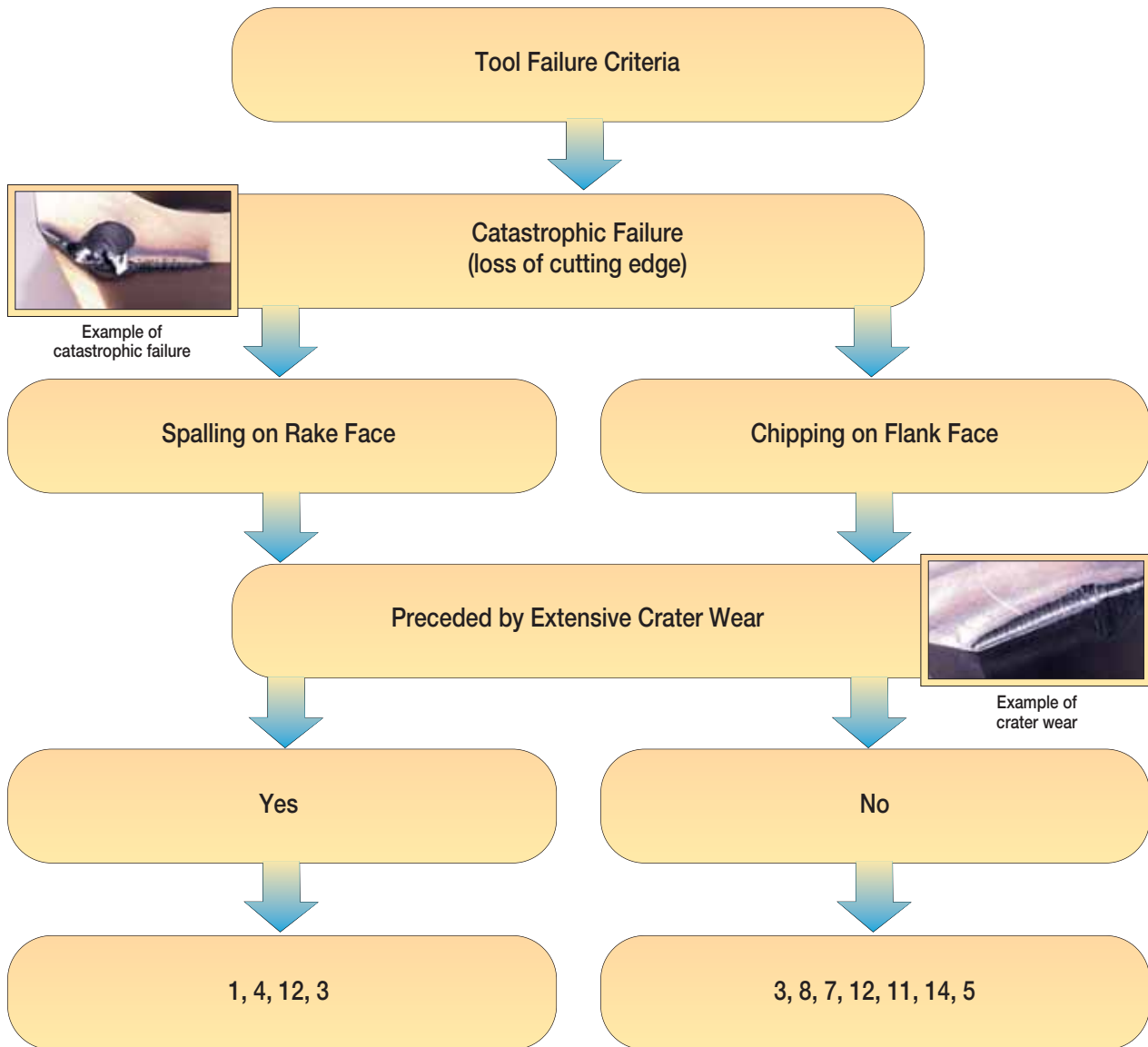
■ Test result • Top Notch

Tool: WSP 4121129 Top Notch KB5625
Material: DIN 16MnCr5/AISI 5115, 59–63 HRC
Machine: Hard/soft machining



Cutting Data	Competitor	Kennametal
Speed:	160 m/min (530 SFM)	160 m/min (530 SFM)
Feed:	0,06 mm/rev (.0024 in/rev)	0,06 mm/rev (.0024 in/rev)
DOC:	2mm (.079")	2mm (.079")
Diameter:	39,5mm (1.56")	39,5mm (1.56")
Performance:	70 pieces	90 pieces

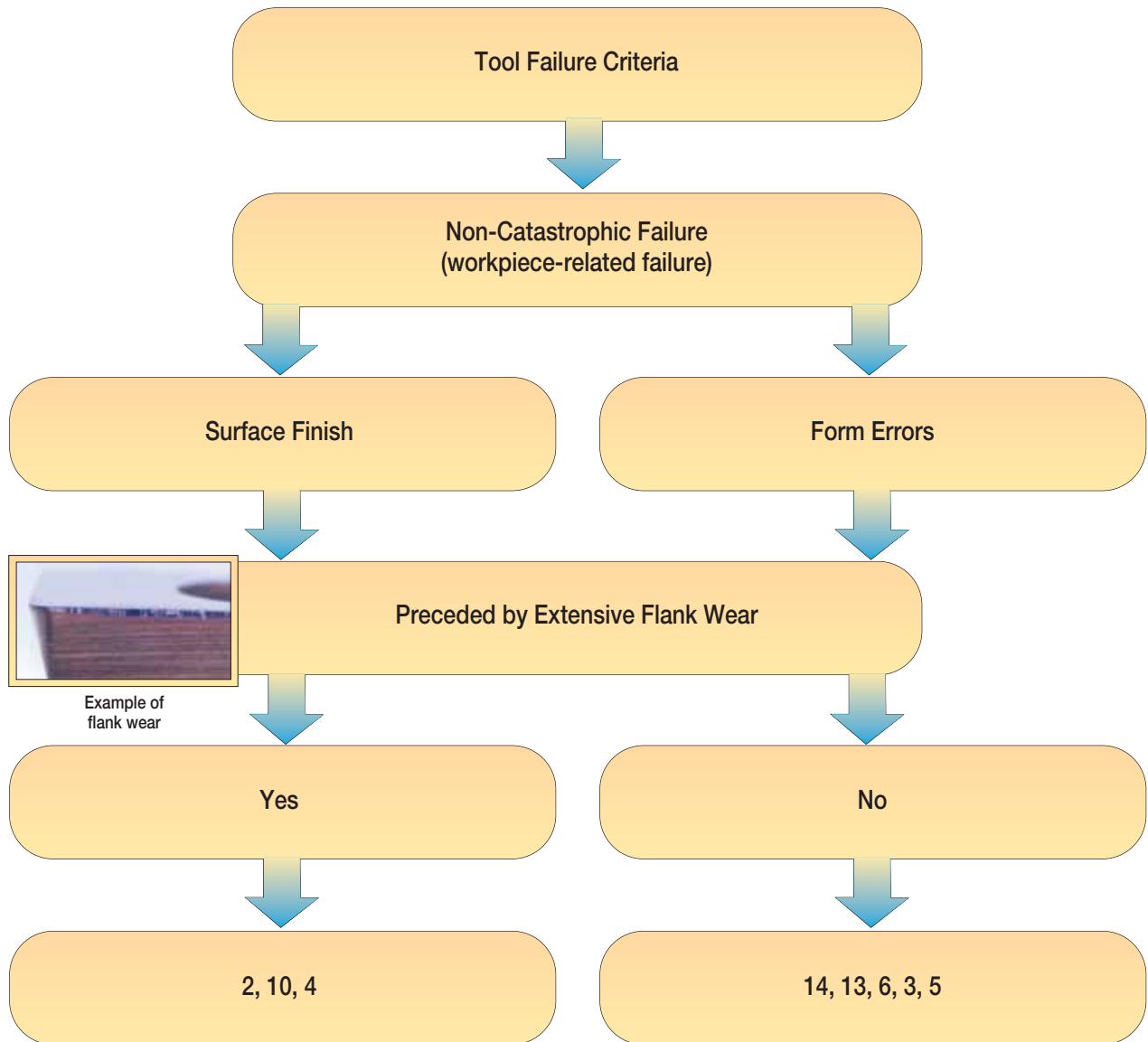
Quick Optimization Guide: Troubleshooting for Catastrophic Failure



Remedial Action

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Select more inert PCBN grade. 2. Select more abrasion-resistant PCBN grade. 3. Select stronger PCBN grade. 4. Reduce cutting speed. 5. Increase cutting speed. 6. Reduce nose radius. 7. Increase nose radius. 8. Increase chamfer angle. | <ol style="list-style-type: none"> 9. Decrease chamfer angle. 10. Increase clearance angle. 11. Reduce clearance angle. 12. Increase edge hone dimension. 13. Reduce edge hone dimension. 14. Reduce feed and/or depth of cut. 15. Increase feed and/or depth of cut. |
|---|--|

Quick Optimization Guide: Troubleshooting for Non-Catastrophic Failure



Remedial Action

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Select more inert PCBN grade. 2. Select more abrasion-resistant PCBN grade. 3. Select stronger PCBN grade. 4. Reduce cutting speed. 5. Increase cutting speed. 6. Reduce nose radius. 7. Increase nose radius. 8. Increase chamfer angle. | <ol style="list-style-type: none"> 9. Decrease chamfer angle. 10. Increase clearance angle. 11. Reduce clearance angle. 12. Increase edge hone dimension. 13. Reduce edge hone dimension. 14. Reduce feed and/or depth of cut. 15. Increase feed and/or depth of cut. |
|---|--|



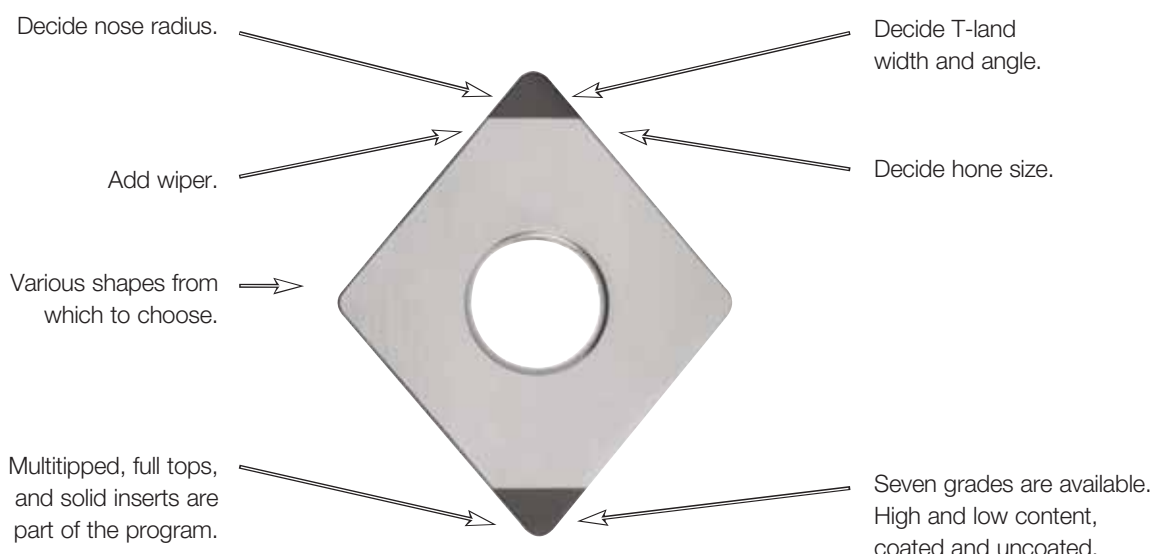
Quick-Turn Solutions Program for CBN Inserts

Standard inserts incorporate latest grade, coating, edge preparation, and manufacturing technology. They cover a wide range of applications and provide superior performance.

However, in some cases, further fine tuning is needed to reach the optimum performance point. Therefore, Kennametal has set up the Quick-Turn Solutions Program (QTSP) to allow edge preparation modifications on selected styles, grades, and formats to further enhance the tool performance.



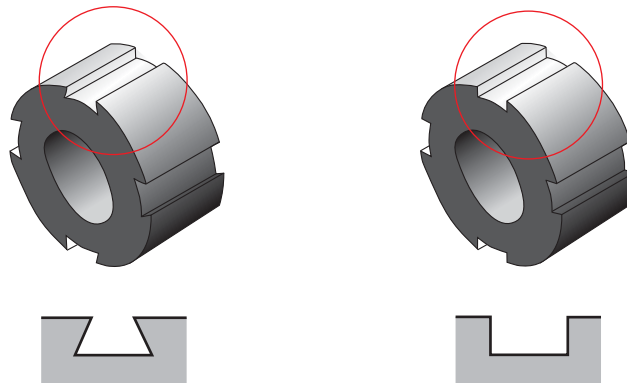
Technical Details • Options for a Customization



For more information, please contact a Kennametal Sales Representative, Authorized Kennametal Distributor, or visit www.kennametal.com.

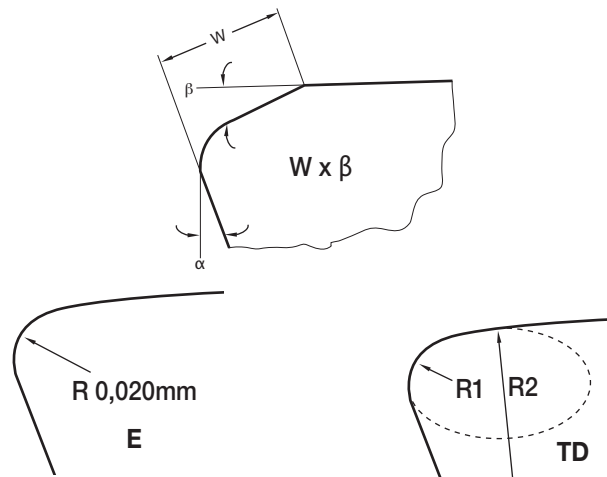
Teardrop (TD Edges) for Demanding Applications

Teardrop (TD) edges are advanced edge preparations used in heavily interrupted operations where standard edge preps fail. They can be ordered as specials.



Possible TD Edges

- W** – Edge Prep Width
- α – Clearance Angle
- β – Edge Prep Angle – between rake face and K-land



Edge Preparation Specifications			TD-Style Selection	
E	hone only	0,020mm		
W x β	width in 0,001mm x angle			
TDR	ellipse based on 0,25 x 30°			
TDF	ellipse based on 0,20 x 20°			
TDS	ellipse based on 0,10 x 20°			



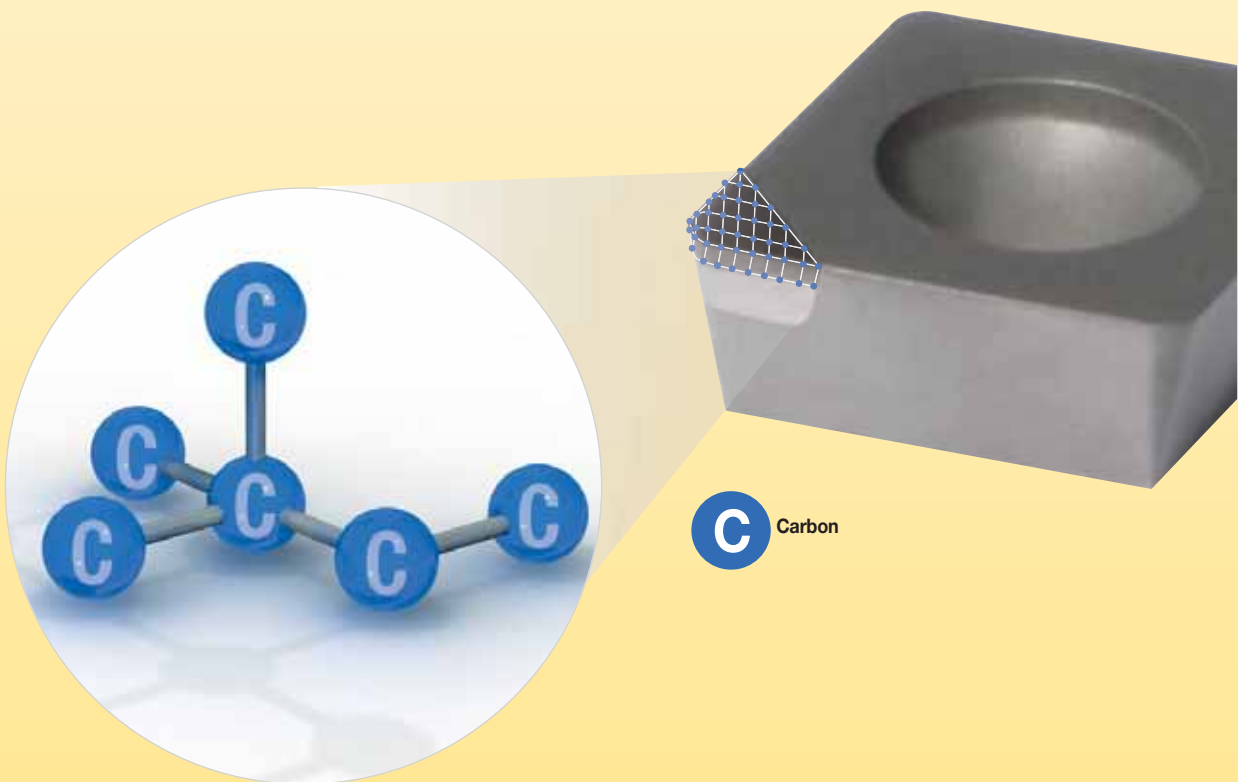
■ PCD

The current global metalcutting climate has put increased focus on high productivity and cost reductions coming from cutting tools. These requirements lead to the rapid growth and implementation of cutting tools using superhard materials. As the name implies, these materials have a significant advantage in hardness over conventional tool materials, which from the end user point of view, translates into increased productivity (higher cutting speeds, longer tool life, etc.), lower tooling cost per part, and also, the ability to process materials previously un-machinable with conventional tooling.

The most widely known superhard materials are diamond and cubic boron nitride. Our industry uses the polycrystalline forms of these materials, i.e., polycrystalline diamond (PCD) and polycrystalline boron nitride (PCBN). PCD tooling is mainly targeted at the machining of non-ferrous materials (e.g., aluminum alloys, plastics, CFRPs, composites, titanium alloys, ceramics, carbides, etc.) whereas PCBN targets iron-based alloys (e.g., cast irons, hard steels, iron-based composites, etc.)

Kennametal is at the forefront of developing and implementing superhard materials in our standard and special tooling solutions across all our product lines. Kennametal's approach to superhard tooling starts with customer needs and constraints. We then use fundamental research to develop the best superhard solutions that would make available the best value for the customer and respond to their specific demands.

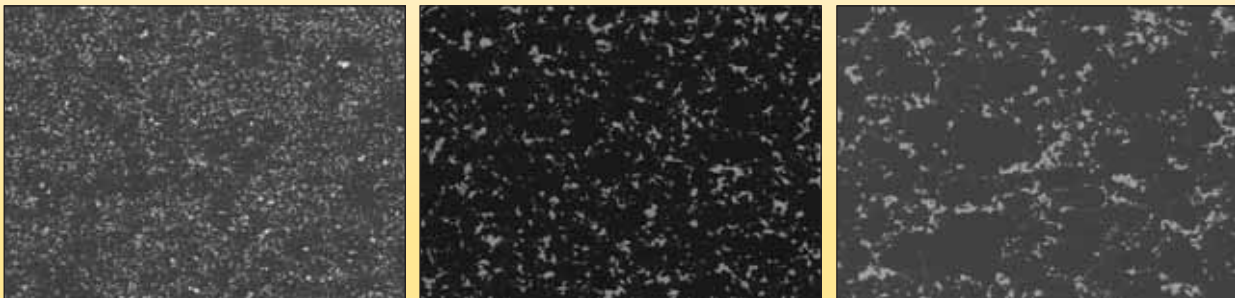
PCBN/PCD Inserts



■ Different kinds of PCD grades

Application demands determine the choice of cutting tool material. The important requirements of the material are:

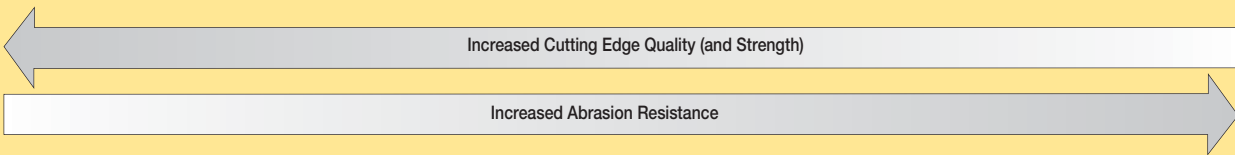
- Abrasion resistance.
- Toughness and strength.
- Thermal behavior.



Fine Grain

Medium Grain

Coarse Grain



■ Comparison of different PCD grades

Behavior in Applications

grade characteristics:	KD1400™	fine grain	medium grain
grain size:	0,5–1 μm	2 μm	10 μm
chip resistance:			
abrasion resistance:			

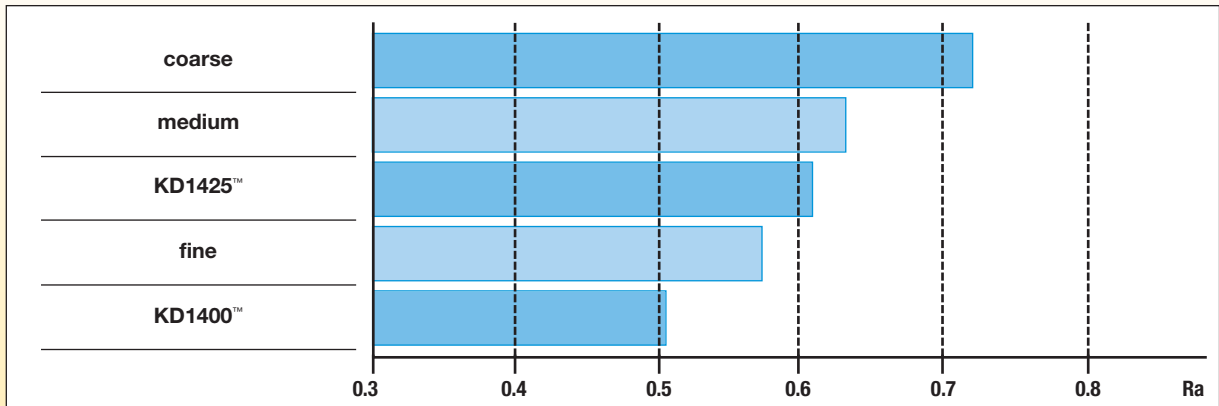
Behavior in Applications

grade characteristics:	coarse grain	KD1425™	KD1405™
grain size:	25 μm	2–30 μm	0 μm
chip resistance:			
abrasion resistance:			

Chipping can be defined as the formation of small notches on the cutting edge and generally occurs when the load at the cutting edge exceeds the strength of the material. An A390 alloy was used in edge milling tests to assess the chip resistance of the different PCD grades.

Abrasion is characterized by the development of grooves and ridges on the flank of the tool in the direction of sliding. The abrasion resistance of PCD was evaluated on a high silicon aluminum alloy, A390, in a continuous cutting operation.

■ PCD grain size • Workpiece surface finish



This chart illustrates the influence of the PCD grain size on surface finish in turning 18% silicon aluminum alloys. The best finish is obtained with the submicron grade KD1400. While the grade KD1425 contains grains as large as 30 microns, this material's unique multimodal grain size distribution results in a microstructure of closely packed diamond grains resulting in a smoother ground edge.

■ KD1400 advantages at a glance • Summary

A sharper cutting edge

- Clean cuts on carbon fibers.
- Permits larger nose radii for increased feed and productivity without loss in finish.

A less serrated (smoother) cutting edge

- Improved surface finish — potentially reducing rough and intermediate honing.

Permits a more positive rake

- Reduced cutting forces, delamination, and burr formation.

Permits increased clearance

- Providing for lower tool wear rates and lower push-off forces — thereby improving process capability.

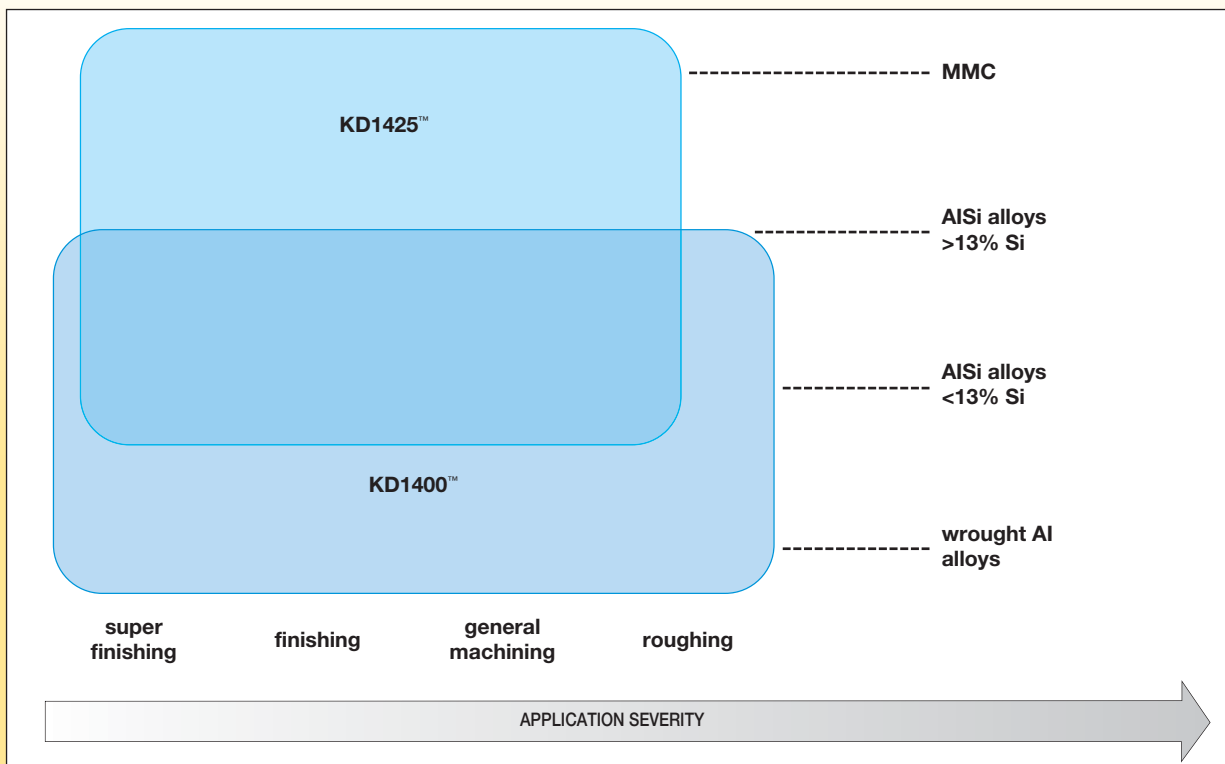
Provides unparalleled chip resistance

- Suitable for heavy milling and interrupted turning with positive edge geometries and longest tool life.

Comparable abrasion resistance to a coarse grade PCD

- Covers the widest range of applications with a single grade — reduce inventory and complexity.

■ PCD grades application/workpiece material



■ PCD application areas and parameter range

material machined	operation	PCD grade	speed				feed rate				DOC			
			m/min		SFM		mm/rev		in/rev		mm		in	
			min	max	min	max	min	max	min	max	min	max	min	max
aluminum alloy	turning	KD1400	1000	4000	3300	13200	0,1	0,4	0,004	0,016	0,1	4,0	0,004	0,157
4-8% Si	milling		2000	5000	6600	16500	0,1	0,3	0,004	0,012	0,1	0,3	0,004	0,012
9-12% Si	turning		700	3000	2310	9900	0,1	0,4	0,004	0,016	0,1	4,0	0,004	0,157
>13 Si	milling	KD1400/KD1425	1000	3000	3300	9900	0,1	0,3	0,004	0,012	0,1	0,3	0,004	0,012
	turning	KD1425	300	1000	990	3300	0,1	0,4	0,004	0,016	0,1	4,0	0,004	0,157
	milling	KD1400	500	1500	1650	4950	0,1	0,3	0,004	0,012	0,1	0,3	0,004	0,012
cast iron	roughing	KD1425	50	300	165	990	0,2	0,5	0,008	0,020	0,5	3,0	0,020	0,118
CGI/NCI	finishing		50	400	165	1320	0,1	0,3	0,004	0,012	—	0,5	—	0,020
MMC 20% SiC/Al	turning/milling		300	700	990	2310	0,1	0,4	0,004	0,016	0,2	1,5	0,008	0,059
copper alloys	turning/milling	KD1400	400	1300	1320	4290	0,03	0,3	0,001	0,012	0,05	2,0	0,002	0,079
copper, zinc, brass														
tungsten carbide <16% Co	turning	KD1425	30	120	99	396	0,1	0,4	0,004	0,016	0,2	1,0	0,008	0,039
unsintered (green)			20	60	66	198	0,1	0,25	0,004	0,010	0,1	0,5	0,004	0,020
sintered	—	—	—	—	—	—	—	—	—	—	—	—	—	—
ceramics	turning	KD1425	70	120	231	396	0,1	0,4	0,004	0,016	0,2	1,0	0,008	0,039
unsintered			50	100	165	330	0,1	0,25	0,004	0,010	0,1	0,5	0,004	0,020
sintered	—	—	—	—	—	—	—	—	—	—	—	—	—	—
plastics/composites	turning/milling	KD1400/KD1425	300	990	990	8250	0,05	0,3	0,002	0,012	0,2	3,0	0,004	0,118
carbon/graphite			200	660	660	3300	0,05	0,5	0,002	0,020	0,1	3,0	0,004	0,118

■ PCD tool failure modes

The gradual wear observed on diamond cutting tools can be divided into:

- Mechanically activated wear (abrasion, adhesion, and wear by microfracture).
- Tribochemical wear (dissolution/diffusion wear and formation of new chemical compounds).

Abrasion

The primary mode of mechanically activated wear for diamond cutting tools is abrasion, which is the removal of tool material by a scoring action of protruding asperities and hard phase inclusions in the workpiece and chip (e.g., silicon grains in aluminum-silicon alloys).

Abrasion is characterized by the development of grooves and ridges in the direction of the tool sliding against a newly machined surface of the workpiece or chip sliding against the rake face.

The severity of abrasion can be increased in cases where the workpiece material contains hard inclusions or when there is hard wear debris from the workpiece or the tool at the interface.

Tribochemical

Tribochemical wear is particularly relevant in the machining of titanium alloys when the carbon in the tool material diffuses into the adhered titanium layer to form a TiC boundary layer on the rake face of the tool.

This boundary quickly becomes saturated with tool constituents and can then act as a protective barrier against any further diffusion.

Attrition

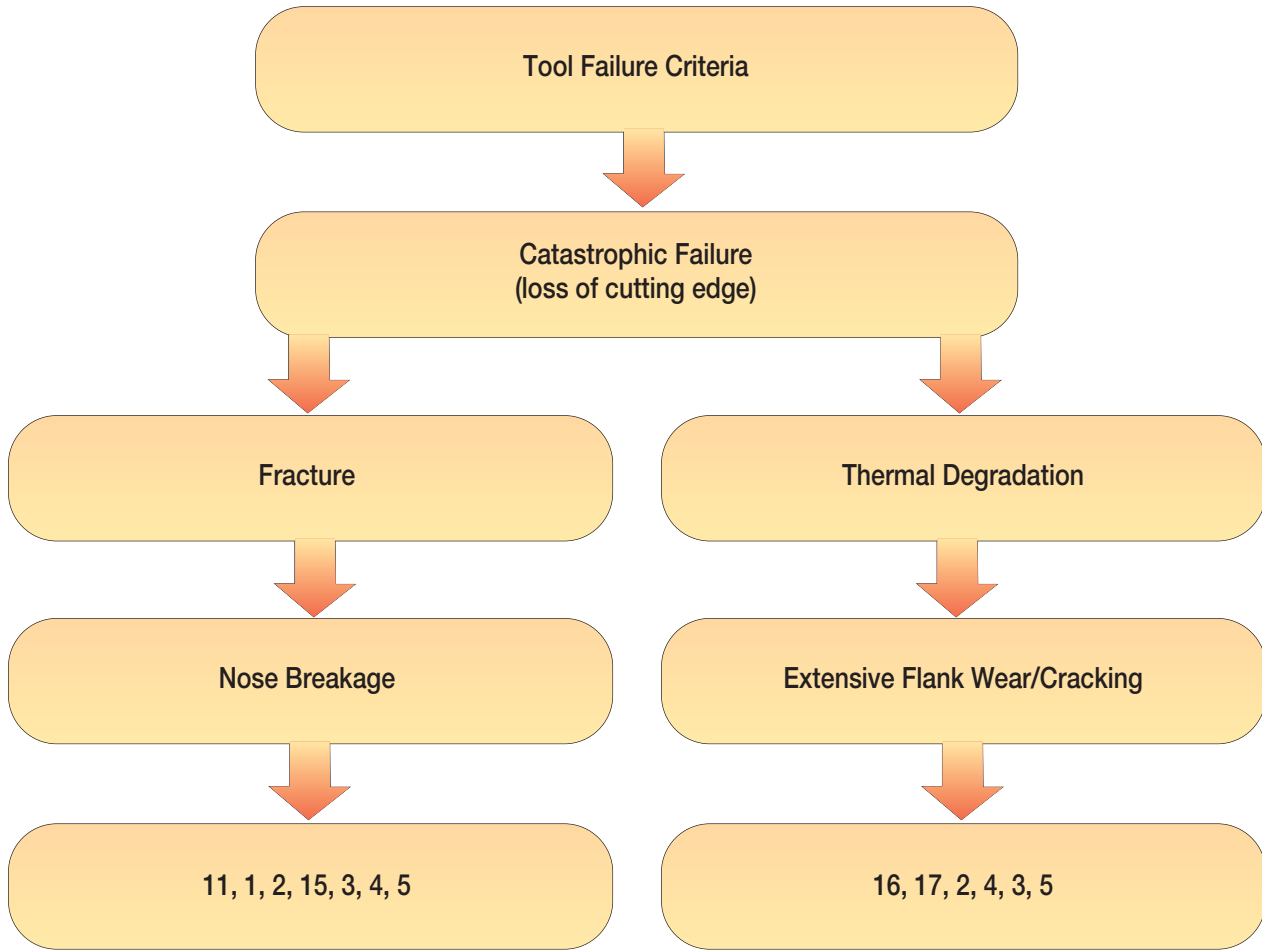
When two surfaces slide over each other, particularly in the absence of a lubricant, some adhesion can occur at the points of contact. Adhesive wear (often called attrition) in cutting tools involves the mechanism in which individual grains or small grain aggregates are pulled out of the tool surfaces and are carried away at the underside of the chip or are torn away by the adherent workpiece. The term “plucking” is also used to describe the loss of tool particles from the edge or faces. For example, when the forces are high enough, the TiC boundary layer that forms in titanium machining can be removed from the rake face of the tool transporting with it a pulled-out diamond grain, to form a crater. Once this crater becomes excessive, fracture of the tool could occur due to the geometrical weakening of the edge. Negative geometries tend to enhance the possibility of adhesive wear and built-up edge formation. Subsequent break-up (fracture) of the adhesive tool/workpiece joints results in attrition wear. The wear scars produced by attrition are rough, as opposed to the usually smooth wear surfaces generated by tribochemical wear.

Microfracture

When cutting tools are employed for continuous machining of high hardness materials or interrupted machining, small fractures can appear on the cutting edge. If fracturing is small, the cutting tool can usually still be used. Wear by microfracture involves a less severe form of fracture and includes chipping, spalling, and cracking whereby the cutting tool can be reused.

Tool Failure and Wear:

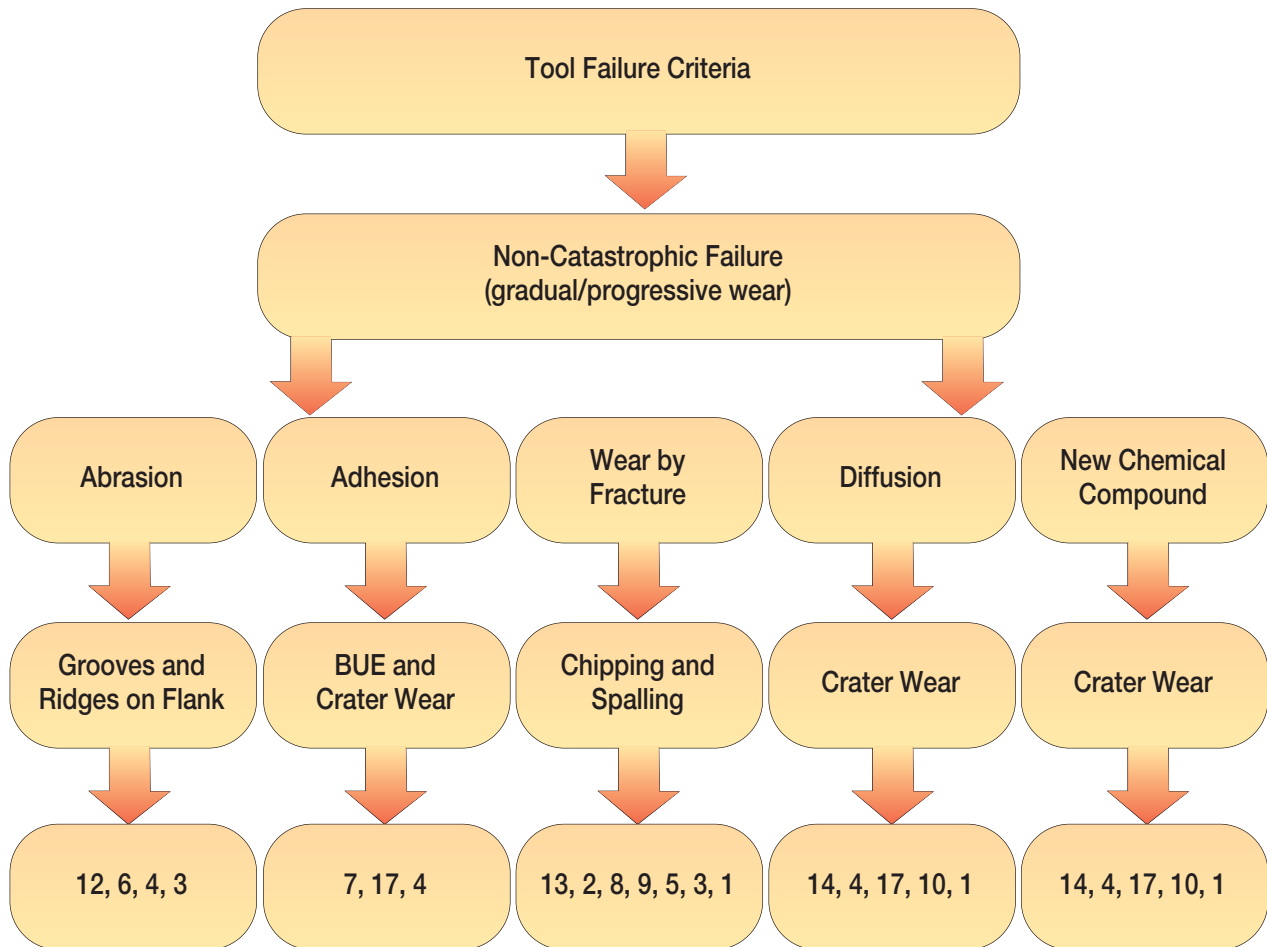
PCBN/PCD Inserts



Remedial Action

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. Increase nose radius. 2. Reduced clearance angle. 3. Reduce feed. 4. Reduce cutting speed. 5. Reduce DOC. 6. Increase clearance angle. 7. Use a positive rake angle. 8. Add a small edge hone. 9. Use neutral rake angle. | <ol style="list-style-type: none"> 10. Increase lead angle. 11. Select a tougher grade. 12. Select more abrasion-resistant grade. 13. Select a higher TRS grade. 14. Choose a more chemically inert grade. 15. Increase thickness. 16. Select a more thermally stable grade. 17. Use coolant. |
|--|---|

Tool Failure and Wear:



Remedial Action

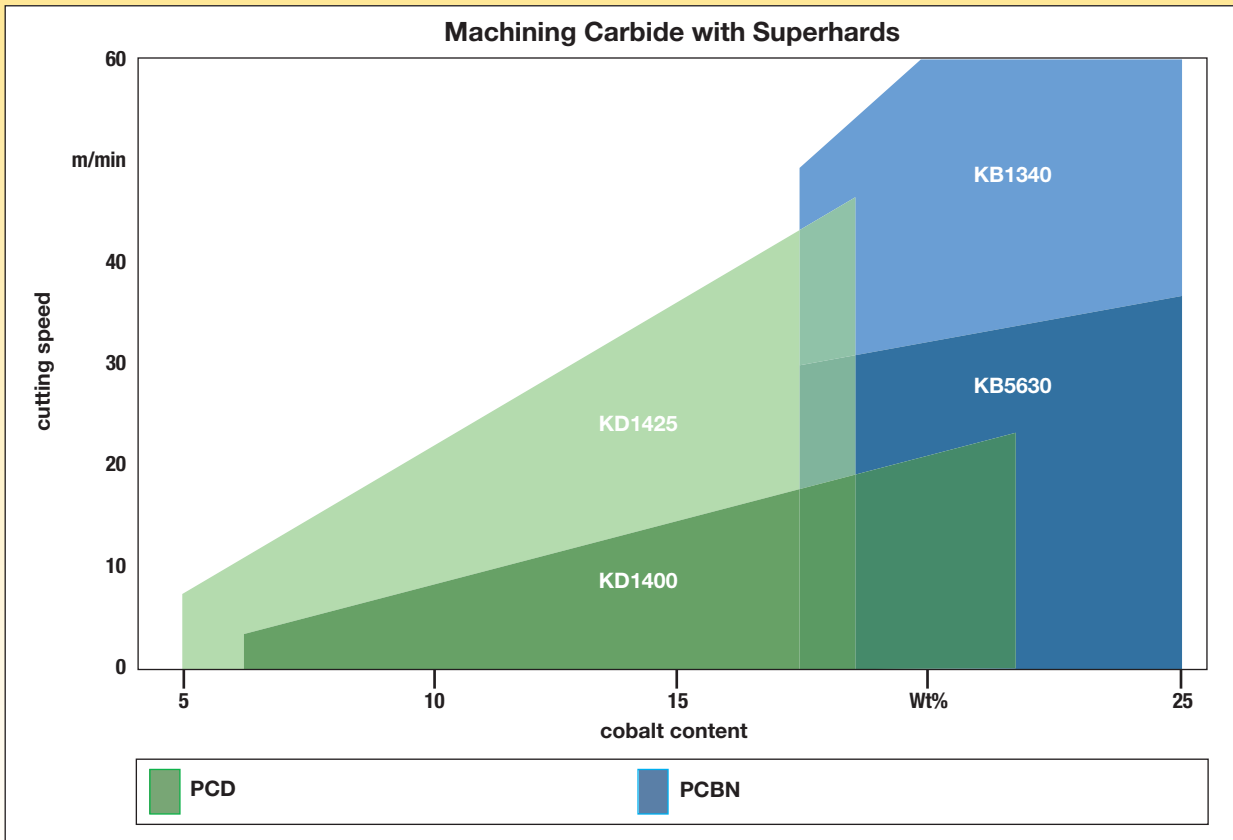
1. Increase nose radius.
2. Reduced clearance angle.
3. Reduce feed.
4. Reduce cutting speed.
5. Reduce DOC.
6. Increase clearance angle.
7. Use a positive rake angle.
8. Add a small edge hone.
9. Use neutral rake angle.
10. Increase lead angle.
11. Select a tougher grade.
12. Select more abrasion-resistant grade.
13. Select a higher TRS grade.
14. Choose a more chemically inert grade.
15. Increase thickness.
16. Select a more thermally stable grade.
17. Use coolant.

■ Machining of carbides with superhard

material machined	operation	PCD grade	speed				feed rate				DOC			
			m/min		SFM		mm/rev		in/rev		mm		in	
			min	max	min	max	min	max	min	max	min	max	min	max
tungsten carbide <19% Co														
unsintered (green)	turning	KD1425	30	120	99	396	0,1	0,4	0,004	0,016	0,2	1,0	0,008	0,039
sintered	turning	KD1425	20	80	66	264	0,1	0,25	0,004	0,010	0,1	0,5	0,004	0,020
tungsten carbide >19% Co														
unsintered (green)	turning	KB1340	50	150	165	495	0,1	0,5	0,004	0,020	0,2	1,0	0,008	0,039
sintered	turning	KB1340	30	100	99	330	0,1	0,4	0,004	0,016	0,1	0,5	0,004	0,020

Application Notes

- PCD tools should be used with a neutral geometry and 7° clearance.
- PCD edge preparation should be either F or E. An E edge preparation is preferred for larger DOCs, low Co content, and interrupted machining.
- PCBN tools should be used in a negative geometry with 5° to 7° negative rake.
- PCBN edge preparation should be either E or S01025.
- Coolant application is recommended and very important, especially with PCD application where failure is determined by heat generation.
- PCD can also be applied for Co concentrations higher than 19% as long as minimal heat is generated.



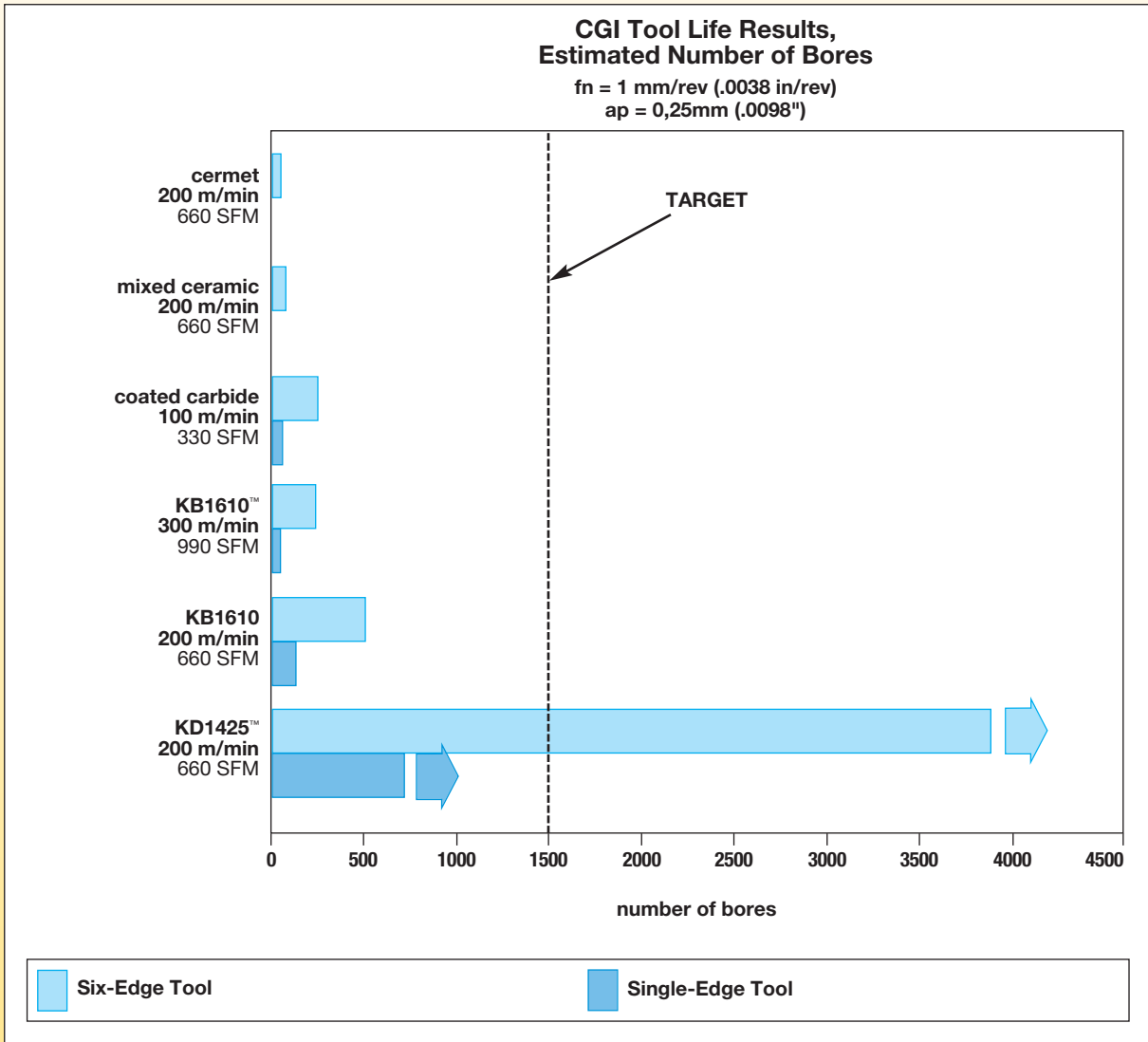
■ CGI boring with turning insert

Machining Parameters

- Feed = 0,1mm (.0038")
- Depth of cut = 0,25mm (.0098")

Tool Life Criteria

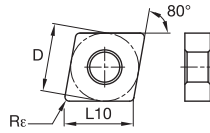
- VB max = 0,3mm (.0098")
- Number of bores = 1500



PCBN/PCD Inserts



■ CNGA



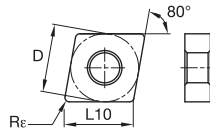
● first choice
○ alternate choice

P																				
M																				
K		●	●																	
N									○	●										
S																○				○
H		○														●	●	●	●	●

ISO catalog number	ANSI catalog number	D		L10		Rε		KB1340	KB1345	KD1400	KD1405	KD1425	KB1610	KB1625	KB1630	KB5610	KB5625	KB5630	
		mm	in	mm	in	mm	in												
CNGA120404E	CNGA431E	12,70	1/2	12,90	.508	0,4	1/64												
CNGA120408E	CNGA432E	12,70	1/2	12,90	.508	0,8	1/32				●								



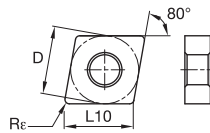
■ CNGA-EMT



ISO catalog number	ANSI catalog number	D		L10		Rε		KB1340	KB1345	KD1400	KD1405	KD1425	KB1610	KB1625	KB1630	KB5610	KB5625	KB5630	
		mm	in	mm	in	mm	in												
CNGA120408EMT	CNGA432EMT	12,70	1/2	12,90	.508	0,8	1/32												●
CNGA120412EMT	CNGA433EMT	12,70	1/2	12,90	.508	1,2	3/64												●



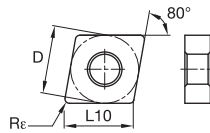
■ CNGA-FST



ISO catalog number	ANSI catalog number	D		L10		Rε		KB1340	KB1345	KD1400	KD1405	KD1425	KB1610	KB1625	KB1630	KB5610	KB5625	KB5630	
		mm	in	mm	in	mm	in												
CNGA120404FST	CNGA431FST	12,70	1/2	12,90	.508	0,4	1/64			●		●							
CNGA120408FST	CNGA432FST	12,70	1/2	12,90	.508	0,8	1/32			●		●							

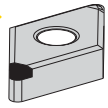


■ CNGA-FW/MW MT

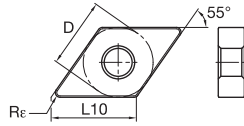


ISO catalog number	ANSI catalog number	D		L10		Rε		KB1340	KB1345	KD1400	KD1405	KD1425	KB1610	KB1625	KB1630	KB5610	KB5625	KB5630	
		mm	in	mm	in	mm	in												
CNGA120404S01025FWMT	CNGA431S0425FWMT	12,70	1/2	12,90	.508	0,4	1/64									●		●	●
CNGA120404EFWMT	CNGA431EFWMT	12,70	1/2	12,90	.508	0,4	1/64												●
CNGA120408EFWMT	CNGA432EFWMT	12,70	1/2	12,90	.508	0,8	1/32												●
CNGA120408S01025FWMT	CNGA432S0425FWMT	12,70	1/2	12,90	.508	0,8	1/32												●
CNGA120412EFWMT	CNGA433EFWMT	12,70	1/2	12,90	.508	1,2	3/64												●
CNGA120416S02015MWMT	CNGA434S0815MWMT	12,70	1/2	12,90	.508	1,6	1/16	●											

PCBN/PCD Inserts



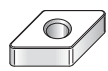
■ DNGM-CB2



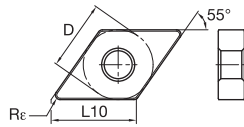
● first choice
○ alternate choice

P																				
M																				
K	●	●																		
N			●					○												
S									●					○						○
H	○									●	●	●	●	●	●	●	●	●	●	●

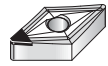
ISO catalog number	ANSI catalog number	D		L10		Rε		KB1340	KB1345	KD1400	KD1405	KD1425	KB1610	KB1625	KB1630	KB5610	KB5625	KB5630	
		mm	in	mm	in	mm	in												
DNGM150408S01325MTCB2	DNGM432S0525MTCB2	12,70	1/2	15,50	.610	0,8	1/32									●			
DNGM150412S01325MTCB2	DNGM433S0525MTCB2	12,70	1/2	15,50	.610	1,2	3/64									●			



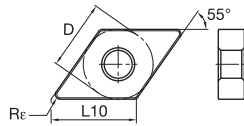
■ DNMA



ISO catalog number	ANSI catalog number	D		L10		Rε		KB1340	KB1345	KD1400	KD1405	KD1425	KB1610	KB1625	KB1630	KB5610	KB5625	KB5630	
		mm	in	mm	in	mm	in												
DNMA110408S02020	DNMA332S0820	9,53	3/8	11,63	.458	0,8	1/32	●											
DNMA110412S02020	DNMA333S0820	9,53	3/8	11,63	.458	1,2	3/64	●											



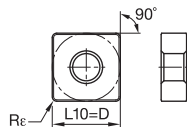
■ DNMS-FST



ISO catalog number	ANSI catalog number	D		L10		Rε		KB1340	KB1345	KD1400	KD1405	KD1425	KB1610	KB1625	KB1630	KB5610	KB5625	KB5630	
		mm	in	mm	in	mm	in												
DNMS150404FST	DNMS431FST	12,70	1/2	15,50	.610	0,4	1/64			●		●							
DNMS150408FST	DNMS432FST	12,70	1/2	15,50	.610	0,8	1/32			●		●							



■ SNGA-FW

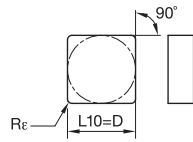


ISO catalog number	ANSI catalog number	D		L10		Rε		KB1340	KB1345	KD1400	KD1405	KD1425	KB1610	KB1625	KB1630	KB5610	KB5625	KB5630	
		mm	in	mm	in	mm	in												
SNGA120408S01020FWMT	SNGA432S0420FWMT	12,70	1/2	12,70	.500	0,8	1/32										●		

PCBN/PCD Inserts



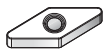
■ SNGX



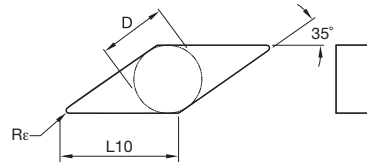
● first choice
○ alternate choice

P																				
M																				
K			●																	
N									○											
S																				
H																				

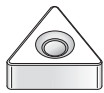
ISO catalog number	ANSI catalog number	D		L10		Re		KB1340	KB1345	KD1400	KD1405	KD1425	KB1610	KB1625	KB1630	KB5610	KB5625	KB5630	
		mm	in	mm	in	mm	in												
SNGX120416S02020	SNGX434S0820	12,70	1/2	12,70	.500	1,6	1/16	●											
SNGX150416S02020	SNGX534S0820	15,88	5/8	15,88	.625	1,6	1/16	●											



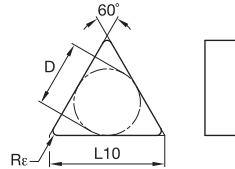
■ VNGX



ISO catalog number	ANSI catalog number	D		L10		Re		KB1340	KB1345	KD1400	KD1405	KD1425	KB1610	KB1625	KB1630	KB5610	KB5625	KB5630	
		mm	in	mm	in	mm	in												
VNGX160412S02020	VNGX333S0820	9,53	3/8	16,61	.654	1,2	3/64	●											



■ TNGX-FW



ISO catalog number	ANSI catalog number	D		L10		Re		KB1340	KB1345	KD1400	KD1405	KD1425	KB1610	KB1625	KB1630	KB5610	KB5625	KB5630	
		mm	in	mm	in	mm	in												
TNGX160412EFW	TNGX333EFW	9,53	3/8	16,50	.650	1,2	3/64	●											

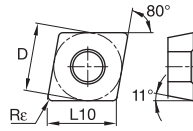
■ Clamp Selection Chart

MM	insert		clamp
	ANSI catalog number	ISO catalog number	
3960807	CNGX433S0415	CNGX120412S01015	551.718 - 100° Corner
3960808	CNGX433S0415FW	CNGX120412S01015FW	551.718 - 100° Corner
3960806	CNGX434S0820	CNGX120416S02020	551.718 - 100° Corner
3960811	DNGX434S0820	DNGX150416S02020	551.720
3960812	SNGX434S0820	SNGX120416S02020	551.718
3960823	SNGX534S0820	SNGX150416S02020	551.718
3960824	VNGX333S0820	VNGX160412S02020	551.721
3876843	CNGF432	CNGF120408	551.718 - 100° Corner
3960825	TNGX333EFW	TNGX160412EFW	551.733

PCBN/PCD Inserts



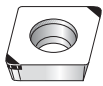
■ CPGW-FWM



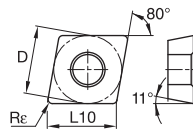
● first choice
○ alternate choice

P																				
M																				
K		●	●																	
N									○	●										
S														○						○
H	○													●	●	●	●	●	●	●

ISO catalog number	ANSI catalog number	D		L10		Re		KB1340	KB1345	KD1400	KD1405	KD1425	KB1610	KB1625	KB1630	KB5610	KB5625	KB5630	
		mm	in	mm	in	mm	in												
CPGW060202EFWM	CPGW21505EFWM	6,35	1/4	6,45	.254	0,2	.008									●			
CPGW060204EFWM	CPGW2151EFWM	6,35	1/4	6,45	.254	0,4	1/64									●			
CPGW060208EFWM	CPGW2152EFWM	6,35	1/4	6,45	.254	0,8	1/32									●			



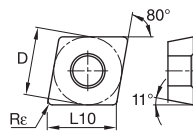
■ CPGW-FWMT



ISO catalog number	ANSI catalog number	D		L10		Re		KB1340	KB1345	KD1400	KD1405	KD1425	KB1610	KB1625	KB1630	KB5610	KB5625	KB5630	
		mm	in	mm	in	mm	in												
CPGW09T304S01015FWMT	CPGW3251S0415FWMT	9,53	3/8	9,67	.381	0,4	1/64								●				
CPGW09T308S01015FWMT	CPGW3252S0415FWMT	9,53	3/8	9,67	.381	0,8	1/32								●				



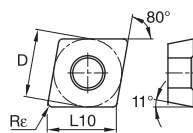
■ CPGW-FWST



ISO catalog number	ANSI catalog number	D		L10		Re		KB1340	KB1345	KD1400	KD1405	KD1425	KB1610	KB1625	KB1630	KB5610	KB5625	KB5630	
		mm	in	mm	in	mm	in												
CPGW060204FWST	CPGW2151FWST	6,35	1/4	6,45	.254	0,4	1/64			●		●							
CPGW09T308FWST	CPGW3252FWST	9,53	3/8	9,67	.381	0,8	1/32			●		●							
CPGW120408FWST	CPGW432FWST	12,70	1/2	12,90	.508	0,8	1/32			●		●							



■ CPGW-ST

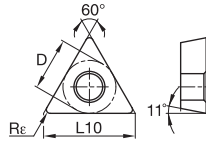


ISO catalog number	ANSI catalog number	D		L10		Re		KB1340	KB1345	KD1400	KD1405	KD1425	KB1610	KB1625	KB1630	KB5610	KB5625	KB5630	
		mm	in	mm	in	mm	in												
CPGW060202FST	CPGW21505FST	6,35	1/4	6,45	.254	0,2	.008			●		●							
CPGW060204FST	CPGW2151FST	6,35	1/4	6,45	.254	0,4	1/64			●		●							
CPGW060208FST	CPGW2152FST	6,35	1/4	6,45	.254	0,8	1/32			●		●							
CPGW09T304FST	CPGW3251FST	9,53	3/8	9,67	.381	0,4	1/64			●		●							
CPGW09T308FST	CPGW3252FST	9,53	3/8	9,67	.381	0,8	1/32			●		●							
CPGW120404FST	CPGW431FST	12,70	1/2	12,90	.508	0,4	1/64			●		●							
CPGW120408FST	CPGW432FST	12,70	1/2	12,90	.508	0,8	1/32			●		●							

PCBN/PCD Inserts



■ TPGW-FST



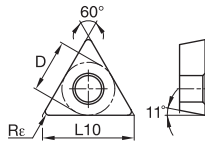
● first choice
○ alternate choice

P																				
M																				
K	●	●																		
N			●	○	●															
S			●																	○
H	○																			○

ISO catalog number	ANSI catalog number	D		L10		Re		KB1340	KB1345	KD1400	KD1405	KD1425	KB1610	KB1625	KB1630	KB5610	KB5625	KB5630	
		mm	in	mm	in	mm	in												
TPGW110204FST	TPGW2151FST	6,35	1/4	11,00	.433	0,4	1/64												
TPGW110208FST	TPGW2152FST	6,35	1/4	11,00	.433	0,8	1/32			●	●								
TPGW16T304FST	TPGW3251FST	9,53	3/8	16,50	.650	0,4	1/64			●									
TPGW16T308FST	TPGW3252FST	9,53	3/8	16,50	.650	0,8	1/32			●	●								



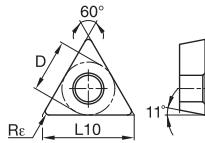
■ TPGW-M



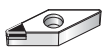
ISO catalog number	ANSI catalog number	D		L10		Re		KB1340	KB1345	KD1400	KD1405	KD1425	KB1610	KB1625	KB1630	KB5610	KB5625	KB5630	
		mm	in	mm	in	mm	in												
TPGW110202EM	TPGW21505EM	6,35	1/4	11,00	.433	0,2	.008												●
TPGW110204S01015M	TPGW2151S0415M	6,35	1/4	11,00	.433	0,4	1/64												●
TPGW110208S01015M	TPGW2152S0415M	6,35	1/4	11,00	.433	0,8	1/32												●
TPGW16T304S01015M	TPGW3251S0415M	9,53	3/8	16,50	.650	0,4	1/64												●
TPGW16T308S01015M	TPGW3252S0415M	9,53	3/8	16,50	.650	0,8	1/32												●



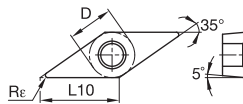
■ TPGW-MT



ISO catalog number	ANSI catalog number	D		L10		Re		KB1340	KB1345	KD1400	KD1405	KD1425	KB1610	KB1625	KB1630	KB5610	KB5625	KB5630	
		mm	in	mm	in	mm	in												
TPGW16T308S01015MT	TPGW3252S0415MT	9,53	3/8	16,50	.650	0,8	1/32												●



■ VBGW-E



ISO catalog number	ANSI catalog number	D		L10		Re		KB1340	KB1345	KD1400	KD1405	KD1425	KB1610	KB1625	KB1630	KB5610	KB5625	KB5630	
		mm	in	mm	in	mm	in												
VBGW160408E	VBGW332E	9,53	3/8	16,61	.654	0,8	1/32				●								



Toolholders, Boring Bars, and Cartridges

Toolholders	C2-C70
Toolholder Selection Guide	C2-C3
Kenclamp	C6-C14
Kenloc	C15-C33
Wedglock	C34-C35
Top Notch	C36-C37
Kendex	C38-C49
Screw-On	C50-C67
V-Bottom	C68-C69
Positive Profiling	C70
Boring Bars	C72-C129
Boring Bar Selection Guide	C72-C73
Kenclamp	C76-C79
Kenloc	C80-C86
Top Notch	C87
Kendex	C88-C93
Screw-On	C94-C118
Boring Heads	C119-C129
Cartridges	C130-C161
Kenloc	C134-C143
Kendex	C144-C148
Screw-On	C149-C161

tool path	insert shape	clamping style	turning	profiling	facing	plunging	chamfering	page(s)
0° Lead Angle								
		C Kenloc™	•	•				C15
		Screw-On	•	•				C50-C52
		Screw-On	•	•				C56
		Screw-On	•	•				C64
		T Kenloc	•	•	•	•	•	C25-C26, C28
		Kenclamp	•	•				C11-C12
		Kendex™	•	•				C42-C43, C46-C49
		Screw-On	•					C61-C63
-3° Lead Angle								
		D Kenloc	•	•				C20
		Kenclamp	•	•				C8
		Screw-On	•	•				C57-C58
		TNT	•	•				-
		V Kenloc	•	•				C30-C31
		Kenclamp	•	•				C13
		Screw-On	•	•				C64-C66
		F Screw-On	•	•				C59
		T Kenloc	•	•				C28-C29
		Kenclamp	•					C12-C13
		Screw-On	•					C63
		Wedglock	•	•				C35

tool path	insert shape	clamping style	turning	profiling	facing	plunging	chamfering	page(s)
-5° Lead Angle								
		C Kenloc	•	•	•			C17, C32
		Kenclamp	•	•	•			C6
		Screw-On	•	•	•			C53-C54
		TNT	•	•	•			C36
		W Kenloc	•	•	•			C32
		Kenclamp	•	•	•			C14
		Screw-On	•	•	•			C66
		TNT	•	•	•			C37
		Wedglock™	•	•	•			C35
15° and -15° Lead Angle								
		C Kenloc	•	•				C16, C19
		Kenclamp	•	•				C6-C7
		Kendex	•					C38
		Screw-On	•	•				C55-C56
		TNT	•					-
		S Kenloc	•	•				C23
		Kenclamp	•	•				C10
		Kendex	•	•				C40-C41, C44-C45
		T Kenloc	•	•				C30
		Kendex	•					C42, C46
	-15° lead angle	Wedglock	•	•	•			C34
17.5° and -17.5° Lead Angle								
		D Kenloc	•	•				C21
		Kenclamp	•	•				C9
		TNT	•	•				-
		F Screw-On	•	•				-
		V Kenloc	•	•				C31
	-17.5° lead angle	Kenclamp	•	•				C14

tool path	insert shape	clamping style	turning	profiling	facing	plunging	chamfering	page(s)	tool path	insert shape	clamping style	turning	profiling	facing	plunging	chamfering	page(s)				
		Kenloc™	•	•				C21			Kenloc	•	•	•			C22, C24				
		Kenclamp™	•	•				C8			Kenclamp	•	•	•				C10-C11			
		Screw-On		•				C58			Kenclamp	•	•	•				C40-C41, C44-C45			
Kenclamp™	•	•				C36	Kenclamp	•			•	•				C40-C41, C44-C45					
		Kenloc	•	•				C26			Kenloc	•	•	•				C16			
		Kenclamp™	•	•				C49			Kenclamp	•	•	•				-			
		Wedglock™	•	•				C34			Kenclamp	•	•	•							
Kenclamp™	•	•				C34	Kenclamp	•			•	•									
		Kenloc	•	•	•			C18			Kenloc	•	•					C22			
		Screw-On	•	•	•			C45			Kenclamp	•	•						C9		
		Kenclamp	•					C13			Kenclamp	•	•					C22			
			Kenclamp	•	•						C9	Kenclamp	•	•							
			Kenclamp	•	•						C39	Kenclamp	•	•							
			Kenclamp	•	•						C59-C61	Kenclamp	•	•							
		Kenclamp	•					C13			Kenclamp	•	•					C59-C61			
			Kenclamp	•	•						C68-C69	Kenclamp	•	•							

Clamping Styles

Kenclamp Style

- Suitable for Kenloc inserts.
- Unique clamp design provides rigid clamping.
- Ensures insert repeatability and seating.
- Reduced chatter and improved tool life.

Kenloc Style

- Suitable for Kenloc inserts.
- Lock pin and top clamp provide rigid clamping.
- Wide variety of insert styles may be used.
- Tools may be used with or without clamp.

Top Notch™ Turning Style

- Proven superior system in holding ceramic inserts rigidly in turning and profiling operations.
- Uses standard insert sizes — 80°, 75°, 55°, square, and trigon.
- This system offers the added versatility of using optional hardware to hold standard Kendex and Kenloc inserts.

Kendex Style

- Suitable for Kendex inserts.
- Chipbreaker option available for ceramic inserts.
- Wide variety of insert styles may be used.

Screw-On Style

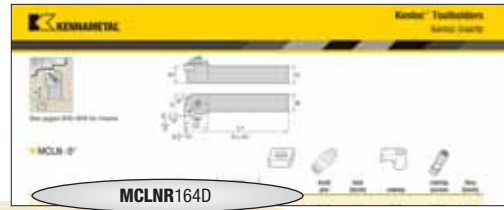
- Top clamping by screw for Screw-On inserts.

Wedglock Style

- Top and hole clamping for inserts with hole.

How Do Catalog Numbers Work?

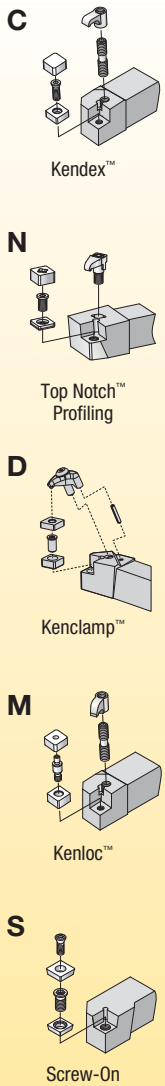
Each character in our catalog number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.



O.D./I.D. Tooling

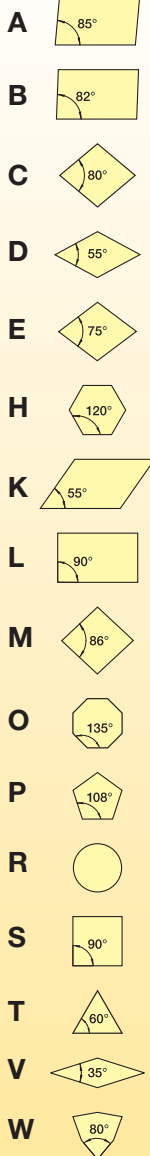
M

Insert Holding Method



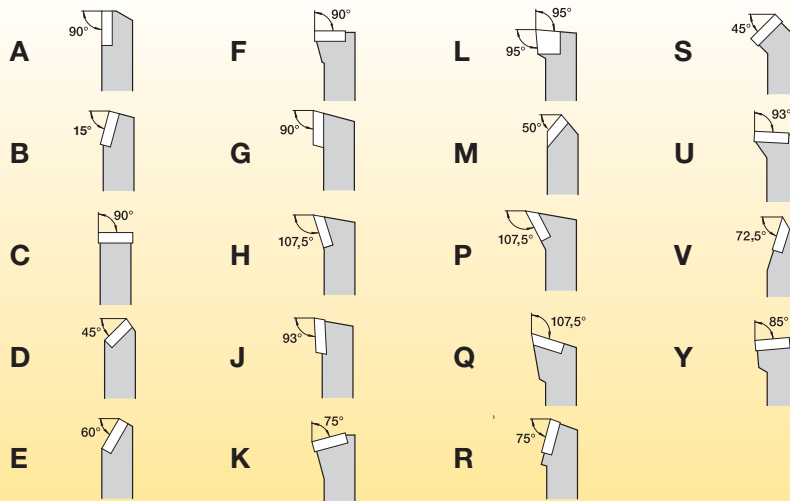
C

Insert Shape



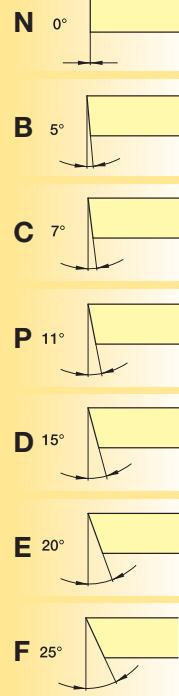
L

Tool Style or Lead Angle



N

Insert Clearance Angle



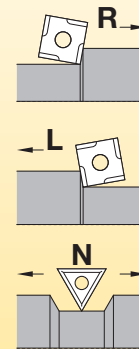
R

Hand of Tool

R = Right hand

L = Left hand

N = Neutral



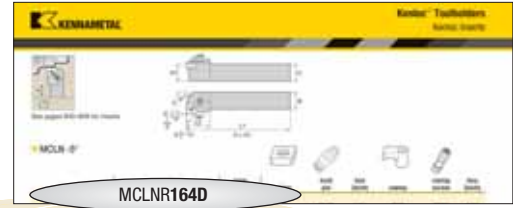
Additional Information

C = Deep pocket for ceramic insert

S = Single pocket locating wall

F = Straight shank, no offset

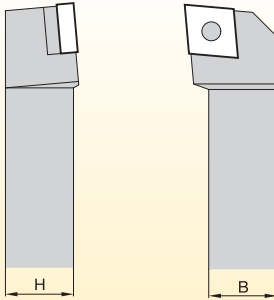
By referencing this easy-to-use guide, you can identify the correct product to meet your needs.



MCLNR164D

1

Shank Dimensions



The 7th and 8th position shall be a significant two-digit number that indicates the holder cross section. For shanks 5/8" square and over, the number will represent the number of sixteenths of width and height. For shanks under 5/8" square, the number of sixteenths of cross section will be preceded by a zero.

For rectangular holders, the first digit represents the number of eighths of width "B" and the second digit the number of quarters of height "H", except for a toolholder 1-1/4" x 1-1/2" which is given the number 91.

6

Shank Dimensions

4

Insert Size

Insert IC
Number of 1/8ths if "D"

D

Qualified Surface and Length

Additional Information

- R** = Radial clearance for 4" minimum bore
- S** = 3.00 minimum bore
- KC** = Kenclamp™
- H4** = Wedglock™ clamping system
- M..** = TNT/MTS clamping system for ceramic and PCBN inserts

Insert Thickness (optional)

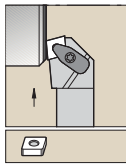
- 3** = .188"
- 4** = .250"

O.D./I.D. Tooling

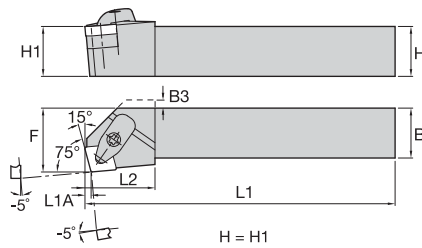
Qualified Surface and Length

- A** = Qualified back and end, 4" long
- B** = Qualified back and end, 4.5" long
- C** = Qualified back and end, 5" long
- D** = Qualified back and end, 6" long
- E** = Qualified back and end, 7" long
- F** = Qualified back and end, 8" long
- G*** = Qualified back and end, 5.5" long
- H*** = Qualified back and end, 5.625" long
- I*** = Qualified back and end, 3" long
- J*** = Qualified back and end, 5.3" long
- K*** = Qualified back and end, 14" long
- L*** = Qualified back and end, 6.8" long
- M** = Qualified front and end, 4" long
- N** = Qualified front and end, 4.5" long
- P** = Qualified front and end, 5" long
- R** = Qualified front and end, 6" long
- S** = Qualified front and end, 7" long
- T** = Qualified front and end, 8" long
- U*** = Qualified front and end, 5.5" long
- V*** = Qualified back and end, 3.5" long
- W*** = Qualified front and end, 3.5" long
- Y*** = Qualified back and end, 3.75" long
- Z*** = Qualified back and end, 3.250" long

*Kennametal standard only.



See page B40–B44 for inserts.

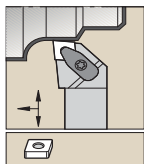


O.D./I.D. Tooling

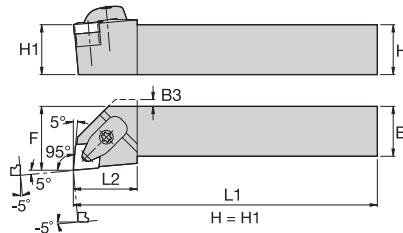
■ **DCKN-KC 15°**



catalog number	H	B	F	L1	L2	L1A	B3	gage insert	shim	shim screw	Torx Plus	clamp assembly	Torx Plus	slotted pin
right hand														
DCKNR124BKC3	.75	.75	1.000	4.50	1.25	.122	.22	CN..432	ICSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DCKNR164CKC3	1.00	1.00	1.250	5.00	1.25	.122	—	CN..432	ICSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DCKNR164DKC3	1.00	1.00	1.250	6.00	1.25	.122	—	CN..432	ICSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DCKNR204DKC3	1.25	1.25	1.500	6.00	1.25	.122	—	CN..432	ICSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DCKNR205DKC4	1.25	1.25	1.500	6.00	1.25	.150	—	CN..543	ICSN543	KMSP515IP	15 IP	CM209R ASSY	15 IP	SSP025016M
DCKNR206DKC4	1.25	1.25	1.500	6.00	1.50	.183	—	CN..643	ICSN643	KMSP625IP	25 IP	CM210R ASSY	25 IP	SSP025016M
left hand														
DCKNL164DKC3	1.00	1.00	1.250	6.00	1.25	.122	—	CN..432	ICSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DCKNL204DKC3	1.25	1.25	1.500	6.00	1.25	.122	—	CN..432	ICSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DCKNL205DKC4	1.25	1.25	1.500	6.00	1.25	.150	—	CN..543	ICSN543	KMSP515IP	15 IP	CM209R ASSY	15 IP	SSP025016M



See page B40–B44 for inserts.



■ **DCLN-KC -5°**



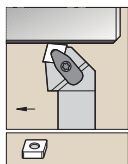
catalog number	H	B	F	L1	L2	B3	gage insert	shim	shim screw	Torx Plus	clamp assembly	Torx Plus	slotted pin
right hand													
DCLNR123BKC3	.75	.75	1.000	4.50	1.12	.06	CN..332	ICSN322	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DCLNR163DKC3	1.00	1.00	1.250	6.00	1.12	—	CN..332	ICSN322	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DCLNR124BKC3	.75	.75	1.000	4.50	1.25	.15	CN..432	ICSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DCLNR164CKC3	1.00	1.00	1.250	5.00	1.25	—	CN..432	ICSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DCLNR164DKC3	1.00	1.00	1.250	6.00	1.25	—	CN..432	ICSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DCLNR204DKC3	1.25	1.25	1.500	6.00	1.25	—	CN..432	ICSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DCLNR244DKC3	1.50	1.50	2.000	6.00	1.25	—	CN..432	ICSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DCLNR165CKC4	1.00	1.00	1.250	5.00	1.38	—	CN..543	ICSN543	KMSP515IP	15 IP	CM209R ASSY	15 IP	SSP025016M
DCLNR165DKC4	1.00	1.00	1.250	6.00	1.38	—	CN..543	ICSN543	KMSP515IP	15 IP	CM209R ASSY	15 IP	SSP025016M
DCLNR205DKC4	1.25	1.25	1.500	6.00	1.38	—	CN..543	ICSN543	KMSP515IP	15 IP	CM209R ASSY	15 IP	SSP025016M
DCLNR245DKC4	1.50	1.50	2.000	6.00	1.38	—	CN..543	ICSN543	KMSP515IP	15 IP	CM209R ASSY	15 IP	SSP025016M

(continued)

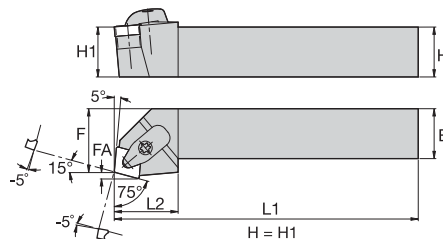
(DCLN-KC -5° continued)

catalog number	H	B	F	L1	L2	B3	gage insert	shim	shim screw	Torx Plus	clamp assembly	Torx Plus	slotted pin
DCLNR166DKC4	1.00	1.00	1.250	6.00	1.62	—	CN..643	ICSN633	KMSP625IP	25 IP	CM210R ASSY	25 IP	SSP025016M
DCLNR206DKC4	1.25	1.25	1.500	6.00	1.62	—	CN..643	ICSN643	KMSP625IP	25 IP	CM210R ASSY	25 IP	SSP025016M
DCLNR246DKC4	1.50	1.50	2.000	6.00	1.62	—	CN..643	ICSN643	KMSP625IP	25 IP	CM210R ASSY	25 IP	SSP025016M
DCLNR246EKC4	1.50	1.50	2.000	7.00	1.62	—	CN..643	ICSN643	KMSP625IP	25 IP	CM210R ASSY	25 IP	SSP025016M
left hand													
DCLNL123BKC3	.75	.75	1.000	4.50	1.12	.06	CN..332	ICSN322	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DCLNL163DKC3	1.00	1.00	1.250	6.00	1.12	—	CN..332	ICSN322	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DCLNL124BKC3	.75	.75	1.000	4.50	1.25	.15	CN..432	ICSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DCLNL164CKC3	1.00	1.00	1.250	5.00	1.25	—	CN..432	ICSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DCLNL164DKC3	1.00	1.00	1.250	6.00	1.25	—	CN..432	ICSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DCLNL854DKC3	1.25	1.00	1.250	6.00	1.25	—	CN..432	ICSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DCLNL204DKC3	1.25	1.25	1.500	6.00	1.25	—	CN..432	ICSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DCLNL244DKC3	1.50	1.50	2.000	6.00	1.25	—	CN..432	ICSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DCLNL165CKC4	1.00	1.00	1.250	5.00	1.38	—	CN..543	ICSN543	KMSP515IP	15 IP	CM209R ASSY	15 IP	SSP025016M
DCLNL165DKC4	1.00	1.00	1.250	6.00	1.38	—	CN..543	ICSN543	KMSP515IP	15 IP	CM209R ASSY	15 IP	SSP025016M
DCLNL205DKC4	1.25	1.25	1.500	6.00	1.38	—	CN..543	ICSN543	KMSP515IP	15 IP	CM209R ASSY	15 IP	SSP025016M
DCLNL245DKC4	1.50	1.50	2.000	6.00	1.38	—	CN..543	ICSN543	KMSP515IP	15 IP	CM209R ASSY	15 IP	SSP025016M
DCLNL166DKC4	1.00	1.00	1.250	6.00	1.62	—	CN..643	ICSN633	KMSP625IP	25 IP	CM210R ASSY	25 IP	SSP025016M
DCLNL206DKC4	1.25	1.25	1.500	6.00	1.62	—	CN..643	ICSN643	KMSP625IP	25 IP	CM210R ASSY	25 IP	SSP025016M
DCLNL246DKC4	1.50	1.50	2.000	6.00	1.62	—	CN..643	ICSN643	KMSP625IP	25 IP	CM210R ASSY	25 IP	SSP025016M

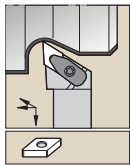
O.D./I.D. Tooling



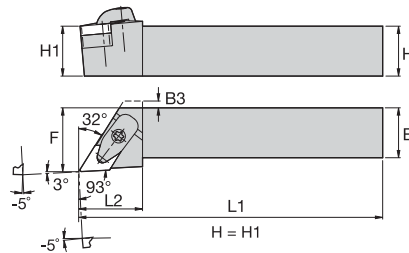
See page B40–B44 for inserts.


DCRN-KC 15°

catalog number	H	B	F	L1	L2	FA	gage insert	shim	shim screw	Torx Plus	clamp assembly	Torx Plus	slotted pin
right hand													
DCRNR124BKC3	.75	.75	.878	4.50	1.25	.12	CN..432	ICSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DCRNR164DKC3	1.00	1.00	1.128	6.00	1.25	.12	CN..432	ICSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DCRNR204DKC3	1.25	1.25	1.378	6.00	1.25	.12	CN..432	ICSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DCRNR245DKC4	1.50	1.50	1.851	6.00	1.38	.15	CN..543	ICSN543	KMSP515IP	15 IP	CM209R ASSY	15 IP	SSP025016M
DCRNR206DKC4	1.25	1.25	1.501	6.00	1.38	.18	CN..643	ICSN643	KMSP625IP	25 IP	CM210R ASSY	25 IP	SSP025016M
left hand													
DCRNL164DKC3	1.00	1.00	1.128	6.00	1.25	.12	CN..432	ICSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DCRNL204DKC3	1.25	1.25	1.378	6.00	1.25	.12	CN..432	ICSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DCRNL245DKC4	1.50	1.50	1.851	6.00	1.38	.15	CN..543	ICSN543	KMSP515IP	15 IP	CM209R ASSY	15 IP	SSP025016M
DCRNL206DKC4	1.25	1.25	1.501	6.00	1.38	.18	CN..643	ICSN643	KMSP625IP	25 IP	CM210R ASSY	25 IP	SSP025016M



See page B50–B57 for inserts.

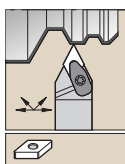


DDJN-KC -3°

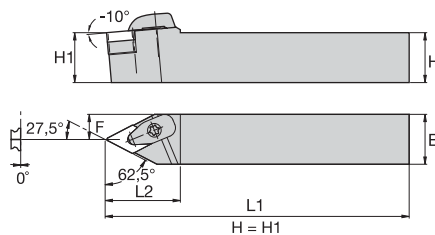
O.D./I.D. Tooling



catalog number	H	B	F	L1	L2	B3	gage insert	shim	shim screw	Torx Plus	clamp assembly	Torx Plus	slotted pin
right hand													
DDJNR123BKC3	.75	.75	1.000	4.50	1.25	.06	DN..332	IDSN322	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DDJNR163CKC3	1.00	1.00	1.250	5.00	1.25	—	DN..332	IDSN322	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DDJNR163DKC3	1.00	1.00	1.250	6.00	1.25	—	DN..332	IDSN322	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DDJNR203DKC3	1.25	1.25	1.500	6.00	1.25	—	DN..332	IDSN322	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DDJNR164CKC3	1.00	1.00	1.250	5.00	1.25	—	DN..432	IDSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DDJNR164DKC3	1.00	1.00	1.250	6.00	1.25	—	DN..432	IDSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DDJNR204DKC3	1.25	1.25	1.500	6.00	1.25	—	DN..432	IDSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DDJNR165DKC4	1.00	1.00	1.250	6.00	1.38	.15	DN..543	IDSN543	KMSP515IP	15 IP	CM209R ASSY	15 IP	SSP025016M
DDJNR205DKC4	1.25	1.25	1.500	6.00	1.38	—	DN..543	IDSN543	KMSP515IP	15 IP	CM209R ASSY	15 IP	SSP025016M
DDJNR245DKC4	1.50	1.50	2.000	6.00	1.38	—	DN..543	IDSN543	KMSP515IP	15 IP	CM209R ASSY	15 IP	SSP025016M
left hand													
DDJNL123BKC3	.75	.75	1.000	4.50	1.25	.06	DN..332	IDSN322	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DDJNL163CKC3	1.00	1.00	1.250	5.00	1.25	—	DN..332	IDSN322	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DDJNL163DKC3	1.00	1.00	1.250	6.00	1.25	—	DN..332	IDSN322	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DDJNL203DKC3	1.25	1.25	1.500	6.00	1.25	—	DN..332	IDSN322	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DDJNL164CKC3	1.00	1.00	1.250	5.00	1.25	—	DN..432	IDSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DDJNL164DKC3	1.00	1.00	1.250	6.00	1.25	—	DN..432	IDSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DDJNL204DKC3	1.25	1.25	1.500	6.00	1.25	—	DN..432	IDSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DDJNL165DKC4	1.00	1.00	1.250	6.00	1.38	.15	DN..543	IDSN543	KMSP515IP	15 IP	CM209R ASSY	15 IP	SSP025016M
DDJNL205DKC4	1.25	1.25	1.500	6.00	1.38	—	DN..543	IDSN543	KMSP515IP	15 IP	CM209R ASSY	15 IP	SSP025016M
DDJNL245DKC4	1.50	1.50	2.000	6.00	1.38	—	DN..543	IDSN543	KMSP515IP	15 IP	CM209R ASSY	15 IP	SSP025016M



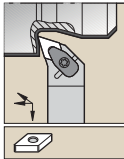
See page B50–B57 for inserts.



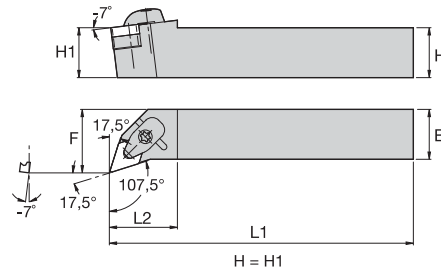
DDPN-KC 27.5°



catalog number	H	B	F	L1	L2	gage insert	shim	shim screw	Torx Plus	clamp assembly	Torx Plus	slotted pin
DDPNN164DKC3	1.00	1.00	.500	6.00	1.62	DN..432	IDSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M



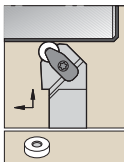
See page B50–B57 for inserts.



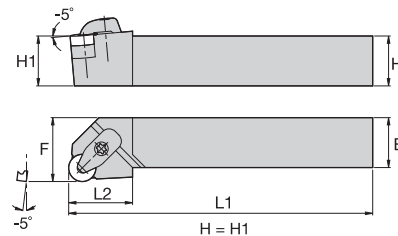
■ **DDQN-KC -17.5°**



catalog number	H	B	F	L1	L2	gage insert	shim	shim screw	Torx Plus	clamp assembly	Torx Plus	slotted pin
right hand												
DDQNR164CKC3	1.00	1.00	1.250	5.00	1.38	DN..432	IDSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DDQNR164DKC3	1.00	1.00	1.250	6.00	1.38	DN..432	IDSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DDQNR204DKC3	1.25	1.25	1.500	6.00	1.38	DN..432	IDSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
left hand												
DDQNL164CKC3	1.00	1.00	1.250	5.00	1.38	DN..432	IDSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DDQNL164DKC3	1.00	1.00	1.250	6.00	1.38	DN..432	IDSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DDQNL204DKC3	1.25	1.25	1.500	6.00	1.38	DN..432	IDSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M



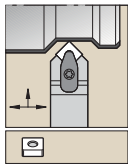
See page B58 for inserts.



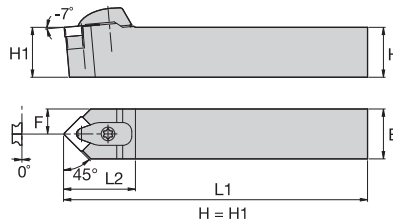
■ **DRGN-KC**



catalog number	H	B	F	L1	L2	gage insert	shim	shim screw	Torx Plus	clamp assembly	Torx Plus	slotted pin
right hand												
DRGNR124BKC3	.75	.75	1.000	4.50	1.25	RN..43	IRSN43	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DRGNR164DKC3	1.00	1.00	1.250	6.00	1.25	RN..43	IRSN44	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DRGNR204DKC3	1.25	1.25	1.500	6.00	1.25	RN..43	IRSN44	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
left hand												
DRGNL124BKC3	.75	.75	1.000	4.50	1.25	RN..43	IRSN43	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DRGNL164DKC3	1.00	1.00	1.250	6.00	1.25	RN..43	IRSN44	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DRGNL204DKC3	1.25	1.25	1.500	6.00	1.25	RN..43	IRSN44	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DRGNL165DKC4	1.00	1.00	1.250	6.00	1.25	RN..54	IRSN54	KMSP515IP	15 IP	CM209R ASSY	15 IP	SSP025016M
DRGNL206DKC4	1.25	1.25	1.500	6.00	1.38	RN..64	IRSN64	KMSP625IP	25 IP	CM210R ASSY	25 IP	SSP025016M



See pages B59–B65 for inserts.

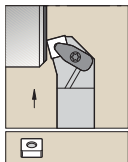


■ DSDN-KC 45°

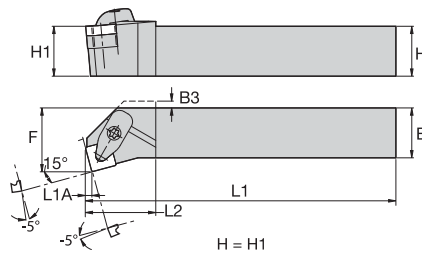
O.D./I.D. Tooling



catalog number	H	B	F	L1	L2	gage insert	shim	shim screw	Torx Plus	clamp assembly	Torx Plus	slotted pin
DSDNN124KC3	.75	.75	.365	4.50	1.44	SN..432	ISSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DSDNN164KC3	1.00	1.00	.500	6.00	1.44	SN..432	ISSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DSDNN204KC3	1.25	1.25	.625	6.00	1.44	SN..432	ISSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DSDNN206KC4	1.25	1.25	.625	6.00	1.75	SN..643	ISSN643	KMSP625IP	25 IP	CM210R ASSY	25 IP	SSP025016M



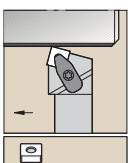
See pages B59–B65 for inserts.



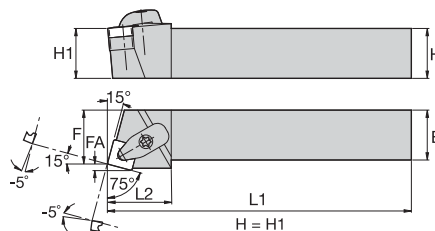
■ DSKN-KC 15°



catalog number	H	B	F	L1	L2	L1A	B3	gage insert	shim	shim screw	Torx Plus	clamp assembly	Torx Plus	slotted pin
right hand														
DSKNR164CKC3	1.00	1.00	1.250	5.00	1.25	.12	.12	SN..432	ISSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DSKNR164DKC3	1.00	1.00	1.250	6.00	1.25	.12	.12	SN..432	ISSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
left hand														
DSKNL164CKC3	1.00	1.00	1.250	5.00	1.25	.12	.12	SN..432	ISSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DSKNL164DKC3	1.00	1.00	1.250	6.00	1.25	.12	.12	SN..432	ISSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M



See pages B59–B65 for inserts.



■ DSRN-KC 15°

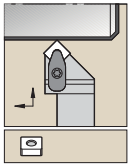


catalog number	H	B	F	L1	L2	FA	gage insert	shim	shim screw	Torx Plus	clamp assembly	Torx Plus	slotted pin
right hand													
DSRNR124BKC3	.75	.75	.880	4.50	1.25	.12	SN..432	ISSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DSRNR164CKC3	1.00	1.00	1.130	5.00	1.25	.12	SN..432	ISSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DSRNR164DKC3	1.00	1.00	1.130	6.00	1.25	.12	SN..432	ISSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DSRNR204DKC3	1.25	1.25	1.380	6.00	1.25	.12	SN..432	ISSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DSRNR206DKC4	1.25	1.25	1.321	6.00	1.50	.18	SN..643	ISSN643	KMSP625IP	25 IP	CM210R ASSY	25 IP	SSP025016M

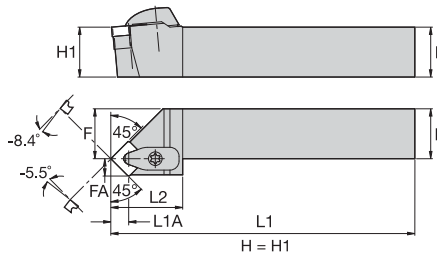
(continued)

(DSRN-KC 15° continued)

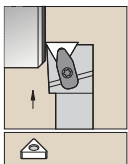
catalog number	H	B	F	L1	L2	FA	gage insert	shim	shim screw	Torx Plus	clamp assembly	Torx Plus	slotted pin
left hand													
DSRNL124BKC3	.75	.75	.880	4.50	1.25	.12	SN..432	ISSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DSRNL164CKC3	1.00	1.00	1.130	5.00	1.25	.12	SN..432	ISSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DSRNL164DKC3	1.00	1.00	1.130	6.00	1.25	.12	SN..432	ISSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DSRNL204DKC3	1.25	1.25	1.380	6.00	1.25	.12	SN..432	ISSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DSRNL165DKC4	1.00	1.00	1.103	6.00	1.50	.15	SN..543	ISSN543	KMSP515IP	15 IP	CM209R ASSY	15 IP	SSP025016M
DSRNL206DKC4	1.25	1.25	1.321	6.00	1.50	.18	SN..643	ISSN643	KMSP625IP	25 IP	CM210R ASSY	25 IP	SSP025016M



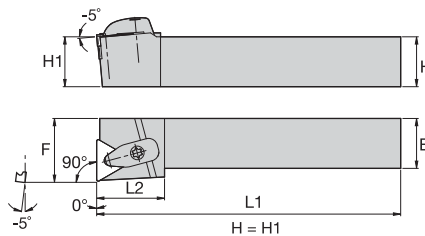
See pages B59–B65 for inserts.


■ DSSN-KC 45°

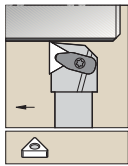
catalog number	H	B	F	L1	L2	FA	L1A	gage insert	shim	shim screw	Torx Plus	clamp assembly	Torx Plus	slotted pin
right hand														
DSSNR164DKC3	1.00	1.00	.912	6.00	1.50	.34	.33	SN..432	ISSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
left hand														
DSSNL164DKC3	1.00	1.00	.912	6.00	1.50	.34	.33	SN..432	ISSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M



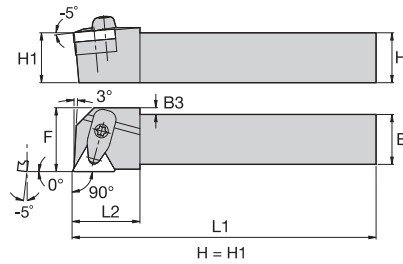
See pages B66–B74 for inserts.


■ DTFN-KC 0°

catalog number	H	B	F	L1	L2	gage insert	shim	shim screw	Torx Plus	clamp assembly	Torx Plus	slotted pin
right hand												
DTFNR123BKC3	.75	.75	1.000	4.50	1.3	TN..332	ITSN323	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DTFNR163DKC3	1.00	1.00	1.250	6.00	1.3	TN..332	ITSN323	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DTFNR164CKC3	1.00	1.00	1.250	5.00	1.4	TN..432	ITSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DTFNR164DKC3	1.00	1.00	1.250	6.00	1.4	TN..432	ITSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
left hand												
DTFNL123BKC3	.75	.75	1.000	4.50	1.3	TN..332	ITSN323	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DTFNL163DKC3	1.00	1.00	1.250	6.00	1.3	TN..332	ITSN323	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DTFNL164CKC3	1.00	1.00	1.250	5.00	1.4	TN..432	ITSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DTFNL164DKC3	1.00	1.00	1.250	6.00	1.4	TN..432	ITSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M



See pages B66–B74 for inserts.

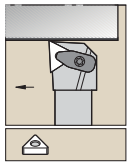


■ **DTGN-KC 0°**

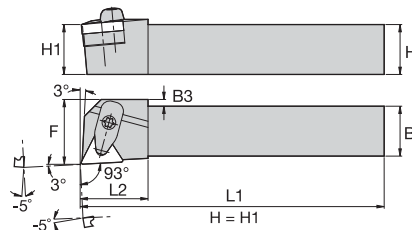
O.D./I.D. Tooling



catalog number	H	B	F	L1	L2	B3	gage insert	shim	shim screw	Torx Plus	clamp assembly	Torx Plus	slotted pin
right hand													
DTGNR123BKC3	.75	.75	1.000	4.50	1.12	.25	TN..332	ITSN323	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DTGNR163DKC3	1.00	1.00	1.250	6.00	1.12	—	TN..332	ITSN323	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DTGNR164DKC3	1.00	1.00	1.250	6.00	1.25	.09	TN..432	ITSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
left hand													
DTGNL123BKC3	.75	.75	1.000	4.50	1.12	.25	TN..332	ITSN323	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DTGNL163DKC3	1.00	1.00	1.250	6.00	1.12	—	TN..332	ITSN323	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DTGNL164DKC3	1.00	1.00	1.250	6.00	1.25	.09	TN..432	ITSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M



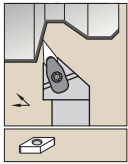
See pages B66–B74 for inserts.



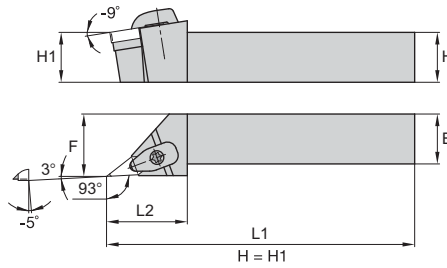
■ **DTJN-KC -3°**



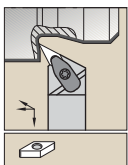
catalog number	H	B	F	L1	L2	B3	gage insert	shim	shim screw	Torx Plus	clamp assembly	Torx Plus	slotted pin
right hand													
DTJNR164DKC3	1.00	1.00	1.250	6.00	1.25	.12	TN..432	ITSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M



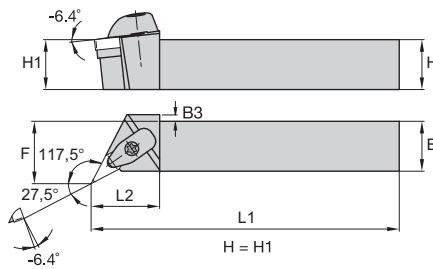
See pages B74–B78 for inserts.


DVJN-KC -3°

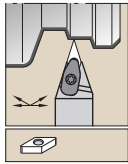

catalog number	H	B	F	L1	L2	gage insert	shim	shim screw	Torx Plus	clamp assembly	Torx Plus	slotted pin
right hand												
DVJNR123CKC3	.75	.75	1.000	5.00	1.82	VN..332	IVSN322	KMSP315IP	15 IP	CM215R ASSY	15 IP	SSP025016M
DVJNR163DKC3	1.00	1.00	1.250	6.00	1.82	VN..332	IVSN322	KMSP315IP	15 IP	CM215R ASSY	15 IP	SSP025016M
DVJNR853DKC3	1.25	1.00	1.250	6.00	1.82	VN..332	IVSN322	KMSP315IP	15 IP	CM215R ASSY	15 IP	SSP025016M
left hand												
DVJNL123CKC3	.75	.75	1.000	5.00	1.82	VN..332	IVSN322	KMSP315IP	15 IP	CM215R ASSY	15 IP	SSP025016M
DVJNL163DKC3	1.00	1.00	1.250	6.00	1.82	VN..332	IVSN322	KMSP315IP	15 IP	CM215R ASSY	15 IP	SSP025016M
DVJNL853DKC3	1.25	1.00	1.250	6.00	1.82	VN..332	IVSN322	KMSP315IP	15 IP	CM215R ASSY	15 IP	SSP025016M
DVJNL164DKC3	1.00	1.00	1.250	6.00	2.00	VN..432	IVSN432	KMSP415IP	15 IP	CM235R ASSY	15 IP	SSP025016M
DVJNL854DKC3	1.25	1.00	1.250	6.00	2.00	VN..432	IVSN432	KMSP415IP	15 IP	CM235R ASSY	15 IP	SSP025016M



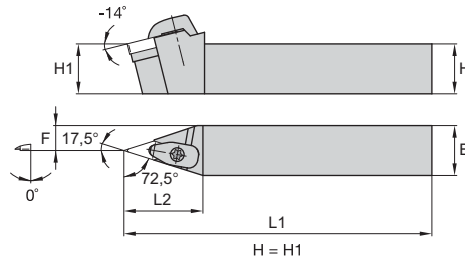
See pages B74–B78 for inserts.


DVON-KC -117.5°


catalog number	H	B	F	L1	L2	B3	gage insert	shim	shim screw	Torx Plus	clamp assembly	Torx Plus	slotted pin
right hand													
DVONR123CKC3	.75	.75	1.000	5.00	1.50	.25	VN..332	IVSN322	KMSP315IP	15 IP	CM215R ASSY	15 IP	SSP025016M
DVONR163DKC3	1.00	1.00	1.250	6.00	1.47	—	VN..332	IVSN322	KMSP315IP	15 IP	CM215R ASSY	15 IP	SSP025016M
DVONR853DKC3	1.25	1.00	1.250	6.00	1.47	—	VN..332	IVSN322	KMSP315IP	15 IP	CM215R ASSY	15 IP	SSP025016M
left hand													
DVONL123CKC3	.75	.75	1.000	5.00	1.50	.25	VN..332	IVSN322	KMSP315IP	15 IP	CM215R ASSY	15 IP	SSP025016M
DVONL163DKC3	1.00	1.00	1.250	6.00	1.47	—	VN..332	IVSN322	KMSP315IP	15 IP	CM215R ASSY	15 IP	SSP025016M
DVONL853DKC3	1.25	1.00	1.250	6.00	1.47	—	VN..332	IVSN322	KMSP315IP	15 IP	CM215R ASSY	15 IP	SSP025016M



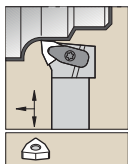
See pages B74–B78 for inserts.



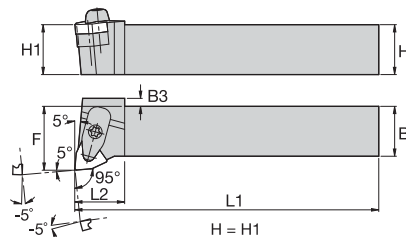
■ **DVNN-KC 17.5°**

O.D./I.D. Tooling

catalog number	H	B	F	L1	L2	gage insert	shim	shim screw	Torx Plus	clamp assembly	Torx Plus	slotted pin
DVVNN123CKC3	.75	.75	.371	5.00	1.94	VN..332	IVSN322	KMSP315IP	15 IP	CM215R ASSY	15 IP	SSP025016M
DVVNN163DKC3	1.00	1.00	.496	6.00	1.97	VN..332	IVSN322	KMSP315IP	15 IP	CM215R ASSY	15 IP	SSP025016M
DVVNN853DKC3	1.25	1.00	.496	6.00	1.88	VN..332	IVSN322	KMSP315IP	15 IP	CM215R ASSY	15 IP	SSP025016M
DVVNN164DKC3	1.00	1.00	.496	6.00	2.28	VN..432	IVSN432	KMSP415IP	15 IP	CM235R ASSY	15 IP	SSP025016M
DVVNN854DKC3	1.25	1.00	.496	6.00	2.28	VN..432	IVSN432	KMSP415IP	15 IP	CM235R ASSY	15 IP	SSP025016M

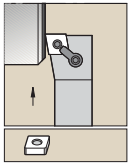


See pages B79–B83 for inserts.

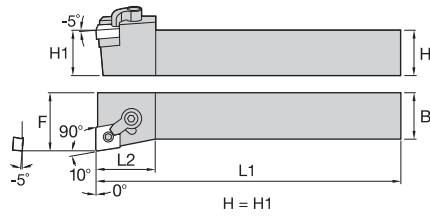


■ **DWLN-KC -5°**

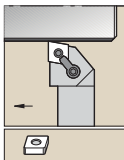
catalog number	H	B	F	L1	L2	B3	gage insert	shim	shim screw	Torx Plus	clamp assembly	Torx Plus	slotted pin
right hand													
DWLN123BKC3	.75	.75	1.000	4.50	1.00	.28	WN..332	IWSN322	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DWLN163CKC3	1.00	1.00	1.250	5.00	1.00	.06	WN..332	IWSN322	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DWLN163DKC3	1.00	1.00	1.250	6.00	1.00	.06	WN..332	IWSN322	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DWLN164CKC3	1.00	1.00	1.250	5.00	1.00	—	WN..432	IWSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DWLN164DKC3	1.00	1.00	1.250	6.00	1.00	—	WN..432	IWSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DWLN204DKC3	1.25	1.25	1.500	6.00	1.00	—	WN..432	IWSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
left hand													
DWLN123BKC3	.75	.75	1.000	4.50	1.00	.28	WN..332	IWSN322	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DWLN163CKC3	1.00	1.00	1.250	5.00	1.00	.06	WN..332	IWSN322	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DWLN163DKC3	1.00	1.00	1.250	6.00	1.00	.06	WN..332	IWSN322	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DWLN164CKC3	1.00	1.00	1.250	5.00	1.00	—	WN..432	IWSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DWLN164DKC3	1.00	1.00	1.250	6.00	1.00	—	WN..432	IWSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M
DWLN204DKC3	1.25	1.25	1.500	6.00	1.00	—	WN..432	IWSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M



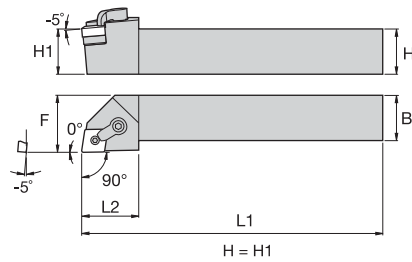
See pages B40–B49 for inserts.


MCFN 0°


catalog number	H	B	F	L1	L2	gage insert	shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
right hand												
MCFNR124B	.75	.75	1.000	4.50	1.25	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
MCFNR164C	1.00	1.00	1.250	5.00	1.25	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
MCFNR164D	1.00	1.00	1.250	6.00	1.25	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
left hand												
MCFNL164C	1.00	1.00	1.250	5.00	1.25	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
MCFNL164D	1.00	1.00	1.250	6.00	1.25	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8

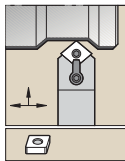


See pages B40–B49 for inserts.

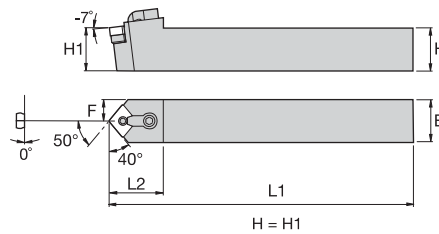

MCGN 0°


catalog number	H	B	F	L1	L2	gage insert	shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
right hand												
MCGNR124B	.75	.75	1.000	4.50	1.25	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
MCGNR164C	1.00	1.00	1.250	5.00	1.25	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
MCGNR164D	1.00	1.00	1.250	6.00	1.25	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
left hand												
MCGNL124B	.75	.75	1.000	4.50	1.25	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
MCGNL164C	1.00	1.00	1.250	5.00	1.25	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
MCGNL164D	1.00	1.00	1.250	6.00	1.25	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8

O.D./I.D. Tooling



See pages B40–B49 for inserts.

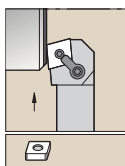


■ **MCHN 50°**

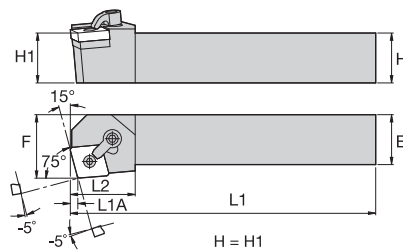
O.D./I.D. Tooling



catalog number	H	B	F	L1	L2	gage insert	shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
MCHNN164C	1.00	1.00	.500	5.00	1.25	CN..432	ICSN433	KL46	3/32	CK21	STC20	1/8
MCHNN205D	1.25	1.25	.625	6.00	1.38	CN..543	ICSN533	KL58	1/8	CK21	STC20	1/8
MCHNN246D	1.50	1.50	.750	6.00	1.60	CN..643	ICSN633	KL68	9/64	CK12	STC4	5/32



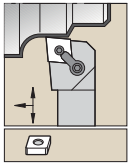
See pages B40–B49 for inserts.



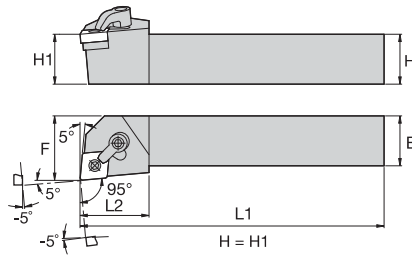
■ **MCKN 15°**



catalog number	H	B	F	L1	L2	L1A	gage insert	shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
right hand													
MCKNR124B	.75	.75	1.000	4.50	1.21	.12	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
MCKNR164C	1.00	1.00	1.250	5.00	1.21	.12	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
MCKNR164D	1.00	1.00	1.250	6.00	1.21	.12	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
MCKNR165C	1.00	1.00	1.250	5.00	1.25	.15	CN..543	ICSN533	KL58	1/8	CK9	STC4	5/32
MCKNR165D	1.00	1.00	1.250	6.00	1.25	.15	CN..543	ICSN533	KL58	1/8	CK9	STC4	5/32
MCKNR204D	1.25	1.25	1.500	6.00	1.21	.12	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
MCKNR205D	1.25	1.25	1.500	6.00	1.25	.15	CN..543	ICSN533	KL58	1/8	CK9	STC4	5/32
MCKNR206D	1.25	1.25	1.500	6.00	1.47	.18	CN..643	ICSN633	KL68	9/64	CK12	STC4	5/32
MCKNR245D	1.50	1.50	2.000	6.00	1.25	.15	CN..543	ICSN533	KL58	1/8	CK9	STC4	5/32
MCKNR246D	1.50	1.50	2.000	6.00	1.47	.18	CN..643	ICSN633	KL68	9/64	CK12	STC4	5/32
left hand													
MCKNL124B	.75	.75	1.000	4.50	1.21	.12	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
MCKNL164C	1.00	1.00	1.250	5.00	1.21	.12	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
MCKNL164D	1.00	1.00	1.250	6.00	1.21	.12	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
MCKNL165D	1.00	1.00	1.250	6.00	1.25	.15	CN..543	ICSN533	KL58	1/8	CK9	STC4	5/32
MCKNL204D	1.25	1.25	1.500	6.00	1.21	.12	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
MCKNL205D	1.25	1.25	1.500	6.00	1.25	.15	CN..543	ICSN533	KL58	1/8	CK9	STC4	5/32
MCKNL206D	1.25	1.25	1.500	6.00	1.47	.18	CN..643	ICSN633	KL68	9/64	CK12	STC4	5/32
MCKNL245D	1.50	1.50	2.000	6.00	1.25	.15	CN..543	ICSN533	KL58	1/8	CK9	STC4	5/32
MCKNL246D	1.50	1.50	2.000	6.00	1.47	.18	CN..643	ICSN633	KL68	9/64	CK12	STC4	5/32



See pages B40–B49 for inserts.


MCLN -5°



catalog number right hand	H	B	F	L1	L2	gage insert	shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
MCLNR083A	.50	.50	.750	4.00	1.00	CN..322	—	KL33	5/64	CK6	STC5	3/32
MCLNR103A	.63	.63	.875	4.00	1.00	CN..322	—	KL33	5/64	CK6	STC5	3/32
MCLNR123B	.75	.75	1.000	4.50	1.00	CN..322	ICSN332	KL34L	5/64	CK6	STC5	3/32
MCLNR124A	.75	.75	1.000	4.00	1.20	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
MCLNR124B	.75	.75	1.000	4.50	1.20	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
MCLNR163C	1.00	1.00	1.250	5.00	1.00	CN..322	ICSN332	KL34L	5/64	CK6	STC5	3/32
MCLNR163D	1.00	1.00	1.250	6.00	1.00	CN..322	ICSN332	KL34L	5/64	CK6	STC5	3/32
MCLNR164C	1.00	1.00	1.250	5.00	1.20	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
MCLNR164D	1.00	1.00	1.250	6.00	1.20	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
MCLNR165C	1.00	1.00	1.250	5.00	1.37	CN..543	ICSN533	KL58	1/8	CK12	STC4	5/32
MCLNR165D	1.00	1.00	1.250	6.00	1.37	CN..543	ICSN533	KL58	1/8	CK12	STC4	5/32
MCLNR166C	1.00	1.00	1.250	5.00	1.49	CN..643	ICSN633	KL68	9/64	CK12	STC4	5/32
MCLNR166D	1.00	1.00	1.250	6.00	1.49	CN..643	ICSN633	KL68	9/64	CK12	STC4	5/32
MCLNR204D	1.25	1.25	1.500	6.00	1.20	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
MCLNR205D	1.25	1.25	1.500	6.00	1.37	CN..543	ICSN533	KL58	1/8	CK12	STC4	5/32
MCLNR206D	1.25	1.25	1.500	6.00	1.49	CN..643	ICSN633	KL68	9/64	CK12	STC4	5/32
MCLNR244D	1.50	1.50	2.000	6.00	1.20	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
MCLNR245D	1.50	1.50	2.000	6.00	1.37	CN..543	ICSN533	KL58	1/8	CK12	STC4	5/32
MCLNR245E	1.50	1.50	2.000	7.00	1.37	CN..543	ICSN533	KL58	1/8	CK12	STC4	5/32
MCLNR246D	1.50	1.50	2.000	6.00	1.49	CN..643	ICSN633	KL68	9/64	CK12	STC4	5/32
MCLNR246E	1.50	1.50	2.000	7.00	1.49	CN..643	ICSN633	KL68	9/64	CK12	STC4	5/32
MCLNR248E	1.50	1.50	2.000	7.00	1.49	CN..866	ICSN846	KL810	5/32	CK24	STC19	3/16
MCLNR326F	2.00	2.00	2.500	8.00	1.49	CN..643	ICSN633	KL68	9/64	CK12	STC4	5/32
MCLNR854D	1.25	1.00	1.250	6.00	1.20	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
MCLNR856D	1.25	1.00	1.250	6.00	1.49	CN..643	ICSN633	KL68	9/64	CK12	STC4	5/32
MCLNR866D	1.50	1.00	1.250	6.00	1.49	CN..643	ICSN633	KL68	9/64	CK12	STC4	5/32
MCLNR866E	1.50	1.00	1.250	7.00	1.49	CN..643	ICSN633	KL68	9/64	CK12	STC4	5/32

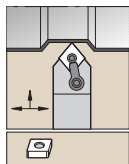
(continued)

O.D./I.D. Tooling

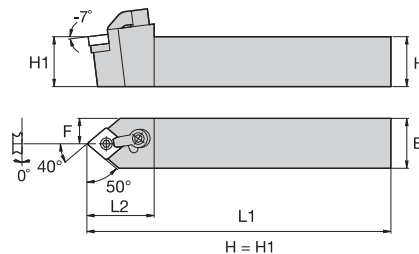
(MCLN -5° continued)

O.D./I.D. Tooling


catalog number	H	B	F	L1	L2	gage insert							
							shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)	
left hand													
MCLNL083A	.50	.50	.750	4.00	1.00	CN..322	—	KL33	5/64	CK6	STC5	3/32	
MCLNL103A	.63	.63	.875	4.00	1.00	CN..322	—	KL33	5/64	CK6	STC5	3/32	
MCLNL123B	.75	.75	1.000	4.50	1.00	CN..322	ICSN332	KL34L	5/64	CK6	STC5	3/32	
MCLNL124A	.75	.75	1.000	4.00	1.20	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8	
MCLNL124B	.75	.75	1.000	4.50	1.20	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8	
MCLNL164C	1.00	1.00	1.250	5.00	1.20	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8	
MCLNL164D	1.00	1.00	1.250	6.00	1.20	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8	
MCLNL165C	1.00	1.00	1.250	5.00	1.37	CN..543	ICSN533	KL58	1/8	CK12	STC4	5/32	
MCLNL165D	1.00	1.00	1.250	6.00	1.37	CN..543	ICSN533	KL58	1/8	CK12	STC4	5/32	
MCLNL166C	1.00	1.00	1.250	5.00	1.49	CN..643	ICSN633	KL68	9/64	CK12	STC4	5/32	
MCLNL166D	1.00	1.00	1.250	6.00	1.49	CN..643	ICSN633	KL68	9/64	CK12	STC4	5/32	
MCLNL204D	1.25	1.25	1.500	6.00	1.20	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8	
MCLNL205D	1.25	1.25	1.500	6.00	1.37	CN..543	ICSN533	KL58	1/8	CK12	STC4	5/32	
MCLNL206D	1.25	1.25	1.500	6.00	1.49	CN..643	ICSN633	KL68	9/64	CK12	STC4	5/32	
MCLNL244D	1.50	1.50	2.000	6.00	1.20	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8	
MCLNL245D	1.50	1.50	2.000	6.00	1.37	CN..543	ICSN533	KL58	1/8	CK12	STC4	5/32	
MCLNL245E	1.50	1.50	2.000	7.00	1.37	CN..543	ICSN533	KL58	1/8	CK12	STC4	5/32	
MCLNL246D	1.50	1.50	2.000	6.00	1.49	CN..643	ICSN633	KL68	9/64	CK12	STC4	5/32	
MCLNL246E	1.50	1.50	2.000	7.00	1.49	CN..643	ICSN633	KL68	9/64	CK12	STC4	5/32	
MCLNL248E	1.50	1.50	2.000	7.00	1.49	CN..866	ICSN846	KL810	5/32	CK24	STC19	3/16	
MCLNL326F	2.00	2.00	2.500	8.00	1.49	CN..643	ICSN633	KL68	9/64	CK12	STC4	5/32	
MCLNL854D	1.25	1.00	1.250	6.00	1.20	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8	
MCLNL856D	1.25	1.00	1.250	6.00	1.49	CN..643	ICSN633	KL68	9/64	CK12	STC4	5/32	
MCLNL866E	1.50	1.00	1.250	7.00	1.49	CN..643	ICSN633	KL68	9/64	CK12	STC4	5/32	



See pages B40–B49 for inserts.

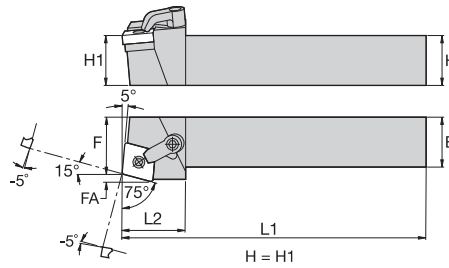


■ MCMN 40°

catalog number	H	B	F	L1	L2	gage insert						
							shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
MCMNN124B	.75	.75	.375	4.500	1.39	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
MCMNN164C	1.00	1.00	.500	5.000	1.39	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
MCMNN164D	1.00	1.00	.500	6.000	1.39	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
MCMNN204D	1.25	1.25	.625	6.000	1.39	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
MCMNN166D	1.00	1.00	.500	6.000	1.67	CN..643	ICSN633	KL68	9/64	CK12	STC4	5/32
MCMNN206D	1.25	1.25	.625	6.000	1.67	CN..643	ICSN633	KL68	9/64	CK12	STC4	5/32
MCMNN246D	1.50	1.50	.750	6.000	1.67	CN..643	ICSN633	KL68	9/64	CK12	STC4	5/32
MCMNN246E	1.50	1.50	.750	7.000	1.67	CN..643	ICSN633	KL68	9/64	CK12	STC4	5/32

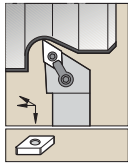


See pages B40–B49 for inserts.

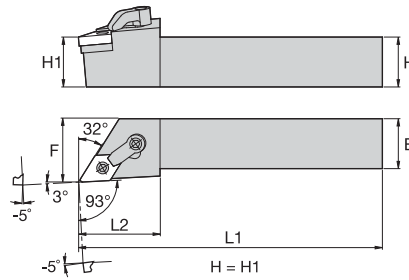

MCRN 15°


catalog number	H	B	F	L1	L2	FA	gage insert	shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
right hand													
MCRNR124B	.75	.75	.751	4.50	1.24	.12	CN..432	ICSN433	KL46	3/32	CK9	STC4	5/32
MCRNR164C	1.00	1.00	1.251	5.00	1.24	.12	CN..432	ICSN433	KL46	3/32	CK9	STC4	5/32
MCRNR164D	1.00	1.00	1.251	6.00	1.24	.12	CN..432	ICSN433	KL46	3/32	CK9	STC4	5/32
MCRNR165D	1.00	1.00	1.251	6.00	1.34	.15	CN..543	ICSN533	KL58	1/8	CK9	STC4	5/32
MCRNR166D	1.00	1.00	1.251	6.00	1.49	.18	CN..643	ICSN633	KL68	9/64	CK12	STC4	5/32
MCRNR204D	1.25	1.25	1.500	6.00	1.24	.12	CN..432	ICSN433	KL46	3/32	CK9	STC4	5/32
MCRNR205D	1.25	1.25	1.501	6.00	1.34	.15	CN..543	ICSN533	KL58	1/8	CK9	STC4	5/32
MCRNR206D	1.25	1.25	1.501	6.00	1.49	.18	CN..643	ICSN633	KL68	9/64	CK12	STC4	5/32
MCRNR244D	1.50	1.50	2.001	6.00	1.24	.12	CN..432	ICSN433	KL46	3/32	CK9	STC4	5/32
MCRNR245D	1.50	1.50	2.001	6.00	1.34	.15	CN..543	ICSN533	KL58	1/8	CK9	STC4	5/32
MCRNR246D	1.50	1.50	2.001	6.00	1.49	.18	CN..643	ICSN633	KL68	9/64	CK12	STC4	5/32
MCRNR246E	1.50	1.50	2.001	7.00	1.49	.18	CN..643	ICSN633	KL68	9/64	CK12	STC4	5/32
left hand													
MCRNL124B	.75	.75	.751	4.50	1.24	.12	CN..432	ICSN433	KL46	3/32	CK9	STC4	5/32
MCRNL164C	1.00	1.00	1.251	5.00	1.24	.12	CN..432	ICSN433	KL46	3/32	CK9	STC4	5/32
MCRNL164D	1.00	1.00	1.251	6.00	1.24	.12	CN..432	ICSN433	KL46	3/32	CK9	STC4	5/32
MCRNL165D	1.00	1.00	1.251	6.00	1.34	.15	CN..543	ICSN533	KL58	1/8	CK9	STC4	5/32
MCRNL166D	1.00	1.00	1.251	6.00	1.49	.18	CN..643	ICSN633	KL68	9/64	CK12	STC4	5/32
MCRNL204D	1.25	1.25	1.500	6.00	1.24	.12	CN..432	ICSN433	KL46	3/32	CK9	STC4	5/32
MCRNL205D	1.25	1.25	1.501	6.00	1.34	.15	CN..543	ICSN533	KL58	1/8	CK9	STC4	5/32
MCRNL206D	1.25	1.25	1.501	6.00	1.49	.18	CN..643	ICSN633	KL68	9/64	CK12	STC4	5/32
MCRNL245D	1.50	1.50	2.001	6.00	1.34	.15	CN..543	ICSN533	KL58	1/8	CK9	STC4	5/32
MCRNL246D	1.50	1.50	2.001	6.00	1.49	.18	CN..643	ICSN633	KL68	9/64	CK12	STC4	5/32
MCRNL246E	1.50	1.50	2.001	7.00	1.49	.18	CN..643	ICSN633	KL68	9/64	CK12	STC4	5/32

O.D./I.D. Tooling



See pages B50–B57 for inserts.

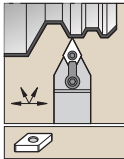


MDJN -3°

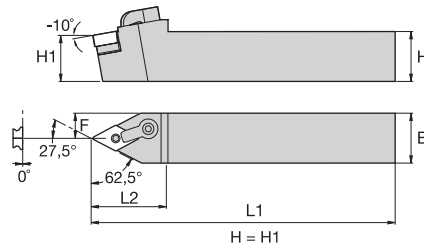
O.D./I.D. Tooling



catalog number	H	B	F	L1	L2	gage insert	shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
right hand												
MDJNR123B	.75	.75	1.000	4.50	1.25	DN..332	IDSN322	KL34L	5/64	CK7	STC5	3/32
MDJNR163C	1.00	1.00	1.250	5.00	1.25	DN..332	IDSN322	KL34L	5/64	CK7	STC5	3/32
MDJNR163D	1.00	1.00	1.250	6.00	1.25	DN..332	IDSN322	KL34L	5/64	CK7	STC5	3/32
MDJNR203D	1.25	1.25	1.500	6.00	1.25	DN..332	IDSN322	KL34L	5/64	CK7	STC5	3/32
MDJNR243D	1.50	1.50	2.000	6.00	1.25	DN..332	IDSN322	KL34L	5/64	CK7	STC5	3/32
MDJNR124B	.75	.75	1.000	4.50	1.38	DN..432	IDSN443	KL46L	3/32	CK23	STC20	1/8
MDJNR124A	.75	.75	1.000	4.00	1.38	DN..432	IDSN443	KL46L	3/32	CK23	STC20	1/8
MDJNR164C	1.00	1.00	1.250	5.00	1.24	DN..432	IDSN443	KL46L	3/32	CK20	STC20	1/8
MDJNR164D	1.00	1.00	1.250	6.00	1.24	DN..432	IDSN443	KL46L	3/32	CK20	STC20	1/8
MDJNR854D	1.25	1.00	1.250	6.00	1.24	DN..432	IDSN443	KL46L	3/32	CK20	STC20	1/8
MDJNR204D	1.25	1.25	1.500	6.00	1.24	DN..432	IDSN443	KL46L	3/32	CK20	STC20	1/8
MDJNR165D	1.00	1.00	1.250	6.00	1.47	DN..543	IDSN533	KL58	1/8	CK12	STC4	5/32
MDJNR205D	1.25	1.25	1.500	6.00	1.47	DN..543	IDSN533	KL58	1/8	CK12	STC4	5/32
MDJNR245D	1.50	1.50	2.000	6.00	1.47	DN..543	IDSN533	KL58	1/8	CK12	STC4	5/32
MDJNR245E	1.50	1.50	2.000	7.00	1.47	DN..543	IDSN533	KL58	1/8	CK12	STC4	5/32
left hand												
MDJNL123B	.75	.75	1.000	4.50	1.25	DN..332	IDSN322	KL34L	5/64	CK7	STC5	3/32
MDJNL163C	1.00	1.00	1.250	5.00	1.25	DN..332	IDSN322	KL34L	5/64	CK7	STC5	3/32
MDJNL163D	1.00	1.00	1.250	6.00	1.25	DN..332	IDSN322	KL34L	5/64	CK7	STC5	3/32
MDJNL203D	1.25	1.25	1.500	6.00	1.25	DN..332	IDSN322	KL34L	5/64	CK7	STC5	3/32
MDJNL124B	.75	.75	1.000	4.50	1.38	DN..432	IDSN443	KL46L	3/32	CK23	STC20	1/8
MDJNL124A	.75	.75	1.000	4.00	1.38	DN..432	IDSN443	KL46L	3/32	CK23	STC20	1/8
MDJNL164C	1.00	1.00	1.250	5.00	1.24	DN..432	IDSN443	KL46L	3/32	CK20	STC20	1/8
MDJNL164D	1.00	1.00	1.250	6.00	1.24	DN..432	IDSN443	KL46L	3/32	CK20	STC20	1/8
MDJNL854D	1.25	1.00	1.250	6.00	1.24	DN..432	IDSN443	KL46L	3/32	CK20	STC20	1/8
MDJNL204D	1.25	1.25	1.500	6.00	1.24	DN..432	IDSN443	KL46L	3/32	CK20	STC20	1/8
MDJNL165D	1.00	1.00	1.250	6.00	1.47	DN..543	IDSN533	KL58	1/8	CK12	STC4	5/32
MDJNL205D	1.25	1.25	1.500	6.00	1.47	DN..543	IDSN533	KL58	1/8	CK12	STC4	5/32
MDJNL245D	1.50	1.50	2.000	6.00	1.47	DN..543	IDSN533	KL58	1/8	CK12	STC4	5/32
MDJNL245E	1.50	1.50	2.000	7.00	1.47	DN..543	IDSN533	KL58	1/8	CK12	STC4	5/32



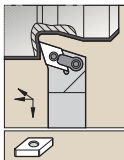
See pages B50–B57 for inserts.



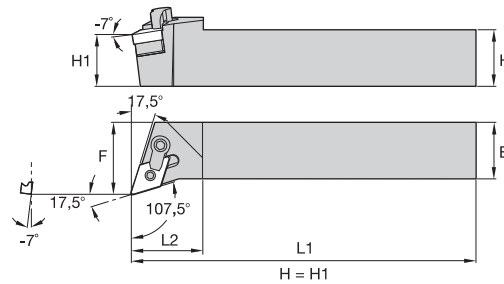
■ **MDPN 27.5°**



catalog number	H	B	F	L1	L2	gage insert	shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
MDPNN123B	.75	.75	.375	4.50	1.50	DN..332	IDSN322	KL34L	5/64	CK7	STC5	3/32
MDPNN163C	1.00	1.00	.500	5.00	1.50	DN..332	IDSN322	KL34L	5/64	CK7	STC5	3/32
MDPNN163D	1.00	1.00	.500	6.00	1.50	DN..332	IDSN322	KL34L	5/64	CK7	STC5	3/32
MDPNN164D	1.00	1.00	.500	6.00	1.63	DN..432	IDSN443	KL46L	3/32	CK12	STC4	5/32
MDPNN855D	1.25	1.00	.500	6.00	1.92	DN..543	IDSN533	KL58	1/8	CK12	STC4	5/32
MDPNN205D	1.25	1.25	.625	6.00	1.92	DN..543	IDSN533	KL58	1/8	CK12	STC4	5/32
MDPNN245D	1.50	1.50	.750	6.00	1.92	DN..543	IDSN533	KL58	1/8	CK12	STC4	5/32



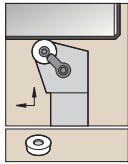
See pages B50–B57 for inserts.



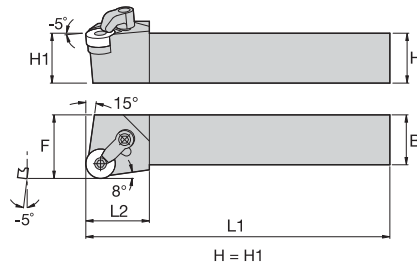
■ **MDQN -17.5°**



catalog number	H	B	F	L1	L2	gage insert	shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
right hand												
MDQNR124B	.75	.75	1.000	4.50	1.37	DN..432	IDSN443	KL46L	3/32	CK23	STC20	1/8
MDQNR164C	1.00	1.00	1.250	5.00	1.37	DN..432	IDSN443	KL46L	3/32	CK20	STC20	1/8
MDQNR164D	1.00	1.00	1.250	6.00	1.37	DN..432	IDSN443	KL46L	3/32	CK20	STC20	1/8
MDQNR204D	1.25	1.25	1.500	6.00	1.37	DN..432	IDSN443	KL46L	3/32	CK20	STC20	1/8
MDQNR244D	1.50	1.50	2.000	6.00	1.37	DN..432	IDSN443	KL46L	3/32	CK20	STC20	1/8
MDQNR244E	1.50	1.50	2.000	7.00	1.37	DN..432	IDSN443	KL46L	3/32	CK20	STC20	1/8
left hand												
MDQNL124B	.75	.75	1.000	4.50	1.37	DN..432	IDSN443	KL46L	3/32	CK23	STC20	1/8
MDQNL164C	1.00	1.00	1.250	5.00	1.37	DN..432	IDSN443	KL46L	3/32	CK20	STC20	1/8
MDQNL164D	1.00	1.00	1.250	6.00	1.37	DN..432	IDSN443	KL46L	3/32	CK20	STC20	1/8
MDQNL204D	1.25	1.25	1.500	6.00	1.37	DN..432	IDSN443	KL46L	3/32	CK20	STC20	1/8
MDQNL244D	1.50	1.50	2.000	6.00	1.37	DN..432	IDSN443	KL46L	3/32	CK20	STC20	1/8
MDQNL244E	1.50	1.50	2.000	7.00	1.37	DN..432	IDSN443	KL46L	3/32	CK20	STC20	1/8
MDQNL245E	1.50	1.50	2.000	7.00	1.47	DN..543	IDSN533	KL58	1/8	CK12	STC4	5/32



See page B58 for inserts.

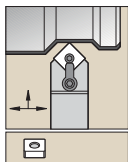


O.D./I.D. Tooling

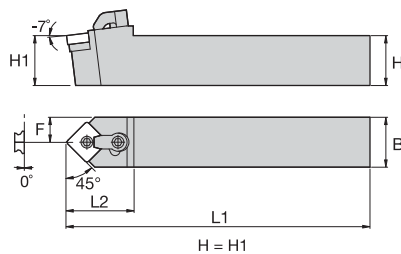
MRGN



catalog number	H	B	F	L1	L2	gage insert	shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
right hand												
MRGNR123B	.75	.75	1.000	4.50	.88	RN..32	IRSN33	KL34L	5/64	CK6	STC5	3/32
MRGNR124B	.75	.75	1.000	4.50	1.00	RN..43	IRSN43	KL46	3/32	CK21	STC20	1/8
MRGNR163D	1.00	1.00	1.250	6.00	.88	RN..32	IRSN33	KL34L	5/64	CK6	STC5	3/32
MRGNR164C	1.00	1.00	1.250	5.00	1.00	RN..43	IRSN43	KL46	3/32	CK9	STC4	5/32
MRGNR164D	1.00	1.00	1.250	6.00	1.00	RN..43	IRSN43	KL46	3/32	CK9	STC4	5/32
MRGNR165D	1.00	1.00	1.250	6.00	1.25	RN..54	IRSN53	KL58	1/8	CK12	STC4	5/32
MRGNR166D	1.00	1.00	1.250	6.00	1.31	RN..64	IRSN63	KL68	9/64	CK12	STC4	5/32
MRGNR204D	1.25	1.25	1.500	6.00	1.00	RN..43	IRSN43	KL46	3/32	CK9	STC4	5/32
MRGNR206D	1.25	1.25	1.500	6.00	1.31	RN..64	IRSN63	KL68	9/64	CK12	STC4	5/32
MRGNR246D	1.50	1.50	2.000	6.00	1.31	RN..64	IRSN63	KL68	9/64	CK12	STC4	5/32
MRGNR248E	1.50	1.50	2.000	7.00	1.56	RN..86	IRSN84	KL810	5/32	CK24	STC19	3/16
left hand												
MRGNL164D	1.00	1.00	1.250	6.00	1.00	RN..43	IRSN43	KL46	3/32	CK9	STC4	5/32
MRGNL165D	1.00	1.00	1.250	6.00	1.25	RN..54	IRSN53	KL58	1/8	CK12	STC4	5/32
MRGNL166D	1.00	1.00	1.250	6.00	1.31	RN..64	IRSN63	KL68	9/64	CK12	STC4	5/32
MRGNL204D	1.25	1.25	1.500	6.00	1.00	RN..43	IRSN43	KL46	3/32	CK9	STC4	5/32
MRGNL206D	1.25	1.25	1.500	6.00	1.31	RN..64	IRSN63	KL68	9/64	CK12	STC4	5/32
MRGNL246D	1.50	1.50	2.000	6.00	1.31	RN..64	IRSN63	KL68	9/64	CK12	STC4	5/32
MRGNL248E	1.50	1.50	2.000	7.00	1.56	RN..86	IRSN84	KL810	5/32	CK24	STC19	3/16



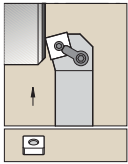
See pages B59–B65 for inserts.



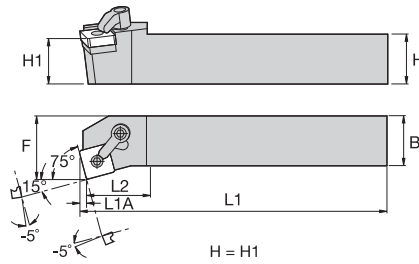
MSDN 45°



catalog number	H	B	F	L1	L2	gage insert	shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
MSDNN083	.50	.50	.250	4.500	1.14	SN..322	ISSN322	KL34	5/64	CK6	STC5	3/32
MSDNN103	.63	.63	.312	4.500	1.14	SN..322	ISSN322	KL34	5/64	CK6	STC5	3/32
MSDNN123	.75	.75	.375	4.500	1.14	SN..322	ISSN322	KL34	5/64	CK6	STC5	3/32
MSDNN124	.75	.75	.375	4.500	1.39	SN..432	ISSN433	KL46	3/32	CK9	STC4	5/32
MSDNN164	1.00	1.00	.500	6.000	1.39	SN..432	ISSN433	KL46	3/32	CK9	STC4	5/32
MSDNN854	1.25	1.00	.500	6.000	1.39	SN..432	ISSN433	KL46	3/32	CK9	STC4	5/32
MSDNN855	1.25	1.00	.500	6.000	1.62	SN..543	ISSN533	KL58	1/8	CK12	STC4	5/32
MSDNN856	1.25	1.00	.500	6.000	1.62	SN..643	ISSN633	KL68	9/64	CK12	STC4	5/32
MSDNN206	1.25	1.25	.625	7.000	1.62	SN..643	ISSN633	KL68	9/64	CK12	STC4	5/32
MSDNN866	1.50	1.00	.500	7.000	1.62	SN..643	ISSN633	KL68	9/64	CK12	STC4	5/32
MSDNN246	1.50	1.50	.750	7.000	1.62	SN..643	ISSN633	KL68	9/64	CK12	STC4	5/32



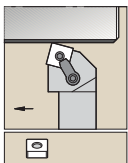
See pages B59–B65 for inserts.



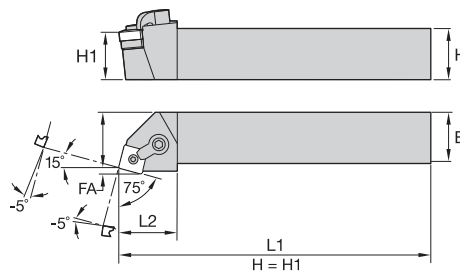
■ **MSKN 15°**



catalog number	H	B	F	L1	L2	L1A	gage insert	shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
right hand													
MSKNR124B	.75	.75	1.000	4.500	1.25	.12	SN..432	ISSN433	KL46	3/32	CK9	STC4	5/32
MSKNR164C	1.00	1.00	1.250	5.000	1.25	.12	SN..432	ISSN433	KL46	3/32	CK9	STC4	5/32
MSKNR164D	1.00	1.00	1.250	6.000	1.25	.12	SN..432	ISSN433	KL46	3/32	CK9	STC4	5/32
MSKNR204D	1.25	1.25	1.500	6.000	1.13	.12	SN..432	ISSN433	KL46	3/32	CK9	STC4	5/32
MSKNR205D	1.25	1.25	1.500	6.000	1.34	.15	SN..543	ISSN533	KL58	1/8	CK12	STC4	5/32
MSKNR206D	1.25	1.25	1.500	6.000	1.50	.18	SN..643	ISSN633	KL68	9/64	CK12	STC4	5/32
MSKNR246D	1.50	1.50	2.000	6.000	1.50	.18	SN..643	ISSN633	KL68	9/64	CK12	STC4	5/32
MSKNR248	1.50	1.50	2.000	8.000	1.62	.23	SN..866	ISSN846	KL810	5/32	CK24	STC19	3/16
left hand													
MSKNL124B	.75	.75	1.000	4.500	1.25	.12	SN..432	ISSN433	KL46	3/32	CK9	STC4	5/32
MSKNL164D	1.00	1.00	1.250	6.000	1.25	.12	SN..432	ISSN433	KL46	3/32	CK9	STC4	5/32
MSKNL204D	1.25	1.25	1.500	6.000	1.13	.12	SN..432	ISSN433	KL46	3/32	CK9	STC4	5/32
MSKNL205D	1.25	1.25	1.500	6.000	1.34	.15	SN..543	ISSN533	KL58	1/8	CK12	STC4	5/32
MSKNL206D	1.25	1.25	1.500	6.000	1.50	.18	SN..643	ISSN633	KL68	9/64	CK12	STC4	5/32
MSKNL246D	1.50	1.50	2.000	6.000	1.50	.18	SN..643	ISSN633	KL68	9/64	CK12	STC4	5/32



See pages B59–B65 for inserts.



■ **MSRN 15°**



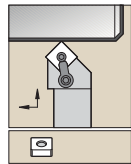
catalog number	H	B	F	L1	L2	FA	gage insert	shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
right hand													
MSRNR124B	.75	.75	.880	4.50	1.23	.12	SN..432	ISSN433	KL46	3/32	CK9	STC4	5/32
MSRNR164C	1.00	1.00	1.130	5.00	1.23	.12	SN..432	ISSN433	KL46	3/32	CK9	STC4	5/32
MSRNR164D	1.00	1.00	1.130	6.00	1.23	.12	SN..432	ISSN433	KL46	3/32	CK9	STC4	5/32
MSRNR204D	1.25	1.25	1.380	6.00	1.25	.12	SN..432	ISSN433	KL46	3/32	CK9	STC4	5/32
MSRNR165C	1.00	1.00	1.103	5.00	1.46	.15	SN..543	ISSN533	KL58	1/8	CK12	STC4	5/32
MSRNR855D	1.25	1.00	1.103	6.00	1.46	.15	SN..543	ISSN533	KL58	1/8	CK12	STC4	5/32
MSRNR205D	1.25	1.25	1.353	6.00	1.46	.15	SN..543	ISSN533	KL58	1/8	CK12	STC4	5/32
MSRNR856D	1.25	1.00	1.071	6.00	1.50	.18	SN..643	ISSN633	KL68	9/64	CK12	STC4	5/32
MSRNR206D	1.25	1.25	1.321	6.00	1.50	.18	SN..643	ISSN633	KL68	9/64	CK12	STC4	5/32
MSRNR246D	1.50	1.50	1.821	6.00	1.50	.18	SN..643	ISSN633	KL68	9/64	CK12	STC4	5/32
MSRNR246E	1.50	1.50	1.821	7.00	1.50	.18	SN..643	ISSN633	KL68	9/64	CK12	STC4	5/32
MSRNR248	1.50	1.50	1.770	8.00	1.62	.23	SN..866	ISSN846	KL810	5/32	CK24	STC19	3/16
MSRNR328	2.00	2.00	2.270	18.00	1.62	.23	SN..866	ISSN846	KL810	5/32	CK24	STC19	3/16

(continued)

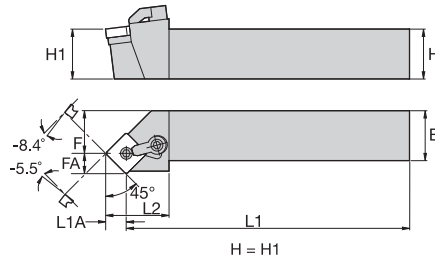
(MSRN 15° continued)

O.D./I.D. Tooling

catalog number	H	B	F	L1	L2	FA	gage insert	shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
left hand													
MSRNL124B	.75	.75	.880	4.50	1.23	.12	SN..432	ISSN433	KL46	3/32	CK9	STC4	5/32
MSRNL164C	1.00	1.00	1.130	5.00	1.23	.12	SN..432	ISSN433	KL46	3/32	CK9	STC4	5/32
MSRNL164D	1.00	1.00	1.130	6.00	1.23	.12	SN..432	ISSN433	KL46	3/32	CK9	STC4	5/32
MSRNL854D	1.25	1.00	1.130	6.00	1.23	.12	SN..432	ISSN433	KL46	3/32	CK9	STC4	5/32
MSRNL204D	1.25	1.25	1.380	6.00	1.25	.12	SN..432	ISSN433	KL46	3/32	CK9	STC4	5/32
MSRNL165C	1.00	1.00	1.103	5.00	1.46	.15	SN..543	ISSN533	KL58	1/8	CK12	STC4	5/32
MSRNL205D	1.25	1.25	1.353	6.00	1.46	.15	SN..543	ISSN533	KL58	1/8	CK12	STC4	5/32
MSRNL856D	1.25	1.00	1.071	6.00	1.50	.18	SN..643	ISSN633	KL68	9/64	CK12	STC4	5/32
MSRNL206D	1.25	1.25	1.321	6.00	1.50	.18	SN..643	ISSN633	KL68	9/64	CK12	STC4	5/32
MSRNL246D	1.50	1.50	1.821	6.00	1.50	.18	SN..643	ISSN633	KL68	9/64	CK12	STC4	5/32
MSRNL246E	1.50	1.50	1.821	7.00	1.50	.18	SN..643	ISSN633	KL68	9/64	CK12	STC4	5/32
MSRNL248	1.50	1.50	1.770	8.00	1.62	.23	SN..866	ISSN846	KL810	5/32	CK24	STC19	3/16
MSRNL328	2.00	2.00	2.270	18.00	1.62	.23	SN..866	ISSN846	KL810	5/32	CK24	STC19	3/16

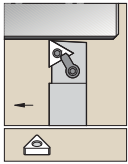


See pages B59–B65 for inserts.

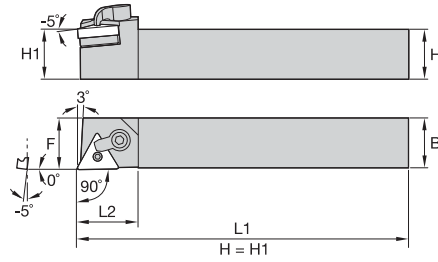


■ **MSSN 45°**

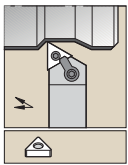
catalog number	H	B	F	L1	L2	F	FA	L1A	gage insert	shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
right hand															
MSSNR123B	.75	.75	.641	4.50	1.12	.64	.25	.25	SN..322	ISSN322	KL34	5/64	CK6	STC5	3/32
MSSNR124B	.75	.75	.662	4.50	1.24	.66	.34	.33	SN..432	ISSN433	KL46	3/32	CK9	STC4	5/32
MSSNR164C	1.00	1.00	.912	5.00	1.24	.91	.34	.33	SN..432	ISSN433	KL46	3/32	CK9	STC4	5/32
MSSNR164D	1.00	1.00	.912	6.00	1.24	.91	.34	.33	SN..432	ISSN433	KL46	3/32	CK9	STC4	5/32
MSSNR854D	1.25	1.00	.912	6.00	1.24	.91	.34	.33	SN..432	ISSN433	KL46	3/32	CK9	STC4	5/32
MSSNR165D	1.00	1.00	.828	6.00	1.38	.83	.42	.42	SN..543	ISSN533	KL58	1/8	CK9	STC4	5/32
MSSNR205D	1.25	1.25	1.078	6.00	1.38	1.08	.42	.42	SN..543	ISSN533	KL58	1/8	CK9	STC4	5/32
MSSNR246D	1.50	1.50	1.511	6.00	1.48	1.51	.52	.53	SN..643	ISSN633	KL68	9/64	CK9	STC4	5/32
MSSNR206D	1.25	1.25	.992	6.00	1.48	.99	.52	.53	SN..643	ISSN633	KL68	9/64	CK9	STC4	5/32
left hand															
MSSNL083B	.50	.50	.391	4.50	1.12	.39	.25	.25	SN..322	ISSN322	KL34	5/64	CK6	STC5	3/32
MSSNL164C	1.00	1.00	.912	5.00	1.24	.91	.34	.33	SN..432	ISSN433	KL46	3/32	CK9	STC4	5/32
MSSNL164D	1.00	1.00	.912	6.00	1.24	.91	.34	.33	SN..432	ISSN433	KL46	3/32	CK9	STC4	5/32
MSSNL854D	1.25	1.00	.912	6.00	1.24	.91	.34	.33	SN..432	ISSN433	KL46	3/32	CK9	STC4	5/32
MSSNL165D	1.00	1.00	.828	6.00	1.38	.83	.42	.42	SN..543	ISSN533	KL58	1/8	CK9	STC4	5/32
MSSNL205D	1.25	1.25	1.078	6.00	1.38	1.08	.42	.42	SN..543	ISSN533	KL58	1/8	CK9	STC4	5/32
MSSNL246D	1.50	1.50	1.511	6.00	1.48	1.51	.52	.53	SN..643	ISSN633	KL68	9/64	CK9	STC4	5/32
MSSNL206D	1.25	1.25	.992	6.00	1.48	.99	.52	.53	SN..643	ISSN633	KL68	9/64	CK9	STC4	5/32



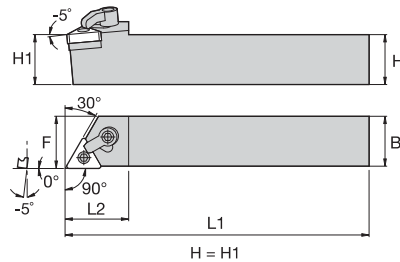
See pages B66–B74 for inserts.


MTAN 0°


catalog number	H	B	F	L1	L2	gage insert	shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
right hand												
MTANR082B	.50	.50	.500	4.50	.96	TN..221	—	KL23	1/16	CK19	STC9	3/32
MTANR103B	.63	.63	.625	4.50	1.12	TN..332	ITSN323	KL34L	5/64	CK6	STC5	3/32
MTANR123B	.75	.75	.750	4.50	1.12	TN..332	ITSN323	KL34L	5/64	CK6	STC5	3/32
MTANR164D	1.00	1.00	1.000	6.00	1.21	TN..432	ITSN433	KL46	3/32	CK9	STC4	5/32
left hand												
MTANL103B	.63	.63	.625	4.50	1.12	TN..332	ITSN323	KL34L	5/64	CK6	STC5	3/32
MTANL123B	.75	.75	.750	4.50	1.12	TN..332	ITSN323	KL34L	5/64	CK6	STC5	3/32
MTANL164D	1.00	1.00	1.000	6.00	1.21	TN..432	ITSN433	KL46	3/32	CK9	STC4	5/32

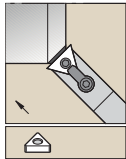


See pages B66–B74 for inserts.

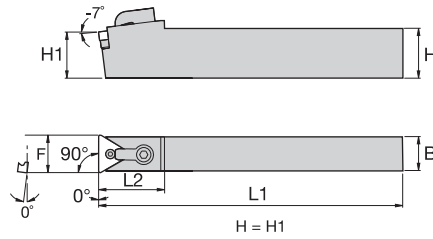

MTAN-S 0°


catalog number	H	B	F	L1	L2	gage insert	shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
right hand												
MTANRS123	.75	.75	.750	4.50	1.12	TN..332	ITSN323	KL34L	5/64	CK6	STC5	3/32
MTANRS163	1.00	1.00	1.000	6.00	1.12	TN..332	ITSN323	KL34L	5/64	CK6	STC5	3/32
MTANRS164	1.00	1.00	1.000	6.00	1.21	TN..432	ITSN433	KL46	3/32	CK9	STC4	5/32
MTANRS854	1.25	1.00	1.000	6.00	1.21	TN..432	ITSN433	KL46	3/32	CK9	STC4	5/32
MTANRS205	1.25	1.25	1.250	6.00	1.46	TN..543	ITSN534	KL58	1/8	CK9	STC4	5/32
left hand												
MTANLS123	.75	.75	.750	4.50	1.12	TN..332	ITSN323	KL34L	5/64	CK6	STC5	3/32
MTANLS163	1.00	1.00	1.000	6.00	1.12	TN..332	ITSN323	KL34L	5/64	CK6	STC5	3/32
MTANLS164	1.00	1.00	1.000	6.00	1.21	TN..432	ITSN433	KL46	3/32	CK9	STC4	5/32
MTANLS854	1.25	1.00	1.000	6.00	1.21	TN..432	ITSN433	KL46	3/32	CK9	STC4	5/32
MTANLS205	1.25	1.25	1.250	6.00	1.46	TN..543	ITSN534	KL58	1/8	CK9	STC4	5/32

O.D./I.D. Tooling



See pages B66–B74 for inserts.

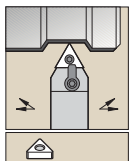


MTCN 0°

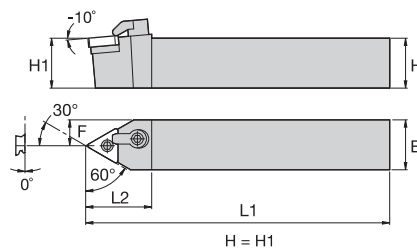
O.D./I.D. Tooling



catalog number	H	B	F	L1	L2	gage insert	shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
MTCNN083	.50	.50	.542	4.50	1.13	TN..332	ITSN323	KL34L	5/64	CK7	STC9	3/32
MTCNN443	1.00	.50	.542	8.00	1.13	TN..332	ITSN323	KL34L	5/64	CK7	STC9	3/32
MTCNN124	.75	.75	.775	6.00	1.43	TN..432	ITSN433	KL46	3/32	CK12	STC4	5/32
MTCNN644	1.00	.75	.775	8.00	1.43	TN..432	ITSN433	KL46	3/32	CK12	STC4	5/32



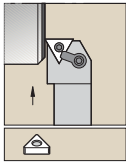
See pages B66–B74 for inserts.



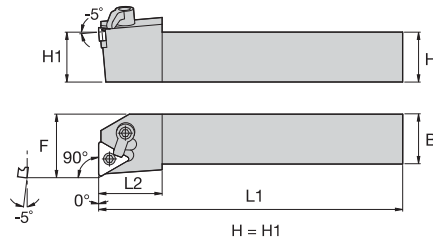
MTEN-S 30°



catalog number	H	B	F	L1	L2	gage insert	shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
MTENNS082	.50	.50	.250	4.50	.99	TN..221	—	KL23	1/16	CK6	STC5	3/32
MTENNS103	.63	.63	.312	4.50	1.16	TN..332	ITSN323	KL34L	5/64	CK6	STC5	3/32
MTENNS123	.75	.75	.375	4.50	1.16	TN..332	ITSN323	KL34L	5/64	CK6	STC5	3/32
MTENNS163	1.00	1.00	.500	5.00	1.16	TN..332	ITSN323	KL34L	5/64	CK6	STC5	3/32
MTENNS164	1.00	1.00	.500	6.00	1.40	TN..432	ITSN433	KL46	3/32	CK9	STC4	5/32
MTENNS854	1.25	1.00	.500	6.00	1.41	TN..432	ITSN433	KL46	3/32	CK9	STC4	5/32
MTENNS205	1.25	1.25	.625	6.00	1.64	TN..543	ITSN534	KL58	1/8	CK9	STC4	5/32
MTENNS246	1.50	1.50	.750	7.00	1.95	TN..663	ITSN636	KL68L	9/64	CK12	STC4	5/32

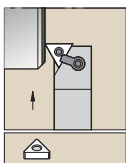


See pages B66–B74 for inserts.

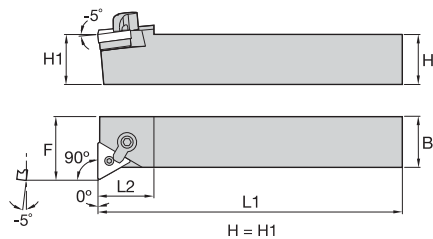

MTFN 0°


catalog number	H	B	F	L1	L2	gage insert	shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
right hand												
MTFNR123B	.75	.75	1.000	4.50	.94	TN..332	ITSN323	KL34L	5/64	CK6	STC5	3/32
MTFNR163C	1.00	1.00	1.250	5.00	.94	TN..332	ITSN323	KL34L	5/64	CK6	STC5	3/32
MTFNR124B	.75	.75	1.000	4.50	1.22	TN..432	ITSN433	KL46	3/32	CK9	STC4	5/32
MTFNR164C	1.00	1.00	1.250	5.00	1.22	TN..432	ITSN433	KL46	3/32	CK9	STC4	5/32
MTFNR164D	1.00	1.00	1.250	6.00	1.22	TN..432	ITSN433	KL46	3/32	CK9	STC4	5/32
MTFNR204D	1.25	1.25	1.500	6.00	1.22	TN..432	ITSN433	KL46	3/32	CK9	STC4	5/32
MTFNR854D	1.25	1.00	1.250	6.00	1.22	TN..432	ITSN433	KL46	3/32	CK9	STC4	5/32
MTFNR205D	1.25	1.25	1.500	6.00	1.43	TN..543	ITSN534	KL58	1/8	CK12	STC4	5/32
MTFNR245D	1.50	1.50	2.000	6.00	1.43	TN..543	ITSN534	KL58	1/8	CK12	STC4	5/32
MTFNR246E	1.50	1.50	2.000	7.00	1.49	TN..663	ITSN636	KL68L	9/64	CK12	STC4	5/32
left hand												
MTFNL103B	.63	.63	.875	4.50	.94	TN..332	ITSN323	KL34L	5/64	CK6	STC5	3/32
MTFNL163D	1.00	1.00	1.250	6.00	.94	TN..332	ITSN323	KL34L	5/64	CK6	STC5	3/32
MTFNL123B	.75	.75	1.000	4.50	.94	TN..332	ITSN323	KL34L	5/64	CK6	STC5	3/32
MTFNL164C	1.00	1.00	1.250	5.00	1.22	TN..432	ITSN433	KL46	3/32	CK9	STC4	5/32
MTFNL164D	1.00	1.00	1.250	6.00	1.22	TN..432	ITSN433	KL46	3/32	CK9	STC4	5/32
MTFNL204D	1.25	1.25	1.500	6.00	1.22	TN..432	ITSN433	KL46	3/32	CK9	STC4	5/32
MTFNL854D	1.25	1.00	1.250	6.00	1.22	TN..432	ITSN433	KL46	3/32	CK9	STC4	5/32
MTFNL245D	1.50	1.50	2.000	6.00	1.43	TN..543	ITSN534	KL58	1/8	CK12	STC4	5/32
MTFNL246E	1.50	1.50	2.000	7.00	1.49	TN..663	ITSN636	KL68L	9/64	CK12	STC4	5/32

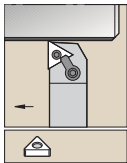
O.D./I.D. Tooling



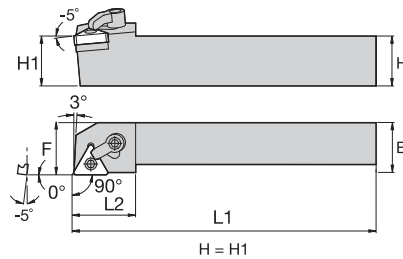
See pages B66–B74 for inserts.


MTFN-S 0°


catalog number	H	B	F	L1	L2	gage insert	shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
right hand												
MTFNRS123	.75	.75	1.000	4.50	.94	TN..332	ITSN323	KL34L	5/64	CK6	STC5	3/32
MTFNRS164	1.00	1.00	1.250	6.00	1.22	TN..432	ITSN433	KL46	3/32	CK9	STC4	5/32
left hand												
MTFNLS123	.75	.75	1.000	4.50	.94	TN..332	ITSN323	KL34L	5/64	CK6	STC5	3/32
MTFNLS164	1.00	1.00	1.250	6.00	1.22	TN..432	ITSN433	KL46	3/32	CK9	STC4	5/32



See pages B66–B74 for inserts.

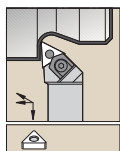


■ **MTGN 0°**

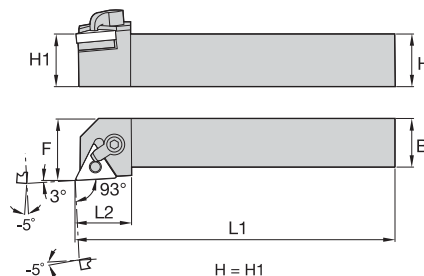
O.D./I.D. Tooling



catalog number	H	B	F	L1	L2	gage insert	shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
right hand												
MTGNR082B	.50	.50	.625	4.50	.96	TN..221	—	KL23	1/16	CK19	STC9	3/32
MTGNR103B	.63	.63	.875	4.50	1.12	TN..322	ITSN333	KL34L	5/64	CK6	STC5	3/32
MTGNR163C	1.00	1.00	1.250	5.00	1.12	TN..322	ITSN333	KL34L	5/64	CK6	STC5	3/32
MTGNR163D	1.00	1.00	1.250	6.00	1.12	TN..322	ITSN333	KL34L	5/64	CK6	STC5	3/32
MTGNR123B	.75	.75	1.000	4.50	1.12	TN..332	ITSN323	KL34L	5/64	CK6	STC5	3/32
MTGNR124B	.75	.75	1.000	4.50	1.20	TN..432	ITSN433	KL46	3/32	CK9	STC4	5/32
MTGNR164C	1.00	1.00	1.250	5.00	1.20	TN..432	ITSN433	KL46	3/32	CK9	STC4	5/32
MTGNR164D	1.00	1.00	1.250	6.00	1.20	TN..432	ITSN433	KL46	3/32	CK9	STC4	5/32
MTGNR204D	1.25	1.25	1.500	6.00	1.20	TN..432	ITSN433	KL46	3/32	CK9	STC4	5/32
MTGNR165C	1.00	1.00	1.250	5.00	1.38	TN..543	ITSN534	KL58	1/8	CK9	STC4	5/32
MTGNR205D	1.25	1.25	1.500	6.00	1.44	TN..543	ITSN534	KL58	1/8	CK9	STC4	5/32
left hand												
MTGNL103B	.63	.63	.875	4.50	1.12	TN..322	ITSN333	KL34L	5/64	CK6	STC5	3/32
MTGNL123B	.75	.75	1.000	4.50	1.12	TN..332	ITSN323	KL34L	5/64	CK6	STC5	3/32
MTGNL124B	.75	.75	1.000	4.50	1.20	TN..432	ITSN433	KL46	3/32	CK9	STC4	5/32
MTGNL164C	1.00	1.00	1.250	5.00	1.20	TN..432	ITSN433	KL46	3/32	CK9	STC4	5/32
MTGNL164D	1.00	1.00	1.250	6.00	1.20	TN..432	ITSN433	KL46	3/32	CK6	STC4	5/32
MTGNL204D	1.25	1.25	1.500	6.00	1.20	TN..432	ITSN433	KL46	3/32	CK9	STC4	5/32
MTGNL205D	1.25	1.25	1.500	6.00	1.44	TN..543	ITSN534	KL58	1/8	CK9	STC4	5/32



See pages B66–B74 for inserts.



■ **MTJN -3°**



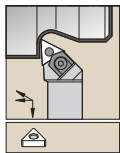
catalog number	H	B	F	L1	L2	gage insert	shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
right hand												
MTJNR082B	.50	.50	.625	4.50	.72	TN..221	—	KL23	1/16	CK19	STC9	3/32
MTJNR103B	.63	.63	.875	4.50	.88	TN..322	ITSN333	KL34L	5/64	CK6	STC5	3/32
MTJNR123B	.75	.75	1.000	4.50	.88	TN..322	ITSN333	KL34L	5/64	CK6	STC5	3/32
MTJNR163C	1.00	1.00	1.250	5.00	.88	TN..322	ITSN333	KL34L	5/64	CK6	STC5	3/32
MTJNR163D	1.00	1.00	1.250	6.00	.88	TN..322	ITSN333	KL34L	5/64	CK6	STC5	3/32
MTJNR164D	1.00	1.00	1.250	6.00	1.12	TN..432	ITSN433	KL46	3/32	CK9	STC4	5/32
MTJNR204D	1.25	1.25	1.500	6.00	1.12	TN..432	ITSN433	KL46	3/32	CK9	STC4	5/32
MTJNR205D	1.25	1.25	1.500	6.00	1.25	TN..543	ITSN534	KL58	1/8	CK9	STC4	5/32

(continued)

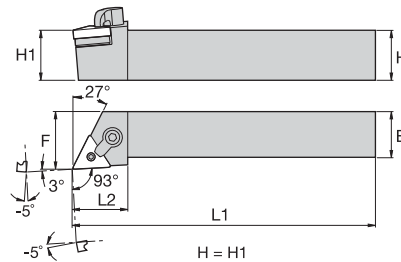
(MTJN -3° continued)

catalog number	H	B	F	L1	L2	gage insert						
							shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
left hand												
MTJNL082B	.50	.50	.625	4.50	.72	TN..221	—	KL23	1/16	CK19	STC9	3/32
MTJNL103B	.63	.63	.875	4.50	.88	TN..322	ITSN333	KL34L	5/64	CK6	STC5	3/32
MTJNL123B	.75	.75	1.000	4.50	.88	TN..322	ITSN333	KL34L	5/64	CK6	STC5	3/32
MTJNL163C	1.00	1.00	1.250	5.00	.88	TN..322	ITSN333	KL34L	5/64	CK6	STC5	3/32
MTJNL163D	1.00	1.00	1.250	6.00	.88	TN..322	ITSN333	KL34L	5/64	CK6	STC5	3/32
MTJNL164D	1.00	1.00	1.250	6.00	1.12	TN..432	ITSN433	KL46	3/32	CK9	STC4	5/32
MTJNL204D	1.25	1.25	1.500	6.00	1.12	TN..432	ITSN433	KL46	3/32	CK9	STC4	5/32
MTJNL205D	1.25	1.25	1.500	6.00	1.25	TN..543	ITSN534	KL58	1/8	CK9	STC4	5/32

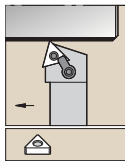
O.D./I.D. Tooling



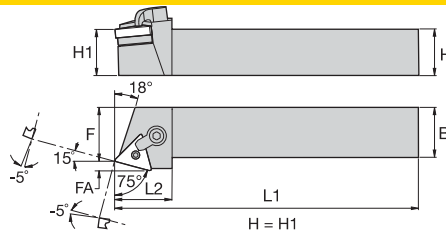
See pages B66–B74 for inserts.


MTJN-S -3°

catalog number	H	B	F	L1	L2	gage insert						
							shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
right hand												
MTJNRS123	.75	.75	1.000	4.500	1.12	TN..332	ITSN323	KL34L	5/64	CK6	STC5	3/32
MTJNRS163	1.00	1.00	1.250	6.000	1.12	TN..332	ITSN323	KL34L	5/64	CK6	STC5	3/32
MTJNRS124	.75	.75	1.000	4.500	1.19	TN..432	ITSN433	KL46	3/32	CK9	STC4	5/32
MTJNRS204	1.25	1.25	1.250	6.000	1.19	TN..432	ITSN433	KL46	3/32	CK9	STC4	5/32
MTJNRS854	1.25	1.00	1.250	6.000	1.19	TN..432	ITSN433	KL46	3/32	CK9	STC4	5/32
MTJNRS864	1.50	1.00	1.250	6.000	1.19	TN..432	ITSN433	KL46	3/32	CK9	STC4	5/32
MTJNRS164	1.00	1.00	1.250	6.000	1.32	TN..432	ITSN433	KL46	3/32	CK9	STC4	5/32
MTJNRS165	1.00	1.00	1.250	6.000	1.44	TN..543	ITSN534	KL58	1/8	CK9	STC4	5/32
MTJNRS205	1.25	1.25	1.500	6.000	1.44	TN..543	ITSN534	KL58	1/8	CK9	STC4	5/32
MTJNRS246	1.50	1.50	2.000	7.000	1.62	TN..663	ITSN636	KL68L	9/64	CK12	STC4	5/32
left hand												
MTJNLS123	.75	.75	1.000	4.500	1.12	TN..332	ITSN323	KL34L	5/64	CK6	STC5	3/32
MTJNLS163	1.00	1.00	1.250	6.000	1.12	TN..332	ITSN323	KL34L	5/64	CK6	STC5	3/32
MTJNLS124	.75	.75	1.000	4.500	1.19	TN..432	ITSN433	KL46	3/32	CK9	STC4	5/32
MTJNLS204	1.25	1.25	1.250	6.000	1.19	TN..432	ITSN433	KL46	3/32	CK9	STC4	5/32
MTJNLS864	1.50	1.00	1.250	6.000	1.19	TN..432	ITSN433	KL46	3/32	CK9	STC4	5/32
MTJNLS164	1.00	1.00	1.250	6.000	1.32	TN..432	ITSN433	KL46	3/32	CK9	STC4	5/32
MTJNLS165	1.00	1.00	1.250	6.000	1.44	TN..543	ITSN534	KL58	1/8	CK9	STC4	5/32
MTJNLS205	1.25	1.25	1.500	6.000	1.44	TN..543	ITSN534	KL58	1/8	CK9	STC4	5/32
MTJNLS246	1.50	1.50	2.000	7.000	1.62	TN..663	ITSN636	KL68L	9/64	CK12	STC4	5/32



See pages B66–B74 for inserts.

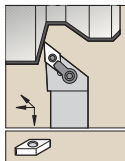


MTRN 15°

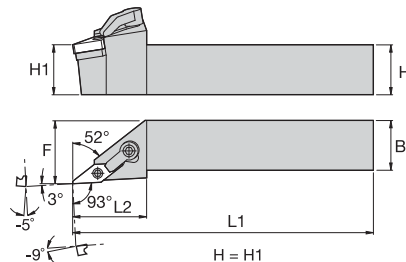
O.D./I.D. Tooling



catalog number	H	B	F	L1	L2	FA	gage insert	shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
right hand													
MTRNR103B	.63	.63	.722	4.50	1.20	.15	TN..322	ITSN333	KL34L	5/64	CK20	STC11	1/8
MTRNR164D	1.00	1.00	1.040	6.00	1.24	.20	TN..432	ITSN433	KL46	3/32	CK9	STC4	5/32
left hand													
MTRNL164D	1.00	1.00	1.040	6.00	1.24	.20	TN..432	ITSN433	KL46	3/32	CK9	STC4	5/32



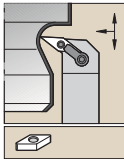
See pages B74–B78 for inserts.



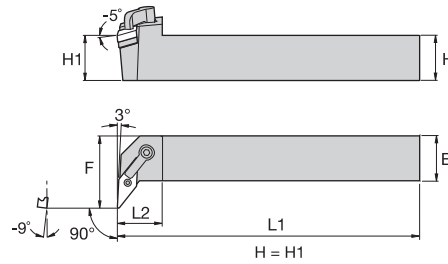
MVJN -3°



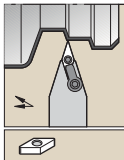
catalog number	H	B	F	L1	L2	gage insert	shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
right hand												
MVJNR123A	.75	.75	1.000	4.00	1.66	VN..332	IVSN322	KL34L	5/64	CK43	STC4	5/32
MVJNR123B	.75	.75	1.000	4.50	1.66	VN..332	IVSN322	KL34L	5/64	CK43	STC4	5/32
MVJNR163C	1.00	1.00	1.250	5.00	1.66	VN..332	IVSN322	KL34L	5/64	CK43	STC4	5/32
MVJNR163D	1.00	1.00	1.250	6.00	1.66	VN..332	IVSN322	KL34L	5/64	CK43	STC4	5/32
MVJNR853D	1.25	1.00	1.250	6.00	1.66	VN..332	IVSN322	KL34L	5/64	CK43	STC4	5/32
MVJNR203D	1.25	1.25	1.500	6.00	1.66	VN..332	IVSN322	KL34L	5/64	CK43	STC4	5/32
MVJNR243D	1.50	1.50	2.000	6.00	1.66	VN..332	IVSN322	KL34L	5/64	CK43	STC4	5/32
MVJNR124B	.75	.75	1.000	4.50	2.00	VN..432	IVSN433	KL46	3/32	CK43	STC4	5/32
MVJNR164C	1.00	1.00	1.250	5.00	2.00	VN..432	IVSN433	KL46	3/32	CK43	STC4	5/32
MVJNR164D	1.00	1.00	1.250	6.00	2.00	VN..432	IVSN433	KL46	3/32	CK43	STC4	5/32
MVJNR204D	1.25	1.25	1.500	6.00	2.00	VN..432	IVSN433	KL46	3/32	CK43	STC4	5/32
MVJNR244D	1.50	1.50	2.000	6.00	2.00	VN..432	IVSN433	KL46	3/32	CK43	STC4	5/32
left hand												
MVJNL123A	.75	.75	1.000	4.00	1.66	VN..332	IVSN322	KL34L	5/64	CK43	STC4	5/32
MVJNL123B	.75	.75	1.000	4.50	1.66	VN..332	IVSN322	KL34L	5/64	CK43	STC4	5/32
MVJNL163C	1.00	1.00	1.250	5.00	1.66	VN..332	IVSN322	KL34L	5/64	CK43	STC4	5/32
MVJNL163D	1.00	1.00	1.250	6.00	1.66	VN..332	IVSN322	KL34L	5/64	CK43	STC4	5/32
MVJNL853D	1.25	1.00	1.250	6.00	1.66	VN..332	IVSN322	KL34L	5/64	CK43	STC4	5/32
MVJNL203D	1.25	1.25	1.500	6.00	1.66	VN..332	IVSN322	KL34L	5/64	CK43	STC4	5/32
MVJNL243D	1.50	1.50	2.000	6.00	1.66	VN..332	IVSN322	KL34L	5/64	CK43	STC4	5/32
MVJNL124B	.75	.75	1.000	4.50	2.00	VN..432	IVSN433	KL46	3/32	CK43	STC4	5/32
MVJNL164C	1.00	1.00	1.250	5.00	2.00	VN..432	IVSN433	KL46	3/32	CK43	STC4	5/32
MVJNL164D	1.00	1.00	1.250	6.00	2.00	VN..432	IVSN433	KL46	3/32	CK43	STC4	5/32
MVJNL204D	1.25	1.25	1.500	6.00	2.00	VN..432	IVSN433	KL46	3/32	CK43	STC4	5/32
MVJNL244D	1.50	1.50	2.000	6.00	2.00	VN..432	IVSN433	KL46	3/32	CK43	STC4	5/32



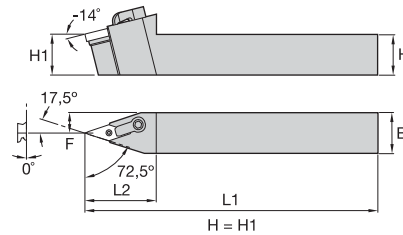
See pages B74–B78 for inserts.


MVUN -3°

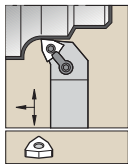

catalog number	H	B	F	L1	L2	gage insert	shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
right hand												
MVUNR204C	1.25	1.25	2.000	5.00	1.25	VN..432	IVSN433	KL46	3/32	CK43	STC4	5/32
MVUNR204D	1.25	1.25	2.000	6.00	1.25	VN..432	IVSN433	KL46	3/32	CK43	STC4	5/32
MVUNR244D	1.50	1.50	2.250	6.00	1.25	VN..432	IVSN433	KL46	3/32	CK43	STC4	5/32
left hand												
MVUNL204C	1.25	1.25	2.000	5.00	1.25	VN..432	IVSN433	KL46	3/32	CK43	STC4	5/32
MVUNL204D	1.25	1.25	2.000	6.00	1.25	VN..432	IVSN433	KL46	3/32	CK43	STC4	5/32
MVUNL244D	1.50	1.50	2.250	6.00	1.25	VN..432	IVSN433	KL46	3/32	CK43	STC4	5/32



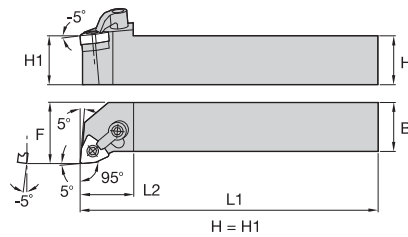
See pages B74–B78 for inserts.


MVVN 17.5°


catalog number	H	B	F	L1	L2	gage insert	shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
MVVNN123B	.75	.75	.375	4.50	1.77	VN..332	IVSN322	KL34L	5/64	CK43	STC4	5/32
MVVNN163C	1.00	1.00	.500	5.00	1.77	VN..332	IVSN322	KL34L	5/64	CK43	STC4	5/32
MVVNN163D	1.00	1.00	.500	6.00	1.77	VN..332	IVSN322	KL34L	5/64	CK43	STC4	5/32
MVVNN853D	1.25	1.00	.500	6.00	1.77	VN..332	IVSN322	KL34L	5/64	CK43	STC4	5/32
MVVNN203D	1.25	1.25	.625	6.00	1.77	VN..332	IVSN322	KL34L	5/64	CK43	STC4	5/32
MVVNN164D	1.00	1.00	.500	6.00	2.25	VN..432	IVSN433	KL46	3/32	CK43	STC4	5/32
MVVNN204D	1.25	1.25	.625	6.00	2.25	VN..432	IVSN433	KL46	3/32	CK43	STC4	5/32
MVVNN244E	1.50	1.50	.750	7.00	2.25	VN..432	IVSN433	KL46	3/32	CK43	STC4	5/32



See pages B79–B83 for inserts.

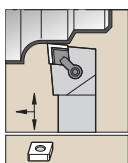


O.D./I.D. Tooling

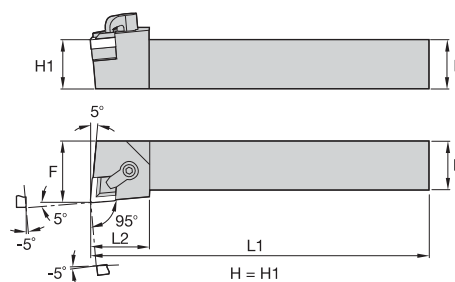
■ **MWLN -5°**



catalog number	H	B	F	L1	L2	gage insert	shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
right hand												
MWLN123B	.75	.75	1.000	4.50	1.00	WN..332	IWSN322	KL34L	5/64	CK6	STC5	3/32
MWLN163C	1.00	1.00	1.250	5.00	1.00	WN..332	IWSN322	KL34L	5/64	CK6	STC5	3/32
MWLN163D	1.00	1.00	1.250	6.00	1.00	WN..332	IWSN322	KL34L	5/64	CK6	STC5	3/32
MWLN203D	1.25	1.25	1.500	6.00	1.00	WN..332	IWSN322	KL34L	5/64	CK6	STC5	3/32
MWLN124B	.75	.75	1.000	4.50	1.13	WN..432	IWSN433	KL46	3/32	CK21	STC20	1/8
MWLN164C	1.00	1.00	1.250	5.00	1.13	WN..432	IWSN433	KL46	3/32	CK9	STC4	5/32
MWLN164D	1.00	1.00	1.250	6.00	1.13	WN..432	IWSN433	KL46	3/32	CK9	STC4	5/32
MWLN854D	1.25	1.00	1.250	6.00	1.13	WN..432	IWSN433	KL46	3/32	CK9	STC4	5/32
MWLN204D	1.25	1.25	1.500	6.00	1.13	WN..432	IWSN433	KL46	3/32	CK9	STC4	5/32
MWLN244D	1.50	1.50	2.000	6.00	1.13	WN..432	IWSN433	KL46	3/32	CK9	STC4	5/32
left hand												
MWLN123B	.75	.75	1.000	4.50	1.00	WN..332	IWSN322	KL34L	5/64	CK6	STC5	3/32
MWLN163C	1.00	1.00	1.250	5.00	1.00	WN..332	IWSN322	KL34L	5/64	CK6	STC5	3/32
MWLN163D	1.00	1.00	1.250	6.00	1.00	WN..332	IWSN322	KL34L	5/64	CK6	STC5	3/32
MWLN124B	.75	.75	1.000	4.50	1.13	WN..432	IWSN433	KL46	3/32	CK21	STC20	1/8
MWLN164C	1.00	1.00	1.250	5.00	1.13	WN..432	IWSN433	KL46	3/32	CK9	STC4	5/32
MWLN164D	1.00	1.00	1.250	6.00	1.13	WN..432	IWSN433	KL46	3/32	CK9	STC4	5/32
MWLN854D	1.25	1.00	1.250	6.00	1.13	WN..432	IWSN433	KL46	3/32	CK9	STC4	5/32



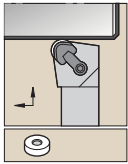
See page B118 for inserts.



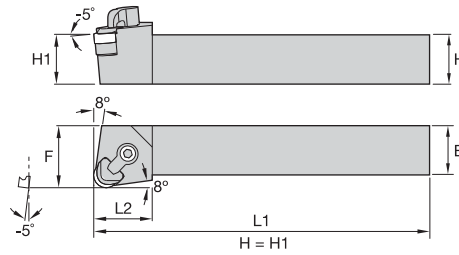
■ **MCLN-C -5°**



catalog number	H	B	F	L1	L2	gage insert	shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
right hand												
MCLNRC164D	1.00	1.00	1.250	6.00	1.25	CN..432	ICSN442	KL46L	3/32	CK21	STC20	1/8
left hand												
MCLNLC164D	1.00	1.00	1.250	6.00	1.25	CN..432	ICSN442	KL46L	3/32	CK21	STC20	1/8



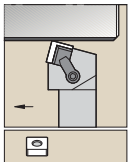
See page B119 for inserts.



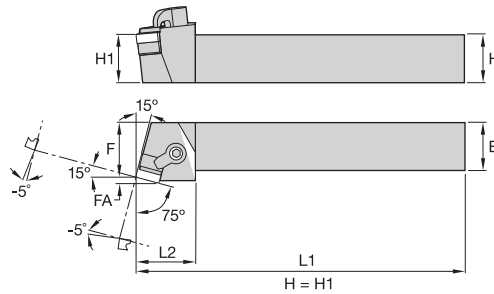
■ **MRGN-C**



catalog number	H	B	F	L1	L2	gage insert	shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
right hand												
MRGNRC164D	1.00	1.00	1.250	6.00	1.25	RN..43	IRSN44	KL46L	3/32	CK21	STC20	1/8
MRGNRC204D	1.25	1.25	1.500	6.00	1.25	RN..43	IRSN44	KL46L	3/32	CK21	STC20	1/8
MRGNRC244D	1.50	1.50	2.000	6.00	1.25	RN..43	IRSN44	KL46L	3/32	CK21	STC20	1/8
left hand												
MRGNLC164D	1.00	1.00	1.250	6.00	1.25	RN..43	IRSN44	KL46L	3/32	CK21	STC20	1/8
MRGNLC204D	1.25	1.25	1.500	6.00	1.25	RN..43	IRSN44	KL46L	3/32	CK21	STC20	1/8
MRGNLC244D	1.50	1.50	2.000	6.00	1.25	RN..43	IRSN44	KL46L	3/32	CK21	STC20	1/8



See page B120 for inserts.

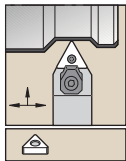


■ **MSRN-C 15°**

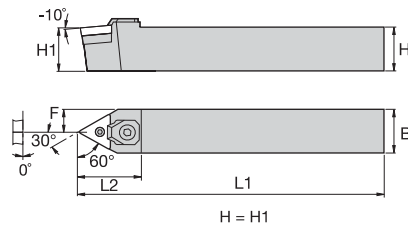


catalog number	H	B	F	L1	L2	FA	gage insert	shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
right hand													
MSRNRC164D	1.00	1.00	1.130	6.00	1.25	.12	SN..432	ISSN442	KL46L	3/32	CK21	STC20	1/8
left hand													
MSRNLC164D	1.00	1.00	1.130	6.00	1.25	.12	SN..432	ISSN442	KL46L	3/32	CK21	STC20	1/8

O.D./I.D. Tooling



See pages B66–B73 for inserts.

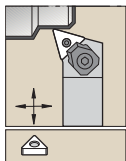


■ **WTEN 30°**

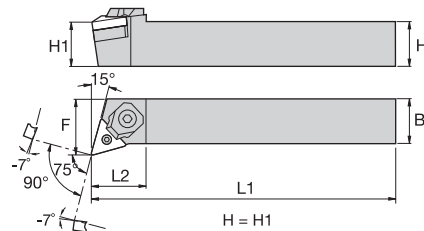
O.D./I.D. Tooling



catalog number	H	B	F	L1	L2	gage insert	shim	lock pin	hex (inch)	clamp	retaining ring	clamp screw	hex (inch)
WTENNS164	1.00	1.00	.500	6.00	1.38	TN..432	SM391	FPE5	1/16 & 3/32	WC5	RR5144-21	S986	5/32 & 1/8
WTENNS205	1.25	1.25	.625	6.00	1.63	TN..543	SM370	FPE6	3/32	WC6	—	—	5/32 & 3/16



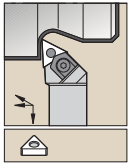
See pages B66–B73 for inserts.



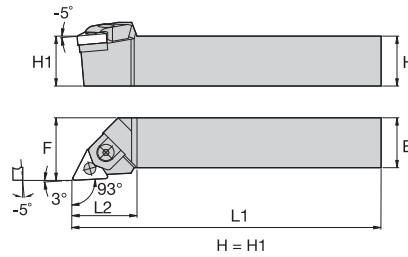
■ **WTIN -15°**



catalog number	H	B	F	L1	L2	gage insert	shim	lock pin	hex (inch)	clamp	retaining ring	clamp screw	hex (inch)
right hand													
WTINRS164	1.00	1.00	1.250	6.00	1.25	TN..432	SM391	FPE5	1/16 & 3/32	WC5	RR5144-21	S986	5/32 & 1/8
WTINRS205	1.25	1.25	1.500	6.00	1.50	TN..543	SM370	FPE6	3/32	WC6	—	—	5/32 & 3/16
left hand													
WTINLS164	1.00	1.00	1.250	6.00	1.25	TN..432	SM391	FPE5	1/16 & 3/32	WC5	RR5144-21	S986	5/32 & 1/8
WTINLS205	1.25	1.25	1.500	6.00	1.50	TN..543	SM370	FPE6	3/32	WC6	—	—	5/32 & 3/16



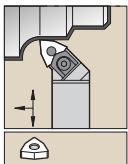
See pages B66–B73 for inserts.



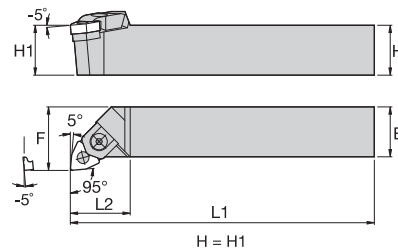
■ **WTJN -3°**



catalog number	H	B	F	L1	L2	gage insert	shim	lock pin	hex (inch)	clamp	retaining ring	clamp screw	hex (inch)
right hand WTJNRS164	1.00	1.00	1.250	6.00	1.38	TN..432	SM391	FPE5	1/16 & 3/32	WC5	RR5144-21	S986	5/32 & 1/8
left hand WTJNRS854	1.25	1.00	1.250	6.00	1.38	TN..432	SM391	FPE5	1/16 & 3/32	WC5	RR5144-21	S986	5/32 & 1/8
right hand WTJNLS164	1.00	1.00	1.250	6.00	1.38	TN..432	SM391	FPE5	1/16 & 3/32	WC5	RR5144-21	S986	5/32 & 1/8
left hand WTJNLS854	1.25	1.00	1.250	6.00	1.38	TN..432	SM391	FPE5	1/16 & 3/32	WC5	RR5144-21	S986	5/32 & 1/8



See pages B79–B83 for inserts.

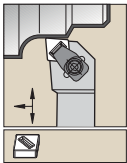


■ **WWLN -5°**

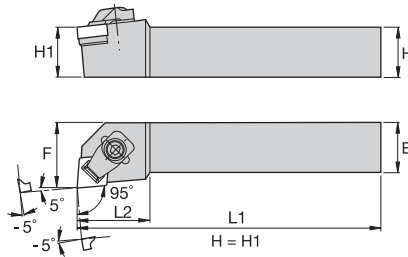


catalog number	H	B	F	L1	L2	gage insert	shim	lock pin	Torx	clamp	clamp screw	E-Clip	Torx
right hand WWLNR124	.75	.75	1.000	4.50	1.25	WN..432	SM443	FP453	T10	MWW4	MS1372	E147	T25
left hand WWLNR164	1.00	1.00	1.250	6.00	1.25	WN..432	SM443	FP477	T10	MWW4	MS1372	E147	T25
right hand WWLNL164	1.00	1.00	1.250	6.00	1.25	WN..432	SM443	FP477	T10	MWW4	MS1372	E147	T25

O.D./I.D. Tooling



See page B122 for inserts.

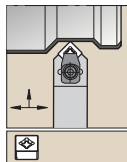


CCLN-MX -5°

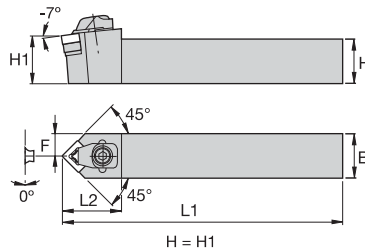
O.D./I.D. Tooling



catalog number	H	B	F	L1	L2	gage insert	shim	shim screw	Torx	clamp assembly	Torx
right hand											
CCLNR164DMX5	1.00	1.00	1.250	6.00	1.25	CN.X452	552.221	554.260	T20	551.326	T25
CCLNR204DMX5	1.25	1.25	1.500	6.00	1.25	CN.X452	552.221	554.260	T20	551.326	T25
left hand											
CCLNL164DMX5	1.00	1.00	1.250	6.00	1.25	CN.X452	552.221	554.260	T20	551.326	T25
CCLNL204DMX5	1.25	1.25	1.500	6.00	1.25	CN.X452	552.221	554.260	T20	551.326	T25
CCLNL245DMX5	1.50	1.50	2.000	6.00	1.38	CN.X553	552.223	554.261	T25	551.342	T25



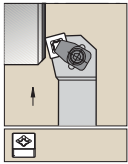
See pages B125–B126 for inserts.



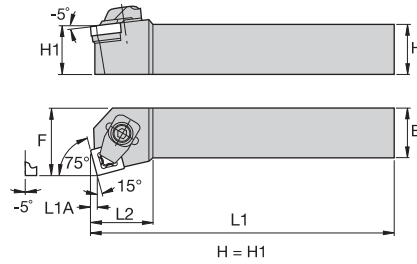
CSDN-MX 45°



catalog number	H	B	F	L1	L2	gage insert	shim	shim screw	Torx	clamp assembly	Torx
CSDNN164DMX5	1.00	1.00	.500	6.00	1.38	SN.X452	552.232	554.260	T20	551.326	T25

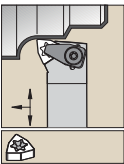


See pages B125–B126 for inserts.

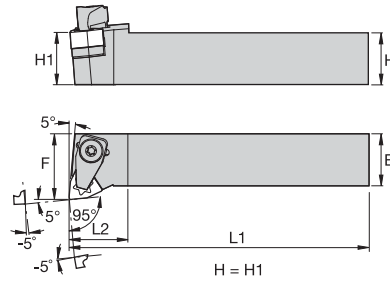


■ CSKN-MX 15°

catalog number	H	B	F	L1	L2	L1A	gage insert	shim	shim screw	Torx	clamp assembly	Torx
right hand												
CSKNR164DMX5	1.00	1.00	1.250	6.00	1.06	.12	SN.X452	552.232	554.260	T20	551.326	T25
left hand												
CSKNL164DMX5	1.00	1.00	1.250	6.00	1.06	.12	SN.X452	552.232	554.260	T20	551.326	T25
CSKNL204DMX5	1.25	1.25	1.500	6.00	1.06	.12	SN.X452	552.232	554.260	T20	551.326	T25



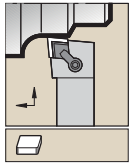
See page B127 for inserts.



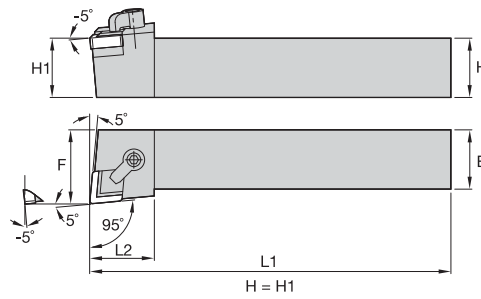
■ CWLN-MX -5°

catalog number	H	B	F	L1	L2	gage insert	shim	shim screw	Torx	clamp assembly	Torx
right hand											
CWLN164DMX5	1.00	1.00	1.250	6.00	1.12	WN.X452	552.210	554.260	T20	551.326	T25
CWLN204DMX5	1.25	1.25	1.500	6.00	1.12	WN.X452	552.210	554.260	T20	551.326	T25
left hand											
CWLN164DMX5	1.00	1.00	1.250	6.00	1.12	WN.X452	552.210	554.260	T20	551.326	T25
CWLN204DMX5	1.25	1.25	1.500	6.00	1.12	WN.X452	552.210	554.260	T20	551.326	T25

O.D./I.D. Tooling



See page B122 for inserts.

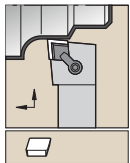


■ **CCLN -5°**

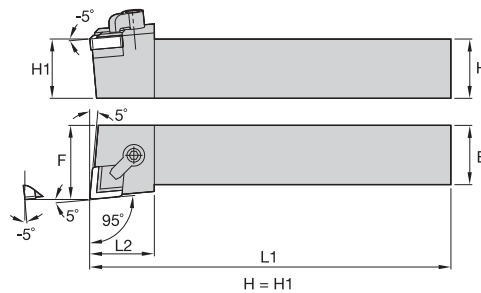


catalog number	H	B	F	L1	L2	gage insert	shim	shim screw	hex (inch)	clamp	clamp screw	hex (inch)
right hand CCLNR164	1.00	1.00	1.250	6.00	1.00	CN.422	SM396	S111	1/16	CK21	STC20	1/8
left hand CCLNL164	1.00	1.00	1.250	6.00	1.00	CN.422	SM396	S111	1/16	CK21	STC20	1/8

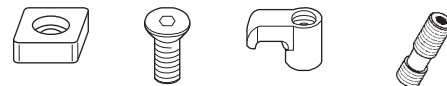
O.D./I.D. Tooling



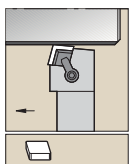
See page B122 for inserts.



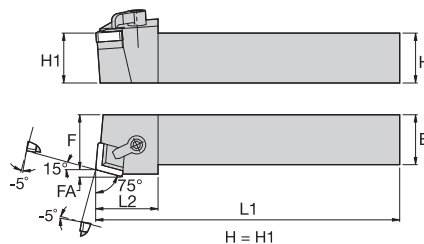
■ **CCLN-P -5°**



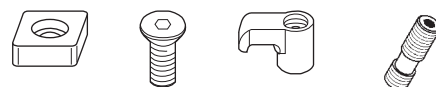
catalog number	H	B	F	L1	L2	gage insert	shim	shim screw	clamp	clamp screw	hex (inch)
right hand CCLNRP163D	1.00	1.00	1.250	6.00	1.25	CN.322	SM432	SL344	CK20	STC11	1/8
left hand CCLNLP163D	1.00	1.00	1.250	6.00	1.25	CN.322	SM432	SL344	CK20	STC11	1/8



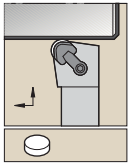
See page B122 for inserts.



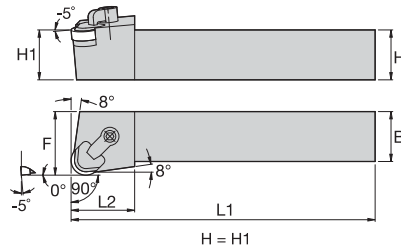
■ **CCRN-P 15°**



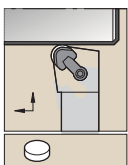
catalog number	H	B	F	L1	L2	FA	gage insert	shim	shim screw	clamp	clamp screw	hex (inch)
right hand CCRNRP163D	1.00	1.00	1.161	6.00	1.25	.09	CN.322	SM432	SL344	CK20	STC11	1/8



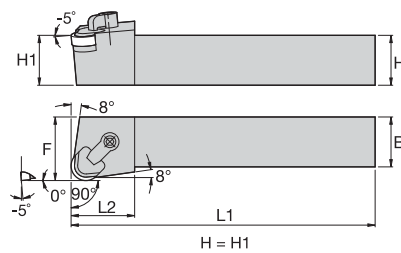
See page B124 for inserts.


CRGN

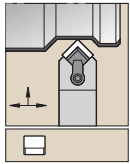

catalog number	H	B	F	L1	L2	gage insert	shim	shim screw	hex (inch)	clamp	clamp screw	hex (inch)
right hand												
CRGNR123	.75	.75	.875	4.50	.75	RN.32	SM46	S111	1/16	CK6	STC5	3/32
CRGNR163	1.00	1.00	1.125	6.00	.75	RN.32	SM46	S111	1/16	CK6	STC5	3/32
CRGNR164	1.00	1.00	1.125	6.00	1.00	RN.42	SM218	S111	1/16	CK12	STC4	5/32
CRGNR854	1.25	1.00	1.125	6.00	1.00	RN.42	SM218	S111	1/16	CK12	STC4	5/32
CRGNR864	1.50	1.00	1.125	8.00	1.00	RN.42	SM218	S111	1/16	CK12	STC4	5/32
CRGNR244F	1.50	1.50	2.000	8.00	1.25	RNG45	SM45	S111	1/16	CK12	STC4	5/32
CRGNR206	1.25	1.25	1.500	6.00	1.38	RNG65	SM456	SL344	—	CK12	STC4	5/32
CRGNR246	1.50	1.50	2.000	8.00	1.38	RNG65	SM456	SL344	—	CK12	STC4	5/32
CRGNR208	1.25	1.25	1.500	6.00	1.56	RNG84	SM444	SL344	—	CK24	STC19	3/16
CRGNR248	1.50	1.50	2.000	8.00	1.56	RNG84	SM444	SL344	—	CK24	STC19	3/16
left hand												
CRGNL123	.75	.75	.875	4.50	.75	RN.32	SM46	S111	1/16	CK6	STC5	3/32
CRGNL163	1.00	1.00	1.125	6.00	.75	RN.32	SM46	S111	1/16	CK6	STC5	3/32
CRGNL164	1.00	1.00	1.125	6.00	1.00	RN.42	SM218	S111	1/16	CK12	STC4	5/32
CRGNL854	1.25	1.00	1.125	6.00	1.00	RN.42	SM218	S111	1/16	CK12	STC4	5/32
CRGNL864	1.50	1.00	1.125	8.00	1.00	RN.42	SM218	S111	1/16	CK12	STC4	5/32
CRGNL244F	1.50	1.50	2.000	8.00	1.25	RNG45	SM45	S111	1/16	CK12	STC4	5/32
CRGNL206	1.25	1.25	1.500	6.00	1.38	RNG65	SM456	SL344	—	CK12	STC4	5/32
CRGNL246	1.50	1.50	2.000	8.00	1.38	RNG65	SM456	SL344	—	CK12	STC4	5/32
CRGNL208	1.25	1.25	1.500	6.00	1.56	RNG84	SM444	SL344	—	CK24	STC19	3/16
CRGNL248	1.50	1.50	2.000	8.00	1.56	RNG84	SM444	SL344	—	CK24	STC19	3/16



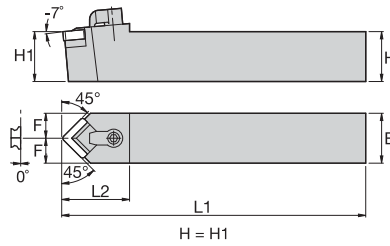
See page B124 for inserts.


CRGN-P


catalog number	H	B	F	L1	L2	gage insert	shim	shim screw	clamp	clamp screw	hex (inch)
right hand											
CRGNRP163D	1.00	1.00	1.250	6.00	.75	RNM32	SM434	SL344	CK20	STC20	1/8
CRGNRP164D	1.00	1.00	1.250	6.00	1.13	RN.42	SM437	SL344	CK28	STC4	5/32
CRGNRP204D	1.25	1.25	1.500	6.00	1.13	RN.42	SM437	SL344	CK28	STC4	5/32
left hand											
CRGNLP163D	1.00	1.00	1.250	6.00	.75	RNM32	SM434	SL344	CK20	STC20	1/8
CRGNLP164D	1.00	1.00	1.250	6.00	1.13	RN.42	SM437	SL344	CK28	STC4	5/32
CRGNLP204D	1.25	1.25	1.500	6.00	1.13	RN.42	SM437	SL344	CK28	STC4	5/32



See pages B125–B126 for inserts.

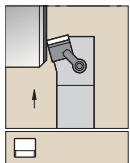


■ **CSDN 45°**

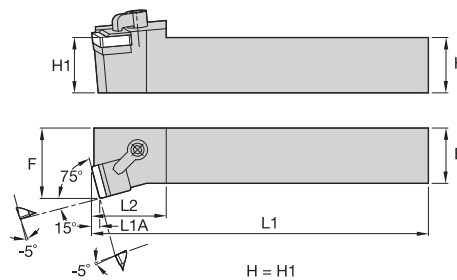
O.D./I.D. Tooling



catalog number	H	B	F	L1	L2	gage insert	shim	shim screw	hex (inch)	clamp	clamp screw	hex (inch)
CSDNN124	.75	.75	.375	4.50	1.31	SN.422	SM47	S111	1/16	CK10	STC4	5/32
CSDNN164	1.00	1.00	.500	6.00	1.31	SN.422	SM47	S111	1/16	CK9	STC4	5/32
CSDNN866	1.50	1.00	.500	8.00	1.75	SN.633	SM216	S125	3/32	CK24	STC19	3/16



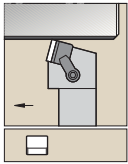
See pages B125–B126 for inserts.



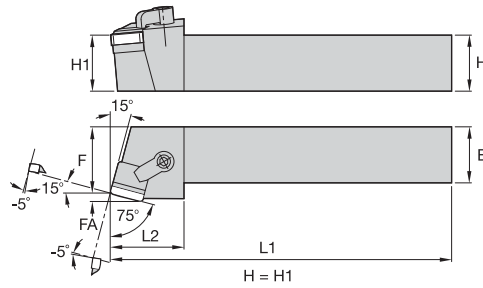
■ **CSKN 15°**



catalog number	H	B	F	L1	L2	L1A	gage insert	shim	shim screw	hex (inch)	clamp	clamp screw	hex (inch)
right hand													
CSKNR123	.75	.75	.830	4.50	.88	.09	SN.322	SM87	SL344	—	CK7	STC5	3/32
CSKNR856	1.25	1.00	1.190	6.00	1.50	.18	SN.633	SM216	S125	3/32	CK9	STC4	5/32



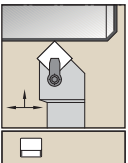
See pages B125–B126 for inserts.



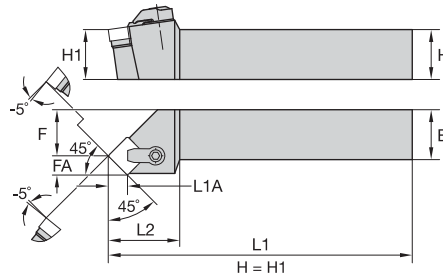
■ **CSRN 15°**



catalog number	H	B	F	L1	L2	FA	gage insert	shim	shim screw	hex (inch)	clamp	clamp screw	hex (inch)
right hand CSRNR124	.75	.75	.855	4.50	1.19	.12	SN.422	SM47	S111	1/16	CK10	STC4	5/32
CSRNR164	1.00	1.00	1.048	6.00	1.19	.12	SN.422	SM47	S111	1/16	CK9	STC4	5/32
CSRNR856	1.25	1.00	1.060	6.00	1.44	.18	SN.633	SM216	S125	3/32	CK9	STC4	5/32



See pages B125–B126 for inserts.

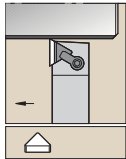


■ **CSSN 45°**

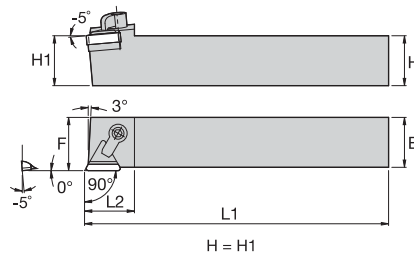


catalog number	H	B	F	L1	L2	FA	L1A	gage insert	shim	shim screw	hex (inch)	clamp	clamp screw	hex (inch)
right hand CSSNR164	1.00	1.00	.720	6.00	1.31	.34	.33	SN.422	SM47	S111	1/16	CK9	STC4	5/32
left hand CSSNL164	1.00	1.00	.720	6.00	1.31	.34	.33	SN.422	SM47	S111	1/16	CK9	STC4	5/32

O.D./I.D. Tooling

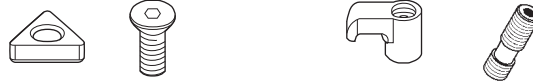


See page B126 for inserts.

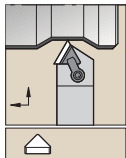


CTAN 0°

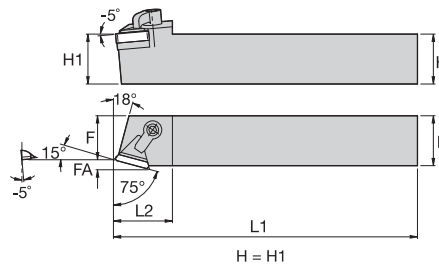
O.D./I.D. Tooling



catalog number	H	B	F	L1	L2	gage insert	shim	shim screw	hex (inch)	clamp	clamp screw	hex (inch)
right hand												
CTANR082	.50	.50	.50	4.500	.75	TN.221	SM88	SL344	—	CK19	STC5	3/32
CTANR123	.75	.75	.75	4.500	1.06	TN.322	SM48	S111	1/16	CK10	STC4	5/32
CTANR164	1.00	1.00	1.00	6.000	1.19	TN.432	SM26	S125	3/32	CK9	STC4	5/32
left hand												
CTANL164	1.00	1.00	1.00	6.000	1.19	TN.432	SM26	S125	3/32	CK9	STC4	5/32



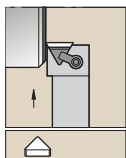
See page B126 for inserts.



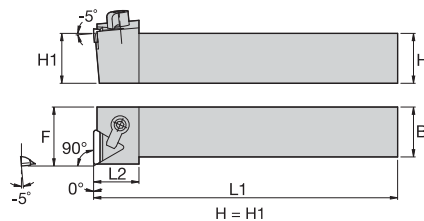
CTBN 15°



catalog number	H	B	F	L1	L2	FA	gage insert	shim	shim screw	hex (inch)	clamp	clamp screw	hex (inch)
right hand													
CTBNR123	.75	.75	.600	4.50	1.19	.15	TN.322	SM48	S111	1/16	CK10	STC4	5/32
CTBNR204	1.25	1.25	1.040	6.00	1.25	.20	TN.432	SM26	S125	3/32	CK9	STC4	5/32
CTBNR864	1.50	1.00	.790	8.00	1.25	.20	TN.432	SM26	S125	3/32	CK9	STC4	5/32
left hand													
CTBNL123	.75	.75	.600	4.50	1.19	.15	TN.322	SM48	S111	1/16	CK10	STC4	5/32
CTBNL204	1.25	1.25	1.040	6.00	1.25	.20	TN.432	SM26	S125	3/32	CK9	STC4	5/32



See page B126 for inserts.



CTFN 0°

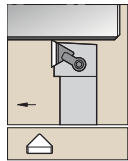


catalog number	H	B	F	L1	L2	gage insert	shim	shim screw	hex (inch)	clamp	clamp screw	hex (inch)
right hand												
CTFN R123	.75	.75	1.000	4.50	.88	TN.322	SM48	S111	1/16	CK10	STC4	5/32
CTFN R853	1.25	1.00	1.250	6.00	.88	TN.322	SM48	S111	1/16	CK9	STC4	5/32

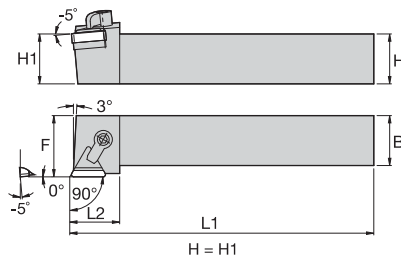
(continued)

(CTFN 0° continued)

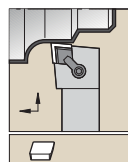
catalog number	H	B	F	L1	L2	gage insert	shim	shim screw	hex (inch)	clamp	clamp screw	hex (inch)
left hand												
CTFNL123	.75	.75	1.000	4.50	.88	TN.322	SM48	S111	1/16	CK10	STC4	5/32
CTFNL163	1.00	1.00	1.250	6.00	.88	TN.322	SM48	S111	1/16	CK9	STC4	5/32



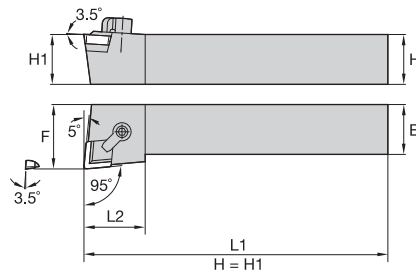
See page B126 for inserts.


CTGN 0°

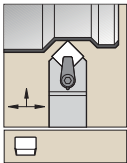
catalog number	H	B	F	L1	L2	gage insert	shim	shim screw	hex (inch)	clamp	clamp screw	hex (inch)
right hand												
CTGNR123	.75	.75	1.000	4.50	1.00	TN.322	SM48	S111	1/16	CK10	STC4	5/32
CTGNR163	1.00	1.00	1.250	6.00	1.00	TN.322	SM48	S111	1/16	CK9	STC4	5/32
CTGNR164	1.00	1.00	1.250	6.00	1.19	TN.432	SM26	S125	3/32	CK9	STC4	5/32
CTGNR204	1.25	1.25	1.500	6.00	1.19	TN.432	SM26	S125	3/32	CK9	STC4	5/32
left hand												
CTGNL123	.75	.75	1.000	4.50	1.00	TN.322	SM48	S111	1/16	CK10	STC4	5/32
CTGNL163	1.00	1.00	1.250	6.00	1.00	TN.322	SM48	S111	1/16	CK9	STC4	5/32
CTGNL164	1.00	1.00	1.250	6.00	1.19	TN.432	SM26	S125	3/32	CK9	STC4	5/32



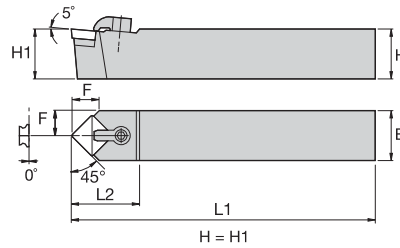
See page B84 for inserts.


CCLP -5°

catalog number	H	B	F	L1	L2	gage insert	shim	shim screw	hex (inch)	clamp	clamp screw	hex (inch)
right hand												
CCLPR084V	.50	.50	.750	3.50	1.00	CP.422	SM369	S19	1/16	CK7	STC9	3/32
CCLPR124B	.75	.75	1.000	4.50	1.25	CP.422	SM369	S111	1/16	CK13	STC8	5/32
CCLPR164C	1.00	1.00	1.250	5.00	1.25	CP.422	SM369	S111	1/16	CK12	STC4	5/32
CCLPR164D	1.00	1.00	1.250	6.00	1.25	CP.422	SM369	S111	1/16	CK12	STC4	5/32
left hand												
CCLPL124B	.75	.75	1.000	4.50	1.25	CP.422	SM369	S111	1/16	CK13	STC8	5/32
CCLPL164C	1.00	1.00	1.250	5.00	1.25	CP.422	SM369	S111	1/16	CK12	STC4	5/32



See pages B85–B86 and B129–B130 for inserts.



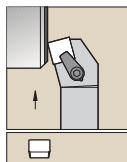
$H = H1$

■ **CSDP 45°**

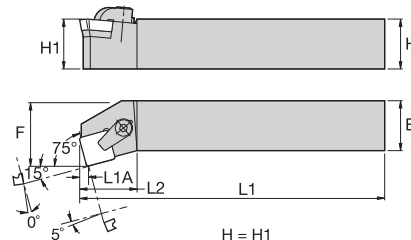
O.D./I.D. Tooling



catalog number	H	B	F	L1	L2	gage insert	shim	shim screw	hex (inch)	clamp	clamp screw	hex (inch)
CSDPN103	.63	.63	.312	4.50	.94	SP.322	SM120	SL344	—	CK7	STC5	3/32
CSDPN124	.75	.75	.375	4.50	1.38	SP.422	SM40	S111	1/16	CK10	STC8	5/32
CSDPN644	1.00	.75	.375	6.00	1.38	SP.422	SM40	S111	1/16	CK9	STC4	5/32
CSDPN164	1.00	1.00	.500	6.00	1.38	SP.422	SM40	S111	1/16	CK9	STC4	5/32
CSDPN856	1.25	1.00	.500	6.00	1.82	SP.633	SM36	S125	3/32	CK29	STC19	3/16



See pages B85–B86 and B129–B130 for inserts.

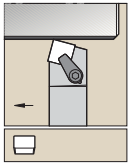


$H = H1$

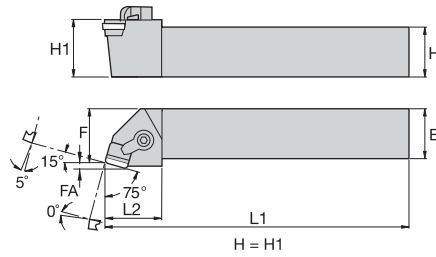
■ **CSKP 15°**



catalog number	H	B	F	L1	L2	L1A	gage insert	shim	shim screw	hex (inch)	clamp	clamp screw	hex (inch)
right hand CSKPR164D	1.00	1.00	1.250	6.00	1.13	.12	SP.422	SM40	S111	1/16	CK9	STC4	5/32
left hand CSKPL164D	1.00	1.00	1.250	6.00	1.13	.12	SP.422	SM40	S111	1/16	CK9	STC4	5/32



See pages B85–B86 and B129–B130 for inserts.

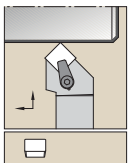


H = H1

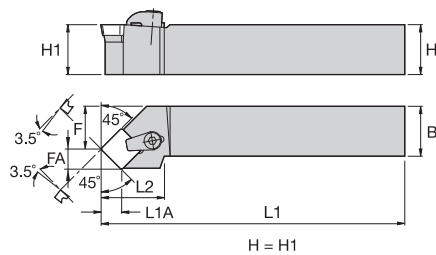
■ CSRPR 15°



catalog number	H	B	F	L1	L2	FA	gage insert	shim	shim screw	hex (inch)	clamp	clamp screw	hex (inch)
right hand													
CSRPR083B	.50	.50	.605	4.50	.88	.09	SP.322	SM120	SL344	—	CK7	STC9	3/32
CSRPR124B	.75	.75	.855	4.50	1.19	.12	SP.422	SM40	S111	1/16	CK10	STC8	5/32
CSRPR164D	1.00	1.00	1.048	6.00	1.19	.12	SP.422	SM40	S111	1/16	CK9	STC4	5/32
CSRPR856D	1.25	1.00	1.060	6.00	1.50	.18	SP.633	SM36	S125	3/32	CK9	STC4	5/32
CSRPR866E	1.50	1.00	1.060	7.00	1.50	.18	SP.633	SM36	S125	3/32	CK9	STC4	5/32
left hand													
CSRPL083B	.50	.50	.605	4.50	.88	.09	SP.322	SM120	SL344	—	CK7	STC9	3/32
CSRPL124B	.75	.75	.855	4.50	1.19	.12	SP.422	SM40	S111	1/16	CK10	STC8	5/32
CSRPL164D	1.00	1.00	1.048	6.00	1.19	.12	SP.422	SM40	S111	1/16	CK9	STC4	5/32
CSRPL856D	1.25	1.00	1.060	6.00	1.50	.18	SP.633	SM36	S125	3/32	CK9	STC4	5/32
CSRPL866E	1.50	1.00	1.060	7.00	1.50	.18	SP.633	SM36	S125	3/32	CK9	STC4	5/32



See pages B85–B86 and B129–B130 for inserts.

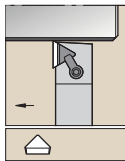


H = H1

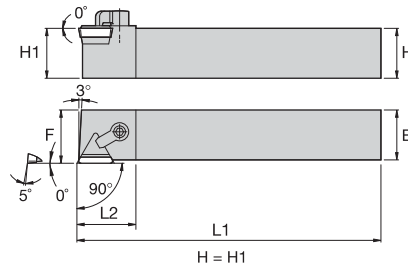
■ CSSPR 45°



catalog number	H	B	F	L1	L2	FA	L1A	gage insert	shim	shim screw	hex (inch)	clamp	clamp screw	hex (inch)
right hand														
CSSPR164D	1.00	1.00	1.170	6.00	1.44	.34	.35	SP.422	SM40	S111	1/16	CK9	STC4	5/32
CSSPR854D	1.25	1.00	1.170	6.00	1.44	.34	.35	SP.422	SM40	S111	1/16	CK9	STC4	5/32
CSSPR856D	1.25	1.00	1.020	6.00	1.50	.48	.53	SP.633	SM36	S125	3/32	CK9	STC4	5/32
left hand														
CSSPL164D	1.00	1.00	1.170	6.00	1.44	.34	.35	SP.422	SM40	S111	1/16	CK9	STC4	5/32
CSSPL854D	1.25	1.00	1.170	6.00	1.44	.34	.35	SP.422	SM40	S111	1/16	CK9	STC4	5/32
CSSPL856D	1.25	1.00	1.020	6.00	1.50	.48	.53	SP.633	SM36	S125	3/32	CK9	STC4	5/32



See pages B86–B87 and B130 for inserts.

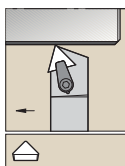


■ **CTAP 0°**

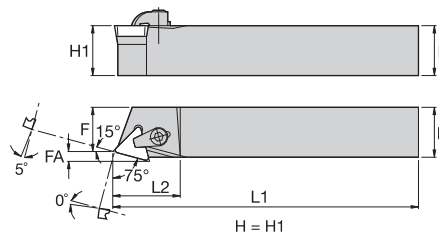
O.D./I.D. Tooling



catalog number	H	B	F	L1	L2	gage insert	shim	shim screw	hex (inch)	clamp	clamp screw	hex (inch)
right hand												
CTAPR082B	.50	.50	.500	4.50	.75	TP.221	SM119	SL344	—	CK19	STC9	3/32
CTAPR102B	.63	.63	.625	4.50	.75	TP.221	SM119	SL344	—	CK19	STC5	3/32
CTAPR123B	.75	.75	.750	4.50	1.06	TP.322	SM41	S111	1/16	CK10	STC8	5/32
CTAPR163D	1.00	1.00	1.000	6.00	1.06	TP.322	SM41	S111	1/16	CK9	STC4	5/32
CTAPR854D	1.25	1.00	1.000	6.00	1.13	TP.432	SM37	S125	3/32	CK9	STC4	5/32
left hand												
CTAPL082B	.50	.50	.500	4.50	.75	TP.221	SM119	SL344	—	CK19	STC9	3/32
CTAPL123B	.75	.75	.750	4.50	1.06	TP.322	SM41	S111	1/16	CK10	STC8	5/32
CTAPL163D	1.00	1.00	1.000	6.00	1.06	TP.322	SM41	S111	1/16	CK9	STC4	5/32
CTAPL854D	1.25	1.00	1.000	6.00	1.13	TP.432	SM37	S125	3/32	CK9	STC4	5/32



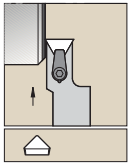
See pages B86–B87 and B130 for inserts.



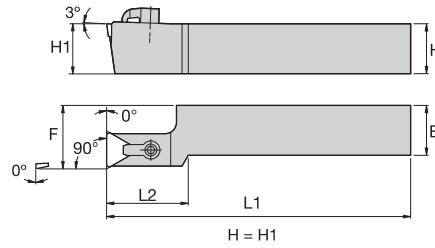
■ **CTBP 15°**



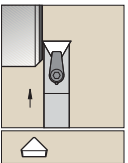
catalog number	H	B	F	L1	L2	FA	gage insert	shim	shim screw	hex (inch)	clamp	clamp screw	hex (inch)
right hand													
CTBPR123B	.75	.75	.600	4.50	1.19	.15	TP.322	SM41	S111	1/16	CK10	STC8	5/32
CTBPR163D	1.00	1.00	.850	6.00	1.19	.15	TP.322	SM41	S111	1/16	CK9	STC4	5/32
left hand													
CTBPL123B	.75	.75	.600	4.50	1.19	.15	TP.322	SM41	S111	1/16	CK10	STC8	5/32
CTBPL163D	1.00	1.00	.850	6.00	1.19	.15	TP.322	SM41	S111	1/16	CK9	STC4	5/32



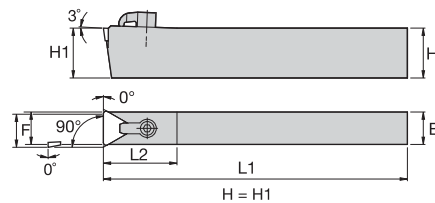
See pages B86–B87 and B130 for inserts.


CTCP 0°

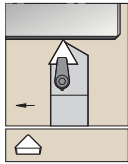
catalog number	H	B	F	L1	L2	gage insert	shim	shim screw	hex (inch)	clamp	clamp screw	hex (inch)
right hand												
CTCPR123B	.75	.75	1.000	4.50	1.50	TP.322	SM41	S111	1/16	CK23	STC11	1/8
CTCPR163C	1.00	1.00	1.250	5.00	1.50	TP.322	SM41	S111	1/16	CK23	STC11	1/8
CTCPR164C	1.00	1.00	1.250	5.00	1.63	TP.432	SM37	S125	3/32	CK13	STC4	5/32
CTCPR164D	1.00	1.00	1.250	6.00	1.63	TP.432	SM37	S125	3/32	CK13	STC4	5/32
CTCPR204D	1.25	1.25	1.500	6.00	1.63	TP.432	SM37	S125	3/32	CK13	STC4	5/32
CTCPR244D	1.50	1.50	2.000	6.00	3.00	TP.432	SM37	S125	3/32	CK13	STC4	5/32
CTCPR205D	1.25	1.25	1.500	6.00	1.75	TP.543	SM99	S132	1/8	CK29	STC19	3/16
left hand												
CTCPL123B	.75	.75	1.000	4.50	1.50	TP.322	SM41	S111	1/16	CK23	STC11	1/8
CTCPL163C	1.00	1.00	1.250	5.00	1.50	TP.322	SM41	S111	1/16	CK23	STC11	1/8
CTCPL164C	1.00	1.00	1.250	5.00	1.63	TP.432	SM37	S125	3/32	CK13	STC4	5/32
CTCPL164D	1.00	1.00	1.250	6.00	1.63	TP.432	SM37	S125	3/32	CK13	STC4	5/32
CTCPL204D	1.25	1.25	1.500	6.00	1.63	TP.432	SM37	S125	3/32	CK13	STC4	5/32
CTCPL244D	1.50	1.50	2.000	6.00	3.00	TP.432	SM37	S125	3/32	CK13	STC4	5/32
CTCPL205D	1.25	1.25	1.500	6.00	1.75	TP.543	SM99	S132	1/8	CK29	STC19	3/16



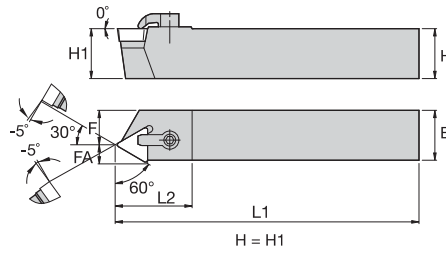
See pages B86–B87 and B130 for inserts.


CTCPN 0°

catalog number	H	B	F	L1	L2	gage insert	shim	shim screw	hex (inch)	clamp	clamp screw	hex (inch)
CTCPN443	1.00	.50	.542	8.00	1.19	TP.322	SM41	S111	1/16	CK23	STC11	1/8
CTCPN124	.75	.75	.782	6.00	1.31	TP.432	SM37	S125	3/32	CK13	STC8	5/32
CTCPN644	1.00	.75	.782	8.00	1.31	TP.432	SM37	S125	3/32	CK13	STC4	5/32
CTCPN664	1.50	.75	.782	8.00	1.31	TP.432	SM37	S125	3/32	CK13	STC4	5/32



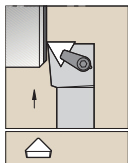
See pages B86–B87 and B130 for inserts.



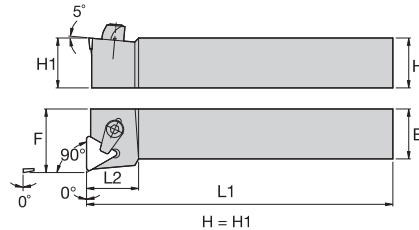
■ **CTEP 30°**

O.D./I.D. Tooling

catalog number	H	B	F	L1	L2	FA	gage insert	shim	shim screw	hex (inch)	clamp	clamp screw	hex (inch)
right hand													
CTEPR102B	.63	.63	.450	4.50	.88	.20	TP.221	SM119	SL344	—	CK19	STC5	3/32
CTEPR123B	.75	.75	.460	4.50	1.25	.28	TP.322	SM41	S111	1/16	CK10	STC8	5/32
CTEPR163D	1.00	1.00	.700	6.00	1.25	.28	TP.322	SM41	S111	1/16	CK9	STC4	5/32
CTEPR854D													
CTEPR854D	1.25	1.00	.610	6.00	1.31	.39	TP.432	SM37	S125	3/32	CK9	STC4	5/32
left hand													
CTEPL102B	.63	.63	.450	4.50	.88	.20	TP.221	SM119	SL344	—	CK19	STC5	3/32
CTEPL123B	.75	.75	.460	4.50	1.25	.28	TP.322	SM41	S111	1/16	CK10	STC8	5/32
CTEPL163D	1.00	1.00	.700	6.00	1.25	.28	TP.322	SM41	S111	1/16	CK9	STC4	5/32
CTEPL854D	1.25	1.00	.610	6.00	1.31	.39	TP.432	SM37	S125	3/32	CK9	STC4	5/32

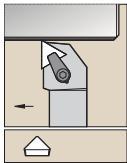


See pages B86–B87 and B130 for inserts.

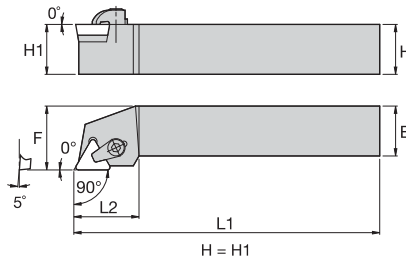


■ **CTFP 0°**

catalog number	H	B	F	L1	L2	gage insert	shim	shim screw	hex (inch)	clamp	clamp screw	hex (inch)
right hand												
CTFPR082V	.50	.50	.750	3.50	.56	TP.221	SM119	SL344	—	CK19	STC9	3/32
CTFPR123B	.75	.75	1.000	4.50	1.13	TP.322	SM41	S111	1/16	CK10	STC8	5/32
CTFPR163C	1.00	1.00	1.250	5.00	1.13	TP.322	SM41	S111	1/16	CK9	STC4	5/32
CTFPR163D	1.00	1.00	1.250	6.00	1.13	TP.322	SM41	S111	1/16	CK9	STC4	5/32
CTFPR164C	1.00	1.00	1.250	5.00	1.25	TP.432	SM37	S125	3/32	CK9	STC4	5/32
CTFPR164D	1.00	1.00	1.250	6.00	1.25	TP.432	SM37	S125	3/32	CK9	STC4	5/32
CTFPR854D	1.25	1.00	1.250	6.00	1.25	TP.432	SM37	S125	3/32	CK9	STC4	5/32
CTFPR204D												
CTFPR204D	1.25	1.25	1.500	6.00	1.25	TP.432	SM37	S125	3/32	CK9	STC4	5/32
left hand												
CTFPL082V	.50	.50	.750	3.50	.56	TP.221	SM119	SL344	—	CK19	STC9	3/32
CTFPL123B	.75	.75	1.000	4.50	1.13	TP.322	SM41	S111	1/16	CK10	STC8	5/32
CTFPL163D	1.00	1.00	1.250	6.00	1.13	TP.322	SM41	S111	1/16	CK9	STC4	5/32
CTFPL164D	1.00	1.00	1.250	6.00	1.25	TP.432	SM37	S125	3/32	CK9	STC4	5/32
CTFPL854D	1.25	1.00	1.250	6.00	1.25	TP.432	SM37	S125	3/32	CK9	STC4	5/32
CTFPL204D	1.25	1.25	1.500	6.00	1.25	TP.432	SM37	S125	3/32	CK9	STC4	5/32



See pages B86–B87 and B130 for inserts.

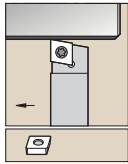


■ CTGP 0°

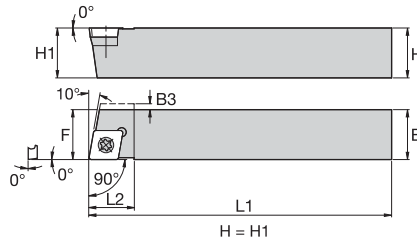


catalog number	H	B	F	L1	L2	gage insert	shim	shim screw	hex (inch)	clamp	clamp screw	hex (inch)
right hand												
CTGPR082B	.50	.50	.750	4.50	.75	TP.221	SM119	SL344	—	CK19	STC9	3/32
CTGPR102B	.63	.63	.875	4.50	.75	TP.221	SM119	SL344	—	CK19	STC9	3/32
CTGPR123A	.75	.75	1.000	4.00	1.13	TP.322	SM41	S111	1/16	CK10	STC8	5/32
CTGPR123B	.75	.75	1.000	4.50	1.13	TP.322	SM41	S111	1/16	CK10	STC8	5/32
CTGPR163C	1.00	1.00	1.250	5.00	1.13	TP.322	SM41	S111	1/16	CK9	STC4	5/32
CTGPR163D	1.00	1.00	1.250	6.00	1.13	TP.322	SM41	S111	1/16	CK9	STC4	5/32
CTGPR164C	1.00	1.00	1.250	5.00	1.25	TP.432	SM37	S125	3/32	CK9	STC4	5/32
CTGPR164D	1.00	1.00	1.250	6.00	1.25	TP.432	SM37	S125	3/32	CK9	STC4	5/32
CTGPR854D	1.25	1.00	1.250	6.00	1.25	TP.432	SM37	S125	3/32	CK9	STC4	5/32
CTGPR204D	1.25	1.25	1.500	6.00	1.25	TP.432	SM37	S125	3/32	CK9	STC4	5/32
CTGPR205D	1.25	1.25	1.500	6.00	1.38	TP.543	SM99	S132	1/8	CK24	STC19	3/16
left hand												
CTGPL102B	.63	.63	.875	4.50	.75	TP.221	SM119	SL344	—	CK19	STC9	3/32
CTGPL123B	.75	.75	1.000	4.50	1.13	TP.322	SM41	S111	1/16	CK10	STC8	5/32
CTGPL163C	1.00	1.00	1.250	5.00	1.13	TP.322	SM41	S111	1/16	CK9	STC4	5/32
CTGPL163D	1.00	1.00	1.250	6.00	1.13	TP.322	SM41	S111	1/16	CK9	STC4	5/32
CTGPL164C	1.00	1.00	1.250	5.00	1.25	TP.432	SM37	S125	3/32	CK9	STC4	5/32
CTGPL164D	1.00	1.00	1.250	6.00	1.25	TP.432	SM37	S125	3/32	CK9	STC4	5/32
CTGPL204D	1.25	1.25	1.500	6.00	1.25	TP.432	SM37	S125	3/32	CK9	STC4	5/32
CTGPL205D	1.25	1.25	1.500	6.00	1.38	TP.543	SM99	S132	1/8	CK24	STC19	3/16

O.D./I.D. Tooling



See pages B88–B91 for inserts.

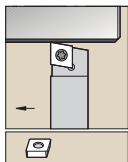


■ SCAC 0°

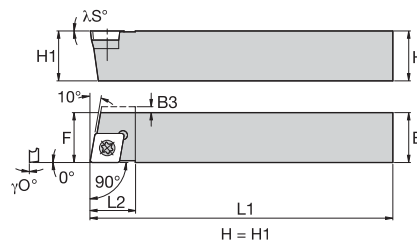
O.D./I.D. Tooling



catalog number	H	B	F	L1	L2	B3	gage insert	shim	shim screw	hex	insert screw	Torx
right hand												
SCACR052D	.31	.31	.312	6.00	.44	.09	CC..2151	—	—	—	MS1153	T7
SCACR062D	.38	.38	.375	6.00	.44	—	CC..2151	—	—	—	MS1153	T7
SCACR083D	.50	.50	.500	6.00	.62	—	CC..3252	—	—	—	MS1155	T15
left hand												
SCACR103B	.63	.63	.625	4.50	.62	—	CC..3252	SKCP343	SRS3	3.5 mm	MS1156	T15
SCACL052D	.31	.31	.312	6.00	.44	.09	CC..2151	—	—	—	MS1153	T7
SCACL062D	.38	.38	.375	6.00	.44	—	CC..2151	—	—	—	MS1153	T7
SCACL083D	.50	.50	.500	6.00	.62	—	CC..3252	—	—	—	MS1155	T15
SCACL103B	.63	.63	.625	4.50	.62	—	CC..3252	SKCP343	SRS3	3.5 mm	MS1156	T15



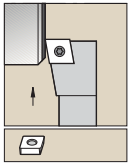
See pages B92–B95 for inserts.



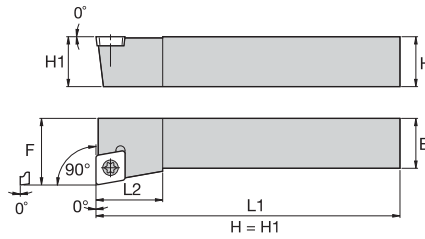
■ SCAP 0°



catalog number	H	B	F	L1	L2	γO°	λS°	B3	gage insert	insert screw	Torx
right hand											
SCAPR052D	.31	.31	.312	6.000	.44	3.50	3.50	.06	CP..2151	MS1153	T7
SCAPR062D	.38	.38	.375	6.000	.44	3.50	3.50	—	CP..2151	MS1153	T7
SCAPR083D	.50	.50	.500	6.000	.62	3.00	4.00	—	CP..3252	MS1027	T9
left hand											
SCAPL052D	.31	.31	.312	6.000	.44	3.50	3.50	.06	CP..2151	MS1153	T7
SCAPL062D	.38	.38	.375	6.000	.44	3.50	3.50	—	CP..2151	MS1153	T7
SCAPL083D	.50	.50	.500	6.000	.62	3.00	4.00	—	CP..3252	MS1027	T9



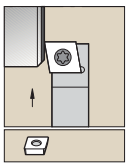
See pages B88–B91 for inserts.



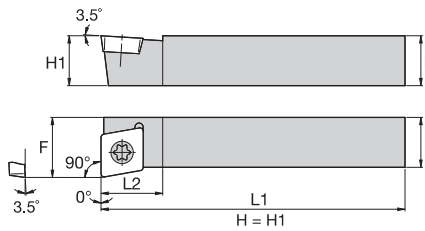
■ SCFC 0°

catalog number	H	B	F	L1	L2	gage insert	insert screw	Torx
right hand SCFCR082	.50	.50	.625	3.50	.50	CC..2151	MS1153	T7
left hand SCFCL082	.50	.50	.625	3.50	.50	CC..2151	MS1153	T7

O.D./I.D. Tooling



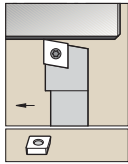
See pages B92–B95 for inserts.



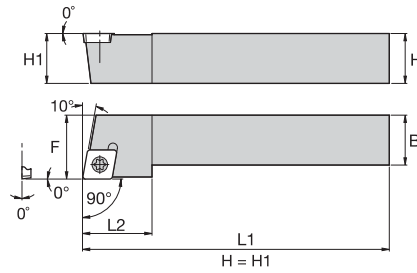
■ SCFP 0°

catalog number	H	B	F	L1	L2	gage insert	insert screw	Torx
right hand SCFPR062	.38	.38	.500	2.50	.44	CP..2151	MS1153	T7
SCFPR083V	.50	.50	.625	3.50	.62	CP..3252	MS1027	T9
left hand SCFPL083V	.50	.50	.625	3.50	.62	CP..3252	MS1027	T9

NOTE: ANSI/ISO compatible 60° countersunk hole insert.
This tool will also accept CPMT/CPGM/CPGT/CPGW-21.5_ inserts.
90° countersunk hole insert (i.e., CPGM/CPGB-32.5_).
ANSI/ISO compatible 60° countersunk hole inserts (i.e., CPMT/CPGT/CPGW-32.5_) do not fit this tool.



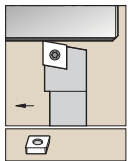
See pages B88–B91 for inserts.



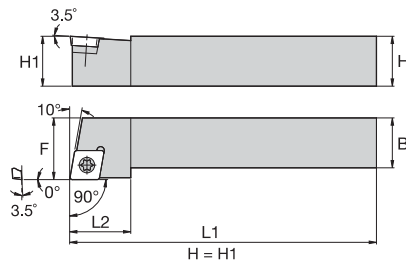
■ SCGC 0°

O.D./I.D. Tooling

catalog number	H	B	F	L1	L2	gage insert	shim	shim screw	hex	insert screw	Torx
right hand											
SCGCR062	.38	.38	.500	2.50	.50	CC..2151	—	—	—	MS1153	T7
SCGCR082	.50	.50	.625	3.50	.50	CC..2151	—	—	—	MS1153	T7
SCGCR102	.63	.63	.750	4.00	.50	CC..2151	—	—	—	MS1153	T7
SCGCR103	.63	.63	.750	4.00	.62	CC..3252	SKCP343	SRS3	3.5 mm	MS1156	T15
SCGCR123	.75	.75	1.000	4.50	.62	CC..3252	SKCP343	SRS3	3.5 mm	MS1156	T15
SCGCR163	1.00	1.00	1.250	6.00	.62	CC..3252	SKCP343	SRS3	3.5 mm	MS1156	T15
left hand											
SCGCL103	.63	.63	.750	4.00	.62	CC..3252	SKCP343	SRS3	3.5 mm	MS1156	T15
SCGCL123	.75	.75	1.000	4.50	.62	CC..3252	SKCP343	SRS3	3.5 mm	MS1156	T15
SCGCL163	1.00	1.00	1.250	6.00	.62	CC..3252	SKCP343	SRS3	3.5 mm	MS1156	T15



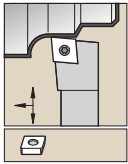
See pages B92–B95 for inserts.



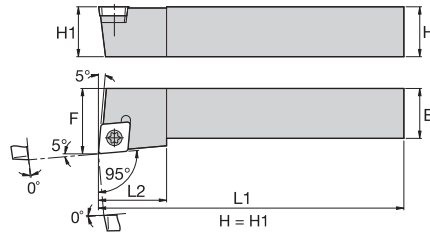
■ SCGP 0°

catalog number	H	B	F	L1	L2	gage insert	shim	shim screw	hex	insert screw	Torx
right hand											
SCGPR062	.38	.38	.500	2.50	.44	CP..2151	—	—	—	MS1153	T7
SCGPR083V	.50	.50	.625	3.50	.62	CP..3252	—	—	—	MS1027	T9
SCGPR123B	.75	.75	1.000	4.50	.62	CP..3252	SM417	MS1028	3/32 IN	MS1027	T9
left hand											
SCGPL062	.38	.38	.500	2.50	.44	CP..2151	—	—	—	MS1153	T7
SCGPL083V	.50	.50	.625	3.50	.62	CP..3252	—	—	—	MS1027	T9
SCGPL123B	.75	.75	1.000	4.50	.62	CP..3252	SM417	MS1028	3/32 IN	MS1027	T9

NOTE: ANSI/ISO compatible 60° countersunk hole insert.
 This tool will also accept CPMT/CPGM/CPGT/CPGW-21.5_ inserts.
 90° countersunk hole insert (i.e., CPGM/CPGB-32.5_).
 ANSI/ISO compatible 60° countersunk hole inserts (i.e., CPMT/CPGT/CPGW-32.5_) do not fit this tool.

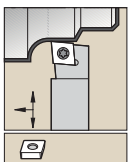


See pages B88–B91 for inserts.

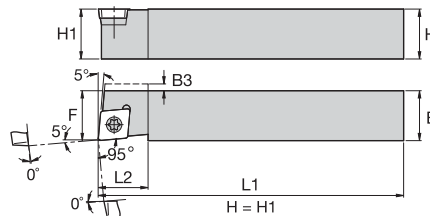


■ SCLC -5°

catalog number	H	B	F	L1	L2	gage insert	shim	shim screw	hex	insert screw	Torx
right hand											
SCLCR052	.31	.31	.375	2.50	.50	CC..2151	—	—	—	MS1153	T7
SCLCR062	.38	.38	.500	2.50	.50	CC..2151	—	—	—	MS1153	T7
SCLCR082	.50	.50	.625	3.50	.50	CC..2151	—	—	—	MS1153	T7
SCLCR102	.63	.63	.750	4.00	.50	CC..2151	—	—	—	MS1153	T7
SCLCR103	.63	.63	.750	4.00	.62	CC..3252	SKCP343	SRS3	3.5 mm	MS1156	T15
SCLCR123	.75	.75	1.000	4.50	.62	CC..3252	SKCP343	SRS3	3.5 mm	MS1156	T15
SCLCR163	1.00	1.00	1.250	6.00	.62	CC..3252	SKCP343	SRS3	3.5 mm	MS1156	T15
SCLCR124B	.75	.75	1.000	4.50	.75	CC..432	SKCP453	SRS4	4 mm	MS1158	T15
SCLCR164D	1.00	1.00	1.250	6.00	.75	CC..432	SKCP453	SRS4	4 mm	MS1158	T15
left hand											
SCLCL052	.31	.31	.375	2.50	.50	CC..2151	—	—	—	MS1153	T7
SCLCL062	.38	.38	.500	2.50	.50	CC..2151	—	—	—	MS1153	T7
SCLCL082	.50	.50	.625	3.50	.50	CC..2151	—	—	—	MS1153	T7
SCLCL102	.63	.63	.750	4.00	.50	CC..2151	—	—	—	MS1153	T7
SCLCL103	.63	.63	.750	4.00	.62	CC..3252	SKCP343	SRS3	3.5 mm	MS1156	T15
SCLCL123	.75	.75	1.000	4.50	.62	CC..3252	SKCP343	SRS3	3.5 mm	MS1156	T15
SCLCL163	1.00	1.00	1.250	6.00	.62	CC..3252	SKCP343	SRS3	3.5 mm	MS1156	T15
SCLCL124B	.75	.75	1.000	4.50	.75	CC..432	SKCP453	SRS4	4 mm	MS1158	T15
SCLCL164D	1.00	1.00	1.250	6.00	.75	CC..432	SKCP453	SRS4	4 mm	MS1158	T15

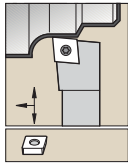


See pages B88–B91 for inserts.

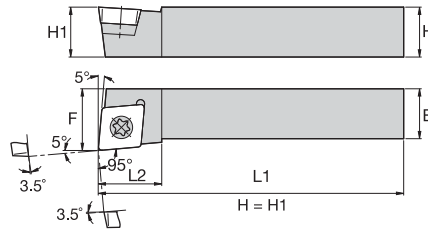


■ SCLC-F -5°

catalog number	H	B	F	L1	L2	B3	gage insert	shim	shim screw	hex	insert screw	Torx
right hand												
SCLCRF062D	.38	.38	.375	6.00	.50	—	CC..2151	—	—	—	MS1153	T7
SCLCRF082D	.50	.50	.500	6.00	.50	—	CC..2151	—	—	—	MS1153	T7
SCLCRF083D	.50	.50	.500	6.00	.62	.09	CC..3252	—	—	—	MS1155	T15
SCLCRF523Z	.50	.63	.625	3.25	.62	—	CC..3252	—	—	—	MS1155	T15
SCLCRF103B	.63	.63	.625	4.50	.62	—	CC..3252	SKCP343	SRS3	3.5 mm	MS1156	T15
left hand												
SCLCLF062D	.38	.38	.375	6.00	.50	—	CC..2151	—	—	—	MS1153	T7
SCLCLF082D	.50	.50	.500	6.00	.50	—	CC..2151	—	—	—	MS1153	T7
SCLCLF083D	.50	.50	.500	6.00	.62	.09	CC..3252	—	—	—	MS1155	T15
SCLCLF523Z	.50	.63	.625	3.25	.62	—	CC..3252	—	—	—	MS1155	T15
SCLCLF103B	.63	.63	.625	4.50	.62	—	CC..3252	SKCP343	SRS3	3.5 mm	MS1156	T15



See pages B92–B95 for inserts.



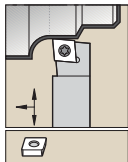
■ **SCLP -5°**

O.D./I.D. Tooling

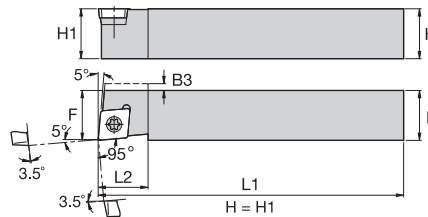


catalog number	H	B	F	L1	L2	gage insert	shim	shim screw	hex	insert screw	Torx
right hand											
SCLPR062	.38	.38	.500	2.50	.44	CP..2151	—	—	—	MS1153	T7
SCLPR083V	.50	.50	.625	3.50	.62	CP..3252	—	—	—	MS1027	T9
SCLPR123B	.75	.75	1.000	4.50	.62	CP..3252	SM417	MS1028	3/32 IN	MS1027	T9
left hand											
SCLPL062	.38	.38	.500	2.50	.44	CP..2151	—	—	—	MS1153	T7
SCLPL083V	.50	.50	.625	3.50	.62	CP..3252	—	—	—	MS1027	T9
SCLPL123B	.75	.75	1.000	4.50	.62	CP..3252	SM417	MS1028	3/32 IN	MS1027	T9

NOTE: ANSI/ISO compatible 60° countersunk hole insert.
 This tool will also accept CPMT/CPGM/CPGT/CPGW-21.5_ inserts.
 90° countersunk hole insert (i.e., CPGM/CPGB-32.5_).
 ANSI/ISO compatible 60° countersunk hole inserts (i.e., CPMT/CPGT/CPGW-32.5_) do not fit this tool.



See pages B92–B95 for inserts.

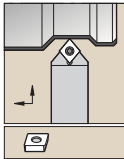


■ **SCLP-F -5°**

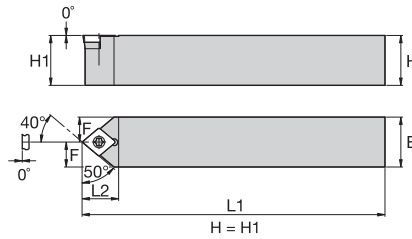


catalog number	H	B	F	L1	L2	gage insert	insert screw	Torx
right hand								
SCLPRF062D	.38	.38	.375	6.00	.44	CP..2151	MS1153	T7
SCLPRF083D	.50	.50	.500	6.00	.62	CP..3252	MS1027	T9
left hand								
SCLPLF062D	.38	.38	.375	6.00	.44	CP..2151	MS1153	T7
SCLPLF083D	.50	.50	.500	6.00	.62	CP..3252	MS1027	T9

NOTE: ANSI/ISO compatible 60° countersunk hole insert.
 This tool will also accept CPMT/CPGM/CPGT/CPGW-21.5_ inserts.
 90° countersunk hole insert (i.e., CPGM/CPGB-32.5_).
 ANSI/ISO compatible 60° countersunk hole inserts (i.e., CPMT/CPGT/CPGW-32.5_) do not fit this tool.

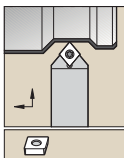


See pages B88–B91 for inserts.

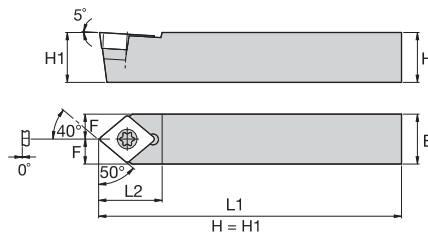


■ SCMC 40°

catalog number	H	B	F	L1	L2	gage insert					
							shim	shim screw	hex	insert screw	Torx
SCMCN062	.38	.38	.188	2.50	.50	CC..2151	—	—	—	MS1153	T7
SCMCN082	.50	.50	.250	3.50	.50	CC..2151	—	—	—	MS1153	T7
SCMCN083	.50	.50	.250	3.50	.62	CC..3252	—	—	—	MS1155	T15
SCMCN103	.63	.63	.312	4.00	.62	CC..3252	SKCP343	SRS3	3.5 mm	MS1156	T15
SCMCN123	.75	.75	.375	4.50	.62	CC..3252	SKCP343	SRS3	3.5 mm	MS1156	T15
SCMCN163	1.00	1.00	.500	6.00	.62	CC..3252	SKCP343	SRS3	3.5 mm	MS1156	T15



See pages B92–B95 for inserts.

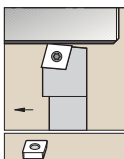


■ SCMP 40°

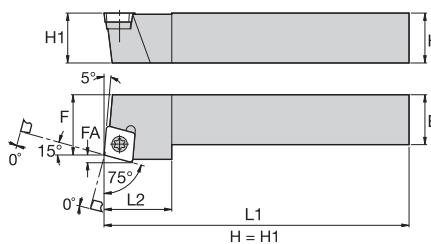
catalog number	H	B	F	L1	L2	gage insert					
							shim	shim screw	hex	insert screw	Torx
SCMPN062	.38	.38	.188	2.50	.44	CP..2151	—	—	—	MS1153	T7
SCMPN083V	.50	.50	.250	3.50	.62	CP..3252	—	—	—	MS1027	T9
SCMPN123B	.75	.75	.375	4.50	.75	CP..3252	SM417	MS1028	3/32 IN	MS1027	T9



NOTE: ANSI/ISO compatible 60° countersunk hole insert.
This tool will also accept CPMT/CPGM/CPGT/CPGW-21.5_ inserts.
90° countersunk hole insert (i.e., CPGM/CPGB-32.5_).
ANSI/ISO compatible 60° countersunk hole inserts (i.e., CPMT/CPGT/CPGW-32.5_) do not fit this tool.



See pages B88–B91 for inserts.

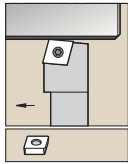


■ SCRC 15°

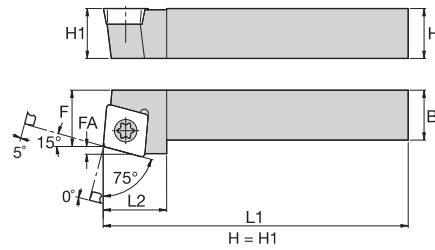
catalog number	H	B	F	L1	L2	FA	gage insert					
								shim	shim screw	hex	insert screw	Torx
right hand SCRCR083	.50	.50	.548	3.50	.62	.09	CC..3252	—	—	—	MS1155	T15
SCRCR103 left hand	.63	.63	.673	4.00	.62	.09	CC..3252	SKCP343	SRS3	3.5 mm	MS1156	T15
SCRCL083	.50	.50	.548	3.50	.62	.09	CC..3252	—	—	—	MS1155	T15



O.D./I.D. Tooling



See pages B92–B95 for inserts.



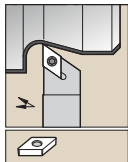
■ SCRP 15°

O.D./I.D. Tooling

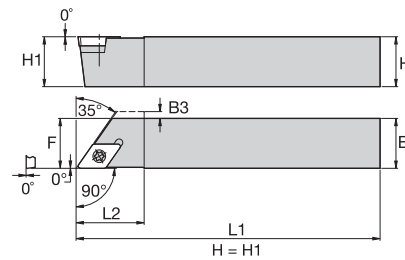


catalog number	H	B	F	L1	L2	FA	gage insert	insert screw	Torx
right hand SCRPR062	.38	.38	.439	2.50	.44	.06	CP..2151	MS1153	T7
SCRPR083V left hand	.50	.50	.537	3.50	.62	.09	CP..3252	MS1027	T9
SCRPL062	.38	.38	.439	2.50	.44	.06	CP..2151	MS1153	T7
SCRPL083V	.50	.50	.537	3.50	.62	.09	CP..3252	MS1027	T9

NOTE: ANSI/ISO compatible 60° countersunk hole insert.
This tool will also accept CPMT/CPGM/CPGT/CPGW-21.5_ inserts.
90° countersunk hole insert (i.e., CPGM/CPGB-32.5_).
ANSI/ISO compatible 60° countersunk hole inserts (i.e., CPMT/CPGT/CPGW-32.5_) do not fit this tool.



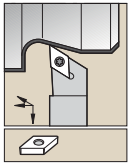
See pages B95–B98 for inserts.



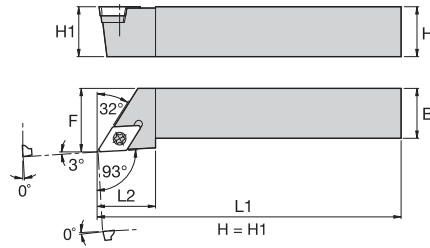
■ SDAC 0°



catalog number	H	B	F	L1	L2	B3	gage insert	shim	shim screw	hex	insert screw	Torx
right hand SDACR062D	.38	.38	.375	6.00	.62	—	DC..2151	—	—	—	MS1153	T7
SDACR082D	.50	.50	.500	6.00	.62	—	DC..2151	—	—	—	MS1153	T7
SDACR103B	.63	.63	.625	4.50	.88	—	DC..3252	SKDP343	SRS3	3.5 mm	MS1156	T15
SDACR083D left hand	.50	.50	.500	6.00	.88	.06	DC..3252	—	—	—	MS1155	T15
SDACL062D	.38	.38	.375	6.00	.62	—	DC..2151	—	—	—	MS1153	T7
SDACL082D	.50	.50	.500	6.00	.62	—	DC..2151	—	—	—	MS1153	T7
SDACL103B	.63	.63	.625	4.50	.88	—	DC..3252	SKDP343	SRS3	3.5 mm	MS1156	T15
SDACL083D	.50	.50	.500	6.00	.88	.06	DC..3252	—	—	—	MS1155	T15



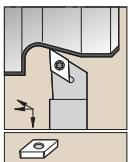
See pages B95–B98 for inserts.



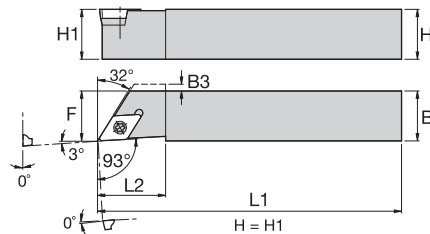
■ SDJC -3°



catalog number	H	B	F	L1	L2	gage insert	shim	shim screw	hex	insert screw	Torx
right hand											
SDJCR062	.38	.38	.500	2.50	.62	DC..2151	—	—	—	MS1153	T7
SDJCR082	.50	.50	.625	3.50	.62	DC..2151	—	—	—	MS1153	T7
SDJCR102	.63	.63	.750	4.00	.62	DC..2151	—	—	—	MS1153	T7
SDJCR083	.50	.50	.625	3.50	.88	DC..3252	—	—	—	MS1155	T15
SDJCR103	.63	.63	.750	4.00	.88	DC..3252	SKDP343	SRS3	3.5 mm	MS1156	T15
SDJCR123	.75	.75	1.000	4.50	.88	DC..3252	SKDP343	SRS3	3.5 mm	MS1156	T15
SDJCR163	1.00	1.00	1.250	6.00	.88	DC..3252	SKDP343	SRS3	3.5 mm	MS1156	T15
left hand											
SDJCL062	.38	.38	.500	2.50	.62	DC..2151	—	—	—	MS1153	T7
SDJCL082	.50	.50	.625	3.50	.62	DC..2151	—	—	—	MS1153	T7
SDJCL102	.63	.63	.750	4.00	.62	DC..2151	—	—	—	MS1153	T7
SDJCL083	.50	.50	.625	3.50	.88	DC..3252	—	—	—	MS1155	T15
SDJCL103	.63	.63	.750	4.00	.88	DC..3252	SKDP343	SRS3	3.5 mm	MS1156	T15
SDJCL123	.75	.75	1.000	4.50	.88	DC..3252	SKDP343	SRS3	3.5 mm	MS1156	T15
SDJCL163	1.00	1.00	1.250	6.00	.88	DC..3252	SKDP343	SRS3	3.5 mm	MS1156	T15



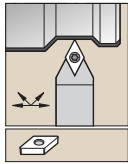
See pages B95–B98 for inserts.



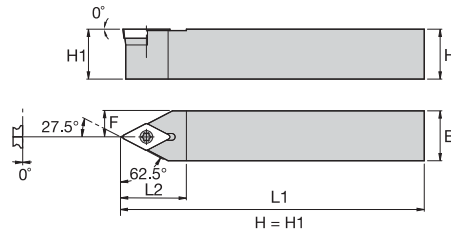
■ SDJC-F -3°



catalog number	H	B	F	L1	L2	gage insert	shim	shim screw	hex	insert screw	Torx
right hand											
SDJCRF062D	.38	.38	.375	6.00	.62	DC..2151	—	—	—	MS1153	T7
SDJCRF082D	.50	.50	.500	6.00	.62	DC..2151	—	—	—	MS1153	T7
SDJCRF103B	.63	.63	.625	4.50	.88	DC..3252	SKDP343	SRS3	3.5 mm	MS1156	T15
SDJCRF083D	.50	.50	.500	6.00	.88	DC..3252	—	—	—	MS1155	T15
left hand											
SDJCLF062D	.38	.38	.375	6.00	.62	DC..2151	—	—	—	MS1153	T7
SDJCLF082D	.50	.50	.500	6.00	.62	DC..2151	—	—	—	MS1153	T7
SDJCLF103B	.63	.63	.625	4.50	.88	DC..3252	SKDP343	SRS3	3.5 mm	MS1156	T15
SDJCLF083D	.50	.50	.500	6.00	.88	DC..3252	—	—	—	MS1155	T15



See pages B95–B98 for inserts.

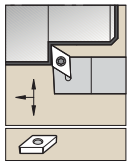


■ SDPC 27.5°

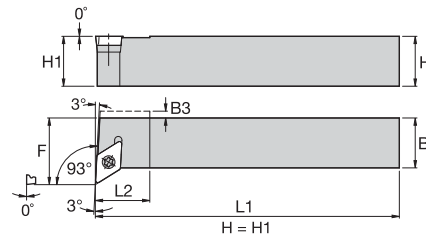
O.D./I.D. Tooling



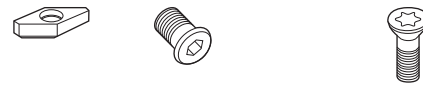
catalog number	H	B	F	L1	L2	gage insert	shim	shim screw	hex	insert screw	Torx
SDPCN062D	.38	.38	.188	6.00	.62	DC..2151	—	—	—	MS1153	T7
SDPCN082D	.50	.50	.250	6.00	.62	DC..2151	—	—	—	MS1153	T7
SDPCN103B	.63	.63	.312	4.50	.88	DC..3252	SKDP343	SRS3	3.5 mm	MS1156	T15
SDPCN083D	.50	.50	.250	6.00	.88	DC..3252	—	—	—	MS1155	T15



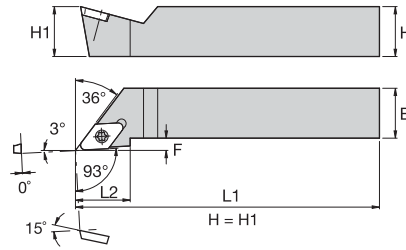
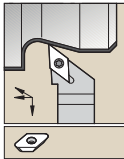
See pages B95–B98 for inserts.



■ SDUC -3°



catalog number	H	B	F	L1	L2	B3	gage insert	shim	shim screw	hex	insert screw	Torx
right hand												
SDUCR082	.50	.50	.670	3.50	.50	—	DC..2151	—	—	—	MS1153	T7
SDUCR102	.63	.63	.795	4.00	.50	—	DC..2151	—	—	—	MS1153	T7
SDUCR083	.50	.50	.746	3.50	.62	.12	DC..3252	—	—	—	MS1155	T15
SDUCR103	.63	.63	.871	4.00	.62	—	DC..3252	SKDP343	SRS3	3.5 mm	MS1156	T15
left hand												
SDUCL082	.50	.50	.670	3.50	.50	—	DC..2151	—	—	—	MS1153	T7
SDUCL102	.63	.63	.795	4.00	.50	—	DC..2151	—	—	—	MS1153	T7
SDUCL083	.50	.50	.746	3.50	.62	.12	DC..3252	—	—	—	MS1155	T15
SDUCL103	.63	.63	.871	4.00	.62	—	DC..3252	SKDP343	SRS3	3.5 mm	MS1156	T15

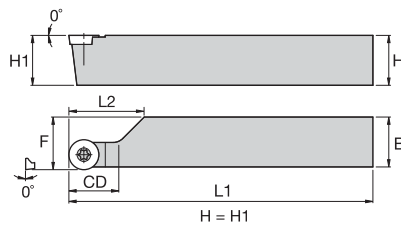
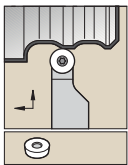


■ SFJF-S -3°

catalog number	H	B	F	L1	L2	gage insert	insert screw	Torx
right hand SFJFRA855S	1.25	1.00	.250	7.00	1.25	FF..210430R	MS1129	T15
left hand SFJFLA855S	1.25	1.00	.250	7.00	1.25	FF..210430L	MS1129	T15



O.D./I.D. Tooling

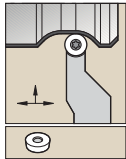


See pages B100–B102 for inserts.

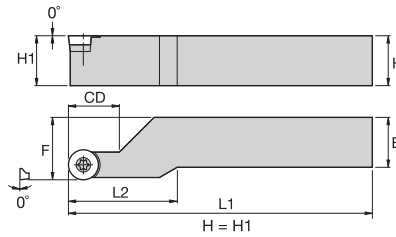
■ SRAC

catalog number	H	B	F	L1	L2	CD	gage insert	shim	insert screw	Torx
right hand SRACR162D	1.00	1.00	1.020	6.00	1.00	1.00	RC..215	—	MS1153	T7
SRACR202D	1.25	1.25	1.270	6.00	1.00	1.00	RC..215	—	MS1153	T7
SRACR163D	1.00	1.00	1.020	6.00	1.00	1.00	RC..325	SR3	MS1156	T15
SRACR203D	1.25	1.25	1.270	6.00	1.00	1.00	RC..325	SR3	MS1156	T15
SRACR164D	1.00	1.00	1.020	6.00	1.00	1.00	RC..43	SR4	MS1158	T15
SRACR204D	1.25	1.25	1.270	6.00	1.00	1.00	RC..43	SR4	MS1158	T15
SRACR244D	1.50	1.50	1.520	6.00	1.00	1.00	RC..43	SR4	MS1158	T15
left hand SRACL162D	1.00	1.00	1.020	6.00	1.00	1.00	RC..215	—	MS1153	T7
SRACL202D	1.25	1.25	1.270	6.00	1.00	1.00	RC..215	—	MS1153	T7
SRACL163D	1.00	1.00	1.020	6.00	1.00	1.00	RC..325	SR3	MS1156	T15
SRACL203D	1.25	1.25	1.270	6.00	1.00	1.00	RC..325	SR3	MS1156	T15
SRACL164D	1.00	1.00	1.020	6.00	1.00	1.00	RC..43	SR4	MS1158	T15
SRACL204D	1.25	1.25	1.270	6.00	1.00	1.00	RC..43	SR4	MS1158	T15
SRACL244D	1.50	1.50	1.520	6.00	1.00	1.00	RC..43	SR4	MS1158	T15





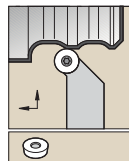
See pages B100–B102 for inserts.



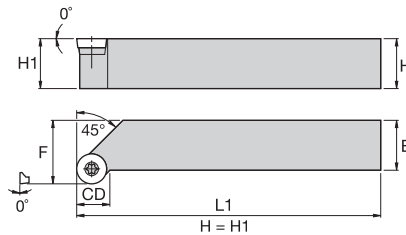
SRCC

O.D./I.D. Tooling

catalog number	CD	H	B	F	L1	L2	gage insert	shim	insert screw	Torx
right hand										
SRCCR122B	.81	.75	.75	1.00	4.50	1.66	RC..215	—	MS1153	T7
SRCCR162D	.81	1.00	1.00	1.25	6.00	1.66	RC..215	—	MS1153	T7
SRCCR123B	1.02	.75	.75	1.00	4.50	1.88	RC..325	SR3	MS1156	T15
SRCCR163D	1.02	1.00	1.00	1.25	6.00	1.88	RC..325	SR3	MS1156	T15
SRCCR203D	1.02	1.25	1.25	1.50	6.00	1.88	RC..325	SR3	MS1156	T15
left hand										
SRCCL162D	.81	1.00	1.00	1.25	6.00	1.66	RC..215	—	MS1153	T7
SRCCL123B	1.02	.75	.75	1.00	4.50	1.88	RC..325	SR3	MS1156	T15
SRCCL163D	1.02	1.00	1.00	1.25	6.00	1.88	RC..325	SR3	MS1156	T15
SRCCL203D	1.02	1.25	1.25	1.50	6.00	1.88	RC..325	SR3	MS1156	T15



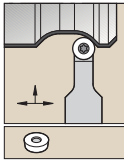
See pages B100–B102 for inserts.



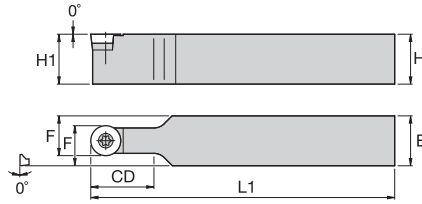
SRGC

catalog number	H	B	F	L1	CD	gage insert	shim	insert screw	Torx
right hand									
SRGCR122	.75	.75	1.000	4.50	.40	RC..215	—	MS1153	T7
SRGCR162	1.00	1.00	1.250	6.00	.40	RC..215	—	MS1153	T7
SRGCR163	1.00	1.00	1.250	6.00	.41	RC..325	SR3	MS1156	T15
SRGCR203	1.25	1.25	1.500	6.00	.43	RC..325	SR3	MS1156	T15
left hand									
SRGCL162	1.00	1.00	1.250	6.00	.40	RC..215	—	MS1153	T7
SRGCL203	1.25	1.25	1.500	6.00	.43	RC..325	SR3	MS1156	T15





See pages B100–B102 for inserts.

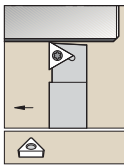


■ SROC

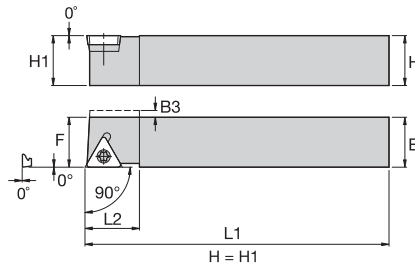
catalog number	H	B	F	L1	CD	gage insert	shim	insert screw	Torx
SROCN102	.63	.63	.438	4.00	.62	RC..215	—	MS1153	T7
SROCN122	.75	.75	.500	4.50	.75	RC..215	—	MS1153	T7
SROCN162	1.00	1.00	.625	6.00	1.00	RC..215	—	MS1153	T7
SROCN123	.75	.75	.562	4.50	.75	RC..325	SR3	MS1156	T15
SROCN163	1.00	1.00	.688	6.00	1.00	RC..325	SR3	MS1156	T15
SROCN203	1.25	1.25	.812	6.00	1.25	RC..325	SR3	MS1156	T15



O.D./I.D. Tooling



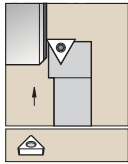
See pages B105–B108 for inserts.



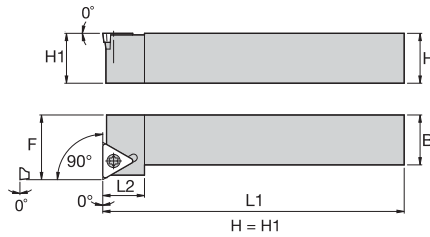
■ STAC 0°

catalog number	H	B	F	L1	L2	B3	gage insert	shim	shim screw	hex	insert screw	Torx
right hand												
STACR062D	.38	.38	.375	6.00	.62	.09	TC..2151	—	—	—	MS1153	T7
STACR082D	.50	.50	.500	6.00	.62	—	TC..2151	—	—	—	MS1153	T7
STACR103B	.63	.63	.625	4.50	.75	—	TC..3252	SKTP343	SRS3	3.5 mm	MS1156	T15
left hand												
STACL082D	.50	.50	.500	6.00	.62	—	TC..2151	—	—	—	MS1153	T7
STACL103B	.63	.63	.625	4.50	.75	—	TC..3252	SKTP343	SRS3	3.5 mm	MS1156	T15





See pages B105–B108 for inserts.

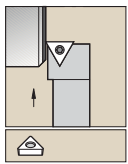


■ **STFC 0°**

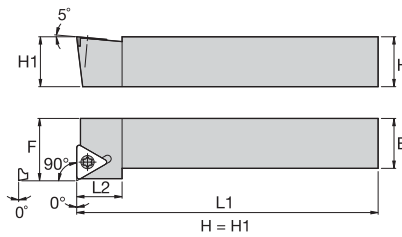
O.D./I.D. Tooling



catalog number	H	B	F	L1	L2	gage insert	shim	shim screw	hex	insert screw	Torx
right hand											
STFCR062	.38	.38	.500	2.50	.62	TC..2151	—	—	—	MS1153	T7
STFCR163	1.00	1.00	1.250	6.00	.75	TC..3252	SKTP343	SRS3	3.5 mm	MS1156	T15
left hand											
STFCL062	.38	.38	.500	2.50	.62	TC..2151	—	—	—	MS1153	T7
STFCL123	.75	.75	1.000	4.50	.75	TC..3252	SKTP343	SRS3	3.5 mm	MS1156	T15
STFCL163	1.00	1.00	1.250	6.00	.75	TC..3252	SKTP343	SRS3	3.5 mm	MS1156	T15



See pages B109–B112 for inserts.

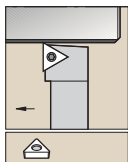


■ **STFP 0°**

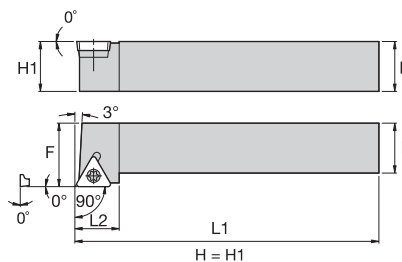


catalog number	H	B	F	L1	L2	gage insert	insert screw	Torx
right hand								
STFPR062	.38	.38	.500	2.50	.44	TP..2151	MS1153	T7
left hand								
STFPL062	.38	.38	.500	2.50	.44	TP..2151	MS1153	T7

NOTE: ANSI/ISO compatible 60° countersunk hole insert.
This tool will also accept TPMT/TPGM/TPGT/TPGW-21.5_ inserts.



See pages B105–B108 for inserts.







■ **STGC 0°**

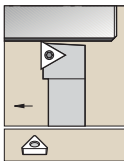


catalog number	H	B	F	L1	L2	gage insert	shim	shim screw	hex	insert screw	Torx
right hand											
STGCR062	.38	.38	.500	2.50	.62	TC..2151	—	—	—	MS1153	T7
STGCR082	.50	.50	.625	3.50	.62	TC..2151	—	—	—	MS1153	T7
STGCR103	.63	.63	.750	4.00	.75	TC..3252	SKTP343	SRS3	3.5 mm	MS1156	T15
STGCR123	.75	.75	1.000	4.50	.75	TC..3252	SKTP343	SRS3	3.5 mm	MS1156	T15
STGCR163	1.00	1.00	1.250	6.00	.75	TC..3252	SKTP343	SRS3	3.5 mm	MS1156	T15

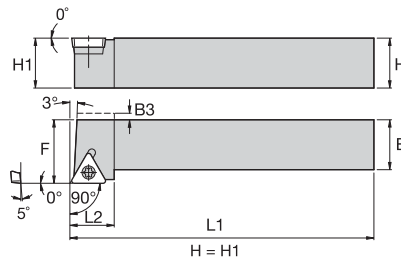
(continued)

(STGC 0° continued)


catalog number	H	B	F	L1	L2	gage insert	   				Torx
							shim	shim screw	hex	insert screw	
left hand											
STGCL062	.38	.38	.500	2.50	.62	TC..2151	—	—	—	MS1153	T7
STGCL082	.50	.50	.625	3.50	.62	TC..2151	—	—	—	MS1153	T7
STGCL103	.63	.63	.750	4.00	.75	TC..3252	SKTP343	SRS3	3.5 mm	MS1156	T15
STGCL123	.75	.75	1.000	4.50	.75	TC..3252	SKTP343	SRS3	3.5 mm	MS1156	T15
STGCL163	1.00	1.00	1.250	6.00	.75	TC..3252	SKTP343	SRS3	3.5 mm	MS1156	T15



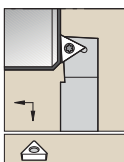
See pages B109–B112 for inserts.



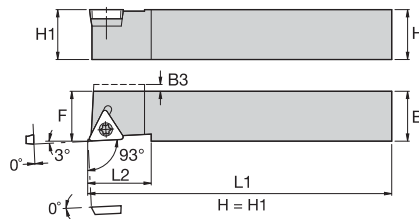
■ STGP 0°

catalog number	H	B	F	L1	L2	gage insert			Torx
							insert screw		
right hand									
STGPR062	.38	.38	.500	2.50	.56	TP..2151	MS1153		T7
STGPR082V	.50	.50	.625	3.50	.56	TP..2151	MS1153		T7
left hand									
STGPL062	.38	.38	.500	2.50	.56	TP..2151	MS1153		T7
STGPL082V	.50	.50	.625	3.50	.56	TP..2151	MS1153		T7





NOTE: ANSI/ISO compatible 60° countersunk hole insert.
This tool will also accept TPMT/TPGM/TPGT/TPGW-21.5_ inserts.

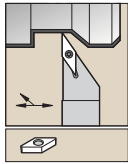


See pages B105–B108 for inserts.

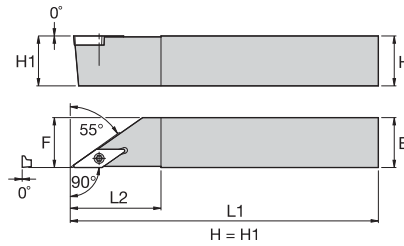


■ STJC-F -3°

catalog number	H	B	F	L1	L2	B3	gage insert	   				Torx
								shim	shim screw	hex	insert screw	
right hand												
STJCRF062D	.38	.38	.375	6.00	.62	.09	TC..2151	—	—	—	MS1153	T7
STJCRF082D	.50	.50	.500	6.00	.62	—	TC..2151	—	—	—	MS1153	T7
STJCRF102B	.63	.63	.625	4.50	.62	—	TC..2151	—	—	—	MS1153	T7
STJCRF103B	.63	.63	.625	4.50	.75	—	TC..3252	SKTP343	SRS3	3.5 mm	MS1156	T15
left hand												
STJCLF062D	.38	.38	.375	6.00	.62	.09	TC..2151	—	—	—	MS1153	T7



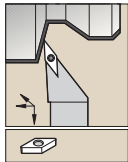
See pages B113–B114 for inserts.



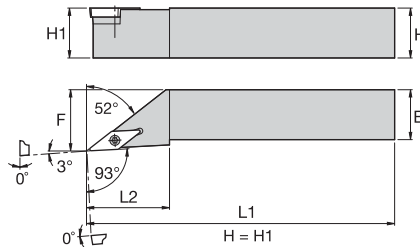
■ SVAB -0°

O.D./I.D. Tooling

catalog number	H	B	F	L1	L2	gage insert	insert screw	Torx
right hand								
SVABR062D	.38	.38	.375	6.00	.88	VB..221	MS1153	T7
SVABR082D	.50	.50	.500	6.00	.88	VB..221	MS1153	T7
SVABR103B	.63	.63	.625	4.50	1.38	VB..332	MS1155	T15
left hand								
SVABL062D	.38	.38	.375	6.00	.88	VB..221	MS1153	T7
SVABL082D	.50	.50	.500	6.00	.88	VB..221	MS1153	T7
SVABL103B	.63	.63	.625	4.50	1.38	VB..332	MS1155	T15



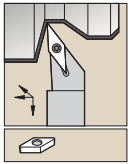
See pages B113–B114 for inserts.



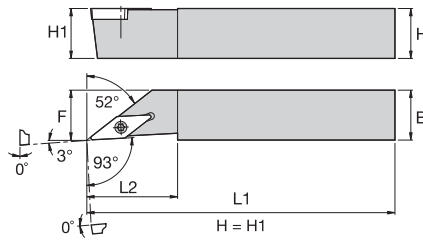
■ SVJB -3°

catalog number	H	B	F	L1	L2	gage insert	shim	shim screw	hex	insert screw	Torx
right hand											
SVJBR062	.38	.38	.500	2.50	.88	VB..221	—	—	—	MS1153	T7
SVJBR082	.50	.50	.625	3.50	.88	VB..221	—	—	—	MS1153	T7
SVJBR102	.63	.63	.750	4.00	.88	VB..221	—	—	—	MS1153	T7
SVJBR123	.75	.75	1.000	4.50	1.38	VB..332	SKVN343	SRS3	3.5 mm	MS1156	T15
SVJBR163	1.00	1.00	1.250	6.00	1.38	VB..332	SKVN343	SRS3	3.5 mm	MS1156	T15
left hand											
SVJBL062	.38	.38	.500	2.50	.88	VB..221	—	—	—	MS1153	T7
SVJBL082	.50	.50	.625	3.50	.88	VB..221	—	—	—	MS1153	T7
SVJBL102	.63	.63	.750	4.00	.88	VB..221	—	—	—	MS1153	T7
SVJBL123	.75	.75	1.000	4.50	1.38	VB..332	SKVN343	SRS3	3.5 mm	MS1156	T15
SVJBL163	1.00	1.00	1.250	6.00	1.38	VB..332	SKVN343	SRS3	3.5 mm	MS1156	T15





See pages B113–B114 for inserts.

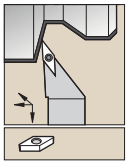


■ SVJB-F -3°

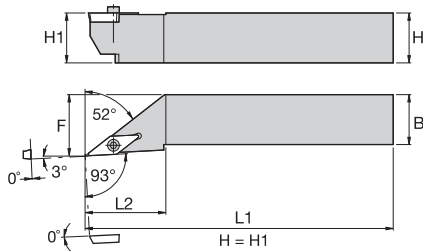
catalog number	H	B	F	L1	L2	gage insert	insert screw	Torx
right hand								
SVJBRF062D	.38	.38	.375	6.00	.94	VB..221	MS1153	T7
SVJBRF082D	.50	.50	.500	6.00	.94	VB..221	MS1153	T7
SVJBRF103B	.63	.63	.625	4.50	1.44	VB..332	MS1155	T15
left hand								
SVJBLF062D	.38	.38	.375	6.00	.94	VB..221	MS1153	T7
SVJBLF082D	.50	.50	.500	6.00	.94	VB..221	MS1153	T7
SVJBLF103B	.63	.63	.625	4.50	1.44	VB..332	MS1155	T15



O.D./I.D. Tooling



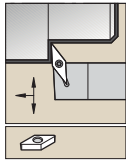
See pages B113–B114 for inserts.



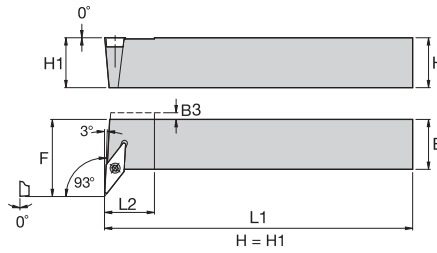
■ SVJP-W -3°

catalog number	H	B	F	L1	L2	gage insert	insert screw	hex
right hand								
SVJPR164EW	1.00	1.00	1.250	7.00	1.62	VP..443	S411	5/32
left hand								
SVJPL164EW	1.00	1.00	1.250	7.00	1.62	VP..443	S411	5/32





See pages B113–B114 for inserts.

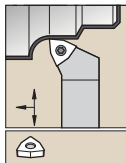


SVUB -3°

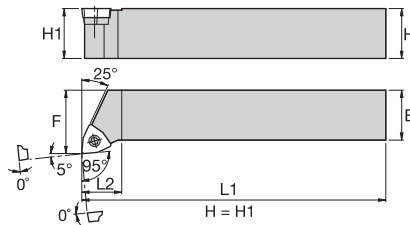
O.D./I.D. Tooling



catalog number	H	B	F	L1	L2	B3	gage insert	insert screw	Torx
right hand SVUBR082	.50	.50	.830	3.50	.50	.12	VB..221	MS1153	T7
SVUBR102	.63	.63	.955	4.00	.50	—	VB..221	MS1153	T7
left hand SVUBL082	.50	.50	.830	3.50	.50	.12	VB..221	MS1153	T7
SVUBL102	.63	.63	.955	4.00	.50	—	VB..221	MS1153	T7



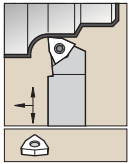
See pages B114–B115 for inserts.



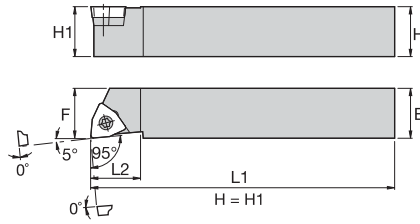
SWLC -5°



catalog number	H	B	F	L1	L2	gage insert	insert screw	Torx
right hand SWLCR082	.50	.50	.625	3.50	.50	WC..2151	MS1153	T7
SWLCR102	.63	.63	.750	4.00	.50	WC..2151	MS1153	T7
left hand SWLCL082	.50	.50	.625	3.50	.50	WC..2151	MS1153	T7
SWLCL102	.63	.63	.750	4.00	.50	WC..2151	MS1153	T7



See pages B114–B115 for inserts.

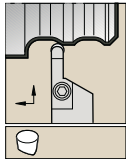


■ SWLC-F -5°

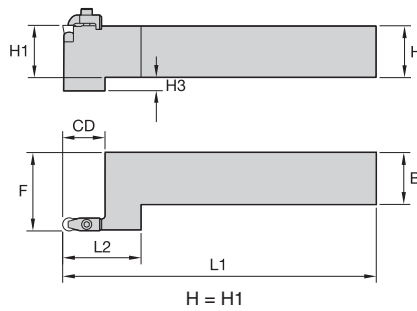


catalog number	H	B	F	L1	L2	gage insert	shim	shim screw	hex	insert screw	Torx
right hand SWLCRF082D	.50	.50	.500	6.00	.50	WC..2151	—	—	—	MS1153	T7
left hand SWLCRF103B	.63	.63	.625	4.50	.62	WC..3252	SKWP343	SRS3	3.5 mm	MS1156	T15
right hand SWLCLF082D	.50	.50	.500	6.00	.50	WC..2151	—	—	—	MS1153	T7
left hand SWLCLF103B	.63	.63	.625	4.50	.62	WC..3252	SKWP343	SRS3	3.5 mm	MS1156	T15

O.D./I.D. Tooling

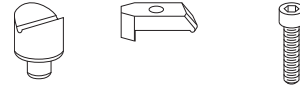


See pages B128–B129 for inserts.

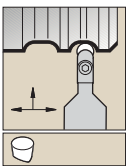


■ 411-VRS

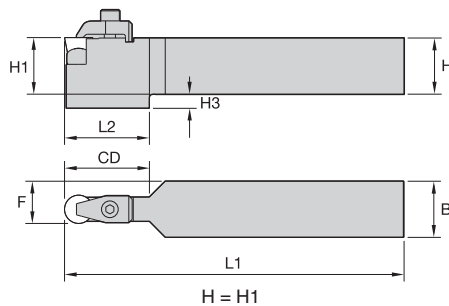
O.D./I.D. Tooling



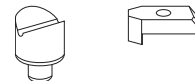
catalog number	H	B	F	L1	L2	CD	H3	gage insert	nest	clamp	clamp screw	hex
right hand												
4111492VRS	1.00	1.00	1.500	6.00	1.50	.75	.25	R..V23	NST1	CM214	MS1321	2.5 mm
4111573VRS	1.00	1.00	1.000	6.00	1.19	1.13	.25	R..V35	NST2	CM219	CS412	3.5 mm
4111593VRS	1.25	1.25	1.250	6.00	1.19	1.13	—	R..V35	NST2	CM219	CS412	3.5 mm
4111613VRS	1.50	1.50	1.500	6.00	1.19	1.10	—	R..V35	NST2	CM219	CS412	3.5 mm
4111654VRS	1.00	1.00	1.000	6.00	1.56	1.50	.25	R..V45	NST3	CM216	CS412	3.5 mm
4111674VRS	1.25	1.25	1.250	6.00	1.56	1.50	—	R..V45	NST3	CM216	CS412	3.5 mm
4111694VRS	1.50	1.50	1.500	6.00	1.56	1.50	—	R..V45	NST3	CM216	CS412	3.5 mm
left hand												
4111603VRS	1.25	1.25	1.250	6.00	1.19	1.13	—	R..V35	NST2	CM219	CS412	3.5 mm
4111664VRS	1.00	1.00	1.000	6.00	1.50	1.50	.25	R..V45	NST3	CM216	CS412	3.5 mm
4111684VRS	1.25	1.25	1.250	6.00	1.56	1.50	—	R..V45	NST3	CM216	CS412	3.5 mm



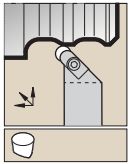
See pages B128–B129 for inserts.



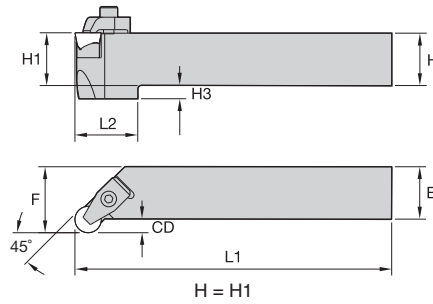
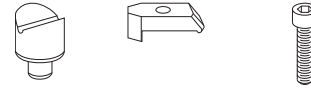
■ CRDP



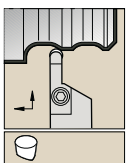
catalog number	H	B	F	L1	CD	H3	gage insert	nest	clamp	clamp screw	hex
CRDPN162DV	1.00	1.00	.496	6.00	.75	—	R..V23	NST1	CM214	MS1321	2.5 mm
CRDPN163DV	1.00	1.00	.496	6.00	1.13	—	R..V35	NST2	CM219	CS412	3.5 mm
CRDPN203DV	1.25	1.25	.621	6.00	1.13	—	R..V35	NST2	CM219	CS412	3.5 mm
CRDPN164DV	1.00	1.00	.496	6.00	1.50	.25	R..V45	NST3	CM216	CS412	3.5 mm
CRDPN204DV	1.25	1.25	.621	6.00	1.50	—	R..V45	NST3	CM216	CS412	3.5 mm
CRDPN205DV	1.25	1.25	.621	6.00	1.50	.25	R..V565	NST4	CM217	MS1294	6 mm
CRDPN206DV	1.25	1.25	.621	6.00	1.50	.25	R..V665	NST5	CM217	MS1294	6 mm
CRDPN246DV	1.50	1.50	.746	6.00	1.50	—	R..V665	NST5	CM217	MS1294	6 mm
CRDPN248DV	1.50	1.50	.746	6.00	1.75	.25	R..V88	NST6	CM218	MS1242	8 mm



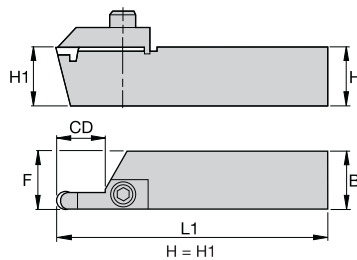
See pages B128–B129 for inserts.


■ CRGP


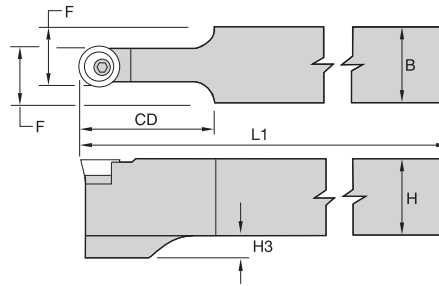
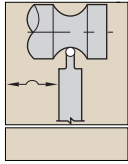
catalog number	H	B	F	L1	CD	H3	gage insert	nest	clamp	clamp screw	hex
right hand											
CRGPR162DV	1.00	1.00	1.250	6.00	.25	—	R..V23	NST1	CM214	MS1321	2.5 mm
CRGPR163DV	1.00	1.00	1.250	6.00	.25	—	R..V35	NST2	CM219	CS412	3.5 mm
CRGPR164DV	1.00	1.00	1.250	6.00	.25	.25	R..V45	NST3	CM216	CS412	3.5 mm
CRGPR203DV	1.25	1.25	1.500	6.00	.25	—	R..V35	NST2	CM219	CS412	3.5 mm
CRGPR204DV	1.25	1.25	1.500	6.00	.25	—	R..V45	NST3	CM216	CS412	3.5 mm
CRGPR205DV	1.25	1.25	1.500	6.00	.25	.25	R..V565	NST4	CM217	MS1294	6 mm
CRGPR206DV	1.25	1.25	1.500	6.00	.25	.25	R..V665	NST5	CM217	MS1294	6 mm
CRGPR246DV	1.50	1.50	1.750	6.00	.25	—	R..V665	NST5	CM217	MS1294	6 mm
left hand											
CRGPL162DV	1.00	1.00	1.250	6.00	.25	—	R..V23	NST1	CM214	MS1321	2.5 mm
CRGPL163DV	1.00	1.00	1.250	6.00	.25	—	R..V35	NST2	CM219	CS412	3.5 mm
CRGPL164DV	1.00	1.00	1.250	6.00	.25	.25	R..V45	NST3	CM216	CS412	3.5 mm
CRGPL203DV	1.25	1.25	1.500	6.00	.25	—	R..V35	NST2	CM219	CS412	3.5 mm
CRGPL204DV	1.25	1.25	1.500	6.00	.25	—	R..V45	NST3	CM216	CS412	3.5 mm
CRGPL205DV	1.25	1.25	1.500	6.00	.25	.25	R..V565	NST4	CM217	MS1294	6 mm
CRGPL206DV	1.25	1.25	1.500	6.00	.25	.25	R..V665	NST5	CM217	MS1294	6 mm
CRGPL246DV	1.50	1.50	1.750	6.00	.25	—	R..V665	NST5	CM217	MS1294	6 mm



See pages B128–B129 for inserts.


■ VRAO


catalog number	H	B	F	L1	CD	gage insert	clamp	clamp screw	hex
right hand									
VRAOR203E	1.25	1.25	1.281	7.00	1.31	R..V35	CM148	S153	3/16
left hand									
VRAOL203E	1.25	1.25	1.281	7.00	1.31	R..V35	CM149	S153	3/16



Bevel Lock

O.D./I.D. Tooling

catalog number	H	B	F	L1	CD	H3	gage insert	lock pin		
								shim	lock pin	hex
PROON164D	1.00	1.00	.750	6.00	1.86	—	RC..43	SMRN42B	BP46	3/32
PROON204D	1.25	1.25	.875	6.00	1.88	—	RC..43	SMRN42B	BP46	3/32
PROON244D	1.50	1.50	1.000	6.00	1.88	—	RC..43	SMRN42B	BP46	3/32
PROON206D	1.25	1.25	1.000	6.00	2.36	—	RC..64	SMRN63B	BP68	1/8
PROON246	1.50	1.50	1.125	8.00	2.37	—	RC..64	SMRN63B	BP68	1/8
PROON208D	1.25	1.25	1.125	6.00	2.32	.25	RC..86	SMRN84B	BP812	9/64
PROON248	1.50	1.50	1.250	8.00	2.37	—	RC..86	SMRN84B	BP812	9/64
PROON328	2.00	2.00	1.500	18.00	4.50	—	RC..86	SMRN84B	BP812	9/64
PROON3210	2.00	2.00	1.625	18.00	4.50	—	RC..106	SMRN104B	BP812	9/64

NOTE: These toolholders accept RCGH-43 inserts only. RCMH-43 inserts will not fit.



Beyond BLAST™ • The First Through-Insert Coolant Delivery System from Kennametal

That's **Beyond BLAST™** 
That's **Different Thinking.**

We didn't just improve metalcutting technology. We reinvented it.

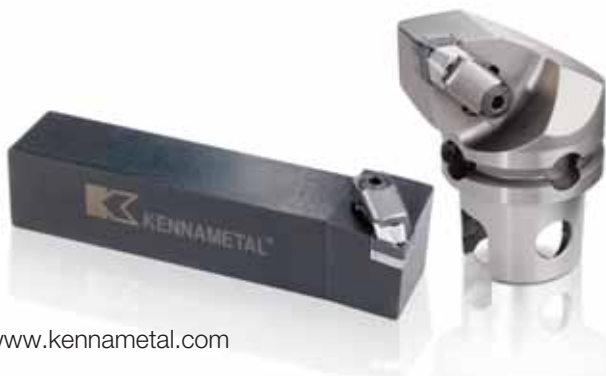
Introducing Beyond BLAST, a revolutionary insert platform that delivers many of the benefits of high-pressure systems at conventional coolant pressures. Advanced coolant-application technology makes cutting more efficient and effective — while extending tool life. This tool is specifically designed for titanium and other high-temp alloys.

Higher Productivity, Extended Tool Life

- Increased tool life up to 300%, depending on the insert geometry and cutting conditions.
- Significant productivity and tool life increase in titanium machining.
- Higher metal removal rates and reduced cycle time.
- Chipbreaker design in combination with PCT provides excellent chip control and workpiece finish.

Versatility

- Ideal for applications where productivity or tool life is limited due to excess heat generated.
- Offered as a standard item with engineered solution capabilities.
- Provides increased performance with high-pressure or low-pressure coolant delivery systems.



tool path	insert shape	clamping style	boring	back boring	profiling	page(s)	
0° Lead Angle							
		Kenloc™	•			C80	
		Screw-On	•	•		C94-C97	
		Kenclamp	•			C76	
		Kenloc	•			C84	
		Kenclamp	•			C79	
		Kendex™	•	•		C91-C93	
		Screw-On	•	•		C108-C111	
-3° Lead Angle							
		Kenloc	•	•		C83	
		Kenclamp	•	•		C78	
		Screw-On	•		•		C105-C106
		TNT	•		•		-
		Kenloc	•	•		C85	
		Screw-On	•		•		C114
		Kenloc	•			C84	
		Screw-On	•			-	
		Screw-On	•		•	C118	
-5° Lead Angle							
		Kenloc	•	•		C81	
		Kenclamp	•	•		C77	
		Kendex	•		•		C87, C90
		Screw-On	•		•		C97-C98 C100-C104
		TNT	•		•		-

tool path	insert shape	clamping style	boring	back boring	profiling	page(s)
-5° Lead Angle						
		Kenloc	•		•	C89
		Screw-On	•		•	C111-C113
		Screw-On		•		C107
		Screw-On	•		•	C114
		Kenloc	•			C85
		Screw-On	•		•	C115-C117
		TNT	•		•	C87
7° Lead Angle						
		Screw-On	•		•	C99
-10° Lead Angle						
		Screw-On	•		•	C114
15 and -15° Lead Angle						
		Kenloc	•			C80
		Kenclamp	•			C76
		Kenloc	•			C83
		Kenclamp	•			C79
		Kendex	•			C90
		TNT	•			-
		Screw-On	•		•	-
		Screw-On	•		•	-
	-15° lead angle					

tool path	insert shape	clamping style	turning	profiling	facing	page(s)	tool path	insert shape	clamping style	turning	profiling	facing	page(s)
■ -17.5° Lead Angle							■ 45° Lead Angle						
		Kenloc™	•	•		C82			Kenloc	•			–
		Kenclamp™	•		•					C78			
		Screw-On	•		•	C114			Kendex™	•		•	C88
		TNT			•					C87			
■ 27.5° Lead Angle													
		Kenloc	•		•	C82							
		Kenclamp	•			•	C77						

Clamping Styles

Kenclamp Style

- Suitable for Kenloc inserts.
- Unique clamp design provides rigid clamping.
- Ensures insert repeatability and seating.
- Reduced chatter and improved tool life.

Screw-On Style

- Top clamping by screw for Screw-On inserts.

Top Notch™ Turning Style

- Proven superior system in holding ceramic inserts rigidly in turning and profiling operations.
- Uses standard insert sizes — 80°, 75°, 55°, square, and trigon.
- This system offers the added versatility of using optional hardware to hold standard Kendex and Kenloc inserts.

Kenloc Style

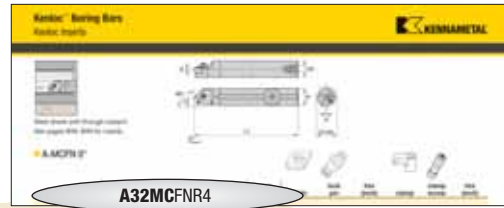
- Suitable for Kenloc inserts.
- Lock pin and top clamp provide rigid clamping.
- Wide variety of insert styles may be used.
- Tools may be used with or without clamp.

Kendex Style

- Suitable for Kendex inserts.
- Chipbreaker option available for ceramic inserts.
- Wide variety of insert styles may be used.

How Do Catalog Numbers Work?

Each character in our catalog number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.

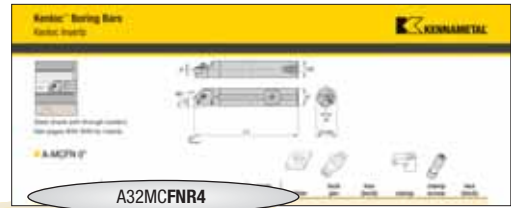


O.D./I.D. Tooling

	A Bar Type	32 Bar Diameter		M Insert Holding Method	C Insert Shape
A	 Steel bar with coolant	Inch: A two-digit number indicates the bar diameter in 1/16" increments	3 = F 3.5 = G 4 = H 4.5 = J 5 = K 5.5 = L 6 = M 6.5 = N 7 = Q 8 = R 10 = S 12 = T 14 = U 16 = V 18 = W 20 = Y	C Kendex™	A
S	 Steel bar without coolant			N Top Notch™ Profiling	B
C	 Carbide bar			D Kenclamp™	C
D	 DeVibrator bar with coolant			M Kenloc™	D
D	 Tuneable bar with coolant			S Screw-On	E
E	 Carbide bar with coolant			P Kenlever™	H
B	 DeVibrator				K
H	 Interchangeable head				L
L	 Heavy metal bar with coolant				M
					O
			P		
			R		
			S		
			T		
			V		
			W		

** Used only when more than one length is available or a special length is required.

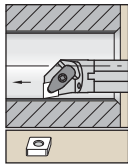
By referencing this easy-to-use guide, you can identify the correct product to meet your needs.



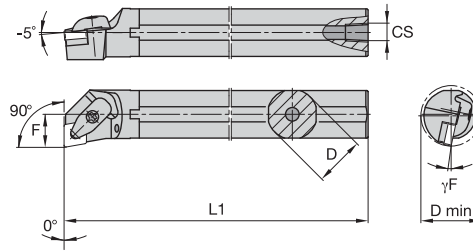
A32MCFNR4

F	N	R	4	
Bar Style or Lead Angle	Insert Clearance Angle	Hand of Tool	Insert Size	Additional Information
E	N 0°	R = Right-hand boring bar 	Inserts IC Number of 1/8ths of "D"	M.. = TNT/MTS clamping systems for ceramic and PCBN inserts D = Dual pocket AP5 = Axial positive KC = Kenclamp + = Insert thickness
F	B 5°	L = Left-hand boring bar 		
K	C 7°			
L	P 11°			
(E-style inserts) L	D 15°			
P	E 20°			
Q	F 25°			
S				
U				
X				

O.D./I.D. Tooling



Steel shank with through coolant.
See pages B40–B49 for inserts.

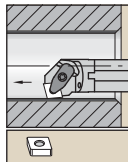


■ **A-DCFN-KC 0°**

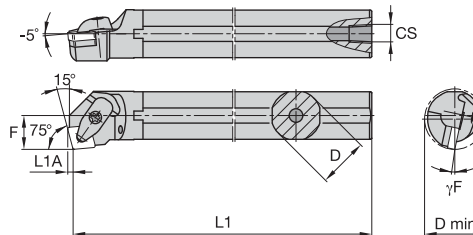
O.D./I.D. Tooling



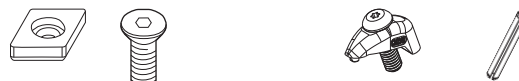
catalog number	D	D min	F	L1	CS	γF°	gage insert	shim	shim screw	wrench size shim screw	clamp assembly	slotted pin	wrench size clamp screw
right hand													
A16TDCFN4KC3	1.000	1.200	.640	12.00	1/4-18 NPT	-12.0	CN..432	—	—	—	CM234RLP ASSY	SSP025016M	15 IP
A20UDCFNR4KC3	1.250	1.470	.765	14.00	1/4-18 NPT	-12.0	CN..432	ICSN433	KMSP4S15IP	15 IP	CM234R ASSY	SSP025016M	15 IP
A24UDCFNR4KC3	1.500	1.760	.890	14.00	1/4-18 NPT	-10.0	CN..432	ICSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP
left hand													
A16TDCFNL4KC3	1.000	1.200	.640	12.00	1/4-18 NPT	-12.0	CN..432	—	—	—	CM234RLP ASSY	SSP025016M	15 IP
A20UDCFNL4KC3	1.250	1.470	.765	14.00	1/4-18 NPT	-12.0	CN..432	ICSN433	KMSP4S15IP	15 IP	CM234R ASSY	SSP025016M	15 IP
A24UDCFNL4KC3	1.500	1.760	.890	14.00	1/4-18 NPT	-10.0	CN..432	ICSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP



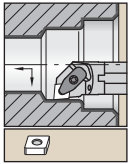
Steel shank with through coolant.
See pages B40–B49 for inserts.



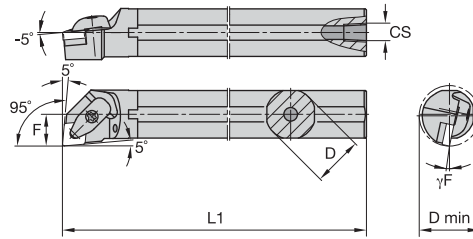
■ **A-DCKN-KC 15°**



catalog number	D	D min	F	L1	L1A	CS	γF°	gage insert	shim	shim screw	wrench size shim screw	clamp assembly	slotted pin	wrench size clamp screw
right hand														
A20UDCKNR4KC3	1.250	1.470	.765	14.00	.12	1/4-18 NPT	-14.0	CN..432	ICSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP
A24UDCKNR4KC3	1.500	1.760	.890	14.00	.12	1/4-18 NPT	-12.0	CN..432	ICSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP
A32VDCKNR4KC3	2.000	2.400	1.281	16.00	.12	1/4-18 NPT	-8.0	CN..432	ICSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP
A32VDCKNR5KC4	2.000	2.400	1.281	16.00	.15	1/4-18 NPT	-10.0	CN..543	ICSN533	KMSP515IP	15 IP	CM209R ASSY	SSP025018M	15 IP
left hand														
A20UDCKNL4KC3	1.250	1.470	.765	14.00	.12	1/4-18 NPT	-14.0	CN..432	ICSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP
A24UDCKNL4KC3	1.500	1.760	.890	14.00	.12	1/4-18 NPT	-12.0	CN..432	ICSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP
A32VDCKNL4KC3	2.000	2.400	1.281	16.00	—	1/4-18 NPT	-8.0	CN..432	ICSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP
A32VDCKNL5KC4	2.000	2.400	1.281	16.00	—	1/4-18 NPT	-10.0	CN..543	ICSN533	KMSP515IP	15 IP	CM209R ASSY	SSP025018M	15 IP



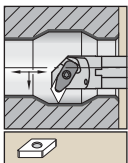
Steel shank with through coolant.
See pages B40–B49 for inserts.



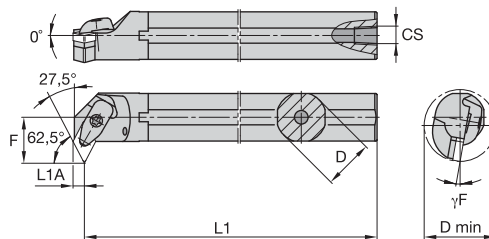
A-DCLN-KC -5°



catalog number	D	D min	F	L1	CS	γF°	gage insert	shim	shim screw	wrench size shim screw	clamp assembly	slotted pin	wrench size clamp screw
right hand													
A16TDCLNR3KC2	1.000	1.200	.640	12.00	1/4-18 NPT	-10.0	CN..322	—	—	—	CM234RLP ASSY	SSP025016M	9 IP
A16TDCLNR4KC3	1.000	1.200	.640	12.00	1/4-18 NPT	-12.0	CN..432	—	—	—	CM234RLP ASSY	SSP025016M	15 IP
A20UDCLNR4KC3	1.250	1.470	.765	14.00	1/4-18 NPT	-12.0	CN..432	ICSN433	KMSP4S15IP	15 IP	CM234R ASSY	SSP025016M	15 IP
A24UDCLNR4KC3	1.500	1.760	.890	14.00	1/4-18 NPT	-12.0	CN..432	ICSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP
A28UDCLNR4KC3	1.750	2.010	1.015	14.00	1/4-18 NPT	-12.0	CN..432	ICSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP
A32VDCLNR4KC3	2.000	2.400	1.281	16.00	1/4-18 NPT	-12.0	CN..432	ICSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP
A40VDCLNR4KC3	2.500	3.030	1.531	16.00	1/4-18 NPT	-8.0	CN..432	ICSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP
A24UDCLNR5KC4	1.500	1.760	.890	14.00	1/4-18 NPT	-14.0	CN..543	ICSN533	KMSP5S15IP	15 IP	CM209R ASSY	SSP025018M	15 IP
A32VDCLNR5KC4	2.000	2.400	1.281	16.00	1/4-18 NPT	-12.0	CN..543	ICSN533	KMSP515IP	15 IP	CM209R ASSY	SSP025018M	15 IP
A32VDCLNR6KC4	2.000	2.400	1.281	16.00	1/4-18 NPT	-12.0	CN..643	ICSN633	KMSP625IP	25 IP	CM210R ASSY	SSP025018M	25 IP
A40VDCLNR6KC4	2.500	3.030	1.531	16.00	1/4-18 NPT	-10.0	CN..643	ICSN633	KMSP625IP	25 IP	CM210R ASSY	SSP025018M	25 IP
left hand													
A16TDCLNL3KC2	1.000	1.200	.640	12.00	1/4-18 NPT	-10.0	CN..322	—	—	—	CM234RLP ASSY	SSP025016M	9 IP
A16TDCLNL4KC3	1.000	1.200	.640	12.00	1/4-18 NPT	-12.0	CN..432	—	—	—	CM234RLP ASSY	SSP025016M	15 IP
A20UDCLNL4KC3	1.250	1.470	.765	14.00	1/4-18 NPT	-12.0	CN..432	ICSN433	KMSP4S15IP	15 IP	CM234R ASSY	SSP025016M	15 IP
A24UDCLNL4KC3	1.500	1.760	.890	14.00	1/4-18 NPT	-12.0	CN..432	ICSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP
A28UDCLNL4KC3	1.750	2.010	1.015	14.00	1/4-18 NPT	-12.0	CN..432	ICSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP
A32VDCLNL4KC3	2.000	2.400	1.281	16.00	1/4-18 NPT	-12.0	CN..432	ICSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP
A40VDCLNL4KC3	2.500	3.030	1.531	16.00	1/4-18 NPT	-8.0	CN..432	ICSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP
A24UDCLNL5KC4	1.500	1.760	.890	14.00	1/4-18 NPT	-14.0	CN..543	ICSN533	KMSP5S15IP	15 IP	CM209R ASSY	SSP025018M	15 IP
A32VDCLNL5KC4	2.000	2.400	1.281	16.00	1/4-18 NPT	-12.0	CN..543	ICSN533	KMSP515IP	15 IP	CM209R ASSY	SSP025018M	15 IP
A32VDCLNL6KC4	2.000	2.400	1.281	16.00	1/4-18 NPT	-12.0	CN..643	ICSN633	KMSP625IP	25 IP	CM210R ASSY	SSP025018M	25 IP
A40VDCLNL6KC4	2.500	3.030	1.531	16.00	1/4-18 NPT	-10.0	CN..643	ICSN633	KMSP625IP	25 IP	CM210R ASSY	SSP025018M	25 IP



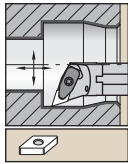
Steel shank with through coolant.
See pages B50–B57 for inserts.



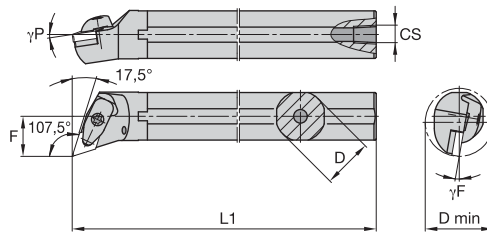
A-DDPN-KC 27.5°



catalog number	D	D min	F	L1	L1A	CS	γF°	gage insert	shim	shim screw	wrench size shim screw	clamp assembly	slotted pin	wrench size clamp screw
right hand														
A20UDDPNR4KC3	1.250	1.705	1.000	14.00	.26	1/4-18 NPT	-13.0	DN.432	IDSN443	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP
A24UDDPNR4KC3	1.500	2.000	1.125	14.00	.26	1/4-18 NPT	-10.0	DN.432	IDSN443	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP
left hand														
A20UDDPNL4KC3	1.250	1.705	1.000	14.00	.26	1/4-18 NPT	-13.0	DN.432	IDSN443	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP
A24UDDPNL4KC3	1.500	2.000	1.125	14.00	.26	1/4-18 NPT	-10.0	DN.432	IDSN443	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP

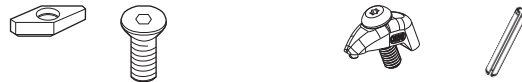


Steel shank with through coolant.
See pages B50–B57 for inserts.

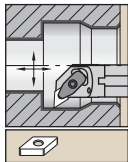


A-DDQN-KC -17.5°

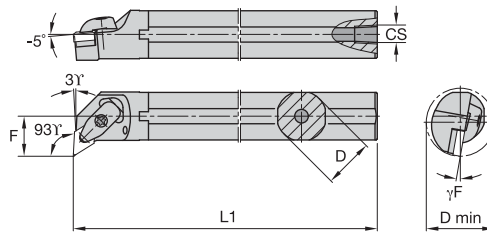
O.D./I.D. Tooling



catalog number	D	D min	F	L1	CS	γF°	γP°	gage insert	shim	shim screw	wrench size shim screw	clamp assembly	slotted pin	wrench size clamp screw
right hand														
A20UDDQNR4KC3	1.250	1.705	1.000	14.00	1/4-18 NPT	-10.0	-12.0	DN.432	IDSN443 KMSP415IP	15 IP	15 IP	CM234R ASSY	SSP025016M	15 IP
A24UDDQNR4KC3	1.500	2.000	1.125	14.00	1/4-18 NPT	-8.5	-8.5	DN.432	IDSN443 KMSP415IP	15 IP	15 IP	CM234R ASSY	SSP025016M	15 IP
left hand														
A20UDDQNL4KC3	1.250	1.705	1.000	14.00	1/4-18 NPT	-10.0	-12.0	DN.432	IDSN443 KMSP415IP	15 IP	15 IP	CM234R ASSY	SSP025016M	15 IP
A24UDDQNL4KC3	1.500	2.000	1.125	14.00	1/4-18 NPT	-8.5	-8.5	DN.432	IDSN443 KMSP415IP	15 IP	15 IP	CM234R ASSY	SSP025016M	15 IP



Steel shank with through coolant.
See pages B50–B57 for inserts.



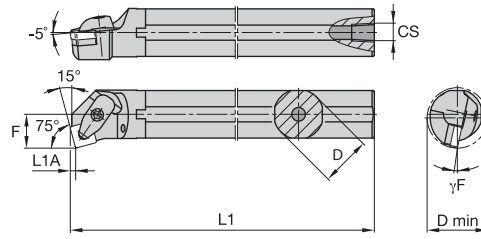
A-DDUN-KC -3°



catalog number	D	D min	F	L1	CS	γF°	gage insert	shim	shim screw	wrench size shim screw	clamp assembly	slotted pin	wrench size clamp screw	
right hand														
A16TDDUNR3KC3	1.000	1.300	.750	12.00	1/4-18 NPT	-12.0	DN..332	—	—	—	CM234R LP ASSY	SSP025016M	9 IP	
A20UDDUNR3KC3	1.250	1.705	1.000	14.00	1/4-18 NPT	-10.0	DN..332	IDSN322 KMSP315IP	9 IP	9 IP	CM234R ASSY	SSP025016M	9 IP	
A20UDDUNR4KC3	1.250	1.705	1.000	14.00	1/4-18 NPT	-12.0	DN..432	IDSN443 KMSP415IP	15 IP	15 IP	CM234R ASSY	SSP025016M	15 IP	
A24UDDUNR4KC3	1.500	2.000	1.125	14.00	1/4-18 NPT	-10.0	DN..432	IDSN443 KMSP415IP	15 IP	15 IP	CM234R ASSY	SSP025016M	15 IP	
A28UDDUNR4KC3	1.750	2.250	1.250	14.00	1/4-18 NPT	-10.0	DN..432	IDSN443 KMSP415IP	15 IP	15 IP	CM234R ASSY	SSP025016M	15 IP	
A32VDDUNR4KC3	2.000	2.500	1.375	16.00	1/4-18 NPT	-8.0	DN..432	IDSN443 KMSP415IP	15 IP	15 IP	CM234R ASSY	SSP025016M	15 IP	
left hand														
A16TDDUNL3KC3	1.000	1.300	.750	12.00	1/4-18 NPT	-12.0	DN..332	—	—	—	CM234R LP ASSY	SSP025016M	9 IP	
A20UDDUNL3KC3	1.250	1.705	1.000	14.00	1/4-18 NPT	-10.0	DN..332	IDSN322 KMSP315IP	9 IP	9 IP	CM234R ASSY	SSP025016M	9 IP	
A20UDDUNL4KC3	1.250	1.705	1.000	14.00	1/4-18 NPT	-12.0	DN..432	IDSN443 KMSP415IP	15 IP	15 IP	CM234R ASSY	SSP025016M	15 IP	
A24UDDUNL4KC3	1.500	2.000	1.125	14.00	1/4-18 NPT	-10.0	DN..432	IDSN443 KMSP415IP	15 IP	15 IP	CM234R ASSY	SSP025016M	15 IP	
A28UDDUNL4KC3	1.750	2.250	1.250	14.00	1/4-18 NPT	-10.0	DN..432	IDSN443 KMSP415IP	15 IP	15 IP	CM234R ASSY	SSP025016M	15 IP	
A32VDDUNL4KC3	2.000	2.500	1.375	16.00	1/4-18 NPT	-8.0	DN..432	IDSN443 KMSP415IP	15 IP	15 IP	CM234R ASSY	SSP025016M	15 IP	



Steel shank with through coolant.
See pages B59–B65 for inserts.



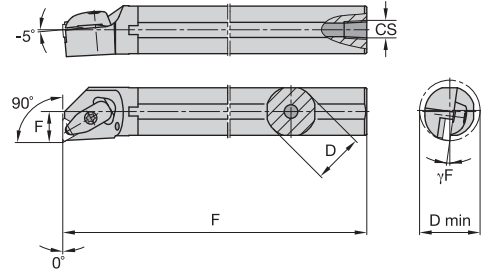
■ **A-DSKN-KC 15°**



catalog number	D	D min	F	L1	L1A	CS	γF°	gage insert	shim	shim screw	wrench size shim screw	clamp assembly	pin	wrench size clamp screw
right hand														
A20UDSKNR4KC3	1.250	1.470	.765	14.00	.12	1/4-18 NPT	-14.0	SN..432	ISSN433 KMSP415IP		15 IP	CM234R ASSY	SSP025016M	15 IP
A24UDSKNR4KC3	1.500	1.760	.890	14.00	.12	1/4-18 NPT	-10.0	SN..432	ISSN433 KMSP415IP		15 IP	CM234R ASSY	SSP025016M	15 IP
A32VDSKNR6KC4	2.000	2.400	1.281	16.00	.18	1/4-18 NPT	-12.0	SN..643	ISSN633 KMSP625IP		25 IP	CM210R ASSY	SSP025018M	25 IP
left hand														
A16TDSKNL3KC2	1.000	1.200	.640	12.00	.09	1/4-18 NPT	-10.0	SN..322	—	—	—	CM234RLP ASSY	SSP025016M	9 IP
A20UDSKNL3KC2	1.250	1.470	.765	14.00	.09	1/4-18 NPT	-10.0	SN..322	ISSN332 KMSP315IP		9 IP	CM234R ASSY	SSP025016M	9 IP
A20UDSKNL4KC3	1.250	1.470	.765	14.00	.12	1/4-18 NPT	-14.0	SN..432	ISSN433 KMSP415IP		15 IP	CM234R ASSY	SSP025016M	15 IP
A24UDSKNL4KC3	1.500	1.760	.890	14.00	.12	1/4-18 NPT	-10.0	SN..432	ISSN433 KMSP415IP		15 IP	CM234R ASSY	SSP025016M	15 IP
A32VDSKNL6KC4	2.000	2.400	1.281	16.00	.18	1/4-18 NPT	-12.0	SN..643	ISSN633 KMSP625IP		25 IP	CM210R ASSY	SSP025018M	25 IP



Steel shank with through coolant.
See pages B66–B74 for inserts.



■ **A-DTFN-KC 0°**

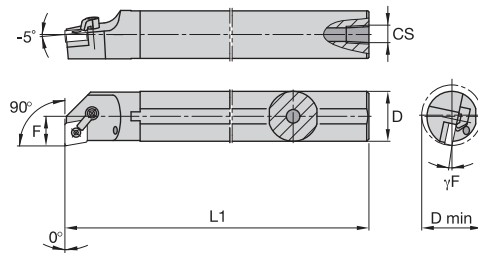


catalog number	D	D min	F	L1	CS	γF°	gage insert	shim	shim screw	wrench size shim screw	clamp assembly	slotted pin	wrench size clamp screw
right hand													
A16TDTFNR3KC3	1.000	1.200	.640	12.00	1/4-18 NPT	-12.0	TN..332	—	—	—	CM234RLP ASSY	SSP025016M	9 IP
A24UDTFNR4KC3	1.500	1.760	.890	14.00	1/4-18 NPT	-10.0	TN..432	ITSN433 KMSP415IP		15 IP	CM234R ASSY	SSP025016M	15 IP
A28UDTFNR3KC3	1.750	2.010	1.015	14.00	1/4-18 NPT	-10.0	TN..332	ITSN323 KMSP315IP		9 IP	CM234R ASSY	SSP025016M	9 IP
A32VDTFNR4KC3	2.000	2.400	1.281	16.00	1/4-18 NPT	-8.0	TN..432	ITSN433 KMSP415IP		15 IP	CM234R ASSY	SSP025016M	15 IP
left hand													
A16TDTFNL3KC3	1.000	1.200	.640	12.00	1/4-18 NPT	-12.0	TN..332	—	—	—	CM234RLP ASSY	SSP025016M	9 IP
A20UDTFNL3KC3	1.250	1.470	1.000	14.00	1/4-18 NPT	-12.0	TN..332	—	—	—	CM234R ASSY	SSP025016M	9 IP
A24UDTFNL3KC3	1.500	1.760	.890	14.00	1/4-18 NPT	-10.0	TN..332	ITSN323 KMSP315IP		9 IP	CM234R ASSY	SSP025016M	9 IP
A24UDTFNL4KC3	1.500	1.760	.890	14.00	1/4-18 NPT	-10.0	TN..432	ITSN433 KMSP415IP		15 IP	CM234R ASSY	SSP025016M	15 IP
A28UDTFNL4KC3	1.750	2.010	1.015	14.00	1/4-18 NPT	-10.0	TN..432	ITSN433 KMSP415IP		15 IP	CM234R ASSY	SSP025016M	15 IP
A32VDTFNL4KC3	2.000	2.400	1.281	16.00	1/4-18 NPT	-8.0	TN..432	ITSN433 KMSP415IP		15 IP	CM234R ASSY	SSP025016M	15 IP
A40VDTFNL4KC3	2.500	3.030	1.531	16.00	1/4-18 NPT	-6.0	TN..432	ITSN433 KMSP415IP		15 IP	CM234R ASSY	SSP025016M	15 IP

O.D./I.D. Tooling



Steel shank with through coolant.
See pages B40–B49 for inserts.



■ **A-MCFN 0°**

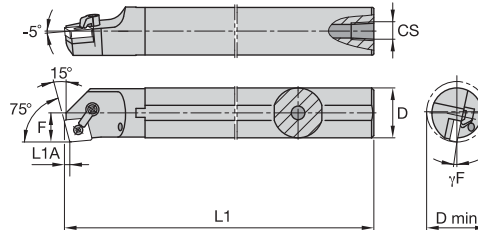
O.D./I.D. Tooling



catalog number	D	D min	F	L1	CS	γF°	gage insert	shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
right hand													
A16MCFNR4	1.000	1.200	.640	12.00	1/4-18 NPT	-14.0	CN..432	—	KL44	—	CK7	STC9	3/32
A20MCFNR4	1.250	1.470	.765	14.00	1/4-18 NPT	-14.0	CN..432	ICSN433	KL46	3/32	CK21	STC20	1/8
A24MCFNR4	1.500	1.760	.890	14.00	1/4-18 NPT	-10.0	CN..432	ICSN433	KL46	3/32	CK21	STC20	1/8
A32MCFNR5													
left hand													
A16MCFNL4	1.000	1.200	.640	12.00	1/4-18 NPT	-14.0	CN..432	—	KL44	—	CK7	STC9	3/32
A20MCFNL4	1.250	1.470	.765	14.00	1/4-18 NPT	-14.0	CN..432	ICSN433	KL46	3/32	CK21	STC20	1/8
A24MCFNL4	1.500	1.760	.890	14.00	1/4-18 NPT	-10.0	CN..432	ICSN433	KL46	3/32	CK21	STC20	1/8
A32MCFNL5	2.000	2.400	1.281	16.00	1/4-18 NPT	-12.0	CN..543	ICSN533	KL58	1/8	CK21	STC20	1/8



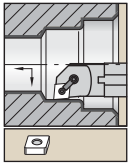
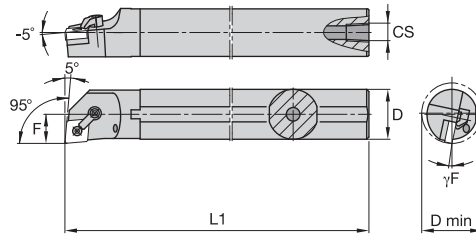
Steel shank with through coolant.
See pages B40–B49 for inserts.



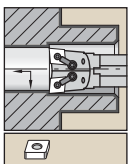
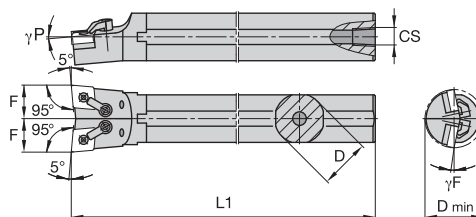
■ **A-MCKN 15°**



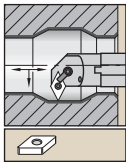
catalog number	D	D min	F	L1	L1A	CS	γF°	gage insert	shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
right hand														
A20MCKNR4	1.250	1.470	.765	14.00	.12	1/4-18 NPT	-14.0	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
A24MCKNR4	1.500	1.760	.890	14.00	.12	1/4-18 NPT	-12.0	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
A32MCKNR4	2.000	2.400	1.281	16.00	.12	1/4-18 NPT	-8.0	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
A32MCKNR5														
left hand														
A20MCKNL4	1.250	1.470	.765	14.00	.12	1/4-18 NPT	-14.0	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
A24MCKNL4	1.500	1.760	.890	14.00	.12	1/4-18 NPT	-12.0	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
A32MCKNL4	2.000	2.400	1.281	16.00	.12	1/4-18 NPT	-8.0	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
A32MCKNL5	2.000	2.400	1.281	16.00	.15	1/4-18 NPT	-10.0	CN..543	ICSN533	KL58	1/8	CK12	STC4	5/32


 Steel shank with through coolant.
 See pages B40–B49 for inserts.

A-MCLN -5°

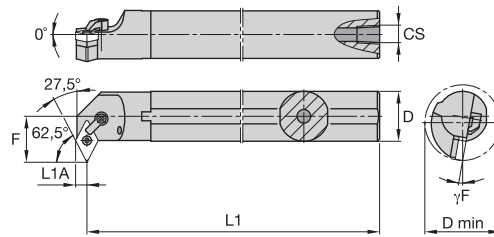

catalog number	D	D min	F	L1	CS	γ°	gage insert	shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
right hand													
A16MCLNR3	1.000	1.200	.640	12.00	1/4-18 NPT	-10.0	CN..322	—	KL33	5/64	CK6	STC5	3/32
A16TMCLNR4	1.000	1.200	.640	12.00	1/4-18 NPT	-14.0	CN..432	—	KL44	3/32	CK20	STC11	1/8
A20UMCLNR4	1.250	1.470	.765	14.00	1/4-18 NPT	-14.0	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
A24UMCLNR4	1.500	1.760	.890	14.00	1/4-18 NPT	-12.0	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
A28UMCLNR4	1.750	2.010	1.015	14.00	1/4-18 NPT	-12.0	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
A32VMCLNR4	2.000	2.400	1.281	16.00	1/4-18 NPT	-12.0	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
A40VMCLNR4	2.500	3.030	1.531	16.00	1/4-18 NPT	-8.0	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
A24MCLNR5	1.500	2.000	.890	14.00	1/4-18 NPT	-12.0	CN..543	ICSN533	KL58	1/8	CK12	STC4	5/32
A32MCLNR5	2.000	2.400	1.281	16.00	1/4-18 NPT	-12.0	CN..543	ICSN533	KL58	1/8	CK12	STC4	5/32
A40MCLNR5	2.500	3.030	1.531	16.00	1/4-18 NPT	-8.0	CN..543	ICSN533	KL58	1/8	CK12	STC4	5/32
A32VMCLNR6	2.000	2.400	1.281	16.00	1/4-18 NPT	-12.0	CN..643	ICSN633	KL68	9/64	CK12	STC4	5/32
A40VMCLNR6	2.500	3.030	1.531	16.00	1/4-18 NPT	-10.0	CN..643	ICSN633	KL68	9/64	CK12	STC4	5/32
left hand													
A16MCLNL3	1.000	1.200	.640	12.00	1/4-18 NPT	-10.0	CN..322	—	KL33	5/64	CK6	STC5	3/32
A16TMCLNL4	1.000	1.200	.640	12.00	1/4-18 NPT	-14.0	CN..432	—	KL44	3/32	CK20	STC11	1/8
A20UMCLNL4	1.250	1.470	.765	14.00	1/4-18 NPT	-14.0	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
A24UMCLNL4	1.500	1.760	.890	14.00	1/4-18 NPT	-12.0	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
A28UMCLNL4	1.750	2.010	1.015	14.00	1/4-18 NPT	-12.0	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
A32MCLNL4	2.000	2.400	1.281	16.00	1/4-18 NPT	-12.0	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
A40MCLNL4	2.500	3.030	1.531	16.00	1/4-18 NPT	-8.0	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
A24MCLNL5	1.500	2.000	.890	14.00	1/4-18 NPT	-12.0	CN..543	ICSN533	KL58	1/8	CK12	STC4	5/32
A32MCLNL5	2.000	2.400	1.281	16.00	1/4-18 NPT	-12.0	CN..543	ICSN533	KL58	1/8	CK12	STC4	5/32
A40MCLNL5	2.500	3.030	1.531	16.00	1/4-18 NPT	-8.0	CN..543	ICSN533	KL58	1/8	CK12	STC4	5/32
A32VMCLNL6	2.000	2.400	1.281	16.00	1/4-18 NPT	-12.0	CN..643	ICSN633	KL68	9/64	CK12	STC4	5/32
A40VMCLNL6	2.500	3.030	1.531	16.00	1/4-18 NPT	-10.0	CN..643	ICSN633	KL68	9/64	CK12	STC4	5/32


 Steel shank with through coolant.
 See pages B40–B49 for inserts.

A-MCLN-D -5°


catalog number	D	D min	F	L1	CS	γ°	gage insert	shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
A16MCLNR4D	1.000	1.625	.640	12.00	1/4-18 NPT	-10.0	CN..432	—	KL44	—	CK7	STC9	3/32
A20MCLNR4D	1.250	1.875	.765	14.00	1/4-18 NPT	-10.0	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
A24MCLNR4D	1.500	2.125	.890	14.00	1/4-18 NPT	-10.0	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
A32MCLNR4D	2.000	2.592	1.281	16.00	1/4-18 NPT	-12.0	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
A32MCLNR5D	2.000	2.592	1.281	16.00	1/4-18 NPT	-12.0	CN..543	ICSN533	KL58	1/8	CK12	STC4	5/32

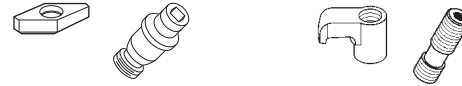


Steel shank with through coolant.
See pages B50–B57 for inserts.

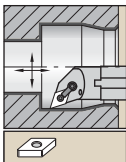


■ **A-MDPN 27.5°**

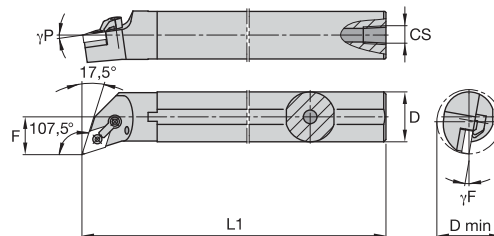
O.D./I.D. Tooling



catalog number	D	D min	F	L1	L1A	CS	γF°	gage insert	shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
right hand														
A20MDPNR4	1.250	1.705	1.000	14.00	.26	1/4-18 NPT	-13.0	DN..432	IDSN443	KL46L	3/32	CK22	STC20	1/8
A24MDPNR4	1.500	2.000	1.125	14.00	.26	1/4-18 NPT	-10.0	DN..432	IDSN443	KL46L	3/32	CK22	STC20	1/8
left hand														
A20MDPNL4	1.250	1.705	1.000	14.00	.26	1/4-18 NPT	-13.0	DN..432	IDSN443	KL46L	3/32	CK22	STC20	1/8
A24MDPNL4	1.500	2.000	1.125	14.00	.26	1/4-18 NPT	-10.0	DN..432	IDSN443	KL46L	3/32	CK22	STC20	1/8



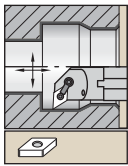
Steel shank with through coolant.
See pages B50–B57 for inserts.



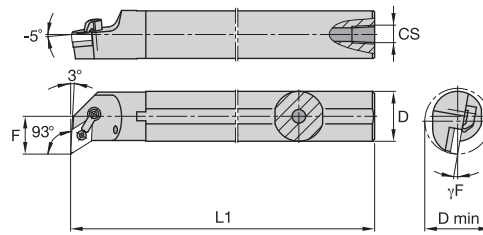
■ **A-MDQN -17.5°**



catalog number	D	D min	F	L1	CS	γF°	γP°	gage insert	shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
right hand														
A20MDQNR4	1.250	1.705	1.000	14.00	1/4-18 NPT	-12.000	-10.0	DN..432	IDSN443	KL46L	3/32	CK12	STC4	5/32
A24MDQNR4	1.500	2.000	1.125	14.00	1/4-18 NPT	-8.500	-8.5	DN..432	IDSN443	KL46L	3/32	CK12	STC4	5/32
left hand														
A20MDQNL4	1.250	1.705	1.000	14.00	1/4-18 NPT	-12.000	-10.0	DN..432	IDSN443	KL46L	3/32	CK12	STC4	5/32
A24MDQNL4	1.500	2.000	1.125	14.00	1/4-18 NPT	-8.500	-8.5	DN..432	IDSN443	KL46L	3/32	CK12	STC4	5/32



Steel shank with through coolant.
See pages B50–B57 for inserts.



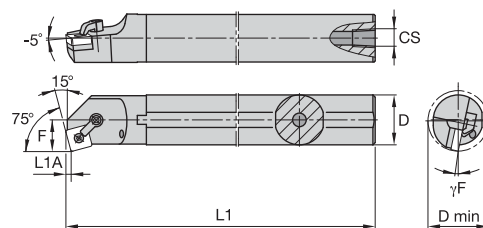
■ **A-MDUN -3°**



catalog number	D	D min	F	L1	CS	γF°	gage insert	shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
right hand													
A16MDUNR3	1.000	1.300	.750	12.00	1/4-18 NPT	-12.0	DN..332	—	KL33L	5/64	CK7	STC5	3/32
A20UMDUNR4	1.250	1.705	1.000	14.00	1/4-18 NPT	-12.0	DN..432	IDSN443	KL46L	3/32	CK12	STC4	5/32
A24UMDUNR4	1.500	2.000	1.125	14.00	1/4-18 NPT	-10.0	DN..432	IDSN443	KL46L	3/32	CK12	STC4	5/32
A28MDUNR4	1.750	2.250	1.250	14.00	1/4-18 NPT	-10.0	DN..432	IDSN443	KL46L	3/32	CK12	STC4	5/32
A32VMDUNR4	2.000	2.500	1.375	16.00	1/4-18 NPT	-8.0	DN..432	IDSN443	KL46L	3/32	CK12	STC4	5/32
left hand													
A16MDUNL3	1.000	1.300	.750	12.00	1/4-18 NPT	-12.0	DN..332	—	KL33L	5/64	CK7	STC5	3/32
A20UMDUNL4	1.250	1.705	1.000	14.00	1/4-18 NPT	-12.0	DN..432	IDSN443	KL46L	3/32	CK12	STC4	5/32
A24UMDUNL4	1.500	2.000	1.125	14.00	1/4-18 NPT	-10.0	DN..432	IDSN443	KL46L	3/32	CK12	STC4	5/32
A28MDUNL4	1.750	2.250	1.250	14.00	1/4-18 NPT	-10.0	DN..432	IDSN443	KL46L	3/32	CK12	STC4	5/32
A32VMDUNL4	2.000	2.500	1.375	16.00	1/4-18 NPT	-8.0	DN..432	IDSN443	KL46L	3/32	CK12	STC4	5/32



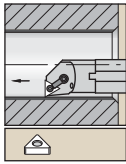
Steel shank with through coolant.
See pages B59–B65 for inserts.



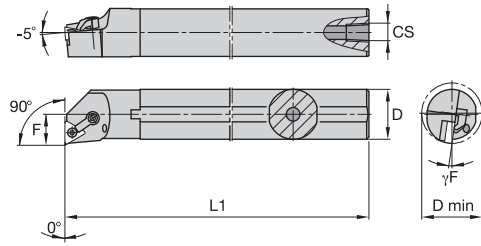
■ **A-MSKN 15°**



catalog number	D	D min	F	L1	L1A	CS	γF°	gage insert	shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
right hand														
A20MSKNR4	1.250	1.470	.765	14.00	.12	1/4-18 NPT	-14.0	SN..432	—	KL44	3/32	CK9	STC4	5/32
A24MSKNR4	1.500	1.760	.890	14.00	.12	1/4-18 NPT	-10.0	SN..432	ISSN432	KL46	3/32	CK9	STC4	5/32
A28MSKNR4	1.750	2.010	1.015	14.00	.12	1/4-18 NPT	-10.0	SN..432	ISSN432	KL46	3/32	CK9	STC4	5/32
A32MSKNR6	2.000	2.400	1.281	16.00	.18	1/4-18 NPT	-12.0	SN..643	ISSN633	KL68	9/64	CK12	STC4	5/32
A40MSKNR6	2.500	3.030	1.531	16.00	.18	1/4-18 NPT	-10.0	SN..643	ISSN633	KL68	9/64	CK12	STC4	5/32
left hand														
A20MSKNL4	1.250	1.470	.765	14.00	.12	1/4-18 NPT	-14.0	SN..432	—	KL44	3/32	CK9	STC4	5/32
A24MSKNL4	1.500	1.760	.890	14.00	.12	1/4-18 NPT	-10.0	SN..432	ISSN443	KL46	3/32	CK9	STC4	5/32
A32MSKNL6	2.000	2.400	1.281	16.00	.18	1/4-18 NPT	-12.0	SN..643	ISSN633	KL68	9/64	CK12	STC4	5/32
A40MSKNL6	2.500	3.030	1.531	16.00	.18	1/4-18 NPT	-10.0	SN..643	ISSN633	KL68	9/64	CK12	STC4	5/32



Steel shank with through coolant.
See pages B66–B74 for inserts.

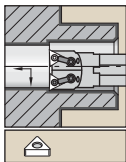


O.D./I.D. Tooling

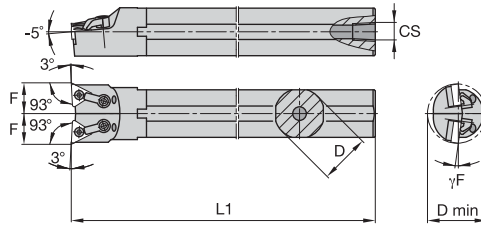
■ **A-MTFN 0°**



catalog number	D	D min	F	L1	CS	γF°	gage insert	shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
right hand													
A16MTFNR3	1.000	1.220	.640	12.00	1/4-18 NPT	-12.0	TN..332	—	KL33L	5/64	CK7	STC9	3/32
A20UMTFNR3	1.250	1.470	.765	14.00	1/4-18 NPT	-12.0	TN..332	—	KL33L	5/64	CK7	STC9	3/32
A24UMTFNR3	1.500	1.760	.890	14.00	1/4-18 NPT	-10.0	TN..332	ITSN323	KL34L	5/64	CK7	STC9	3/32
A28MTFNR3	1.750	2.010	1.015	14.00	1/4-18 NPT	-10.0	TN..332	ITSN323	KL34L	5/64	CK7	STC9	3/32
A24UMTFNR4	1.500	1.760	.890	14.00	1/4-18 NPT	-10.0	TN..432	ITSN433	KL46	3/32	CK9	STC4	5/32
A28MTFNR4	1.750	2.010	1.015	14.00	1/4-18 NPT	-10.0	TN..432	ITSN433	KL46	3/32	CK9	STC4	5/32
A32MTFNR4	2.000	2.400	1.281	16.00	1/4-18 NPT	-8.0	TN..432	ITSN433	KL46	3/32	CK9	STC4	5/32
A40MTFNR4	2.500	3.030	1.531	16.00	1/4-18 NPT	-6.0	TN..432	ITSN433	KL46	3/32	CK9	STC4	5/32
left hand													
A16MTFNL3	1.000	1.220	.640	12.00	1/4-18 NPT	-12.0	TN..332	—	KL33L	5/64	CK7	STC9	3/32
A20UMTFNL3	1.250	1.470	.765	14.00	1/4-18 NPT	-12.0	TN..332	—	KL33L	5/64	CK7	STC9	3/32
A24UMTFNL3	1.500	1.760	.890	14.00	1/4-18 NPT	-10.0	TN..332	ITSN323	KL34L	5/64	CK7	STC9	3/32
A24UMTFNL4	1.500	1.760	.890	14.00	1/4-18 NPT	-10.0	TN..432	ITSN433	KL46	3/32	CK9	STC4	5/32
A28MTFNL4	1.750	2.010	1.015	14.00	1/4-18 NPT	-10.0	TN..432	ITSN433	KL46	3/32	CK9	STC4	5/32
A40MTFNL4	2.500	3.030	1.531	16.00	1/4-18 NPT	-6.0	TN..432	ITSN433	KL46	3/32	CK9	STC4	5/32



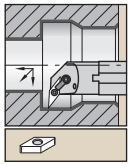
Steel shank with through coolant.
See pages B66–B74 for inserts.



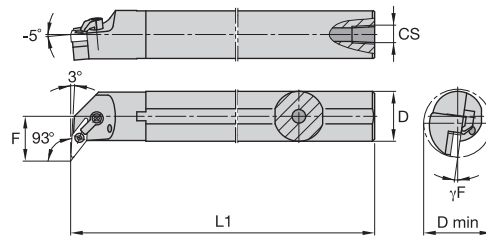
■ **A-MTUN-D -3°**



catalog number	D	D min	F	L1	CS	γF°	gage insert	shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
A16MTUNR3D	1.000	1.312	.640	12.00	1/4-18 NPT	-10.0	TN..332	—	KL33L	5/64	CK7	STC9	3/32
A20MTUNR3D	1.250	1.550	.765	14.00	1/4-18 NPT	-10.0	TN..332	—	KL33L	5/64	CK7	STC9	3/32
A32MTUNR4D	2.000	2.592	1.281	16.00	1/4-18 NPT	-8.0	TN..432	ITSN433	KL46	3/32	CK9	STC4	5/32



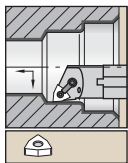
Steel shank with through coolant.
See pages B74–B78 for inserts.



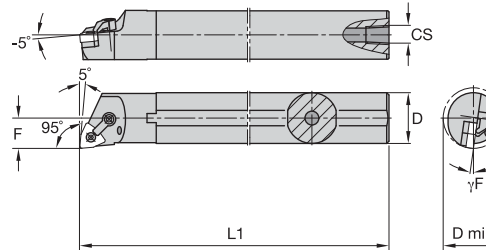
■ **A-MVUN -3°**



catalog number	D	D min	F	L1	CS	γF°	gage insert	shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
right hand													
A20MVUNR3	1.250	1.705	1.000	14.00	1/4-18 NPT	-12.0	VN..332	IVSN322	KL34L	5/64	CK43	STC4	5/32
A24UMVUNR3	1.500	2.000	1.125	14.00	1/4-18 NPT	-12.0	VN..332	IVSN322	KL34L	5/64	CK43	STC4	5/32
A32MVUNR4	2.000	2.500	1.325	16.00	1/4-18 NPT	-10.0	VN..432	IVSN433	KL46	3/32	CK43	STC4	5/32
A40MVUNR4													
left hand													
A20UMVUNL3	1.250	1.705	1.000	14.00	1/4-18 NPT	-12.0	VN..332	IVSN322	KL34L	5/64	CK43	STC4	5/32
A24MVUNL3	1.500	2.000	1.125	14.00	1/4-18 NPT	-12.0	VN..332	IVSN322	KL34L	5/64	CK43	STC4	5/32
A32MVUNL4	2.000	2.500	1.325	16.00	1/4-18 NPT	-10.0	VN..432	IVSN433	KL46	3/32	CK43	STC4	5/32
A40MVUNL4	2.500	3.250	1.750	16.00	1/4-18 NPT	-10.0	VN..432	IVSN433	KL46	3/32	CK43	STC4	5/32



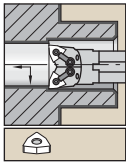
Steel shank with through coolant.
See pages B79–B83 for inserts.



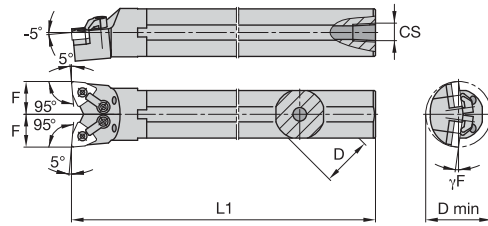
■ **A-MWLN 5°**



catalog number	D	D min	F	L1	CS	γF°	gage insert	shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
right hand													
A16MWLNR3	1.000	1.200	.640	12.00	1/4-18 NPT	-12.0	WN..332	—	KL33L	5/64	CK6	STC5	3/32
A24MWLNR3	1.500	1.760	.890	14.00	1/4-18 NPT	-8.0	WN..332	IWSN322	KL34L	5/64	CK6	STC5	3/32
A16TMWLN4	1.000	1.220	.640	12.00	1/4-18 NPT	-12.0	WN..432	—	KL44	3/32	CK20	STC11	1/8
A20UMWLN4	1.250	1.470	.765	14.00	1/4-18 NPT	-14.0	WN..432	IWSN433	KL46	3/32	CK20	STC20	1/8
A24UMWLN4	1.500	1.760	.890	14.00	1/4-18 NPT	-14.0	WN..432	IWSN433	KL46	3/32	CK20	STC20	1/8
left hand													
A16MWLNL3	1.000	1.200	.640	12.00	1/4-18 NPT	-12.0	WN..332	—	KL33L	5/64	CK6	STC5	3/32
A24MWLNL3	1.500	1.760	.890	14.00	1/4-18 NPT	-8.0	WN..332	IWSN322	KL34L	5/64	CK6	STC5	3/32
A16MWLNL4	1.000	1.220	.640	12.00	1/4-18 NPT	-12.0	WN..432	—	KL44	3/32	CK20	STC11	1/8
A20UMWLN4	1.250	1.470	.765	14.00	1/4-18 NPT	-14.0	WN..432	IWSN433	KL46	3/32	CK20	STC20	1/8
A24UMWLN4	1.500	1.760	.890	14.00	1/4-18 NPT	-14.0	WN..432	IWSN433	KL46	3/32	CK20	STC20	1/8



Steel shank with through coolant.
See pages B79–B83 for inserts.

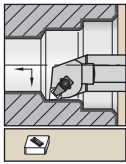


■ **A-MWLN-D 5°**

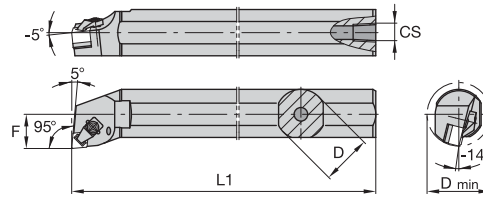
O.D./I.D. Tooling



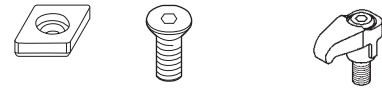
catalog number	D	D min	F	L1	CS	γF°	gage insert	shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
A16MWLNR3D	1.000	1.310	.640	12.00	1/4-18 NPT	-11.0	WN..332	—	KL33L	5/64	CK6	STC5	3/32
A16MWLNR4D	1.000	1.420	.700	12.00	1/4-18 NPT	-12.0	WN..432	—	KL44	3/32	CK6	STC5	3/32
A20MWLNR3D	1.250	1.560	.765	14.00	1/4-18 NPT	-10.0	WN..332	IWSN322	KL34L	5/64	CK6	STC5	3/32
A20MWLNR4D	1.250	1.550	.765	14.00	1/4-18 NPT	-14.0	WN..432	IWSN433	KL46	3/32	CK6	STC5	3/32
A24MWLNR4D	1.500	1.810	.890	14.00	1/4-18 NPT	-14.0	WN..432	IWSN433	KL46	3/32	CK20	STC20	1/8
A32MWLNR4D	2.000	2.582	1.276	16.00	1/4-18 NPT	-14.0	WN..432	IWSN433	KL46	3/32	CK20	STC20	1/8



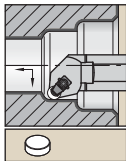
Steel shank with through coolant.
See page B122 for inserts.



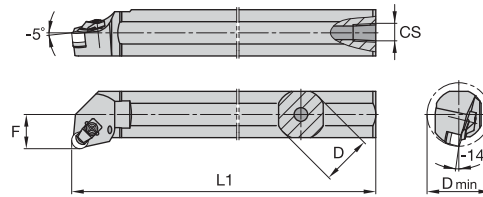
■ A-CCLN-MX -5°



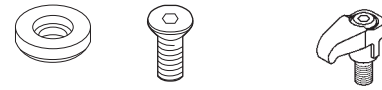
catalog number	D	D min	F	L1	CS	gage insert	shim	shim screw	Torx	clamp assembly	Torx
right hand											
A24CCLNR4MX5	1.500	2.165	.890	14.00	1/4-18 NPT	CN.X452	552.221	554.260	T20	551.326	T25
A32CCLNR4MX5	2.000	2.323	1.281	16.00	1/4-18 NPT	CN.X452	552.221	554.260	T20	551.326	T25
left hand											
A24CCLNL4MX5	1.500	2.165	.890	14.00	1/4-18 NPT	CN.X452	552.221	554.260	T20	551.326	T25
A32CCLNL4MX5	2.000	2.323	1.281	16.00	1/4-18 NPT	CN.X452	552.221	554.260	T20	551.326	T25



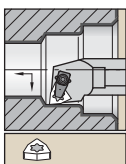
Steel shank with through coolant.
See page B124 for inserts.



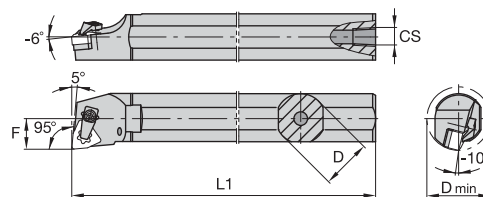
■ A-CRGN-MN



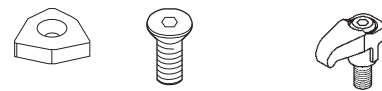
catalog number	D	D min	F	L1	CS	gage insert	shim	shim screw	Torx	clamp assembly	Torx
right hand											
A32CRGNR4MN5	2.000	2.559	1.281	16.00	1/4-18 NPT	RN.45	552.230	554.260	T20	551.343	T25
left hand											
A32CRGNL4MN5	2.000	2.559	1.281	16.00	1/4-18 NPT	RN.45	552.230	554.260	T20	551.343	T25



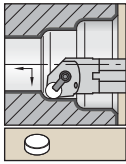
Steel shank with through coolant.
See page B127 for inserts.



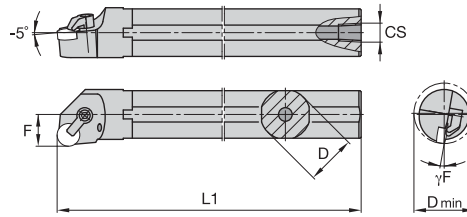
■ A-CWLN-MX -5°



catalog number	D	D min	F	L1	CS	gage insert	shim	shim screw	Torx	clamp assembly	Torx
right hand											
A24CWLN4MX5	1.500	3.150	.890	14.00	1/4-18 NPT	WN.X452	552.210	554.260	T20	551.326	T25
left hand											
A24CWLN4MX5	1.500	3.150	.890	14.00	1/4-18 NPT	WN.X452	552.210	554.260	T20	551.326	T25



Steel shank with through coolant.
See page B182 for inserts.

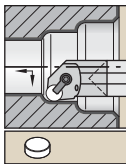


■ **A-CRGN**

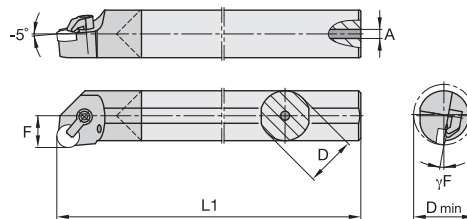
O.D./I.D. Tooling



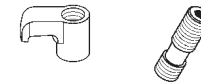
catalog number	D	D min	F	L1	CS	γF°	gage insert	clamp	clamp screw	hex (inch)
right hand										
A16CRGNR3	1.000	1.200	.640	12.00	1/4-18 NPT	-10.0	RN.32	CK7LP	STC9	3/32
A16CRGNR4	1.000	1.200	.640	12.00	1/4-18 NPT	-10.0	RN.42	CK7LP	STC9	3/32
left hand										
A12CRGNL3	.750	.930	.500	10.00	1/8-27 NPT	-11.0	RN.32	CK7LP	STC9	3/32
A16CRGNL3	1.000	1.200	.640	12.00	1/4-18 NPT	-10.0	RN.32	CK7LP	STC9	3/32



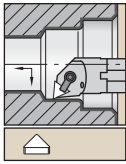
Carbide shank with through coolant.
See page B182 for inserts.



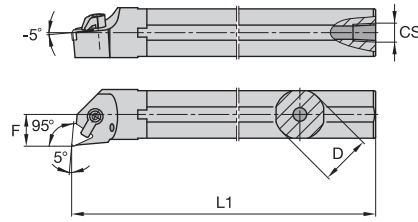
■ **E-CRGN**



catalog number	D	D min	F	L1	A	γF°	gage insert	clamp	clamp screw	hex (inch)
right hand										
E16CRGNR3	1.000	1.200	.640	12.00	.3120	-10.0	RN.32	CK7LP	STC9	3/32
left hand										
E10CRGNL3	.625	.770	.406	10.00	.2180	-12.0	RN.32	CK7LP	STC9	3/32



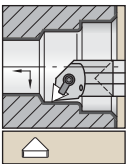
Steel shank with through coolant.
See page B184 for inserts.



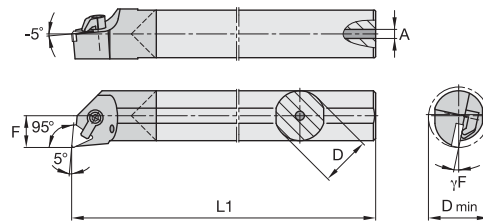
■ **A-CTLN-5°**



catalog number	D	D min	F	L1	CS	gage insert	clamp	clamp screw	hex (inch)
right hand									
A08CTLNR2	.500	.600	.312	8.00	1/16-27 NPT	TN.221	CK27	STC27	5/64
A10CTLNR2	.625	.770	.406	10.00	1/8-27 NPT	TN.221	CK7LP	STC9	3/32
A16CTLNR2	1.000	1.200	.640	12.00	1/4-18 NPT	TN.221	CK7LP	STC9	3/32
left hand									
A10CTLNL2	.625	.770	.406	10.00	1/8-27 NPT	TN.221	CK7LP	STC9	3/32



Carbide shank with through coolant.
See page B184 for inserts.



■ **E-CTLN-5°**

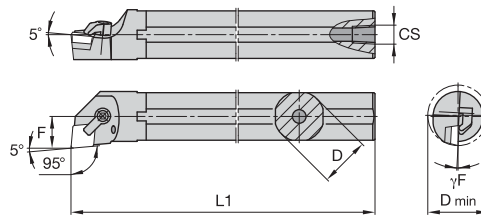


catalog number	D	D min	F	L1	A	gage insert	clamp	clamp screw	hex (inch)
right hand									
E08CTLNR2	.500	.600	.312	8.00	.19	TN.221	CK27	STC27	5/64
E12CTLNR2	.750	.930	.500	10.00	.28	TN.221	CK7LP	STC9	3/32
left hand									
E08CTLNL2	.500	.600	.312	8.00	.19	TN.221	CK27	STC27	5/64

O.D./I.D. Tooling



Steel shank with through coolant.
See page B84 for inserts.



■ **A-CCLP-5°**

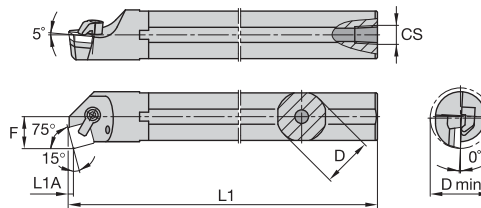
O.D./I.D. Tooling



catalog number	D	D min	F	L1	CS	γF°	gage insert	shim	shim screw	hex (inch)	clamp	clamp screw	hex (inch)
right hand													
A16CCLPR4	1.000	1.200	.640	12.00	1/4-18 NPT	-3.0	CP.422	SM369	S19	1/16	CK20	STC11	1/8
A24CCLPR4	1.500	1.760	.890	14.00	1/4-18 NPT	0.0	CP.422	SM369	S19	1/16	CK22	STC26	1/8



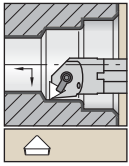
Steel shank with through coolant.
See pages B85–B86 and B129–B130 for inserts.



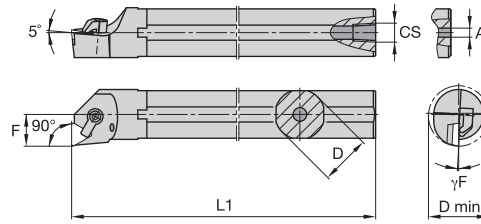
■ **A-CSKP 15°**



catalog number	D	D min	F	L1	L1A	CS	gage insert	shim	shim screw	hex (inch)	clamp	clamp screw	hex (inch)
A16CSKPR4	1.000	1.200	.640	12.00	.12	1/4-18 NPT	SP.422	—	—	—	CK20	STC11	1/8
A20CSKPR4	1.250	1.470	.765	14.00	.12	1/4-18 NPT	SP.422	SM40	S19	1/16	CK10	STC8	5/32
A24CSKPR4	1.500	1.760	.890	14.00	.12	1/4-18 NPT	SP.422	SM40	S19	1/16	CK10	STC8	5/32



Steel shank with through coolant.
See pages B86–B87 and
B130 for inserts.

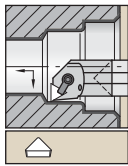


■ A-CTFP 0°

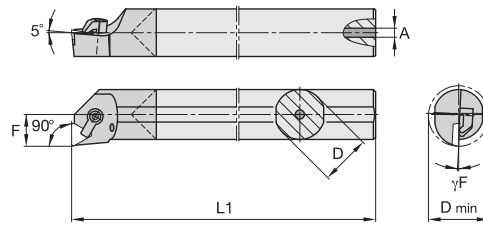


catalog number	D	D min	F	L1	A	CS	γF°	gage insert	shim	shim screw	hex (inch)	clamp	clamp screw	hex (inch)	
right hand															
A06CTFPR2	.375	.480	.250	6.00	.13	—	-3.0	TP..2151	—	—	—	CK27	STC27	5/64	
A08CTFPR2	.500	.600	.312	8.00	—	1/16-27 NPT	-3.0	TP.221	—	—	—	CK27	STC27	5/64	
A10CTFPR2	.625	.770	.406	10.00	—	1/8-27 NPT	-4.0	TP.221	—	—	—	CK19	STC9	3/32	
A12CTFPR3	.750	.930	.500	10.00	—	1/8-27 NPT	0.0	TP.322	—	—	—	CK7	STC9	3/32	
A16TCTFPR3	1.000	1.200	.640	12.00	—	1/4-18 NPT	0.0	TP.322	—	—	—	CK20	STC11	1/8	
A20UCTFPR3	1.250	1.470	.765	14.00	—	1/4-18 NPT	-3.0	TP.322	SM41	S19	1/16	CK10	STC8	5/32	
A24CTFPR3	1.500	1.760	.890	14.00	—	1/4-18 NPT	-3.0	TP.322	SM41	S19	1/16	CK10	STC8	5/32	
A24CTFPR4	1.500	1.760	.890	14.00	—	1/4-18 NPT	-3.0	TP.432	SM37	S125	3/32	CK10	STC8	5/32	
A32CTFPR4	2.000	2.400	1.281	16.00	—	1/4-18 NPT	-3.0	TP.432	SM37	S125	3/32	CK9	STC4	5/32	
A40CTFPR4	2.500	3.030	1.531	16.00	—	1/4-18 NPT	-3.0	TP.432	SM37	S125	3/32	CK9	STC4	5/32	
left hand															
A08CTFPL2	.500	.600	.312	8.00	—	1/16-27 NPT	-3.0	TP.221	—	—	—	CK27	STC27	5/64	
A10CTFPL2	.625	.770	.406	10.00	—	1/8-27 NPT	-4.0	TP.221	—	—	—	CK19	STC9	3/32	
A12CTFPL3	.750	.930	.500	10.00	—	1/8-27 NPT	0.0	TP.322	—	—	—	CK7	STC9	3/32	
A16TCTFPL3	1.000	1.200	.640	12.00	—	1/4-18 NPT	0.0	TP.322	—	—	—	CK20	STC11	1/8	
A20UCTFPL3	1.250	1.470	.765	14.00	—	1/4-18 NPT	-3.0	TP.322	SM41	S19	1/16	CK10	STC8	5/32	
A24CTFPL4	1.500	1.760	.890	14.00	—	1/4-18 NPT	-3.0	TP.432	SM37	S125	3/32	CK10	STC8	5/32	
A32CTFPL4	2.000	2.400	1.281	16.00	—	1/4-18 NPT	-3.0	TP.432	SM37	S125	3/32	CK9	STC4	5/32	

O.D./I.D. Tooling

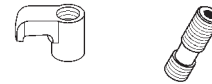


Carbide shank with through coolant.
See pages B86–B87 and B130 for inserts.

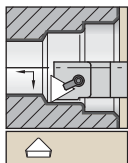


■ E-CTFP 0°

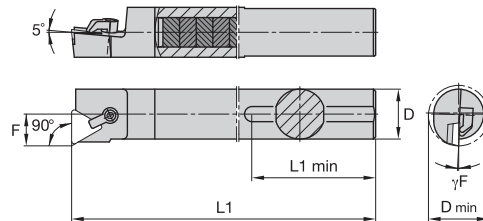
O.D./I.D. Tooling



catalog number	D	D min	F	L1	A	γF°	gage insert	clamp	clamp screw	hex (inch)
right hand										
E08KCTFPR2	.500	.600	.312	5.00	.19	-3.0	TP.221	CK27	STC27	5/64
E08RCTFPR2	.500	.600	.312	8.00	.19	-3.0	TP.221	CK27	STC27	5/64
E10MCTFPR2	.625	.770	.406	6.00	.22	0.0	TP.221	CK19	STC9	3/32
E10SCTFPR2	.625	.770	.406	10.00	.22	0.0	TP.221	CK19	STC9	3/32
E12QCTFPR3	.750	.930	.500	7.00	.28	0.0	TP.322	CK7	STC9	3/32
E12SCTFPR3	.750	.930	.500	10.00	.28	0.0	TP.322	CK7	STC9	3/32
E16TCTFPR3	1.000	1.200	.640	12.00	.31	0.0	TP.322	CK20	STC11	1/8
left hand										
E10MCTFPL2	.625	.770	.406	6.00	.22	0.0	TP.221	CK19	STC9	3/32
E12QCTFPL3	.750	.930	.500	7.00	.28	0.0	TP.322	CK7	STC9	3/32
E12SCTFPL3	.750	.930	.500	10.00	.28	0.0	TP.322	CK7	STC9	3/32
E16TCTFPL3	1.000	1.200	.640	12.00	.31	0.0	TP.322	CK20	STC11	1/8



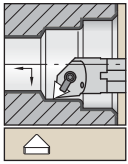
DeVibrator shank.
See pages B86–B87 and B130 for inserts.



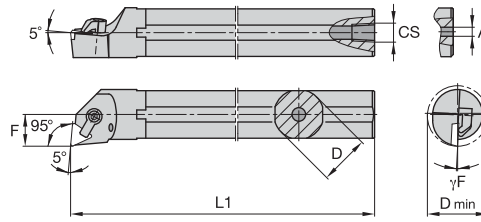
■ B-CTFP 0°



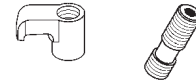
catalog number	D	D min	F	L1	L1 min	γF°	gage insert	shim	shim screw	hex (inch)	clamp	clamp screw	hex (inch)
B10CTFPR2	.625	.770	.406	10.00	5.25	0.0	TP.221	—	—	—	CK19	STC9	3/32
B12CTFPR3	.750	.930	.500	10.00	5.75	0.0	TP.322	—	—	—	CK7	STC9	3/32
B14CTFPR3	.875	1.060	.516	10.00	6.25	0.0	TP.322	—	—	—	CK20	STC11	1/8
B16CTFPR3	1.000	1.200	.640	12.00	6.50	0.0	TP.322	—	—	—	CK20	STC11	1/8
B20CTFPR3	1.250	1.470	.765	14.00	8.25	-3.0	TP.322	SM41	S111	1/16	CK10	STC8	5/32
B24CTFPR4	1.500	1.760	.890	15.50	9.75	-3.0	TP.432	SM37	S125	3/32	CK10	STC8	5/32
B28CTFPR4	1.750	2.010	1.015	18.50	10.75	-3.0	TP.432	SM37	S125	3/32	CK10	STC8	5/32
B32CTFPR4	2.000	2.400	1.281	21.50	12.25	-3.0	TP.432	SM37	S125	3/32	CK9	STC4	5/32



Steel shank with through coolant.
See pages B86–B87 and B130 for inserts.



■ **A-CTLP -5°**



catalog number	D	D min	F	L1	A	CS	γF°	gage insert	clamp	clamp screw	hex (inch)
right hand											
A06CTLPR2	.375	.480	.250	6.00	.13	—	-3.0	TP.2151	CK27	STC27	5/64
A08CTLPR2	.500	.600	.312	8.00	—	1/16-27 NPT	-3.0	TP.221	CK27	STC27	5/64
A12CTLPR3	.750	.930	.500	10.00	—	1/8-27 NPT	0.0	TP.322	CK7	STC9	3/32
left hand											
A16CTLPR3	1.000	1.220	.640	12.00	—	1/4-18 NPT	0.0	TP.322	CK20	STC11	1/8
right hand											
A06CTLPL2	.375	.480	.250	6.00	.13	—	-3.0	TP.2151	CK27	STC27	5/64
A08CTLPL2	.500	.600	.312	8.00	—	1/16-27 NPT	-3.0	TP.221	CK27	STC27	5/64
A10CTLPL2	.625	.770	.406	10.00	.16	1/8-27 NPT	-3.0	TP.221	CK19	STC9	3/32
A12CTLPL3	.750	.930	.500	10.00	—	1/8-27 NPT	0.0	TP.322	CK7	STC9	3/32
A16CTLPL3	1.000	1.220	.640	12.00	—	1/4-18 NPT	0.0	TP.322	CK20	STC11	1/8

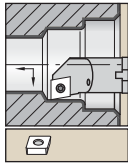
O.D./I.D. Tooling

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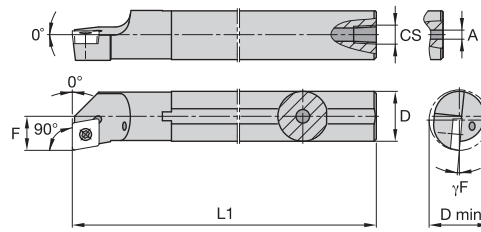


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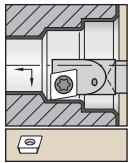
Steel shank with through coolant.
See pages B88–B91 for inserts.



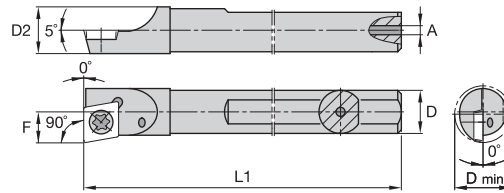
■ A-SCFC 0°

O.D./I.D. Tooling

catalog number	D	D min	D2	F	L1	A	CS	γF°	gage insert	insert screw	Torx
right hand											
A06MSCFCR2	.375	.480	—	.250	6.00	.13	—	-8.0	CC..2151	MS1153	T7
A08RSCFCR2	.500	.600	—	.312	8.00	—	1/16-27 NPT	-7.0	CC..2151	MS1153	T7
A10SSFCR2	.625	.770	—	.406	10.00	—	1/8-27 NPT	-5.0	CC..2151	MS1153	T7
A12SSFCR3	.750	.930	—	.500	10.00	—	1/8-27 NPT	-5.0	CC..3252	MS1155	T15
A16TSCFCR3	1.000	1.200	—	.640	12.00	—	1/4-18 NPT	-4.0	CC..3252	MS1155	T15
left hand											
A08RSCFCL2	.500	.600	—	.312	8.00	—	1/16-27 NPT	-7.0	CC..2151	MS1153	T7
A10SSCFCL2	.625	.770	—	.406	10.00	—	1/8-27 NPT	-5.0	CC..2151	MS1153	T7
A12SSCFCL3	.750	.930	—	.500	10.00	—	1/8-27 NPT	-5.0	CC..3252	MS1155	T15
A16TSCFCL3	1.000	1.200	—	.640	12.00	—	1/4-18 NPT	-4.0	CC..3252	MS1155	T15



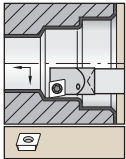
Steel shank with through coolant.
See pages B91–B92 for inserts.



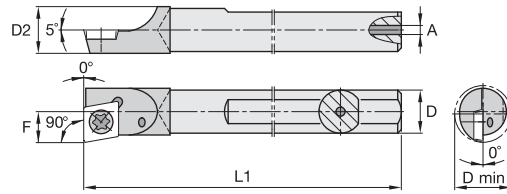
■ A-SCFD 0°

catalog number	D	D min	D2	F	L1	A	gage insert	insert screw	Torx
A03XSCFDR12	.188	.234	.203	.122	2.50	.040	CD..120605	CC09	T6
A04FSCFDR12	.250	.292	.260	.152	3.00	.040	CD..120605	CC11	T6



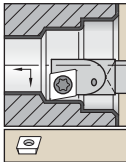
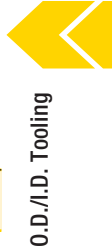


Carbide shank with through coolant.
See pages B91–B92 for inserts.

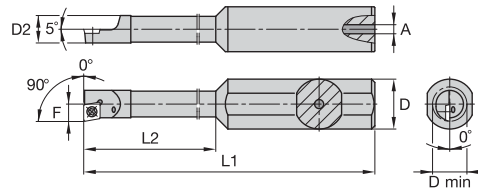


■ E-SCFD 0°

catalog number	D	D min	D2	F	L1	A	gage insert	insert screw	Torx
right hand									
E03HSCFDR12	.188	.224	.193	.117	4.00	.040	CD..120605	CC11	T6
E03MSCFDR12	.188	.224	.193	.117	6.00	.040	CD..120605	CC11	T6
E04HSCFDR12	.250	.292	.258	.152	4.00	.047	CD..120605	CC11	T6
E04MSCFDR12	.250	.292	.258	.152	6.00	.047	CD..120605	CC11	T6
E05MSCFDR12	.312	.356	.322	.185	6.00	.093	CD..120605	CC11	T6
left hand									
E04HSCFDL12	.250	.292	.258	.152	4.00	.047	CD..120605	CC11	T6



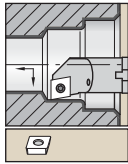
Necked steel shank with through coolant.
See pages B91–B92 for inserts.



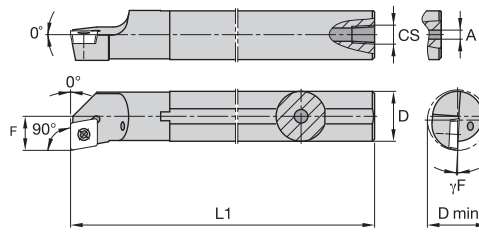
■ A-SCFD 0°

catalog number	D	D min	D2	F	L1	L2	A	gage insert	insert screw	Torx
right hand										
A0406XSCFDR12125	.375	.292	.260	.152	2.50	1.25	.040	CD..120605	CC11	T6
A0408XSCFDR12075	.500	.292	.260	.152	2.75	.75	.040	CD..120605	CC11	T6





Steel shank with through coolant.
See pages B92–B95 for inserts.



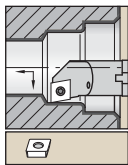
■ A-SCFP 0°

O.D./I.D. Tooling

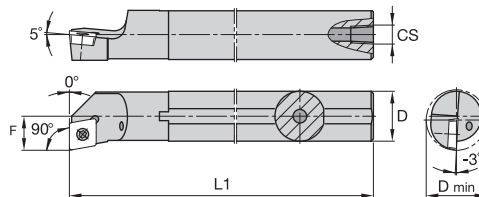
catalog number	D	D min	F	L1	A	CS	γF°	gage insert	insert screw	Torx
right hand										
A06SCFPR2	.375	.480	.250	6.00	.13	—	-4.0	CP..2151	MS1153	T7
A08SCFPR2	.500	.600	.312	8.00	—	1/16-27 NPT	-2.0	CP..2151	MS1153	T7
A10SCFPR2	.625	.770	.406	10.00	—	1/8-27 NPT	0.0	CP..2151	MS1153	T7
A12SCFPR3	.750	.930	.500	10.00	—	1/8-27 NPT	-2.0	CP..3252	MS1155	T15
A16SCFPR3	1.000	1.200	.640	12.00	—	1/4-18 NPT	0.0	CP..3252	MS1155	T15
left hand										
A06SCFPL2	.375	.480	.250	6.00	.13	—	-4.0	CP..2151	MS1153	T7
A08SCFPL2	.500	.600	.312	8.00	—	1/16-27 NPT	-2.0	CP..2151	MS1153	T7
A10SCFPL2	.625	.770	.406	10.00	—	1/8-27 NPT	0.0	CP..2151	MS1153	T7
A12SCFPL3	.750	.930	.500	10.00	—	1/8-27 NPT	-2.0	CP..3252	MS1155	T15
A16SCFPL3	1.000	1.200	.640	12.00	—	1/4-18 NPT	0.0	CP..3252	MS1155	T15



NOTE: ANSI/ISO compatible 60° countersunk hole insert.
This tool will also accept CPGM/CPGT/CPGW-21.5_ inserts.
60° countersunk hole insert (i.e., CPMT/CPGT/CPGW-32.5_).
90° countersunk hole inserts (i.e., CPGM/CPGB-32.5_) do not fit this tool.



Steel shank with through coolant.
See pages B92–B95 for inserts.

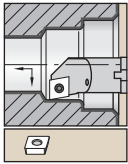


■ A-SCFP-A 0°

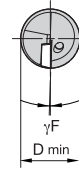
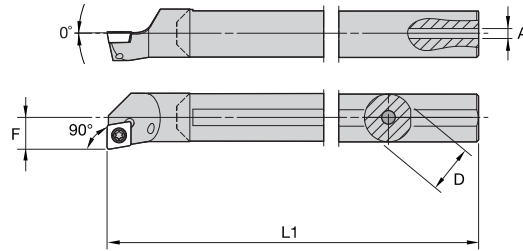
catalog number	D	D min	F	L1	CS	gage insert	insert screw	Torx
right hand								
A12SCFPR3AP5	.750	.930	.500	10.000	1/8-27 NPT	CP..3252	MS1027	T9
A16SCFPR3AP5	1.000	1.190	.625	12.000	1/4-18 NPT	CP..3252	MS1027	T9
left hand								
A12SCFPL3AP5	.750	.930	.500	10.000	1/8-27 NPT	CP..3252	MS1027	T9
A16SCFPL3AP5	1.000	1.190	.625	12.000	1/4-18 NPT	CP..3252	—	T9



NOTE: 90° countersunk hole insert (i.e., CPGM/CPG1332.5).
ANSI/ISO compatible 60° countersunk hole.
Insert (i.e., CPMT/CPGT/CPGW 32.5) does not fit this tool.



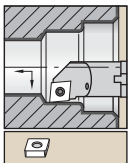
Heavy metal bar with through coolant.
See pages B92–B95 for inserts.



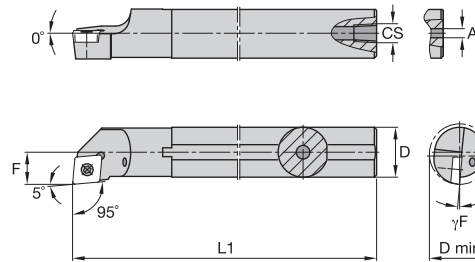
■ L-SCFP 0°

catalog number	D	D min	F	L1	A	γF°	gage insert	insert screw	Torx
right hand									
L06MSCFPR2	.375	.480	.250	6.059	.125	-4.0	CP..2151..	MS1939	T7
L08RSCFPR2	.500	.600	.312	7.928	.156	-2.0	CP..2151..	MS1153	T7
L10RSCFPR2	.625	.770	.406	7.992	.156	0.0	CP..2151..	MS1153	T7
left hand									
L06MSCFPL2	.375	.480	.250	6.059	.125	-4.0	CP..2151..	MS1939	T7
L08RSCFPL2	.500	.600	.312	7.928	.156	-2.0	CP..2151..	MS1153	T7
L10RSCFPL2	.625	.770	.406	7.992	.156	0.0	CP..2151..	MS1153	T7
L12RSCFPL3	.750	.930	.500	7.960	.156	-2.0	CP..3252..	MS1155	T15
L16SSCFPR3	1.000	1.200	.640	9.941	.250	0.0	CP..3252..	MS1155	T15

NOTE: ANSI/ISO compatible 68° countersunk hole insert.
This tool will accept CPGM/CPGT/CPGW 21.5° inserts.
ANSI/ISO compatible 60° countersunk hole inserts (i.e., CPMT/CPGT/CPGW 32.5).
90° countersunk hole inserts (i.e., CPGM/CPGB 32.5) do not fit this tool.

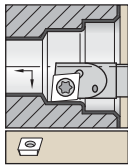


Steel shank with through coolant.
See pages B88–B91 for inserts.

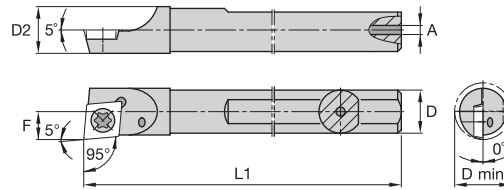


■ A-SCLC -5°

catalog number	D	D min	F	L1	A	CS	γF°	gage insert	insert screw	Torx
right hand										
A06MSCLCR2	.375	.480	.250	6.000	.13	—	-8.0	CC..2151	MS1939	T7
A08RSCLCR2	.500	.600	.312	8.000	—	1/16-27 NPT	-7.0	CC..2151	MS1153	T7
A10SSCLCR2	.625	.770	.406	10.000	—	1/8-27 NPT	-5.0	CC..2151	MS1153	T7
A10SSCLCR3	.625	.770	.406	10.000	—	1/8-27 NPT	-8.0	CC..3252	MS1155	T15
A12SSCLCR3	.750	.930	.500	10.000	—	1/8-27 NPT	-5.0	CC..3252	MS1155	T15
A16TSCLCR3	1.000	1.200	.640	12.000	—	1/4-18 NPT	-4.0	CC..3252	MS1155	T15
left hand										
A06MSCLCL2	.375	.480	.250	6.000	.13	—	-8.0	CC..2151	MS1939	T7
A08RSCLCL2	.500	.600	.312	8.000	—	1/16-27 NPT	-7.0	CC..2151	MS1153	T7
A10SSCLCL2	.625	.770	.406	10.000	—	1/8-27 NPT	-5.0	CC..2151	MS1153	T7
A10SSCLCL3	.625	.770	.406	10.000	—	1/8-27 NPT	-8.0	CC..3252	MS1155	T15
A12SSCLCL3	.750	.930	.500	10.000	—	1/8-27 NPT	-5.0	CC..3252	MS1155	T15
A16TSCLCL3	1.000	1.200	.640	12.000	—	1/4-18 NPT	-4.0	CC..3252	MS1155	T15



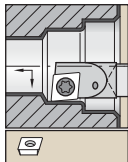
Steel shank with through coolant.
See pages B91–B92 for inserts.



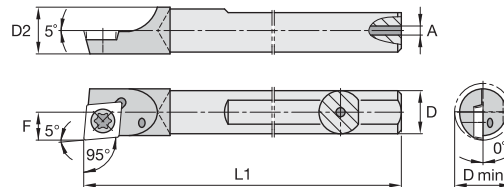
■ **A-SCLD -5°**

O.D./I.D. Tooling

catalog number	D	D min	D2	F	L1	A	gage insert	insert screw	Torx
right hand									
A03XSCLDR12A	.188	.204	.180	.104	2.50	.040	CD..120605	CC09	T6
A03XSCLDR12	.188	.230	.203	.116	2.50	.040	CD..120605	CC09	T6
A04FSCLDR12	.250	.285	.260	.145	3.00	.040	CD..120605	CC11	T6
left hand									
A03XSCLDL12	.188	.230	.203	.116	2.50	.040	CD..120605	CC09	T6
A04FSCLDL12	.250	.285	.260	.145	3.00	.040	CD..120605	CC11	T6



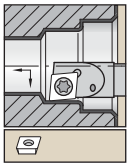
Carbide shank with through coolant.
See pages B91–B92 for inserts.



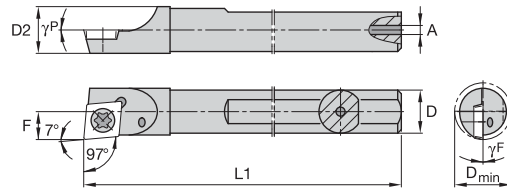
■ **E-SCLD -5°**

catalog number	D	D min	D2	F	L1	L2	A	gage insert	insert screw	Torx
right hand										
E03HSCLDR12A	.187	.218	—	.111	4.00	.42	.040	CD..120605	CC09	T6
E03HSCLDR12	.187	.224	—	.117	4.00	.42	.040	CD..120605	CC09	T6
E03MSCLDR12	.188	.224	.189	.117	6.00	—	.040	CD..120605	CC09	T6
E03MSCLDR12A	.188	.218	.193	.111	6.00	—	.040	CD..120605	CC09	T6
E04HSCLDR12	.250	.285	.260	.145	4.00	.48	.047	CD..120605	CC11	T6
E04MSCLDR12	.250	.285	—	.145	6.00	.48	.047	CD..120605	CC11	T6
E05MSCLDR12	.312	.356	—	.185	6.00	.54	.093	CD..120605	CC11	T6
left hand										
E03MSCLDL12	.188	.224	.189	.117	6.00	—	.040	CD..120605	CC09	T6
E03HSCLDL12A	.188	.218	.193	.111	4.00	—	.040	CD..120605	CC09	T6
E03MSCLDL12A	.188	.218	.193	.111	6.00	—	.040	CD..120605	CC09	T6
E03HSCLDL12	.188	.224	.193	.117	4.00	—	.040	CD..120605	CC09	T6
E04MSCLDL12	.250	.285	.258	.145	6.00	—	.047	CD..120605	CC11	T6
E04HSCLDL12	.250	.285	.263	.145	4.00	.48	.047	CD..120605	CC11	T6
E05MSCLDL12	.312	.356	.322	.185	6.00	—	.093	CD..120605	CC11	T6




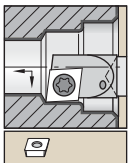


Steel shank with through coolant.
See page B91 for inserts.

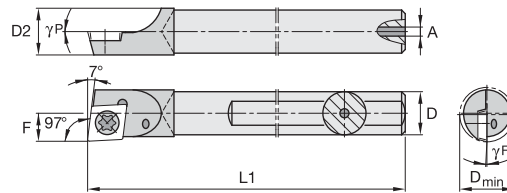


■ A-SC7D -7°


catalog number	D	D min	D2	F	L1	A	gage insert	insert screw	Torx
right hand A03XSC7DR12	.188	.180	.165	.095	2.50	.040	CDHB120605	 CC09	T6
left hand A03XSC7DL12	.188	.180	.165	.095	2.50	.040	CDHB120605	CC09	T6



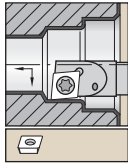
Carbide shank with through coolant.
See pages B91–B92 for inserts.



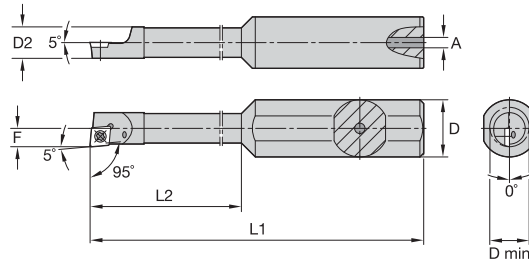
■ E-SC7D -7°

catalog number	D	D min	D2	F	L1	A	gage insert	insert screw	Torx
right hand E25MSC7DR12	.156	.180	.165	.095	6.00	.039	CD..120605	 CC09	T6
left hand E25MSC7DL12	.156	.180	.165	.095	6.00	.039	CD..120605	CC09	T6

O.D./I.D. Tooling



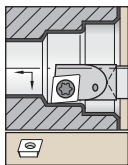
Necked steel shank with through coolant.
See pages B91–B92 for inserts.



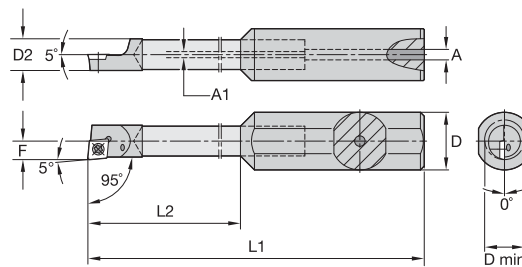
■ A-SCLD -5°

O.D./I.D. Tooling

catalog number	D	D min	D2	F	L1	L2	A	γF°	gage insert	insert screw	Torx
right hand											
A2906XSCLDR1205	.375	.204	.180	.104	2.50	.50	.040	0.0	CD..120605	CC09	T6
A2906XSCLDR121	.375	.204	.180	.104	2.50	1.00	.040	0.0	CD..120605	CC09	T6
A0306XSCLDR12	.375	.243	.193	.126	3.50	1.00	.078	-4.0	CD..12061	MS1454	T5
left hand											
A3206XSCLDR1205	.375	.228	.203	.116	2.50	.50	.040	0.0	CD..120605	CC11	T6
A3206XSCLDR121	.375	.228	.203	.116	2.50	1.00	.040	0.0	CD..120605	CC11	T6
A0406XSCLDR12	.375	.300	.234	.156	4.00	1.25	.078	-1.0	CD..12061	MS1454	T5
A0406XSCLDR12075	.375	.285	.260	.145	2.50	.75	.040	0.0	CD..120605	CC11	T6
A0406XSCLDR12125	.375	.285	.260	.145	2.50	1.25	.040	0.0	CD..120605	CC11	T6
left hand											
A0306XSCLDL12	.375	.243	.193	.126	3.50	1.00	.078	-4.0	CD..12061	MS1454	T5
A0406XSCLDL12	.375	.300	.234	.156	4.00	1.25	.078	-1.0	CD..12061	MS1454	T5



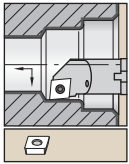
Necked carbide shank with through coolant.
See pages B91–B92 for inserts.



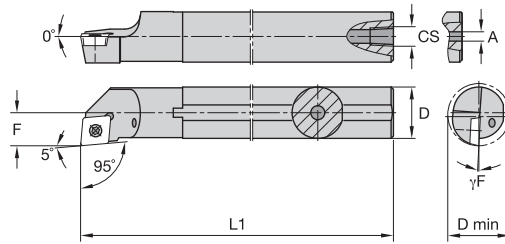
■ E-SCLD -5°

catalog number	D	D min	D2	F	L1	L2	A	A1	gage insert	insert screw	Torx
right hand											
E3208XSCLDR121	.500	.234	.187	.119	2.50	1.00	.13	.047	CD..120605	CC09	T6
E0408XSCLDR1225	.500	.285	.258	.145	4.00	2.50	.13	.047	CD..120605	CC11	T6
E2910XSCLDR12088	.625	.208	.189	.104	3.38	.88	.13	.047	CD..120605	CC09	T6
E3210XSCLDR122	.625	.234	.210	.119	4.50	2.00	.13	.047	CD..120605	CC09	T6
E0410XSCLDR12125	.625	.285	.258	.145	3.75	1.25	.13	.047	CD..120605	CC11	T6





Steel shank with through coolant.
See pages B92–B95 for inserts.



■ A-SCLP -5°

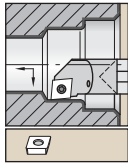


catalog number	D	D min	F	L1	A	CS	γF°	gage insert	insert screw	Torx
right hand										
A06SCLPR2	.375	.480	.250	6.00	.13	—	-6.0	CP..2151	MS1153	T7
A08SCLPR2	.500	.600	.312	8.00	—	1/16-27 NPT	-3.0	CP..2151	MS1153	T7
A10SCLPR2	.625	.770	.406	10.00	—	1/8-27 NPT	-2.0	CP..2151	MS1153	T7
A10SCLPR3	.625	.770	.406	10.00	—	1/8-27 NPT	-2.0	CP..3252	MS1155	T15
A12SCLPR3	.750	.930	.500	10.00	—	1/8-27 NPT	-2.0	CP..3252	MS1155	T15
A16SCLPR3	1.000	1.200	.640	12.00	—	1/4-18 NPT	0.0	CP..3252	MS1155	T15
left hand										
A06SCLPL2	.375	.480	.250	6.00	.13	—	-6.0	CP..2151	MS1153	T7
A08SCLPL2	.500	.600	.312	8.00	—	1/16-27 NPT	-3.0	CP..2151	MS1153	T7
A10SCLPL2	.625	.770	.406	10.00	—	1/8-27 NPT	-2.0	CP..2151	MS1153	T7
A10SCLPL3	.625	.770	.406	10.00	—	1/8-27 NPT	-2.0	CP..3252	MS1155	T15
A12SCLPL3	.750	.930	.500	10.00	—	1/8-27 NPT	-2.0	CP..3252	MS1155	T15
A16SCLPL3	1.000	1.200	.640	12.00	—	1/4-18 NPT	0.0	CP..3252	MS1155	T15

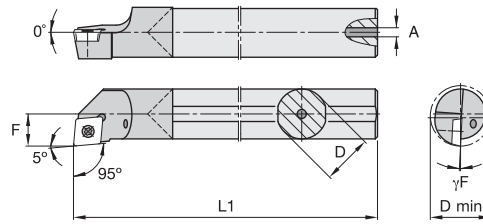
NOTE: ANSI/ISO compatible 60° countersunk hole insert.
This tool will also accept CPGM/CPGT/CPGW-21.5_ inserts.
ANSI/ISO compatible 60° countersunk hole insert (i.e., CPMT/CPGT/CPGW-32.5_).
90° countersunk hole inserts (i.e., CPGM/CPGB-32.5_) do not fit this tool.



O.D./I.D. Tooling



Carbide shank with through coolant.
See pages B92–B95 for inserts.



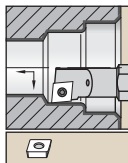
■ E-SCLP -5°

O.D./I.D. Tooling

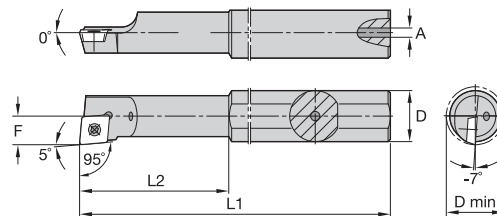


catalog number	D	D min	F	L1	A	γF°	gage insert	insert screw	Torx
right hand									
E05KSCLP18	.313	.415	.219	5.000	.093	-5.0	CP..18151	MS1933	T7
E06SCLPR2	.375	.480	.250	6.000	.125	-6.0	CP..2151	MS1939	T7
E08SCLPR2	.500	.600	.312	8.000	.187	-2.0	CP..2151	MS1153	T7
E10SCLPR2	.625	.770	.406	10.000	.218	-2.0	CP..2151	MS1153	T7
E10SCLPR3	.625	.770	.406	10.000	.218	-2.0	CP..3252	MS1155	T15
E12SCLPR2	.750	.930	.500	10.000	.281	-2.0	CP..2151	MS1153	T7
E12SCLPR3	.750	.930	.500	10.000	.281	-2.0	CP..3252	MS1155	T15
E16SCLPR3	1.000	1.200	.640	12.000	.312	0.0	CP..3252	MS1155	T15
left hand									
E05KSCLP18	.313	.415	.219	5.000	.093	-5.0	CP..18151	MS1933	T7
E06SCLPL2	.375	.480	.250	6.000	.125	-6.0	CP..2151	MS1939	T7
E08SCLPL2	.500	.600	.312	8.000	.187	-2.0	CP..2151	MS1153	T7
E10SCLPL2	.625	.770	.406	10.000	.218	-2.0	CP..2151	MS1153	T7
E10SCLPL3	.625	.770	.406	10.000	.218	-2.0	CP..3252	MS1155	T15
E12SCLPL2	.750	.930	.500	10.000	.281	-2.0	CP..2151	MS1153	T7
E12SCLPL3	.750	.930	.500	10.000	.281	-2.0	CP..3252	MS1155	T15
E16SCLPL3	1.000	1.200	.640	12.000	.312	0.0	CP..3252	MS1155	T15

NOTE: ANSI/ISO compatible 60° countersunk hole insert.
This tool will also accept CPGM/CPGT/CPGW-21.5_ inserts.
ANSI/ISO compatible 60° countersunk hole insert (i.e., CPMT/CPGT/CPGW-32.5_).
90° countersunk hole inserts (i.e., CPGM/CPGB-32.5_) do not fit this tool.



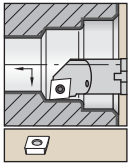
Necked steel shank with through coolant.
See pages B92–B95 for inserts.



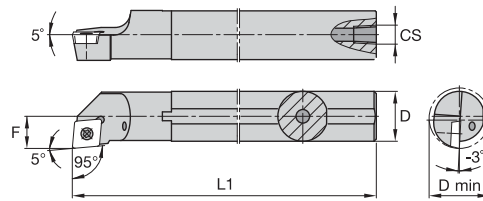
■ A-SCLP -5°



catalog number	D	D min	F	L1	L2	A	gage insert	insert screw	Torx
right hand									
A0506SCLPR18	.375	.415	.219	5.00	1.63	.094	CP..18151	MS1152	T7
left hand									
A0506SCLPL18	.375	.415	.219	5.00	1.63	.094	CP..18151	MS1152	T7



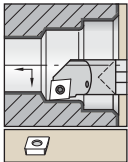
Steel shank with through coolant.
See pages B92–B95 for inserts.



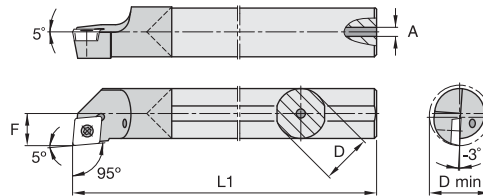
■ A-SCLP-AP -5°

catalog number	D	D min	F	L1	CS	gage insert	insert screw	Torx
right hand								
A10SCLPR3AP5	.625	.770	.406	10.000	1/8-27 NPT	CP..3252	MS1027	T9
A12SCLPR3AP5	.750	.930	.500	10.000	1/8-27 NPT	CP..3252	MS1027	T9
A16SCLPR3AP5	1.000	1.190	.625	12.000	1/4-18 NPT	CP..3252	MS1027	T9
left hand								
A10SCLPL3AP5	.625	.770	.406	10.000	1/8-27 NPT	CP..3252	MS1027	T9
A12SCLPL3AP5	.750	.930	.500	10.000	1/8-27 NPT	CP..3252	MS1027	T9
A16SCLPL3AP5	1.000	1.190	.625	12.000	1/4-18 NPT	CP..3252	MS1027	T9

NOTE: 90° countersunk hole insert (i.e., CPGM/CPGB-32.5_)
ANSI/ISO compatible 60° countersunk hole insert (i.e., CPMT/CPGT/CPGW-32.5_) do not fit this tool.



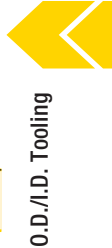
Carbide shank with through coolant.
See pages B92–B95 for inserts.

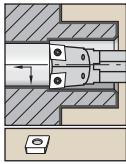


■ E-SCLP-AP -5°

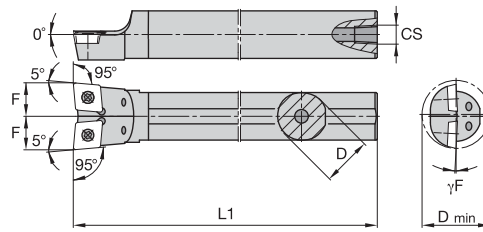
catalog number	D	D min	F	L1	A	gage insert	insert screw	insert screw wrench size
right hand								
E12SCLPR3AP5	.750	1.000	.500	10.000	.281	CP..3252	MS1027	T9
E16SCLPR3AP5	1.000	1.190	.625	12.000	.312	CP..3252	MS1027	T9
left hand								
E12SCLPL3AP5	.750	1.000	.500	10.000	.281	CP..3252	MS1027	T9
E16SCLPL3AP5	1.000	1.190	.625	12.000	.312	CP..3252	MS1027	T9

NOTE: 90° countersunk hole insert (i.e., CPGM/CPGB-32.5_)
ANSI/ISO compatible 60° countersunk hole insert (i.e., CPMT/CPGT/CPGW-32.5_) do not fit this tool.





Steel shank with through coolant.
See pages B92–B95 for inserts.



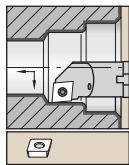
■ A-SCLP-D -5°

O.D./I.D. Tooling

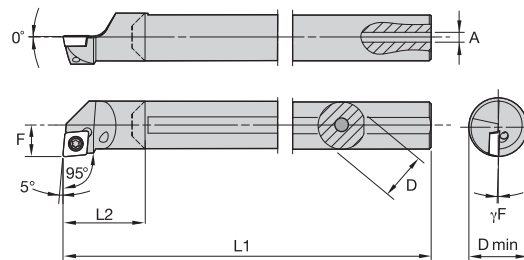
catalog number	D	D min	F	L1	CS	γF°	gage insert	insert screw	Torx
A08SCLPR2D	.500	.650	.312	8.00	1/16-27 NPT	-3.0	CP..2151	MS1153	T7
A10SCLPR2D	.625	.842	.406	10.00	1/8-27 NPT	-2.0	CP..2151	MS1153	T7
A12SCLPR3D	.750	1.030	.500	10.00	1/8-27 NPT	-2.0	CP..3252	MS1155	T15



NOTE: ANSI/ISO compatible 60° countersunk hole insert.
This tool will also accept CPGM/CPGT/CPGW-21.5_ inserts.
ANSI/ISO compatible 60° countersunk hole insert (i.e., CPMT/CPGT/CPGW-32.5_).
90° countersunk hole inserts (i.e., CPGM/CPGB-32.5_) do not fit this tool.



Heavy metal bar with through coolant.
See pages B92–B95 for inserts.

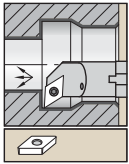


■ L-SCLP -5°

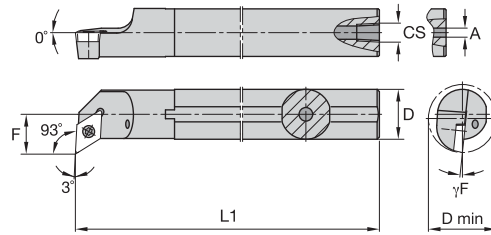
catalog number	D	D min	F	L1	L2	A	γF°	gage insert	insert screw	Torx
right hand										
L05MSCLPR2	.313	.415	.219	5.995	.76	.094	-6.0	CP..2151..	MS1939	T7
L06MSCLPR2	.375	.480	.250	6.059	.91	.125	-6.0	CP..2151..	MS1939	T7
L08RSCCLPR2	.500	.600	.312	7.928	.93	.156	-2.0	CP..2151..	MS1153	T7
L10RSCCLPR2	.625	.770	.406	7.992	1.03	.156	-2.0	CP..2151..	MS1153	T7
L10RSCCLPR3	.625	.770	.406	8.012	1.05	.156	-2.0	CP..3252..	MS1155	T15
L12RSCCLPR3	.750	.930	.500	7.960	1.30	.156	-2.0	CP..3252..	MS1155	T15
L16SSCLPR3	1.000	1.200	.640	9.941	1.41	.250	0.0	CP..3252..	MS1155	T15
left hand										
L05MSCLPL2	.313	.415	.219	5.995	.76	.094	-6.0	CP..2151..	MS1939	T7
L06MSCLPL2	.375	.480	.250	6.059	.91	.125	-6.0	CP..2151..	MS1939	T7
L08RSCCLPL2	.500	.600	.312	7.928	.93	.156	-2.0	CP..2151..	MS1153	T7
L10RSCCLPL2	.625	.770	.406	7.992	1.03	.156	-2.0	CP..2151..	MS1153	T7
L10RSCCLPL3	.625	.770	.406	8.012	1.05	.156	-2.0	CP..3252..	MS1155	T15
L12RSCCLPL3	.750	.930	.500	7.960	1.30	.156	-2.0	CP..3252..	MS1155	T15
L16SSCLPL3	1.000	1.200	.640	9.941	1.41	.250	0.0	CP..3252..	MS1155	T15



NOTE: ANSI/ISO compatible 60° countersunk hole insert.
This tool will also accept CPGM/CPGT/CPGW-21.5_ inserts.
ANSI/ISO compatible 60° countersunk hole insert (i.e., CPMT/CPGT/CPGW-32.5_).
90° countersunk hole inserts (i.e., CPGM/CPGB-32.5_) do not fit this tool.



Steel shank with through coolant.
See pages B95–B98 for inserts.

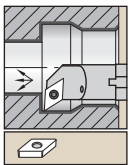


■ A-SDUC -3°

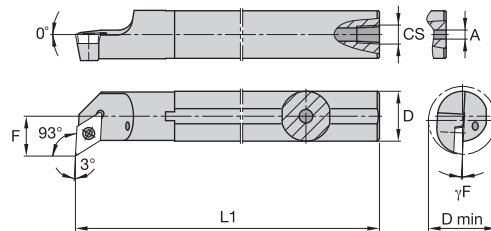
catalog number	D	D min	F	L1	A	CS	γF°	gage insert	insert screw	Torx
right hand										
A06MSDUCR2	.375	.600	.375	6.000	.125	—	-7.0	DC..2151	MS1153	T7
A08RSDUCR2	.500	.730	.437	8.000	—	1/16-27 NPT	-5.0	DC..2151	MS1153	T7
A10SSDUCR2	.625	.850	.500	10.000	—	1/8-27 NPT	-4.0	DC..2151	MS1153	T7
A12SSDUCR3	.750	.980	.562	10.000	—	1/8-27 NPT	-5.0	DC..3252	MS1155	T15
A16TSDUCR3	1.000	1.300	.750	12.000	—	1/4-18 NPT	-3.0	DC..3252	MS1155	T15
left hand										
A06MSDUCL2	.375	.600	.375	6.000	.125	—	-7.0	DC..2151	MS1153	T7
A08SDUCL2	.500	.730	.437	8.000	—	1/16-27 NPT	-5.0	DC..2151	MS1153	T7
A10SSDUCL2	.625	.850	.500	10.000	—	1/8-27 NPT	-4.0	DC..2151	MS1153	T7
A12SSDUCL3	.750	.980	.562	10.000	—	1/8-27 NPT	-5.0	DC..3252	MS1155	T15
A16TSDUCL3	1.000	1.300	.750	12.000	—	1/4-18 NPT	-3.0	DC..3252	MS1155	T15



O.D./I.D. Tooling



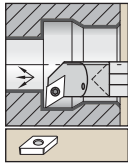
Steel shank with through coolant.
See pages B98–B100 for inserts.



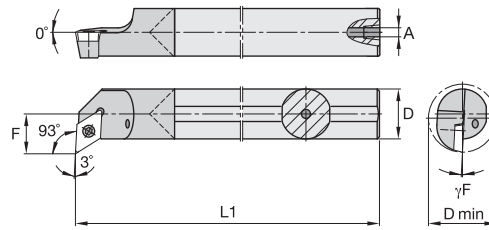
■ A-SDUP -3°

catalog number	D	D min	F	L1	A	CS	γF°	gage insert	insert screw	Torx
right hand										
A06MSDUPR2	.375	.600	.375	6.000	.125	—	-3.0	DP..2151	MS1153	T7
A08RSDUPR2	.500	.730	.437	8.000	—	1/16-27 NPT	0.0	DP..2151	MS1153	T7
A10SSDUPR2	.625	.850	.500	10.000	—	1/8-27 NPT	0.0	DP..2151	MS1153	T7
A12SSDUPR3	.750	.980	.562	10.000	—	1/8-27 NPT	0.0	DP..3252	MS1155	T15
A16TSDUPR3	1.000	1.300	.750	12.000	—	1/4-18 NPT	0.0	DP..3252	MS1155	T15
left hand										
A06MSDUPL2	.375	.600	.375	6.000	.125	—	-3.0	DP..2151	MS1153	T7
A08RSDUPL2	.500	.730	.437	8.000	—	1/16-27 NPT	0.0	DP..2151	MS1153	T7
A10SSDUPL2	.625	.850	.500	10.000	—	1/8-27 NPT	0.0	DP..2151	MS1153	T7
A12SSDUPL3	.750	.980	.562	10.000	—	1/8-27 NPT	0.0	DP..3252	MS1155	T15
A16TSDUPL3	1.000	1.300	.750	12.000	—	1/4-18 NPT	0.0	DP..3252	MS1155	T15





Carbide shank with through coolant.
See pages B98–B100 for inserts.

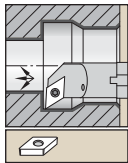


■ E-SDUP -3°

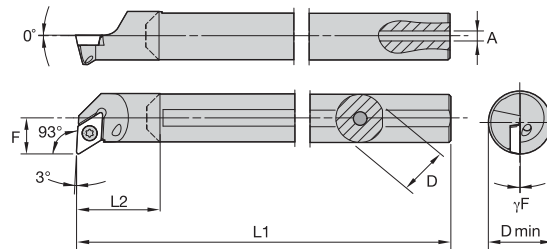
O.D./I.D. Tooling



catalog number	D	D min	F	L1	A	γF°	gage insert	insert screw	Torx
right hand									
E06SDUPR2	.375	.600	.375	6.000	.125	-2.0	DP..2151	MS1153	T7
E08SDUPR2	.500	.730	.437	8.000	.187	0.0	DP..2151	MS1153	T7
E10SDUPR2	.625	.850	.500	10.000	.218	0.0	DP..2151	MS1153	T7
E12SDUPR2	.750	.980	.562	10.000	.281	0.0	DP..2151	MS1153	T7
E12SSDUPR3	.750	.980	.562	10.000	.281	0.0	DP..3252	MS1155	T15
E16TSDUPR3	1.000	1.300	.750	12.000	.312	0.0	DP..3252	MS1155	T15
left hand									
E06SDUPL2	.375	.600	.375	6.000	.125	-2.0	DP..2151	MS1153	T7
E08SDUPL2	.500	.730	.437	8.000	.187	0.0	DP..2151	MS1153	T7
E10SDUPL2	.625	.850	.500	10.000	.218	0.0	DP..2151	MS1153	T7
E12SDUPL2	.750	.980	.562	10.000	.281	0.0	DP..2151	MS1153	T7
E12SSDUPL3	.750	.980	.562	10.000	.281	0.0	DP..3252	MS1155	T15
E16TSDUPL3	1.000	1.300	.750	12.000	.312	0.0	DP..3252	MS1155	T15



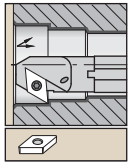
Heavy metal bar with through coolant.
See pages B98–B100 for inserts.



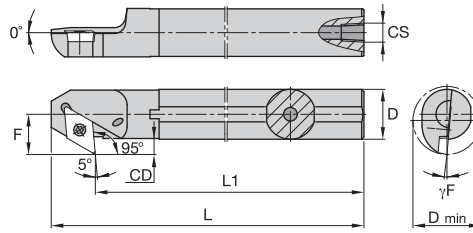
■ L-SDUP -3°



catalog number	D	D min	F	L1	L2	A	γF°	gage insert	insert screw	Torx
right hand										
L06MSDUPR2	.375	.600	.375	6.059	.91	.125	-2.0	DP..2151..	MS1153	T7
L08RSDUPR2	.500	.730	.437	7.928	.93	.156	0.0	DP..2151..	MS1153	T7
L10RSDUPR2	.625	.850	.500	7.992	1.03	.156	0.0	DP..2151..	MS1153	T7
L12RSDUPR3	.750	.980	.562	7.960	1.30	.156	0.0	DP..3252..	MS1155	T15
left hand										
L06MSDUPL2	.375	.600	.375	6.059	.91	.125	-2.0	DP..2151..	MS1153	T7
L08RSDUPL2	.500	.730	.437	7.928	.93	.156	0.0	DP..2151..	MS1153	T7
L10RSDUPL2	.625	.850	.500	7.992	1.03	.156	0.0	DP..2151..	MS1153	T7
L12RSDUPL3	.750	.980	.562	7.960	1.30	.156	0.0	DP..3252..	MS1155	T15

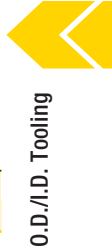


Steel shank with through coolant.
See pages B95–B98 for inserts.

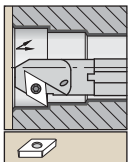


■ A-SDXC -5°

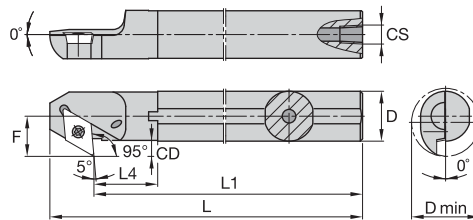
catalog number	D	D min	F	L1	CD	L	CS	γF°	gage insert	insert screw	Torx
right hand											
A08RSDXCR2	.500	.730	.437	8.00	.187	8.50	1/16-27 NPT	-6.0	DC..2151	MS1153	T7
A10SSDXCR2	.625	.850	.500	10.00	.187	10.50	1/8-27 NPT	-5.0	DC..2151	MS1153	T7
A12SSDXCR3	.750	.980	.562	10.00	.187	10.63	1/8-27 NPT	-5.0	DC..3252	MS1155	T15
A16TSDXCR3	1.000	1.300	.750	12.00	.250	12.63	1/4-18 NPT	-3.0	DC..3252	MS1155	T15
left hand											
A08RSDXCL2	.500	.730	.437	8.00	.187	8.50	1/16-27 NPT	-6.0	DC..2151	MS1153	T7
A10SSDXCL2	.625	.850	.500	10.00	.187	10.50	1/8-27 NPT	-5.0	DC..2151	MS1153	T7
A12SSDXCL3	.750	.980	.562	10.00	.187	10.63	1/8-27 NPT	-5.0	DC..3252	MS1155	T15
A16TSDXCL3	1.000	1.300	.750	12.00	.250	12.63	1/4-18 NPT	-3.0	DC..3252	MS1155	T15



O.D./I.D. Tooling



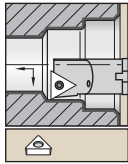
Steel shank with through coolant.
See pages B98–B100 for inserts.



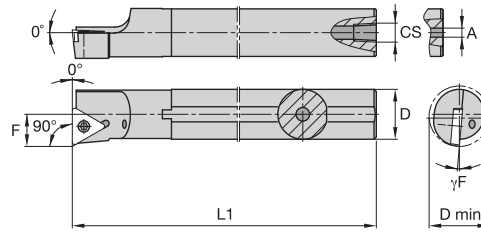
■ A-SDXP-5°

catalog number	D	D min	F	L1	L	L4	CD	CS	gage insert	insert screw	Torx
right hand											
A08RSDXPR2	.500	.730	.437	8.00	8.50	2.79	.187	1/16-27 NPT	DP..2151	MS1153	T7
A10SSDXPR2	.625	.850	.500	10.00	10.50	2.31	.187	1/8-27 NPT	DP..2151	MS1153	T7
A12SSDXPR3	.750	.980	.562	10.00	10.75	2.29	.187	1/8-27 NPT	DP..3252	MS1155	T15
A16TSDXPR3	1.000	1.300	.750	12.00	12.75	4.62	.250	1/4-18 NPT	DP..3252	MS1155	T15
left hand											
A08RSDXPL2	.500	.730	.437	8.00	8.50	2.79	.187	1/16-27 NPT	DP..2151	MS1153	T7
A10SSDXPL2	.625	.850	.500	10.00	10.50	2.31	.187	1/8-27 NPT	DP..2151	MS1153	T7
A12SSDXPL3	.750	.980	.562	10.00	10.75	2.29	.187	1/8-27 NPT	DP..3252	MS1155	T15
A16TSDXPL3	1.000	1.300	.750	12.00	12.75	4.62	.250	1/4-18 NPT	DP..3252	MS1155	T15





Steel shank with through coolant.
See pages B105–B108 for inserts.

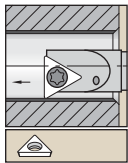


■ A-STFC 0°

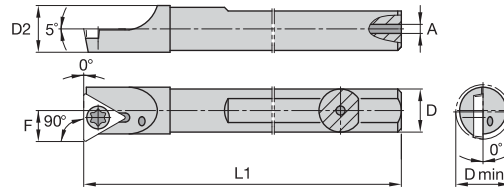
O.D./I.D. Tooling



catalog number	D	D min	F	L1	A	CS	γF°	gage insert	insert screw	Torx
right hand										
A06MSTFCR2	.375	.480	.250	6.00	.125	—	-8.0	TC..2151	MS1153	T7
A08RSTFCR2	.500	.600	.312	8.00	—	1/16-27 NPT	-7.0	TC..2151	MS1153	T7
A10SSTFCR2	.625	.770	.406	10.00	—	1/8-27 NPT	-5.0	TC..2151	MS1153	T7
left hand										
A08RSTFCL2	.500	.600	.312	8.00	—	1/16-27 NPT	-7.0	TC..2151	MS1153	T7
A10SSTFCL2	.625	.770	.406	10.00	—	1/8-27 NPT	-5.0	TC..2151	MS1153	T7
A12STFCL3	.750	.930	.500	10.00	—	1/8-27 NPT	-5.0	TC..3252	MS1155	T15
A16STFCL3	1.000	1.200	.640	12.00	—	1/4-18 NPT	-4.0	TC..3252	MS1155	T15



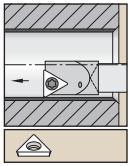
Steel shank with through coolant.
See page B109 for inserts.



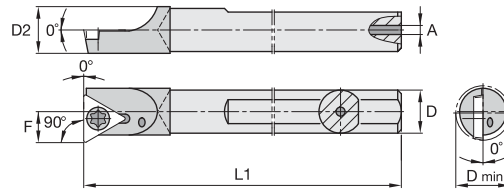
■ A-STFD 0°



catalog number	D	D min	D2	F	L1	A	gage insert	insert screw	Torx
right hand									
A04HSTFDR128	.250	.296	.260	.156	4.00	.040	TDHB12807501	FC14	T7
A05HSTFDR128	.312	.358	.322	.187	4.00	.060	TDHB12807501	FC14	T7



Carbide shank with through coolant.
See page B109 for inserts.

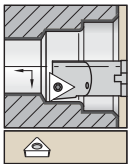


■ E-STFD 0°

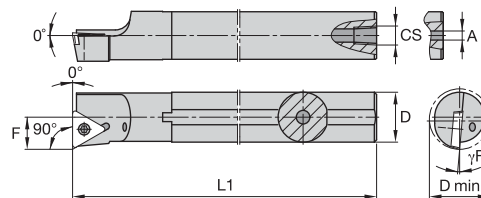
catalog number	D	D min	D2	F	L1	A	gage insert	insert screw	Torx
right hand									
E03HSTFDR128	.188	.275	.203	.134	4.00	.040	TD..12807505	FC11	T7
E04HSTFDR128	.250	.300	.260	.156	4.00	.047	TD..12807505	FC11	T7
E04MSTFDR128	.250	.300	.260	.156	6.00	.047	TD..12807505	FC11	T7
E05HSTFDR128	.313	.360	.322	.187	4.00	.093	TD..12807505	FC11	T7
E05MSTFDR128	.313	.360	.322	.187	6.00	.093	TD..12807505	FC11	T7



O.D./I.D. Tooling



Steel shank with through coolant.
See pages B109–B112 for inserts.

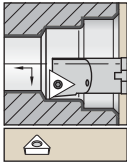


■ A-STFP 0°

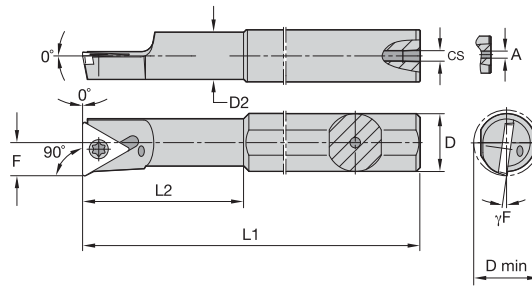
catalog number	D	D min	D2	F	L1	L2	A	CS	γF°	gage insert	insert screw	Torx
right hand												
A05STFPR18	.313	.415	—	.219	5.00	—	.094	—	-8.0	TP..18151	MS1933	T7
A06STFPR2	.375	.480	—	.250	6.00	—	.125	—	-4.0	TP..2151	MS1153	T7
A08RSTFPR2	.500	.600	—	.312	8.00	—	—	1/16-27 NPT	-2.0	TP..2151	MS1153	T7
A10STFPR2	.625	.770	—	.406	10.00	—	—	1/8-27 NPT	0.0	TP..2151	MS1153	T7
A12STFPR3	.750	.930	—	.500	10.00	—	—	1/8-27 NPT	-2.0	TP..3252	MS1155	T15
A16STFPR3	1.000	1.200	—	.640	12.00	—	—	1/4-18 NPT	0.0	TP..3252	MS1155	T15
left hand												
A06STFPL2	.375	.480	—	.250	6.00	—	.125	—	-4.0	TP..2151	MS1153	T7
A08STFPL2	.500	.600	—	.312	8.00	—	—	1/16-27 NPT	-2.0	TP..2151	MS1153	T7
A12STFPL3	.750	.930	—	.500	10.00	—	—	1/8-27 NPT	-2.0	TP..3252	MS1155	T15



NOTE: ANSI/ISO compatible 60° countersunk hole insert.
This tool will also accept TPGM/TPGT/TPGW-21.5_ inserts.
ANSI/ISO compatible 60° countersunk hole insert (i.e., TPMT/TPGT/TPGW-32.5_).
90° countersunk hole inserts (i.e., TPGM/TPGB-32.5_) do not fit this tool.



Steel shank with through coolant.
See pages B109–B112 for inserts.



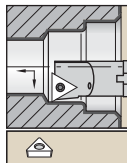
■ A-STFP 0°

O.D./I.D. Tooling

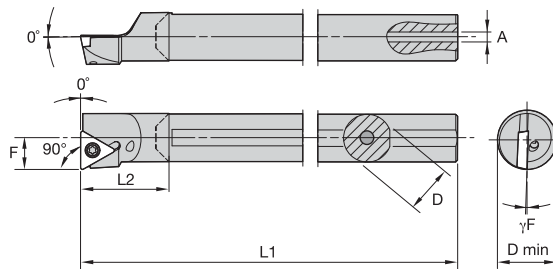


catalog number	D	D min	F	L1	A	CS	γF°	gage insert	insert screw	Torx
right hand A0506STFPR18	.375	.415	.219	5.000	.094	—	-8.0	TP..18151	MS1152	T7

NOTE: ANSI/ISO compatible 60° countersunk hole insert (i.e., CPMT/CPGT/CPGW32.5).
90° countersunk hole inserts (i.e., CPGM/CPGB 32.5) do not fit this tool.



Heavy metal bar with through coolant.
See pages B109–B112 for inserts.

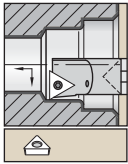


■ L-STFP 0°

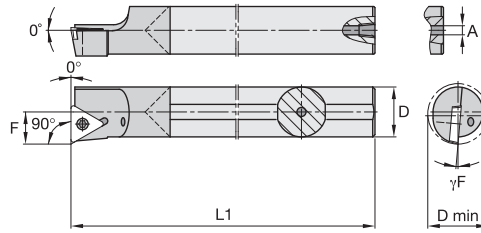


catalog number	D	D min	F	L1	L2	A	γF°	gage insert	insert screw	Torx
right hand L06MSTFPR2	.375	.480	.250	6.059	.91	.125	-4.0	TP..2151	MS1153	T7
L08RSTFPR2	.500	.600	.312	7.928	.93	.156	-2.0	TP..2151	MS1153	T7
L10RSTFPR2	.625	.770	.406	8.082	1.12	.156	0.0	TP..2151	MS1153	T7
L12RSTFPR3	.750	.930	.500	8.050	1.39	.156	-2.0	TP..3252	MS1155	T15
left hand L06MSTFPL2	.375	.480	.250	6.059	.91	.125	-4.0	TP..2151	MS1153	T7
L08RSTFPL2	.500	.600	.312	7.928	.93	.156	-2.0	TP..2151	MS1153	T7
L12RSTFPL3	.750	.930	.500	8.050	1.39	.156	-2.0	TP..3252	MS1155	T15

NOTE: ANSI/ISO compatible 60° countersunk hole insert.
This tool will also accept TPGM/TPGT/TPGW-21.5_ inserts.
ANSI/ISO compatible 60° countersunk hole insert (i.e., TPMT/TPGT/TPGW-32.5_).
90° countersunk hole inserts (i.e., TPGM/TPGB-32.5_) do not fit this tool.



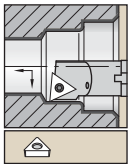
Carbide shank with through coolant.
See pages B109–B112 for inserts.



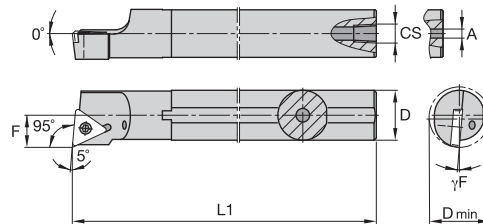
■ E-STFP 0°

catalog number	D	D min	F	L1	A	γF°	gage insert	insert screw	Torx
right hand									
E05STFPR18	.313	.415	.219	5.000	.093	-5.0	TP..18151	MS1152	T7
E06STFPR2	.375	.480	.250	6.000	.125	-4.0	TP..2151	MS1153	T7
E08STFPR2	.500	.600	.312	8.000	.187	-2.0	TP..2151	MS1153	T7
E10STFPR2	.625	.770	.406	10.000	.218	0.0	TP..2151	MS1153	T7
E12STFPR3	.750	.930	.500	10.000	.281	-2.0	TP..3252	MS1155	T15
E16STFPR3	1.000	1.200	.640	12.000	.312	0.0	TP..3252	MS1155	T15
left hand									
E05STFPL18	.313	.415	.219	5.000	.093	-5.0	TP..18151	MS1152	T7
E06STFPL2	.375	.480	.250	6.000	.125	-4.0	TP..2151	MS1153	T7
E08STFPL2	.500	.600	.312	8.000	.187	-2.0	TP..2151	MS1153	T7
E10STFPL2	.625	.770	.406	10.000	.218	0.0	TP..2151	MS1153	T7
E12STFPL3	.750	.930	.500	10.000	.281	-2.0	TP..3252	MS1155	T15
E16STFPL3	1.000	1.200	.640	12.000	.312	0.0	TP..3252	MS1155	T15

NOTE: ANSI/ISO compatible 60° countersunk hole insert.
This tool will also accept TPGM/TPGT/TPGW-21.5_ inserts.
ANSI/ISO compatible 60° countersunk hole insert (i.e., TPMT/TPGT/TPGW-32.5_).
90° countersunk hole inserts (i.e., TPGM/TPGB-32.5_) do not fit this tool.

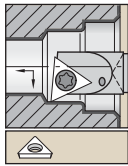


Steel shank with through coolant.
See pages B105–B108 for inserts.

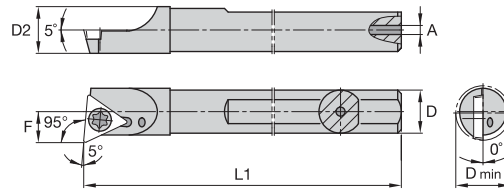


■ A-STLC -5°

catalog number	D	D min	F	L1	A	CS	γF°	gage insert	insert screw	Torx
right hand										
A06STLCR2	.375	.480	.250	6.000	.125	—	-8.0	TC..2151	MS1153	T7
A08STLCR2	.500	.600	.312	8.000	—	1/16-27 NPT	-7.0	TC..2151	MS1153	T7
A10STLCR2	.625	.770	.406	10.000	—	1/8-27 NPT	-5.0	TC..2151	MS1153	T7
A12STLCR3	.750	.930	.500	10.000	—	1/8-27 NPT	-5.0	TC..3252	MS1155	T15
A16STLCR3	1.000	1.200	.640	12.000	—	1/4-18 NPT	-4.0	TC..3252	MS1155	T15
left hand										
A06STLCL2	.375	.480	.250	6.000	.125	—	-8.0	TC..2151	MS1153	T7
A08STLCL2	.500	.600	.312	8.000	—	1/16-27 NPT	-7.0	TC..2151	MS1153	T7
A10STLCL2	.625	.770	.406	10.000	—	1/8-27 NPT	-5.0	TC..2151	MS1153	T7
A12STLCL3	.750	.930	.500	10.000	—	1/8-27 NPT	-5.0	TC..3252	MS1155	T15
A16STLCL3	1.000	1.200	.640	12.000	—	1/4-18 NPT	-4.0	TC..3252	MS1155	T15



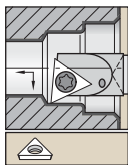
Steel shank with through coolant.
See page B109 for inserts.



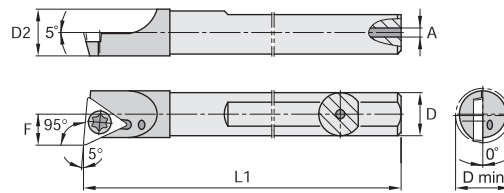
■ A-STLD -5°

O.D./I.D. Tooling

catalog number	D	D min	D2	F	L1	A	gage insert	insert screw	Torx
right hand									
A03GSTLDR128	.187	.275	.197	.126	3.50	.040	TD..12807505	FC11	T7
A04HSTLDR128	.250	.296	.260	.156	4.00	.040	TD..130805	FC14	T7
A05HSTLDR128	.313	.358	.322	.187	4.00	.060	TD..130805	FC14	T7



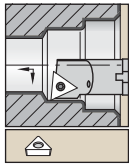
Carbide shank with through coolant.
See page B109 for inserts.



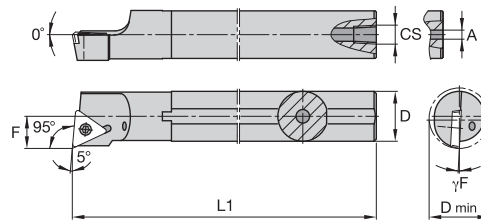
■ E-STLD -5°

catalog number	D	D min	D2	F	L1	A	gage insert	insert screw	Torx
right hand									
E03HSTLDR128	.188	.275	.197	.126	4.000	.040	TD..12807505	FC11	T7
E03MSTLDR128	.188	.275	.197	.126	6.000	.040	TD..12807505	FC11	T7
E04HSTLDR128	.250	.296	.260	.156	4.000	.047	TD..130805	FC14	T7
E04MSTLDR128	.250	.300	.260	.156	6.000	.047	TD..12807505	FC14	T7
E05HSTLDR128	.312	.358	—	.187	4.000	.093	TD..130805	FC14	T7
E05MSTLDR128	.313	.360	.322	.187	6.000	.093	TD..12807505	FC14	T7
left hand									
E03HSTLDL128	.188	.275	.197	.126	4.000	.040	TD..12807505	FC11	T7
E04MSTLDL128	.250	.300	.260	.156	6.000	.047	TD..12807505	FC14	T7
E05MSTLDL128	.313	.360	.322	.187	6.000	.093	TD..12807505	FC14	T7





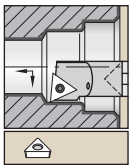
Steel shank with through coolant.
See pages B109–B112 for inserts.



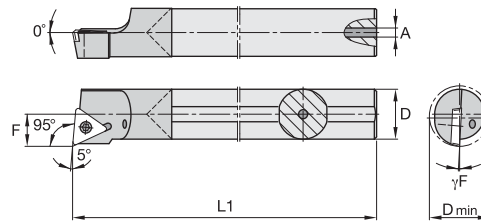
■ A-STLP -5°

catalog number	D	D min	F	L1	A	CS	γF°	gage insert	insert screw	Torx
right hand										
A06STLPR2	.375	.480	.250	6.000	.125	—	-4.0	TP..2151	MS1153	T7
A08STLPR2	.500	.600	.312	8.000	—	1/16-27 NPT	-2.0	TP..2151	MS1153	T7
A10STLPR2	.625	.770	.406	10.000	—	1/8-27 NPT	0.0	TP..2151	MS1153	T7
A12STLPR3	.750	.930	.500	10.000	—	1/8-27 NPT	-2.0	TP..3252	MS1155	T15
A16STLPR3	1.000	1.220	.640	12.000	—	1/4-18 NPT	0.0	TP..3252	MS1155	T15
left hand										
A06STLPL2	.375	.480	.250	6.000	.125	—	-4.0	TP..2151	MS1153	T7
A08STLPL2	.500	.600	.312	8.000	—	1/16-27 NPT	-2.0	TP..2151	MS1153	T7
A10STLPL2	.625	.770	.406	10.000	—	1/8-27 NPT	0.0	TP..2151	MS1153	T7
A12STLPL3	.750	.930	.500	10.000	—	1/8-27 NPT	-2.0	TP..3252	MS1155	T15
A16STLPL3	1.000	1.220	.640	12.000	—	1/4-18 NPT	0.0	TP..3252	MS1155	T15

NOTE: ANSI/ISO compatible 60° countersunk hole insert.
This tool will also accept TPGM/TPGT/TPGW-21.5_ inserts.
ANSI/ISO compatible 60° countersunk hole insert (i.e., TPMT/TPGT/TPGW-32.5_).
90° countersunk hole inserts (i.e., TPGM/TPGB-32.5_) do not fit this tool.



Carbide shank with through coolant.
See pages B109–B112 for inserts.

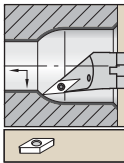


■ E-STLP -5°

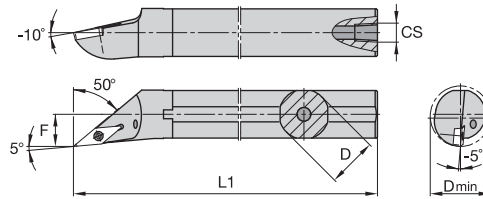
catalog number	D	D min	F	L1	A	γF°	gage insert	insert screw	Torx
right hand									
E06STLPR2	.375	.480	.250	6.000	.125	-4.0	TP..2151	MS1153	T7
E08STLPR2	.500	.600	.312	8.000	.187	-2.0	TP..2151	MS1153	T7
E10STLPR2	.625	.770	.406	10.000	.218	0.0	TP..2151	MS1153	T7
E12STLPR3	.750	.930	.500	10.000	.281	-2.0	TP..3252	MS1155	T15
E16STLPR3	1.000	1.220	.640	12.000	.312	0.0	TP..3252	MS1155	T15
left hand									
E06STLPL2	.375	.480	.250	6.000	.125	-4.0	TP..2151	MS1153	T7
E08STLPL2	.500	.600	.312	8.000	.187	-2.0	TP..2151	MS1153	T7
E10STLPL2	.625	.770	.406	10.000	.218	0.0	TP..2151	MS1153	T7
E12STLPL3	.750	.930	.500	10.000	.281	-2.0	TP..3252	MS1155	T15
E16STLPL3	1.000	1.220	.640	12.000	.312	0.0	TP..3252	MS1155	T15

NOTE: ANSI/ISO compatible 60° countersunk hole insert.
This tool will also accept TPGM/TPGT/TPGW-21.5_ inserts.
ANSI/ISO compatible 60° countersunk hole insert (i.e., TPMT/TPGT/TPGW-32.5_).
90° countersunk hole inserts (i.e., TPGM/TPGB-32.5_) do not fit this tool.





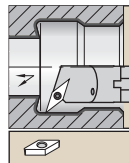
Steel shank with through coolant.
See pages B113–B114 for inserts.



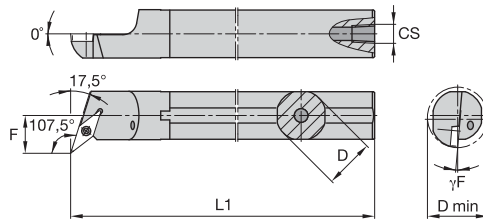
■ A-SVMB -5°

O.D./I.D. Tooling

catalog number	D	D min	F	L1	CS	gage insert	insert screw	Torx
A08RSVMBR2E	.500	.980	.312	8.000	1/16-27 NPT	VB..221	MS1153	T7
A10SSVMBR2E	.625	.980	.406	10.000	1/8-27 NPT	VB..221	MS1153	T7
A12SSVMBR3E	.750	1.286	.500	10.000	1/8-27 NPT	VB..332	MS1155	T15
A16TSVMBR3E	1.000	1.286	.640	12.000	1/4-18 NPT	VB..332	MS1155	T15

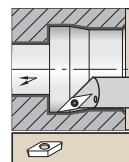


Steel shank with through coolant.
See pages B113–B114 for inserts.

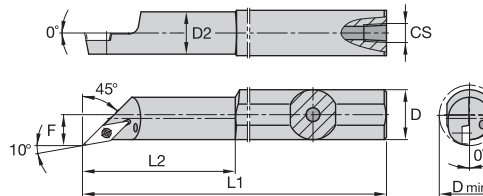


■ A-SVQB -17.5°

catalog number	D	D min	F	L1	CS	gage insert	insert screw	Torx
right hand								
A10SSVQBR2	.625	.850	.500	10.00	1/8-27 NPT	VB..221	MS1153	T7
A12SSVQBR2	.750	.980	.562	10.00	1/8-27 NPT	VB..221	MS1153	T7
A16TSVQBR3	1.000	1.300	.750	12.00	1/4-18 NPT	VB..332	MS1155	T15
left hand								
A10SSVQBL2	.625	.850	.500	10.00	1/8-27 NPT	VB..221	MS1153	T7
A12SSVQBL2	.750	.980	.562	10.00	1/8-27 NPT	VB..221	MS1153	T7
A16TSVQBL3	1.000	1.300	.750	12.00	1/4-18 NPT	VB..332	MS1155	T15

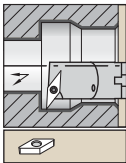


Necked steel shank with through coolant.
See pages B113–B114 for inserts.

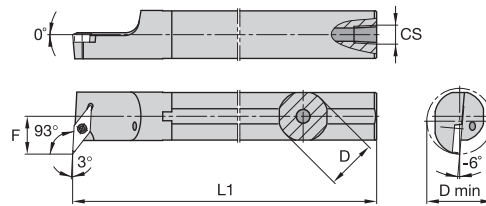


■ A-SVSP -10°

catalog number	D	D min	D2	F	L1	L2	CS	gage insert	insert screw	hex (inch)
A2732SVSPRW4	2.000	2.200	1.688	1.080	14.00	5.31	1/4-18 NPT	VP..443K	S411	5/32



Steel shank with through coolant.
See pages B113–B114 for inserts.

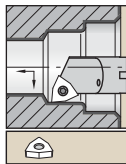


■ A-SVUB -3°

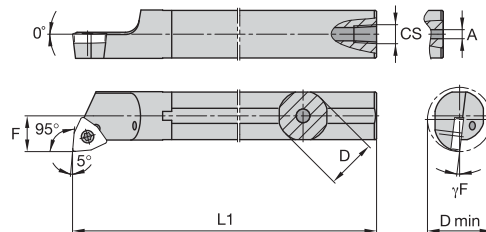
catalog number	D	D min	F	L1	CS	gage insert	insert screw	Torx
right hand								
A12SSVUBR2	.750	.980	.562	10.00	1/8-27 NPT	VB..221	MS1153	T7
A16TSVUBR3	1.000	1.300	.750	12.00	1/4-18 NPT	VB..332	MS1155	T15
left hand								
A12SSVUBL2	.750	.980	.562	10.00	1/8-27 NPT	VB..221	MS1153	T7
A16TSVUBL3	1.000	1.300	.750	12.00	1/4-18 NPT	VB..332	MS1155	T15



O.D./I.D. Tooling



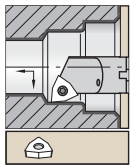
Steel shank with through coolant.
See pages B114–B115 for inserts.



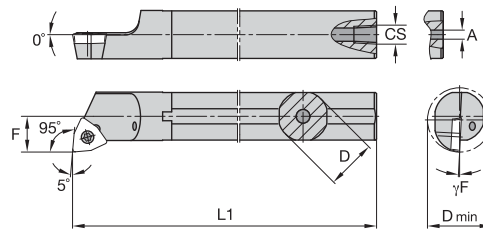
■ A-SWLC -5°

catalog number	D	D min	F	L1	A	CS	γF°	gage insert	insert screw	Torx
right hand										
A06SWLCR2	.375	.480	.250	6.000	.130	—	-8.0	WC..2151	MS1939	T7
A08SWLCR2	.500	.600	.312	8.000	—	1/16-27 NPT	-6.0	WC..2151	MS1153	T7
A10SWLCR3	.625	.770	.406	10.000	—	1/8-27 NPT	-7.0	WC..3252	MS1155	T15
A12SWLCR3	.750	.930	.500	10.000	—	1/8-27 NPT	-5.0	WC..3252	MS1155	T15
left hand										
A06SWLCL2	.375	.480	.250	6.000	.130	—	-8.0	WC..2151	MS1939	T7
A08SWLCL2	.500	.600	.312	8.000	—	1/16-27 NPT	-6.0	WC..2151	MS1153	T7





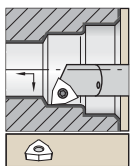
Steel shank with through coolant.
See page B115 for inserts.



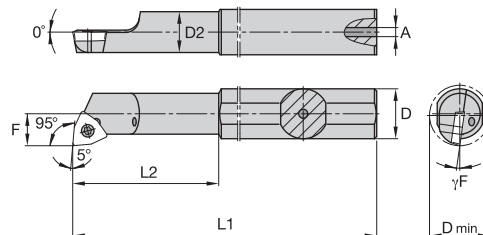
■ A-SWLP -5°

O.D./I.D. Tooling

catalog number	D	D min	F	L1	A	CS	γF°	gage insert	insert screw	Torx
right hand										
A06SWLPR2	.375	.480	.250	6.00	.125	—	-7.0	WP..2151	MS1939	T7
A08SWLPR2	.500	.600	.312	8.00	—	1/16-27 NPT	-2.0	WP..2151	MS1153	T7
A10SWLPR3	.625	.770	.406	10.00	—	1/8-27 NPT	-3.0	WP..3252	MS1155	T15
A12SWLPR3	.750	.930	.500	10.00	—	1/8-27 NPT	-2.0	WP..3252	MS1155	T15
A16SWLPR3	1.000	1.200	.640	12.00	—	1/4-18 NPT	0.0	WP..3252	MS1155	T15
left hand										
A06SWLPL2	.375	.480	.250	6.00	.125	—	-7.0	WP..2151	MS1939	T7
A08SWLPL2	.500	.600	.312	8.00	—	1/16-27 NPT	-2.0	WP..2151	MS1153	T7
A10SWLPL3	.625	.770	.406	10.00	—	1/8-27 NPT	-3.0	WP..3252	MS1155	T15
A12SWLPL3	.750	.930	.500	10.00	—	1/8-27 NPT	-2.0	WP..3252	MS1155	T15



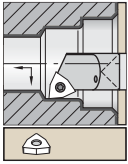
Necked steel shank with through coolant.
See page B115 for inserts.



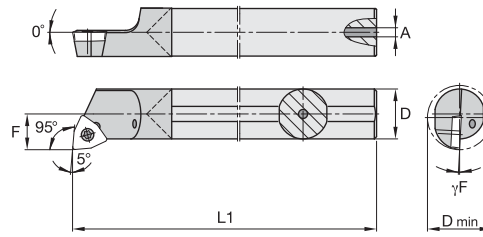
■ A-SWLP -5°

catalog number	D	D min	D2	F	L1	L2	A	γF°	gage insert	insert screw	Torx
right hand											
A0306SWLPR15	.375	.260	.187	.126	3.50	1.00	.078	-10.0	WP..15121	MS1438	T5
A0406SWLPR15	.375	.321	.234	.156	4.00	1.25	.078	-8.0	WP..15121	MS1438	T5
A0506SWLPR15	.375	.415	.299	.219	5.00	1.63	.094	-4.0	WP..15121	MS1438	T5
left hand											
A0306SWLPL15	.375	.260	.187	.126	3.50	1.00	.078	-10.0	WP..15121	MS1438	T5





Carbide shank with through coolant.
See page B115 for inserts.



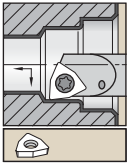
■ E-SWLP -5°



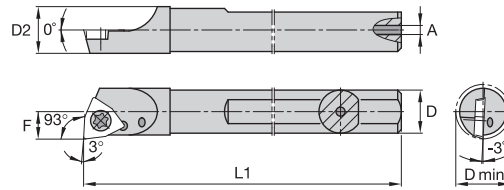
catalog number	D	D min	F	L1	A	γF°	gage insert	insert screw	Torx
right hand									
E03SWLPR15	.188	.260	.260	4.000	.040	-10.0	WP..15121	MS1438	T5
E04SWLPR15	.250	.321	.156	4.015	.047	-8.0	WP..15121	MS1438	T5
E05SWLPR15	.313	.415	.219	5.000	.093	-4.0	WP..15121	MS1438	T5
E06SWLPR2	.375	.480	.250	6.000	.125	-4.0	WP..2151	MS1153	T7
E08SWLPR2	.500	.600	.312	8.000	.187	-2.0	WP..2151	MS1153	T7
E10SWLPR3	.625	.770	.406	10.000	.218	-3.0	WP..3252	MS1155	T15
E12SWLPR3	.750	.930	.500	10.000	.281	-2.0	WP..3252	MS1155	T15
E16SWLPR3	1.000	1.200	.640	12.000	.312	0.0	WP..3252	MS1155	T15
left hand									
E03SWLPL15	.188	.260	.126	4.000	.040	-10.0	WP..15121	MS1438	T5
E04SWLPL15	.250	.321	.156	4.000	.047	-8.0	WP..15121	MS1438	T5
E05SWLPL15	.313	.415	.219	5.000	.093	-4.0	WP..15121	MS1438	T5
E06SWLPL2	.375	.480	.250	6.000	.125	-4.0	WP..2151	MS1153	T7
E08SWLPL2	.500	.600	.312	8.000	.187	-2.0	WP..2151	MS1153	T7
E10SWLPL3	.625	.770	.406	10.000	.218	-3.0	WP..3252	MS1155	T15
E12SWLPL3	.750	.930	.500	10.000	.281	-2.0	WP..3252	MS1155	T15
E16SWLPL3	1.000	1.200	.640	12.000	.312	0.0	WP..3252	MS1155	T15



O.D./I.D. Tooling



Steel shank with through coolant.
See page B115 for inserts.

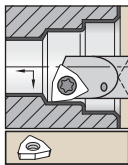


A-SWUP -3°

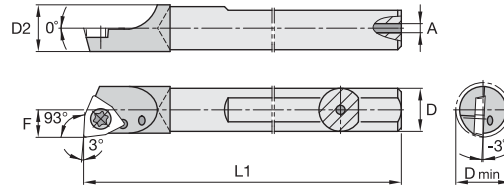
O.D./I.D. Tooling



catalog number	D	D min	D2	F	L1	A	gage insert	insert screw	Torx
right hand									
A04HSWUPR15	.250	.285	.260	.143	4.00	.040	WP..1511	CT11	T6
A05HSWUPR15	.312	.347	.322	.174	4.00	.040	WP..1511	CT15	T6



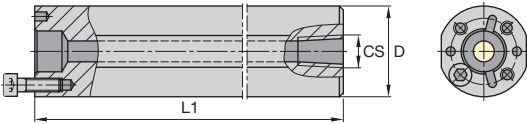
Carbide shank with through coolant.
See page B115 for inserts.



E-SWUP -3°



catalog number	D	D min	D2	F	L1	A	gage insert	insert screw	Torx
right hand									
E03MSWUPR15	.187	.260	.225	.126	6.00	.040	WP..15105	CT15	T6
E04MSWUPR15	.250	.285	—	.143	6.00	.047	WP..S30104	CT11	T6
E05MSWUPR15	.312	.347	.322	.174	6.00	.093	WP..15105	CT15	T6
E06MSWUPR2	.375	.415	.385	.211	6.00	.125	WP..21505	MS1153	T7
E08RSWUPR2	.500	.540	.510	.273	8.00	.500	WP..21505	MS1153	T7

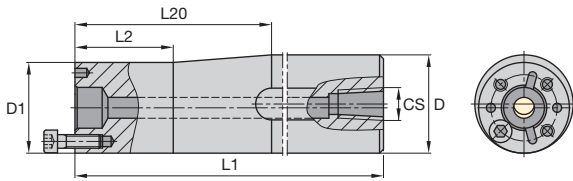


Steel shank with through coolant.
Max 4:1 overhang ratio.

■ S-4400W

catalog number	D	L1	CS	screw 3 required	screw	hex (inch)
S4416W	1.000	9.00	1/4-18NPT	S319PKG	S322	9/64
S4420W	1.250	9.00	1/4-18NPT	S327	S330	5/32
S4424W	1.500	10.00	1/4-18NPT	S327	S330	5/32
S4428W	1.750	12.00	1/4-18NPT	S337	S340	3/16
S4432W	2.000	13.00	1/4-18NPT	S337	S340	3/16
S4440W	2.500	17.00	1/4-18 NPT	S350	S353	1/4

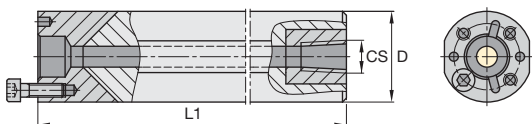
O.D./I.D. Tooling



Steel shank with through coolant.
Max 4:1 overhang ratio.

■ S-4400W48

catalog number	D	L1	CS	L2	L20	D1	screw 3 required	screw	hex (inch)
S4440W48	3.000	18.00	3/8-18NPT	3.00	6.00	2.50	S350	S353	1/4

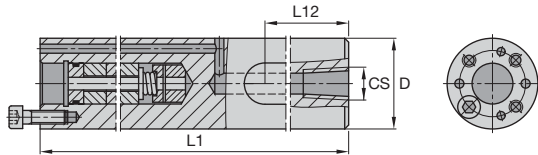


Carbide shank with through coolant.
Max 6:1 overhang ratio.

■ C-11800W

catalog number	D	L1	CS	screw 3 required	screw	hex (inch)
C11816W	1.000	11.00	1/4-18NPT	S319PKG	S322	9/64
C11820W	1.250	11.00	1/4-18NPT	S412	S415	5/32

O.D./I.D. Tooling

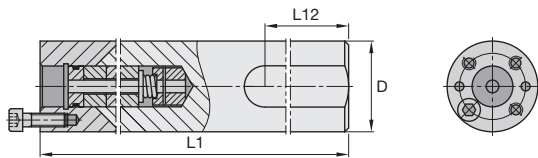


Steel shank DeVibrator with through coolant.

Max 6:1 overhang ratio.

■ D-5400W

catalog number	D	L1	CS	L12	L1 min	screw 3 required	screw	hex (inch)
D5420W	1.250	10.00	3/8-18NPT	7.75	7.00	S327	S330	5/32
D5424W	1.500	12.00	3/8-18NPT	9.25	8.00	S327	S330	5/32
D5428W	1.750	14.00	3/8-18NPT	10.12	9.00	S337	S340	3/16
D5432W	2.000	16.00	3/8-18NPT	12.75	10.00	S337	S340	3/16
D5440W	2.500	20.00	3/8-18NPT	14.87	12.00	S350	S353	1/4

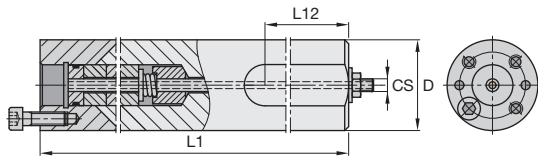


Carbide shank DeVibrator with through coolant.

Max 8:1 overhang ratio.

■ C-6400

catalog number	D	L1	L12	L1 min	screw 3 required	screw	hex (inch)
C6420	1.250	11.00	8.75	7.00	S412	S415	5/32

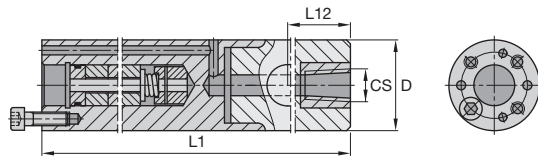


Carbide shank DeVibrator with through coolant.

Max 8:1 overhang ratio.

■ C-6400W

catalog number	D	L1	CS	L12	L1 min	screw 3 required	screw	hex (inch)
C6420W	1.250	11.00	1/4-28UNF	8.75	7.00	S412	S415	5/32
C6424W	1.500	14.00	1/4-28UNF	11.25	8.00	S412	S415	5/32
C6428W	1.750	16.00	3/8-24UNF	11.38	9.00	S422	S425	3/16
C6432W	2.000	19.00	3/8-24UNF	15.75	10.00	S422	S425	3/16
C6440W	2.500	24.00	3/8-24UNF	18.00	12.00	S432	S435	1/4

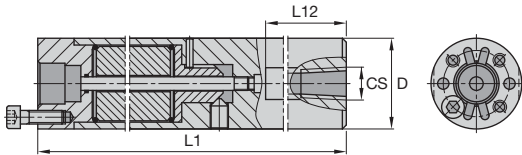


Composite shank DeVibrator with through coolant.

Max 10:1 overhang ratio.

■ C-11900W

catalog number	D	L1	CS	L12	screw 3 required	screw	hex (inch)
C11924W	1.500	15.00	3/8-18NPT	7.75	S327	S330	5/32
C11928W	1.750	17.00	3/8-18NPT	8.25	S337	S340	3/16
C11932W	2.000	20.00	3/8-18NPT	9.75	S337	S340	3/16
C11940W	2.500	25.00	3/8-18NPT	11.75	S350	S353	1/4



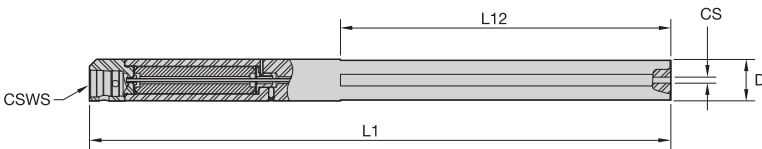
Tunable steel shank with through coolant.

■ **D...TTB • Inch**

catalog number	D	L1	CS	L12	L1 min	screw 3 required	screw	hex (inch)
D16TTB16	1.000	15.000	1/4-18NPT	8.000	9.086	S316	S321	9/64
D20TTB18	1.250	16.125	1/4-18NPT	10.000	9.590	S325	S329	5/32
D24TTB21	1.500	19.375	1/4-18NPT	12.000	11.038	S327	S330	5/32
D28TTB25	1.750	23.375	1/4-18NPT	15.750	12.350	S337	S340	3/16
D32TTB28	2.000	26.375	1/4-18NPT	18.500	12.266	S337	S340	3/16
D40TTB35	2.500	33.375	1/4-18NPT	24.750	14.880	S350	S353	1/4
D48TTB42	3.000	40.370	1/4-18NPT	24.000	20.000	S350	S353	1/4
D64TTB56	4.000	54.480	3/8-18NPT	20.000	25.760	S350	S353	1/4



NOTE: Order number 1309256 and order number 1909159 use 2.5" diameter heads.

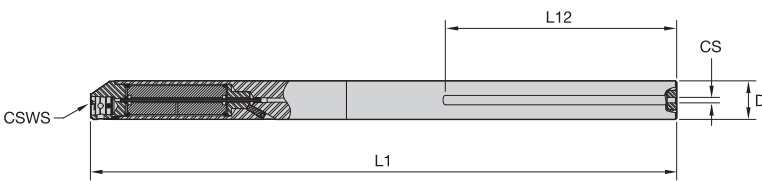


Tunable steel shank with through coolant and front end KM™ clamping unit.

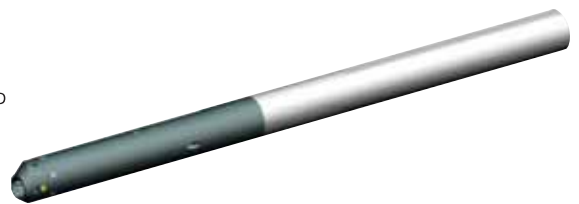


■ **D...TTB-KM • Inch**

catalog number	D	L1	CS	L12	CSWS system size	L1 min
D28TTB26KM40	1.750	24.440	1/4 - 18 NPT	15.750	KM40	13.500
D32TTB29KM40	2.000	27.440	1/4 - 18 NPT	18.500	KM40	13.380
D40TTB36KM40	2.500	34.450	1/4 - 18 NPT	24.750	KM40	16.000
D48TTB45KM63	3.000	42.230	1/4 - 18 NPT	24.000	KM63	21.700
D64TTB58KM63	4.000	56.240	3/8 - 18 NPT	20.000	KM63	27.620

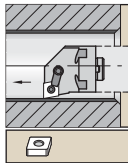


Carbide tunable boring bar with KM™ Quick Change connection.

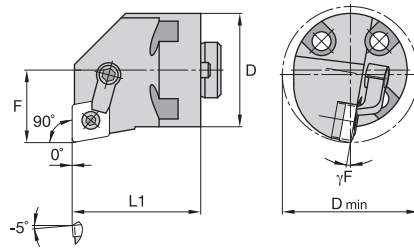


■ **G-KM-TTB • Inch**

order number	catalog number	D	L1	CS	L12	CSWS system size
3954294	G32TTB41KM40	2.00	39.45	3/8 - 18 NPT	12.00	KM40
3954295	G40TTB51KM40	2.50	49.45	3/8 - 18 NPT	15.00	KM40
3954296	G48TTB63KM63	3.00	58.56	3/8 - 18 NPT	18.00	KM63
3954297	G64TTB83KM63	4.00	76.56	3/8 - 18 NPT	24.00	KM63



With through coolant.
See pages B40–B49 for inserts.

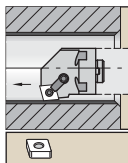


O.D./I.D. Tooling

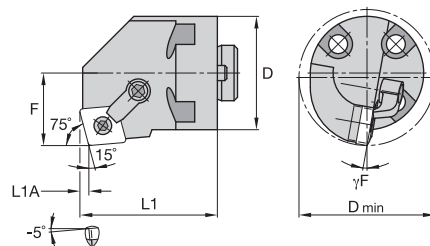
H-MCFN 0°



catalog number	D	F	L1	D min	γF°	gage insert	shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
right hand												
H20MCFNR4	1.250	.765	1.625	1.470	-14.0	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
H24MCFNR4	1.500	.890	1.625	1.760	-12.0	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
H32MCFNR5	2.000	1.281	1.625	2.400	-10.0	CN..543	ICSN533	KL58	1/8	CK12	STC4	5/32
H40MCFNR6	2.500	1.531	1.625	3.030	-10.0	CN..643	ICSN633	KL68	9/64	CK12	STC4	5/32
left hand												
H24MCFNL4	1.500	.890	1.625	1.760	-12.0	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8



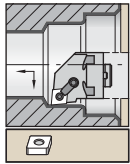
With through coolant.
See pages B40–B49 for inserts.



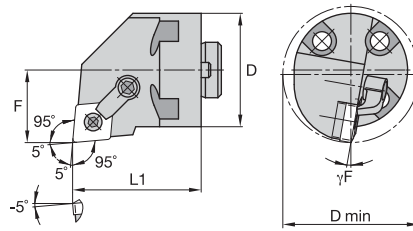
H-MCKN 15°



catalog number	D	F	L1	L1A	D min	γF°	gage insert	shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
right hand													
H24MCKNR4	1.500	.890	1.625	.120	1.760	-12.0	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
H32MCKNR4	2.000	1.281	1.625	.120	2.400	-12.0	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
H32MCKNR5	2.000	1.281	1.625	.149	2.400	-12.0	CN..543	ICSN533	KL58	1/8	CK21	STC20	1/8
H40MCKNR5	2.500	1.531	1.625	.149	3.030	-10.0	CN..543	ICSN533	KL58	1/8	CK12	STC4	5/32
H40MCKNR6	2.500	1.531	1.625	.182	3.030	-10.0	CN..643	ICSN633	KL68	9/64	CK12	STC4	5/32
left hand													
H24MCKNL4	1.500	.890	1.625	.120	1.760	-12.0	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
H32MCKNL4	2.000	1.281	1.625	.120	2.400	-10.0	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
H32MCKNL5	2.000	1.281	1.625	.149	2.400	-12.0	CN..543	ICSN533	KL58	1/8	CK21	STC20	1/8
H40MCKNL5	2.500	1.531	1.625	.149	3.030	-10.0	CN..543	ICSN533	KL58	1/8	CK12	STC4	5/32



With through coolant.
See pages B40–B49 for inserts.

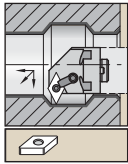


■ **H-MCLN -5°**

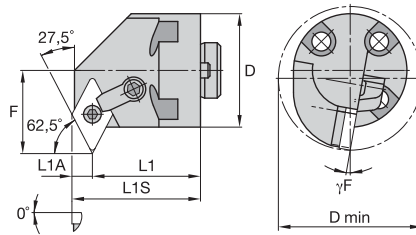


catalog number	D	F	L1	D min	γF°	gage insert	shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
right hand												
H16MCLNR3	1.000	.640	1.625	1.200	-10.0	CN..322	—	KL33	5/64	CK6	STC5	3/32
H16MCLNR4	1.000	.640	1.625	1.200	-14.0	CN..432	—	KL44	3/32	CK7	STC9	3/32
H20MCLNR4	1.250	.765	1.625	1.470	-14.0	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
H24MCLNR4	1.500	.890	1.625	1.760	-12.0	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
H28MCLNR4	1.750	1.015	1.625	2.010	-10.0	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
H32MCLNR4	2.000	1.281	1.625	2.400	-12.0	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
H40MCLNR4	2.500	1.531	1.625	3.030	-8.0	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
H24MCLNR5	1.500	.890	1.625	1.760	-12.0	CN..543	ICSN533	KL58	1/8	CK12	STC4	5/32
H32MCLNR5	2.000	1.281	1.625	2.400	-12.0	CN..543	ICSN533	KL58	1/8	CK12	STC4	5/32
H40MCLNR5	2.500	1.531	1.625	3.030	-8.0	CN..543	ICSN533	KL58	1/8	CK12	STC4	5/32
H32MCLNR6	2.000	1.281	1.625	2.400	-12.0	CN..643	ICSN633	KL68	9/64	CK12	STC4	5/32
H36MCLNR6	2.250	1.406	1.625	2.650	-10.0	CN..643	ICSN633	KL68	9/64	CK12	STC4	5/32
H40MCLNR6	2.500	1.531	1.625	3.030	-10.0	CN..643	ICSN633	KL68	9/64	CK12	STC4	5/32
left hand												
H16MCLNL3	1.000	.640	1.625	1.200	-10.0	CN..322	—	KL33	5/64	CK6	STC5	3/32
H16MCLNL4	1.000	.640	1.625	1.200	-14.0	CN..432	—	KL44	3/32	CK7	STC9	3/32
H20MCLNL4	1.250	.765	1.625	1.470	-14.0	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
H24MCLNL4	1.500	.890	1.625	1.760	-12.0	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
H28MCLNL4	1.750	1.015	1.625	2.010	-12.0	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
H32MCLNL4	2.000	1.281	1.625	2.400	-12.0	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
H40MCLNL4	2.500	1.531	1.625	3.030	-8.0	CN..432	ICSN433	KL46	3/32	CK20	STC20	1/8
H24MCLNL5	1.500	.890	1.625	1.760	-12.0	CN..543	ICSN533	KL58	1/8	CK12	STC4	5/32
H32MCLNL5	2.000	1.281	1.625	2.400	-12.0	CN..543	ICSN533	KL58	1/8	CK12	STC4	5/32
H40MCLNL5	2.500	1.531	1.625	3.030	-8.0	CN..543	ICSN533	KL58	1/8	CK12	STC4	5/32
H32MCLNL6	2.000	1.281	1.625	2.400	-12.0	CN..643	ICSN633	KL68	9/64	CK12	STC4	5/32
H36MCLNL6	2.250	1.406	1.625	2.650	-10.0	CN..643	ICSN633	KL68	9/64	CK12	STC4	5/32
H40MCLNL6	2.500	1.531	1.625	3.030	-10.0	CN..643	ICSN633	KL68	9/64	CK12	STC4	5/32

O.D./I.D. Tooling



With through coolant.
See pages B50–B57 for inserts.

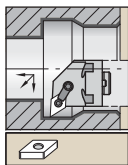


■ **H-MDPN 27.5°**

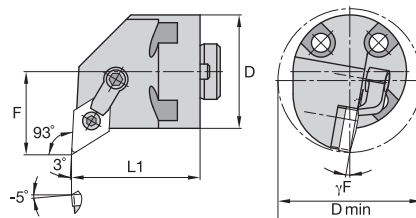
O.D./I.D. Tooling



catalog number	D	F	L1	L1A	L1S	D min	γF°	gage insert	shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
right hand														
H20MDPNR4	1.250	1.000	1.367	.258	1.625	1.705	-13.0	DN..432	IDSN443	KL46L	3/32	CK22	STC20	1/8
H24MDPNR4	1.500	1.125	1.365	.260	1.625	2.000	-10.0	DN..432	IDSN443	KL46L	3/32	CK22	STC20	1/8
left hand														
H20MDPNL4	1.250	1.000	1.367	.258	1.625	1.705	-13.0	DN..432	IDSN443	KL46L	3/32	CK22	STC20	1/8
H24MDPNL4	1.500	1.125	1.365	.260	1.625	2.000	-10.0	DN..432	IDSN443	KL46L	3/32	CK22	STC20	1/8



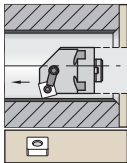
With through coolant.
See pages B50–B57 for inserts.



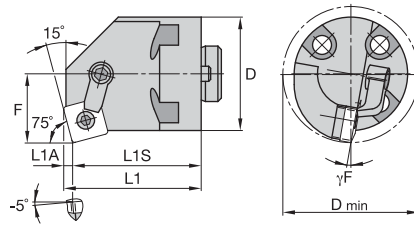
■ **H-MDUN -3°**



catalog number	D	F	L1	D min	γF°	gage insert	shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
right hand												
H16MDUNR3	1.000	.750	1.625	1.300	-11.0	DN..332	—	KL33L	5/64	CK7	STC5	3/32
H24MDUNR3	1.500	1.125	1.625	2.000	-10.0	DN..332	IDSN322	KL34L	5/64	CK7	STC5	3/32
H32MDUNR3	2.000	1.325	1.625	2.500	-8.0	DN..332	IDSN322	KL34L	5/64	CK7	STC5	3/32
H20MDUNR4	1.250	1.000	1.625	1.705	-10.0	DN..432	IDSN443	KL46L	3/32	CK22	STC20	1/8
H24MDUNR4	1.500	1.125	1.625	2.000	-10.0	DN..432	IDSN443	KL46L	3/32	CK12	STC4	5/32
H28MDUNR4	1.750	1.250	1.625	2.250	-10.0	DN..432	IDSN443	KL46L	3/32	CK12	STC4	5/32
H32MDUNR4	2.000	1.375	1.625	2.500	-8.0	DN..432	IDSN443	KL46L	3/32	CK12	STC4	5/32
H36MDUNR4	2.250	1.500	1.625	2.870	-8.0	DN..432	IDSN443	KL46L	3/32	CK12	STC4	5/32
H40MDUNR4	2.500	1.750	1.625	3.250	-8.0	DN..432	IDSN443	KL46L	3/32	CK12	STC4	5/32
left hand												
H16MDUNL3	1.000	.750	1.625	1.300	-11.0	DN..332	—	KL33L	5/64	CK7	STC5	3/32
H24MDUNL3	1.500	1.125	1.625	2.000	-10.0	DN..332	IDSN322	KL34L	5/64	CK7	STC5	3/32
H32MDUNL3	2.000	1.325	1.625	2.500	-8.0	DN..332	IDSN322	KL34L	5/64	CK7	STC5	3/32
H20MDUNL4	1.250	1.000	1.625	1.705	-10.0	DN..432	IDSN443	KL46L	3/32	CK22	STC20	1/8
H24MDUNL4	1.500	1.125	1.625	2.000	-10.0	DN..432	IDSN443	KL46L	3/32	CK12	STC4	5/32
H28MDUNL4	1.750	1.250	1.625	2.250	-10.0	DN..432	IDSN443	KL46L	3/32	CK12	STC4	5/32
H32MDUNL4	2.000	1.375	1.625	2.500	-8.0	DN..432	IDSN443	KL46L	3/32	CK12	STC4	5/32
H36MDUNL4	2.250	1.500	1.625	2.870	-8.0	DN..432	IDSN443	KL46L	3/32	CK12	STC4	5/32
H40MDUNL4	2.500	1.750	1.625	3.250	-8.0	DN..432	IDSN443	KL46L	3/32	CK12	STC4	5/32



With through coolant.
See pages B59–B65 for inserts.

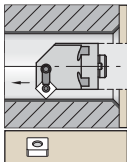


■ **H-MSKN 15°**

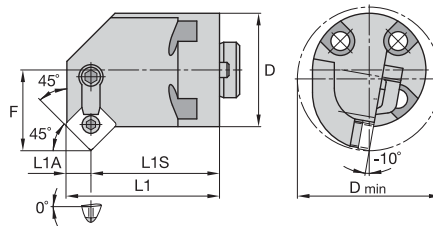


catalog number	D	F	L1	L1A	L1S	D min	γF°	gage insert	shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
right hand														
H24MSKNR4	1.500	.890	1.625	.119	1.744	1.760	-10.0	SN..432	ISSN433	KL46	3/32	CK21	STC20	1/8
H28MSKNR4	1.750	1.015	1.625	.119	1.744	2.010	-10.0	SN..432	ISSN433	KL46	3/32	CK21	STC20	1/8
H32MSKNR4	2.000	1.281	1.625	.119	1.744	2.400	-12.0	SN..432	ISSN433	KL46	3/32	CK21	STC20	1/8
H40MSKNR6	2.500	1.531	1.625	.179	1.804	3.030	-10.0	SN..643	ISSN633	KL68	9/64	CK12	STC4	5/32
left hand														
H20MSKNL4	1.250	.765	1.625	.118	1.743	1.470	-14.0	SN..432	—	KL44	3/32	CK21	STC20	1/8
H24MSKNL4	1.500	.890	1.625	.119	1.744	1.760	-10.0	SN..432	ISSN433	KL46	3/32	CK21	STC20	1/8
H40MSKNL6	2.500	1.531	1.625	.179	1.804	3.030	-10.0	SN..643	ISSN633	KL68	9/64	CK12	STC4	5/32

O.D./I.D. Tooling



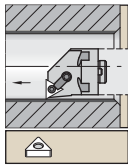
With through coolant.
See pages B59–B65 for inserts.



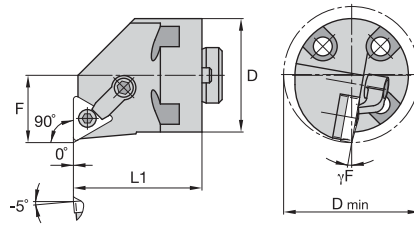
■ **H-MSSN 45°**



catalog number	D	F	L1	L1A	L1S	D min	gage insert	shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
right hand													
H24MSSNR4	1.500	1.125	1.625	.338	1.287	2.000	SN..432	ISSN433	KL46	3/32	CK21	STC20	1/8
H32MSSNR6	2.000	1.375	1.625	.507	1.118	2.500	SN..633	ISSN633	KL68	9/64	CK12	STC4	5/32
H40MSSNR6	2.500	1.750	1.625	.507	1.118	3.250	SN..643	ISSN633	KL68	9/64	CK12	STC4	5/32
left hand													
H40MSSNL6	2.500	1.750	1.625	.507	1.118	3.250	SN..643	ISSN633	KL68	9/64	CK12	STC4	5/32

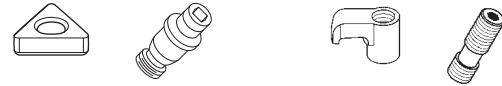


With through coolant.
See pages B66–B74 for inserts.

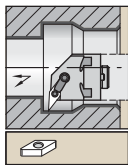


H-MTFN 0°

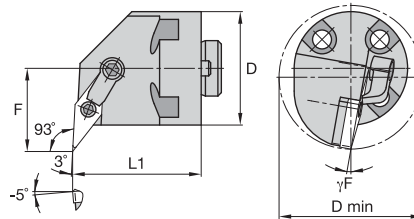
O.D./I.D. Tooling



catalog number	D	F	L1	D min	γF°	gage insert	shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
right hand												
H16MTFNR3	1.000	.640	1.625	1.200	-12.0	TN..332	—	KL33L	5/64	CK7	STC9	3/32
H20MTFNR3	1.250	.765	1.625	1.470	-12.0	TN..332	—	KL33L	5/64	CK7	STC9	3/32
H24MTFNR3	1.500	.890	1.625	1.760	-10.0	TN..332	ITSN323	KL34L	5/64	CK7	STC9	3/32
H28MTFNR3	1.750	1.015	1.625	2.010	-10.0	TN..332	ITSN323	KL34L	5/64	CK7	STC9	3/32
H32MTFNR4	2.000	1.281	1.625	2.400	-8.0	TN..432	ITSN433	KL46	3/32	CK9	STC4	5/32
H40MTFNR4	2.500	1.531	1.625	3.030	-6.0	TN..432	ITSN433	KL46	3/32	CK9	STC4	5/32
left hand												
H16MTFNL3	1.000	.640	1.625	1.200	-12.0	TN..332	—	KL33L	5/64	CK7	STC9	3/32
H24MTFNL3	1.500	.890	1.625	1.760	-10.0	TN..332	ITSN323	KL34L	5/64	CK7	STC9	3/32
H28MTFNL3	1.750	1.015	1.625	2.010	-10.0	TN..332	ITSN323	KL34L	5/64	CK7	STC9	3/32
H32MTFNL4	2.000	1.281	1.625	2.400	-8.0	TN..432	ITSN433	KL46	3/32	CK9	STC4	5/32
H40MTFNL4	2.500	1.531	1.625	3.030	-6.0	TN..432	ITSN433	KL46	3/32	CK9	STC4	5/32



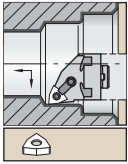
With through coolant.
See pages B74–B78 for inserts.



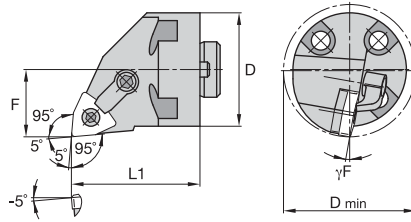
H-MVUN -3°



catalog number	D	F	L1	D min	γF°	gage insert	shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
right hand												
H20MVUNR3	1.250	1.000	1.625	1.705	-12.0	VN..332	IVSN322	KL34L	5/64	CK22	STC20	1/8
H24MVUNR3	1.500	1.125	1.625	2.000	-10.0	VN..332	IVSN322	KL34L	5/64	CK22	STC20	1/8
H32MVUNR3	2.000	1.325	1.625	2.650	-10.0	VN..332	IVSN322	KL34L	5/64	CK22	STC20	1/8
H40MVUNR3	2.500	1.750	1.625	3.250	-10.0	VN..332	IVSN322	KL34L	5/64	CK22	STC20	1/8
H32MVUNR4	2.000	1.375	1.625	2.500	-10.0	VN..432	IVSN433	KL46	3/32	CK43	STC4	5/32
H40MVUNR4	2.500	1.750	1.625	3.250	-10.0	VN..432	IVSN433	KL46	3/32	CK43	STC4	5/32
left hand												
H20MVUNL3	1.250	1.000	1.625	1.705	-12.0	VN..332	IVSN322	KL34L	5/64	CK22	STC20	1/8
H24MVUNL3	1.500	1.125	1.625	2.000	-12.0	VN..332	IVSN322	KL34L	5/64	CK22	STC20	1/8
H32MVUNL3	2.000	1.325	1.625	2.650	-10.0	VN..332	IVSN322	KL34L	5/64	CK22	STC20	1/8
H40MVUNL3	2.500	1.750	1.625	3.250	-10.0	VN..332	IVSN322	KL34L	5/64	CK22	STC20	1/8
H32MVUNL4	2.000	1.375	1.625	2.500	-10.0	VN..432	IVSN433	KL46	3/32	CK43	STC4	5/32
H40MVUNL4	2.500	1.750	1.625	3.250	-10.0	VN..432	IVSN433	KL46	3/32	CK43	STC4	5/32



With through coolant.
 See pages B79–B83 for inserts.



■ **H-MWLN -5°**



catalog number	D	F	L1	D min	γF°	gage insert	shim	lock pin	hex (inch)	clamp	clamp screw	hex (inch)
right hand												
H16MWLN3	1.000	.640	1.625	1.200	-12.0	WN..332	—	KL33L	5/64	CK6	STC5	3/32
H20MWLN4	1.250	.765	1.625	1.470	-14.0	WN..432	IWSN433	KL46	3/32	CK20	STC20	1/8
H24MWLN4	1.500	.890	1.625	1.760	-14.0	WN..432	IWSN433	KL46	3/32	CK20	STC20	1/8
H28MWLN4	1.750	1.015	1.625	2.010	-14.0	WN..432	IWSN433	KL46	3/32	CK20	STC20	1/8
H32MWLN4	2.000	1.281	1.625	2.400	-14.0	WN..432	IWSN433	KL46	3/32	CK20	STC20	1/8
left hand												
H16MWLN3	1.000	.640	1.625	1.200	-12.0	WN..332	—	KL33L	5/64	CK6	STC5	3/32
H20MWLN4	1.250	.765	1.625	1.470	-14.0	WN..432	IWSN433	KL46	3/32	CK20	STC20	1/8
H24MWLN4	1.500	.890	1.625	1.760	-14.0	WN..432	IWSN433	KL46	3/32	CK20	STC20	1/8
H28MWLN4	1.750	1.015	1.625	2.010	-14.0	WN..432	IWSN433	KL46	3/32	CK20	STC20	1/8
H32MWLN4	2.000	1.281	1.625	2.400	-14.0	WN..432	IWSN433	KL46	3/32	CK20	STC20	1/8

O.D./I.D. Tooling



Carbide Recycling

Help preserve and protect our planet!

It's easy for your company to be environmentally conscious with the Kennametal Carbide Recycling Program.

By sending us your used carbide tools, you help preserve and protect the environment and ensure that these products are recycled responsibly. Kennametal accepts any coated or non-coated carbide items, including inserts, drills, reamers, and taps.



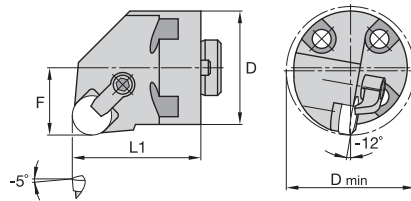
By using the Kennametal Carbide Recycling Program, you will receive:

- A partner who cares about a sustainable environment.
- Easy-to-use web portal to value your used carbide.
- Access to our popular Green Box™ options for carbide collection.
- Systematic and efficient disposal of carbide materials.
- Improved profitability.

Program is not currently available in all geographical areas.
 For more information, please visit www.kennametal.com/carbiderecycling.



With through coolant.
See page B128 for inserts.

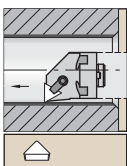


H-CRGN

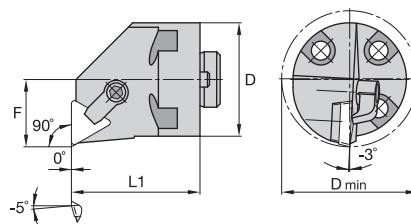
O.D./I.D. Tooling



catalog number	D	F	L1	D min	gage insert	shim	shim screw	hex (inch)	clamp	clamp screw	hex (inch)
right hand H24CRGNR4	1.500	.890	1.625	1.760	RN.42	SM437	SL344	—	CK7LP	STC9	3/32
H32CRGNR4	2.000	1.281	1.625	2.400	RN.42	SM437	SL344	—	CK7LP	STC9	3/32



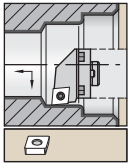
With through coolant.
See pages B86–B87 and B130 for inserts.



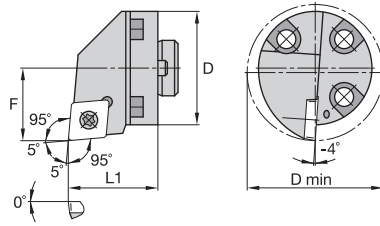
H-CTFP 0°



catalog number	D	F	L1	D min	gage insert	shim	shim screw	hex (inch)	clamp	clamp screw	hex (inch)
right hand H20CTFPR3W	1.250	.765	1.625	1.470	TP.322	SM41	S111	1/16	CK10	STC8	5/32
H24CTFPR3W	1.500	.890	1.625	1.760	TP.322	SM41	S111	1/16	CK10	STC8	5/32
H32CTFPR4W	2.000	1.281	1.625	2.400	TP.432	SM37	S125	3/32	CK10	STC4	5/32
H40CTFPR4W	2.500	1.531	1.625	3.030	TP.432	SM37	S125	3/32	CK10	STC4	5/32
left hand H20CTFPL3W	1.250	.765	1.625	1.470	TP.322	SM41	S111	1/16	CK10	STC8	5/32
H24CTFPL3W	1.500	.890	1.625	1.760	TP.322	SM41	S111	1/16	CK10	STC8	5/32
H32CTFPL4W	2.000	1.281	1.625	2.400	TP.432	SM37	S125	3/32	CK10	STC4	5/32
H40CTFPL4W	2.500	1.531	1.625	3.030	TP.432	SM37	S125	3/32	CK10	STC4	5/32

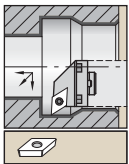


With through coolant.
See pages B88–B91 for inserts.

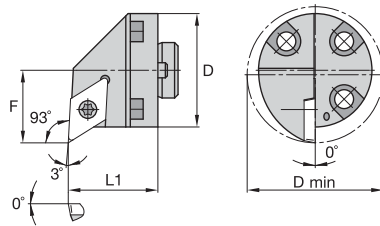


■ H-SCLC -5°

catalog number	D	F	L1	D min	gage insert	insert screw	Torx
right hand H16SCLCR3	1.000	.640	.790	1.2000	CC..3252	 MS1155	T15
left hand H16SCLCL3	1.000	.640	.790	1.2000	CC..3252	MS1155	T15

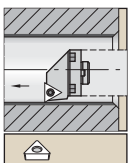


With through coolant.
See pages B98–B100 for inserts.

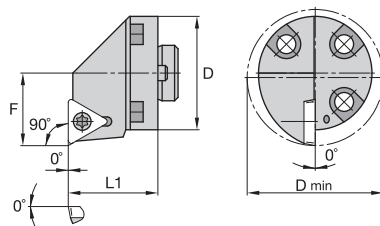


■ H-SDUP -3°

catalog number	D	F	L1	D min	gage insert	insert screw	Torx
right hand H16SDUPR3	1.000	.640	.790	1.200	DP..3252	 MS1155	T15
left hand H16SDUPL3	1.000	.640	.790	1.200	DP..3252	MS1155	T15



With through coolant.
See pages B109–B112 for inserts.



■ H-STFP 0°

catalog number	D	F	L1	D min	gage insert	insert screw	Torx
right hand H16STFPR2	1.000	.640	.790	1.200	TP..2151	 MS1153	T7
left hand H16STFPL2	1.000	.640	.790	1.200	TP..2151	MS1153	T7





Cartridges

Primary Application

Modern machining operations demand high-quality, high-performance toolholders that provide straightforward design and application versatility.

Standard Kennametal cartridges are ideal for turning tools with one, or several, cutting edges. A wide range of cartridge sizes and styles provide numerous combinations and application possibilities.

Features and Benefits

Kenloc™ Style (M-Clamping)

- Used for Kenloc inserts.
- Lock pin and top clamp provide rigid clamping.
- Wide variety of insert styles may be used.
- Tools may be used with or without top clamp.
- Optional hardware available for thicker inserts.
- Extreme sturdy clamping system, specially designed for interrupted cuts.
- Tool is protected by a carbide shim.

Kenlever™ Style (P-Clamping*)

- Proven superior system for holding ceramic inserts rigidly in turning and profiling operations.
- Can be used on Kendex or Kenloc inserts using optional hardware.
- Lever-type clamping system for negative indexable inserts with hole to DIN 4988 and positive round inserts more than 20mm in diameter.
- Inserts with one- and two-side chip control geometries have positive rakes from 6–18°.
- Advantages include fast insert changes and no interference with chip flow.

*NOTE: P-style available in metric sizes only.



Kendex™ Style (C-Clamping)

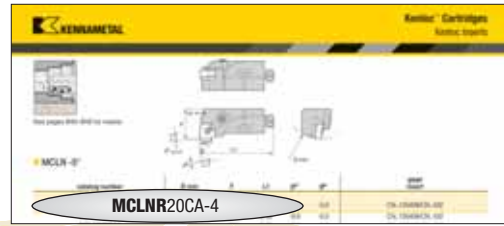
- Suitable for Kendex inserts.
- Chipbreaker option available for ceramic inserts.
- Wide variety of insert styles may be used.
- Top clamping system for negative and positive indexable inserts to DIN 4968.
- Universal clamping system is robust and easy to handle.
- Some height-adjustable clamps enable the use of additional chipbreakers.
- Carbide shim provides additional tool protection.

Screw-On Style (S-Clamping)

- Used for Screw-On inserts.
- Top clamping by screw.
- Screw clamping system for positive indexable inserts with countersunk hole to DIN 4967.
- Compact design using a minimum of spare parts for high reliability and cost efficiency.
- Toolholders with cutting edge heights greater than .625" (16mm) and insert ICs from .375" (9,52mm) are secured by a threaded bushing.
- Carbide shim provides additional tool protection.

How Do Catalog Numbers Work?

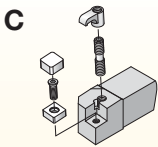
Each character in our catalog number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.



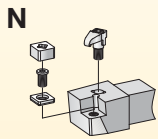
O.D./I.D. Tooling

M

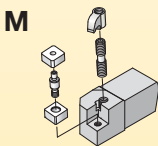
Insert Holding Method



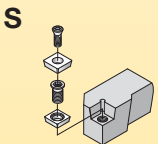
Kendex™



Top Notch™ Profiling



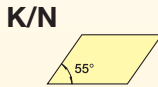
Kenloc™



Screw-On

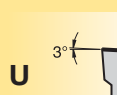
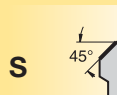
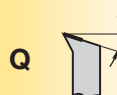
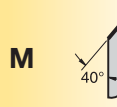
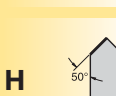
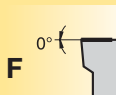
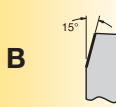
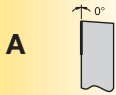
C

Insert Shape



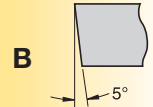
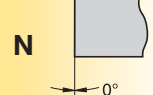
L

Tool Style or Lead Angle



N

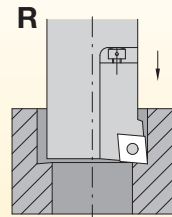
Insert Clearance Angle



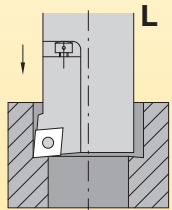
R

Hand of Tool

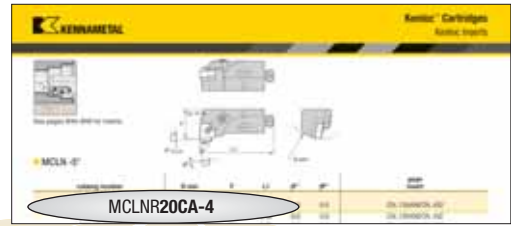
R = Right-hand boring bar



L = Left-hand boring bar

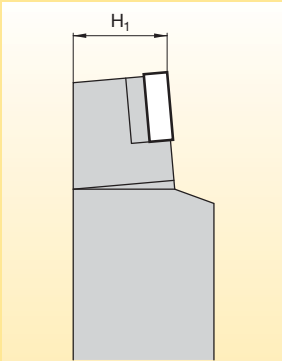


By referencing this easy-to-use guide, you can identify the correct product to meet your needs.



20

Cartridge Size



H_1 =
Cutting edge height of cartridge,
in millimeters

C

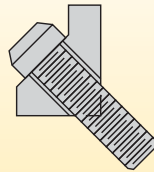
Cartridge Identification

C =
Cartridge

A

Cartridge Mounting

A =
Angular acc.
ISO 5611

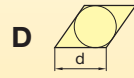
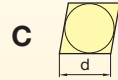


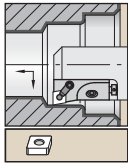
—

4

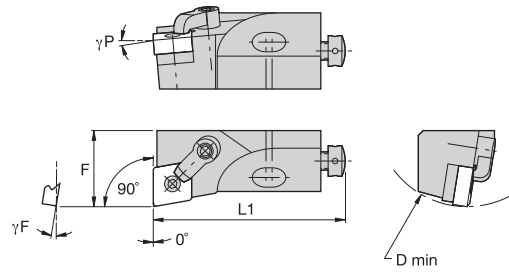
Insert Size

Inserts IC
Number of 1/8ths of "D"





See pages B40–B49 for inserts.



O.D./I.D. Tooling

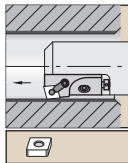
■ **MCFN 0°**

catalog number	D min	F	L1	γF°	γP°	gage insert
right hand						
MCFNR10CA3	1.575	.551	1.97	-9.0	-9.0	CN..090308/CN..322
MCFNR12CA4	1.969	.787	2.17	-9.0	-5.0	CN..120408/CN..432
MCFNR16CA4	2.362	.984	2.48	-9.0	-5.0	CN..120408/CN..432
MCFNR20CA4	2.756	.984	2.76	-9.0	-5.0	CN..120408/CN..432
left hand						
MCFNL10CA3	1.575	.551	1.97	-9.0	-9.0	CN..090308/CN..322
MCFNL12CA4	1.969	.787	2.17	-9.0	-5.0	CN..120408/CN..432
MCFNL16CA4	2.362	.984	2.48	-9.0	-5.0	CN..120408/CN..432

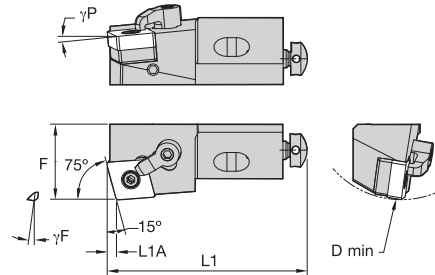
■ **Spare Parts**



D min	shim	lock pin	hex	clamp	clamp screw	hex	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
1.575	—	KLM33	2 mm	CKM36	STCM38	2 mm	KUAM28	2 mm	KUAM30	191.405	4 mm	CSWM 060 050
1.969	—	KLM43	2 mm	CKM34	STCM38	2 mm	KUAM22	2 mm	KUAM31	191.406	4 mm	CSWM 060 050
2.362	ICSN432	KLM46S	2.5 mm	CKM34	STCM9	2.5 mm	KUAM25	2.5 mm	KUAM32	191.407	5 mm	CSWM 080 050
2.756	ICSN432	KLM46	2.5 mm	CKM34	STCM9	2.5 mm	KUAM25	2.5 mm	KUAM32	191.407	5 mm	CSWM 080 050



See pages B40–B49 for inserts.



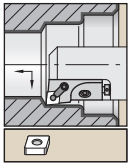
■ **MCKN 15°**

catalog number	D min	F	L1	L1A	γF°	γP°	gage insert
right hand							
MCKNR12CA4	1.969	.787	2.17	.12	-9.0	-5.0	CN..120408/CN..432
MCKNR16CA4	2.362	.984	2.48	.12	-9.0	-5.0	CN..120408/CN..432
left hand							
MCKNL12CA4	1.969	.787	2.17	.12	-9.0	-5.0	CN..120408/CN..432
MCKNL16CA4	2.362	.984	2.48	.12	-9.0	-5.0	CN..120408/CN..432

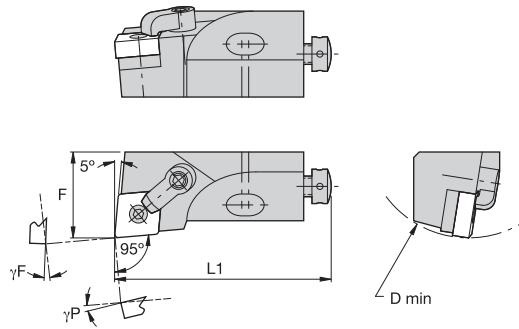
■ **Spare Parts**



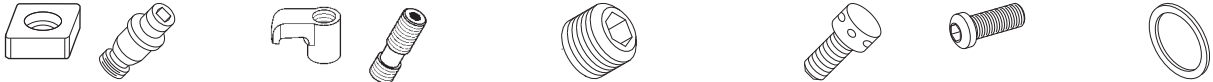
D min	shim	lock pin	hex	clamp	clamp screw	hex	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
1.969	—	KLM43	2 mm	CKM34	STCM38	2 mm	KUAM22	2 mm	KUAM31	191.406	4 mm	CSWM 060 050
2.362	ICSN432	KLM46S	2.5 mm	CKM34	STCM9	2.5 mm	KUAM25	2.5 mm	KUAM32	191.407	5 mm	CSWM 080 050



See pages B40–B49 for inserts.


■ MCLN -5°

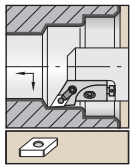
catalog number	D min	F	L1	γF°	γP°	gage insert
right hand						
MCLNR12CA4	1.969	.787	2.17	-9.0	-5.0	CN..120408/CN..432
MCLNR16CA4	2.362	.984	2.48	-9.0	-5.0	CN..120408/CN..432
MCLNR20CA4	2.756	.984	2.76	-9.0	-5.0	CN..120408/CN..432
MCLNR25CA4	3.937	1.260	3.94	-9.0	-5.0	CN..120408/CN..432
MCLNR25CA5	3.937	1.260	3.94	-9.0	-5.0	CN..160612/CN..543
MCLNR25CA6	3.937	1.260	3.94	-9.0	-5.0	CN..190612/CN..643
left hand						
MCLNL12CA4	1.969	.787	2.17	-9.0	-5.0	CN..120408/CN..432
MCLNL16CA4	2.362	.984	2.48	-9.0	-5.0	CN..120408/CN..432
MCLNL20CA4	2.756	.984	2.76	-9.0	-5.0	CN..120408/CN..432
MCLNL25CA4	3.937	1.260	3.94	-9.0	-5.0	CN..120408/CN..432
MCLNL25CA5	3.937	1.260	3.94	-9.0	-5.0	CN..160612/CN..543
MCLNL25CA6	3.937	1.260	3.94	-9.0	-5.0	CN..190612/CN..643

■ Spare Parts


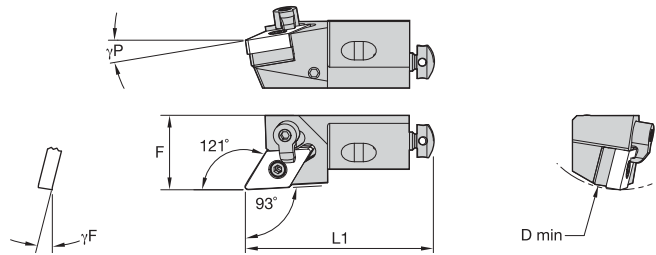
D min	shim	lock pin	hex	clamp	clamp screw	hex	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
1.969	—	KLM43	2 mm	CKM34	STCM38	2 mm	KUAM22	2 mm	KUAM31	191.406	4 mm	CSWM 060 050
2.362	ICSN432	KLM46S	2.5 mm	CKM34	STCM9	2.5 mm	KUAM25	2.5 mm	KUAM32	191.407	5 mm	CSWM 080 050
2.756	ICSN432	KLM46	2.5 mm	CKM34	STCM9	2.5 mm	KUAM25	2.5 mm	KUAM32	191.407	5 mm	CSWM 080 050
3.937	ICSN432	KLM46	2.5 mm	CKM37	STCM40	2.5 mm	KUAM25	2.5 mm	KUAM32	MS364	8 mm	CSWM 100 080
3.937	ICSN533	KLM58	3 mm	CKM41	STCM20	3 mm	KUAM26	3 mm	KUAM32	MS364	8 mm	CSWM 100 080
3.937	ICSN633	KLM68	4 mm	CKM35	STCM8	4 mm	KUAM27	4 mm	KUAM32	MS364	8 mm	CSWM 100 080

NOTE: Select spare parts based off of D min and insert size selected.





See pages B50–B57 for inserts.



O.D./I.D. Tooling

■ MDJN-3°

catalog number	D min	F	L1	γF°	γP°	gage insert
right hand						
MDJNR12CA3	1.969	.787	2.17	-9.0	-9.0	DN..110408/DN..322
MDJNR16CA4	2.362	.984	2.48	-9.0	-9.0	DN..150408/DN..3.532
MDJNR20CA4	2.756	.984	2.76	-8.5	-8.5	DN..150408/DN..3.532
left hand						
MDJNL12CA3	1.969	.787	2.17	-9.0	-9.0	DN..110408/DN..322
MDJNL16CA4	2.362	.984	2.48	-9.0	-9.0	DN..150408/DN..3.532
MDJNL20CA4	2.756	.984	2.76	-8.5	-8.5	DN..150408/DN..3.532

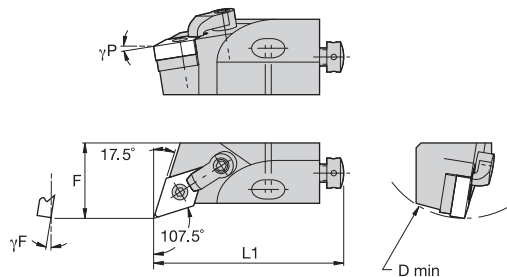
■ Spare Parts



D min	shim	lock pin	hex	clamp	clamp screw	hex	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
1.969	—	KLM33L	2 mm	CKM34	STCM38	2 mm	KUAM22	2 mm	KUAM31	191.406	4 mm	CSWM 060 050
2.362	IDSN432	KLM46S	2.5 mm	CKM36	STCM9	2.5 mm	KUAM25	2.5 mm	KUAM32	191.407	5 mm	CSWM 080 050
2.756	IDSN432	KLM46	2.5 mm	CKM41	STCM40	2.5 mm	KUAM25	2.5 mm	KUAM32	191.407	5 mm	CSWM 080 050



See pages B50–B57 for inserts.



■ MDQN -17.5°

catalog number	D min	F	L1	γF°	γP°	gage insert
right hand						
MDQNR16CA4	2.362	.984	2.48	-9.0	-6.0	DN..150408/DN..3.532
MDQNR20CA4	2.756	.984	2.76	-9.0	-8.0	DN..150408/DN..3.532
left hand						
MDQNL16CA4	2.362	.984	2.48	-9.0	-6.0	DN..150408/DN..3.532
MDQNL20CA4	2.756	.984	2.76	-9.0	-8.0	DN..150408/DN..3.532

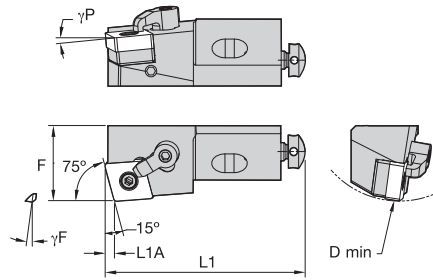
■ Spare Parts



D min	shim	lock pin	hex	clamp	clamp screw	hex	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
2.362	IDSN432	KLM46S	2.5 mm	CKM36	STCM9	2.5 mm	KUAM25	2.5 mm	KUAM32	191.407	5 mm	CSWM 080 050
2.756	IDSN432	KLM46	2.5 mm	CKM34	STCM9	2.5 mm	KUAM25	2.5 mm	KUAM32	191.407	5 mm	CSWM 080 050



See pages B59–B65 for inserts.


MSKN 15°

catalog number	D min	F	L1	L1A	γF°	γP°	gage insert
right hand							
MSKNR10CA3	1.575	.551	1.97	.09	-9.0	-5.0	SN..090308/SN..322
MSKNR12CA4	1.969	.787	2.17	.12	-9.0	-5.0	SN..120408/SN..432
MSKNR16CA4	2.362	.984	2.48	.12	-9.0	-5.0	SN..120408/SN..432
MSKNR20CA5	2.756	.984	2.76	.15	-9.0	-5.0	SN..150612/SN..543
MSKNR25CA6	3.937	1.260	3.94	.18	-9.0	-5.0	SN..190612/SN..543
left hand							
MSKNL10CA3	1.575	.551	1.97	.09	-9.0	-5.0	SN..090308/SN..322
MSKNL12CA4	1.969	.787	2.17	.12	-9.0	-5.0	SN..120408/SN..432
MSKNL16CA4	2.362	.984	2.48	.12	-9.0	-5.0	SN..120408/SN..432
MSKNL25CA4	3.937	1.260	3.94	.12	-9.0	-5.0	SN..120408/SN..432
MSKNL20CA5	2.756	.984	2.76	.15	-9.0	-5.0	SN..150612/SN..543

O.D./I.D. Tooling

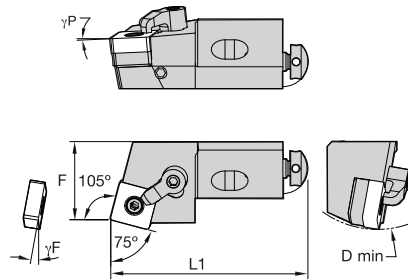
Spare Parts


D min	shim	lock pin	hex	clamp	clamp screw	hex	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
1.575	—	KLM33	2 mm	CKM36	STCM38	2 mm	KUAM28	2 mm	KUAM30	191.405	4 mm	CSWM 060 050
1.969	—	KLM43	2 mm	CKM34	STCM38	2 mm	KUAM22	2 mm	KUAM31	191.406	4 mm	CSWM 060 050
2.362	ISSN432	KLM46S	2.5 mm	CKM34	STCM9	2.5 mm	KUAM25	2.5 mm	KUAM32	191.407	5 mm	CSWM 080 050
2.756	SKSN566K	KLM54	2.5 mm	CKM37	STCM40	2.5 mm	KUAM25	2.5 mm	KUAM32	191.407	5 mm	CSWM 080 050
3.937	ICSN432	KLM46	2.5 mm	CKM34	STCM9	2.5 mm	KUAM25	2.5 mm	KUAM32	MS364	8 mm	CSWM 100 080
3.937	ICSN633	KLM68	4 mm	CKM35	STCM8	4 mm	KUAM27	4 mm	KUAM32	MS364	8 mm	CSWM 100 080

NOTE: Select spare parts based off of D min and insert size selected.



See pages B59–B65 for inserts.



O.D./I.D. Tooling

MSRN 15°

catalog number	D min	F	L1	γF°	γP°	gage insert
right hand						
MSRNR10CA3	1.575	.551	1.97	-9.0	-5.0	SN..090308/SN..322
MSRNR12CA4	1.969	.787	2.17	-9.0	-5.0	SN..120408/SN..432
MSRNR16CA4	2.362	.984	2.48	-9.0	-5.0	SN..120408/SN..432
MSRNR20CA5	2.756	.984	2.76	-9.0	-5.0	SN..150612/SN..543
left hand						
MSRNL10CA3	1.575	.551	1.97	-9.0	-5.0	SN..090308/SN..322
MSRNL12CA4	1.969	.787	2.17	-9.0	-5.0	SN..120408/SN..432
MSRNL16CA4	2.362	.984	2.48	-9.0	-5.0	SN..120408/SN..432
MSRNL20CA5	2.756	.984	2.76	-9.0	-5.0	SN..150612/SN..543

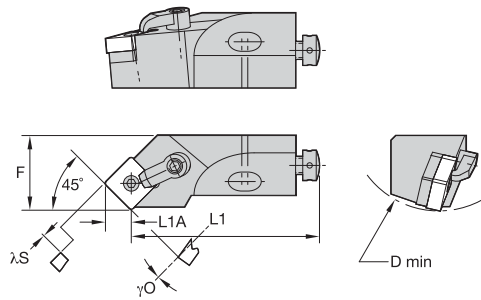
Spare Parts



D min	shim	lock pin	hex	clamp	clamp screw	hex	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
1.575	—	KLM33	2 mm	CKM36	STCM38	2 mm	KUAM28	2 mm	KUAM30	191.405	4 mm	CSWM 060 050
1.969	—	KLM43	2 mm	CKM34	STCM38	2 mm	KUAM22	2 mm	KUAM31	191.406	4 mm	CSWM 060 050
2.362	ISSN432	KLM46S	2.5 mm	CKM34	STCM9	2.5 mm	KUAM25	2.5 mm	KUAM32	191.407	5 mm	CSWM 080 050
2.756	SKSN566K	KLM54	2.5 mm	CKM37	STCM40	2.5 mm	KUAM25	2.5 mm	KUAM32	191.407	5 mm	CSWM 080 050



See pages B59–B65 for inserts.


■ MSSN 45°

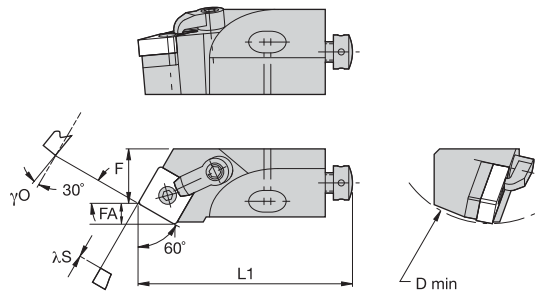
catalog number	D min	F	L1	FA	L1A	λS°	γO°	gage insert
MSSNR10CA3	2	.551	1.73	.25	.24	-13.000	0.0	SN..090308/SN..322
MSSNR12CA4	2	.787	1.85	—	.33	-13.000	0.0	SN..120408/SN..432
MSSNR16CA4	2	.984	2.09	.34	.33	-13.000	0.0	SN..120408/SN..432
MSSNR20CA5	3	.984	2.36	.56	.40	-13.000	0.0	SN..150612/SN..543
MSSNL10CA3	2	.551	1.73	.25	.24	-13.000	0.0	SN..090308/SN..322
MSSNL12CA4	2	.787	1.85	—	.33	-13.000	0.0	SN..120408/SN..432
MSSNL16CA4	2	.984	2.09	.34	.33	-13.000	0.0	SN..120408/SN..432
MSSNL20CA5	3	.984	2.36	.56	.40	-13.000	0.0	SN..150612/SN..543

■ Spare Parts


D min	shim	lock pin	hex	clamp	clamp screw	hex	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
1.575	—	KLM33	2 mm	CKM36	STCM38	2 mm	KUAM28	2 mm	KUAM30	191.405	4 mm	CSWM 060 050
1.969	—	KLM43	2 mm	CKM34	STCM38	2 mm	KUAM22	2 mm	KUAM31	191.406	4 mm	CSWM 060 050
2.362	ISSN432	KLM46S	2.5 mm	CKM36	STCM9	2.5 mm	KUAM25	2.5 mm	KUAM32	191.407	5 mm	CSWM 080 050
2.756	SKSN566K	KLM54	2.5 mm	CKM37	STCM40	2.5 mm	KUAM25	2.5 mm	KUAM32	191.407	5 mm	CSWM 080 050



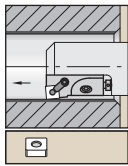
See pages B59–B65 for inserts.


■ MSTN 30°

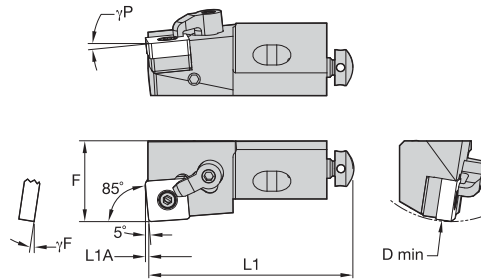
catalog number	D min	F	L1	FA	λS°	γO°	gage insert
right hand							
MSTNR10CA3	1.575	.354	1.97	.52	-11.0	0.0	SN..090308/SN..322
MSTNR12CA4	1.969	.512	2.17	.23	-11.0	0.0	SN..120408/SN..432
left hand							
MSTNL10CA3	1.575	.354	1.97	.52	-11.0	0.0	SN..090308/SN..322
MSTNL16CA4	2.362	.591	2.48	.23	-11.0	0.0	SN..120408/SN..432

■ Spare Parts


D min	shim	lock pin	hex	clamp	clamp screw	hex	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
1.575	—	KLM33	2 mm	CKM36	STCM38	2 mm	KUAM28	2 mm	KUAM30	191.405	4 mm	CSWM 060 050
1.969	—	KLM43	2 mm	CKM34	STCM38	2 mm	KUAM22	2 mm	KUAM31	191.406	4 mm	CSWM 060 050
2.362	ISSN432	KLM46S	2.5 mm	CKM34	STCM9	2.5 mm	KUAM25	2.5 mm	KUAM32	191.407	5 mm	CSWM 080 050



See pages B59–B65 for inserts.



O.D./I.D. Tooling

■ **MSYN 5°**

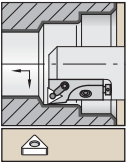
catalog number	D min	F	L1	L1A	γF°	γP°	gage insert
right hand							
MSYNR10CA3	1.575	.551	1.97	.03	-9.0	-5.0	SN..090308/SN..322
MSYNR12CA4	1.969	.787	2.17	.04	-9.0	-5.0	SN..120408/SN..432
MSYNR16CA4	2.362	.984	2.48	.04	-9.0	-5.0	SN..120408/SN..432
MSYNR25CA19	3.937	1.260	3.94	.06	-9.0	-5.0	SN..190612/SN..643
left hand							
MSYNL10CA3	1.575	.551	1.97	.03	-9.0	-5.0	SN..090308/SN..322
MSYNL12CA4	1.969	.787	2.17	.04	-9.0	-5.0	SN..120408/SN..432
MSYNL16CA4	2.362	.984	2.48	.04	-9.0	-5.0	SN..120408/SN..432
MSYNL20CA15	2.756	.984	2.76	.05	-9.0	-5.0	SN..150612/SN..543

■ **Spare Parts**

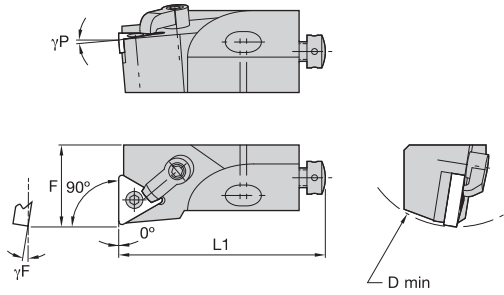


D min	shim	lock pin	hex	clamp	clamp screw	hex	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
1.575	—	KLM33	2 mm	CKM36	STCM38	2 mm	KUAM28	2 mm	KUAM30	191.405	4 mm	CSWM 060 050
1.969	—	KLM43	2 mm	CKM34	STCM38	2 mm	KUAM22	2 mm	KUAM31	191.406	4 mm	CSWM 060 050
2.362	ISSN432	KLM46S	2.5 mm	CKM34	STCM9	2.5 mm	KUAM25	2.5 mm	KUAM32	191.407	5 mm	CSWM 080 050
2.362	ISSN432	KLM46S	2.5 mm	CKM36	STCM9	2.5 mm	KUAM25	2.5 mm	KUAM32	191.407	5 mm	CSWM 080 050
2.756	SKSN566K	KLM54	2.5 mm	CKM37	STCM40	2.5 mm	KUAM25	2.5 mm	KUAM33	191.407	6 mm	CSWM 080 050
3.937	ISSN633	KLM68	4 mm	CKM34	STCM8	4 mm	KUAM27	4 mm	KUAM33	MS-364	8 mm	CSWM 100 080

NOTE: Select spare parts based off of D min and insert size selected.



See pages B66–B74 for inserts.


MTFN 0°

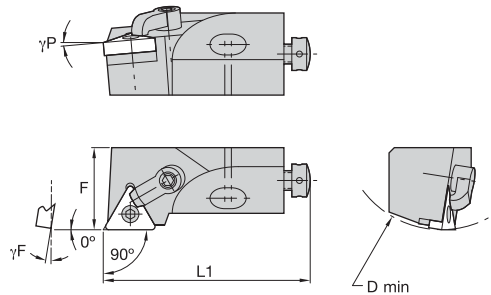
catalog number	D min	F	L1	γF°	γP°	gage insert
right hand						
MTFNR12CA3	1.969	.787	2.17	-9.0	-5.0	TN..160408/TN..332
MTFNR16CA3	2.362	.984	2.48	-9.0	-5.0	TN..160408/TN..332
MTFNR20CA4	2.756	.984	2.76	-9.0	-5.0	TN..220408/TN..432
left hand						
MTFNL12CA3	1.969	.787	2.17	-9.0	-5.0	TN..160408/TN..332
MTFNL16CA3	2.362	.984	2.48	-9.0	-5.0	TN..160408/TN..332
MTFNL20CA4	2.756	.984	2.76	-9.0	-5.0	TN..220408/TN..432

Spare Parts


D min	shim	lock pin	hex	clamp	clamp screw	hex	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
1.969	—	KLM33L	2 mm	CKM34	STCM38	2 mm	KUAM22	2 mm	KUAM31	191.406	4 mm	CSWM 060 050
2.362	ITSN322	KLM34L	2 mm	CKM34	STCM9	2 mm	KUAM25	2 mm	KUAM32	191.407	5 mm	CSWM 080 050
2.756	ITSN433	KLM46	2.5 mm	CKM35	STCM37	2.5 mm	KUAM25	2.5 mm	KUAM32	191.407	5 mm	CSWM 080 050



See pages B66–B74 for inserts.


MTGN 0°

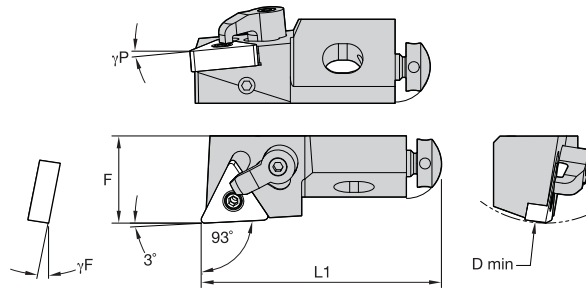
catalog number	D min	F	L1	γF°	γP°	gage insert
right hand						
MTGNR12CA3	1.969	.787	2.17	-9.0	-5.0	TN..160408/TN..332
MTGNR16CA3	2.362	.984	2.48	-9.0	-5.0	TN..160408/TN..332
MTGNR20CA4	2.756	.984	2.76	-9.0	-5.0	TN..220408/TN..432
left hand						
MTGNL12CA3	1.969	.787	2.17	-9.0	-5.0	TN..160408/TN..332
MTGNL16CA3	2.362	.984	2.48	-9.0	-5.0	TN..160408/TN..332
MTGNL20CA4	2.756	.984	2.76	-9.0	-5.0	TN..220408/TN..432

Spare Parts


D min	shim	lock pin	hex	clamp	clamp screw	hex	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
1.969	—	KLM33L	2 mm	CKM34	STCM38	2 mm	KUAM22	2 mm	KUAM31	191.406	4 mm	CSWM 060 050
2.362	ITSN322	KLM34L	2 mm	CKM34	STCM9	2 mm	KUAM25	2 mm	KUAM32	191.407	5 mm	CSWM 080 050
2.756	ITSN433	KLM46	2.5 mm	CKM35	STCM37	2.5 mm	KUAM25	2.5 mm	KUAM32	191.407	5 mm	CSWM 080 050



See pages B66–B74 for inserts.



MTJN -3°

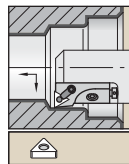
catalog number	D min	F	L1	γF°	γP°	gage insert
right hand MTJNR12CA3	1.969	.787	2.17	-9.000	-5.000	TN..160408/TN..332
left hand MTJNL12CA3	1.969	.787	2.17	-9.000	-5.000	TN..160408/TN..332

Spare Parts

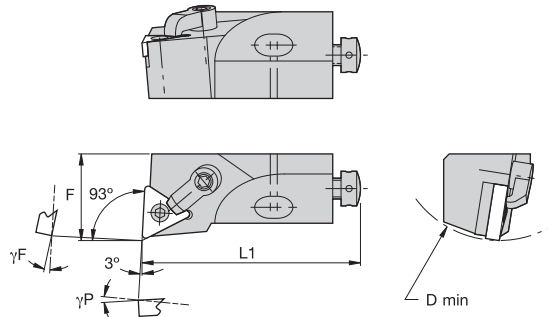


D min	lock pin	hex	clamp	clamp screw	hex	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
1.969	KLM33L	2 mm	CKM34	STCM38	2 mm	KUAM22	2 mm	KUAM31	191.406	4 mm	CSWM 060 050

O.D./I.D. Tooling



See pages B66–B74 for inserts.



MTUN -3°

catalog number	D min	F	L1	γF°	γP°	gage insert
right hand MTUNR16CA3	2.362	.984	2.48	-9.000	-5.0	TN..160408/TN..332
MTUNR20CA4	2.756	.984	2.76	-9.000	-5.0	TN..220408/TN..432
left hand MTUNL12CA3	1.969	.787	2.17	-9.000	-5.0	TN..160408/TN..332
MTUNL16CA3	2.362	.984	2.48	-9.000	-5.0	TN..160408/TN..332
MTUNL20CA4	2.756	.984	2.76	-9.000	-5.0	TN..220408/TN..432

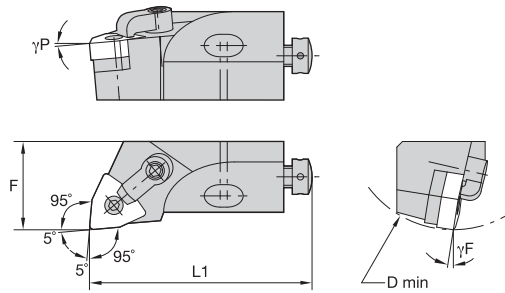
Spare Parts



D min	shim	lock pin	hex	clamp	clamp screw	hex	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
1.969	—	KLM33L	2 mm	CKM34	STCM38	2 mm	KUAM22	2 mm	KUAM31	191.406	4 mm	CSWM 060 050
2.362	ITSN322	KLM34L	2 mm	CKM34	STCM9	2 mm	KUAM25	2 mm	KUAM32	191.407	5 mm	CSWM 080 050
2.756	ITSN433	KLM46	2.5 mm	CKM37	STCM40	2.5 mm	KUAM25	2.5 mm	KUAM33	191.407	5 mm	CSWM 080 050
2.756	ITSN433	KLM46	2.5 mm	CKM35	STCM37	2.5 mm	KUAM25	2.5 mm	KUAM33	191.407	5 mm	CSWM 080 050



See pages B79–B83 for inserts.

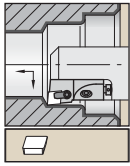

MWLN-5°

catalog number	D min	F	L1	γF°	γP°	gage insert
right hand						
MWLN12CA3	1.969	.787	2.17	-9.0	-5.0	WN..060408/WN..332
MWLN16CA3	2.362	.984	2.48	-9.0	-5.0	WN..060408/WN..332
MWLN20CA3	2.756	.984	2.76	-9.0	-5.0	WN..060408/WN..332
MWLN25CA4	3.937	1.260	3.94	-9.0	-5.0	WN..080408/WN..432

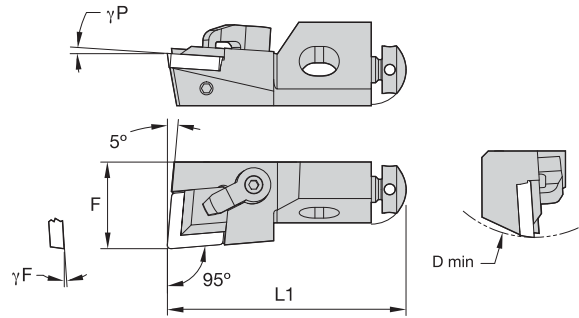
Spare Parts


D min	shim	lock pin	hex	clamp	clamp screw	hex	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
1.969	—	KLM33L	2 mm	CKM34	STCM38	2 mm	KUAM22	2 mm	KUAM31	191.406	4 mm	CSWM 060 050
2.362	IWSN322	KLM34L	2 mm	CKM34	STCM38	2 mm	KUAM24	2 mm	KUAM32	191.407	5 mm	CSWM 080 050
2.756	IWSN322	KLM34L	2 mm	CKM34	STCM38	2 mm	KUAM24	2 mm	KUAM32	191.407	5 mm	CSWM 080 050
3.937	IWSN433	KLM46	2.5 mm	CKM37	STCM40	2.5 mm	KUAM25	2.5 mm	KUAM32	MS364	8 mm	CSWM 100 080

O.D./I.D. Tooling



See page B84 for inserts.



O.D./I.D. Tooling

CCLP -5°

catalog number	D min	F	L1	γF°	γP°	gage insert
right hand CCLPR12CA4	1.969	.787	2.17	3.5	3.5	CP..120308/CP..422
left hand CCLPL12CA4	1.969	.787	2.17	3.5	3.5	CP..120308/CP..422

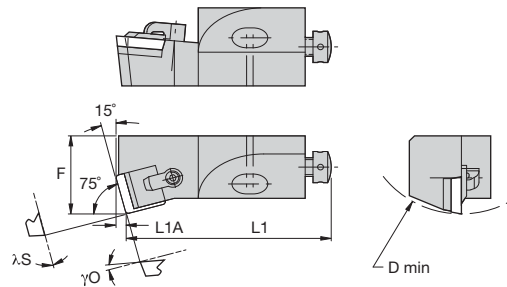
Spare Parts



D min	clamp	clamp screw	hex	radial adjusting screw	hex	axial adjusting screw	hex	mounting screw	hex	washer
1.969	CKM34	STCM38	2 mm	KUAM22	2 mm	KUAM31	2 mm	191.406	4 mm	CSWM 060 050



See pages B85–B86 and B129–B130 for inserts.



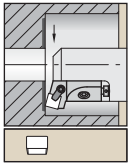
CSKP 15°

catalog number	D min	F	L1	λS°	γO°	gage insert
right hand CSKPR10CA3	1.575	.551	1.97	0.0	5.0	SP..090308/SP..322
CSKPR12CA4	1.969	.787	2.17	0.0	5.0	SP..120308/SP..422
CSKPR20CA4	2.756	.984	2.76	0.0	5.0	SP..120308/SP..422
left hand CSKPL12CA4	1.969	.787	2.17	0.0	5.0	SP..120308/SP..422
CSKPL20CA4	2.756	.984	2.76	0.0	5.0	SP..120308/SP..422

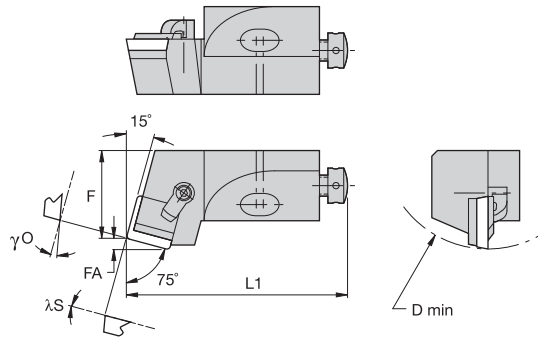
Spare Parts



D min	shim	shim screw	hex	clamp	clamp screw	hex	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
1.575	—	—	—	CKM34	STCM38	2 mm	KUAM28	2 mm	KUAM30	191.405	4 mm	CSWM 060 050
1.969	—	—	—	CKM34	STCM38	2 mm	KUAM22	2 mm	KUAM31	191.406	4 mm	CSWM 060 050
2.756	SM840	MS109	2 mm	CKM34	STCM38	2 mm	KUAM24	2 mm	KUAM32	191.407	5 mm	CSWM 080 050



See pages B85–B86 and B129–B130 for inserts.



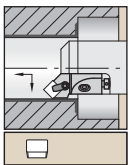
■ CSRPR -15°

catalog number	D min	F	L1	FA	λS°	γO°	gage insert
right hand							
CSRPR10CA3	1.575	.551	1.97	.09	0.0	0.0	SP..090308/SP..322
CSRPR12CA4	1.969	.787	2.17	.12	3.0	0.0	SP..120308/SP..422
left hand							
CSRPL10CA3	1.575	.551	1.97	.09	0.0	0.0	SP..090308/SP..322
CSRPL12CA4	1.969	.787	2.17	.12	3.0	0.0	SP..120308/SP..422

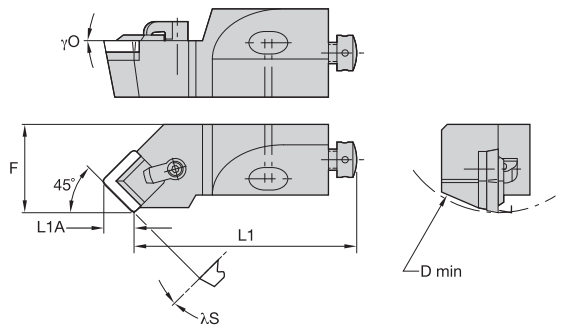
■ Spare Parts



D min	clamp	clamp screw	hex	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
1.575	CKM34	STCM38	2 mm	KUAM28	2 mm	KUAM30	191.405	4 mm	CSWM 060 050
1.969	CKM34	STCM38	2 mm	KUAM22	2 mm	KUAM31	191.406	4 mm	CSWM 060 050



See pages B85–B86 and B129–B130 for inserts.



■ CSSPR 45°

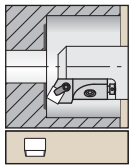
catalog number	D min	F	L1	FA	L1A	λS°	γO°	gage insert
right hand								
CSSPR10CA3	1.575	.551	1.7323	.25	.239	0.0	0.0	SP..090308/SP..322
CSSPR12CA4	1.969	.787	1.8504	.34	.328	0.0	0.0	SP..120308/SP..422
CSSPR16CA4	2.362	.984	2.0866	.34	.328	0.0	0.0	SP..120308/SP..422
left hand								
CSSPL10CA3	1.575	.551	1.7323	.25	.239	0.0	0.0	SP..090308/SP..322
CSSPL12CA4	1.969	.787	1.8504	.34	.328	0.0	0.0	SP..120308/SP..422
CSSPL16CA4	2.362	.984	2.0866	.34	.328	0.0	0.0	SP..120308/SP..422

■ Spare Parts

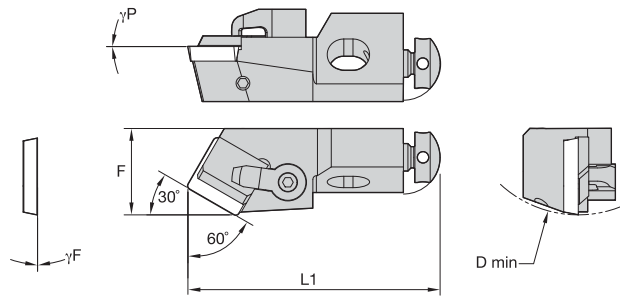


D min	shim	shim screw	hex	clamp	clamp screw	hex	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
1.575	—	—	—	CKM34	STCM38	2 mm	KUAM28	2 mm	KUAM30	191.405	4 mm	CSWM 060 050
1.969	—	—	—	CKM34	STCM38	2 mm	KUAM22	2 mm	KUAM31	191.406	4 mm	CSWM 060 050
2.362	SM840	CS109PKG	2 mm	CKM34	STCM9	2.5 mm	KUAM25	2 mm	KUAM32	191.407	5 mm	CSWM 080 050
2.362	SM840	CS109PKG	2 mm	CKM34	STCM9	2 mm	KUAM25	2 mm	KUAM32	191.407	5 mm	CSWM 080 050

NOTE: Select spare parts based off of D min and insert size selected.



See pages B85–B86 and B129–B130 for inserts.



■ CSTP 30°

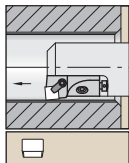
catalog number	D min	F	L1	γF°	γP°	gage insert
right hand CSTPR10CA3	1.575	.354	1.97	0.0	0.0	SP..090308/SP..322

■ Spare Parts

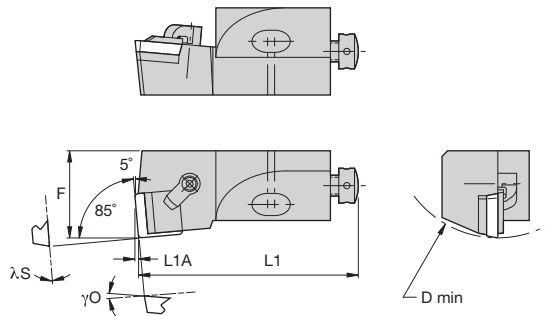


D min	clamp	clamp screw	hex	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
1.575	CKM34	STCM38	2 mm	KUAM28	2 mm	KUAM30	191.405	4 mm	CSWM 060 050

O.D./I.D. Tooling



See pages B85–B86 and B129–B130 for inserts.



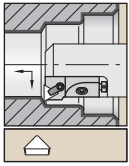
■ CSYP 5°

catalog number	D min	F	L1	L1A	λS°	γO°	gage insert
right hand CSYPR10CA3	1.575	.551	1.97	.030	0.0	5.0	SP..090308/SP..322
left hand CSYPL10CA3	1.575	.551	1.97	.030	0.0	5.0	SP..090308/SP..322

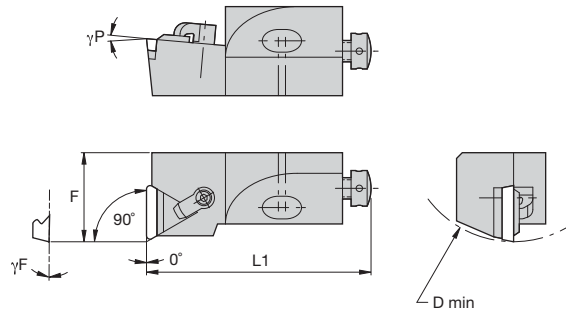
■ Spare Parts



D min	clamp	clamp screw	hex	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
1.575	CKM34	STCM38	2 mm	KUAM28	2 mm	KUAM30	191.405	4 mm	CSWM 060 050



See pages B86–B87 and B130 for inserts.



CTFP 0°

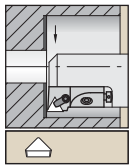
catalog number	D min	F	L1	γF°	γP°	gage insert
right hand						
CTFPR10CA2	1.575	.551	1.97	0.0	5.0	TP..110304/TP..421
CTFPR12CA3	1.969	.787	2.17	0.0	5.0	TP..160308/TP..322
CTFPR16CA3	2.362	.984	2.48	0.0	5.0	TP..160308/TP..322
left hand						
CTFPL10CA2	1.575	.551	1.97	0.0	5.0	TP..110304/TP..421
CTFPL12CA3	1.969	.787	2.17	0.0	5.0	TP..160308/TP..322
CTFPL16CA3	2.362	.984	2.48	0.0	5.0	TP..160308/TP..322

Spare Parts

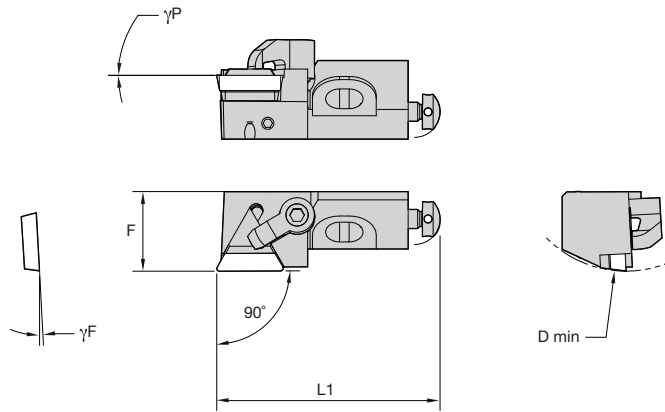


D min	shim	shim screw	hex	clamp	clamp screw	hex	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
1.575	—	—	—	CKM34	STCM38	2 mm	KUAM28	2 mm	KUAM30	191.405	4 mm	CSWM 060 050
1.969	—	—	—	CKM34	STCM38	2 mm	KUAM22	2 mm	KUAM31	191.406	4 mm	CSWM 060 050
2.362	SM841	MS109	2 mm	CKM34	STCM38	2 mm	KUAM24	2 mm	KUAM32	191.407	5 mm	CSWM 080 050
2.756	SM837	MS125	2.5 mm	CKM35	STCM8	2.5 mm	KUAM25	4 mm	KUAM32	191.407	5 mm	CSWM 080 050

O.D./I.D. Tooling



See pages B86–B87 and B130 for inserts.



O.D./I.D. Tooling

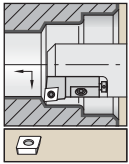
CTGP 0°

catalog number	D min	F	L1	γF°	γP°	gage insert
right hand						
CTGPR10CA2	1.575	.551	1.97	3.0	0.0	TP..110304/TP..421
CTGPR12CA3	1.969	.787	2.17	3.0	0.0	TP..160308/TP..322
CTGPR16CA3	2.362	.984	2.48	3.0	0.0	TP..160308/TP..322
left hand						
CTGPL12CA3	1.969	.787	2.17	3.0	0.0	TP..160308/TP..322
CTGPL20CA4	2.756	.984	2.76	3.0	0.0	TP..220408/TP..432

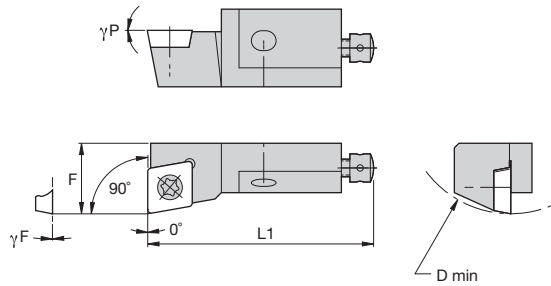
Spare Parts



D min	shim	shim screw	hex	clamp	clamp screw	hex	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
1.575	—	—	—	CKM34	STCM38	2 mm	KUAM28	2 mm	KUAM30	191.405	4 mm	CSWM 060 050
1.969	—	—	—	CKM34	STCM38	2 mm	KUAM22	2 mm	KUAM31	191.406	4 mm	CSWM 060 050
2.362	SM841	MS109	2 mm	CKM34	STCM38	2 mm	KUAM24	2 mm	KUAM32	191.407	5 mm	CSWM 080 050
2.756	SM837	MS125	2.5 mm	CKM35	STCM8	2.5 mm	KUAM25	4 mm	KUAM32	191.407	5 mm	CSWM 080 050



See pages B92–B95 for inserts.



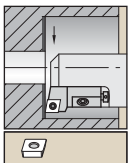
■ **SCFP 0°**

catalog number	D min	F	L1	γF°	γP°	gage insert
right hand						
SCFPR06CA05	.787	.315	.98	0.0	0.0	CP..050204/CP..18151
SCFPR08CA06	.984	.394	1.26	0.0	0.0	CP..060204/CP..2151
SCFPR10CA09	1.575	.551	1.97	0.0	0.0	CPMT09T308
left hand						
SCFPL06CA05	.787	.315	.98	0.0	0.0	CP..050204/CP..18151
SCFPL08CA06	.984	.394	1.26	0.0	0.0	CP..060204/CP..2151

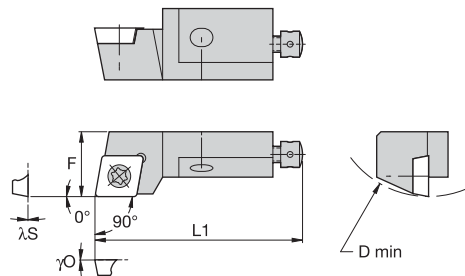
■ **Spare Parts**

D min	insert screw	Torx	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
.787	MS1933	T7	KUAM34	1.5 mm	KUAM35	MS2173	2 mm	CSWM 035 040
.984	MS1153	T7	KUAM34	1.5 mm	KUAM20	MS2175	2.5 mm	CSWM 040 050
1.575	MS1155	T15	KUAM28	2 mm	KUAM30	191.405	4 mm	CSWM 060 050

NOTE: ANSI/ISO compatible 60° countersunk hole inserts.
This tool also accepts CPGM/CPGT/CPGW-21.5_ inserts.



See pages B92–B95 for inserts.



■ **SCGP 0°**

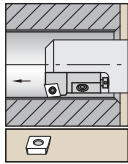
catalog number	D min	F	L1	λS°	γO°	gage insert
right hand						
SCGPR08CA06	.984	.394	1.26	0.0	0.0	CP..060204/CP..2151
left hand						
SCGPL08CA06	.984	.394	1.26	0.0	0.0	CP..060204/CP..2151

■ **Spare Parts**

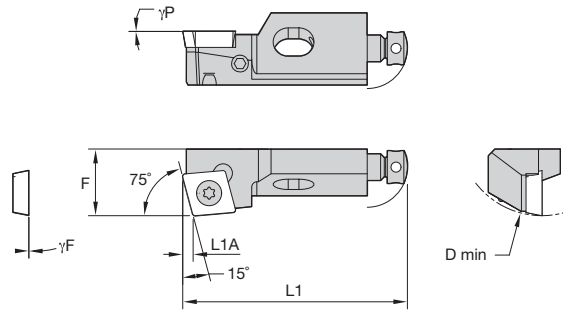
D min	insert screw	Torx	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
.984	MS1153	T7	KUAM34	1.5 mm	KUAM20	MS2175	2.5 mm	CSWM 040 050

NOTE: ANSI/ISO compatible 60° countersunk hole inserts.
This tool also accepts CPGM/CPGT/CPGW-21.5_ inserts.

O.D./I.D. Tooling



See pages B92–B95 for inserts.



SCKP 15°

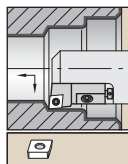
catalog number	D min	F	L1	L1A	γF°	γP°	gage insert
right hand SCKPR08CA06	.984	.394	1.26	.061	0.0	0.0	CP..060204/CP..2151
left hand SCKPL08CA06	.984	.394	1.26	.061	0.0	0.0	CP..060204/CP..2151

Spare Parts

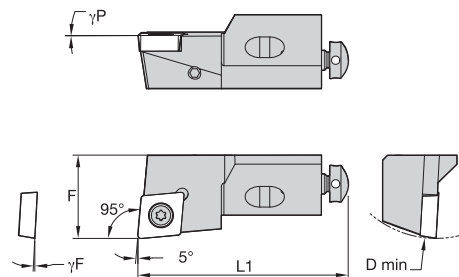
D min	insert screw	Torx	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
.984	MS1153	T7	KUAM34	1.5 mm	KUAM20	MS2175	2.5 mm	CSWM 040 050

NOTE: ANSI/ISO compatible 60° countersunk hole inserts.
This tool also accepts CPGM/CPGT/CPGW-21.5_ inserts.

O.D./I.D. Tooling



See pages B88–B91 for inserts.

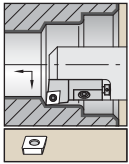


SCLC -5°

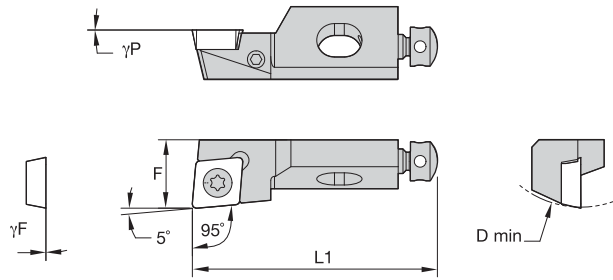
catalog number	D min	F	L1	γF°	γP°	gage insert
right hand SCLCR12CA12	1.969	.787	2.17	-3.0	0.0	CC..120408/CC..432
SCLCR16CA12	2.362	.984	2.48	-3.0	0.0	CC..120408/CC..432
left hand SCLCL12CA12	1.969	.787	2.17	-3.0	0.0	CC..120408/CC..432
SCLCL16CA12	2.362	.984	2.48	-3.0	0.0	CC..120408/CC..432

Spare Parts

D min	insert screw	Torx	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
1.969	MS1157	T15	KUAM23	2.5 mm	KUAM31	191.406	4 mm	CSWM 060 050
2.362	MS1157	T15	KUAM25	2.5 mm	KUAM32	191.407	5 mm	CSWM 080 050



See pages B92–B95 for inserts.



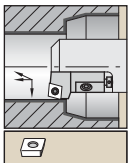
■ **SCLP -5°**

catalog number	D min	F	L1	γF°	γP°	gage insert
right hand						
SCLPR06CA05	.787	.315	.984	0.0	0.0	CP..050204/CP..18151
SCLPR08CA06	.984	.394	1.260	0.0	0.0	CP..060204/CP..2151
SCLPR10CA09	1.575	.551	1.969	0.0	0.0	CP..09T308/CP..3252
left hand						
SCLPL06CA05	.787	.315	.984	0.0	0.0	CP..050204/CP..18151
SCLPL08CA06	.984	.394	1.260	0.0	0.0	CP..060204/CP..2151
SCLPL10CA09	1.575	.551	1.969	0.0	0.0	CP..09T308/CP..3252

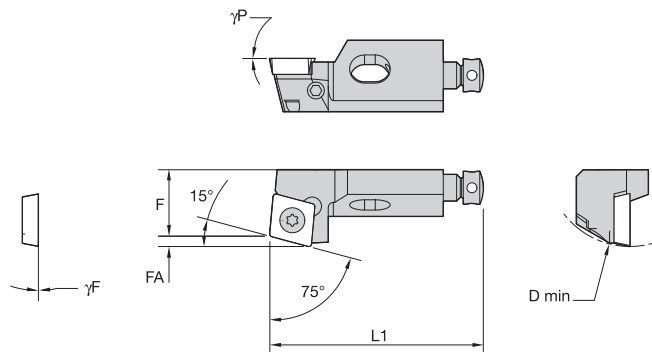
■ **Spare Parts**

D min	insert screw	Torx	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
.787	MS1933	T7	KUAM34	1.5 mm	KUAM35	MS2173	2 mm	CSWM 035 040
.984	MS1153	T7	KUAM34	1.5 mm	KUAM20	MS2175	2.5 mm	CSWM 040 050
1.575	MS1155	T15	KUAM28	2 mm	KUAM30	191.405	4 mm	CSWM 060 050

NOTE: ANSI/ISO compatible 60° countersunk hole inserts.
This tool also accepts CPGM/CPGT/CPGW-21.5_ inserts.
ANSI/ISO compatible 60° countersunk hole inserts (i.e., CPMT/CPGT/CPGW-32.5_) and 90° countersunk hole inserts (i.e., CPGM/CPGB-32.5_) do not fit this tool.



See pages B92–B95 for inserts.



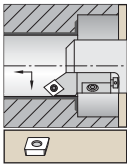
■ **SCR 15°**

catalog number	D min	F	FA	L1	γF°	γP°	gage insert
right hand							
SCRPR08CA06	.984	.394	.059	1.26	0.0	0.0	CP..060204/CP..2151
left hand							
SCRPL08CA06	.984	.394	.059	1.26	0.0	0.0	CP..060204/CP..2151

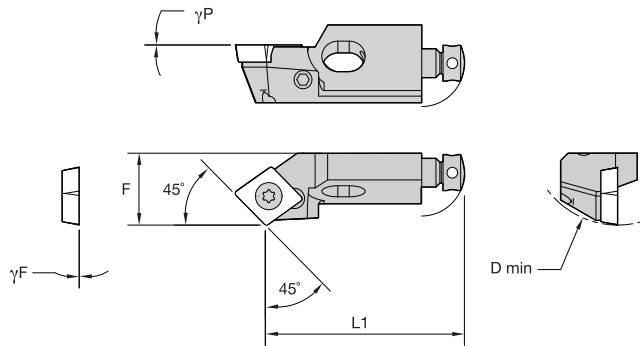
■ **Spare Parts**

D min	insert screw	Torx	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
.984	MS1153	T7	KUAM34	1.5 mm	KUAM20	MS2175	2.5 mm	CSWM 040 050

NOTE: ANSI/ISO compatible 60° countersunk hole inserts.
This tool also accepts CPGM/CPGT/CPGW-21.5_ inserts.



See pages B92–B95 for inserts.



■ SCSP 45°

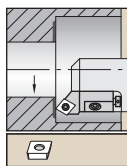
O.D./I.D. Tooling

catalog number	D min	F	L1	γF°	γP°	gage insert
right hand						
SCSPR06CA05	.787	.315	.83	0.0	0.0	CP..050204/CP..18151
SCSPR08CA06	.984	.394	1.10	0.0	0.0	CP..060204/CP..2151
left hand						
SCSPL06CA05	.787	.315	.83	0.0	0.0	CP..050204/CP..18151
SCSPL08CA06	.984	.394	1.10	0.0	0.0	CP..060204/CP..2151

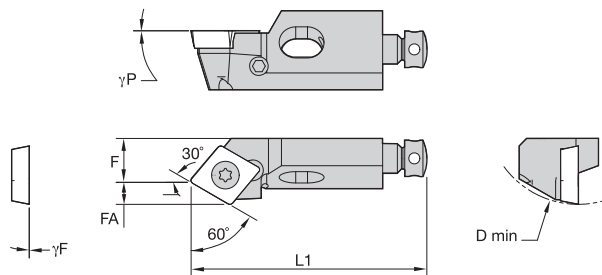
■ Spare Parts

D min	insert screw	Torx	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
.787	MS1933	T7	—	—	KUAM35	MS2173	2 mm	CSWM 035 040
.984	MS1153	T7	KUAM34	1.5 mm	KUAM20	MS2175	2.5 mm	CSWM 040 050

NOTE: ANSI/ISO compatible 60° countersunk hole inserts.
This tool also accepts CPGM/CPGT/CPGW-21.5_ inserts.



See pages B92–B95 for inserts.



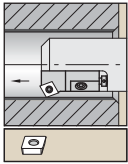
■ SCTP 30°

catalog number	D min	F	FA	L1	γF°	γP°	gage insert
right hand							
SCTPR06CA05	.787	.217	.102	.98	0.0	0.0	CP..050204/CP..18151
SCTPR08CA06	.984	.236	.116	1.26	0.0	0.0	CP..060204/CP..2151
left hand							
SCTPL08CA06	.984	.236	.116	1.26	0.0	0.0	CP..060204/CP..2151

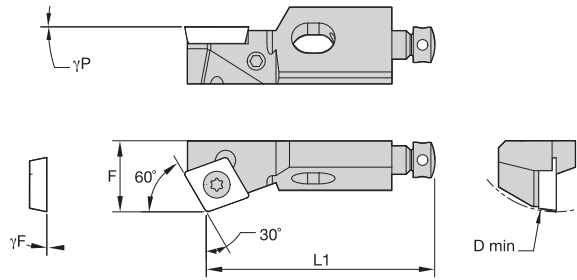
■ Spare Parts

D min	insert screw	Torx	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
.787	MS1933	T7	—	—	KUAM35	MS2173	2 mm	CSWM 035 040
.984	MS1153	T7	KUAM34	1.5 mm	KUAM20	MS2175	2.5 mm	CSWM 040 050
.984	MS1153	T7	KUAM34	1.5 mm	KUAM20	MS2175	2.5 mm	CSWM 040 050

NOTE: ANSI/ISO compatible 60° countersunk hole inserts.
This tool also accepts CPGM/CPGT/CPGW-21.5_ inserts.



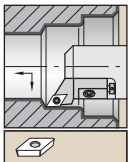
See pages B92–B95 for inserts.


SCWP 30°

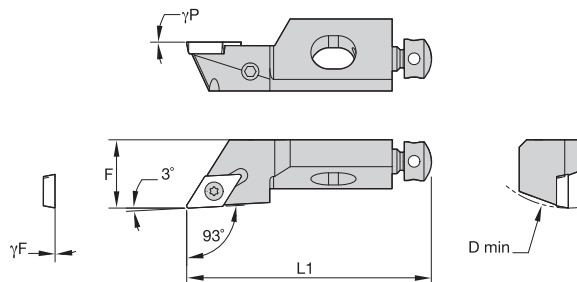
catalog number	D min	F	L1	L1A	γF°	γP°	gage insert
right hand SCWPR08CA06	.984	.394	1.26	.118	0.0	0.0	CP..060204/CP..2151
left hand SCWPL08CA06	.984	.394	1.26	.118	0.0	0.0	CP..060204/CP..2151

Spare Parts

D min	insert screw	Torx	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
.984	MS1153	T7	KUAM34	1.5 mm	KUAM20	MS2175	2.5 mm	CSWM 040 050

 NOTE: ANSI/ISO compatible 60° countersunk hole inserts.
 This tool also accepts CPGM/CPGT/CPGW-21.5_ inserts.


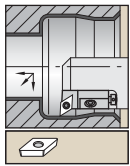
See pages B98–B100 for inserts.


SDJP -3°

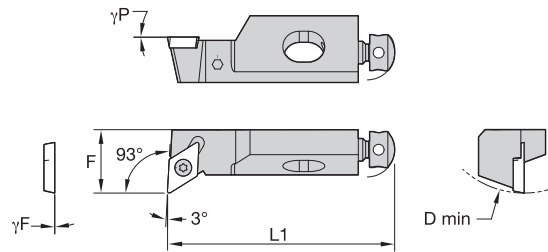
catalog number	D min	F	L1	γF°	γP°	gage insert
right hand SDJPR10CA07	1.575	.551	1.97	0.0	0.0	DP..070204/DP..2151
left hand SDJPL10CA07	1.575	.551	1.97	0.0	0.0	DP..070204/DP..2151

Spare Parts

D min	insert screw	Torx	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
1.575	MS1153	T7	KUAM28	2 mm	KUAM30	191.405	4 mm	CSWM 060 050



See pages B98–B100 for inserts.



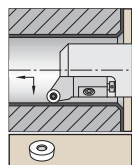
SDUP -3°

catalog number	D min	F	L1	γF°	γP°	gage insert
right hand SDUPR10CA07	1.575	.551	1.97	0.0	0.0	DP..070204/DP..2151

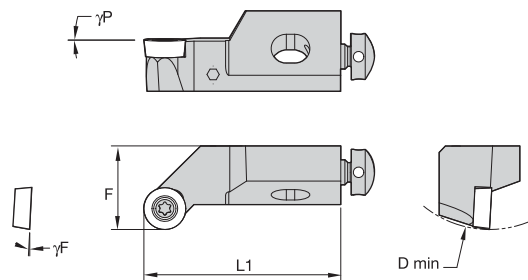
Spare Parts

D min	insert screw	Torx	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
1.575	MS1153	T7	KUAM28	2 mm	KUAM30	191.405	4 mm	CSWM 060 050

O.D./I.D. Tooling



See pages B100–B102 for inserts.

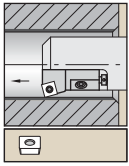


SRGC

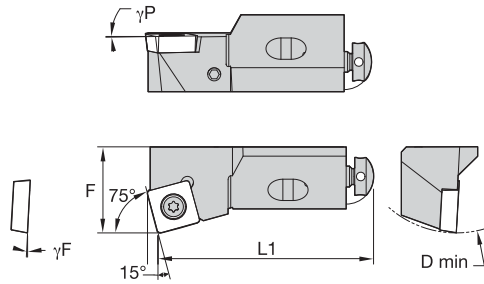
catalog number	D min	F	L1	γF°	γP°	gage insert
right hand SRGCR08CA06	.984	.394	1.26	-4.0	0.0	RC..0602M0/RC..215
SRGCR10CA08	1.575	.551	1.97	-3.0	0.0	RC..0803M0/RC..0803M0
SRGCR12CA10	1.969	.787	2.17	-3.0	0.0	RC..10T3M0/RC..10T3M0
left hand SRGCL08CA06	.984	.394	1.26	-4.0	0.0	RC..0602M0/RC..215
SRGCL12CA10	1.969	.787	2.17	-3.0	0.0	RC..10T3M0/RC..10T3M0

Spare Parts

D min	insert screw	Torx	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
.984	MS1153	T7	KUAM34	1.5 mm	KUAM20	MS2175	2.5 mm	CSWM 040 050
1.575	MS1154	T9	KUAM28	2 mm	KUAM30	191.405	4 mm	CSWM 060 050
1.969	MS1155	T15	KUAM23	2.5 mm	KUAM31	191.406	4 mm	CSWM 060 050



See pages B103–B104 for inserts.

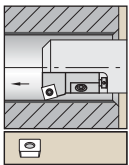


■ **SSKC 15°**

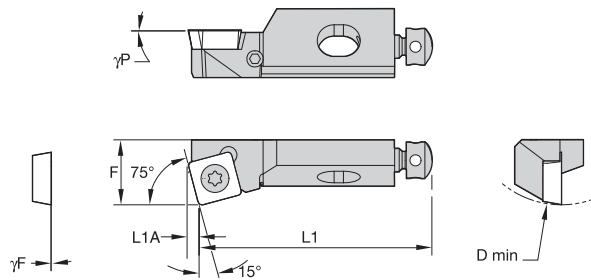
catalog number	D min	F	L1	γF°	γP°	gage insert
right hand SSKCR12CA12	1.969	.787	2.17	-3.0	0.0	SC..120408/SC..432
left hand SSKCR16CA12	2.362	.984	2.48	-3.0	0.0	SC..120408/SC..432
left hand SSKCL12CA12	1.969	.787	2.17	-3.0	0.0	SC..120408/SC..432

■ **Spare Parts**

D min	insert screw	Torx	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
1.969	MS1157	T15	KUAM23	2.5 mm	KUAM31	191.406	4 mm	CSWM 060 050
2.362	MS1157	T15	KUAM25	2.5 mm	KUAM32	191.407	5 mm	CSWM 080 050



See pages B104–B106 for inserts.



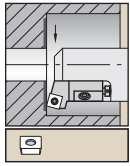
■ **SSKP 15°**

catalog number	D min	F	L1	L1A	γF°	γP°	gage insert
right hand SSKPR10CA09	1.575	.551	1.97	.09	0.0	0.0	SP..09T308/SP..3252
left hand SSKPL10CA09	1.575	.551	1.97	.09	0.0	0.0	SP..09T308/SP..3252

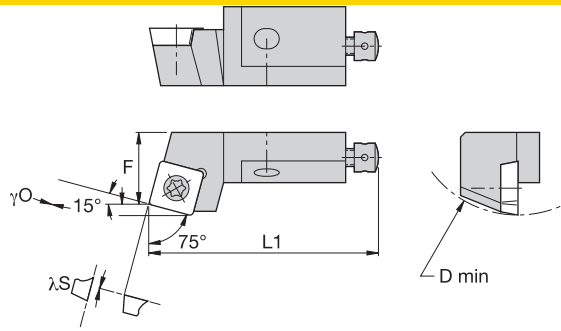
■ **Spare Parts**

D min	insert screw	Torx	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
1.575	MS1155	T15	KUAM28	2 mm	KUAM30	191.405	4 mm	CSWM 060 050

O.D./I.D. Tooling



See pages B103–B104 for inserts.



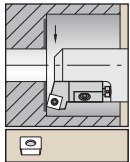
SSRC 15°

catalog number	D min	F	L1	γO°	λS°	gage insert
right hand SSRCR12CA12	1.969	.787	2.17	0.0	-3.0	SC..120408/SC..432
left hand SSRCL12CA12	1.969	.787	2.17	0.0	-3.0	SC..120408/SC..432

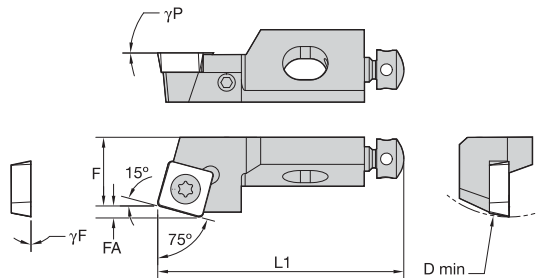
Spare Parts

D min	insert screw	Torx	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
1.969	MS1157	T15	KUAM23	2.5 mm	KUAM31	191.406	4 mm	CSWM 060 050

O.D./I.D. Tooling



See pages B104–B106 for inserts.

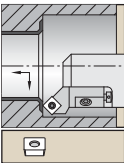


SSRP 15°

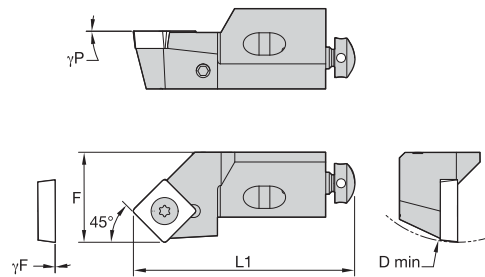
catalog number	D min	F	FA	L1	γF°	γP°	gage insert
right hand SSRPR10CA09	1.575	.551	.09	1.97	0.0	0.0	SP..09T308/SP..3252
left hand SSRPL10CA09	1.575	.551	.09	1.97	0.0	0.0	SP..09T308/SP..3252

Spare Parts

D min	insert screw	Torx	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
1.575	MS1155	T15	KUAM28	2 mm	KUAM30	191.405	4 mm	CSWM 060 050



See pages B103–B104 for inserts.

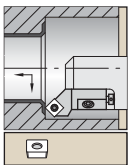


■ SSSC 45°

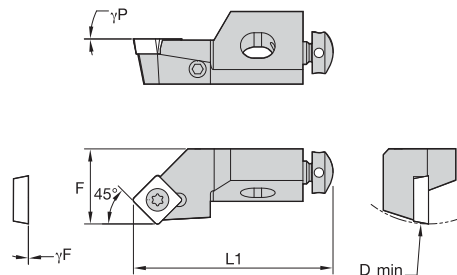
catalog number	D min	F	L1	γF°	γP°	gage insert
right hand						
SSSCR12CA12	1.969	.787	1.85	-3.0	0.0	SC..120408/SC..432
SSSCR16CA12	2.362	.984	2.09	0.0	0.0	SC..120408/SC..432
left hand						
SSSCL12CA12	1.969	.787	1.85	-3.0	0.0	SC..120408/SC..432

■ Spare Parts

D min	insert screw	Torx	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
1.969	MS1157	T15	KUAM23	2.5 mm	KUAM31	191.406	4 mm	CSWM 060 050
2.362	MS1157	T15	KUAM25	2.5 mm	KUAM32	191.407	5 mm	CSWM 080 050



See pages B104–B106 for inserts.

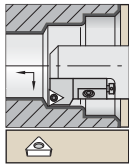


■ SSSP 45°

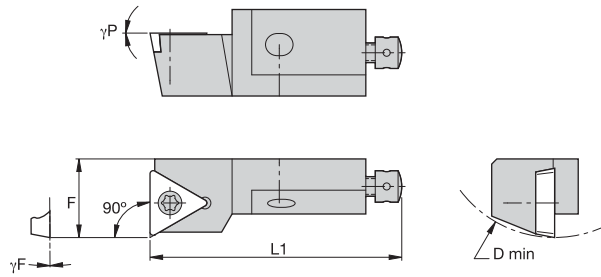
catalog number	D min	F	L1	γF°	γP°	gage insert
right hand						
SSSPR10CA09	1.575	.551	1.73	0.0	0.0	SP..09T308/SP..3252
SSSPR12CA09	1.969	.787	1.85	0.0	0.0	SP..09T308/SP..3252
left hand						
SSSPL10CA09	1.575	.551	1.73	0.0	0.0	SP..09T308/SP..3252

■ Spare Parts

D min	insert screw	Torx	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
1.575	MS1155	T15	KUAM28	2 mm	KUAM30	191.405	4 mm	CSWM 060 050
1.969	MS1155	T15	KUAM23	2.5 mm	KUAM31	191.406	4 mm	CSWM 060 050



See pages B109–B112 for inserts.



O.D./I.D. Tooling

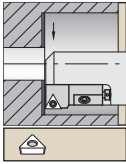
STFP

catalog number	D min	F	L1	γF°	γP°	gage insert
right hand						
STFPR08CA09	.984	.394	1.26	0.0	0.0	TP..090204/TP..18151
STFPR10CA11	1.575	.551	1.97	0.0	0.0	TP..110204/TP..2151
STFPR12CA16	1.969	.787	2.17	0.0	0.0	TP..16T308/TP..3252
left hand						
STFPL08CA09	.984	.394	1.26	0.0	0.0	TP..090204/TP..18151
STFPL10CA11	1.575	.551	1.97	0.0	0.0	TP..110204/TP..2151
STFPL12CA16	1.969	.787	2.17	0.0	0.0	TP..16T308/TP..3252

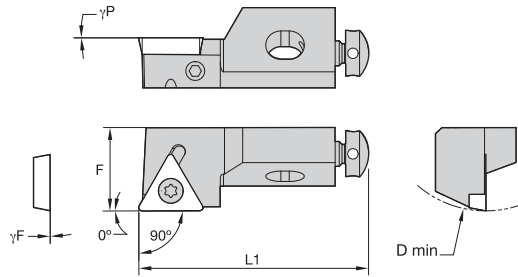
Spare Parts

D min	insert screw	Torx	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
.984	MS1152	T7	KUAM34	1.5 mm	KUAM20	MS2175	2.5 mm	CSWM 040 050
1.575	MS1153	T7	KUAM28	2 mm	KUAM30	191.405	4 mm	CSWM 060 050
1.969	MS1155	T15	KUAM23	2.5 mm	KUAM31	191.406	4 mm	CSWM 060 050
2.362	MS1155	T15	KUAM25	4 mm	KUAM32	191.407	5 mm	CSWM 080 050

NOTE: ANSI/ISO compatible 60° countersunk hole inserts.
 This tool also accepts TPGM/TPGT/TPGW-21.5_ inserts.
 ANSI/ISO compatible 60° countersunk hole inserts (i.e., TPMT/TPGT/TPGW-32.5_).
 90° countersunk hole inserts (i.e., TPGM/TPGB-32.5_) do not fit this tool.



See pages B109–B112 for inserts.



■ STGP

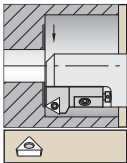
catalog number	D min	F	L1	γF°	γP°	gage insert
right hand						
STGPR08CA09	.984	.394	1.26	0.0	0.0	TP..090204/TP..18151
STGPR10CA11	1.575	.551	1.97	0.0	0.0	TP..110204/TP..2151
STGPR12CA16	1.969	.787	2.17	0.0	0.0	TP..16T308/TP..3252
left hand						
STGPL08CA09	.984	.394	1.26	0.0	0.0	TP..090204/TP..18151
STGPL10CA11	1.575	.551	1.97	0.0	0.0	TP..110204/TP..2151

O.D./I.D. Tooling

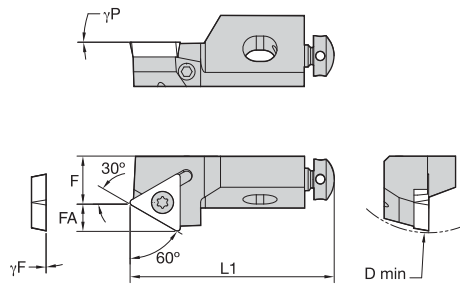
■ Spare Parts

D min	insert screw	Torx	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
.984	MS1152	T7	KUAM34	1.5 mm	KUAM20	MS2175	2.5 mm	CSWM 040 050
1.575	MS1153	T7	KUAM28	2 mm	KUAM30	191.405	4 mm	CSWM 060 050
1.969	MS1155	T15	KUAM23	2.5 mm	KUAM31	191.406	4 mm	CSWM 060 050

NOTE: ANSI/ISO compatible 60° countersunk hole inserts.
 This tool also accepts TPGM/TPGT/TPGW-21.5_ inserts.
 ANSI/ISO compatible 60° countersunk hole inserts (i.e., TPMT/TPGT/TPGW-32.5_).
 90° countersunk hole inserts (i.e., TPGM/TPGB-32.5_) do not fit this tool.



See pages B109–B112 for inserts.



■ STTP 30°

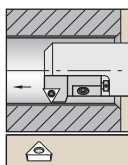
catalog number	D min	F	FA	L1	γF°	γP°	gage insert
right hand							
STTPR08CA09	.984	.236	.167	1.26	0.0	0.0	TP..090204/TP..18151
STTPR10CA11	1.575	.354	.195	1.97	0.0	0.0	TP..110204/TP..2151
STTPR12CA16	1.969	.512	.282	2.17	0.0	0.0	TP..16T308/TP..3252

O.D./I.D. Tooling

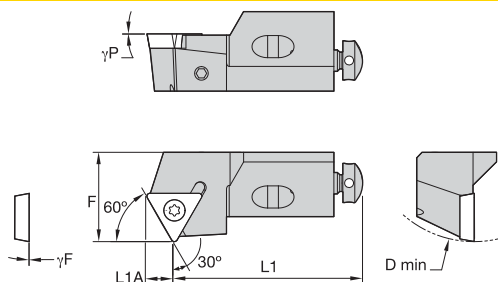
■ Spare Parts

D min	insert screw	Torx	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
.984	MS1152	T7	KUAM34	1.5 mm	KUAM20	MS2175	2.5 mm	CSWM 040 050
1.575	MS1153	T7	KUAM28	2 mm	KUAM30	191.405	4 mm	CSWM 060 050
1.969	MS1155	T15	KUAM23	2.5 mm	KUAM31	191.406	4 mm	CSWM 060 050

NOTE: ANSI/ISO compatible 60° countersunk hole inserts.
This tool also accepts TPGM/TPGT/TPGW-21.5_ inserts.



See pages B109–B112 for inserts.



■ **STWP 30°**

catalog number	D min	F	L1	γF°	γP°	gage insert
right hand						
STWPR08CA09	.984	.394	1.10	0.0	0.0	TP..090204/TP..18151
STWPR10CA11	1.575	.551	1.73	0.0	0.0	TP..110204/TP..2151
STWPR12CA16	1.969	.787	1.85	0.0	0.0	TP..16T308/TP..3252
STWPR16CA16	2.362	.984	2.09	0.0	0.0	TP..16T308/TP..3252

■ **Spare Parts**

D min	insert screw	Torx	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
.984	MS1152	T7	KUAM34	1.5 mm	KUAM20	MS2175	2.5 mm	CSWM 040 050
1.575	MS1153	T7	KUAM28	2 mm	KUAM30	191.405	4 mm	CSWM 060 050
1.969	MS1155	T15	KUAM23	2.5 mm	KUAM31	191.406	4 mm	CSWM 060 050
2.362	MS1155	T15	KUAM25	2.5 mm	KUAM32	191.407	5 mm	CSWM 080 050

NOTE: ANSI/ISO compatible 60° countersunk hole inserts.
This tool also accepts TPGM/TPGT/TPGW-21.5_ inserts.

O.D./I.D. Tooling

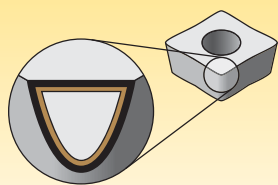


Grooving and Cut-Off

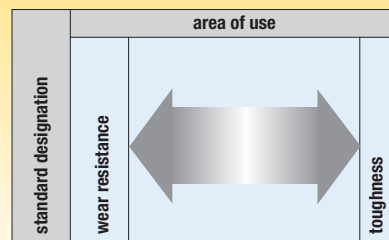
Grooving Application Guide .....	.D2-D3
Grades and Grade Descriptions .....	.D4-D7
A2 Cut-Off .....	.D8-D19, D22-D25
A3 Deep Grooving .....	.D26-D63
VG Deep Grooving .....	.D64-D68
A4 Grooving and Turning .....	.D70-D121
Top Notch Grooving .....	.D122-D154
KGF and KGT Cut-Off Inserts .....	.D158-D161

	Cut-Off	Grooving	Face Grooving
Application			
Top Notch™ Grooving generally recommended for cutting depth/width ratios of 1.5 or less		<p>Inserts</p> <ul style="list-style-type: none"> • Cutting widths from .031–.375" (0,8–9,5mm). • Cutting depths from .050–.500" (1,27–12,70mm). • Chip control, positive rake, and neutral flat top inserts are available. <p>O.D. Application</p> <ul style="list-style-type: none"> • Integral shank toolholders and KM™ heads are available. <p>I.D. Application</p> <ul style="list-style-type: none"> • Boring bars with a .453" (11,5mm) minimum bore diameter. 	<p>Minimum Face Groove Diameter Capabilities</p> <ul style="list-style-type: none"> • Standard inserts: 2.125–13" (54–330mm) depending on size. • NF/NFD face grooving inserts: .940–2.25" (24–57mm). • All have unlimited maximum diameter. <p>Cutting Width Range</p> <ul style="list-style-type: none"> • Standard inserts: .031–.375" (0,8–9,5mm). • NF/NFD face grooving inserts: .079–.250" (2–6,35mm). <p>Cutting Depth Range</p> <ul style="list-style-type: none"> • Standard inserts: .050–.500" (1,27–12,7mm). • NF/NFD face grooving inserts: .150–.250" (3,8–6,35mm).
A4™ Grooving and Turning	<p>Cut-Off Capabilities</p> <ul style="list-style-type: none"> • Cut-off widths from .059–.159" (1,5–4,05mm). • Satisfies extreme demands for rigidity and dimensional accuracy. • Integral screw-clamping toolholders with .670" (17mm) maximum cutting depth available. • Economical double-edge inserts. 	<p>Inserts</p> <ul style="list-style-type: none"> • Cutting widths from .079–.396" (2–10,05mm). • Precision ground and molded inserts — all available with chip control. <p>O.D. Application</p> <ul style="list-style-type: none"> • Integral shank toolholders and modular KM heads are available. • Cutting depths from .55–1.02" (14–26mm). <p>I.D. Application</p> <ul style="list-style-type: none"> • Boring bars with .984" (25mm) minimum bore diameter. • Cutting widths from .079–.250" (2–6,35mm). 	<p>Minimum Face Groove Diameter Capabilities</p> <ul style="list-style-type: none"> • .630" (16mm) minimum diameter. • Unlimited maximum diameter. <p>Cutting Width Range</p> <ul style="list-style-type: none"> • Cutting widths from .079–.394" (2–10,05mm). <p>Cutting Depth Range</p> <ul style="list-style-type: none"> • Cutting depths from .47–.94" (12–24mm).
A3™ Deep Grooving generally recommended for cutting depth/width ratios of more than 1.5		<p>Inserts</p> <ul style="list-style-type: none"> • Cutting widths from .093–.396" (2,36–10,05mm). • Precision ground and molded inserts — all available with chip control. <p>O.D. Application</p> <ul style="list-style-type: none"> • Integral shank toolholders and modular KM heads are available. • Cutting depths from .394–1.26" (10–32mm). <p>I.D. Application</p> <ul style="list-style-type: none"> • Boring bars with 1.26" (32mm) minimum bore diameter. 	<p>Minimum Face Groove Diameter Capabilities</p> <ul style="list-style-type: none"> • .984" (25mm) minimum diameter. • Unlimited maximum diameter. <p>Cutting Width Range</p> <ul style="list-style-type: none"> • Cutting widths from .118–.250" (3–6,35mm). <p>Cutting Depth Range</p> <ul style="list-style-type: none"> • Cutting depths from .393–1.26" (10–32mm).
A2™ Cut-Off	<p>Cut-Off Capabilities</p> <ul style="list-style-type: none"> • Cut-off widths from .055–.315" (1,4–8mm). • Left- and right-hand styles with 6–16° lead angles. • Self-clamping blades and screw-clamping integral shank toolholders are available. • Single-edge inserts for maximum depth capability. 		

	Grooving and Turning	Undercutting	Profiling
Application			
Top Notch™ Grooving generally recommended for cutting depth/width ratios of 1.5 or less		Top Notch Undercutting Capabilities <ul style="list-style-type: none"> Undercutting insert widths from .094–.156" (2,4–4mm). Economical double-ended inserts. 	Recommended for Moderate to Heavy Stock Removal at Shallow Profile Depths Full Radius Inserts <ul style="list-style-type: none"> Cutting widths from .062–.250" (1,57–6,35mm). Cutting depths from .094–.250" (2,39–6,35mm). O.D. Application <ul style="list-style-type: none"> Integral shank toolholders and KM heads are available.
A4™ Grooving and Turning	Recommended for Heavy Stock Removal, Particularly in Turning Applications Inserts <ul style="list-style-type: none"> Cutting widths from .079–.396" (2–10,05mm). Double-ended, precision ground, and molded inserts — all available with chip control. O.D. Application <ul style="list-style-type: none"> Integral shank toolholders and modular KM™ heads are available. Cutting depths from .55–1.02" (14–26mm). I.D. Application <ul style="list-style-type: none"> Boring bars with .984" (25mm) minimum bore diameter. Cutting widths from .079–.250" (2–6,35mm). 		Recommended for Heavy Stock Removal Full Radius Inserts <ul style="list-style-type: none"> Cutting widths from .079–.396" (2–10,05mm). O.D. Application <ul style="list-style-type: none"> Integral shank toolholders and modular KM heads are available. Cutting depths from .55–1.02" (14–26mm).
A3™ Deep Grooving generally recommended for cutting depth/width ratios of more than 1.5	Recommended for Light Cutting Inserts <ul style="list-style-type: none"> Cutting widths from .093–.396" (2,36–10mm). Precision ground and molded inserts — all available with chip control. O.D. Application <ul style="list-style-type: none"> Integral shank toolholders and modular KM heads are available. Cutting depths from .394–1.26" (10–32mm). I.D. Application <ul style="list-style-type: none"> Boring bars with 1.26" (32mm) minimum bore diameter. 	Full Radius Undercutting <ul style="list-style-type: none"> Full radius inserts with cutting widths from .118–.315" (3–8mm) at 45° lead angle. 35° Insert Undercutting <ul style="list-style-type: none"> 35° V-form inserts for profiling undercuts. Toolholder lead angles of 45°, 93°, and 117.5°. 	Recommended for Light Cutting <ul style="list-style-type: none"> Full radius inserts with cutting widths from .118–.315" (3–8mm). 1.26" (32mm) maximum cutting depth. Integral shank toolholders and modular KM heads are available. 35° V-form inserts are also available.
A2™ Cut-Off			



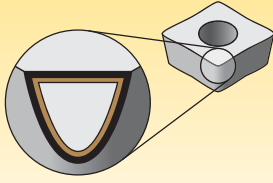
Reduce cycle times. High speed and feed capability. Long tool life. New multilayer coating provides better wear resistance.



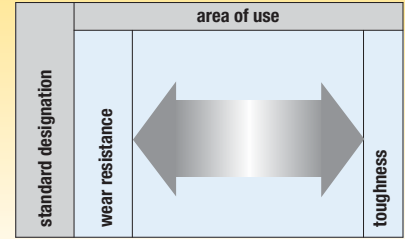
Grooving and Cut-Off


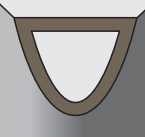
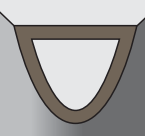
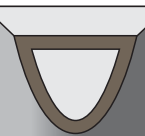
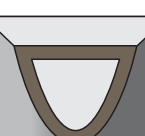
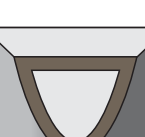
Grade

Coating	Grade Description	05	10	15	20	25	30	35	40	45	
K68 C3	<p>Composition: A hard, low binder content, unalloyed WC/Co fine-grain grade.</p> <p>Application: The K68 grade has excellent abrasion resistance for machining cast irons, austenitic stainless steels, non-ferrous metals, non-metals, and as an alternative to the K313 grade on most high-temp alloys. Use as a general-purpose grade for non-ferrous materials.</p>	M									
		K									
		N									
		S									
K313 C3-C4	<p>Composition: A hard, low binder content, unalloyed WC/Co fine-grain grade.</p> <p>Application: Exceptional edge wear resistance combined with very high strength for machining titanium, cast irons, austenitic stainless steels, non-ferrous metals, non-metals, and most high-temp alloys. Superior thermal deformation and depth-of-cut notch resistance. The grain structure is well controlled for minimal pits and flaws, which contributes to long, reliable service.</p>	M									
		K									
		N									
		S									
KT315 C3, C7	<p>Composition: A multilayered, PVD TiN/TiCN/TiN-coated cermet turning grade.</p> <p>Application: Ideal for high-speed finishing to medium machining of most carbon and alloy steels and stainless steels. Performs very well in cast and ductile iron applications too. Provides long and consistent tool life and will produce excellent workpiece finishes.</p>	P									
		M									
		K									
K1025 (KMF) C2, C6	<p>Composition: Medium in hardness and binder content unalloyed WC/Co fine-grain grade.</p> <p>Application: For machining high-temp alloys, titanium, and non-ferrous workpiece materials under unfavorable conditions.</p>	N									
		S									
KCP10 C3, C7	<p>Composition: A specially engineered cobalt-enriched carbide grade with thick MTCVD-TiCN-Al₂O₃ coating for maximum crater-wear, deformation, and abrasion resistance for high-speed machining.</p> <p>Application: An excellent finishing to medium machining grade for a variety of workpiece materials including most steels, ferritic and martensitic stainless steels, and cast irons. The smooth coating provides good resistance to edge build-up and microchipping and produces excellent surface finishes.</p>	P									
		M									
		K									
KCP25 C2-C3, C6-C7	<p>Composition: A tough cobalt-enriched carbide grade with a newly designed multilayer MTCVD-TiCN-Al₂O₃ coating with superior interlayer adhesion.</p> <p>Application: General-purpose turning grade for most steels and ferritic and martensitic stainless steels. The substrate design ensures adequate deformation resistance along with excellent insert edge strength. Coating layers offer wear resistance and the post-coat treatment minimizes microchipping and improves coating adhesion to the substrate for long tool life.</p>	P									
		M									
		K									

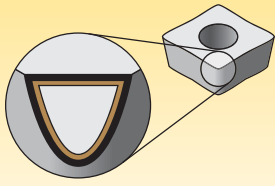


Reduce cycle times. High speed and feed capability. Long tool life. New multilayer coating provides better wear resistance.

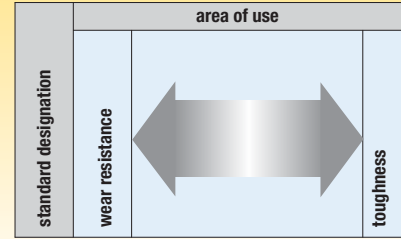


Grade	Coating	Grade Description	area of use																					
			05	10	15	20	25	30	35	40	45	standard designation												
KCU10	 C3-C4	<p>Composition: An advanced multilayer PVD coating over a very deformation-resistant unalloyed carbide substrate. The new and improved coating improves edge stability with wide range speed and feed capabilities.</p> <p>Application: The KCU10 grade is ideal for finishing to general machining of most workpiece materials at a wide range of speed and feed capabilities. Excellent for machining most steels, stainless steels, cast irons, non-ferrous materials, and super alloys with improved edge toughness and higher cutting speed/feed capability.</p>	P																					
			M																					
			K																					
			N																					
			S																					
			H																					
KC5010	 C3-C4	<p>Composition: An advanced PVD TiAlN coating over a very deformation-resistant unalloyed carbide substrate.</p> <p>Application: The KC5010 grade is ideal for finishing to general machining of most workpiece materials at higher speeds. Excellent for machining most steels, stainless steels, cast irons, non-ferrous materials, and super alloys under stable conditions. It also performs well machining hardened and short chipping materials.</p>	P																					
			M																					
			K																					
			N																					
			S																					
			H																					
KC5510	 C3-C4	<p>Composition: An advanced PVD TiAlN-coated fine-grain tungsten carbide grade.</p> <p>Application: The KC5510 grade is specifically engineered for the productive machining of high-temp alloys. The fine-grained tungsten carbide 6% cobalt substrate has excellent toughness and deformation resistance while the advanced PVD coating enables metal cutting speeds double those of conventional PVD-coated cutting tools.</p>	P																					
			M																					
			K																					
			N																					
			S																					
			H																					
KCU25	 C2, C6	<p>Composition: An advanced PVD grade with hard AlTiN coating and ultra-fine-grain unalloyed substrate. The new and improved coating improves edge stability with wide range speed and feed capabilities.</p> <p>Application: The KCU25 grade is ideal for general machining of most steels, stainless steels, high-temp alloys, titanium, irons and non-ferrous materials, in a wide range of speeds and feeds, with improved edge toughness for interrupted cut and high feed rates.</p>	P																					
			M																					
			K																					
			N																					
			S																					
			H																					
KC5025	 C2, C6	<p>Composition: An advanced PVD TiAlN-coated grade with a tough, ultra-fine-grain unalloyed substrate.</p> <p>Application: For general-purpose machining of most steels, stainless steels, high-temp alloys, titanium, irons, and non-ferrous materials. Speeds may vary from low to medium and will handle interruptions and high feed rates.</p>	P																					
			M																					
			K																					
			N																					
			S																					
			H																					
KC5525	 C2-C6	<p>Composition: Advanced PVD TiAlN-coated fine-grain high-cobalt carbide grade.</p> <p>Application: The KC5525 grade utilizes the same advanced PVD coating as the KC5025 grade in conjunction with a fine-grained tungsten carbide 10% cobalt substrate. The higher cobalt enables added security in interrupted cuts while the fine-grained WC maintains hardness-resisting deformation at higher speeds. Designed for medium to heavy interruptions in high-temp alloys.</p>	P																					
			M																					
			K																					
			N																					
			S																					
			H																					





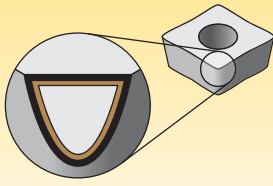
Reduce cycle times. High speed and feed capability. Long tool life. New multilayer coating provides better wear resistance.



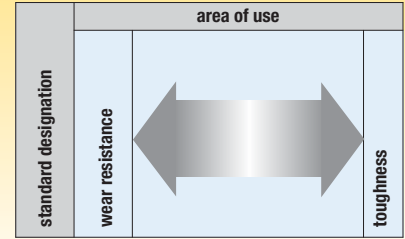
Grooving and Cut-Off

Grade

Coating	Grade Description	05	10	15	20	25	30	35	40	45
 KC5410 C3-C4	<p>Composition: PVD TiB₂ coating over a thermal deformation-resistant unalloyed substrate.</p> <p>Application: The KC5410 grade is designed for roughing, semi-finishing, and finishing of free machining (hypoeutectic <12.2% Si) aluminum, aluminum alloys, and magnesium alloys. Harder than TiN and TiAlN coatings, TiB₂ has an extremely smooth surface for improved surface friction, chip flow, and wear and built-up edge resistance. Unalloyed and fine-grained offering sharp edges and excellent edge integrity. Inserts with a ground periphery are polished before coating; molded inserts have a light hone.</p>									
		N								
 KC9110 C3, C7	<p>Composition: Specially engineered, cobalt-enriched carbide grade with thick K-MTCVDTiCN coating layer, an Al₂O₃ layer of controlled grain size, and outer layers of TiCN and TiN for maximum abrasion and wear resistance for high-speed machining.</p> <p>Application: An excellent finishing to medium machining grade for a variety of workpiece materials including most steels, ferritic and martensitic stainless steels, and cast irons. A balanced combination of deformation resistance and edge toughness. The smooth coating resists built-up edge and microchipping. For rougher cutting, use the KC9125 grade.</p>	P								
		K								
 KC9125 C2-C3, C6-C7	<p>Composition: A tough cobalt-enriched carbide grade with a newly designed multilayer K-MTCVD TiCNAl₂O₃-TiCN-TiN coating with superior interlayer adhesion.</p> <p>Application: General-purpose turning grade for most steels and ferritic and martensitic stainless steels. The substrate design ensures adequate deformation resistance along with excellent bulk toughness and insert edge strength. Coating layers offer wear resistance over a wide range of machining conditions and reduce frictional heat, minimize microchipping, and improve workpiece surface finishes. Performs well in moderately heavy roughing to semi-finishing cuts. Use the KC9110 grade for finishing cuts.</p>	P								
		K								
 KC9320 C3-C4	<p>Composition: A proprietary specially toughened MTCVD-TiCN and Al₂O₃ coating over a wear-resistant substrate.</p> <p>Application: KC9320 is specifically engineered to maximize coating adhesion and edge strength making this grade ideal in wet interrupted cutting of ductile and gray irons. It can be in a wide range of applications from finishing to roughing to maximize productivity wherever strength and reliability are needed.</p>	P								
 KY3500 C2	<p>Composition: Pure silicon nitride grade.</p> <p>Application: Maximum toughness; used at high feed rates for rough machining of gray cast iron, including machining through interruptions.</p>	K								
 KD1400 C4	<p>Composition: An ultra-fine-grain polycrystalline diamond (PCD) tip brazed onto a carbide substrate.</p> <p>Application: Designed for general-purpose turning of primarily non-ferrous materials. It can be applied over a wide range of continuous to interrupted cuts where superior surface finish is needed. Use on low to medium silicon-content aluminum alloys, non-metallics, copper, and brass- and zinc-based alloys. The ultra-fine-grain diamond particle size enables superior surface finishes while ensuring the best mechanical shock resistance of any PCD cutting tool.</p>	N								
		S								



Reduce cycle times. High speed and feed capability. Long tool life. New multilayer coating provides better wear resistance.



Grade	Coating	Grade Description	area of use										
			05	10	15	20	25	30	35	40	45		
KD1405		Composition: A pure CVD deposited diamond sheet tool directly brazed to a carbide substrate. Application: The KD1405 grade is Kennametal's and the industry's most abrasion-resistant tool material for non-ferrous and non-metallic materials. The KD1405 grade inserts are not as tough as the KD1400 and KD1425 grades but can withstand moderate interruptions when turning and traditional face milling operations.											
	C4		N										
KB1630		Composition: A high CBN content, PCBN tip brazed onto a carbide insert. Application: The KB1630 grade is designed for roughing to finishing in interrupted cuts on hardened steels (>45 HRC). It can also be applied on gray cast iron, chilled irons, high-chrome alloyed steels, and sintered powdered metals. The tipped PCBN insert is available in a wide range of insert styles including positive rake geometries that are ideally suited for boring applications.											
	—		K										
			S										
KB5625		Composition: A PVD TiAlN coating over a low content, PCBN tip brazed onto a carbide insert. Application: Designed for roughing to finishing of hardened steels (>45 HRC). Use on bearing steel, hot and cold work tool steels, high-speed steels, die steels, case hardened steels, carburized and nitrided irons, and some hard coatings.											
	C4, C8		H										
			H										



A2™ Cut-Off • High-Performance Tools to Maximize Productivity!

The A2 platform is the ideal system for parting operations on a wide variety of workpiece materials. It works well in smooth and interrupted cuts in both wet and dry operations. Now it is available in KCU25™ for superior edge toughness and excellent wear resistance.

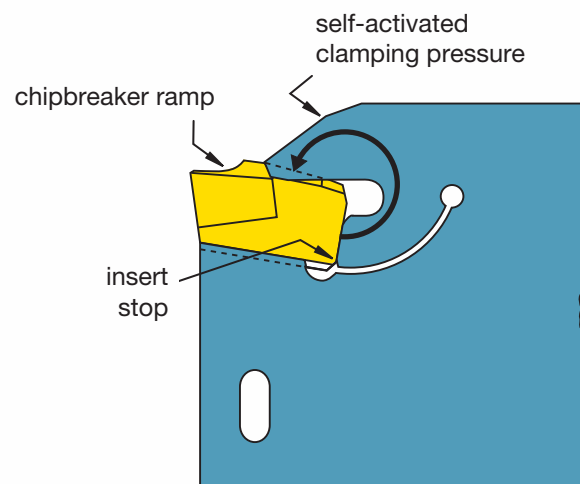
Features and Benefits

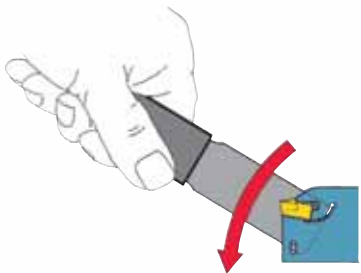
Innovative A2 Insert Design

- V-prisms on both top and bottom enable higher clamping force to prevent insert movement, even when cutting at high-feed rates.
- The cutting edge has a molded-in chipbreaker ramp to direct chips away from the blade, extending blade life.
- Positive rake cutting action combined with Kennametal's high-performance PVD coatings result in superior tool life and chip control.

A2™ Insert Stop Design

- As cutting forces increase, clamping forces also increase for secure holding power.
- Fixed insert stop ensures solid seating with every index and delivers up to 30% longer life.
- Cutting height is accurately controlled for maximum reliability and performance on even small-diameter parts.

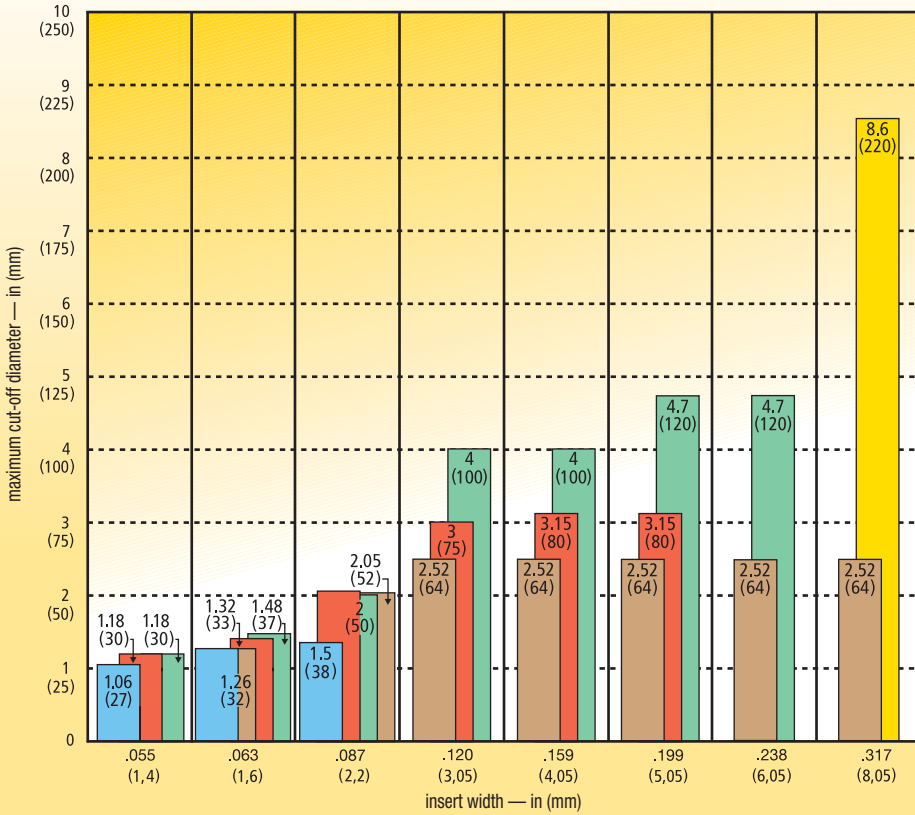




Quick and Easy Insert Indexing

- A convenient indexing wrench is available to minimize downtime by enabling fast removal and insertion without damage to the cutting edge.

Step 1 • Select insert width and holder type



blade height	
19mm	
26mm	
32mm	
52mm	
Integral Shank Toolholders	

What you need to know:

- Cut-off diameter.
- Part/machine requirements.

For required cut-off diameter, select insert width and holder type based on the part and machine requirement:

- To maximize rigidity, select the largest possible blade height or an integral shank toolholder.
- Diameters shown are for cut-off to center. Maximum cut-off depth to a through-hole depth is one half of the diameter.
- To determine depth capability for cut-off to a through-hole on integral shank or reinforced blades, please refer to listing for that tool in this catalog.

Toolholder Type

blade: (self-clamping)	blade: (self-clamping, reinforced version)	toolholder: (with clamping screw)
	 Available in 26mm and 32mm heights	
<ul style="list-style-type: none"> • Frequently used tool. • Two insert seats. • Deepest depth-of-cut capability. 	<ul style="list-style-type: none"> • Efficient tooling solution with improved stability. • Limited depth-of-cut capability. 	<ul style="list-style-type: none"> • Shank tool with the highest stability. • Limited depth of cut. • Single insert seat.

Step 2 • Select the insert lead angle

- Part type.
- Burr and center stub considerations.
- Cut-off to center or through hole.

	neutral (0°)	right/left 6-10°	right/left 15-16°
insert type			
recommended application	<ul style="list-style-type: none"> • For cutting off solid workpieces. • Center stub will form on cut-off part. • Eliminates lateral deflection. • Best for deep cut-off depths. 	<ul style="list-style-type: none"> • For cutting off solid workpieces with reduced formation of center stub. • For cut-off to a through-hole with reduced burr. 	<ul style="list-style-type: none"> • For thin-walled workpieces. • For cutting off small diameter workpieces with minimal burr or center stub.
tool life	Best tool life	Better tool life	Good tool life

Step 3 • Select chipbreaker style and feed rate

- Lead angle or neutral insert.
- Workpiece material.

-CL Cut-Off Low Feed	-CF Cut-Off Fine	-CM Cut-Off Medium	-CR Cut-Off Rough
<ul style="list-style-type: none"> • Excellent chip evacuation in low feed applications. • Offers improved stability and rigidity in difficult-to-control applications. 	<ul style="list-style-type: none"> • Cut-off insert with precision ground cutting edge for low feeds. • Curved cutting edge. 	<ul style="list-style-type: none"> • Cut-off insert with precision molded cutting edge for medium feeds. • Stabilized straight cutting edge. 	<ul style="list-style-type: none"> • Cut-off insert with precision molded cutting edge for higher feed rates. • Curved cutting edge.

Chipbreaker Style and Feed Rates • in/rev (mm/rev)

insert type	P	M	K	N	S	H
	N-CR .003-.012 (0,08-0,3)	N-CF .002-.005 (0,05-0,12)	N-CM .002-.008 (0,05-0,2)	N-CF .002-.007 (0,05-0,18)	N-CF .002-.004 (0,04-0,10)	CBN available upon request
	N-CF .002-.006 (0,05-0,15)	—	—	—	—	—
	N-CL .002-.006 (0,05-0,15)	N-CL .002-.005 (0,05-0,12)	—	N-CL .002-.007 (0,05-0,18)	N-CL .002-.004 (0,04-0,10)	—
	R/L-CR .002-.005 (0,05-0,12)	R/L-CF .002-.003 (0,04-0,08)	R/L-CM .002-.005 (0,05-0,12)	R/L-CF .002-.004 (0,04-0,10)	R/L-CF .002-.003 (0,04-0,08)	CBN available upon request
	R/L-CF .002-.003 (0,04-0,08)	—	—	—	—	—
	R/L-CL .002-.003 (0,04-0,08)	R/L-CL .002-.003 (0,04-0,08)	—	R/L-CL .002-.004 (0,04-0,10)	R/L-CL .002-.003 (0,04-0,08)	—

Step 4 • Select grade and speed

Recommendations for Grade and Speed Selection • SFM (m/min)

machining condition	workpiece material					
	P	M	K	N	S	H
high-performance, optimum conditions, higher speeds	KT315 120-190 (395-625)	KT315 70-170 (230-560)	KCU25/KC5025 80-170 (265-560)	KT315 180-400 (600-1300)	KCU25/KC5025 30-100 (100-325)	—
Beyond™ first choice for general machining conditions	KCU25/KC5025 80-170 (265-560)	KCU25/KC5025 80-150 (265-500)	KCU25/KC5025 70-150 (230-500)	KCU25/KC5025 150-300 (500-980)	KCU25/KC5025 25-75 (80-250)	CBN available upon request
unfavorable conditions, interrupted cuts, low speeds	KCU25/KC5025 60-100 (200-325)	KMF 40-80 (135-265)	KMF 25-80 (80-265)	KMF 60-180 (200-600)	KMF 30-25 (30-80)	—

Step 5 • Select insert and holder from catalog page

NOTE: The insert seat size must match the seat size of your holder selection.

Example for A2 • Cut-Off

Material low carbon steel
Workpiece diameter 1.02" (27mm)
Depth of cut157" (4mm)

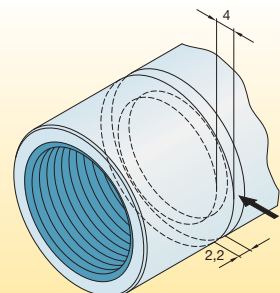
Recommendation

Insert A2022R10CF00
Grade KC5025
Cutting width087" (2,2mm)
Insert seat size 2

Toolholder A2BNSN3202
Seat size 2

Congratulations!

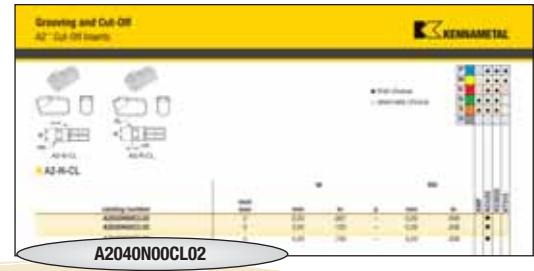
You have successfully maximized cut-off productivity by selecting the best insert, toolholder, grade, and cutting specifications for your application!



Speed: 460 SFM (140 m/min)
Feed: .002 in/rev (0,05 mm/rev)

How Do Catalog Numbers Work?

Each character in our catalog number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.



Grooving and Cut-Off

A2

Insert Type

A2 = Cut-Off

040

Cutting Width

(in 1/10mm)

cutting width (mm)	pocket seat size
1,40	1B
1,60	01
2,20	02
3,05	03
4,05	04
5,05	05
6,05	06
8,05	08

N

Hand of Insert

N = Neutral
R = Right hand
L = Left hand

00

Approach Angle of Main Cutting Edge

00 = Neutral
06 = 6°
10 = 10°
15 = 15°
16 = 16°

CL

Chipbreaker

-CF (Cut-Off Fine)
-CM (Cut-Off Medium)
-CR (Cut-Off Rough)
-CL (Cut-Off Low Feed)

02

Corner Radius

	mm	inch
00	0,0	.000
01	0,1	.004/.006
02	0,2	.008
03	0,3	.010
04	0,4	.016



With more than 140 insert line items in four grades and four chipbreaker styles, Kennametal offers a complete line of inserts designed to productively handle any cut-off application.

TG&C • The Latest Metalcutting Innovations

Our latest metalcutting innovations are designed to deliver higher productivity, longer tool life, and increased application versatility.

A2™ — Cut-Off

- The cutting edge has a molded-in chipbreaker ramp to direct chips away from the blade, extending blade life.
- Fixed insert stop ensures solid seating with every index and delivers up to 30% longer life.

A3™ — Deep Grooving

- Designed for deep grooving.
- Reach deeper depths while maintaining chip control and tool rigidity.

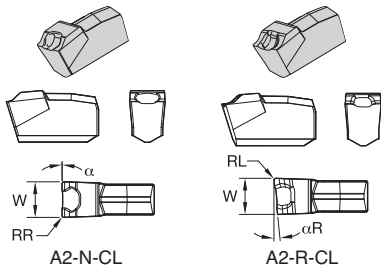
A4™ — Groove and Turn

- One tool for turning, facing, grooving, face-grooving, and cut-off in O.D. and I.D. applications — that means exceptionally fast cycle times, no turret indexes!
- Precise insert positioning is ensured — for accurate cuts!

Top Notch™

- Rigid clamping securely locks insert in place through the toughest cuts.
- Chip control inserts provide excellent chip evacuation in grooving and offer better chip control in multi-directional turning.





● first choice
○ alternate choice

P	○	●	●	●
M	○	●	●	●
K	○	●	●	○
N	○	●	●	○
S	○	●	●	○
H	○	●	●	○

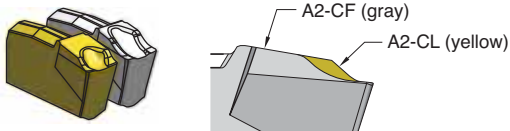
■ A2-N-CL

catalog number	seat size	W		α	RR		KMF	KCU25	KC5025	KT315
		mm	in		mm	in				
A2022N00CL02	2	2,20	.087	—	0,20	.008		●		
A2030N00CL02	3	3,05	.120	—	0,20	.008		●		
A2040N00CL02	4	4,05	.159	—	0,20	.008		●		

■ A2-R-CL

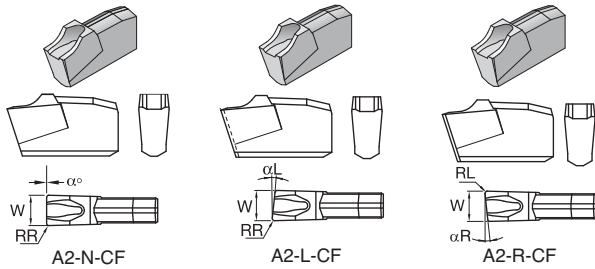
catalog number	seat size	W		αR	RL		KMF	KCU25	KC5025	KT315
		mm	in		mm	in				
right hand A2016R16CL01	1	1,60	.063	16	0,15	.006		●		
A2022R06CL02	2	2,20	.087	6	0,20	.008		●		
A2030R06CL02	3	3,05	.120	6	0,20	.008		●		
A2040R06CL02	4	4,05	.159	6	0,20	.008		●		

Grooving and Cut-Off



Tolerance on "W" Dimension

metric		inch	
width	tolerance	width	tolerance
1,4	+0,05/-0,05	.055	+0.002/-0.002
1,6	+0,07/-0,07	.063	+0.000/-0.004
2,2	+0,15/-0,00	.087	+0.006/-0.000
3,0	+0,15/-0,00	.118	+0.006/-0.000
4,0	+0,15/-0,00	.157	+0.006/-0.000
5,0	+0,25/-0,00	.197	+0.010/-0.000
6,0	+0,25/-0,00	.236	+0.010/-0.000
8,0	+0,15/-0,00	.315	+0.010/-0.000



● first choice
○ alternate choice

P	●	○	●	●	●
M	●	○	●	●	●
K	●	○	●	●	○
N	●	○	●	●	○
S	●	○	●	●	○
H	●	○	●	●	○

■ A2-N-CF

catalog number	seat size	W		α	RR		KMF	KCU25	KC5025	KT315
		mm	in		mm	in				
A2014N00CF01	1B	1,40	.055	—	0,15	.006	●	●	●	●
A2016N00CF00	1	1,55	.061	—	—	—	●	●	●	●
A2016N00CF01	1	1,60	.063	—	0,15	.006	●	●	●	●
A2022N00CF00	2	2,20	.087	—	—	—	●	●	●	●
A2022N00CF02	2	2,20	.087	—	0,20	.008	●	●	●	●
A2030N00CF02	3	3,00	.118	—	0,20	.008	●	●	●	●
A2030N00CF00	3	3,10	.122	—	—	—	●	●	●	●
A2040N00CF02	4	4,00	.157	—	0,20	.008	●	●	●	●
A2040N00CF00	4	4,05	.159	—	—	—	●	●	●	●
A2050N00CF03	5	5,00	.197	—	0,30	.012	●	●	●	●

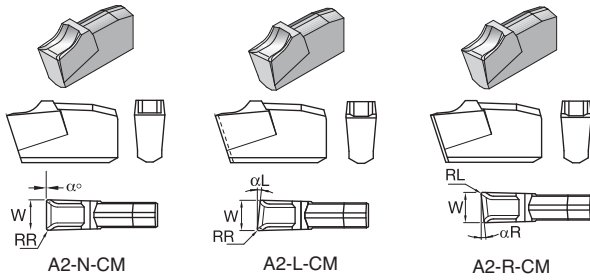
■ A2-L-CF

catalog number	seat size	W		αL	RR		KMF	KCU25	KC5025	KT315
		mm	in		mm	in				
left hand										
A2014L06CF01	1B	1,40	.055	6	0,15	.006	●	●	●	●
A2016L06CF00	1	1,60	.063	6	—	—	●	●	●	●
A2016L10CF00	1	1,60	.063	10	—	—	●	●	●	●
A2016L16CF00	1	1,60	.063	16	—	—	●	●	●	●
A2022L06CF02	2	2,20	.087	6	0,20	.008	●	●	●	●
A2022L10CF00	2	2,20	.087	10	—	—	●	●	●	●
A2022L16CF00	2	2,20	.087	16	—	—	●	●	●	●
A2030L06CF02	3	3,00	.118	6	0,20	.008	●	●	●	●
A2030L10CF00	3	3,00	.118	10	—	—	●	●	●	●
A2030L15CF00	3	3,00	.118	15	—	—	●	●	●	●
A2040L06CF02	4	4,00	.157	6	0,20	.008	●	●	●	●
A2050L06CF03	5	5,00	.197	6	0,30	.012	●	●	●	●

■ A2-R-CF

catalog number	seat size	W		αR	RL		KMF	KCU25	KC5025	KT315
		mm	in		mm	in				
right hand										
A2014R06CF01	1B	1,40	.055	6	0,15	.006	●	●	●	●
A2016R06CF00	1	1,60	.063	6	—	—	●	●	●	●
A2016R10CF00	1	1,60	.063	10	—	—	●	●	●	●
A2016R16CF00	1	1,60	.063	16	—	—	●	●	●	●
A2022R06CF02	2	2,20	.087	6	0,20	.008	●	●	●	●
A2022R10CF00	2	2,20	.087	10	—	—	●	●	●	●
A2022R16CF00	2	2,20	.087	16	—	—	●	●	●	●
A2030R06CF02	3	3,00	.118	6	0,20	.008	●	●	●	●
A2030R10CF00	3	3,00	.118	10	—	—	●	●	●	●
A2030R15CF00	3	3,00	.118	15	—	—	●	●	●	●
A2040R06CF02	4	4,00	.157	6	0,20	.008	●	●	●	●
A2050R06CF03	5	5,00	.197	6	0,30	.012	●	●	●	●

Grooving and Cut-Off



● first choice
○ alternate choice

P	●	○	●	●	●
M	●	○	●	●	●
K	●	○	●	●	○
N	●	●	●	●	●
S	●	●	●	●	●
H	●	●	●	●	●

Grooving and Cut-Off

■ A2-N-CM

catalog number	seat size	W			RR		KMF	KCUP25	KC5025	KT315
		mm	in	α	mm	in				
A2014N00CM01	1B	1,40	.055	—	0,15	.006	●	●	●	●
A2016N00CM01	1	1,60	.063	—	0,10	.004	●	●	●	●
A2022N00CM02	2	2,20	.087	—	0,20	.008	●	●	●	●
A2030N00CM02	3	3,00	.118	—	0,20	.008	●	●	●	●
A2040N00CM02	4	4,00	.157	—	0,20	.008	●	●	●	●
A2050N00CM03	5	5,00	.197	—	0,30	.012	●	●	●	●
A2060N00CM03	6	6,00	.236	—	0,30	.012	●	●	●	●
A2080N00CM04	8	8,00	.315	—	0,40	.016	●	●	●	●

■ A2-L-CM

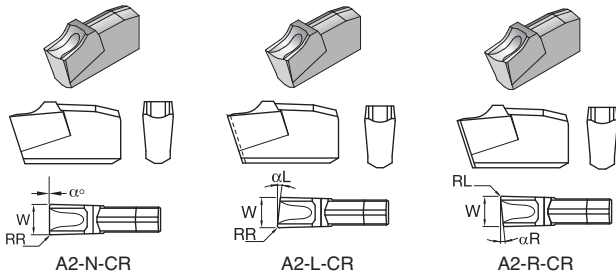
catalog number	seat size	W			RR		KMF	KCUP25	KC5025	KT315
		mm	in	α_L	mm	in				
left hand										
A2016L06CM00	1	1,60	.063	6	—	—	●	●	●	●
A2016L16CM00	1	1,60	.063	16	—	—	●	●	●	●
A2022L06CM00	2	2,20	.087	6	—	—	●	●	●	●
A2030L06CM01	3	3,00	.118	6	0,10	.004	●	●	●	●

■ A2-R-CM

catalog number	seat size	W			RL		KMF	KCUP25	KC5025	KT315
		mm	in	α_R	mm	in				
right hand										
A2016R06CM00	1	1,60	.063	6	—	—	●	●	●	●
A2016R16CM00	1	1,60	.063	16	—	—	●	●	●	●
A2022R06CM00	2	2,20	.087	6	—	—	●	●	●	●
A2030R06CM01	3	3,00	.118	6	0,10	.004	●	●	●	●

Tolerance on "W" Dimension

metric		inch	
width	tolerance	width	tolerance
1,4	+0,05/-0,05	.055	+.002/-0,002
1,6	+0,07/-0,07	.063	+.000/-0,004
2,2	+0,15/-0,00	.087	+.006/-0,000
3,0	+0,15/-0,00	.118	+.006/-0,000
4,0	+0,15/-0,00	.157	+.006/-0,000
5,0	+0,25/-0,00	.197	+.010/-0,000
6,0	+0,25/-0,00	.236	+.010/-0,000
8,0	+0,15/-0,00	.315	+.010/-0,000



● first choice
○ alternate choice

P	○	●	●	●
M	○	●	●	●
K	○	●	●	○
N	○	●	●	○
S	○	●	●	○
H	○	●	●	○

■ A2-N-CR

catalog number	seat size	W		α	RR		KMF	KCU25	KC5025	KT315
		mm	in		mm	in				
A2022N00CR02	2	2,20	.087	—	0,20	.008	●	●	●	●
A2030N00CR02	3	3,00	.118	—	0,20	.008	●	●	●	●
A2040N00CR02	4	4,00	.157	—	0,20	.008	●	●	●	●
A2050N00CR03	5	5,00	.197	—	0,30	.012	●	●	●	●
A2060N00CR03	6	6,00	.236	—	0,30	.012	●	●	●	●
A2080N00CR04	8	8,00	.315	—	0,40	.016	●	●	●	●

■ A2-L-CR

catalog number	seat size	W		α_L	RR		KMF	KCU25	KC5025	KT315
		mm	in		mm	in				
left hand										
A2022L06CR03	2	2,20	.087	6	0,30	.012	●	●	●	●
A2030L06CR03	3	3,00	.118	6	0,30	.012	●	●	●	●
A2040L06CR03	4	4,00	.157	6	0,30	.012	●	●	●	●
A2050L06CR04	5	5,00	.197	6	0,40	.016	●	●	●	●

■ A2-R-CR

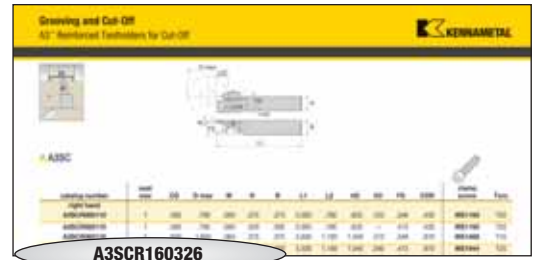
catalog number	seat size	W		α_R	RL		KMF	KCU25	KC5025	KT315
		mm	in		mm	in				
right hand										
A2022R06CR03	2	2,20	.087	6	0,30	.012	●	●	●	●
A2030R06CR03	3	3,00	.118	6	0,30	.012	●	●	●	●
A2040R06CR03	4	4,00	.157	6	0,30	.012	●	●	●	●
A2050R06CR04	5	5,00	.197	6	0,40	.016	●	●	●	●
A2060R06CR04	6	6,00	.236	6	0,40	.016	●	●	●	●

Tolerance on "W" Dimension

metric		inch	
width	tolerance	width	tolerance
1,4	+0,05/-0,05	.055	+.002/-0,002
1,6	+0,07/-0,07	.063	+.000/-0,004
2,2	+0,15/-0,00	.087	+.006/-0,000
3,0	+0,15/-0,00	.118	+.006/-0,000
4,0	+0,15/-0,00	.157	+.006/-0,000
5,0	+0,25/-0,00	.197	+.010/-0,000
6,0	+0,25/-0,00	.236	+.010/-0,000
8,0	+0,15/-0,00	.315	+.010/-0,000

How Do Catalog Numbers Work?

Each character in our catalog number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.



Grooving and Cut-Off

<h2 style="margin: 0;">A3</h2> <p style="margin: 0;">A3 Screw-Clamp Holder*</p>	<h2 style="margin: 0;">S</h2> <p style="margin: 0;">Tool Style</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>S = Straight</p> </div>	<h2 style="margin: 0;">C</h2> <p style="margin: 0;">Support Type</p>	<h2 style="margin: 0;">R</h2> <p style="margin: 0;">Hand of Tool</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>R = Right L = Left</p> </div>	<h2 style="margin: 0;">16</h2> <p style="margin: 0;">Shank Size</p>	<h2 style="margin: 0;">03</h2> <p style="margin: 0;">Seat Size</p> <table border="1" style="margin-top: 10px;"> <thead> <tr> <th style="text-align: left;">pocket seat size</th> <th style="text-align: left;">cutting width (mm)</th> </tr> </thead> <tbody> <tr><td>01</td><td>1,60</td></tr> <tr><td>02</td><td>2,20</td></tr> <tr><td>03</td><td>3,05</td></tr> <tr><td>04</td><td>4,05</td></tr> <tr><td>05</td><td>5,05</td></tr> <tr><td>06</td><td>6,05</td></tr> <tr><td>08</td><td>8,05</td></tr> </tbody> </table>	pocket seat size	cutting width (mm)	01	1,60	02	2,20	03	3,05	04	4,05	05	5,05	06	6,05	08	8,05	<h2 style="margin: 0;">26</h2> <p style="margin: 0;">Max Cutting Depth</p> <p style="margin-top: 10px;">in millimeters</p>
pocket seat size	cutting width (mm)																					
01	1,60																					
02	2,20																					
03	3,05																					
04	4,05																					
05	5,05																					
06	6,05																					
08	8,05																					
<p>*NOTE: A3™ screw-clamp O.D. holders are also designed to hold A2 inserts (see Technical Information, page D25)</p>	<p>S = Standard (straight clearance) M = Max support (straight clearance) C = Reinforced max support (circular clearance)</p>	<p>metric: Height x width in mm, letter indicates tool length according to ISO (see table in tool block identification system on next page)</p> <p>inch: For square shanks, the number indicates the height and width in 1/16" increments (rectangular: 2nd digit = height in 1/4" increments)</p>																				

How Do Catalog Numbers Work?

Each character in our catalog number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.

A2BNCR32J0221

Cut-Off • Blades

A2

A2
Cut-Off
Blade



BN = 2 pocket blade
BH = 1 pocket blade

BN

Tool
Style

C

Support
Style

S = Standard
C = Reinforced

R

Hand
of Tool

R = Right
L = Left
N = Neutral

32

Blade
Size

in (mm)
19/26/32/52

Letter designation according
to ISO (see table in tool block
identification system below)

G = 90mm
J = 110mm
M = 150mm
X = Special

J

Overall
Length

02

Seat
Size

1B = 1,40mm
01 = 1,60mm
02 = 2,20mm
03 = 3,05mm
04 = 4,05mm
05 = 5,05mm
06 = 6,05mm
08 = 8,05mm

21

Max
Cutting
Depth

in (mm)
(reinforced
blade only)

Grooving and Cut-Off

A2TEN2523N32

Cut-Off • Tool Blocks

A2

A2
Cut-Off



T

Tool
Block

E

Clamping
Style

E = Integral
clamp
Z = Removable
clamp

N

Hand
of Tool

R = Right
L = Left
N = Neutral

25

Shank
Height

in
millimeters

23

Shank
Width

in
millimeters

N

Tool Length
in (mm)

J = 110
X = Other
length

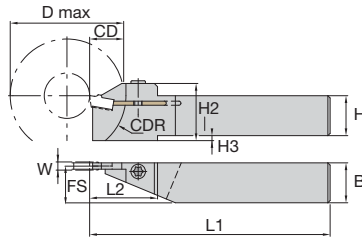
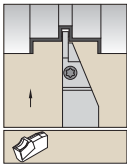
32

Blade
Size

in
millimeters

Grooving and Cut-Off

A3™ Reinforced Toolholders for Cut-Off



A3SC

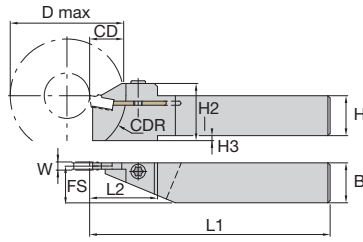
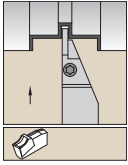
Grooving and Cut-Off



catalog number	seat size	CD	D max	W	H	B	L1	L2	H2	H3	FS	CDR	clamp screw	Torx
right hand														
A3SCR060110	1	.390	.790	.063	.375	.375	5.000	.790	.620	.125	.348	.430	MS1160	T20
A3SCR080110	1	.390	.790	.063	.500	.500	5.000	.790	.620	—	.473	.430	MS1160	T20
A3SCR060116	1	.630	1.650	.063	.375	.375	3.500	1.100	1.040	.412	.348	.870	MS1488	T15
A3SCR080116	1	.630	1.650	.063	.500	.500	3.500	1.180	1.040	.290	.473	.870	MS1944	T25
A3SCR100116	1	.630	1.650	.063	.625	.625	4.500	1.180	1.040	.160	.599	.870	MS1944	T25
A3SCR120116	1	.630	1.650	.063	.750	.750	4.500	1.180	1.040	—	.723	.870	MS1944	T25
A3SCR060210	2	.390	.790	.087	.375	.375	5.000	.790	.620	.125	.340	.430	MS1160	T20
A3SCR080210	2	.390	.790	.087	.500	.500	5.000	.790	.620	—	.465	.430	MS1160	T20
A3SCR080216	2	.630	1.650	.087	.500	.500	3.500	1.140	1.040	.290	.465	.870	MS1944	T25
A3SCR100216	2	.630	1.650	.087	.625	.625	4.500	1.180	1.040	.160	.590	.870	MS1944	T25
A3SCR120216	2	.630	1.650	.087	.750	.750	4.500	1.180	1.040	—	.715	.870	MS1944	T25
A3SCR060310	3	.390	.790	.118	.375	.375	5.000	.790	.600	.125	.328	.430	MS1160	T20
A3SCR080310	3	.390	.790	.118	.500	.500	5.000	.790	.600	—	.453	.430	MS1160	T20
A3SCR080316	3	.630	2.050	.118	.500	.500	3.500	1.140	1.040	.290	.453	1.060	MS1944	T25
A3SCR100316	3	.630	2.050	.118	.625	.625	4.500	1.180	1.040	.160	.578	1.060	MS1944	T25
A3SCR120316	3	.630	2.050	.118	.750	.750	4.500	1.180	1.040	—	.703	1.060	MS1944	T25
A3SCR120326	3	1.020	2.440	.118	.750	.750	4.500	1.670	1.040	—	.703	1.260	MS1595	T30
A3SCR160316	3	.630	2.440	.118	1.000	1.000	6.000	1.180	1.240	—	.953	1.260	MS1944	T25
A3SCR160326	3	1.020	2.440	.118	1.000	1.000	6.000	1.670	1.260	—	.953	1.260	MS1595	T30
A3SCR200332	3	1.260	2.440	.118	1.250	1.250	6.000	1.970	1.670	.160	1.203	1.260	MS1595	T30
A3SCR100416	4	.630	2.050	.158	.625	.625	4.500	1.180	1.040	.160	.558	1.060	MS1944	T25
A3SCR120416	4	.630	2.050	.158	.750	.750	4.500	1.180	1.040	—	.683	1.060	MS1944	T25
A3SCR120426	4	1.020	2.440	.158	.750	.750	4.500	1.670	1.040	—	.683	1.260	MS1595	T30
A3SCR160416	4	.630	2.440	.158	1.000	1.000	6.000	1.180	1.240	—	.933	1.260	MS1944	T25
A3SCR160426	4	1.020	2.440	.158	1.000	1.000	6.000	1.670	1.260	—	.933	1.260	MS1595	T30
A3SCR200432	4	1.260	2.440	.158	1.250	1.250	6.000	1.970	1.670	.160	1.183	1.260	MS1595	T30

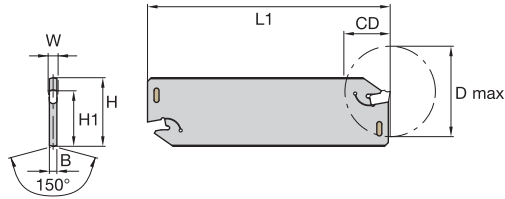
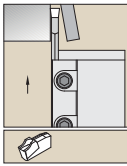
(continued)

(A3SC continued)



catalog number	seat size	CD	D max	W	H	B	L1	L2	H2	H3	FS	CDR	clamp screw	Torx
left hand														
A3SCL060110	1	.390	.790	.063	.375	.375	5.000	.790	.620	.125	.348	.430	MS1160	T20
A3SCL080110	1	.390	.790	.063	.500	.500	5.000	.790	.620	—	.473	.430	MS1160	T20
A3SCL060116	1	.630	1.650	.063	.375	.375	3.500	1.100	1.040	.412	.348	.870	MS1488	T15
A3SCL080116	1	.630	1.650	.063	.500	.500	3.500	1.180	1.040	.290	.473	.870	MS1944	T25
A3SCL100116	1	.630	1.650	.063	.625	.625	4.500	1.180	1.040	.160	.599	.870	MS1944	T25
A3SCL120116	1	.630	1.650	.063	.750	.750	4.500	1.180	1.040	—	.723	.870	MS1944	T25
A3SCL060210	2	.390	.790	.087	.375	.375	5.000	.790	.620	.125	.340	.430	MS1160	T20
A3SCL080210	2	.390	.790	.087	.500	.500	5.000	.790	.620	—	.465	.430	MS1160	T20
A3SCL080216	2	.630	1.650	.087	.500	.500	3.500	1.140	1.040	.290	.465	.870	MS1944	T25
A3SCL100216	2	.630	1.650	.087	.625	.625	4.500	1.180	1.040	.160	.590	.870	MS1944	T25
A3SCL120216	2	.630	1.650	.087	.750	.750	4.500	1.180	1.040	—	.715	.870	MS1944	T25
A3SCL060310	3	.390	.790	.118	.375	.375	5.000	.790	.600	.125	.328	.430	MS1160	T20
A3SCL080310	3	.390	.790	.118	.500	.500	5.000	.790	.600	—	.453	.430	MS1160	T20
A3SCL080316	3	.630	2.050	.118	.500	.500	3.500	1.140	1.040	.290	.453	1.060	MS1944	T25
A3SCL100316	3	.630	2.050	.118	.625	.625	4.500	1.180	1.040	.160	.578	1.060	MS1944	T25
A3SCL120316	3	.630	2.050	.118	.750	.750	4.500	1.180	1.040	—	.703	1.060	MS1944	T25
A3SCL120326	3	1.020	2.440	.118	.750	.750	4.500	1.670	1.040	—	.703	1.260	MS1595	T30
A3SCL160316	3	.630	2.440	.118	1.000	1.000	6.000	1.180	1.240	—	.953	1.260	MS1944	T25
A3SCL160326	3	1.020	2.440	.118	1.000	1.000	6.000	1.670	1.260	—	.953	1.260	MS1595	T30
A3SCL200332	3	1.260	2.440	.118	1.250	1.250	6.000	1.970	1.670	.160	1.203	1.260	MS1595	T30
A3SCL120426	4	1.020	2.440	.158	.750	.750	4.500	1.670	1.040	—	.683	1.260	MS1595	T30
A3SCL160416	4	.630	2.440	.158	1.000	1.000	6.000	1.180	1.240	—	.933	1.260	MS1944	T25
A3SCL160426	4	1.020	2.440	.158	1.000	1.000	6.000	1.670	1.260	—	.933	1.260	MS1595	T30
A3SCL200432	4	1.260	2.440	.158	1.250	1.250	6.000	1.970	1.670	.160	1.183	1.260	MS1595	T30

Grooving and Cut-Off



A2BNSN

Grooving and Cut-Off

catalog number	H	seat size	W	H1	L1	B	D max	CD	assembly wrench
A2BNSN19X1B13	.748	1B	.055	.608	3.396	.07	1.063	.53	170.137
A2BNSN26G1B15	1.024	1B	.055	.845	3.553	.07	1.181	.59	170.137
A2BNSN26J1B15	1.024	1B	.055	.845	4.341	.07	1.181	.59	170.137
A2BNSN32M1B15	1.260	1B	.055	.986	5.915	.09	1.181	.59	170.137
A2BNSN19X0116	.748	1	.063	.608	3.396	.07	1.181	.63	170.137
A2BNSN26J0117	1.024	1	.063	.844	4.341	.07	1.339	.67	170.137
A2BNSN32M0119	1.260	1	.063	.986	5.915	.09	1.496	.75	170.137
A2BNSN19X02	.748	2	.087	.608	3.396	.07	—	.79	170.137
A2BNSN26J02	1.024	2	.087	.845	4.339	.08	—	.98	170.137
A2BNSN26G02	1.024	2	.087	.845	3.551	.07	—	.98	170.137
A2BNSN26M02	1.024	2	.087	.845	5.913	.07	—	.98	170.137
A2BNSN32M02	1.260	2	.087	.986	5.913	.07	—	2.36	170.137
A2BNSN26J03	1.024	3	.118	.845	4.339	.09	—	1.57	170.137
A2BNSN26G03	1.024	3	.118	.845	3.551	.09	—	1.57	170.137
A2BNSN26M03	1.024	3	.118	.845	5.913	.09	—	1.57	170.137
A2BNSN32H03	1.260	3	.118	.986	4.339	.09	—	1.97	170.137
A2BNSN32M03	1.260	3	.118	.986	5.915	.09	—	1.97	170.137
A2BNSN26J04	1.024	4	.158	.844	4.341	.13	—	1.57	170.137
A2BNSN32M04	1.260	4	.158	.986	5.915	.13	—	1.97	170.137
A2BNSN26J05	1.024	5	.197	.843	4.331	.17	—	1.57	170.130
A2BNSN32M05	1.260	5	.197	.984	5.906	.17	—	2.36	170.130
A2BNSN26J06	1.024	6	.236	.843	4.331	.21	—	1.57	170.130
A2BNSN32M06	1.260	6	.236	.984	5.906	.21	—	2.36	170.130
A2BNSN52X08	2.047	8	.315	1.780	10.236	.28	—	4.72	170.132

NOTE: Assembly wrench 170.137 and 170.130 must be ordered separately.

170.130 is designed for the larger cutting widths size 4-6. It has two small pins on one side — these are designed to remove the insert only.

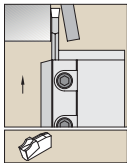
On the opposite side, there is a large pin and a rotating tang — these are designed to assemble the insert into the pocket.

The large pin and tang are a better design for assembling the larger inserts because the smaller insertion pins will bend or break if used repeatedly for assembly.

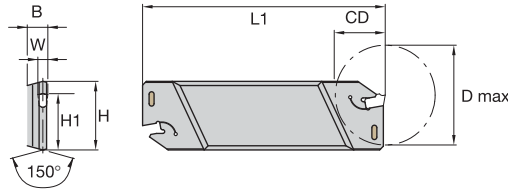
170.137 is designed for the smaller widths below 4mm. It has only the two small pins that are used for both assembly and removal.

When using the smallest 1,4mm and 1,6mm cut-off blades, please note that the wrench can only be used to remove the insert.

The insert must be installed by tapping the edge of the insert with a plastic hammer.



Reinforced Blades



■ A2BNC



catalog number	H	seat size	W	H1	L1	B	D max	CD	assembly wrench
right hand									
A2BNCR26J0221	1.023	2	.087	.844	4.341	.31	1.654	.83	170.137
A2BNCR32J0221	1.259	2	.087	.986	4.341	.31	1.654	.83	170.137
A2BNCR26J0321	1.022	3	.118	.844	4.341	.31	1.654	.83	170.137
A2BNCR32J0321	1.259	3	.118	.986	4.341	.31	1.654	.83	170.137
A2BNCR26J0421	1.022	4	.158	.844	4.341	.31	1.654	.83	170.130
left hand									
A2BNCL26J0221	1.020	2	.087	.844	4.341	.31	1.654	.83	170.137
A2BNCL32J0221	1.260	2	.087	.986	4.341	.31	1.654	.83	170.137
A2BNCL26J0321	1.020	3	.118	.844	4.341	.31	1.654	.83	170.137
A2BNCL32J0321	1.260	3	.118	.986	4.341	.31	1.654	.83	170.137
A2BNCL26J0421	1.020	4	.158	.844	4.341	.31	1.654	.83	170.130

Grooving and Cut-Off

NOTE: Assembly wrench 170.137 and 170.130 must be ordered separately.

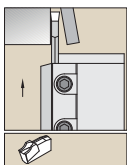
170.130 is designed for the larger cutting widths size 4–6. It has two small pins on one side — these are designed to remove the insert only. On the opposite side, there is a large pin and a rotating tang — these are designed to assemble the insert into the pocket.

The large pin and tang are a better design for assembling the larger inserts because the smaller insertion pins will bend or break if used repeatedly for assembly.

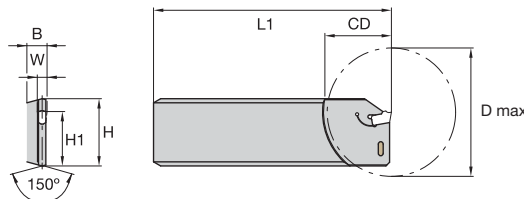
170.137 is designed for the smaller widths below 4mm. It has only the two small pins that are used for both assembly and removal.

When using the smallest 1,4mm and 1,6mm cut-off blades, please note that the wrench can only be used to remove the insert.

The insert must be installed by tapping the edge of the insert with a plastic hammer.



Reinforced Blades



■ A2BHC



catalog number	H	seat size	W	H1	L1	B	D max	CD	assembly wrench
right hand									
A2BHCR32K0333	1.260	3	.118	.986	4.931	.31	2.598	1.30	170.137
A2BHCR32K0433	1.260	4	.158	.986	4.931	.31	2.598	1.30	170.137
left hand									
A2BHCL32K0333	1.260	3	.118	.986	4.931	.31	2.598	1.30	170.137
A2BHCL32K0433	1.260	4	.158	.986	4.931	.31	2.598	1.30	170.137

NOTE: Assembly wrench 170.137 and 170.130 must be ordered separately.

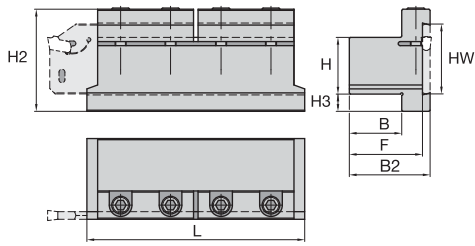
170.130 is designed for the larger cutting widths size 4–6. It has two small pins on one side — these are designed to remove the insert only. On the opposite side, there is a large pin and a rotating tang — these are designed to assemble the insert into the pocket.

The large pin and tang are a better design for assembling the larger inserts because the smaller insertion pins will bend or break if used repeatedly for assembly.

170.137 is designed for the smaller widths below 4mm. It has only the two small pins that are used for both assembly and removal.

When using the smallest 1,4mm and 1,6mm cut-off blades, please note that the wrench can only be used to remove the insert.

The insert must be installed by tapping the edge of the insert with a plastic hammer.

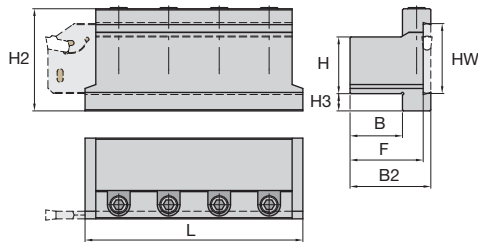


■ A2TE • Integral Clamp



Grooving and Cut-Off

catalog number	HW	H	B	F	H2	B2	H3	L	clamp screw	hex
left hand										
A2TEN1019	.748	.625	.625	.945	1.18	1.02	.16	2.95	125.525	4 mm
A2TEN1226	1.024	.750	.750	1.161	1.57	1.34	.32	3.39	125.625	5 mm
A2TEN1232	1.260	.750	.750	1.163	1.89	1.38	.55	4.33	125.630	5 mm
A2TEN1632	1.260	1.000	1.000	1.417	1.89	1.63	.30	4.33	125.630	5 mm
A2TEN2032	1.260	1.250	1.250	1.673	1.97	1.89	.13	4.33	125.630	5 mm
A2TEN2432	1.260	1.500	1.500	1.913	2.25	2.13	.16	4.33	125.630	5 mm
A2TEN2452	2.067	1.500	1.500	2.008	3.15	2.32	.83	5.32	125.835	6 mm



■ A2TZ • Removable Clamp



catalog number	HW	H	B	F	H2	B2	H3	L	clamp	clamp screw	hex
left hand											
A2TZN1226	1.024	.750	.750	1.201	1.63	1.38	.32	3.39	168.682	125.616	5 mm
A2TZN1626	1.024	1.000	1.000	1.457	1.88	1.63	.32	3.39	168.682	125.616	5 mm
A2TZN2026	1.024	1.250	1.250	1.713	1.93	1.89	.12	3.39	168.682	125.616	5 mm
A2TZN1632	1.260	1.000	1.000	1.417	1.87	1.63	.30	4.33	168.936	125.616	5 mm
A2TZN2032	1.260	1.250	1.250	1.673	1.95	1.89	.13	4.33	168.936	125.616	5 mm

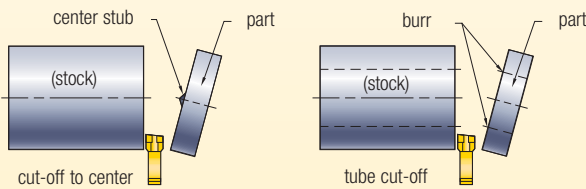
Definitions and Guidelines

1. Width of cut (W) = width of the insert.
2. Lead angle = 0° (neutral); 4°, 5°, 12°, 18° (RH or LH).

Reduce burr of cut-off faces:

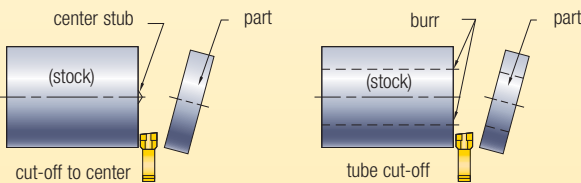
- Use lead angle-type inserts (Figures 1 and 2). Lead angle on a cut-off insert reduces the burr that remains on the part but decreases tool life and increases tool-side deflection and possibly cycle time.

Figure 1
Insert selection **left-hand lead**



Left-hand lead insert leaves center stub or burr on part and produces clean stock surface.

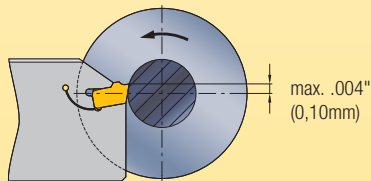
Figure 2
Insert selection **right-hand lead**



Right-hand lead insert leaves center stub or burr on stock and produces clean part surface.

- Check total height and maintain on center with part diameter.
- The cutting edge height should be within $\pm .004"$ ($\pm 0,1\text{mm}$) to the center; recommended cutting position is $.002"$ ($0,05\text{mm}$) above center.

Figure 3
Above center



- If 0° lead angle is mandatory, use the narrowest possible cut-off insert and blade. This will minimize the center stub or cut-off burr length. Decrease the feed rate to maximum $.002"$ ($0,05\text{mm}$) or less at the point where diameter equals insert width.

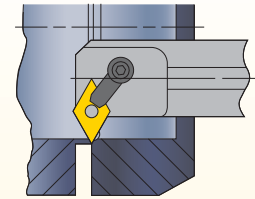


Figure 4
Internal chamfer line up

- On tubing-type parts that require a chamfer on the ID, align ID chamfer tool with cut-off surface. This will enable the chamfering operation to actually separate the part from the bar (see Figure 4). Note the part may drop onto the chamfering bar, which, in this case, will act like a catcher for the part.

Improve surface finish of cut-off faces:

- Use insert with 0° lead angle.
- Increase coolant flow or improve application technique, as shown in Figure 5.
- Decrease the feed rate near the break-through point of the cut.
- Check that the grooving tool is set at the correct angle.
- Use blades with the greatest possible face height and smallest possible cutting width.
- Increase the speed.

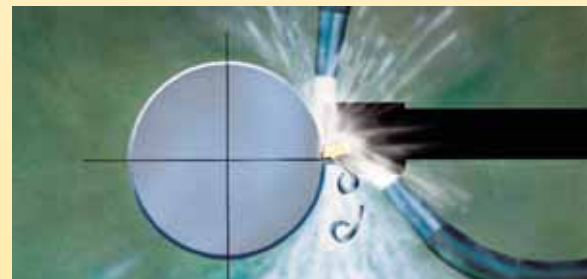


Figure 5
Preferred method for applying coolant

- Mount cut-off tool upside down. This enables gravity to remove chips and avoid cutting the chips twice. Another benefit of mounting the tool upside down is preventing chips from wedging between the tool insert and the groove side walls, which galls the side wall surfaces.



A3™ Deep Grooving Is the Best Choice for High Productivity — with Outstanding Application Flexibility!

Primary Application

The A3 System is designed specifically for deep grooving operations. The A3 platform enables customers to reach deeper depths while maintaining chip control and tool rigidity.

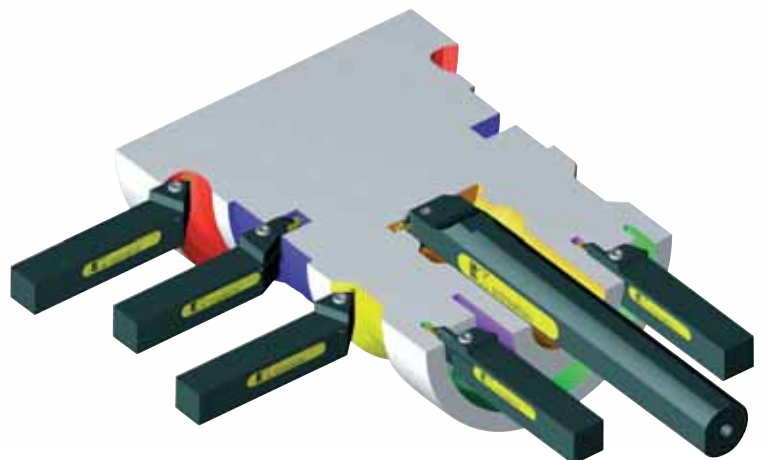
Features and Benefits

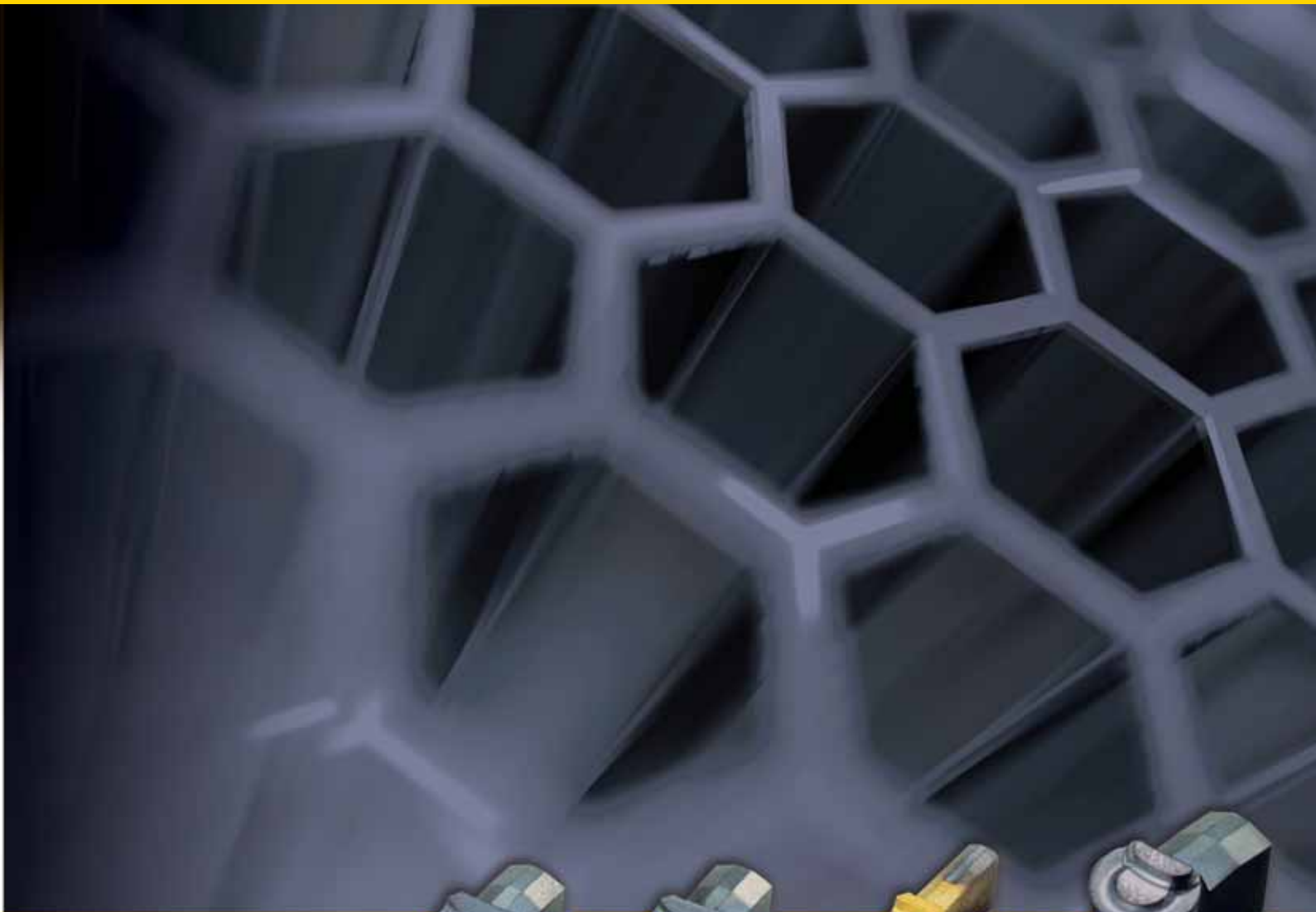
Performance

- One insert performs:
 - O.D. operations
 - I.D. operations
 - Face grooving operations
- In addition, the A3 system's performance is enhanced by:
 - Beyond™ CVD grades
 - The Beyond Tooling Selection System

Compatibility

- A3 deep grooving tooling is compatible with square shank, KM™, and Kennametal Capto® platforms.





Step 1 • Select system based on the groove depth required

What you need to know:

- Groove depth, width, and profile.
- Material to be machined.
- Application to be performed (face, O.D., or I.D. grooving).
- Toolholder requirements (e.g., KM™, square shank, right/left).

Top Notch™



Grooving

For grooving depth $\leq 1.5x$ grooving width, see Top Notch grooving, page D122.

A3™ or A4™



Deep Grooving

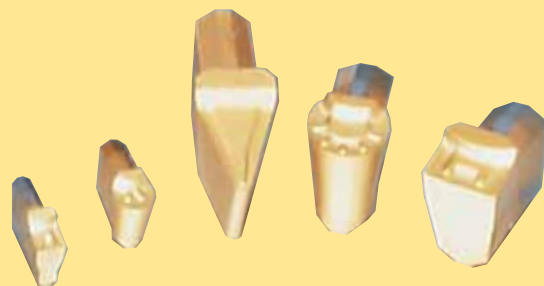
For grooving depth $\geq 1.5x$ grooving width, proceed to Step 2 for the A3 Deep Grooving program or see A4 Grooving and Turning program on page D70.

A3 Deep Grooving for Deep Internal, External, and Face Grooving Applications

System Capabilities

groove	min	max
width	.087" (2,25mm)	.397" (10,05mm)
depth	—	1.260" (32mm)

Face grooving diameter range .984" (25mm) to ∞



Step 2 • Select toolholder based on the application

NOTE: Toolholders are available as conventional square shank versions as well as quick-change versions. Please select equal seat sizes for the insert and the toolholder.

- I.D. grooving applicationssee page D44
- Face grooving with integral square shank toolholderssee page D38
- O.D. grooving with integral square shank toolholderssee page D34
- Face and O.D. grooving with modular toolholderssee pages D46–D60

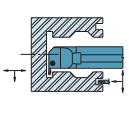
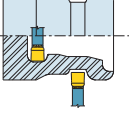
Step 3 • Select chipbreaker style and feed rate

DF — Deep Finishing	DM — Deep Medium	DR — Deep Roughing

(continued)

(continued)

Chipbreaker and Feed Rates • in/rev (mm/rev)

workpiece material and application	P	M	K	N	S	H
 deep O.D. grooving	DM .002-.010 (0,05-0,25)	DF .002-.006 (0,05-0,15)	DM .002-.009 (0,05-0,23)	DF .002-.010 (0,05-0,25)	DF .002-.005 (0,05-0,13)	CBN tip on request .002-.004 (0,05-0,10)
	DF .002-.007 (0,05-0,18)	—	—	—	—	—
 face and I.D. grooving	DF .002-.006 (0,05-0,15)	DF .002-.005 (0,05-0,13)	DM .002-.007 (0,05-0,18)	DF .002-.007 (0,05-0,18)	DF .0015-.004 (0,04-0,10)	CBN tip on request .002-.004 (0,05-0,10)
	—	—	DF .002-.006 (0,05-0,15)	—	—	—
 profiling*	DR .004-.015 (0,10-0,40)	DF .002-.010 (0,05-0,25)	DR .004-.015 (0,10-0,40)	DF .002-.010 (0,05-0,25)	DF .002-.010 (0,05-0,25)	CBN tip on request .002-.004 (0,05-0,10)
	DF .002-.010 (0,05-0,25)	—	—	—	—	—

*For profiling, the maximum recommended depth of cut is 1/3 the insert width.
 NOTE: Use minimum feed rates for narrower grooves and heavier feed rates for wider grooves. Increase feed rate as operation allows.

Step 4 • Select grade and speed

Recommendations for Grade and Speed Selection • SFM (m/min)

machining condition	workpiece material					
	P	M	K	N	S	H
high-performance for optimal conditions (clean cuts, good machine condition, higher speed capability)	KT315 100-230 (330-750)	KT315 70-170 (230-560)	KCU10/KC5010 70-220 (230-720)	KCU10/KC5010 180-850 (590-2800)	KCU10/KC5010 10-110 (35-360)	KB5625* 120-150 (390-500)
	KC9110 110-220 (360-720)	—	—	—	—	—
general purpose (first choice for general machining)	KCU10/KC5010 60-160 (200-525)	KCU10/KC5010 50-140 (160-450)	KCU25/KC5025 70-150 (230-500)	KCU10/KC5010 150-730 (500-2400)	KCU25/KC5025 10-60 (35-200)	KB5625* 80-130 (260-425)
unfavorable conditions (roughing, poor machine condition, interrupted cuts, low speed)	KCU25/KC5025 50-110 (160-360)	KCU25/KC5025 40-90 (130-300)	KCU25/KC5025 25-140 (80-450)	KCU25/KC5025 60-305 (200-1000)	KCU25/KC5025 10-46 (35-150)	KCU10/KC5010 10-35 (35-115)
	—	—	—	KMF 60-200 (200-650)	KMF 10-30 (35-100)	—

*NOTE: PCBN-tipped inserts in KB5625 are available on request.

Step 5 • Select insert and holder from catalog page

NOTE: The insert seat size and cutting width must match the seat size and cutting width of your toolholder selection.

Example for A3 • Deep Grooving

Material.....low-alloyed steel
 Groove depth5" (12mm)
 Groove width250" (6,35mm)
 Smooth cut

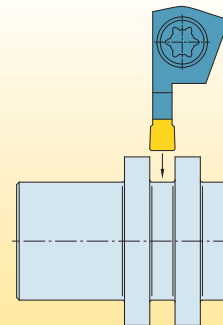
Recommendation

InsertA3G250I06P1DF
 GradeKC5010
 Insert width250" (6,35mm)
 Insert seat size6

Toolholder.....A3SML2525M0616
 Grooving depth..... .630" (16mm)
 Seat size2

Congratulations!

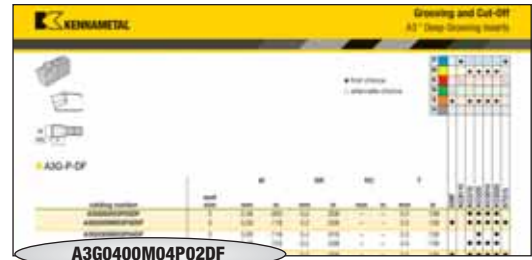
You have successfully maximized your productivity by selecting the best A3 insert geometry, grade, and cutting specifications for your application!



Speed: 570 SFM (180 m/min)
 Feed: .008 in/rev (0,15 mm/rev)

How Do Catalog Numbers Work?

Each character in our catalog number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.



A3G0400M04P02DF

Grooving and Cut-Off

A3

Type of Program

A3 = Deep Grooving

G

Insert Style

G = Square
R = Full radius
V = V-style 35°

0400

Groove Width

Expressed in .001" or 1/100mm
0000 for V shape

M

Units

I = inch
M = metric

04

Insert Size

03
(*)3S
04
(*)4S
05
06
08
10

P

Insert Tolerance

P = Precision ground
grooving width tolerance:
±.001" (0,025mm)

U = Utility molded
grooving width tolerance:
3,05-4,05: $\frac{+.006''}{-0}$ $\frac{(+0,15\text{mm})}{-0}$
5,05-10,05: $\frac{+.010''}{-0}$ $\frac{(+0,25\text{mm})}{-0}$

02

Corner Radii

inch	metric
0	01
05 = .008	02
1 = .016	04
2 = .032	08
3 = .047	12
4 = .062	16

full radius = 00

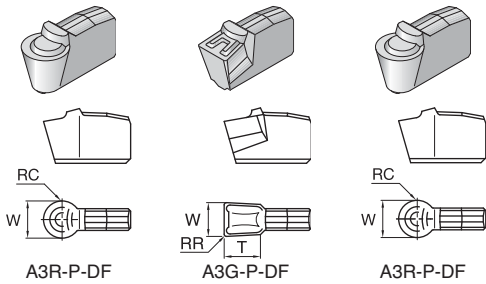
DF

Chipbreaker

DF = Deep Finishing
DM = Deep Medium
DR = Deep Roughing

(*) 3S/4S designates a small size insert for face grooving of small diameters.





● first choice
○ alternate choice

P	●	○	○	○	○	○	○	○	○
M	●	○	○	○	○	○	○	○	○
K	○	○	○	○	○	○	○	○	○
N	○	○	○	○	○	○	○	○	○
S	○	○	○	○	○	○	○	○	○
H	○	○	○	○	○	○	○	○	○

■ A3R-P-DF

Grooving and Cut-Off

catalog number	seat size	W		RR		RC		T		KMF	KC9110	KCU10	KCU25	KC5010	KC5025	KT315
		mm	in	mm	in	mm	in	mm	in							
A3R093I03P00DF	3	2,36	.093	—	—	1,2	.047	—	—			●	●	●	●	●
A3R0300M03P00DF	3	3,00	.118	—	—	1,5	.059	—	—	●		●	●	●	●	●
A3R125I03P00DF	3	3,18	.125	—	—	1,6	.063	—	—			●	●	●	●	●
A3R125I04P00DF	4	3,18	.125	—	—	1,6	.063	—	—	●		●	●	●	●	●
A3R0400M04P00DF	4	4,00	.157	—	—	2,0	.079	—	—	●		●	●	●	●	●
A3R187I05P00DF	5	4,75	.187	—	—	2,4	.094	—	—			●	●	●	●	●
A3R0500M05P00DF	5	5,00	.197	—	—	2,5	.098	—	—			●	●	●	●	●
A3R218I06P00DF	6	5,54	.218	—	—	2,8	.109	—	—			●	●	●	●	●
A3R0600M06P00DF	6	6,00	.236	—	—	3,0	.118	—	—	●		●	●	●	●	●
A3R250I06P00DF	6	6,35	.250	—	—	3,2	.125	—	—			●	●	●	●	●
A3R250I08P00DF	8	6,35	.250	—	—	3,2	.125	—	—			●	●	●	●	●
A3R312I08P00DF	8	7,93	.312	—	—	4,0	.156	—	—	●		●	●	●	●	●
A3R0800M08P00DF	8	8,00	.315	—	—	4,0	.157	—	—			●	●	●	●	●

■ A3G-P-DF • Face Grooving

catalog number	seat size	W		RR		RC		T		KMF	KC9110	KCU10	KCU25	KC5010	KC5025	KT315
		mm	in	mm	in	mm	in	mm	in							
A3G0300M3SP02DF	3S	3,00	.118	0,2	.008	—	—	3,5	.138			●	●	●	●	●
A3G0300M3SP04DF	3S	3,00	.118	0,4	.016	—	—	3,5	.138			●	●	●	●	●
A3G125I3SP05DF	3S	3,18	.125	0,2	.008	—	—	3,5	.138			●	●	●	●	●
A3G0400M4SP04DF	4S	4,00	.157	0,4	.016	—	—	3,5	.138			●	●	●	●	●
A3G0400M4SP02DF	4S	4,00	.158	0,2	.008	—	—	3,5	.138			●	●	●	●	●
A3G0400M4SP08DF	4S	4,00	.158	0,8	.032	—	—	3,5	.138			●	●	●	●	●

NOTE: Face grooving for small diameter 25–60mm (.98–2.36").

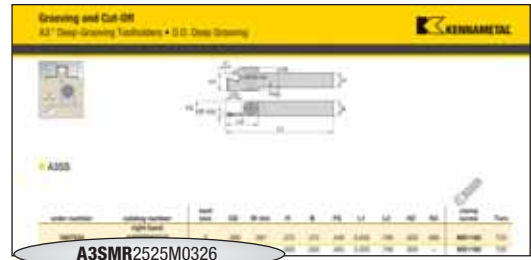
■ A3R-P-DF • Face Grooving

catalog number	seat size	W		RR		RC		T		KMF	KC9110	KCU10	KCU25	KC5010	KC5025	KT315
		mm	in	mm	in	mm	in	mm	in							
A3R0300M3SP00DF	3S	3,00	.118	—	—	1,5	.059	—	—			●	●	●	●	●
A3R0400M4SP00DF	4S	4,00	.157	—	—	2,0	.079	—	—			●	●	●	●	●




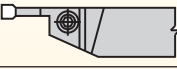
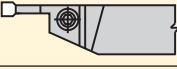
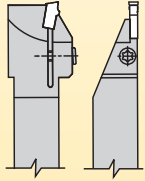

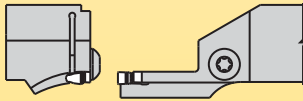


NOTE: Face grooving for small diameter 25–60mm (.98–2.36").

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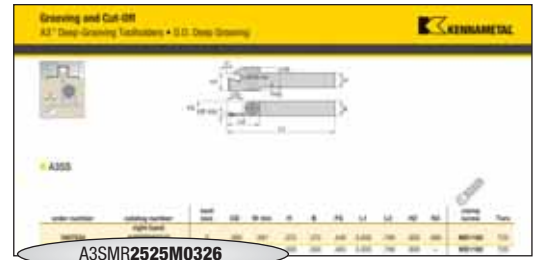


Grooving and Cut-Off

Metric				
A3	S	M	R	
A3	S	S	R	
Type of Program	Tool Style	Support Type	Hand of Tool	
<p>A3 = Screw Clamp Holder</p>	<p>S = Straight</p>  <hr/> <p>D = 45° profiling</p>  <hr/> <p>P = 117.5° V-profiling U = 93° V-profiling</p> 	<p>S = Standard support for a range of groove widths and straight clearance for unlimited workpiece diameters</p>  <hr/> <p>M = Maximum support for specific groove widths and straight clearance for unlimited workpiece diameters</p>  <hr/> <p>C = Reinforced maximum support width circular clearance</p>  <hr/> <p>A = Inboard sweep face grooving toolholder</p>  <hr/> <p>B = Outboard sweep face grooving toolholder</p> 	<p>R = Right</p>  <p>L = Left</p>  <p>N = Neutral</p>	

NOTE: A2™ inserts can be used in A3 toolholders with equal seat sizes.

By referencing this easy-to-use guide, you can identify the correct product to meet your needs.



A3SMR2525M0326

A3SSR160326

Metric

2525M

03

26

Inch

16

03

26

Shank Size

Seat Size

Max Cutting Depth

Face Grooving Diameter (optional)

metric:

Height x width in mm, letter indicates tool length according to ISO

inch:

For square shanks, the number indicates the height and width in 1/16" increments (rectangular: 1st digit = width in 1/8" increments, 2nd digit = height in 1/4" increments)

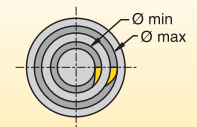
metric tool length (mm)

J = 110 K = 125 X = Other length
 M = 150
 P = 170

pocket seat size	nominal cutting width (mm)
03/3S	3,05
04/4S	4,05
05	5,05
06	6,05
08	8,05
10	10,05



Ø min – Ø max



Screw-Clamping Holder Options

Both A2™ and A3 inserts are designed to fit all A3-style holders.



Example:
A3SCR -1603-26

circular clearance

C-style reinforced maximum support toolholder with circular clearance:

- Provides maximum support for cut-off operations.
- For cut-off to center or small through-hole applications.
- Ideal for A3 deep grooving operations as well.



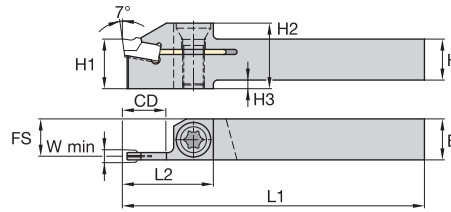
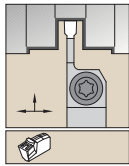
Example:
A3SSR-1605-26

straight clearance

S-style standard support toolholder with straight clearance:

- Provides maximum flexibility.
- Unlimited diameter capability for cut-off to through-hole applications.
- Narrower support blade width allows full insert width flexibility for A3 deep grooving operations.
- Straight clearance is also available in selected M-style maximum support integral shank and modular toolholders.

Grooving and Cut-Off



■ A3SS

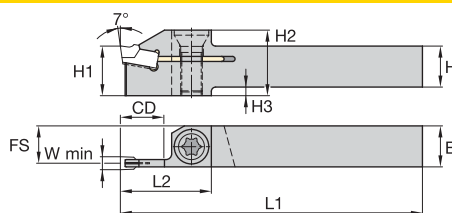
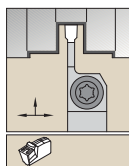
Grooving and Cut-Off



order number	catalog number	seat size	CD	W min	H	B	FS	L1	L2	H1	H2	H3	clamp screw	Torx
	right hand													
1607524	A3SSR060310	3	.390	.087	.375	.375	.340	3.500	.790	.375	.600	.080	MS1160	T20
1607526	A3SSR080310	3	.390	.087	.500	.500	.465	3.500	.790	.500	.600	—	MS1160	T20
1607620	A3SSR080316	3	.630	.087	.500	.500	.465	3.500	1.100	.500	1.040	.320	MS1944	T25
1607802	A3SSR100316	3	.630	.087	.625	.625	.590	4.500	1.100	.625	1.040	.160	MS1944	T25
1607804	A3SSR120316	3	.630	.087	.750	.750	.715	4.500	1.180	.750	1.040	—	MS1944	T25
1607806	A3SSR160316	3	.630	.087	1.000	1.000	.965	6.000	1.180	1.000	1.240	—	MS1944	T25
1607808	A3SSR160326	3	1.020	.087	1.000	1.000	.965	6.000	1.650	1.000	1.240	—	MS1944	T25
1246600	A3SSR080410	4	.390	.118	.500	.500	.453	3.500	1.100	.500	1.040	.287	MS1944	T25
1246606	A3SSR100413	4	.510	.118	.625	.625	.578	4.500	1.100	.625	1.080	.162	MS1944	T25
1246611	A3SSR100419	4	.750	.118	.625	.625	.578	4.500	1.650	.625	1.040	.162	MS1595	T30
1246616	A3SSR120413	4	.510	.118	.750	.750	.703	4.500	1.140	.750	1.040	—	MS1944	T25
1246618	A3SSR120419	4	.750	.118	.750	.750	.703	4.500	1.650	.750	1.040	—	MS1595	T30
1246620	A3SSR160416	4	.630	.118	1.000	1.000	.953	6.000	1.650	1.000	1.240	—	MS1595	T30
1246625	A3SSR160426	4	1.020	.118	1.000	1.000	.953	6.000	1.650	1.000	1.240	—	MS1595	T30
1246629	A3SSR200426	4	1.020	.118	1.250	1.250	1.203	6.000	1.650	1.250	1.500	—	MS1595	T30
1246637	A3SSR200432	4	1.260	.118	1.250	1.250	1.203	6.000	1.970	1.250	1.500	—	MS1595	T30
1246643	A3SSR120513	5	.510	.157	.750	.750	.683	6.000	1.260	.750	1.040	—	MS1595	T30
1246649	A3SSR120519	5	.750	.157	.750	.750	.683	6.000	1.650	.750	1.040	—	MS1595	T30
1246655	A3SSR160516	5	.630	.157	1.000	1.000	.933	6.000	1.260	1.000	1.240	—	MS1595	T30
1246660	A3SSR160526	5	1.020	.157	1.000	1.000	.933	6.000	1.650	1.000	1.240	—	MS1595	T30
1246665	A3SSR200526	5	1.020	.157	1.250	1.250	1.183	6.000	1.650	1.250	1.530	—	MS1595	T30
1192244	A3SSR200532	5	1.260	.157	1.250	1.250	1.183	6.000	2.100	1.250	1.520	—	MS1595	T30
1607810	A3SSR120616	6	.630	.197	.750	.750	.663	4.500	1.280	.750	1.040	—	MS1595	T30
1607812	A3SSR160616	6	.630	.197	1.000	1.000	.913	6.000	1.260	1.000	1.240	—	MS1595	T30
1607814	A3SSR160626	6	1.020	.197	1.000	1.000	.913	6.000	1.650	1.000	1.240	—	MS1595	T30
1607816	A3SSR200626	6	1.020	.197	1.250	1.250	1.163	6.000	1.650	1.250	1.530	—	MS1595	T30
1607818	A3SSR200632	6	1.260	.197	1.250	1.250	1.163	6.000	2.100	1.250	1.530	—	MS1595	T30
1192243	A3SSR160819	8	.750	.236	1.000	1.000	.894	6.000	1.970	1.000	1.300	—	MS1875	T45
1246677	A3SSR160826	8	1.020	.236	1.000	1.000	.894	6.000	1.970	1.000	1.300	—	MS1875	T45
1246680	A3SSR200826	8	1.020	.236	1.250	1.250	1.144	6.000	2.090	1.250	1.560	—	MS1875	T45
1192245	A3SSR200832	8	1.260	.236	1.250	1.250	1.144	6.000	2.090	1.250	1.560	—	MS1875	T45
1775740	A3SSR201032	10	1.260	.375	1.250	1.250	1.085	6.000	2.090	1.250	1.560	—	MS1875	T45

(continued)

(A3SS continued)



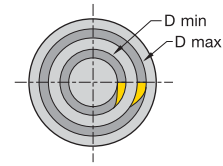
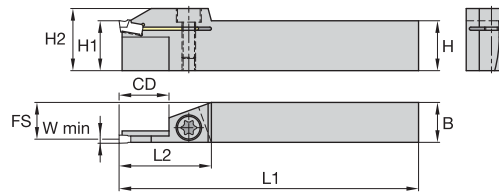
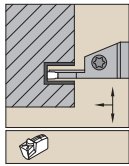
order number	catalog number	seat size	CD	W min	H	B	FS	L1	L2	H1	H2	H3	clamp screw	Torx
	left hand													
1607527	A3SSL080310	3	.390	.087	.500	.500	.465	3.500	.790	.500	.600	—	MS1160	T20
1607801	A3SSL080316	3	.630	.087	.500	.500	.465	3.500	1.100	.500	1.040	.320	MS1944	T25
1607803	A3SSL100316	3	.630	.087	.625	.625	.590	4.500	1.100	.625	1.040	.160	MS1944	T25
1607805	A3SSL120316	3	.630	.087	.750	.750	.715	4.500	1.180	.750	1.040	—	MS1944	T25
1607807	A3SSL160316	3	.630	.087	1.000	1.000	.965	6.000	1.180	1.000	1.240	—	MS1944	T25
1607809	A3SSL160326	3	1.020	.087	1.000	1.000	.965	6.000	1.650	1.000	1.240	—	MS1944	T25
1246617	A3SSL120413	4	.510	.118	.750	.750	.703	4.500	1.140	.750	1.040	—	MS1944	T25
1246619	A3SSL120419	4	.750	.118	.750	.750	.703	4.500	1.650	.750	1.040	—	MS1595	T30
1246623	A3SSL160416	4	.630	.118	1.000	1.000	.953	6.000	1.650	1.000	1.240	—	MS1595	T30
1246627	A3SSL160426	4	1.020	.118	1.000	1.000	.953	6.000	1.650	1.000	1.240	—	MS1595	T30
1246632	A3SSL200426	4	1.020	.118	1.250	1.250	1.203	6.000	1.650	1.250	1.500	—	MS1595	T30
1246640	A3SSL200432	4	1.260	.118	1.250	1.250	1.203	6.000	1.970	1.250	1.500	—	MS1595	T30
1246659	A3SSL160516	5	.630	.157	1.000	1.000	.933	6.000	1.260	1.000	1.240	—	MS1595	T30
1246662	A3SSL160526	5	1.020	.157	1.000	1.000	.933	6.000	1.650	1.000	1.240	—	MS1595	T30
1246667	A3SSL200526	5	1.020	.157	1.250	1.250	1.183	6.000	1.650	1.250	1.530	—	MS1595	T30
1246671	A3SSL200532	5	1.260	.157	1.250	1.250	1.183	6.000	2.100	1.250	1.520	—	MS1595	T30
1607811	A3SSL120616	6	.630	.197	.750	.750	.663	4.500	1.280	.750	1.040	—	MS1595	T30
1607813	A3SSL160616	6	.630	.197	1.000	1.000	.913	6.000	1.260	1.000	1.240	—	MS1595	T30
1607815	A3SSL160626	6	1.020	.197	1.000	1.000	.913	6.000	1.650	1.000	1.240	—	MS1595	T30
1607817	A3SSL200626	6	1.020	.197	1.250	1.250	1.163	6.000	1.650	1.250	1.530	—	MS1595	T30
1607819	A3SSL200632	6	1.260	.197	1.250	1.250	1.163	6.000	2.100	1.250	1.530	—	MS1595	T30
1246674	A3SSL160819	8	.750	.236	1.000	1.000	.894	6.000	1.970	1.000	1.300	—	MS1875	T45
1229300	A3SSL160826	8	1.020	.236	1.000	1.000	.894	6.000	1.970	1.000	1.300	—	MS1875	T45
1246681	A3SSL200826	8	1.020	.236	1.250	1.250	1.144	6.000	2.090	1.250	1.560	—	MS1875	T45
1246686	A3SSL200832	8	1.260	.236	1.250	1.250	1.144	6.000	2.090	1.250	1.560	—	MS1875	T45

NOTE: Seat size 4 inserts can be used in seat size 3 and 4 toolholders, within cutting width range.
 Seat size 6 inserts can be used in seat size 5 and 6 toolholders, within cutting width range.
 Seat size 8 inserts can be used in seat size 8 and 10 toolholders, within cutting width range.
 Use the larger seat size toolholder for optimal performance.

Grooving and Cut-Off

Grooving and Cut-Off

A3™ Deep-Grooving Toolholders • Face Grooving



A3SA

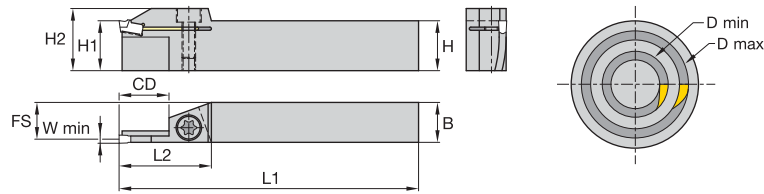
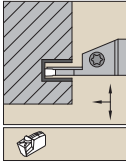


Grooving and Cut-Off

order number	catalog number	seat size	D min	D max	W min	CD	H	B	L1	L2	H1	H2	clamp screw	Torx
	right hand													
1513070	A3SAR120425060075	4	2.362	2.953	.158	.980	.750	.750	6.000	1.650	.750	1.197	MS1970	T30
1513565	A3SAR160425060075	4	2.362	2.953	.158	.980	1.000	1.000	6.000	1.650	1.000	1.197	MS1970	T30
1513069	A3SAR120425075100	4	2.953	3.937	.158	.980	.750	.750	6.000	1.650	.750	1.197	MS1970	T30
1513349	A3SAR160425075100	4	2.953	3.937	.158	.980	1.000	1.000	6.000	1.650	1.000	1.197	MS1970	T30
1513068	A3SAR120425100180	4	3.937	7.087	.158	.980	.750	.750	6.000	1.650	.750	1.197	MS1970	T30
1514278	A3SAR160425100180	4	3.937	7.087	.158	.980	1.000	1.000	6.000	1.650	1.000	1.197	MS1970	T30
1513561	A3SAR160425180250	4	7.087	9.843	.158	.980	1.000	1.000	6.000	1.650	1.000	1.197	MS1970	T30
1513560	A3SAR160425250350	4	9.843	13.780	.158	.980	1.000	1.000	6.000	1.650	1.000	1.197	MS1970	T30
1513558	A3SAR160425350999	4	13.780	—	.158	.980	1.000	1.000	6.000	1.650	1.000	1.197	MS1970	T30
1513516	A3SAR124S10025030	4S	.984	1.181	.158	.390	.750	.750	6.000	1.024	.750	1.197	MS1970	T30
1513570	A3SAR164S10025030	4S	.984	1.181	.158	.390	1.000	1.000	6.000	1.024	1.000	1.197	MS1970	T30
1513512	A3SAR124S10030035	4S	1.181	1.378	.158	.390	.750	.750	6.000	1.024	.750	1.197	MS1970	T30
1513569	A3SAR164S10030035	4S	1.181	1.378	.158	.390	1.000	1.000	6.000	1.024	1.000	1.197	MS1970	T30
1513514	A3SAR124S20035040	4S	1.378	1.575	.158	.790	.750	.750	6.000	1.402	.750	1.197	MS1970	T30
1513568	A3SAR164S20035040	4S	1.378	1.575	.158	.790	1.000	1.000	6.000	1.402	1.000	1.197	MS1970	T30
1513513	A3SAR124S25040050	4S	1.575	1.969	.158	.980	.750	.750	6.000	1.650	.750	1.197	MS1970	T30
1514266	A3SAR164S25040050	4S	1.575	1.969	.158	.980	1.000	1.000	6.000	1.650	1.000	1.197	MS1970	T30
1513511	A3SAR124S25050060	4S	1.969	2.362	.158	.980	.750	.750	6.000	1.650	.750	1.197	MS1970	T30
1513566	A3SAR164S25050060	4S	1.969	2.362	.158	.980	1.000	1.000	6.000	1.650	1.000	1.197	MS1970	T30
1513557	A3SAR160525060075	5+6	2.362	2.953	.197	.980	1.000	1.000	6.000	1.650	1.000	1.197	MS1970	T30
1513555	A3SAR160530075100	5+6	2.953	3.937	.197	1.180	1.000	1.000	6.000	1.839	1.000	1.197	MS1970	T30
1513554	A3SAR160530100180	5+6	3.937	7.087	.197	1.180	1.000	1.000	6.000	1.839	1.000	1.197	MS1970	T30
1513552	A3SAR160530180250	5+6	7.087	9.843	.197	1.180	1.000	1.000	6.000	1.839	1.000	1.197	MS1970	T30
1513550	A3SAR160530250350	5+6	9.843	13.780	.197	1.180	1.000	1.000	6.000	1.839	1.000	1.197	MS1970	T30
1514280	A3SAR160530350999	5+6	13.780	—	.197	1.180	1.000	1.000	6.000	1.839	1.000	1.197	MS1970	T30

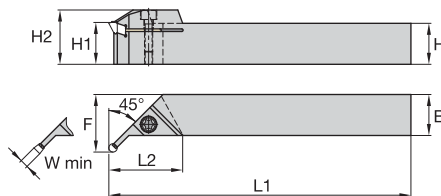
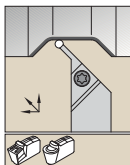
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(A3SA continued)



order number	catalog number	seat size	D min	D max	W min	CD	H	B	L1	L2	H1	H2	clamp screw	Torx
	left hand													
1513531	A3SAL120425060075	4	2.362	2.953	.158	.980	.750	.750	6.000	1.650	.750	1.197	MS1970	T30
1513537	A3SAL160425060075	4	2.362	2.953	.158	.980	1.000	1.000	6.000	1.650	1.000	1.197	MS1970	T30
1513529	A3SAL120425075100	4	2.953	3.937	.158	.980	.750	.750	6.000	1.650	.750	1.197	MS1970	T30
1513535	A3SAL160425075100	4	2.953	3.937	.158	.980	1.000	1.000	6.000	1.650	1.000	1.197	MS1970	T30
1513527	A3SAL120425100180	4	3.937	7.087	.158	.980	.750	.750	6.000	1.650	.750	1.197	MS1970	T30
1513533	A3SAL160425100180	4	3.937	7.087	.158	.980	1.000	1.000	6.000	1.650	1.000	1.197	MS1970	T30
1513525	A3SAL120425180250	4	7.087	9.843	.158	.980	.750	.750	6.000	1.650	.750	1.197	MS1970	T30
1513532	A3SAL160425180250	4	7.087	9.843	.158	.980	1.000	1.000	6.000	1.650	1.000	1.197	MS1970	T30
1513523	A3SAL120425250350	4	9.843	13.780	.158	.980	.750	.750	6.000	1.650	.750	1.197	MS1970	T30
1513530	A3SAL160425250350	4	9.843	13.780	.158	.980	1.000	1.000	6.000	1.650	1.000	1.197	MS1970	T30
1513521	A3SAL120425350999	4	13.780	—	.158	.980	.750	.750	6.000	1.650	.750	1.197	MS1970	T30
1513526	A3SAL160425350999	4	13.780	—	.158	.980	1.000	1.000	6.000	1.650	1.000	1.197	MS1970	T30
1513544	A3SAL124S10025030	4S	.984	1.181	.158	.390	.750	.750	6.000	1.024	.750	1.197	MS1970	T30
1513547	A3SAL164S10025030	4S	.984	1.181	.158	.390	1.000	1.000	6.000	1.024	1.000	1.197	MS1970	T30
1513541	A3SAL124S10030035	4S	1.181	1.378	.158	.390	.750	.750	6.000	1.024	.750	1.197	MS1970	T30
1513546	A3SAL164S10030035	4S	1.181	1.378	.158	.390	1.000	1.000	6.000	1.024	1.000	1.197	MS1970	T30
1513538	A3SAL124S20035040	4S	1.378	1.575	.158	.790	.750	.750	6.000	1.402	.750	1.197	MS1970	T30
1513543	A3SAL164S20035040	4S	1.378	1.575	.158	.790	1.000	1.000	6.000	1.402	1.000	1.197	MS1970	T30
1513536	A3SAL124S25040050	4S	1.575	1.969	.158	.980	.750	.750	6.000	1.650	.750	1.197	MS1970	T30
1513540	A3SAL164S25040050	4S	1.575	1.969	.158	.980	1.000	1.000	6.000	1.650	1.000	1.197	MS1970	T30
1513534	A3SAL124S25050060	4S	1.969	2.362	.158	.980	.750	.750	6.000	1.650	.750	1.197	MS1970	T30
1514321	A3SAL164S25050060	4S	1.969	2.362	.158	.980	1.000	1.000	6.000	1.650	1.000	1.197	MS1970	T30
1513519	A3SAL120525060075	5+6	2.362	2.953	.197	.980	.750	.750	6.000	1.650	.750	1.197	MS1970	T30
1513524	A3SAL160525060075	5+6	2.362	2.953	.197	.980	1.000	1.000	6.000	1.650	1.000	1.197	MS1970	T30
1513522	A3SAL160530075100	5+6	2.953	3.937	.197	1.180	1.000	1.000	6.000	1.839	1.000	1.197	MS1970	T30
1513067	A3SAL120530100180	5+6	3.937	7.087	.197	1.180	.750	.750	6.000	1.839	.750	1.197	MS1970	T30
1514225	A3SAL160530100180	5+6	3.937	7.087	.197	1.180	1.000	1.000	6.000	1.839	1.000	1.197	MS1970	T30
1513066	A3SAL120530180250	5+6	7.087	9.843	.197	1.180	.750	.750	6.000	1.839	.750	1.197	MS1970	T30
1513520	A3SAL160530180250	5+6	7.087	9.843	.197	1.180	1.000	1.000	6.000	1.839	1.000	1.197	MS1970	T30
1513064	A3SAL120530250350	5+6	9.843	13.780	.197	1.180	.750	.750	6.000	1.839	.750	1.197	MS1970	T30
1513517	A3SAL160530250350	5+6	9.843	13.780	.197	1.180	1.000	1.000	6.000	1.839	1.000	1.197	MS1970	T30
1513346	A3SAL120530350999	5+6	13.780	—	.197	1.180	.750	.750	6.000	1.839	.750	1.197	MS1970	T30
1513515	A3SAL160530350999	5+6	13.780	—	.197	1.180	1.000	1.000	6.000	1.839	1.000	1.197	MS1970	T30

Grooving and Cut-Off

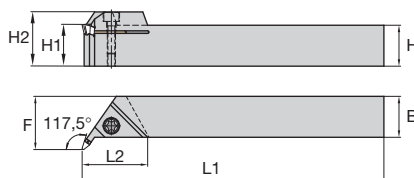
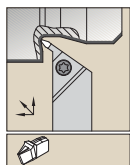


A3DS



Grooving and Cut-Off

order number	catalog number	seat size	H	B	L1	L2	F	H1	H2	clamp screw	Torx
	right hand										
2598657	A3DSR1604	3+4	1.00	1.00	6.00	1.34	1.25	1.00	1.24	MS1944	T25
2598679	A3DSR1606	5+6	1.00	1.00	6.00	1.57	1.25	1.00	1.24	MS1595	T30
	left hand										
2598658	A3DSL1604	3+4	1.00	1.00	6.00	1.34	1.25	1.00	1.24	MS1944	T25
2598660	A3DSL1606	5+6	1.00	1.00	6.00	1.57	1.25	1.00	1.24	MS1595	T30

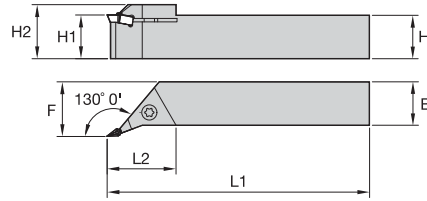
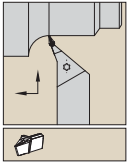


A3PS



order number	catalog number	seat size	H	B	L1	L2	F	H1	H2	clamp screw	Torx
	right hand										
2598680	A3PSR1604	4	1.00	1.00	6.00	1.34	1.25	1.00	1.24	MS1595	T30
2598673	A3PSR1608	8	1.00	1.00	6.00	1.96	1.25	1.00	1.28	MS1875	T45
	left hand										
2598662	A3PSL1604	4	1.00	1.00	6.00	1.34	1.25	1.00	1.24	MS1595	T30
2598674	A3PSL1608	8	1.00	1.00	6.00	1.96	1.25	1.00	1.28	MS1875	T45

NOTE: Approach angle 117.5°.
Only insert A3V-U-DM can be used.



■ A3US

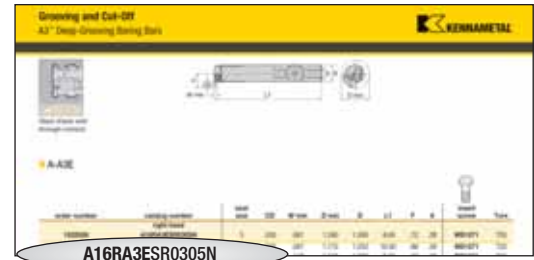


order number	catalog number	seat size	H	B	L1	L2	F	H1	H2	clamp screw	Torx
	right hand										
2598675	A3USR1604	4	1.00	1.00	6.00	1.57	1.25	1.00	1.24	MS1595	T30
2598677	A3USR1608	8	1.00	1.00	6.00	1.96	1.25	1.00	1.28	MS1875	T45
	left hand										
2598681	A3USL1604	4	1.00	1.00	6.00	1.57	1.25	1.00	1.24	MS1595	T30

NOTE: Approach angle 93°.
Only insert A3V-U-DM can be used with these toolholders.

How Do Catalog Numbers Work?

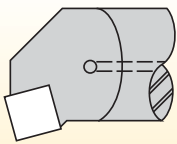
Each character in our catalog number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.



Grooving and Cut-Off

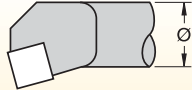
A

Steel Bar
with Coolant



16

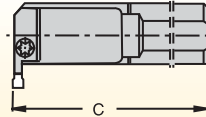
Bar
Diameter



inch bars:
A two-digit number
which indicates the
bar diameter in
1/16" increments.
metric bars:
Bar diameter in millimeters

R

Bar
Length



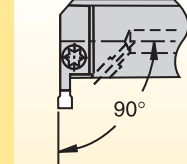
inch bars:
R = 8"
S = 10"
T = 12"
metric bars:
R = 200mm
S = 250mm
T = 300mm

A3

A3
System

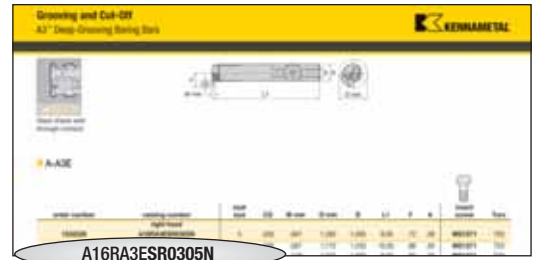
E

Tool
Style



E = End mounted (90°)

By referencing this easy-to-use guide, you can identify the correct product to meet your needs.



A16RA3ESR0305N

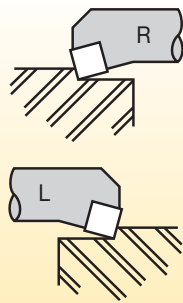
S

Support Type

S = Standard support for a wide range of groove widths

R

Hand of Tool



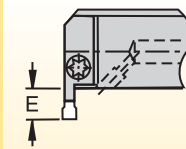
03

Seat Size

pocket seat size	cutting width (mm)
03	2,25–3,05
04	3,05–4,05
05	4,05–5,05
06	5,05–6,05
08	6,05–8,05

05

Grooving Depth in mm



conversions:

mm	inch
5mm	= .20"
8mm	= .32"
10mm	= .39"
12mm	= .47"
15mm	= .59"

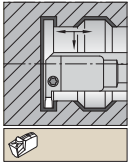
N

Tool Units

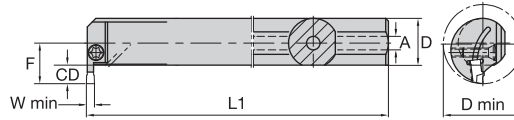
N = Inch
M = Metric

Grooving and Cut-Off





Steel shank with through coolant.



■ A-A3E



Grooving and Cut-Off

order number	catalog number	seat size	CD	W min	D min	D	L1	F	A	insert screw	Torx
	right hand										
1522528	A16RA3ESR0305N	3	.200	.087	1.260	1.000	8.00	.72	.28	MS1571	T20
1522530	A20SA3ESR0305N	3	.200	.087	1.772	1.250	10.00	.86	.39	MS1571	T20
1522830	A16RA3ESR0408N	4	.315	.118	1.575	1.000	8.00	.80	.28	MS1571	T20
1522841	A20SA3ESR0408N	4	.315	.118	1.890	1.250	10.00	.98	.39	MS1571	T20
1522844	A24TA3ESR0408N	4	.315	.118	2.205	1.500	12.00	1.10	.39	MS1571	T20
1522720	A20SA3ESR0510N	5	.390	.157	1.772	1.250	10.00	1.02	.39	MS1162	T25
1522881	A24TA3ESR0510N	5	.390	.157	2.362	1.500	12.00	1.18	.39	MS1162	T25
1522882	A20SA3ESR0612N	6	.470	.197	1.772	1.250	10.00	1.10	.39	MS1162	T25
1522884	A24TA3ESR0612N	6	.470	.197	2.520	1.500	12.00	1.26	.39	MS1162	T25
1522885	A24TA3ESR0815N	8	.590	.236	2.756	1.500	12.00	1.37	.39	MS1163	T30
	left hand										
1522886	A16RA3ESL0305N	3	.200	.087	1.260	1.000	8.00	.72	.28	MS1571	T20
1522887	A20SA3ESL0305N	3	.200	.087	1.772	1.250	10.00	.86	.39	MS1571	T20
1522892	A16RA3ESL0408N	4	.315	.118	1.575	1.000	8.00	.80	.28	MS1571	T20
1522895	A20SA3ESL0408N	4	.315	.118	1.890	1.250	10.00	.98	.39	MS1571	T20
1522896	A24TA3ESL0408N	4	.315	.118	2.205	1.500	12.00	1.10	.39	MS1571	T20
1522898	A20SA3ESL0510N	5	.390	.157	1.772	1.250	10.00	1.02	.39	MS1162	T25
1522899	A24TA3ESL0510N	5	.390	.157	2.362	1.500	12.00	1.18	.39	MS1162	T25
1522900	A20SA3ESL0612N	6	.470	.197	1.772	1.250	10.00	1.10	.39	MS1162	T25
1522901	A24TA3ESL0612N	6	.470	.197	2.520	1.500	12.00	1.26	.39	MS1162	T25
1522902	A24TA3ESL0815N	8	.590	.236	2.756	1.500	12.00	1.37	.39	MS1163	T30



A3™ Deep Grooving

The best choice for high productivity with outstanding application flexibility.

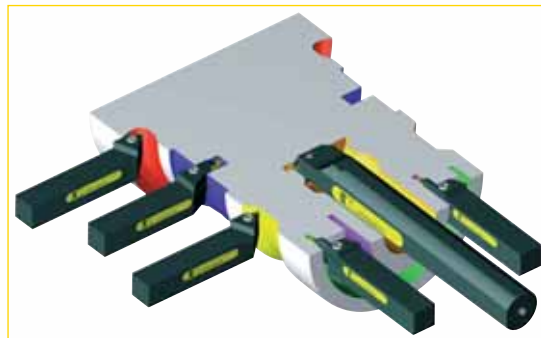
The A3 System is designed specifically for deep grooving operations. The A3 platform enables customers to reach deeper depths while maintaining chip control and tool rigidity.

Performance

- One insert performs:
 - O.D. operations
 - I.D. operations
 - Face grooving operations
- In addition, the A3 system's performance is enhanced by:
 - Beyond™ CVD grades
 - The Beyond Tooling Selection System

Performance

- A3 deep grooving tooling is compatible with square shank, KM™, and Kennametal Capto® platforms.



Experience the advantages at your Authorized Kennametal Distributor or at www.kennametal.com.

www.kennametal.com

 **KENNAMETAL®**

How Do Catalog Numbers Work?

Each character in our catalog number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.

A3M50R426M

A3M

A3 Modular Grooving System

50

Blade Size

R

Hand of Tool

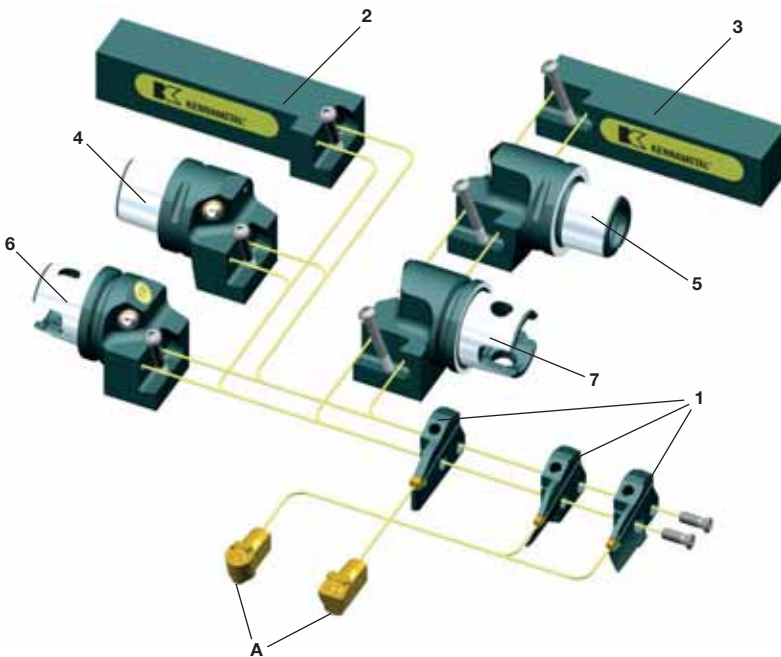
R = Right hand



L = Left hand



Grooving and Cut-Off



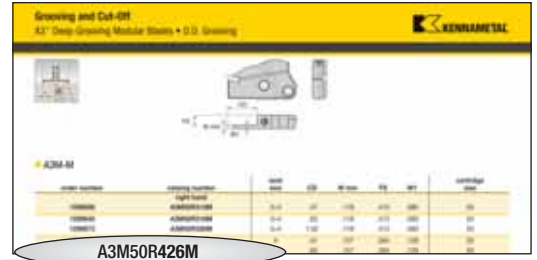
Legend

		page(s)
A	A2™/A3 Inserts	D30–D33
1	O.D. and Face Grooving Blades	D46–D50
2	KGME Toolholder	D55
3	KGMS Toolholder	D54
4	Capto® KGME Cutting Unit	D58
5	Capto KGMS Cutting Unit	D58
6	KM™ KGME Cutting Unit	D57
7	KM KGMS Cutting Unit	D56–D57

By customer demand, Kennametal Inc. and Sandvik Coromant have entered into an agreement that allows both companies to manufacture, market, and sell KM and Coromant Capto products worldwide. Using the trademark Kennametal Capto, we make available a variety of leading and innovative Kennametal tooling designs utilizing the Coromant Capto coupling.

The manufacture and marketing of Kennametal Capto products and the use of the “Capto” trademark are in accordance with a license granted from Sandvik.

By referencing this easy-to-use guide, you can identify the correct product to meet your needs.



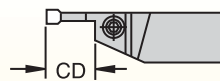
4

Seat Size

pocket seat size	nominal cutting width (mm)
03/3S	3,05
04/4S	4,05
05	5,05
06	6,05

26

Grooving Depth in mm



conversions:

mm	inch
12mm	= .47
16mm	= .63
20mm	= .79
26mm	= 1.02
32mm	= 1.26

M

Tool Style

S = Standard support for a range of groove widths and straight clearance for unlimited workpiece diameters



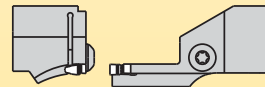
M = Maximum support for specific groove widths and straight clearance for unlimited workpiece diameters



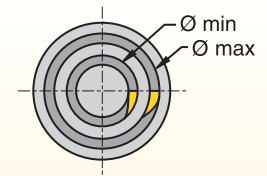
A = Inboard sweep face grooving toolholder



B = Outboard sweep face grooving toolholder

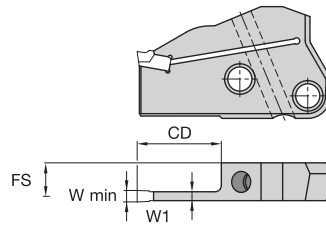
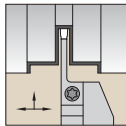


Face Grooving Diameter Range



Grooving and Cut-Off

A3™ Deep-Grooving Modular Blades • O.D. Grooving

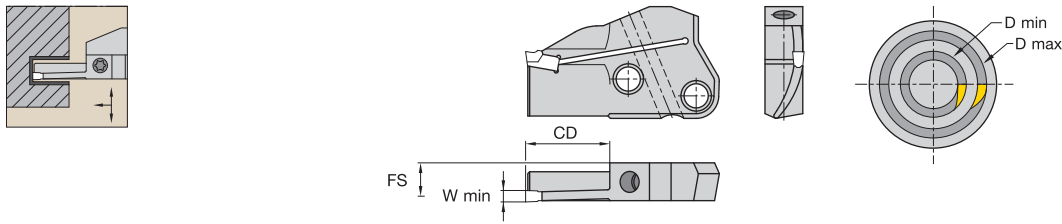


■ A3M-M

Grooving and Cut-Off

order number	catalog number	seat size	CD	W min	FS	W1	blade size
	right hand						
1599838	A3M50R312M	3+4	.47	.118	.413	.090	50
1599840	A3M50R316M	3+4	.63	.118	.413	.090	50
1599873	A3M50R326M	3+4	1.02	.118	.413	.090	50
1599875	A3M50R412M	4	.47	.157	.394	.129	50
1599912	A3M50R416M	4	.63	.157	.394	.129	50
1599915	A3M50R426M	4	1.02	.157	.394	.129	50
1599917	A3M50R432M	4	1.26	.157	.394	.129	50
1599919	A3M50R516M	5+6	.63	.187	.374	.169	50
1599921	A3M50R526M	5+6	1.02	.187	.374	.169	50
1599923	A3M50R532M	5+6	1.26	.187	.374	.169	50
1599925	A3M50R616M	6	.63	.236	.354	.208	50
1599927	A3M50R626M	6	1.02	.236	.354	.208	50
1599929	A3M50R632M	6	1.26	.236	.354	.208	50
	left hand						
1599839	A3M50L312M	3+4	.47	.118	.413	.090	50
1599872	A3M50L316M	3+4	.63	.118	.413	.090	50
1599874	A3M50L326M	3+4	1.02	.118	.413	.090	50
1599911	A3M50L412M	4	.47	.157	.394	.129	50
1599913	A3M50L416M	4	.63	.157	.394	.129	50
1599916	A3M50L426M	4	1.02	.157	.394	.129	50
1599918	A3M50L432M	4	1.26	.157	.394	.129	50
1599920	A3M50L516M	5+6	.63	.187	.374	.169	50
1599922	A3M50L526M	5+6	1.02	.187	.374	.169	50
1599924	A3M50L532M	5+6	1.26	.187	.374	.169	50
1599926	A3M50L616M	6	.63	.236	.354	.208	50
1599928	A3M50L626M	6	1.02	.236	.354	.208	50
1599930	A3M50L632M	6	1.26	.236	.354	.208	50

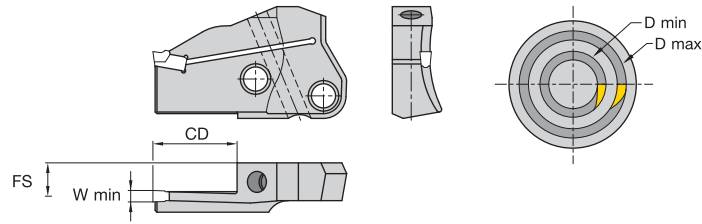
NOTE: Seat size 4 inserts can be used in seat size 3 and 4 toolholders, within cutting width range.
 Seat size 6 inserts can be used in seat size 5 and 6 toolholders, within cutting width range.
 Use the larger seat size toolholder for optimal performance.



■ A3M-A Inboard Sweep

order number	catalog number	seat size	D min	D max	W min	CD	FS	blade size
right hand								
2542476	A3M50R312A025030	3S	.984	1.181	.118	.47	.413	50
2542477	A3M50R312A030035	3S	1.181	1.378	.118	.47	.413	50
2542478	A3M50R316A035040	3S	1.378	1.575	.118	.63	.413	50
2542479	A3M50R316A040050	3S	1.575	1.969	.118	.63	.413	50
2542480	A3M50R316A050060	3S	1.969	2.362	.118	.63	.413	50
1599937	A3M50R412A025030	4S	.984	1.181	.157	.47	.394	50
1599938	A3M50R412A030035	4S	1.181	1.378	.157	.47	.394	50
1599939	A3M50R420A035040	4S	1.378	1.575	.157	.79	.394	50
1599940	A3M50R420A040050	4S	1.575	1.969	.157	.79	.394	50
1599951	A3M50R420A050060	4S	1.969	2.362	.157	.79	.394	50
1599952	A3M50R426A060075	4	2.362	2.953	.157	1.02	.394	50
1599953	A3M50R426A075100	4	2.953	3.937	.157	1.02	.394	50
1599955	A3M50R426A100180	4	3.937	7.087	.157	1.02	.394	50
1599956	A3M50R426A180250	4	7.087	9.843	.157	1.02	.394	50
1599957	A3M50R426A250350	4	9.843	13.780	.157	1.02	.394	50
1599958	A3M50R426A350999	4	13.780	—	.157	1.02	.394	50
1599959	A3M50R526A060075	5+6	2.362	2.953	.197	1.02	.374	50
1599960	A3M50R532A075100	5+6	2.953	3.937	.197	1.26	.374	50
1599961	A3M50R532A100180	5+6	3.937	7.087	.197	1.26	.374	50
1599962	A3M50R532A180250	5+6	7.087	9.843	.197	1.26	.374	50
1599963	A3M50R532A250350	5+6	9.843	13.780	.197	1.26	.374	50
1599964	A3M50R532A350999	5+6	13.780	—	.197	1.26	.374	50
left hand								
2542481	A3M50L312A025030	3S	.984	1.181	.118	.47	.413	50
2542482	A3M50L312A030035	3S	1.181	1.378	.118	.47	.413	50
2542483	A3M50L316A035040	3S	1.378	1.575	.118	.63	.413	50
2542484	A3M50L316A040050	3S	1.575	1.969	.118	.63	.413	50
2542485	A3M50L316A050060	3S	1.969	2.362	.118	.63	.413	50
1599965	A3M50L412A025030	4S	.984	1.181	.157	.47	.394	50
1599966	A3M50L412A030035	4S	1.181	1.378	.157	.47	.394	50
1600096	A3M50L420A035040	4S	1.378	1.575	.157	.79	.394	50
1600098	A3M50L420A040050	4S	1.575	1.969	.157	.79	.394	50
1600099	A3M50L420A050060	4S	1.969	2.362	.157	.79	.394	50
1600142	A3M50L426A060075	4	2.362	2.953	.157	1.02	.394	50
1600143	A3M50L426A075100	4	2.953	3.937	.157	1.02	.394	50
1600144	A3M50L426A100180	4	3.937	7.087	.157	1.02	.394	50
1600145	A3M50L426A180250	4	7.087	9.843	.157	1.02	.394	50
1600146	A3M50L426A250350	4	9.843	13.780	.157	1.02	.394	50
1600147	A3M50L426A350999	4	13.780	—	.157	1.02	.394	50
1600149	A3M50L526A060075	5+6	2.362	2.953	.197	1.02	.374	50
1600150	A3M50L532A075100	5+6	2.953	3.937	.197	1.26	.374	50
1600161	A3M50L532A100180	5+6	3.937	7.087	.197	1.26	.374	50
1600162	A3M50L532A180250	5+6	7.087	9.843	.197	1.26	.374	50
1600163	A3M50L532A250350	5+6	9.843	13.780	.197	1.26	.374	50
1600164	A3M50L532A350999	5+6	13.780	—	.197	1.26	.374	50

Grooving and Cut-Off



■ A3M-B Outboard Sweep

Grooving and Cut-Off

order number	catalog number	seat size	D min	D max	W min	CD	FS	blade size
right hand								
2542486	A3M50R312B025030	3S	.984	1.181	.118	.47	.413	50
2542487	A3M50R312B030035	3S	1.181	1.378	.118	.47	.413	50
2542488	A3M50R316B035040	3S	1.378	1.575	.118	.63	.413	50
2542489	A3M50R316B040050	3S	1.575	1.969	.118	.63	.413	50
2542490	A3M50R316B050060	3S	1.969	2.362	.118	.63	.413	50
1600165	A3M50R412B025030	4S	.984	1.181	.157	.47	.394	50
1600166	A3M50R412B030035	4S	1.181	1.378	.157	.47	.394	50
1600167	A3M50R420B035040	4S	1.378	1.575	.157	.79	.394	50
1600168	A3M50R420B040050	4S	1.575	1.969	.157	.79	.394	50
1600169	A3M50R420B050060	4S	1.969	2.362	.157	.79	.394	50
1600170	A3M50R426B060075	4	2.362	2.953	.157	1.02	.394	50
1600171	A3M50R426B075100	4	2.953	3.937	.157	1.02	.394	50
1600172	A3M50R426B100180	4	3.937	7.087	.157	1.02	.394	50
1600173	A3M50R426B180250	4	7.087	9.843	.157	1.02	.394	50
1600174	A3M50R426B250350	4	9.843	13.780	.157	1.02	.394	50
1600175	A3M50R426B350999	4	13.780	—	.157	1.02	.394	50
1600176	A3M50R526B060075	5+6	2.362	2.953	.197	1.02	.374	50
1600177	A3M50R532B075100	5+6	2.953	3.937	.197	1.26	.374	50
1600178	A3M50R532B100180	5+6	3.937	7.087	.197	1.26	.374	50
1600179	A3M50R532B180250	5+6	7.087	9.843	.197	1.26	.374	50
1600180	A3M50R532B250350	5+6	9.843	13.780	.197	1.26	.374	50
1600191	A3M50R532B350999	5+6	13.780	—	.197	1.26	.374	50
left hand								
2542491	A3M50L312B025030	3S	.984	1.181	.118	.47	.413	50
2542492	A3M50L312B030035	3S	1.181	1.378	.118	.47	.413	50
2542493	A3M50L316B035040	3S	1.378	1.575	.118	.63	.413	50
2542494	A3M50L316B040050	3S	1.575	1.969	.118	.63	.413	50
2542495	A3M50L316B050060	3S	1.969	2.362	.118	.63	.413	50
1600192	A3M50L412B025030	4S	.984	1.181	.157	.47	.394	50
1600193	A3M50L412B030035	4S	1.181	1.378	.157	.47	.394	50
1600194	A3M50L420B035040	4S	1.378	1.575	.157	.79	.394	50
1600195	A3M50L420B040050	4S	1.575	1.969	.157	.79	.394	50
1600196	A3M50L420B050060	4S	1.969	2.362	.157	.79	.394	50
1600197	A3M50L426B060075	4	2.362	2.953	.157	1.02	.394	50
1600198	A3M50L426B075100	4	2.953	3.937	.157	1.02	.394	50
1600212	A3M50L426B100180	4	3.937	7.087	.157	1.02	.394	50
1600213	A3M50L426B180250	4	7.087	9.843	.157	1.02	.394	50
1600214	A3M50L426B250350	4	9.843	13.780	.157	1.02	.394	50
1600215	A3M50L426B350999	4	13.780	—	.157	1.02	.394	50
1600216	A3M50L526B060075	5+6	2.362	2.953	.197	1.02	.374	50
1600217	A3M50L532B075100	5+6	2.953	3.937	.197	1.26	.374	50
1600218	A3M50L532B100180	5+6	3.937	7.087	.197	1.26	.374	50
1600219	A3M50L532B180250	5+6	7.087	9.843	.197	1.26	.374	50
1600241	A3M50L532B250350	5+6	9.843	13.780	.197	1.26	.374	50
1600242	A3M50L532B350999	5+6	13.780	—	.197	1.26	.374	50



Beyond™ PVD Grades

beyond™

The advanced PVD coating offered by Beyond ISO Carbide Insert Expansion is well suited to resist high-temperatures associated with machining tough alloys. By offering increased tool life (by 30–40%), the general engineering, transportation, aerospace, energy, and earthworks markets can experience benefits in their profitability as well as utilize the strength of the new PVD coating in combination with the broad product offering to perform turning, grooving, and cut-off operations in a wide array of materials and applications while maintaining consistent chip control and minimizing insert edge wear.

KCU10

- PVD-coated grade with excellent wear resistance. Finishing to medium applications.
- Use in all materials, especially stainless steels and high-temp alloys.
- Increase speed by 20–30% and feed by 10–15%.

KCU25

- PVD-coated grade with superior edge toughness and excellent wear resistance. Medium to roughing applications.
- Use in all materials.
- Increase speed, feed, and depth of cut by 10–20%.

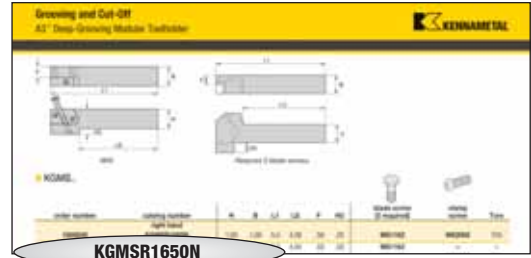
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 **KENNAMETAL®**

How Do Catalog Numbers Work?

Each character in our catalog number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.



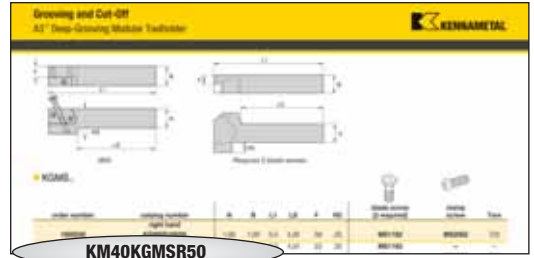
KGMSR1650N
KGMSR2525M50

Grooving and Cut-Off

Inch		Metric				
KGM	S	R	16	50	N	
KGM Grooving Modular	S Tool Style	R Hand of Tool	25 Shank Dimensions	25 Blade Size	M Tool Length	50 Blade Size
	<p>S</p> <p>E</p>		<p>shank height in millimeters</p> <p>shank width in millimeters</p> <p>square shanks: The number indicates the toolholder cross section in 1/16" increments.</p> <p>rectangular shanks: The first digit indicates the number of 1/8" increments of width and the second digit indicates the number of 1/4" increments of height.</p>	<p>N = Inch M = 150mm P = 170mm</p> <p>length over insert in a support blade with a 12,5mm D dimension according to ISO</p>		

How Do Catalog Numbers Work?

Each character in our catalog number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.



KM40

System and Size

KGM

Grooving Modular

S

Tool Style

R

Hand of Tool

50

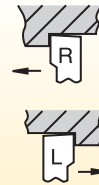
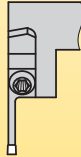
Blade Size

Special Conditions

S



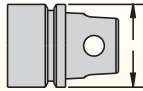
E



Y =
Mazak® INTEGREX®
Y-series machines

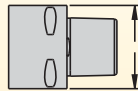
KM size

KM40™ = 40mm dia.
KM50™ = 50mm dia.
KM63™ = 63mm dia.



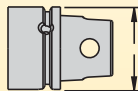
Kennametal Capto® size

C4 = 40mm dia.
C5 = 50mm dia.
C6 = 63mm dia.



KMXMZ size

KM63XMZ™ = 63mm dia.



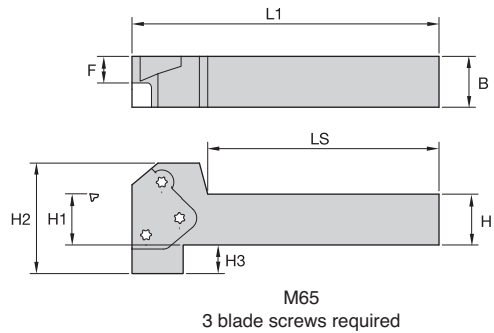
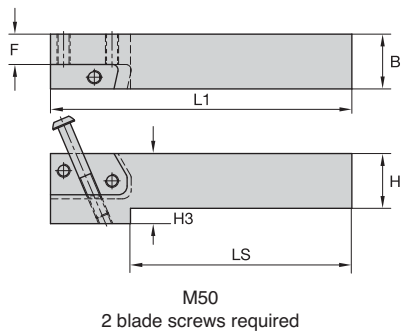
(KM-KGMSR...)

(KM-KGMEL...)

Grooving and Cut-Off

Grooving and Cut-Off

A4™ Grooving and Turning Modular Toolholder • O.D. Grooving



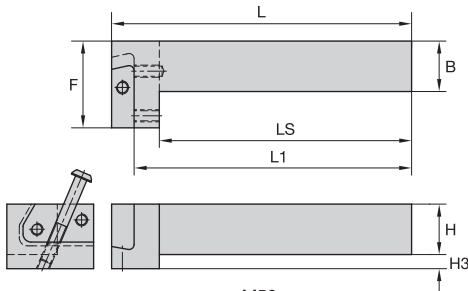
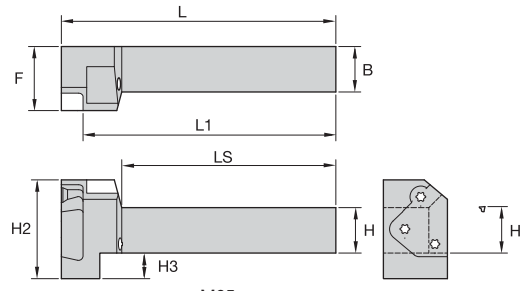
KGMS..



Grooving and Cut-Off

order number	catalog number	H	B	L1	LS	F	H2	H3	blade screw	Torx	clamp screw	Torx
right hand												
1600245	KGMSR1650N	1.00	1.00	5.5	4.26	.56	—	.25	MS1162	T25	MS2002	T25
3556992	KGMSR1665N	1.00	1.00	6.0	4.54	.53	2.09	.50	MS1163	T30	—	—
1617400	KGMSR2050N	1.25	1.25	5.5	—	.81	—	—	MS1162	T25	MS2002	T25
3557104	KGMSR2065N	1.25	1.25	6.0	4.90	.78	2.09	.25	MS1163	T30	—	—
1903553	KGMSR2450N	1.50	1.50	5.5	—	1.06	—	—	MS1162	T25	MS2002	T25
3557106	KGMSR2465N	1.50	1.50	7.0	5.90	1.03	2.09	—	MS1163	T30	—	—
left hand												
1600246	KGMSL1650N	1.00	1.00	5.5	4.26	.56	—	.25	MS1162	T25	MS2002	T25
3557103	KGMSL1665N	1.00	1.00	6.0	4.54	.53	2.09	.50	MS1163	T30	—	—
1617591	KGMSL2050N	1.25	1.25	5.5	—	.81	—	—	MS1162	T25	MS2002	T25
3557105	KGMSL2065N	1.25	1.25	6.0	4.90	.78	2.09	.25	MS1163	T30	—	—
1909004	KGMSL2450N	1.50	1.50	5.5	—	1.06	—	—	MS1162	T25	MS2002	T25
3557107	KGMSL2465N	1.50	1.50	7.0	5.90	1.03	2.09	—	MS1163	T30	—	—

NOTE: KGMS..: Right-hand holder uses right-hand blades.
 KGME..: Right-hand holder uses left-hand blades.
 M50 blade and clamp screw torque equals 8–10 Nm (71–88 in. lbs.)
 M65 blade and clamp screw torque equals 18–20 Nm (159–177 in. lbs.)
 See Modular Blade Assembly Diagrams on pages D59–D60.


 M50
2 blade screws required

 M65
3 blade screws required

KGME..

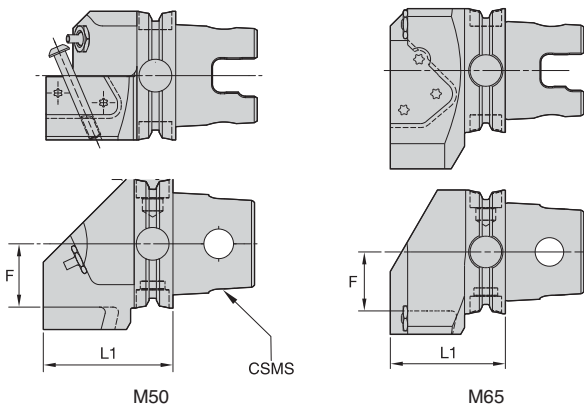

order number	catalog number	H	B	L1	LS	F	H2	H3	blade screw	Torx	clamp screw	Torx
	right hand											
1600263	KGMER1650N	1.00	1.00	5.5	4.96	1.70	—	.24	MS1162	T25	MS2002	T25
3557108	KGMER1665N	1.00	1.00	5.5	4.70	1.38	2.09	.50	MS1163	T30	—	—
1617592	KGMER2050N	1.25	1.25	5.5	4.96	1.70	—	—	MS1162	T25	MS2002	T25
3557110	KGMER2065N	1.25	1.25	5.5	4.70	1.38	2.09	.25	MS1163	T30	—	—
1907344	KGMER2450N	1.50	1.50	5.5	4.96	1.70	—	—	MS1162	T25	MS2002	T25
3557112	KGMER2465N	1.50	1.50	6.5	5.70	1.50	2.09	—	MS1163	T30	—	—
	left hand											
1600264	KGME1650N	1.00	1.00	5.5	4.96	1.70	—	.24	MS1162	T25	MS2002	T25
3557109	KGME1665N	1.00	1.00	5.5	4.70	1.38	2.09	.50	MS1163	T30	—	—
1617593	KGME12050N	1.25	1.25	5.5	4.96	1.70	—	—	MS1162	T25	MS2002	T25
3557111	KGME12065N	1.25	1.25	5.5	4.70	1.38	2.09	.25	MS1163	T30	—	—
1909003	KGME12450N	1.50	1.50	5.5	4.96	1.70	—	—	MS1162	T25	MS2002	T25
3557113	KGME12465N	1.50	1.50	6.5	5.70	1.50	2.09	—	MS1163	T30	—	—

NOTE: KGMS..: Right-hand holder uses right-hand blades.
 KGME..: Right-hand holder uses left-hand blades.
 M50 blade and clamp screw torque equals 8–10 Nm (71–88 in. lbs.)
 M65 blade and clamp screw torque equals 18–20 Nm (159–177 in. lbs.)
 See Modular Blade Assembly Diagrams on pages D59–D60.

Grooving and Cut-Off

Grooving and Cut-Off

A4™ Grooving and Turning Modular • KM™ Cutting Units

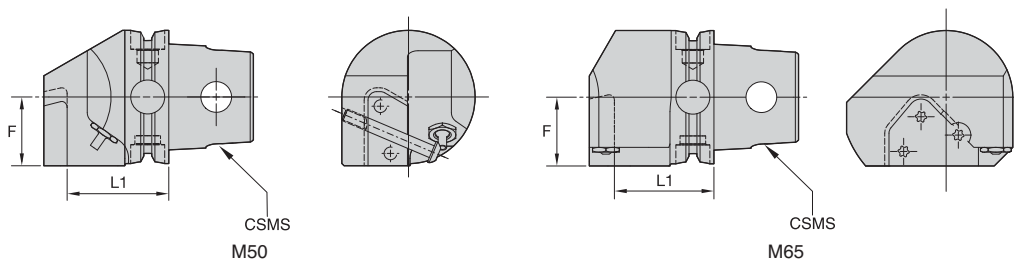


Grooving and Cut-Off

■ KM-KGMS..

order number	catalog number	CSMS system size	L1		F		blade screw (2 required)	Torx	clamp screw	Torx
			mm	in	mm	in				
right hand										
3950268	KM40TSKGMSR50	KM40TS	53,5	2.11	15,0	.59	MS1162	T25	MS2002	T25
1982206	KM40XTSKGMSR50	KM40XTS	53,5	2.11	15,0	.59	MS1162	T25	MS2002	T25
3747129	KM50TSKGMSR50	KM50TS	58,5	2.30	23,0	.91	—	T25	—	T25
3747134	KM50TSKGMSR65	KM50TS	53,5	2.11	22,0	.87	MS1163	T30	—	—
2255824	KM63TSKGMSR50	KM63TS	63,5	2.50	31,0	1.22	MS1162	T25	MS2002	T25
3670383	KM80TSKGMSR50	KM80TS	66,5	2.62	41,0	1.61	MS1162	T25	MS2002	T25
3670384	KM80TSKGMSR65	KM80TS	63,5	2.50	40,0	1.57	MS1163	T30	—	—
left hand										
3950267	KM40TSKGMSL50	KM40TS	53,5	2.11	15,0	.59	MS1162	T25	MS2002	T25
3747130	KM50TSKGMSL50	KM50TS	58,5	2.30	23,0	.91	—	T25	—	T25
3747135	KM50TSKGMSL65	KM50TS	53,5	2.11	22,0	.87	MS1163	T30	—	—
2255543	KM63TSKGMSL50	KM63TS	63,5	2.50	31,0	1.22	MS1162	T25	MS2002	T25
3670371	KM80TSKGMSL50	KM80TS	66,5	2.62	41,0	1.61	MS1162	T25	MS2002	T25
3670372	KM80TSKGMSL65	KM80TS	63,5	2.50	40,0	1.57	MS1163	T30	—	—

NOTE: KGMS..: Right-hand holder uses right-hand blades.
 KGME..: Right-hand holder uses left-hand blades.
 M50 blade and clamp screw torque equals 8–10 Nm (71–88 in. lbs.)
 M65 blade and clamp screw torque equals 18–20 Nm (159–177 in. lbs.)
 See Modular Blade Assembly Diagrams on pages D59–D60.



■ KM-KGME..

order number	catalog number	CSMS system size	L1		F		blade screw (2 required)	Torx	clamp screw	Torx
			mm	in	mm	in				
right hand										
3950266	KM40TSKGMER50	KM40TS	28,0	1.10	20,5	.81	MS1162	T25	MS2002	T25
3747133	KM50TSKGMER50	KM50TS	38,0	1.50	25,5	1.00	MS1162	T25	MS2002	T25
3747136	KM50TSKGMER65	KM50TS	47,0	1.85	25,5	1.00	MS1163	T30	—	—
2265404	KM63TSKGMER50	KM63TS	48,0	1.89	32,5	1.28	MS1162	T25	MS2002	T25
3590205	KM63TSKGMER65	KM63TS	47,0	1.85	32,5	1.28	MS1163	T30	—	—
3590203	KM63TSKGMSR65	KM63TS	58,5	2.30	30,0	1.18	MS1163	T30	—	—
3670369	KM80TSKGMER50	KM80TS	58,0	2.28	40,5	1.59	MS1162	T25	MS2002	T25
3670370	KM80TSKGMER65	KM80TS	57,0	2.24	40,5	1.59	MS1163	T30	—	—

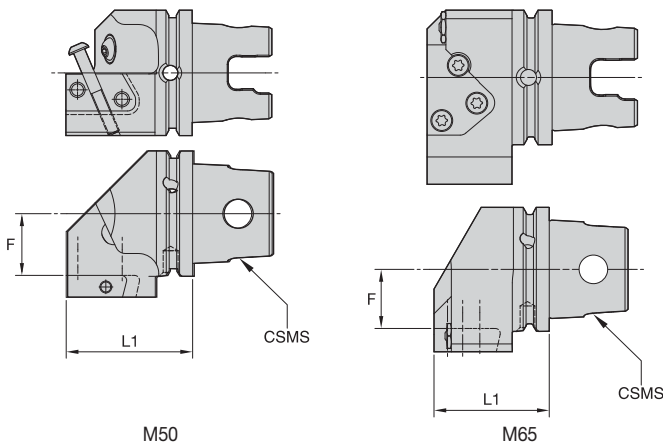
(continued)



(KM-KGME.. continued)

order number	catalog number	CSMS system size	L1		F		blade screw (2 required)	Torx	clamp screw	Torx
			mm	in	mm	in				
left hand										
3950265	KM40TSKGMEL50	KM40TS	28,0	1.10	20,5	.81	MS1162	T25	MS2002	T25
3747132	KM50TSKGMEL50	KM50TS	38,0	1.50	25,5	1.00	MS1162	T25	MS2002	T25
3747137	KM50TSKGMEL65	KM50TS	47,0	1.85	25,5	1.00	MS1163	T30	—	—
2265405	KM63TSKGMEL50	KM63TS	48,0	1.89	32,5	1.28	MS1162	T25	MS2002	T25
3590206	KM63TSKGMEL65	KM63TS	47,0	1.85	32,5	1.28	MS1163	T30	—	—
3590204	KM63TSKGMSEL65	KM63TS	58,5	2.30	30,0	1.18	MS1163	T30	—	—
3670367	KM80TSKGMEL50	KM80TS	58,0	2.28	40,5	1.59	MS1162	T25	MS2002	T25
3670368	KM80TSKGMEL65	KM80TS	57,0	2.24	40,5	1.59	MS1163	T30	—	—

NOTE: KGMS..: Right-hand holder uses right-hand blades.
 KGME..: Right-hand holder uses left-hand blades.
 M50 blade and clamp screw torque equals 8–10 Nm (71–88 in. lbs.)
 M65 blade and clamp screw torque equals 18–20 Nm (159–177 in. lbs.)
 See Modular Blade Assembly Diagrams on pages D59–D60.

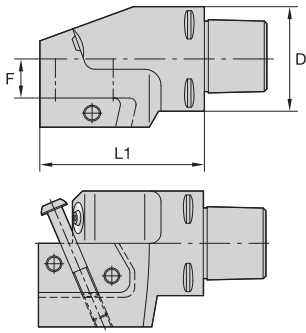


Grooving and Cut-Off

■ KM-XMZKGS..

order number	catalog number	CSMS system size	L1		F		blade screw (2 required)	Torx	clamp screw	Torx
			mm	in	mm	in				
right hand										
1756550	KM63XMZKGMRS50Y	KM63XMZ	63,5	2.50	31,0	1.22	MS1162	T25	MS2002	T25
3588679	KM63XMZKGMRS65Y	KM63XMZ	58,5	2.30	30,0	1.18	MS1163	T30	—	—
left hand										
1756574	KM63XMZKGMSLF50Y	KM63XMZ	63,5	2.50	31,0	1.22	MS1162	T25	MS2002	T25
3588680	KM63XMZKGMSLF65Y	KM63XMZ	58,5	2.30	30,0	1.18	MS1163	T30	—	—

NOTE: KGMS..: Right-hand holder uses right-hand blades.
 KGME..: Right-hand holder uses left-hand blades.
 M50 blade and clamp screw torque equals 8–10 Nm (71–88 in. lbs.)
 M65 blade and clamp screw torque equals 18–20 Nm (159–177 in. lbs.)
 See Modular Blade Assembly Diagrams on pages D59–D60.

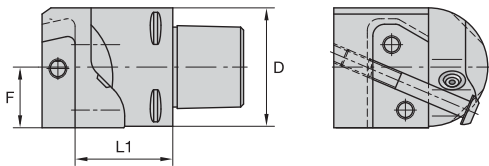


Grooving and Cut-Off

■ C-KGMS

order number	catalog number	D		L1		F		blade screw (2 required)	Torx	clamp screw	Torx
		mm	in	mm	in	mm	in				
	right hand										
1756576	C4KGMSR50	40	1.57	63,5	2.50	10	.39	MS1162	T25	MS2002	T25
1756584	C5KGMSR50	50	1.97	63,5	2.50	15	.59	MS1162	T25	MS2002	T25
	left hand										
1756578	C4KGMSL50	40	1.57	63,5	2.50	10	.39	MS1162	T25	MS2002	T25
1756585	C5KGMSL50	50	1.97	63,5	2.50	15	.59	MS1162	T25	MS2002	T25

NOTE: KGMS.: Right-hand holder uses right-hand blades.
 KGME.: Right-hand holder uses left-hand blades.
 Blade and clamp screw torque 8–10 Nm (71–88 in. lbs.).
 See Modular Blade Assembly Diagrams on pages D59–D60.



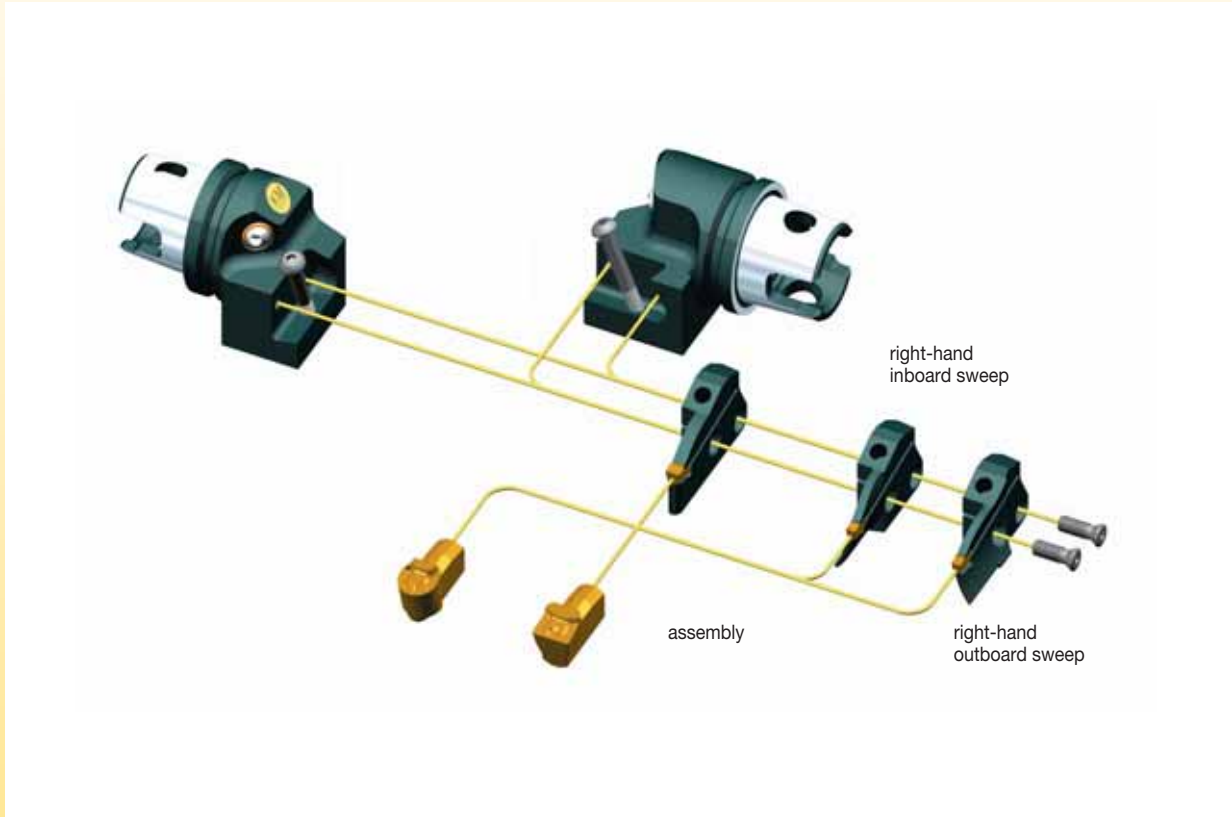
■ C-KGME

order number	catalog number	D		L1		F		blade screw (2 required)	Torx	clamp screw	Torx
		mm	in	mm	in	mm	in				
	right hand										
1756579	C4KGMER50	40	1.57	33,0	1.30	21	.81	MS1162	T25	MS2002	T25
1756587	C5KGMER50	50	1.97	43,0	1.69	26	1.00	MS1162	T25	MS2002	T25
	left hand										
1756583	C4KGME L50	40	1.57	33,0	1.30	21	.81	MS1162	T25	MS2002	T25
1756589	C5KGME L50	50	1.97	43,0	1.69	26	1.00	MS1162	T25	MS2002	T25

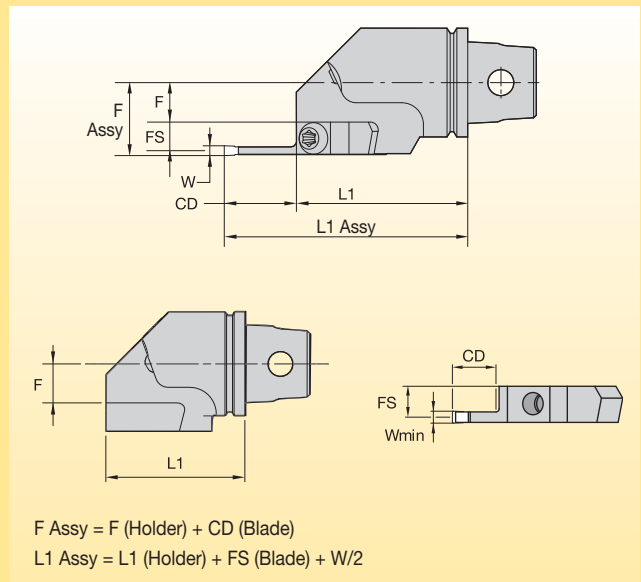
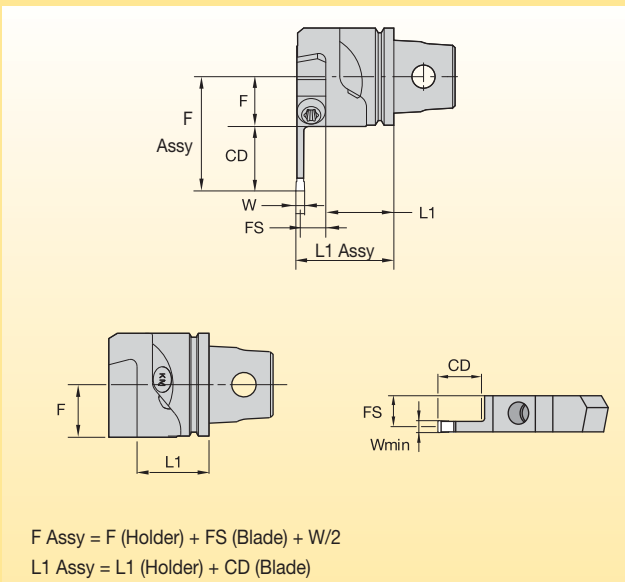
NOTE: KGMS.: Right-hand holder uses right-hand blades.
 KGME.: Right-hand holder uses left-hand blades.
 Blade and clamp screw torque equals 8–10 Nm (71–88 in. lbs.).
 See Modular Blade Assembly Diagrams on pages D59–D60.

■ A3™ and A4™ Modular Blade Assemblies

Kennametal's A3 and A4 grooving systems are the best choice for high-productivity with outstanding application flexibility.

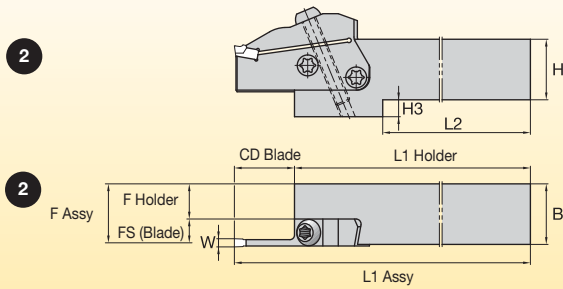


Grooving and Cut-Off



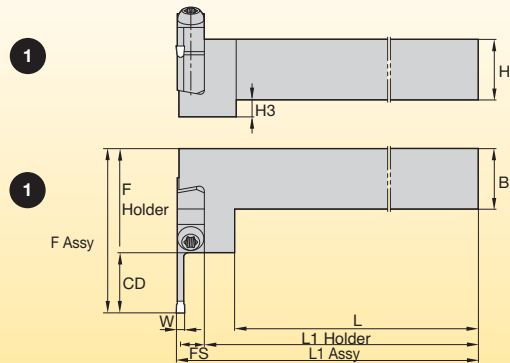
A3™ Modular Blades Assemblies

KGMS Toolholder with Modular Blade Assemblies



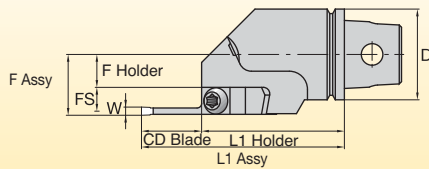
2 $F \text{ Assy} = F \text{ (Holder)} + FS \text{ (Blade)} + W/2$
 2 $L1 \text{ Assy} = L1 \text{ (Holder)} + CD \text{ (Blade)}$

KGME Toolholder with Modular Blade Assemblies



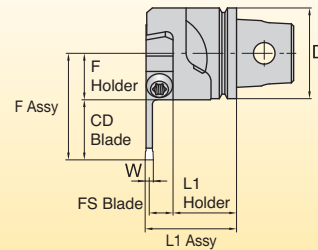
1 $F \text{ Assy} = F \text{ (Holder)} + CD \text{ (Blade)}$
 1 $L1 \text{ Assy} = L1 \text{ (Holder)} + FS \text{ (Blade)} + W/2$

KM-KGMS



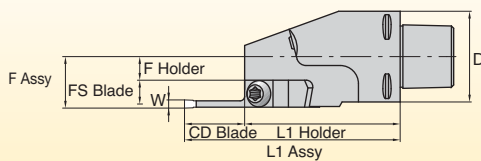
$F \text{ Assy} = F \text{ (Holder)} + FS \text{ (Blade)} + W/2$
 $L1 \text{ Assy} = L1 \text{ (Holder)} + CD \text{ (Blade)}$

KM-KGME



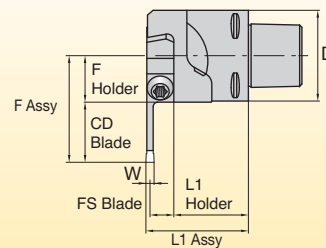
$F \text{ Assy} = F \text{ (Holder)} + CD \text{ (Blade)}$
 $L1 \text{ Assy} = L1 \text{ (Holder)} + FS \text{ (Blade)} + W/2$

C-KGMS



$F \text{ Assy} = F \text{ (Holder)} + FS \text{ (Blade)} + W/2$
 $L1 \text{ Assy} = L1 \text{ (Holder)} + CD \text{ (Blade)}$

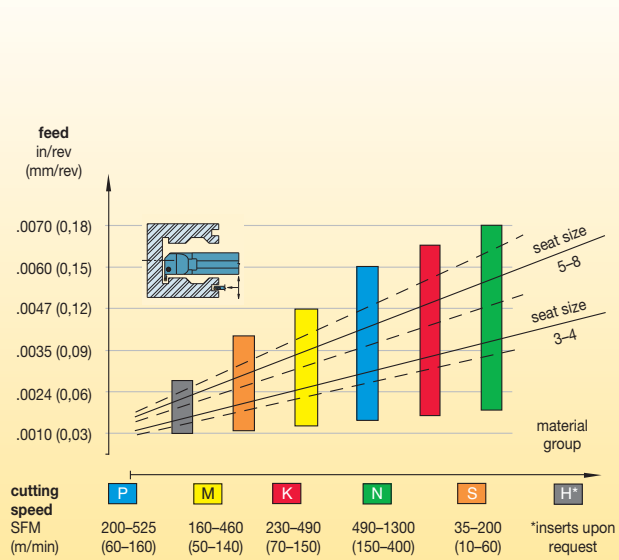
C-KGME



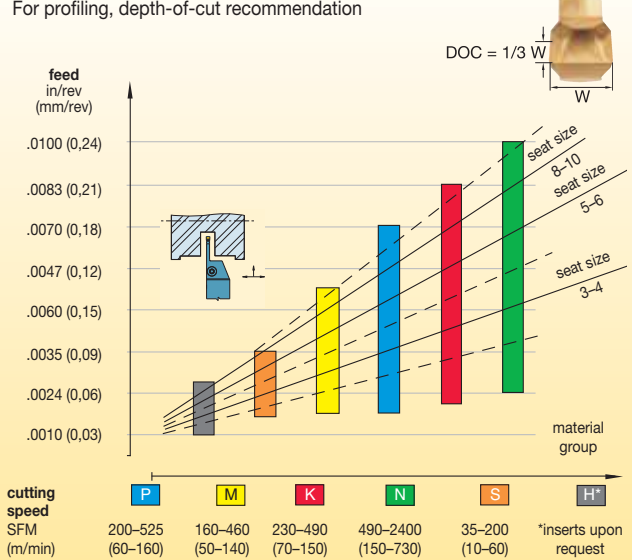
$F \text{ Assy} = F \text{ (Holder)} + CD \text{ (Blade)}$
 $L1 \text{ Assy} = L1 \text{ (Holder)} + FS \text{ (Blade)} + W/2$

Application Guidelines

Speed and Feed Selection for I.D. and Face Grooving



Speed and Feed Selection for O.D. Grooving

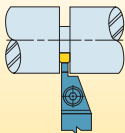


For radial grooving under stable conditions, feed can be increased by up to 50%.

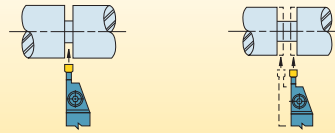
Tool Application Guidelines

- Always use good general machining practices.
- Make the machine and workpiece setup as rigid as possible.
- Integral shank toolholders offer the best rigidity. They should be your first toolholder choice, when possible.
- Use the toolholder with the shortest possible depth of cut for the application ("CD" dimension).
- When changing inserts, make sure the new insert locates securely against the toolholder's positive stop.
- Never tighten the clamping screw without an insert in the pocket.
- Toolholder projection out of the tool block should be as short as possible.
- Inserts should cut as close to center as possible.
- Dwell time in bottom of groove should be less than three revolutions.
- Recommended cutting speeds and feeds are a starting point. Adjust, as necessary, for optimum tool life and chip control.

Deep Grooves

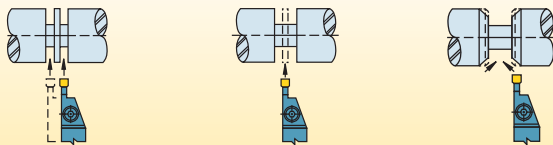


Deep Grooves Slightly Wider than the Tool



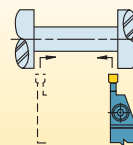
1. Plunge the center of the groove.
2. Plunge each side of the groove to get the specified width. Use a slower feed rate when cutting groove sides.

Extra-Wide Deep Grooves



1. Plunge out both sides of the groove width.
2. Plunge center area to remove web of remaining material.
3. Plunge both sides of groove at the required angle, using approximately one-half the width of the grooving tool for maximum width of cut.

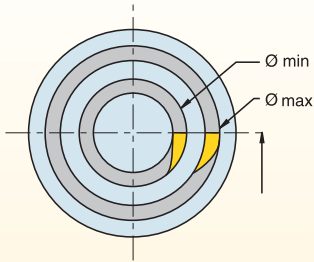
Finish Turning of the Groove/Light Profiling



1. Follow recommendations explained above.
2. To avoid insert chipping and to achieve groove wall perpendicularity, follow the tool path shown here.
3. Use the lightest depth of cut possible while still maintaining good chip breaking, tool life, and surface finish.

■ Grooving Tool Failure and Solution Guide

Face Grooving Application Guidelines



Tool Selection

- When selecting the toolholder, always start at the largest diameter possible and work toward the smaller diameter.

Cutting the First Groove

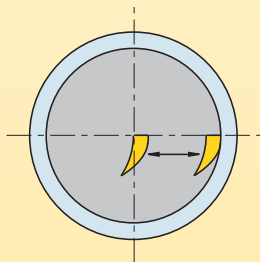
- The outside diameter of the first groove must be between the diameter minimum and diameter maximum capability of the face grooving tool (see illustration above). This creates clearance for the toolholder.

Chip Control

- Adjust speed and feed for good chip control and evacuation from the groove. Chip compaction can cause poor surface finish, tool breakage, and reduced tool life.

Tool Setting

- The tool should be set as close to the center as possible to avoid extreme formation of burrs.
- Align the cutting edge square to the workpiece.



Widening a Face Groove

- After the first groove has been cut, the groove width can be widened in either direction using the same tool. The best practice is to work from the O.D. to the I.D.

Practical Solutions to Grooving Problems

problem	remedy
burr	<ol style="list-style-type: none"> 1. Verify tool center height. 2. Use sharp tools (index more often). 3. Use positive rake PVD coated insert. 4. Use correct grade for workpiece material. 5. Use correct geometry (e.g., positive rake for workhardening material). 6. Change tool path.
poor surface finish	<ol style="list-style-type: none"> 1. Increase speed. 2. Use sharp tools (index more often). 3. Dwell time in bottom 1-3 revolutions (max). 4. Use proper chip control geometry. 5. Increase coolant flow. 6. Verify proper setup (overhang, shank size). 7. Use correct geometry (e.g., positive rake for workhardening material).
groove bottom not flat	<ol style="list-style-type: none"> 1. Use sharp tools (index more often). 2. Dwell time in bottom 1-3 revolutions (max). 3. Reduce tool overhang (increase rigidity). 4. Reduce feed rate at groove bottom. 5. Use a wider insert. 6. Verify tool center height.
poor chip control	<ol style="list-style-type: none"> 1. Use sharp tools (index more often). 2. Increase coolant concentration. 3. Adjust feed rate (usually increase first).
chatter	<ol style="list-style-type: none"> 1. Reduce tool and workpiece overhang. 2. Adjust speed (usually increase first). 3. Adjust feed (usually increase first). 4. Verify tool center height.
insert chipping	<ol style="list-style-type: none"> 1. Use correct grade for workpiece material. 2. Increase speed. 3. Reduce feed. 4. Use a stronger grade. 5. Increase tool and setup rigidity.
built-up edge	<ol style="list-style-type: none"> 1. Use positive rake PVD coated insert. 2. Increase speed. 3. Reduce feed. 4. Increase coolant flow/concentration. 5. Use cermets.
side walls not straight	<ol style="list-style-type: none"> 1. Check tool alignment for square. 2. Reduce workpiece and tool overhang. 3. Use sharp inserts (index more often).



KM Micro[™] Quick Change Tooling System

A smaller, more compact version of the internationally renowned KM[™] system.

- Quick-change cutter heads reduce indexing and set-up times by 66%.
- Specially designed for use with automatic and smaller universal lathes.
- Unique flange attachment system increases machine tool capacity.
- KM Micro square shank adapters can be installed quickly and easily in existing tool block adapters.

Experience the advantages at your Authorized Kennametal Distributor or at www.kennametal.com.

www.kennametal.com



VG Deep Grooving

Primary Application

The VG Deep-Grooving system is your first choice for productive machining of high-temperature alloys on medium to large lathes.

Features and Benefits

Toolholders

- Rigid bridge clamping system.
- Fast and easy tool change by loosening one screw.
- High-quality standard, close tolerances.

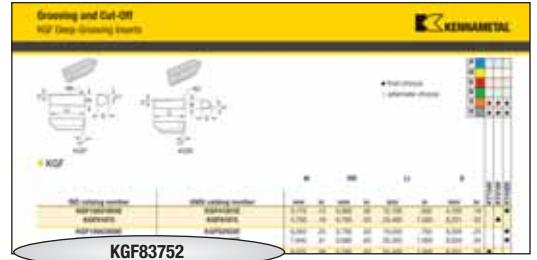
Inserts

- Available in flat top geometries with ground periphery.
- Single-ended styles in industry standard sizes.
- Available in high-performance ceramic grades.



How Do Catalog Numbers Work?

Each character in our catalog number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.



VG Deep-Grooving Inserts

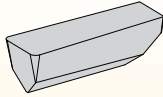
KG

Deep Grooving
Insert

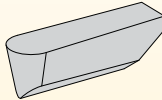
F

Groove
Style

F = Flat



R = Radius



8

Insert
Length

inch =
1/8" increments
metric =
millimeters

375

Width of
Groove

inch =
1/1000"
metric =
1/100mm

2

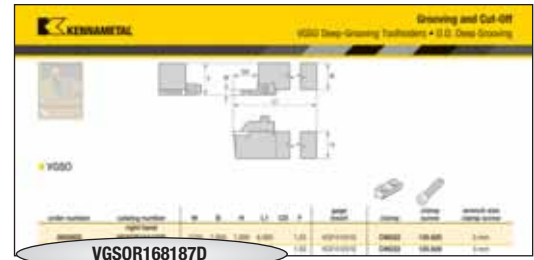
Corner Radii,
(*KGf only*)

symbol		corner radius	
inch	mm	inch	mm
1	04	.02	0,4
2	08	.03	0,8
4	16	.06	1,6

Grooving and Cut-Off

How Do Catalog Numbers Work?

Each character in our catalog number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.



VGSOR168187D

V-Bottom Deep-Grooving Inserts

VG

V-Bottom
Deep
Grooving

S

Tool
Style

O

O.D.
Grooving

R

Hand of
Tool

16

Shank
Dimensions

8187

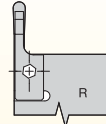
Insert
Size

D

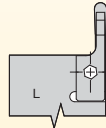
Qualified
Surfaces and
Length

Grooving and Cut-Off

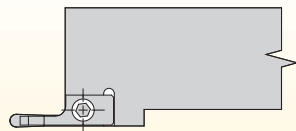
R = Right



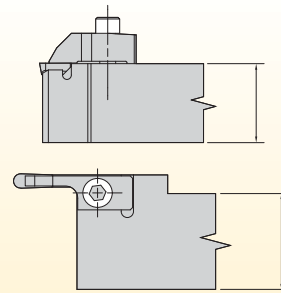
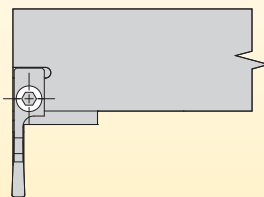
L = Left



S



E



square shanks =

The number indicates the toolholder cross section in 1/16" increments.

rectangular shanks =

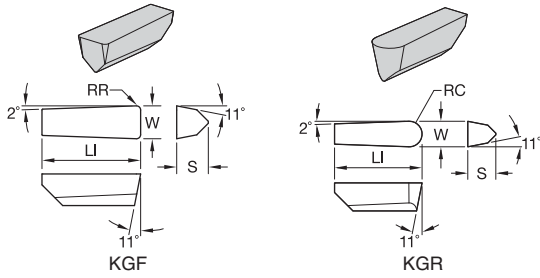
The first digit indicates the number of 1/8" increments of width and the second digit indicates the number of 1/4" increments of height.

D =

Qualified back and end, 6" long

E =

Qualified back and end, 7" long



● first choice
○ alternate choice

P			
M			
K			
N			
S	●	●	●
H	●	●	●

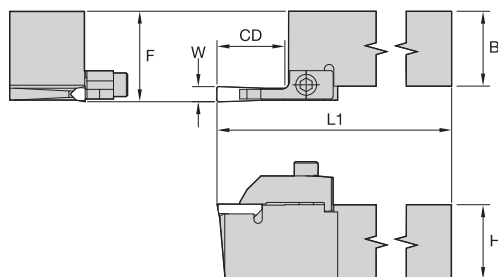
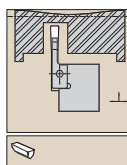
■ KGF

ISO catalog number	ANSI catalog number	W		RR		LI		S		KY1540	KY2100	KY4300
		mm	in	mm	in	mm	in	mm	in			
KGF12031804E	KGF41251E	3,175	.13	0,380	.02	12,700	.500	4,750	.19			●
KGF81872	KGF81872	4,750	.19	0,790	.03	25,400	1.000	8,331	.33	●		
KGF19063508E	KGF62502E	6,350	.25	0,790	.03	19,050	.750	6,300	.25			●
KGF25079408E	KGF83122E	7,940	.31	0,080	.03	25,400	1.000	8,520	.34			●
KGF25095208E	KGF83752	9,525	.38	0,790	.03	25,400	1.000	8,331	.33	●		
KGF25095208E	KGF83752E	9,525	.38	0,790	.03	25,400	1.000	8,520	.34			●

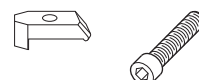
■ KGR

ISO catalog number	ANSI catalog number	W		RR		LI		S		KY1540	KY2100	KY4300
		mm	in	mm	in	mm	in	mm	in			
KGR19055628E	KGR6219E	5,563	.22	—	—	19,050	.750	6,096	.24			●
KGR19055628T02020	KGR6219T0820	5,563	.22	—	—	19,050	.750	6,096	.24			●
KGR25079440E	KGR8312E	7,940	.31	—	—	25,400	1.000	8,520	.34			●

Grooving and Cut-Off



■ VGSO



Grooving and Cut-Off

order number	catalog number	W	B	H	L1	CD	F	gage insert	clamp	clamp screw	wrench size clamp screw	
	right hand											
3650822	VGSOR164125D	.1250	1.000	1.000	6.000	.75	1.25	KGF41251E	CM222	125.620	5 mm	
3650864	VGSOR204125E	.1250	1.250	1.250	7.000	.75	1.50	KGF41251E	CM222	125.620	5 mm	
3650866	VGSOR244125E	.1250	1.500	1.500	7.000	.75	2.00	KGF41251E	CM222	125.620	5 mm	
3650868	VGSOR164156D	.1563	1.000	1.000	6.000	.75	1.25	KGF41562E	CM222	125.620	5 mm	
3650870	VGSOR204156E	.1563	1.250	1.250	7.000	.75	1.50	KGF41562E	CM222	125.620	5 mm	
3650872	VGSOR244156E	.1563	1.500	1.500	7.000	.75	2.00	KGF41562E	CM222	125.620	5 mm	
3650874	VGSOR164187D	.1870	1.000	1.000	6.000	.75	1.25	KGR4187E	CM186	125.625	5 mm	
1095845	VGSOR168187D	.1870	1.000	1.000	6.000	1.06	1.25	KGF81872	CM186	S423	—	
3650876	VGSOR204187E	.1870	1.250	1.250	7.000	.75	1.50	KGR4187E	CM186	125.625	5 mm	
3650878	VGSOR244187E	.1870	1.500	1.500	7.000	.75	2.00	KGR4187E	CM186	125.625	5 mm	
3650880	VGSOR206219E	.2190	1.250	1.250	7.000	1.13	1.50	KGF62191E	CM220	125.625	5 mm	
3650882	VGSOR246219E	.2190	1.500	1.500	7.000	1.13	2.00	KGF62191E	CM220	125.625	5 mm	
3650884	VGSOR206250E	.2500	1.250	1.250	7.000	1.13	1.50	KGF62502E	CM220	125.625	5 mm	
3650886	VGSOR246250E	.2500	1.500	1.500	7.000	1.13	2.00	KGF62502E	CM220	125.625	5 mm	
1015932	VGSOR248312E	.3120	1.500	1.500	7.000	1.56	2.00	KGF83122	CM130	S423	—	
3650888	VGSOR208344E	.3440	1.250	1.250	7.000	1.50	1.50	KFG83441E	CM130	125.625	5 mm	
3650890	VGSOR248344E	.3440	1.500	1.500	7.000	1.50	2.00	KFG83441E	CM130	125.625	5 mm	
1015891	VGSOR208375E	.3750	1.250	1.250	7.000	1.56	1.50	KGF83752	CM130	S423	—	
1015933	VGSOR248375E	.3750	1.500	1.500	7.000	1.56	2.00	KGF83752	CM130	S423	—	
	left hand											
3650863	VG SOL164125D	.1250	1.000	1.000	6.000	.75	1.25	KGF41251E	CM222	125.620	5 mm	
3650865	VG SOL204125E	.1250	1.250	1.250	7.000	.75	1.50	KGF41251E	CM222	125.620	5 mm	
3650867	VG SOL244125E	.1250	1.500	1.500	7.000	.75	2.00	KGF41251E	CM222	125.620	5 mm	
3650869	VG SOL164156D	.1563	1.000	1.000	6.000	.75	1.25	KGF41562E	CM222	125.620	5 mm	
3650871	VG SOL204156E	.1563	1.250	1.250	7.000	.75	1.50	KGF41562E	CM222	125.620	5 mm	
3650873	VG SOL244156E	.1563	1.500	1.500	7.000	.75	2.00	KGF41562E	CM222	125.620	5 mm	
3650875	VG SOL164187D	.1870	1.000	1.000	6.000	.75	1.25	KGR4187E	CM187	125.625	5 mm	
1095846	VG SOL168187D	.1870	1.000	1.000	6.000	1.06	1.25	KGF81872	CM187	S423	—	
3650877	VG SOL204187E	.1870	1.250	1.250	7.000	.75	1.50	KGR4187E	CM187	125.625	5 mm	
3650879	VG SOL244187E	.1870	1.500	1.500	7.000	.75	2.00	KGR4187E	CM187	125.625	5 mm	
3650881	VG SOL206219E	.2190	1.250	1.250	7.000	1.13	1.50	KGF62191E	CM220	125.625	5 mm	
3650883	VG SOL246219E	.2190	1.500	1.500	7.000	1.13	2.00	KGF62191E	CM220	125.625	5 mm	
3650885	VG SOL206250E	.2500	1.250	1.250	7.000	1.13	1.50	KGF62502E	CM220	125.625	5 mm	
3650887	VG SOL246250E	.2500	1.500	1.500	7.000	1.13	2.00	KGF62502E	CM220	125.625	5 mm	
1015926	VG SOL208312E	.3120	1.250	1.250	7.000	1.56	1.50	KGF83122	CM131	S423	—	
1015958	VG SOL248312E	.3120	1.500	1.500	7.000	1.56	2.00	KGF83122	CM131	S423	—	
3650889	VG SOL208344E	.3440	1.250	1.250	7.000	1.50	1.50	KFG83441E	CM131	125.625	5 mm	
3650891	VG SOL248344E	.3440	1.500	1.500	7.000	1.50	2.00	KFG83441E	CM131	125.625	5 mm	
1015927	VG SOL208375E	.3750	1.250	1.250	7.000	1.56	1.50	KGF83752	CM131	S423	—	
1015959	VG SOL248375E	.3750	1.500	1.500	7.000	1.56	2.00	KGF83752	CM131	S423	—	

A2™ Cut-Off tool. The image shows a grey metal cutting tool with a yellow handle, resting on a yellow surface. The tool has a cutting edge and a chipbreaker ramp. The background is a black and white checkered pattern.

A2TM Cut-Off

High-performance tools to maximize productivity.

The A2 platform is the ideal system for parting operations on a wide variety of workpiece materials. It works well in smooth and interrupted cuts in both wet and dry operations. Now it is available in KCU25™ for superior edge toughness and excellent wear resistance.

- V-prisms on both top and bottom enable higher clamping force to prevent insert movement, even when cutting at high-feed rates.
- The cutting edge has a molded-in chipbreaker ramp to direct chips away from the blade, extending blade life.
- Positive rake cutting action combined with Kennametal's high-performance PVD coatings result in superior tool life and chip control.
- Fixed insert stop ensures solid seating with every index and delivers up to 30% longer life.
- Cutting height is accurately controlled for maximum reliability and performance on even small-diameter parts.

Experience the advantages at your Authorized Kennametal Distributor or at www.kennametal.com.

www.kennametal.com

 **KENNAMETAL[®]**



A4™ Tooling and Beyond™ Inserts for All Your O.D. and I.D. Applications



Primary Application

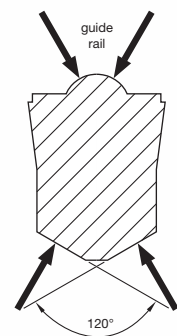
Choose A4 tooling for turning, facing, grooving, face grooving, and cut-off applications across a broad range of workpiece materials. The unique clamping system and versatile insert geometry deliver the highest metal removal rates in the industry.

Features and Benefits

A4 Grooving and Turning System

- One tool for turning, facing, grooving, face-grooving, and cut-off in O.D. and I.D. applications means exceptionally fast cycle times, no turret indexes!
- Extra-long clamping area, ground 120° bottom prism seating surface, and an exclusive top guide rail combine to deliver unsurpassed grooving and side-turning stability!
- Precise insert positioning is ensured for accurate cuts!
- Rigid clamping securely locks insert in place through the toughest cuts.

- Versatile design enables one system to handle O.D. and I.D. grooving, face grooving, back turning, undercutting, and even threading operations.
- Chip control inserts provide excellent chip evacuation in grooving, and offer better chip control in multidirectional turning.



A4 Chipbreakers



GMN Chipbreaker



GMP Chipbreaker



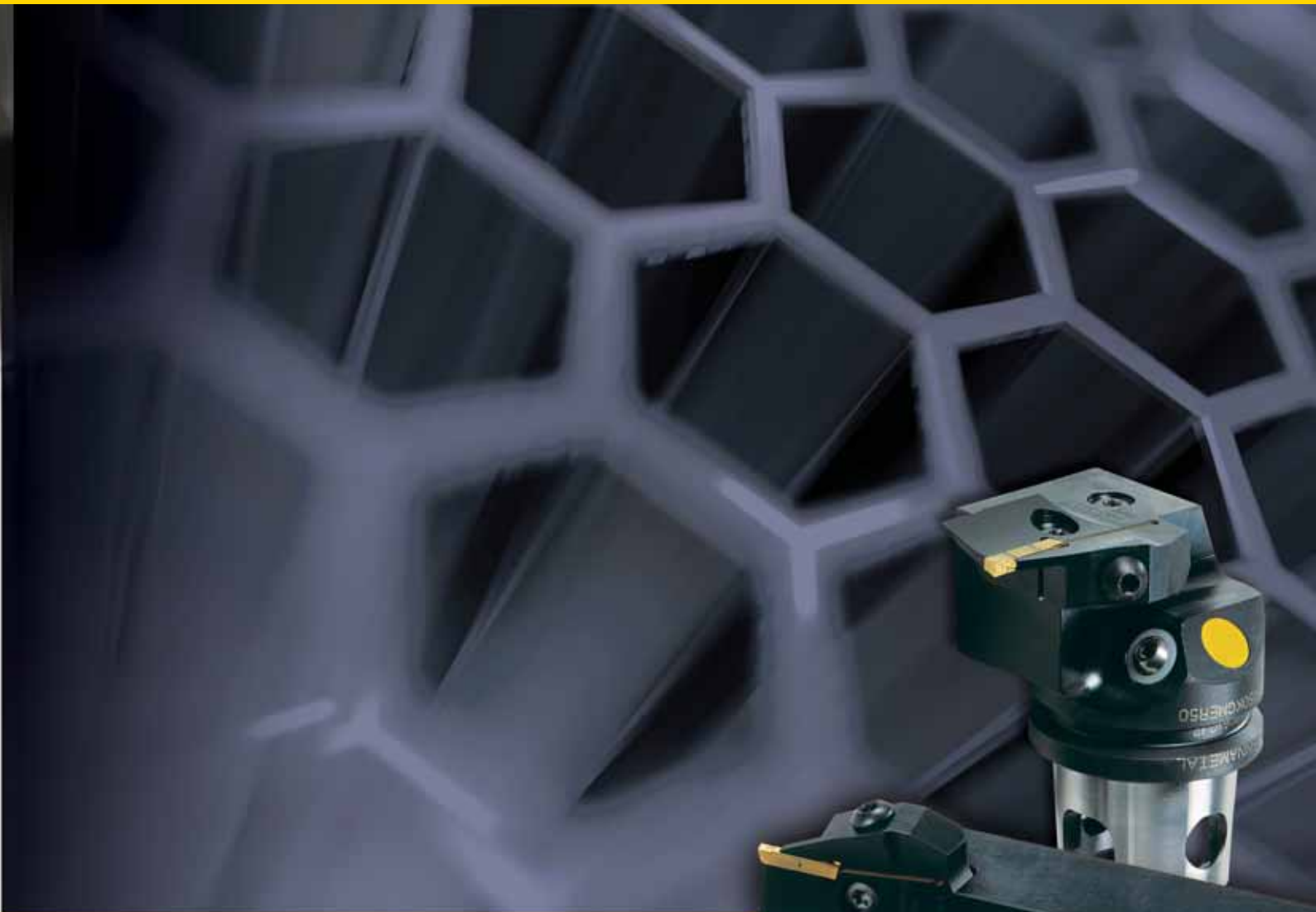
GMN Chipbreaker



GMP Chipbreaker



GUP Chipbreaker



The A4™ System Increases Productivity

- Covers multiple applications.
- Reduces tool cost.
- Minimizes machining time.



To learn more, scan here.
For instructions on how to scan, please see page xxix.



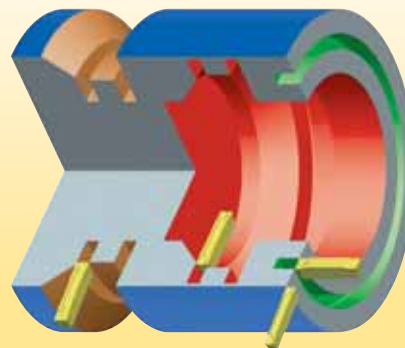
■ Step 1 • Select A4 size for grooving and turning application

What you need to know:

- Groove depth, width, and profile.
- Material being machined.
- Application to be performed (O.D. and I.D. grooving, turning, face grooving, and cut-off).

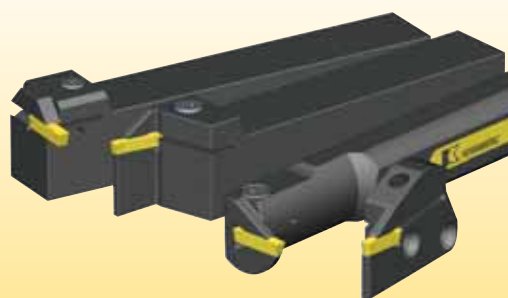
General Recommendation to Select the Insert Size

for workpiece diameters	insert seat size
<25mm	3
25–50mm	4
>50mm	5–10



■ Step 2 • Select toolholder based on the application

	conventional toolholders	modular blades
O.D. grooving, cut-off, and turning	page D90	page D106
face grooving	page D94	page D107
I.D. grooving, cut-off, and turning	page D95	—



NOTE: Insert seat size must match the seat size of the toolholder.

■ Step 3 • Select chipbreaker style and feed rate

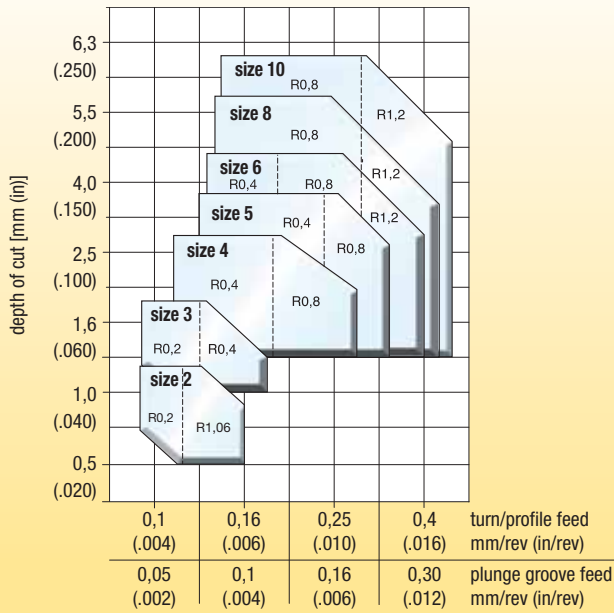
Choose Chipbreaker Based on Material Type

P	M	N	S	H
GMN	GUP/GMP	GUP/GMP precision ground (-E for KD 1405)	GUP/GMP precision ground	GMN

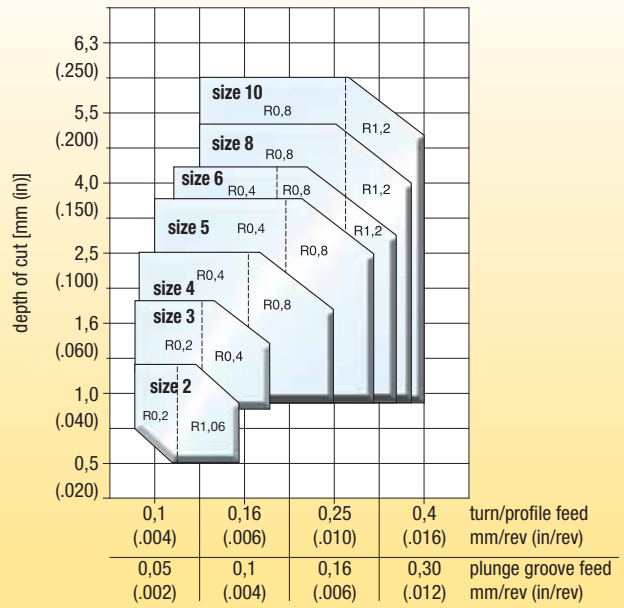
NOTE: Precision ground A4-P-GMN inserts can be applied on all material groups for inch-width grooving.

Depth of Cut and Feed Guidelines

square inserts (A4G...)			full radius inserts (A4R...)	
GMN chipbreaker	GMP chipbreaker	GUP chipbreaker	GMN chipbreaker	GMP chipbreaker
<ul style="list-style-type: none"> • Groove and turn molded and precision ground inserts. • Stable cutting edge. • Available in metric and inch widths. 	<ul style="list-style-type: none"> • Groove and turn inserts. • Available in molded and precision-ground styles. • Positive rake angle. • Available in metric widths only. 	<ul style="list-style-type: none"> • Groove and turn inserts in new Beyond™ grades. • Available in molded and precision-ground styles. • Positive rake angle with enhanced chip control. • Available in metric widths only. 	<ul style="list-style-type: none"> • Maximum turning and profiling depth of cut equals half the insert width. • The maximum turn and profile feed rate depends on the material to be machined and the depth of cut. For easy-to-machine materials, feed can be increased up to 1.5 times. 	<ul style="list-style-type: none"> • Groove and turn inserts. • Available in molded and precision-ground styles. • Positive rake angle. • Available in metric widths only.

GMN


NOTE: Select feed based on nose radius.
Diagram explanation: R0,2 - R = corner radius; 0,2 = 0,2mm radius

GMP/GUP


■ Step 4 • Select grade and speed

Recommended Beyond™ Grades

cutting condition		P	M	K	N	S	H
heavily interrupted cut		KCU25/KC5025	KCU25/KC5025	KC9125	KCU25/KC5025	KCU25/KC5025	—
lightly interrupted cut		KCP25/KC9125/ KC9125/KCU25/ KC5025	KCU25/KC5025	KC9125	KCU25/KC5025	KCU25/KC5025	—
varying depth of cut, casting, or forging skin		KCU10/KC5010	KCU10/KC5010	KC9110	KCU10/KC5010/ KD1405	K313/KU10/ KCU10/KC5010	KCU10/KC5010
smooth cut, pre-turned surface		KT315/KCP10/ KC9110	KT315	KC9110	KCU10/KC5010/ KD1405	K313/KU10/ KCU10/KC5010	KCU10/KC5010

Recommended Beyond Cutting Speeds

Steel starting conditions

material group	grade	speed — m/min (SFM)						m/min	SFM
		60 (200)	120 (400)	185 (600)	245 (800)	300 (1000)	360 (1200)		
P	KCU10							120	400
	KCP10							275	900
	KCP25							220	725
	KC5025							120	400
	KC9110							250	800
	KC9125							200	650
	KT315**							260	850

**KT315 is an alternative choice for steel; primarily available in the GMP chipbreaker.

Stainless Steel starting conditions

material group	grade	speed — m/min (SFM)						m/min	SFM
		45 (150)	90 (300)	140 (450)	185 (600)	230 (750)	275 (900)		
M	KU10							55	185
	KCU10							140	465
	KCU25							110	365
	KC5010							135	450
	KC5025							105	350
	KT315							170	400

Non-Ferrous Metals starting conditions

material group	grade	speed — m/min (SFM)						m/min	SFM
		150 (500)	300 (1000)	460 (1500)	610 (2000)	760 (2500)	900 (3000)		
N	KC5025							365	1200
	KC5010							455	1500
	KD1405***							610	2000

***Recommended for high-silicon aluminum alloys and abrasive nonmetallics.

High-Temperature Alloys starting conditions

material group	grade	speed — m/min (SFM)						m/min	SFM
		15 (60)	35 (120)	55 (180)	75 (240)	90 (300)	140 (450)		
S	KU10							22	75
	KCU10							65	220
	KCU25							50	160
	KC5010							60	200
	KC5025							45	150
	KT315							30	100

Hardened Materials starting conditions

material group	grade	speed — m/min (SFM)						m/min	SFM
		15 (60)	35 (120)	55 (180)	75 (240)	95 (300)	115 (360)		
H	KC5010							30	100

Grooving and Cut-Off

■ **Step 5 • Select insert and holder from catalog page**

NOTE: The insert seat size must match the seat size of your toolholder selection.

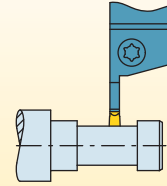
Example for A4 — Groove and Turn

Material low-alloyed steel
 Workpiece O.D. 1.5" (38mm)
 Groove depth5" (12mm)
 Groove width850" (22mm)
 Lightly interrupted cut

Recommendation

Insert A4G0405M04U08GMN
 Grade KC9125
 Insert width 4,05mm
 Insert seat size 4

 Toolholder A4SMR160417
 Grooving depth670" (17mm)
 Seat size 4



Speed: 650 SFM (200 m/min)
 Feed: .010 in/rev (0,25 mm/rev)
 Plunge feed: .006 in/rev (0,14 mm/rev)

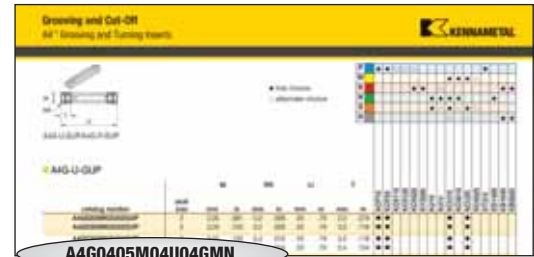
Congratulations!

You have successfully maximized your productivity by selecting the best A4 insert geometry, grade, and cutting specifications for your application!



How Do Catalog Numbers Work?

Each character in our catalog number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.



A4G0405M04U04GMN

Grooving and Cut-Off

Grooving and Turning Inserts

A4	G	0405	M	04	U	04	GMN
Tooling System	Insert Type	Groove Width	Unit of Measurement for Grooving Width	Seat Size	Insert Tolerance	Corner Radii	Chipbreaker Type/Edge Prep
A4 = Grooving and Turning	G = Square R = Full radius C = Cut-off	Expressed in 1/100mm or .00"	M = Metric N = Inch				GMN = Grooving and turning medium machining stable cutting edge GMP = Grooving and turning medium machining positive rake angle GUP = Grooving and turning high positive geometry. Especially in stainless steels and high-temp alloys B = Flat top for special forms and applications E = Flat top, slight honed edge S = Negative land plus hone ST = Single tip

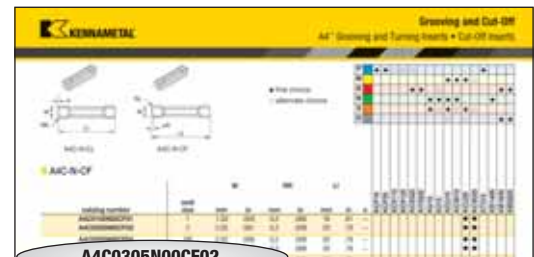
pocket seat size	cutting width (mm)
02	2,00-2,62
2B	2,39-2,62
03	3,0-3,05
04	4,0-4,05
05	5,0-5,05
06	6,0-6,05
08	8,0-8,05
10	10,0-10,05
2S	2,00-2,62
3S	3,00-3,05
4S	4,00-4,05
5S	5,00-5,05

P = Precision ground
grooving width tolerance:
± .001" (0,025mm)

U = Utility molded
grooving width tolerance:

3,05-4,05:	+ .006"	(+0,15mm)
	-0	-0
5,05-10,05:	+ .010"	(+0,25mm)
	-0	-0

inch	mm
0 = .004	01 = 0,1
05 = .008	02 = 0,2
1 = .016	04 = 0,4
2 = .032	08 = 0,8
3 = .047	12 = 1,2
full radius = 00	



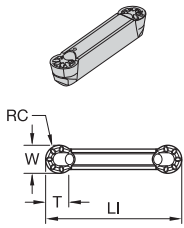
A4C0305N00CF02

Cut-Off Inserts

A4	C	0305	N	00	CF	02				
Tooling System	Insert Type	Cutting Width	Hand of Insert	Main Cutting Edge Lead Angle	Chipbreaker Type	Corner Radius				
A4 = Grooving and Turning	C = Cut-off	Expressed in 1/100mm	R = Right hand L = Left hand N = Neutral	00 = Neutral 06 = 6° 10 = 10°	CF = Cut-off fine positive rake	<table border="1"> <thead> <tr> <th>inch</th> <th>mm</th> </tr> </thead> <tbody> <tr> <td>.008</td> <td>02 = 0,2</td> </tr> </tbody> </table>	inch	mm	.008	02 = 0,2
inch	mm									
.008	02 = 0,2									

insert type and chipbreaker designation		application range	metric widths (mm)	inch widths (in)	P	M	N	S	H
Molded: A4G-U-GUP		Groove and Turn: • Stable cutting edge for higher feed rates. • Utility molded.	2–10	—	●	●	●	●	○
Precision Ground: A4G-P-GUP		• Stable, precision ground cutting edge. • General grooving for specific inch widths. • ± .001" (0,025mm) width tolerance.	2–10	—	●	●	●	●	○
Molded: A4G-U-GMN		Groove and Turn: • Stable cutting edge for higher feed rates. • Utility molded.	3,05–10,05	—	●				●
Precision Ground: A4G-P-GMN		• Stable, precision ground cutting edge. • General grooving for specific inch widths. • ± .001" (0,025mm) width tolerance.	—	.125–.375	●	○	○	○	●
Molded: A4G-U-GMP		Groove and Turn: • Positive rake angle. • Reduced cutting force. • Small to medium feed rates. • Utility molded.	3,05–10,05	—	○	●			
Precision Ground: A4G-P-GMP		• Positive rake angle. • Precision ground cutting edge. • ± .001" (0,025mm) width tolerance.	3–10	—		○	●	●	
Molded: A4R-U-GMN		Groove and Turn: • Stable cutting edge for higher feed rates. • Utility molded.	3,05–10,05	—	●				●
Precision Ground: A4R-P-GMN		• Stable, precision ground cutting edge. • General grooving for specific inch widths. • ± .001" (0,025mm) width tolerance.	—	.125–.375	●	○	○	○	●
Precision Ground: A4R-P-GMP		Groove and Turn: • Positive rake angle. • Precision ground cutting edge. • ± .001" (0,025mm) width tolerance.	3–10	—		●	●	●	
Molded: A4G-U-B		Groove and Turn: • For special profiles and for PCBN-tipped inserts (by request only). • Secondary choice for cast iron and high-temp alloys.	3,05–10,05	—				○	
Precision Ground: A4G-P-E-PCD		• Diamond sheet-tipped tool for high-performance non-ferrous machining.	3–5	—			●		
Molded: A4C-CF		Cut-Off: • High positive rake angle. • Sharp cutting edge. • Available in neutral lead angle in 6° and 10° right- and left-hand styles.	3,05–4,05	—	●	●	●	●	





A4R-P-GUP/A4R-U-GUP

A4R-P-GUP

catalog number	seat size	W		RC		LI		KCP10	KCP25	KC9110	KC9125	KC9320	KY3500	KU10	K313	KCU10	KC5010	KCU25	KC5025	KT315	KD1405	KB1630	KB5625
		mm	in	mm	in	mm	in																
A4R0300M03P00GUP	3	3,00	.118	1,5	.059	20	.79																
A4R0400M04P00GUP	4	4,00	.157	2,0	.079	20	.79																
A4R0500M05P00GUP	5	5,00	.197	2,5	.098	25	.98																
A4R0600M06P00GUP	6	6,00	.236	3,0	.118	30	1.18																
A4R0800M08P00GUP	8	8,00	.315	4,0	.158	30	1.18																
A4R1000M10P00GUP	10	10,00	.394	5,0	.197	30	1.18																
A4R125I03P00GUP	3	3,18	.125	1,6	.063	20	.79																
A4R187I04P00GUP	4	4,76	.188	2,4	.094	20	.79																
A4R250I06P00GUP	6	6,35	.250	3,2	.125	30	1.18																
A4R312I08P00GUP	8	7,94	.312	4,0	.156	30	1.18																
A4R375I10P00GUP	10	9,52	.375	4,8	.188	30	1.18																

A4R-U-GUP

catalog number	seat size	W		RC		LI		KCP10	KCP25	KC9110	KC9125	KC9320	KY3500	KU10	K313	KCU10	KC5010	KCU25	KC5025	KT315	KD1405	KB1630	KB5625
		mm	in	mm	in	mm	in																
A4R0305M03U00GUP	3	3,05	.120	1,5	.060	20	.79																
A4R0505M05U00GUP	5	5,05	.199	2,5	.099	25	.99																
A4R1005M10U00GUP	10	10,05	.396	5,0	.198	30	1.19																

P	●	○	○	○																			
M																							
K																							
N																							
S																							
H																							

● first choice
○ alternate choice

Grooving and Cut-Off

How Do Catalog Numbers Work?

Each character in our catalog number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.

A4SMR100214

Grooving and Cut-Off

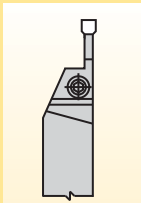
A4

Tooling System

A4 = Grooving and Turning

S

Tool Style



S = Straight



E = End mounted 90°

M

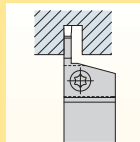
Support Type

M = Maximum support for specific groove widths and straight clearance for unlimited workpiece diameters

E = No steel support for face grooving

R

Hand of Tool



R = Right hand
L = Left hand
N = Neutral

10

Shank Size

inch: For square shanks, the number indicates the height and width in 1/16-inch increments (rectangular: 1st digit = width in 1/8-inch increments, 2nd digit = height in 1/4-inch increments)

metric: Height x width in mm, letter indicates tool length according to ISO

metric tool length (mm)
K = 125
M = 150
P = 170

02

Seat Size

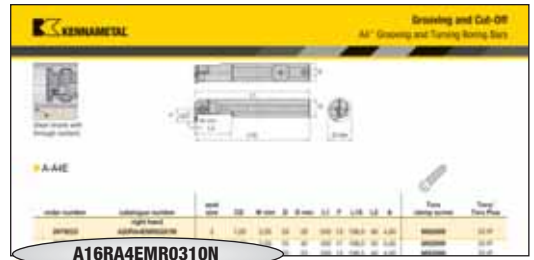
- 02
- 03
- 04
- 05
- 06
- 08
- 10

14

Max Grooving Depth

in millimeters

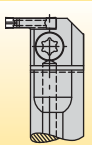
By referencing this easy-to-use guide, you can identify the correct product to meet your needs.



A16RA4EMR0310N

A

Steel Bar with Coolant



16

Bar Diameter

R

Bar Length

A4

A4 Groove & Turn System

E

Tool Style

M

Support Type

R

Hand of Tool

03

Insert Seat Size

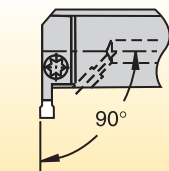
10

Grooving Depth in mm

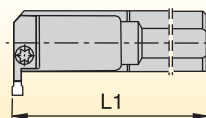
N

Tool Units

N = Inch
M = Metric

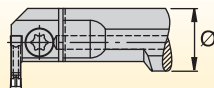


E = End mounted (90°)



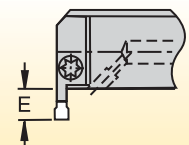
inch bars:
R = 8"
S = 10"
T = 12"

metric bars:
R = 200mm
S = 250mm
T = 300mm



inch bars:
A two-digit number which indicates the bar diameter in 1/16" increments.

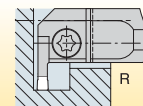
metric bars:
Bar diameter in millimeters



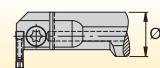
conversions:

mm	inch
7mm	= .28"
10mm	= .39"
12mm	= .47"
16mm	= .63"

pocket seat size	cutting width (mm)
02	2,00–2,62
2B	2,39–2,62
03	3,0–3,05
04	4,0–4,05
05	5,0–5,05
06	6,0–6,05
08	8,0–8,05
10	10,0–10,05



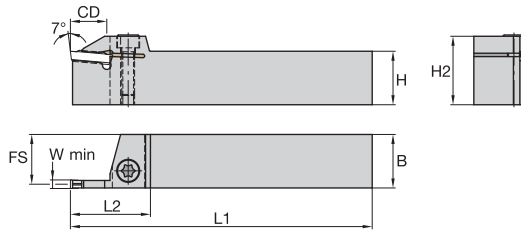
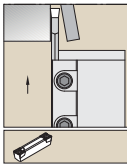
R = Right hand



L = Left hand

M = Maximum support

Grooving and Cut-Off



A4SM

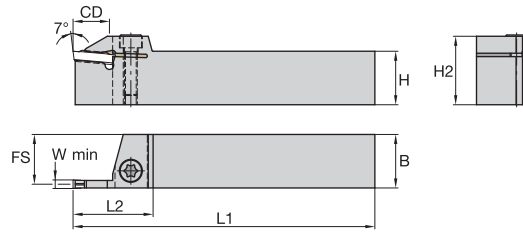
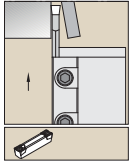


Grooving and Cut-Off

order number	catalog number	seat size	CD	W min	H	B	H2	L1	FS	L2	clamp screw	Torx
	right hand											
2976495	A4SMR100214	2	.55	.079	.625	.625	.98	5.00	.59	1.18	MS1160	T20
2976496	A4SMR120214	2	.55	.079	.750	.750	.95	5.00	.71	1.18	MS1160	T20
2976497	A4SMR120217	2	.67	.079	.750	.750	1.18	5.00	.71	1.34	MS1944	T25
2976498	A4SMR160217	2	.67	.079	1.000	1.000	1.24	6.00	.96	1.34	MS1944	T25
1953179	A4SMR120314	3	.55	.118	.750	.750	1.06	5.00	.69	1.38	MS1595	T30
1953177	A4SMR100314	3	.55	.118	.625	.625	1.03	5.00	.57	1.38	MS2091	T25
1953181	A4SMR160317	3	.67	.118	1.000	1.000	1.26	6.00	.94	1.46	MS1970	T30
1957224	A4SMR100414	4	.55	.157	.625	.625	1.03	5.00	.55	1.38	MS2091	T25
1953323	A4SMR120414	4	.55	.157	.750	.750	1.06	5.00	.67	1.38	MS1595	T30
1953325	A4SMR160417	4	.67	.157	1.000	1.000	1.26	6.00	.92	1.46	MS1970	T30
1957226	A4SMR200417	4	.67	.157	1.250	1.250	1.54	6.00	1.17	1.46	MS1970	T30
1953327	A4SMR120519	5	.75	.197	.750	.750	1.10	5.00	.65	1.57	MS1595	T30
1953329	A4SMR160520	5	.79	.197	1.000	1.000	1.30	6.00	.90	1.57	MS1970	T30
1957228	A4SMR200522	5	.87	.197	1.250	1.250	1.54	6.00	1.15	1.65	MS1970	T30
2263175	A4SMR120620	6	.79	.236	.750	.750	1.06	5.00	.64	1.57	MS1595	T30
2263176	A4SMR160620	6	.79	.236	1.000	1.000	1.30	6.00	.89	1.57	MS1970	T30
2263177	A4SMR160624	6	.94	.236	1.000	1.000	1.30	6.00	.89	1.69	MS1970	T30
2263178	A4SMR200626	6	1.02	.236	1.250	1.250	1.57	6.00	1.14	1.77	MS1970	T30
2263179	A4SMR240626	6	1.02	.236	1.500	1.500	1.81	7.00	1.39	1.77	MS1970	T30
2263185	A4SMR160820	8	.79	.315	1.000	1.000	1.34	6.00	.86	1.69	MS1490	T45
2263186	A4SMR160824	8	.94	.315	1.000	1.000	1.34	6.00	.86	1.81	MS1490	T45
2263187	A4SMR200826	8	1.02	.315	1.250	1.250	1.61	6.00	1.11	1.85	MS1490	T45
2263188	A4SMR240826	8	1.02	.315	1.500	1.500	1.85	7.00	1.36	1.85	MS1490	T45
2263193	A4SMR201026	10	1.02	.394	1.250	1.250	1.61	6.00	1.08	1.85	MS1490	T45
2263195	A4SMR241026	10	1.02	.394	1.500	1.500	1.85	7.00	1.33	1.85	MS1490	T45


(continued)

(A4SM continued)



order number	catalog number	seat size	CD	W min	H	B	H2	L1	FS	L2	clamp screw	Torx
	left hand											
2976491	A4SML100214	2	.55	.079	.625	.625	.98	5.00	.59	1.18	MS1160	T20
2976492	A4SML120214	2	.55	.079	.750	.750	.95	5.00	.71	1.18	MS1160	T20
2976493	A4SML120217	2	.67	.079	.750	.750	1.18	5.00	.71	1.34	MS1944	T25
2976494	A4SML160217	2	.67	.079	1.000	1.000	1.24	6.00	.96	1.34	MS1944	T25
1953178	A4SML100314	3	.55	.118	.625	.625	1.03	5.00	.57	1.38	MS2091	T25
1953180	A4SML120314	3	.55	.118	.750	.750	1.06	5.00	.69	1.38	MS1595	T30
1953182	A4SML160317	3	.67	.118	1.000	1.000	1.26	6.00	.94	1.46	MS1970	T30
1953324	A4SML120414	4	.55	.157	.750	.750	1.06	5.00	.67	1.38	MS1595	T30
1957227	A4SML200417	4	.67	.157	1.250	1.250	1.54	6.00	1.17	1.46	MS1970	T30
1953326	A4SML160417	4	.67	.157	1.000	1.000	1.26	6.00	.92	1.46	MS1970	T30
1953328	A4SML120519	5	.75	.197	.750	.750	1.10	5.00	.65	1.57	MS1595	T30
1953330	A4SML160520	5	.79	.197	1.000	1.000	1.30	6.00	.90	1.57	MS1970	T30
1957229	A4SML200522	5	.87	.197	1.250	1.250	1.54	6.00	1.15	1.65	MS1970	T30
2263180	A4SML120620	6	.79	.236	.750	.750	1.06	5.00	.64	1.57	MS1595	T30
2263181	A4SML160620	6	.79	.236	1.000	1.000	1.30	6.00	.89	1.57	MS1970	T30
2263182	A4SML160624	6	.94	.236	1.000	1.000	1.30	6.00	.89	1.69	MS1970	T30
2263183	A4SML200626	6	1.02	.236	1.250	1.250	1.57	6.00	1.14	1.77	MS1970	T30
2263184	A4SML240626	6	1.02	.236	1.500	1.500	1.81	7.00	1.39	1.77	MS1970	T30
2263189	A4SML160820	8	.79	.315	1.000	1.000	1.34	6.00	.86	1.69	MS1490	T45
2263190	A4SML160824	8	.94	.315	1.000	1.000	1.34	6.00	.86	1.81	MS1490	T45
2263191	A4SML200826	8	1.02	.315	1.250	1.250	1.61	6.00	1.11	1.85	MS1490	T45
2263192	A4SML240826	8	1.02	.315	1.500	1.500	1.85	7.00	1.36	1.85	MS1490	T45
2263194	A4SML201026	10	1.02	.394	1.250	1.250	1.61	6.00	1.08	1.85	MS1490	T45
2263196	A4SML241026	10	1.02	.394	1.500	1.500	1.85	7.00	1.33	1.85	MS1490	T45

Grooving and Cut-Off



KM MicroTM Quick Change Tooling System

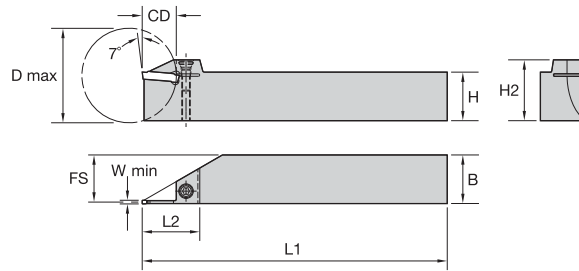
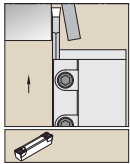
A smaller, more compact version of the internationally renowned KMTM system.

- Quick-change cutter heads reduce indexing and set-up times by 66%.
- Specially designed for use with automatic and smaller universal lathes.
- Unique flange attachment system increases machine tool capacity.
- KM Micro square shank adapters can be installed quickly and easily in existing tool block adapters.

Experience the advantages at your Authorized Kennametal Distributor or at www.kennametal.com.

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A4SC

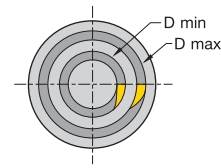
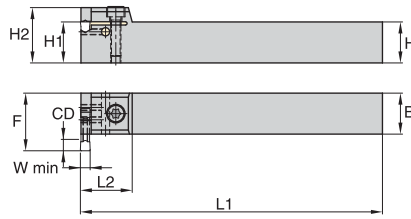
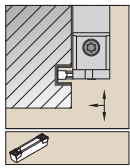


catalog number	seat size	CD	W min	H	B	H2	H3	L1	FS	L2	insert screw	Torx wrench
right hand												
A4SCR060113	1	.53	.059	.375	.375	.82	.25	4.50	.35	.98	MS1156	KT15
A4SCR080113	1	.53	.059	.500	.500	.82	.13	4.50	.47	.98	MS1156	KT15
A4SCR100113	1	.53	.059	.625	.625	.82	—	4.50	.60	.98	MS1156	KT15
A4SCR120113	1.5	.53	.059	.750	.743	.95	—	5.00	.72	.98	MS1156	KT15
A4SCR100217	2	.69	.079	.625	.625	1.02	.16	4.50	.59	1.22	—	KT25
A4SCR080214	2	.57	.079	.500	.500	.82	.13	4.50	.46	1.10	—	KT20
A4SCR100317	3	.69	.118	.625	.625	1.06	.16	4.50	.57	1.30	—	—
A4SCR080314	3	.57	.118	.500	.500	.90	.13	4.50	.45	1.18	—	—
left hand												
A4SCL080113	1	.53	.059	.500	.500	.82	.13	4.50	.47	.98	MS1156	KT15
A4SCL060113	1	.53	.059	.375	.375	.82	.25	4.50	.35	.98	MS1156	KT15
A4SCL120113	1.5	.53	.059	.750	.750	.95	—	5.00	.72	.98	MS1156	KT15
A4SCL100113	1.5	.53	.059	.625	.625	.82	—	4.50	.60	.98	MS1156	KT15
A4SCL100217	2	.69	.079	.625	.625	1.02	.16	4.50	.59	1.22	—	KT25
A4SCL080214	2	.57	.079	.500	.500	.82	.13	4.50	.46	1.10	—	KT20
A4SCL100317	3	.69	.118	.625	.625	1.06	.16	4.50	.57	1.30	—	—
A4SCL080314	3	.57	.118	.500	.500	.90	.13	4.50	.45	1.18	—	—

Grooving and Cut-Off

Grooving and Cut-Off

A4™ Grooving and Turning Toolholders



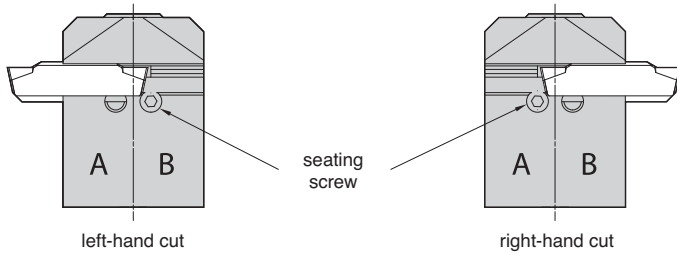
A4EN

Grooving and Cut-Off

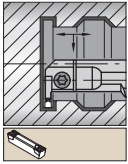
order number	catalog number	seat size	CD	W min	D min	H	H1	B	H2	L1	F	L2	clamp screw		seating screw		hex
													Torx	hex	hex	hex	
2414138	A4ENN120305	3	.20	.118	2.756	.75	.75	.75	1.06	5.00	.965	.98	MS2091	T25	MS2090	1.5 mm	
2414139	A4ENN160305	3	.20	.118	2.756	1.00	1.00	1.00	1.26	6.00	1.213	.98	MS2091	T25	MS2090	1.5 mm	
1953332	A4ENN160407	4	.28	.157	3.543	1.00	1.00	1.00	1.26	6.00	1.309	.98	MS2091	T25	MS2090	1.5 mm	
1953331	A4ENN120407	4	.28	.157	3.543	.75	.75	.75	1.06	5.00	1.061	.98	MS2091	T25	MS2090	1.5 mm	
1953334	A4ENN160509	5	.35	.197	4.724	1.00	1.00	1.00	1.30	6.00	1.398	1.34	MS1970	T30	193.297	1.5 mm	
1953333	A4ENN120509	5	.35	.197	4.724	.75	.75	.75	1.10	5.00	1.148	1.10	MS1595	T30	MS2090	1.5 mm	
2511468	A4ENN120611	6	.43	.236	4.724	.75	.75	.75	1.10	5.00	1.374	1.34	MS1595	T30	193.297	2 mm	
2511470	A4ENN200611	6	.43	.236	4.724	1.25	1.25	1.25	1.57	6.00	1.697	1.34	MS1970	T30	193.297	2 mm	
2511469	A4ENN160611	6	.43	.236	4.724	1.00	1.00	1.00	1.30	6.00	1.539	1.34	MS1970	T30	193.297	2 mm	
2511471	A4ENN160811	8	.43	.315	4.724	1.00	1.00	1.00	1.38	6.00	1.539	1.57	MS1490	T45	193.407	2.5 mm	
2511472	A4ENN200811	8	.43	.315	4.724	1.25	1.25	1.25	1.65	6.00	1.697	1.57	MS1490	T45	193.407	2.5 mm	

NOTE: D min for face grooving applications.
 A4EN-style toolholders are designed without steel support for face grooving capacity.
 Cutting feed recommendations should be reduced by 25–30%.
 Recommended clamp screw torque, 6–8 Nm (50–70 in. lbs.).
 Minimum cutting width supplied for reference only; see insert listing for actual width. Always match seat size of insert to seat size of holder.

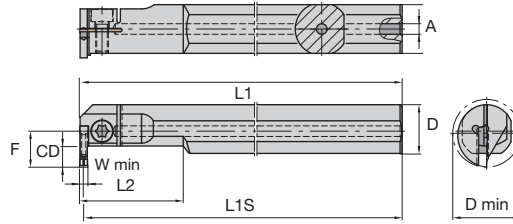
A4EN Insert Mounting



A4EN-style holders can be used for either left- or right-hand applications. The seating screw is to be used in position B for a left-hand cut and in position A for a right-hand cut.



Steel shank with through coolant.

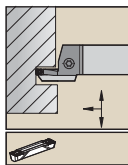


■ A-A4E

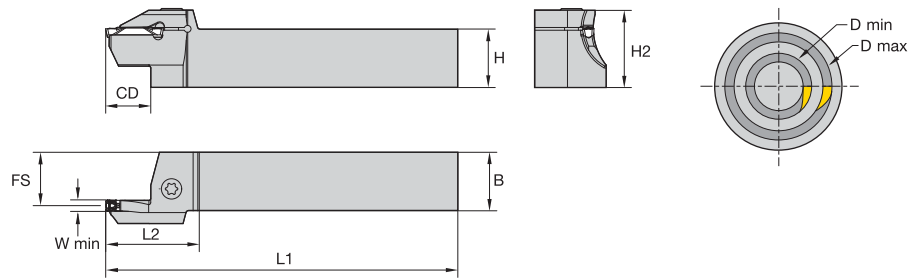


order number	catalog number	seat size	CD	W min	D	D min	L1	F	L1S	L2	A	clamp screw	Torx/Torx Plus
	right hand												
2979229	A16RA4EMR0210N	2	.394	.079	1.000	1.260	8.02	.664	7.98	1.97	.20	MS2089	25 IP
2979227	A12RA4EMR0207N	2	.276	.079	.750	.984	8.02	.507	7.98	1.57	.16	MS2089	25 IP
1953337	A16RA4EMR0310N	3	.394	.118	1.000	1.260	8.02	.669	7.96	1.97	.20	MS1595	T30
1953339	A20SA4EMR0312N	3	.472	.118	1.250	1.575	10.00	.866	9.94	2.52	.24	MS1595	T30
1953335	A12RA4EMR0307N	3	.276	.118	.750	.984	8.00	.512	7.94	1.57	.16	MS2089	25 IP
1953341	A12RA4EMR0407N	4	.276	.157	.750	.984	8.00	.512	7.92	1.57	.16	MS2089	25 IP
1953343	A16RA4EMR0410N	4	.394	.157	1.000	1.260	8.02	.669	7.94	1.97	.20	MS1595	T30
1953347	A24TA4EMR0416N	4	.630	.157	1.500	2.047	12.00	1.181	11.92	3.15	.24	MS1970	T30
1953345	A20SA4EMR0412N	4	.472	.157	1.250	1.575	10.00	.866	9.92	2.52	.24	MS1595	T30
1953351	A24TA4EMR0516N	5	.630	.197	1.500	2.047	12.00	1.181	11.90	3.15	.24	MS1970	T30
1953349	A20SA4EMR0516N	5	.630	.197	1.250	1.732	10.00	1.024	9.90	2.52	.24	MS1595	T30
2263199	A24TA4EMR0616N	6	.630	.236	1.500	2.047	12.00	1.181	11.88	3.15	.24	MS1970	T30
2263203	A20SA4EMR0616N	6	.630	.236	1.250	1.732	10.00	1.024	9.88	2.52	.24	MS1595	T30
2263200	A32TA4EMR0616N	6	.630	.236	2.000	2.559	12.00	1.378	11.88	3.94	.24	MS1970	T30
	left hand												
2979226	A12RA4EML0207N	2	.276	.079	.750	.984	8.02	.507	7.98	1.57	.16	MS2089	25 IP
1953340	A20SA4EML0312N	3	.472	.118	1.250	1.575	10.00	.866	9.94	2.52	.24	MS1595	T30
1953336	A12RA4EML0307N	3	.276	.118	.750	.984	8.00	.512	7.94	1.57	.16	MS2089	25 IP
1953338	A16RA4EML0310N	3	.394	.118	1.000	1.260	8.02	.669	7.96	1.97	.20	MS1595	T30
1953344	A16RA4EML0410N	4	.394	.157	1.000	1.260	8.02	.669	7.94	1.97	.20	MS1595	T30
1953346	A20SA4EML0412N	4	.472	.157	1.250	1.575	10.00	.866	9.92	2.52	.24	MS1595	T30
1953348	A24TA4EML0416N	4	.630	.157	1.500	2.047	12.00	1.181	11.92	3.15	.24	MS1970	T30
1953342	A12RA4EML0407N	4	.276	.157	.750	.984	8.00	.512	7.92	1.57	.16	MS2089	25 IP
1953352	A24TA4EML0516N	5	.630	.197	1.500	2.047	12.00	1.181	11.90	3.15	.24	MS1970	T30
1953350	A20SA4EML0516N	5	.630	.197	1.250	1.732	10.00	1.024	9.90	2.52	.24	MS1595	T30
2263202	A32TA4EML0616N	6	.630	.236	2.000	2.559	12.00	1.378	11.88	3.94	.24	MS1970	T30
2263201	A24TA4EML0616N	6	.630	.236	1.500	2.047	12.00	1.181	11.88	3.15	.24	MS1970	T30
2263204	A20SA4EML0616N	6	.630	.236	1.250	1.732	10.00	1.024	9.88	2.52	.24	MS1595	T30

Grooving and Cut-Off



Right hand shown.

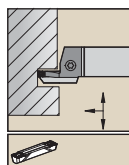


■ A4SB Outboard Sweep

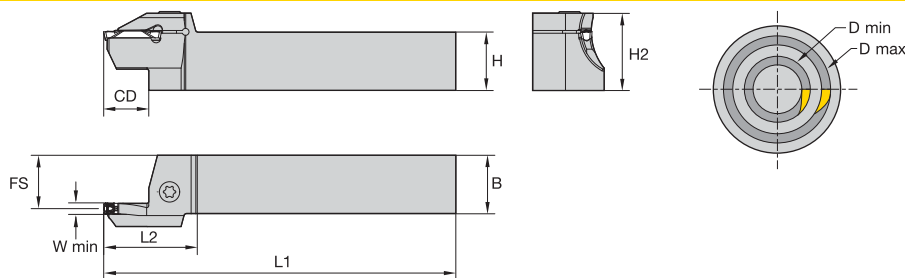


Grooving and Cut-Off

order number	catalog number	seat size	CD	D min	D max	W min	H	B	H2	L1	FS	L2	Torx clamp screw	Torx
right hand														
3865921	A4SBR2020K2S12020025	2S	12	20	25	2,00	20	20	25	125	19,20	28	MS1160	T20
3865922	A4SBR2020K2S12025036	2S	12	25	36	2,00	20	20	25	125	19,20	28	MS1160	T20
3865920	A4SBR2020K2S12016020	2S	12	16	20	2,00	20	20	25	125	19,20	28	MS1160	T20
3865924	A4SBR2020K3S14025036	3S	14	25	36	3,00	20	20	28	125	18,70	35	MS1595	T30
3865923	A4SBR2020K3S14020025	3S	14	20	25	3,00	20	20	28	125	18,70	35	MS1595	T30
3865926	A4SBR2020K4S14035048	4S	14	35	48	4,00	20	20	28	125	18,20	35	MS1595	T30
3865925	A4SBR2020K4S14025035	4S	14	25	35	4,00	20	20	28	125	18,20	35	MS1595	T30
3865927	A4SBR2525M5S19028038	5S	19	28	38	5,00	25	25	33	150	22,70	40	MS1970	T30
3865928	A4SBR2525M5S19038058	5S	19	38	58	5,00	25	25	33	150	22,70	40	MS1970	T30
left hand														
3865929	A4SBL2020K2S12016020	2S	12	16	20	2,00	20	20	25	125	19,20	28	MS1160	T20
3865930	A4SBL2020K2S12020025	2S	12	20	25	2,00	20	20	25	125	19,20	28	MS1160	T20
3865931	A4SBL2020K2S12025036	2S	12	25	36	2,00	20	20	25	125	19,20	28	MS1160	T20
3865932	A4SBL2020K3S14020025	3S	14	20	25	3,00	20	20	28	125	18,70	35	MS1595	T30
3865933	A4SBL2020K3S14025036	3S	14	25	36	3,00	20	20	28	125	18,70	35	MS1595	T30
3865935	A4SBL2020K4S14035048	4S	14	35	48	4,00	20	20	28	125	18,20	35	MS1595	T30
3865934	A4SBL2020K4S14025035	4S	14	25	35	4,00	20	20	28	125	18,20	35	MS1595	T30
3865936	A4SBL2525M5S19028038	5S	19	28	38	5,00	25	25	33	150	22,70	40	MS1970	T30
3865937	A4SBL2525M5S19038058	5S	19	38	58	5,00	25	25	33	150	22,70	40	MS1970	T30

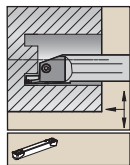


Right hand shown.

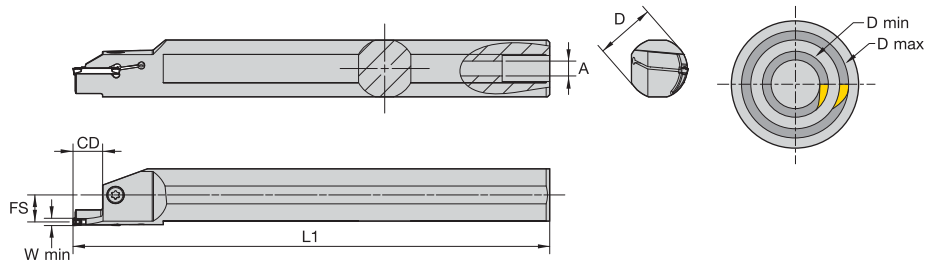

A4SB Outboard Sweep • Inch


order number	catalog number	seat size	CD	D min	D max	W min	H	B	H2	L1	FS	L2	Torx clamp screw	Torx
right hand														
3865903	A4SBR122S12020025	2S	.47	.787	.984	.079	.75	.75	.95	5.00	.718	1.10	MS1160	T20
3865904	A4SBR122S12025036	2S	.47	.984	1.417	.079	.75	.75	.95	5.00	.718	1.10	MS1160	T20
3865852	A4SBR122S12016020	2S	.47	.630	.787	.079	.75	.75	.95	5.00	.718	1.10	MS1160	T20
3865905	A4SBR123S14020025	3S	.55	.787	.984	.118	.75	.75	1.07	5.00	.699	1.18	MS1595	T30
3865906	A4SBR123S14025036	3S	.55	.984	1.417	.118	.75	.75	1.07	5.00	.699	1.38	MS1595	T30
3865907	A4SBR124S14025035	4S	.55	.984	1.378	.157	.75	.75	1.07	5.00	.679	1.38	MS1595	T30
3865908	A4SBR124S14035048	4S	.55	1.378	1.890	.157	.75	.75	1.07	5.00	.679	1.38	MS1595	T30
3865910	A4SBR165S19038058	4S	.75	1.496	2.284	.197	1.00	1.00	1.32	6.00	.909	1.57	MS1970	T30
3865909	A4SBR165S19028038	4S	.75	1.102	1.496	.197	1.00	1.00	1.32	6.00	.909	1.57	MS1970	T30
left hand														
3865912	A4SBL122S12020025	2S	.47	.787	.984	.079	.75	.75	.95	5.00	.718	1.10	MS1160	T20
3865911	A4SBL122S12016020	2S	.47	.630	.787	.079	.75	.75	.95	5.00	.718	1.10	MS1160	T20
3865913	A4SBL122S12025036	2S	.47	.984	1.417	.079	.75	.75	.95	5.00	.718	1.10	MS1160	T20
3865914	A4SBL123S14020025	3S	.55	.787	.984	.118	.75	.75	1.07	5.00	.699	1.18	MS1595	T30
3865915	A4SBL123S14025036	3S	.55	.984	1.417	.118	.75	.75	1.07	5.00	.699	1.38	MS1595	T30
3865916	A4SBL124S14025035	4S	.55	.984	1.378	.157	.75	.75	1.07	5.00	.679	1.38	MS1595	T30
3865917	A4SBL124S14035048	4S	.55	1.378	1.890	.157	.75	.75	1.07	5.00	.679	1.38	MS1595	T30
3865919	A4SBL165S19038058	4S	.75	1.496	2.284	.187	1.00	1.00	1.32	6.00	.909	1.57	MS1970	T30
3865918	A4SBL165S19028038	4S	.75	1.102	1.496	.197	1.00	1.00	1.32	6.00	.909	1.57	MS1970	T30

Grooving and Cut-Off



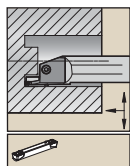
Right hand shown.



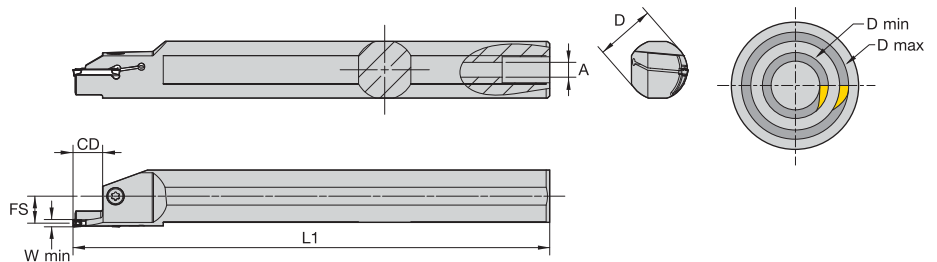
■ A4SS Inboard Sweep

Grooving and Cut-Off

order number	catalog number	seat size	CD	D min	D max	W min	D	L1	FS	A	Torx clamp screw	
											Torx clamp screw	Torx
right hand												
3871038	A16RA4SAR2S12M017021	2S	12,00	17	21	2,00	16	201	7	4,00	MS1160	T20
3871039	A20RA4SAR2S12M021026	2S	12,00	21	23	2,00	20	201	9	4,00	MS1160	T20
3871040	A25RA4SAR2S12M026036	2S	12,00	26	36	2,00	25	201	12	6,35	MS1160	T20
3871041	A20RA4SAR3S14M021026	3S	14,00	21	26	3,00	20	201	9	4,00	MS1160	T20
3871042	A25RA4SAR3S14M026036	3S	14,00	26	36	3,00	25	201	11	6,35	MS1160	T20
left hand												
3871033	A16RA4SAL2S12M017021	2S	12,00	17	21	2,00	16	201	7	4,00	MS1160	T20
3871034	A20RA4SAL2S12M021026	2S	12,00	21	26	2,00	20	201	9	4,00	MS1160	T20
3871035	A25RA4SAL2S12M026036	2S	12,00	26	36	2,00	25	201	12	6,35	MS1160	T20
3871036	A20RA4SAL3S14M021026	3S	14,00	21	26	3,00	20	201	9	4,00	MS1160	T20
3871037	A25RA4SAL3S14M026036	3S	14,00	26	36	3,00	25	201	11	6,35	MS1160	T20



Right hand shown.



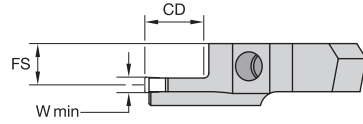
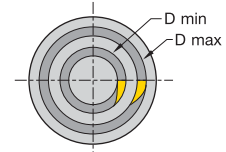
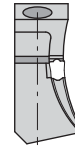
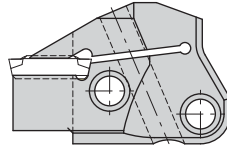
■ A4SS Inboard Sweep • Inch

order number	catalog number	seat size	CD	D min	D max	W min	D	L1	FS	A	Torx clamp screw	
											Torx clamp screw	Torx
right hand												
3871028	A10RA4SAR2S12N017021	2S	.472	.669	.827	.079	.63	8.012	.28	.158	MS1160	T20
3871029	A12RA4SAR2S12N021026	2S	.472	.827	1.024	.079	.75	8.012	.34	.158	MS1160	T20
3871030	A16RA4SAR2S12N026036	2S	.472	1.024	1.417	.079	1.00	8.012	.47	.250	MS1160	T20
3871032	A16RA4SAR3S14N026036	3S	.551	1.024	1.417	.118	1.00	8.012	.45	.250	MS1160	T20
3871031	A12RA4SAR3S14N021026	3S	.551	.827	1.024	.118	.75	8.012	.33	.158	MS1160	T20
left hand												
3871024	A12RA4SAL2S12N021026	2S	.472	.827	1.024	.079	.75	8.012	.34	.158	MS1160	T20
3871023	A10RA4SAL2S12N017021	2S	.472	.669	.827	.079	.63	8.012	.28	.158	MS1160	T20
3871025	A16RA4SAL2S12N026036	2S	.472	1.024	1.417	.079	1.00	8.012	.47	.250	MS1160	T20
3871026	A12RA4SAL3S14N021026	3S	.551	.827	1.024	.118	.75	8.012	.33	.158	MS1160	T20
3871027	A16RA4SAL3S14N026036	3S	.551	1.024	1.417	.118	1.00	8.012	.45	.250	MS1160	T20





Right hand shown.



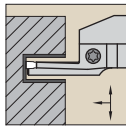
■ A4M-SB Outboard Sweep

order number	catalog number	seat size	D min	D max	CD	W min	FS	cartridge size
right hand								
3867458	A4M50R2S12B020025	2S	20	25	12	2	10,90	50
3867459	A4M50R2S12B025036	2S	25	36	12	2	10,90	50
3867457	A4M50R2S12B016020	2S	16	20	12	2	10,90	50
left hand								
3867461	A4M50R3S14B025036	3S	25	36	14	3	10,49	50
3867460	A4M50R3S14B020025	3S	20	25	14	3	10,49	50
3867463	A4M50R4S14B035048	4S	35	48	14	4	10,00	50
3867462	A4M50R4S14B025035	4S	25	35	14	4	10,00	50
3867465	A4M50R5S17B038058	5S	38	58	17	5	9,50	50
3867464	A4M50R5S17B028038	5S	28	38	17	5	9,50	50
left hand								
3867467	A4M50L2S12B020025	2S	20	25	12	2	10,90	50
3867468	A4M50L2S12B025036	2S	25	36	12	2	10,90	50
3867466	A4M50L2S12B016020	2S	16	20	12	2	10,90	50
3867470	A4M50L3S14B025036	3S	25	36	14	3	10,49	50
3867469	A4M50L3S14B020025	3S	20	25	14	3	10,49	50
3867472	A4M50L4S14B035048	4S	35	48	14	4	10,00	50
3867471	A4M50L4S14B025035	4S	25	35	14	4	10,00	50
3867485	A4M50L5S17B038058	5S	38	58	17	5	9,50	50
3867484	A4M50L5S17B028038	5S	28	38	17	5	9,50	50

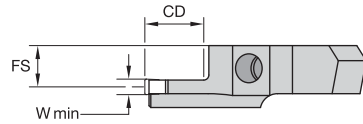
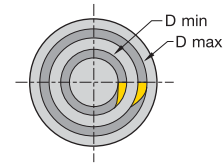
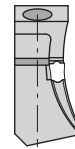
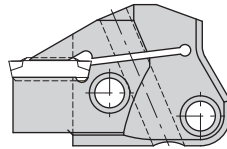


Grooving and Cut-Off

A4™ Grooving and Turning • Modular Small-Diameter Face Grooving



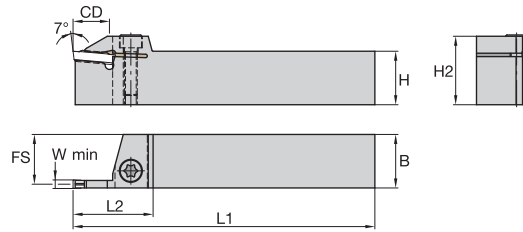
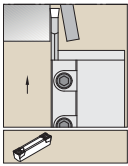
Right hand shown.



■ A4M-SB Outboard Sweep • Inch

Grooving and Cut-Off

order number	catalog number	seat size	D min	D max	CD	W min	FS	cartridge size
right hand								
3867458	A4M50R2S12B020025	2S	.787	.984	.47	.079	.429	50
3867459	A4M50R2S12B025036	2S	.984	1.417	.47	.079	.429	50
3867457	A4M50R2S12B016020	2S	.630	.787	.47	.079	.429	50
3867461	A4M50R3S14B025036	3S	.984	1.417	.55	.118	.413	50
3867460	A4M50R3S14B020025	3S	.787	.984	.55	.118	.413	50
3867463	A4M50R4S14B035048	4S	1.378	1.890	.55	.157	.394	50
3867462	A4M50R4S14B025035	4S	.984	1.378	.55	.157	.394	50
3867465	A4M50R5S17B038058	5S	1.496	2.284	.67	.197	.374	50
3867464	A4M50R5S17B028038	5S	1.102	1.496	.67	.197	.374	50
left hand								
3867467	A4M50L2S12B020025	2S	.787	.984	.47	.079	.429	50
3867468	A4M50L2S12B025036	2S	.984	1.417	.47	.079	.429	50
3867466	A4M50L2S12B016020	2S	.630	.787	.47	.079	.429	50
3867470	A4M50L3S14B025036	3S	.984	1.417	.55	.118	.413	50
3867469	A4M50L3S14B020025	3S	.787	.984	.55	.118	.413	50
3867472	A4M50L4S14B035048	4S	1.378	1.890	.55	.157	.394	50
3867471	A4M50L4S14B025035	4S	.984	1.378	.55	.157	.394	50
3867485	A4M50L5S17B038058	5S	1.496	2.284	.67	.197	.374	50
3867484	A4M50L5S17B028038	5S	1.102	1.496	.67	.197	.374	50

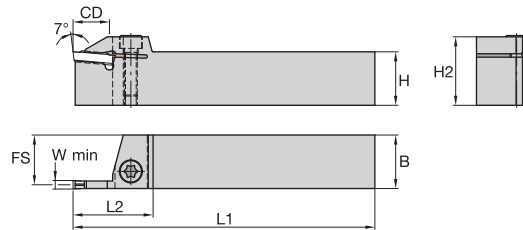
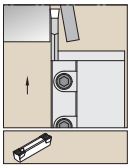


■ A4SM



order number	catalog number	seat size	CD	W min	H	B	H2	L1	FS	L2	Torx clamp screw	Torx
right hand												
3854265	A4SMR2020K0208	2	8	2	20	20	24	125	19	26	MS1160	T20
3854267	A4SMR2020K0308	3	8	3	20	20	27	125	19	28	MS1595	T30
3854269	A4SMR2020K0408	4	8	4	20	20	27	125	18	28	MS1595	T30
3854271	A4SMR2525M0510	5	10	5	25	25	33	150	23	32	MS1970	T30
3854273	A4SMR2525M0610	6	10	6	25	25	33	150	22	37	MS1970	T30
left hand												
3854266	A4SML2020K0208	2	8	2	20	20	24	125	19	26	MS1160	T20
3854268	A4SML2020K0308	3	8	3	20	20	27	125	19	28	MS1595	T30
3854270	A4SML2020K0408	4	8	4	20	20	27	125	18	28	MS1595	T30
3854272	A4SML2525M0510	5	10	5	25	25	33	150	23	32	MS1970	T30
3854274	A4SML2525M0610	6	10	6	25	25	33	150	22	37	MS1970	T30

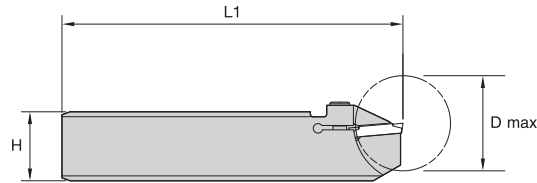
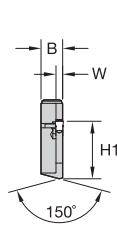
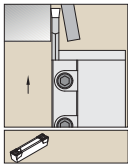
Grooving and Cut-Off



■ A4SM • Inch



order number	catalog number	seat size	CD	W min	H	B	H2	L1	FS	L2	Torx clamp screw	Torx
right hand												
3854275	A4SMR120208	2	.32	.079	.750	.750	.91	5.00	.71	1.02	MS1160	T20
3854277	A4SMR120308	3	.32	.118	.750	.750	1.01	5.00	.69	1.10	MS1595	T30
3854279	A4SMR120408	4	.32	.158	.750	.750	1.01	5.00	.67	1.10	MS1595	T30
3854281	A4SMR160510	5	.39	.197	1.000	1.000	1.30	6.00	.91	1.26	MS1970	T30
3854283	A4SMR160610	6	.39	.236	1.000	1.000	1.30	6.00	.89	1.46	MS1970	T30
left hand												
3854276	A4SML120208	2	.32	.079	.750	.750	.91	5.00	.71	1.02	MS1160	T20
3854278	A4SML120308	3	.32	.118	.750	.750	1.01	5.00	.69	1.10	MS1595	T30
3854280	A4SML120408	4	.32	.158	.750	.750	1.01	5.00	.67	1.10	MS1595	T30
3854282	A4SML160510	5	.39	.197	1.000	1.000	1.30	6.00	.91	1.26	MS1970	T30
3854284	A4SML160610	6	.39	.236	1.000	1.000	1.30	6.00	.89	1.46	MS1970	T30

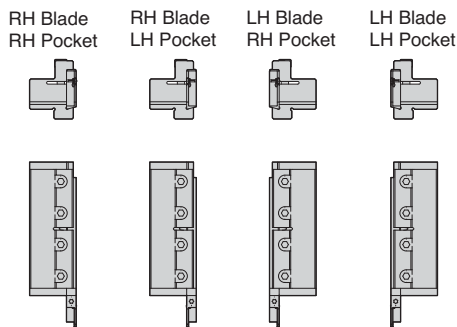


A4BHC



Grooving and Cut-Off

order number	catalog number	H	seat size	W	H1	L1	B	D max	Torx clamp screw	Torx
right hand										
3967125	A4BHCL26K0113R	26	1	1,5	21,4	125	7,95	27	MS1156	T15
3967126	A4BHCL26K0217R	26	2	2,0	21,4	125	7,95	35	MS1571	T20
3967127	A4BHCL26K0317R	26	3	3,0	21,4	125	7,95	35	MS1571	T20
left hand										
3967122	A4BHCL32K0113R	32	1	1,5	25,0	125	7,95	27	MS1156	T15
3967123	A4BHCL32K0217R	32	2	2,0	25,0	125	7,95	35	MS1571	T20
3967124	A4BHCL32K0317R	32	3	3,0	25,0	125	7,95	35	MS1571	T20
3967119	A4BHCR26K0113R	26	1	1,5	21,4	125	7,95	27	MS1156	T15
3967120	A4BHCR26K0217R	26	2	2,0	21,4	125	7,95	35	MS1571	T20
3967121	A4BHCR26K0317R	26	3	3,0	21,4	125	7,95	35	MS1571	T20
3967116	A4BHCR32K0113R	32	1	1,5	25,0	125	7,95	27	MS1156	T15
3967117	A4BHCR32K0217R	32	2	2,0	25,0	125	7,95	35	MS1571	T20
3967118	A4BHCR32K0317R	32	3	3,0	25,0	125	7,95	35	MS1571	T20
left hand										
3967138	A4BHCL26K0113L	26	1	1,5	21,4	125	7,95	27	MS1156	T15
3967139	A4BHCL26K0217L	26	2	2,0	21,4	125	7,95	35	MS1571	T20
3967140	A4BHCL26K0317L	26	3	3,0	21,4	125	7,95	35	MS1571	T20
3967135	A4BHCL32K0113L	32	1	1,5	25,0	125	7,95	27	MS1156	T15
3967136	A4BHCL32K0217L	32	2	2,0	25,0	125	7,95	35	MS1571	T20
3967137	A4BHCL32K0317L	32	3	3,0	25,0	125	7,95	35	MS1571	T20
3967131	A4BHCR26K0113L	26	1	1,5	21,4	125	7,95	27	MS1156	T15
3967132	A4BHCR26K0217L	26	2	2,0	21,4	125	7,95	35	MS1571	T20
3967134	A4BHCR26K0317L	26	3	3,0	21,4	125	7,95	35	MS1571	T20
3967128	A4BHCR32K0113L	32	1	1,5	25,0	125	7,95	27	MS1156	T15
3967129	A4BHCR32K0217L	32	2	2,0	25,0	125	7,95	35	MS1571	T20
3967130	A4BHCR32K0317L	32	3	3,0	25,0	125	7,95	35	MS1571	T20



Grooving and Cut-Off
A4™ Grooving and Turning • A4 Cut-Off Blades

■ A4BHC

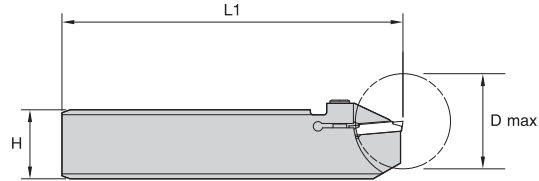
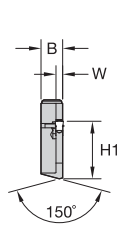
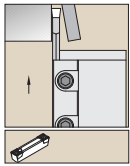
order number	catalog number	H	seat size	W	H1	L1	B	D max	Torx clamp screw	Torx
3967125	A4BHCL26K0113R	26	1	1,5	21,4	125	7,95	27	MS1156	T15

L

Pocket

R

Blade

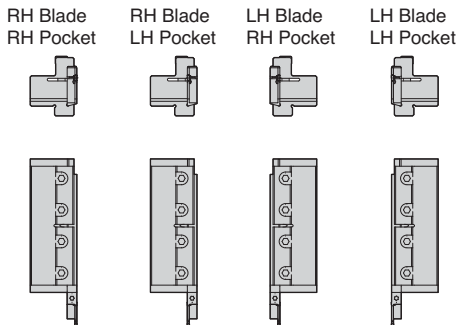


■ A4BHC • Inch



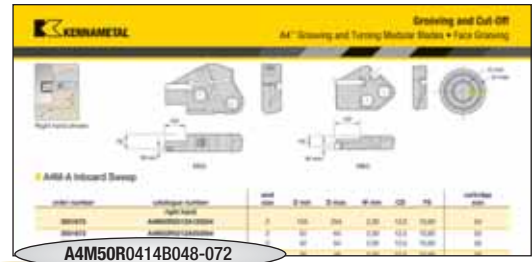
order number	catalog number	H	seat size	W	H1	L1	B	D max	Torx clamp screw	Torx
	right hand									
3967125	A4BHCL26K0113R	1.024	1	.059	.843	4.921	.31	1.063	MS1156	T15
3967126	A4BHCL26K0217R	1.024	2	.079	.843	4.921	.31	1.378	MS1571	T20
3967127	A4BHCL26K0317R	1.024	3	.118	.843	4.921	.31	1.378	MS1571	T20
3967122	A4BHCL32K0113R	1.260	1	.059	.984	4.921	.31	1.063	MS1156	T15
3967123	A4BHCL32K0217R	1.260	2	.079	.984	4.921	.31	1.378	MS1571	T20
3967124	A4BHCL32K0317R	1.260	3	.118	.984	4.921	.31	1.378	MS1571	T20
3967119	A4BHCR26K0113R	1.024	1	.059	.843	4.921	.31	1.063	MS1156	T15
3967120	A4BHCR26K0217R	1.024	2	.079	.843	4.921	.31	1.378	MS1571	T20
3967121	A4BHCR26K0317R	1.024	3	.118	.843	4.921	.31	1.378	MS1571	T20
3967116	A4BHCR32K0113R	1.260	1	.059	.984	4.921	.31	1.063	MS1156	T15
3967117	A4BHCR32K0217R	1.260	2	.079	.984	4.921	.31	1.378	MS1571	T20
3967118	A4BHCR32K0317R	1.260	3	.118	.984	4.921	.31	1.378	MS1571	T20
	left hand									
3967138	A4BHCL26K0113L	1.024	1	.059	.843	4.921	.31	1.063	MS1156	T15
3967139	A4BHCL26K0217L	1.024	2	.079	.843	4.921	.31	1.378	MS1571	T20
3967140	A4BHCL26K0317L	1.024	3	.118	.843	4.921	.31	1.378	MS1571	T20
3967135	A4BHCL32K0113L	1.260	1	.059	.984	4.921	.31	1.063	MS1156	T15
3967136	A4BHCL32K0217L	1.260	2	.079	.984	4.921	.31	1.378	MS1571	T20
3967137	A4BHCL32K0317L	1.260	3	.118	.984	4.921	.31	1.378	MS1571	T20
3967131	A4BHCR26K0113L	1.024	1	.059	.843	4.921	.31	1.063	MS1156	T15
3967132	A4BHCR26K0217L	1.024	2	.079	.843	4.921	.31	1.378	MS1571	T20
3967134	A4BHCR26K0317L	1.024	3	.118	.843	4.921	.31	1.378	MS1571	T20
3967128	A4BHCR32K0113L	1.260	1	.059	.984	4.921	.31	1.063	MS1156	T15
3967129	A4BHCR32K0217L	1.260	2	.079	.984	4.921	.31	1.378	MS1571	T20
3967130	A4BHCR32K0317L	1.260	3	.118	.984	4.921	.31	1.378	MS1571	T20

Grooving and Cut-Off



How Do Catalog Numbers Work?

Each character in our catalog number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.



A4M

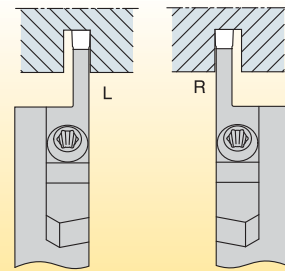
A4
Tooling System

50

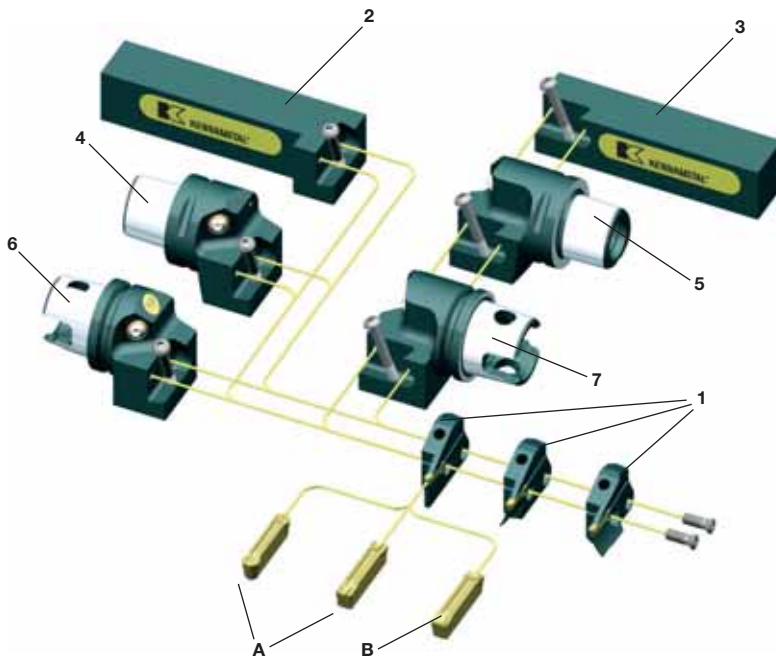
Modular
System Size

R

Hand
of Tool



Grooving and Cut-Off



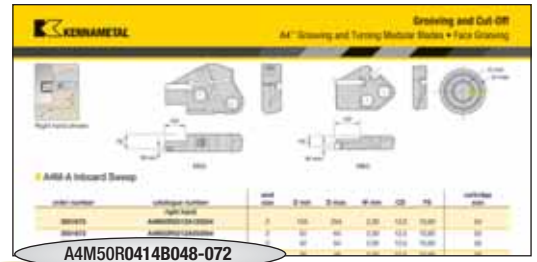
Legend

		page(s)
A	A4 Grooving and Turning Inserts	D78–D87
B	A4 Cut-Off Inserts	D86
1	O.D. and Face Grooving Blades	D106–D110
2	KGME Toolholder	D114
3	KGMS Toolholder	D114
4	Capto® KGME Cutting Unit	D117
5	Capto KGMS Cutting Unit	D117
6	KM™ KGME Cutting Unit	D115–D116
7	KM KGMS Cutting Unit	D115–D116

By customer demand, Kennametal Inc. and Sandvik® Coromant have entered into an agreement that allows both companies to manufacture, market, and sell KM and Coromant Capto products worldwide. Using the trademark Kennametal Capto, we make available a variety of leading and innovative Kennametal tooling designs utilizing the Coromant Capto coupling.

The manufacture and marketing of Kennametal Capto products and the use of the “Capto” trademark are in accordance with a license granted from Sandvik.

By referencing this easy-to-use guide, you can identify the correct product to meet your needs.



A4M50R0414B048-072

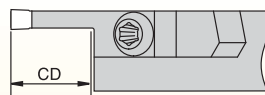
04

Seat Size

pocket seat size	cutting width (mm)
02	2,00–2,62
2B	2,39–2,62
03	3,0–3,05
04	4,0–4,05
05	5,0–5,05
06	6,0–6,05
08	8,0–8,05
10	10,0–10,05

14

Maximum Groove Depth

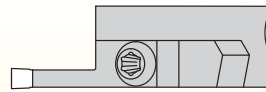


conversions:

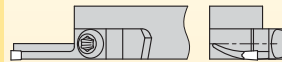
mm	inch
14mm	= .55"
19mm	= .75"
20mm	= .79"
26mm	= 1.02"

B

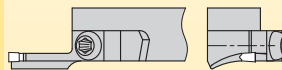
Tool Style



M = Maximum support for specific groove widths and straight clearance for unlimited workpiece diameters



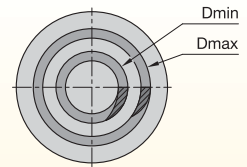
A = Inboard sweep face grooving toolholder



B = Outboard sweep face grooving toolholder

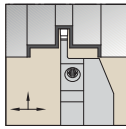
048-072

Face Grooving Diameter Range

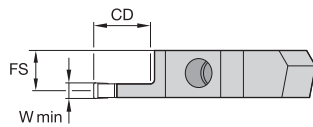
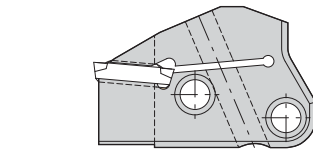


diameters are min and max for outer face groove dia. 999 = unlimited D max

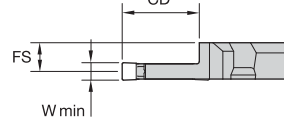
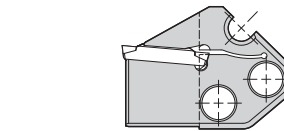
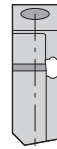
Grooving and Cut-Off



Right hand shown.



M50



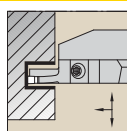
M65

A4M-M

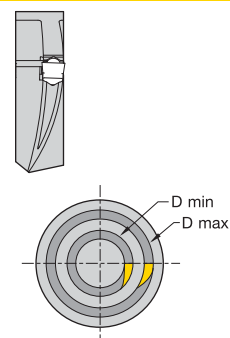
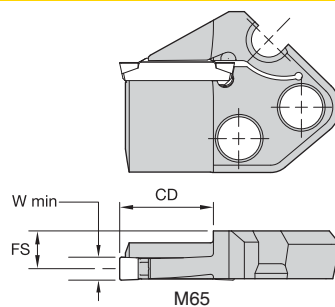
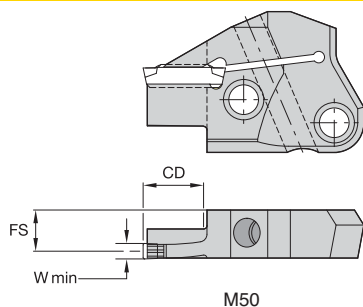
Grooving and Cut-Off

order number	catalog number	seat size	CD	W min	FS	blade size
	right hand					
3051624	A4M50R0214M	2	.55	.079	.428	50
1989348	A4M50R0314M	3	.55	.118	.410	50
1989350	A4M50R0414M	4	.55	.157	.391	50
1989352	A4M50R0519M	5	.75	.197	.371	50
3557114	A4M65R0620M	6	.79	.236	.389	65
3557116	A4M65R0626M	6	1.02	.236	.389	65
3557120	A4M65R0826M	8	1.02	.315	.354	65
3557118	A4M65R0820M	8	.79	.315	.354	65
3557122	A4M65R1020M	10	.79	.394	.329	65
3557124	A4M65R1026M	10	1.02	.394	.329	65
	left hand					
3022625	A4M50L0214M	2	.55	.079	.428	50
3051623	A4M50L2B14M	2B	.55	.098	.421	50
1989347	A4M50L0314M	3	.55	.118	.410	50
1989349	A4M50L0414M	4	.55	.157	.391	50
1989351	A4M50L0519M	5	.75	.197	.371	50
3557117	A4M65L0626M	6	1.02	.236	.389	65
3557115	A4M65L0620M	6	.79	.236	.389	65
3557119	A4M65L0820M	8	.79	.315	.354	65
3557121	A4M65L0826M	8	1.02	.315	.354	65
3557123	A4M65L1020M	10	.79	.394	.329	65
3557125	A4M65L1026M	10	1.02	.394	.329	65

NOTE: Seat size 2B only accepts 2B inserts. Seat size 2 accepts 2 or 2B inserts.



Right hand shown.



■ A4M-A Inboard Sweep

order number	catalog number	seat size	D min	D max	W min	CD	FS	blade size
	right hand							
3051670	A4M50R0212A036046	2	1.417	1.811	.079	.47	.429	50
3051671	A4M50R0212A042054	2	1.654	2.126	.079	.47	.429	50
3051672	A4M50R0212A050064	2	1.969	2.520	.079	.47	.429	50
3051673	A4M50R0212A060084	2	2.362	3.307	.079	.47	.429	50
3051674	A4M50R0212A080124	2	3.150	4.882	.079	.47	.429	50
3051675	A4M50R0212A120254	2	4.724	10.000	.079	.47	.429	50
3051676	A4M50R0212A250999	2	9.843	—	.079	.47	.429	50
2542517	A4M50R0314A036048	3	1.417	1.890	.118	.55	.413	50
2542518	A4M50R0314A042058	3	1.654	2.284	.118	.55	.413	50
2542519	A4M50R0314A052074	3	2.047	2.913	.118	.55	.413	50
2542520	A4M50R0314A068100	3	2.677	3.937	.118	.55	.413	50
2542521	A4M50R0314A090160	3	3.543	6.299	.118	.55	.413	50
2542522	A4M50R0314A130300	3	5.118	11.811	.118	.55	.413	50
2542523	A4M50R0314A290999	3	11.417	—	.118	.55	.413	50
2542531	A4M50R0414A048072	4	1.890	2.835	.157	.55	.394	50
2542532	A4M50R0414A064100	4	2.520	3.937	.157	.55	.394	50
2542533	A4M50R0414A092150	4	3.622	5.906	.157	.55	.394	50
2542534	A4M50R0414A132300	4	5.197	11.811	.157	.55	.394	50
2542535	A4M50R0414A290999	4	11.417	—	.157	.55	.394	50
2542541	A4M50R0519A058094	5	2.284	3.701	.197	.75	.374	50
2542542	A4M50R0519A080136	5	3.150	5.354	.197	.75	.374	50
2542543	A4M50R0519A120300	5	4.724	11.811	.197	.75	.374	50
2542544	A4M50R0519A250999	5	9.843	—	.197	.75	.374	50
3557131	A4M65R0624A070-112	6	2.756	4.409	.236	.94	.389	65
3557163	A4M65R0624A100-212	6	3.937	8.347	.236	.94	.389	65
3557165	A4M65R0624A200-999	6	7.874	39.331	.236	.94	.389	65
3557167	A4M65R0824A090-200	8	3.543	7.874	.315	.94	.354	65
3557169	A4M65R0824A184-999	8	7.244	39.331	.315	.94	.354	65
3557171	A4M65R1024A100-220	10	3.937	8.661	.394	.94	.329	65
3557173	A4M65R1024A200-999	10	7.874	39.331	.394	.94	.329	65

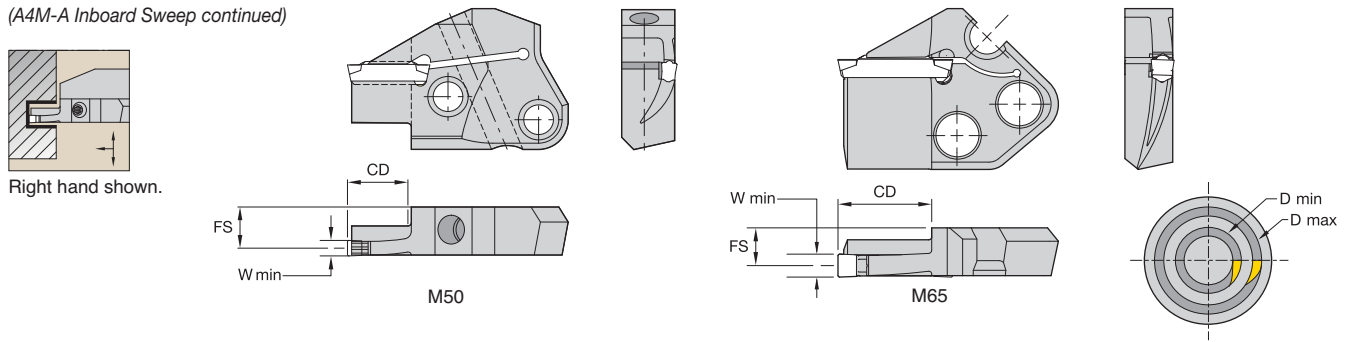
(continued)

Grooving and Cut-Off

A4™ Grooving and Turning Modular Blades • Face Grooving

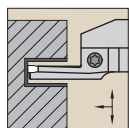


(A4M-A Inboard Sweep continued)

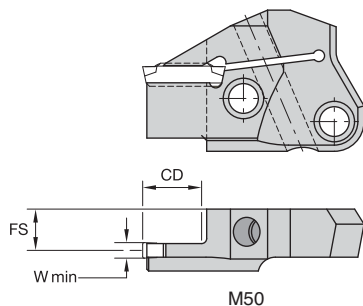


Grooving and Cut-Off

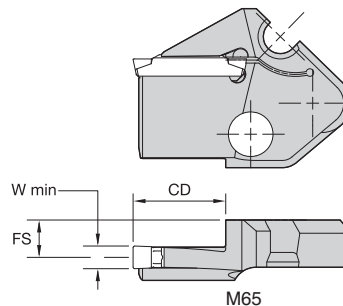
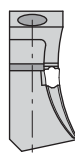
order number	catalog number	seat size	D min	D max	W min	CD	FS	blade size
left hand								
3051626	A4M50L0212A036046	2	1.417	1.811	.079	.47	.429	50
3051627	A4M50L0212A042054	2	1.654	2.126	.079	.47	.429	50
3051628	A4M50L0212A050064	2	1.969	2.520	.079	.47	.429	50
3051629	A4M50L0212A060084	2	2.362	3.307	.079	.47	.429	50
3051630	A4M50L0212A080124	2	3.150	4.882	.079	.47	.429	50
3051631	A4M50L0212A120254	2	4.724	10.000	.079	.47	.429	50
3051632	A4M50L0212A250999	2	9.843	—	.079	.47	.429	50
2542524	A4M50L0314A036048	3	1.417	1.890	.118	.55	.413	50
2542525	A4M50L0314A042058	3	1.654	2.284	.118	.55	.413	50
2542526	A4M50L0314A052074	3	2.047	2.913	.118	.55	.413	50
2542527	A4M50L0314A068100	3	2.677	3.937	.118	.55	.413	50
2542528	A4M50L0314A090160	3	3.543	6.299	.118	.55	.413	50
2542529	A4M50L0314A130300	3	5.118	11.811	.118	.55	.413	50
2542530	A4M50L0314A290999	3	11.417	—	.118	.55	.413	50
2542536	A4M50L0414A048072	4	1.890	2.835	.157	.55	.394	50
2542537	A4M50L0414A064100	4	2.520	3.937	.157	.55	.394	50
2542538	A4M50L0414A092150	4	3.622	5.906	.157	.55	.394	50
2542539	A4M50L0414A132300	4	5.197	11.811	.157	.55	.394	50
2542540	A4M50L0414A290999	4	11.417	—	.157	.55	.394	50
2542545	A4M50L0519A058094	5	2.284	3.701	.197	.75	.374	50
2542546	A4M50L0519A080136	5	3.150	5.354	.197	.75	.374	50
2542547	A4M50L0519A120300	5	4.724	11.811	.197	.75	.374	50
2542548	A4M50L0519A250999	5	9.843	—	.197	.75	.374	50
3557132	A4M65L0624A070-112	6	2.756	4.409	.236	.94	.389	65
3557164	A4M65L0624A100-212	6	3.937	8.347	.236	.94	.389	65
3557166	A4M65L0624A200-999	6	7.874	39.331	.236	.94	.389	65
3557168	A4M65L0824A090-200	8	3.543	7.874	.315	.94	.354	65
3557170	A4M65L0824A184-999	8	7.244	39.331	.315	.94	.354	65
3557172	A4M65L1024A100-220	10	3.937	8.661	.394	.94	.329	65
3557174	A4M65L1024A200-999	10	7.874	39.331	.394	.94	.329	65



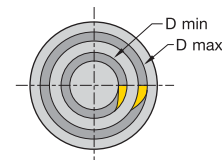
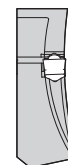
Right hand shown.



M50



M65



■ A4M-B Outboard Sweep

order number	catalog number	seat size	D min	D max	W min	CD	FS	blade size
	right hand							
3867457	A4M50R2S12B016020	2S	.630	.787	.079	.47	.429	50
3867458	A4M50R2S12B020025	2S	.787	.984	.079	.47	.429	50
3867459	A4M50R2S12B025036	2S	.984	1.417	.079	.47	.429	50
3051677	A4M50R0212B036046	2	1.417	1.811	.079	.47	.429	50
3051678	A4M50R0212B042054	2	1.654	2.126	.079	.47	.429	50
3051679	A4M50R0212B050064	2	1.969	2.520	.079	.47	.429	50
3051680	A4M50R0212B060084	2	2.362	3.307	.079	.47	.429	50
3051681	A4M50R0212B080124	2	3.150	4.882	.079	.47	.429	50
3051682	A4M50R0212B120254	2	4.724	10.000	.079	.47	.429	50
3051683	A4M50R0212B250999	2	9.843	—	.079	.47	.429	50
3867460	A4M50R3S14B020025	3S	.787	.984	.118	.55	.413	50
3867461	A4M50R3S14B025036	3S	.984	1.417	.118	.55	.413	50
2398751	A4M50R0314B036048	3	1.417	1.890	.118	.55	.413	50
2398752	A4M50R0314B042058	3	1.654	2.284	.118	.55	.413	50
2398763	A4M50R0314B052074	3	2.047	2.913	.118	.55	.413	50
2398764	A4M50R0314B068100	3	2.677	3.937	.118	.55	.413	50
2398765	A4M50R0314B090160	3	3.543	6.299	.118	.55	.413	50
2398766	A4M50R0314B130300	3	5.118	11.811	.118	.55	.413	50
2398767	A4M50R0314B290999	3	11.417	—	.118	.55	.413	50
3867462	A4M50R4S14B025035	4S	.984	1.378	.157	.55	.394	50
3867463	A4M50R4S14B035048	4S	1.378	1.890	.157	.55	.394	50
2398775	A4M50R0414B048072	4	1.890	2.835	.157	.55	.394	50
2398776	A4M50R0414B064100	4	2.520	3.937	.157	.55	.394	50
2398777	A4M50R0414B092150	4	3.622	5.906	.157	.55	.394	50
2398778	A4M50R0414B132300	4	5.197	11.811	.157	.55	.394	50
2398779	A4M50R0414B290999	4	11.417	—	.157	.55	.394	50
2398785	A4M50R0519B058094	5	2.284	3.701	.197	.75	.374	50
2398786	A4M50R0519B080136	5	3.150	5.354	.197	.75	.374	50
2398787	A4M50R0519B120300	5	4.724	11.811	.197	.75	.374	50
2398788	A4M50R0519B250999	5	9.843	—	.197	.75	.374	50
3867464	A4M50R5S17B028038	5S	1.102	1.496	.197	.67	.374	50
3867465	A4M50R5S17B038058	5S	1.496	2.284	.197	.67	.374	50
3557175	A4M65R0624B070-112	6	2.756	4.409	.236	.94	.389	65
3557177	A4M65R0624B100-212	6	3.937	8.347	.236	.94	.389	65
3557179	A4M65R0624B200-999	6	7.874	39.331	.236	.94	.389	65
3557181	A4M65R0824B090-200	8	3.543	7.874	.315	.94	.354	65
3557193	A4M65R0824B184-999	8	7.244	39.331	.315	.94	.354	65
3557195	A4M65R1024B100-220	10	3.937	8.661	.394	.94	.329	65
3557197	A4M65R1024B200-999	10	7.874	39.331	.394	.94	.329	65

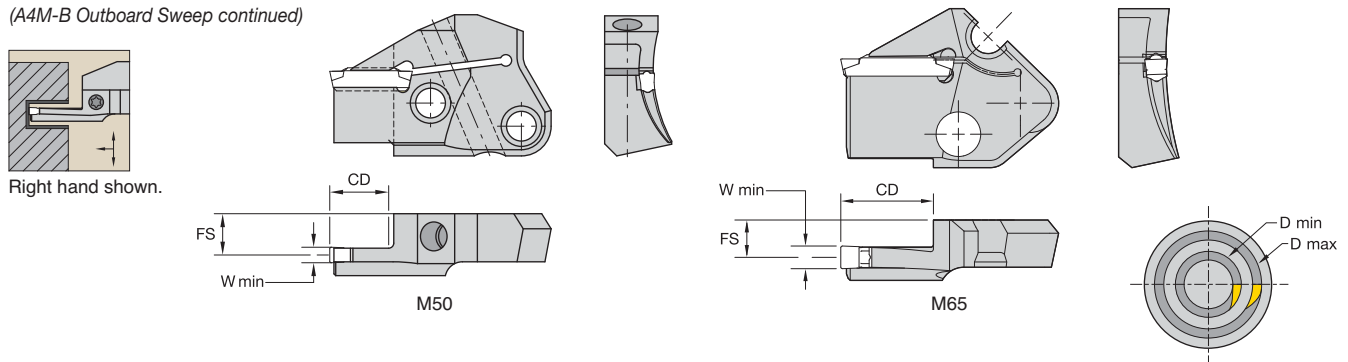
(continued)

Grooving and Cut-Off

A4™ Grooving and Turning Modular Blades • Face Grooving



(A4M-B Outboard Sweep continued)



Grooving and Cut-Off

order number	catalog number	seat size	D min	D max	W min	CD	FS	blade size
left hand								
3867466	A4M50L2S12B016020	2S	.630	.787	.079	.47	.429	50
3867467	A4M50L2S12B020025	2S	.787	.984	.079	.47	.429	50
3867468	A4M50L2S12B025036	2S	.984	1.417	.079	.47	.429	50
3051663	A4M50L0212B036046	2	1.417	1.811	.079	.47	.429	50
3051664	A4M50L0212B042054	2	1.654	2.126	.079	.47	.429	50
3051665	A4M50L0212B050064	2	1.969	2.520	.079	.47	.429	50
3051666	A4M50L0212B060084	2	2.362	3.307	.079	.47	.429	50
3051667	A4M50L0212B080124	2	3.150	4.882	.079	.47	.429	50
3051668	A4M50L0212B120254	2	4.724	10.000	.079	.47	.429	50
3867469	A4M50L3S14B020025	3S	.787	.984	.118	.55	.413	50
3867470	A4M50L3S14B025036	3S	.984	1.417	.118	.55	.413	50
2398768	A4M50L0314B036048	3	1.417	1.890	.118	.55	.413	50
2398769	A4M50L0314B042058	3	1.654	2.284	.118	.55	.413	50
2398770	A4M50L0314B052074	3	2.047	2.913	.118	.55	.413	50
2398771	A4M50L0314B068100	3	2.677	3.937	.118	.55	.413	50
2398772	A4M50L0314B090160	3	3.543	6.299	.118	.55	.413	50
2398773	A4M50L0314B130300	3	5.118	11.811	.118	.55	.413	50
2398774	A4M50L0314B290999	3	11.417	—	.118	.55	.413	50
3867471	A4M50L4S14B025035	4S	.984	1.378	.157	.55	.394	50
3867472	A4M50L4S14B035048	4S	1.378	1.890	.157	.55	.394	50
2398780	A4M50L0414B048072	4	1.890	2.835	.157	.55	.394	50
2398781	A4M50L0414B064100	4	2.520	3.937	.157	.55	.394	50
2398782	A4M50L0414B092150	4	3.622	5.906	.157	.55	.394	50
2398783	A4M50L0414B132300	4	5.197	11.811	.157	.55	.394	50
2398784	A4M50L0414B290999	4	11.417	—	.157	.55	.394	50
2398789	A4M50L0519B058094	5	2.284	3.701	.197	.75	.374	50
2398790	A4M50L0519B080136	5	3.150	5.354	.197	.75	.374	50
2398791	A4M50L0519B120300	5	4.724	11.811	.197	.75	.374	50
2398792	A4M50L0519B250999	5	9.843	—	.197	.75	.374	50
3867484	A4M50L5S17B028038	5S	1.102	1.496	.197	.67	.374	50
3867485	A4M50L5S17B038058	5S	1.496	2.284	.197	.67	.374	50
3557176	A4M65L0624B070-112	6	2.756	4.409	.236	.94	.389	65
3557178	A4M65L0624B100-212	6	3.937	8.347	.236	.94	.389	65
3557180	A4M65L0624B200-999	6	7.874	39.331	.236	.94	.389	65
3557182	A4M65L0824B090-200	8	3.543	7.874	.315	.94	.354	65
3557194	A4M65L0824B184-999	8	7.244	39.331	.315	.94	.354	65
3557196	A4M65L1024B100-220	10	3.937	8.661	.394	.94	.329	65
3557198	A4M65L1024B200-999	10	7.874	39.331	.394	.94	.329	65

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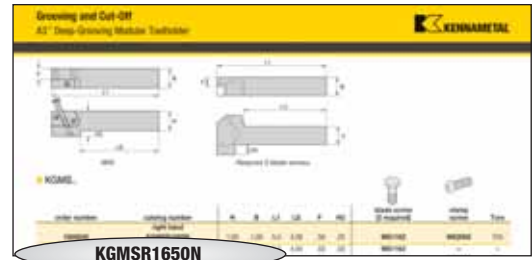
Turning

Online product catalog available 24/7

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How Do Catalog Numbers Work?

Each character in our catalog number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.



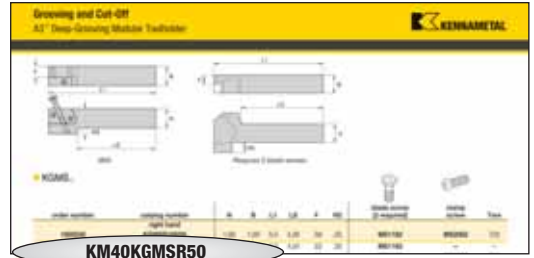
KGMSR1650N
KGMSR2525M50

Grooving and Cut-Off

Inch		Metric				
KGM	S	R	16	50	N	
KGM Grooving Modular	S Tool Style	R Hand of Tool	25 Shank Dimensions	25 Blade Size	M Tool Length	50 Blade Size
	<p>S</p> <p>E</p>		<p>shank height in millimeters</p> <p>shank width in millimeters</p> <p>square shanks: The number indicates the toolholder cross section in 1/16" increments.</p> <p>rectangular shanks: The first digit indicates the number of 1/8" increments of width and the second digit indicates the number of 1/4" increments of height.</p>	<p>N = Inch M = 150mm P = 170mm</p> <p>length over insert in a support blade with a 12,5mm D dimension according to ISO</p>		

How Do Catalog Numbers Work?

Each character in our catalog number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.



KM40

System and Size

KGM

Grooving Modular

S

Tool Style

R

Hand of Tool

50

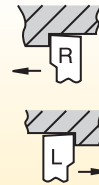
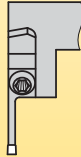
Blade Size

Special Conditions

S



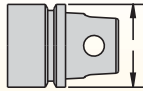
E



Y =
Mazak® INTEGREX®
Y-series machines

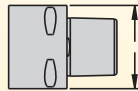
KM size

KM40™ = 40mm dia.
KM50™ = 50mm dia.
KM63™ = 63mm dia.



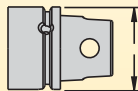
Kennametal Capto® size

C4 = 40mm dia.
C5 = 50mm dia.
C6 = 63mm dia.



KMXMZ size

KM63XMZ™ = 63mm dia.



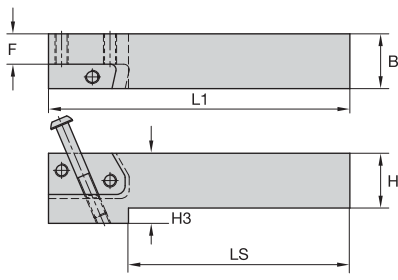
(KM-KGMSR...)

(KM-KGMEL...)

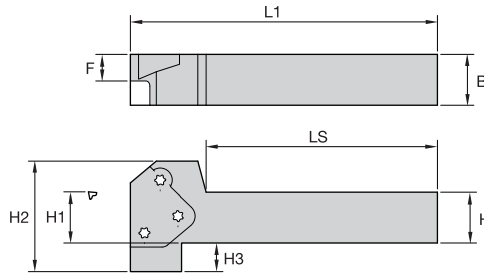
Grooving and Cut-Off

Grooving and Cut-Off

A4™ Grooving and Turning Modular Toolholder • O.D. Grooving



M50
2 blade screws required.



M65
3 blade screws required.

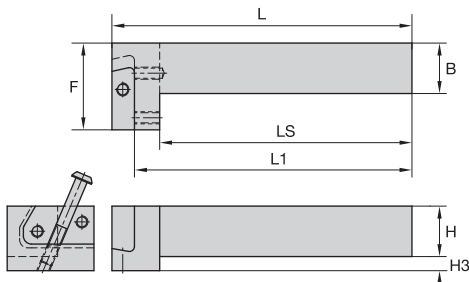
KGMS..



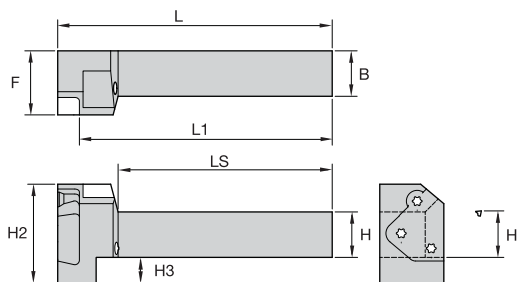
order number	catalog number	H	B	L1	LS	F	H2	H3	blade screw	Torx	clamp screw	Torx
right hand												
1600245	KGMSR1650N	1.00	1.00	5.5	4.26	.56	—	.25	MS1162	T25	MS2002	T25
3556992	KGMSR1665N	1.00	1.00	6.0	4.54	.53	2.09	.50	MS1163	T30	—	—
1617400	KGMSR2050N	1.25	1.25	5.5	—	.81	—	—	MS1162	T25	MS2002	T25
3557104	KGMSR2065N	1.25	1.25	6.0	4.90	.78	2.09	.25	MS1163	T30	—	—
1903553	KGMSR2450N	1.50	1.50	5.5	—	1.06	—	—	MS1162	T25	MS2002	T25
3557106	KGMSR2465N	1.50	1.50	7.0	5.90	1.03	2.09	—	MS1163	T30	—	—
left hand												
1600246	KGMSL1650N	1.00	1.00	5.5	4.26	.56	—	.25	MS1162	T25	MS2002	T25
3557103	KGMSL1665N	1.00	1.00	6.0	4.54	.53	2.09	.50	MS1163	T30	—	—
1617591	KGMSL2050N	1.25	1.25	5.5	—	.81	—	—	MS1162	T25	MS2002	T25
3557105	KGMSL2065N	1.25	1.25	6.0	4.90	.78	2.09	.25	MS1163	T30	—	—
1909004	KGMSL2450N	1.50	1.50	5.5	—	1.06	—	—	MS1162	T25	MS2002	T25
3557107	KGMSL2465N	1.50	1.50	7.0	5.90	1.03	2.09	—	MS1163	T30	—	—

NOTE: KGMS..: Right-hand holder uses right-hand blades. KGME..: Right-hand holder uses left-hand blades. M50 blade and clamp screw torque equals 8–10 Nm (71–88 in. lbs.) M65 blade and clamp screw torque equals 18–20 Nm (159–177 in. lbs.) See Modular Blade Assembly Diagrams on pages D118–D119.

Grooving and Cut-Off



M50
2 blade screws required.



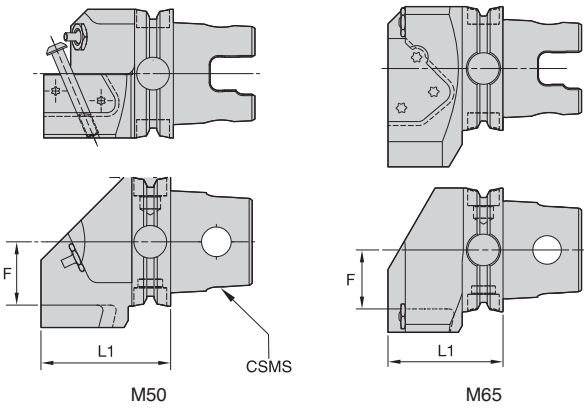
M65
3 blade screws required.

KGME..



order number	catalog number	H	B	L1	LS	F	H2	H3	blade screw	Torx	clamp screw	Torx
right hand												
1600263	KGMER1650N	1.00	1.00	5.5	4.96	1.70	—	.24	MS1162	T25	MS2002	T25
3557108	KGMER1665N	1.00	1.00	5.5	4.70	1.38	2.09	.50	MS1163	T30	—	—
1617592	KGMER2050N	1.25	1.25	5.5	4.96	1.70	—	—	MS1162	T25	MS2002	T25
3557110	KGMER2065N	1.25	1.25	5.5	4.70	1.38	2.09	.25	MS1163	T30	—	—
1907344	KGMER2450N	1.50	1.50	5.5	4.96	1.70	—	—	MS1162	T25	MS2002	T25
3557112	KGMER2465N	1.50	1.50	6.5	5.70	1.50	2.09	—	MS1163	T30	—	—
left hand												
1600264	KGME L1650N	1.00	1.00	5.5	4.96	1.70	—	.24	MS1162	T25	MS2002	T25
3557109	KGME L1665N	1.00	1.00	5.5	4.70	1.38	2.09	.50	MS1163	T30	—	—
1617593	KGME L2050N	1.25	1.25	5.5	4.96	1.70	—	—	MS1162	T25	MS2002	T25
3557111	KGME L2065N	1.25	1.25	5.5	4.70	1.38	2.09	.25	MS1163	T30	—	—
1909003	KGME L2450N	1.50	1.50	5.5	4.96	1.70	—	—	MS1162	T25	MS2002	T25
3557113	KGME L2465N	1.50	1.50	6.5	5.70	1.50	2.09	—	MS1163	T30	—	—

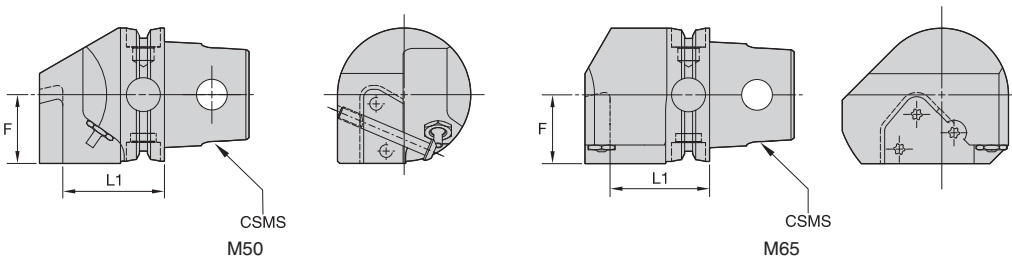
NOTE: KGMS..: Right-hand holder uses right-hand blades. KGME..: Right-hand holder uses left-hand blades. M50 blade and clamp screw torque equals 8–10 Nm (71–88 in. lbs.) M65 blade and clamp screw torque equals 18–20 Nm (159–177 in. lbs.) See Modular Blade Assembly Diagrams on pages D118–D119.



■ KM-KGMS..

order number	catalog number	CSMS system size	L1		F		blade screw (2 required)	Torx	clamp screw	Torx
			mm	in	mm	in				
right hand										
3950268	KM40TSKGMSR50	KM40TS	53,5	2.11	15,0	.59	MS1162	T25	MS2002	T25
1982206	KM40XTSKGMSR50	KM40XTS	53,5	2.11	15,0	.59	MS1162	T25	MS2002	T25
3747129	KM50TSKGMSR50	KM50TS	58,5	2.30	23,0	.91	MS1162	T25	MS2002	T25
3747134	KM50TSKGMSR65	KM50TS	53,5	2.11	22,0	.87	MS1163	T30	—	—
2255824	KM63TSKGMSR50	KM63TS	63,5	2.50	31,0	1.22	MS1162	T25	MS2002	T25
3590203	KM63TSKGMSR65	KM63TS	58,5	2.30	30,0	1.18	MS1163	T30	—	—
3670383	KM80TSKGMSR50	KM80TS	66,5	2.62	41,0	1.61	MS1162	T25	MS2002	T25
3670384	KM80TSKGMSR65	KM80TS	63,5	2.50	40,0	1.57	MS1163	T30	—	—
left hand										
3950267	KM40TSKGMSL50	KM40TS	53,5	2.11	15,0	.59	MS1162	T25	MS2002	T25
3747130	KM50TSKGMSL50	KM50TS	58,5	2.30	23,0	.91	MS1162	T25	MS2002	T25
3747135	KM50TSKGMSL65	KM50TS	53,5	2.11	22,0	.87	MS1163	T30	—	—
2255543	KM63TSKGMSL50	KM63TS	63,5	2.50	31,0	1.22	MS1162	T25	MS2002	T25
3590204	KM63TSKGMSL65	KM63TS	58,5	2.30	30,0	1.18	MS1163	T30	—	—
3670371	KM80TSKGMSL50	KM80TS	66,5	2.62	41,0	1.61	MS1162	T25	MS2002	T25
3670372	KM80TSKGMSL65	KM80TS	63,5	2.50	40,0	1.57	MS1163	T30	—	—

NOTE: KGMS..: Right-hand holder uses right-hand blades.
 KGME..: Right-hand holder uses left-hand blades.
 M50 blade and clamp screw torque equals 8–10 Nm (71–88 in. lbs.)
 M65 blade and clamp screw torque equals 18–20 Nm (159–177 in. lbs.)
 See Modular Blade Assembly Diagrams on pages D118–D119.

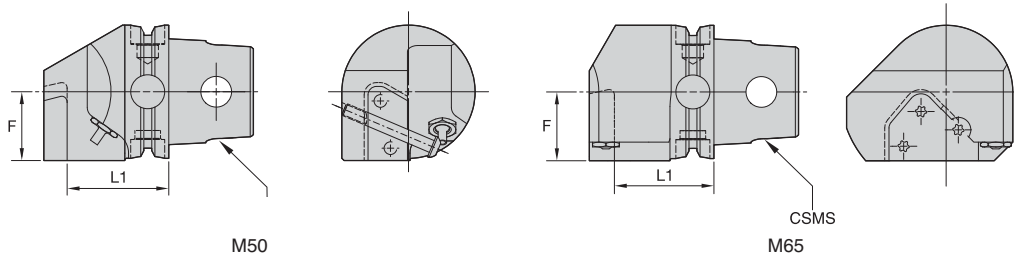


■ KM-KGME..

order number	catalog number	CSMS system size	L1		F		blade screw (2 required)	Torx	clamp screw	Torx
			mm	in	mm	in				
right hand										
3950266	KM40TSKGMER50	KM40TS	28,0	1.10	20,5	.81	MS1162	T25	MS2002	T25
3747133	KM50TSKGMER50	KM50TS	38,0	1.50	25,5	1.00	MS1162	T25	MS2002	T25
3747136	KM50TSKGMER65	KM50TS	47,0	1.85	25,5	1.00	MS1163	T30	—	—
2265404	KM63TSKGMER50	KM63TS	48,0	1.89	32,5	1.28	MS1162	T25	MS2002	T25
3590205	KM63TSKGMER65	KM63TS	47,0	1.85	32,5	1.28	MS1163	T30	—	—
3670369	KM80TSKGMER50	KM80TS	58,0	2.28	40,5	1.59	MS1162	T25	MS2002	T25
3670370	KM80TSKGMER65	KM80TS	57,0	2.24	40,5	1.59	MS1163	T30	—	—

(continued)

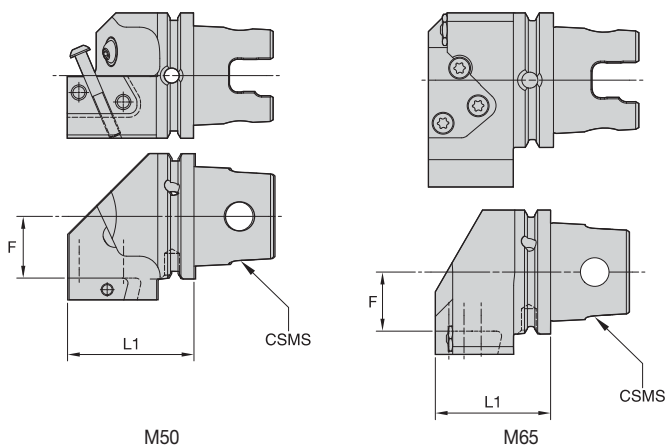
(KM-KGME.. continued)



Grooving and Cut-Off

order number	catalog number	CSMS system size	L1		F		blade screw (2 required)	Torx	clamp screw	Torx
			mm	in	mm	in				
left hand										
3950265	KM40TSKGMEL50	KM40TS	28,0	1.10	20,5	.81	MS1162	T25	MS2002	T25
3747132	KM50TSKGMEL50	KM50TS	38,0	1.50	25,5	1.00	MS1162	T25	MS2002	T25
3747137	KM50TSKGMEL65	KM50TS	47,0	1.85	25,5	1.00	MS1163	T30	—	—
2265405	KM63TSKGMEL50	KM63TS	48,0	1.89	32,5	1.28	MS1162	T25	MS2002	T25
3590206	KM63TSKGMEL65	KM63TS	47,0	1.85	32,5	1.28	MS1163	T30	—	—
3670367	KM80TSKGMEL50	KM80TS	58,0	2.28	40,5	1.59	MS1162	T25	MS2002	T25
3670368	KM80TSKGMEL65	KM80TS	57,0	2.24	40,5	1.59	MS1163	T30	—	—

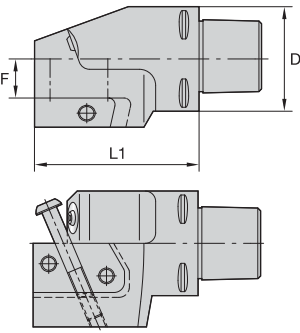
NOTE: KGMS..: Right-hand holder uses right-hand blades.
 KGME..: Right-hand holder uses left-hand blades.
 M50 blade and clamp screw torque equals 8–10 Nm (71–88 in. lbs.)
 M65 blade and clamp screw torque equals 18–20 Nm (159–177 in. lbs.)
 See Modular Blade Assembly Diagrams on pages D118–D119.



■ KM-XMZKGS..

order number	catalog number	CSMS system size	L1		F		blade screw (2 required)	Torx	clamp screw	Torx
			mm	in	mm	in				
right hand										
1756550	KM63XMZKGM50Y	KM63XMZ	63,5	2.50	31,0	1.22	MS1162	T25	MS2002	T25
3588679	KM63XMZKGM65Y	KM63XMZ	58,5	2.30	30,0	1.18	MS1163	T30	—	—
left hand										
1756574	KM63XMZKGM50Y	KM63XMZ	63,5	2.50	31,0	1.22	MS1162	T25	MS2002	T25
3588680	KM63XMZKGM65Y	KM63XMZ	58,5	2.30	30,0	1.18	MS1163	T30	—	—

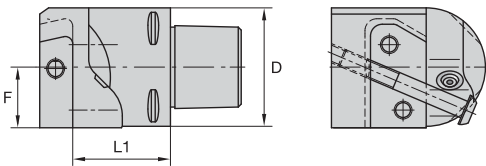
NOTE: KGMS..: Right-hand holder uses right-hand blades.
 KGME..: Right-hand holder uses left-hand blades.
 M50 blade and clamp screw torque equals 8–10 Nm (71–88 in. lbs.)
 M65 blade and clamp screw torque equals 18–20 Nm (159–177 in. lbs.)
 See Modular Blade Assembly Diagrams on page D118–D119.



■ C-KGMS

order number	catalog number	D		L1		F		blade screw (2 required)	Torx	clamp screw	Torx
		mm	in	mm	in	mm	in				
	right hand										
1756576	C4KGMSR50	40	1.57	63,5	2.50	10	.39	MS1162	T25	MS2002	T25
1756584	C5KGMSR50	50	1.97	63,5	2.50	15	.59	MS1162	T25	MS2002	T25
	left hand										
1756578	C4KGMSL50	40	1.57	63,5	2.50	10	.39	MS1162	T25	MS2002	T25
1756585	C5KGMSL50	50	1.97	63,5	2.50	15	.59	MS1162	T25	MS2002	T25

NOTE: KGMS...: Right-hand holder uses right-hand blades.
 KGME...: Right-hand holder uses left-hand blades.
 Blade and clamp screw torque 8–10 Nm (71–88 in. lbs.).
 See Modular Blade Assembly Diagrams on pages D118–D119.



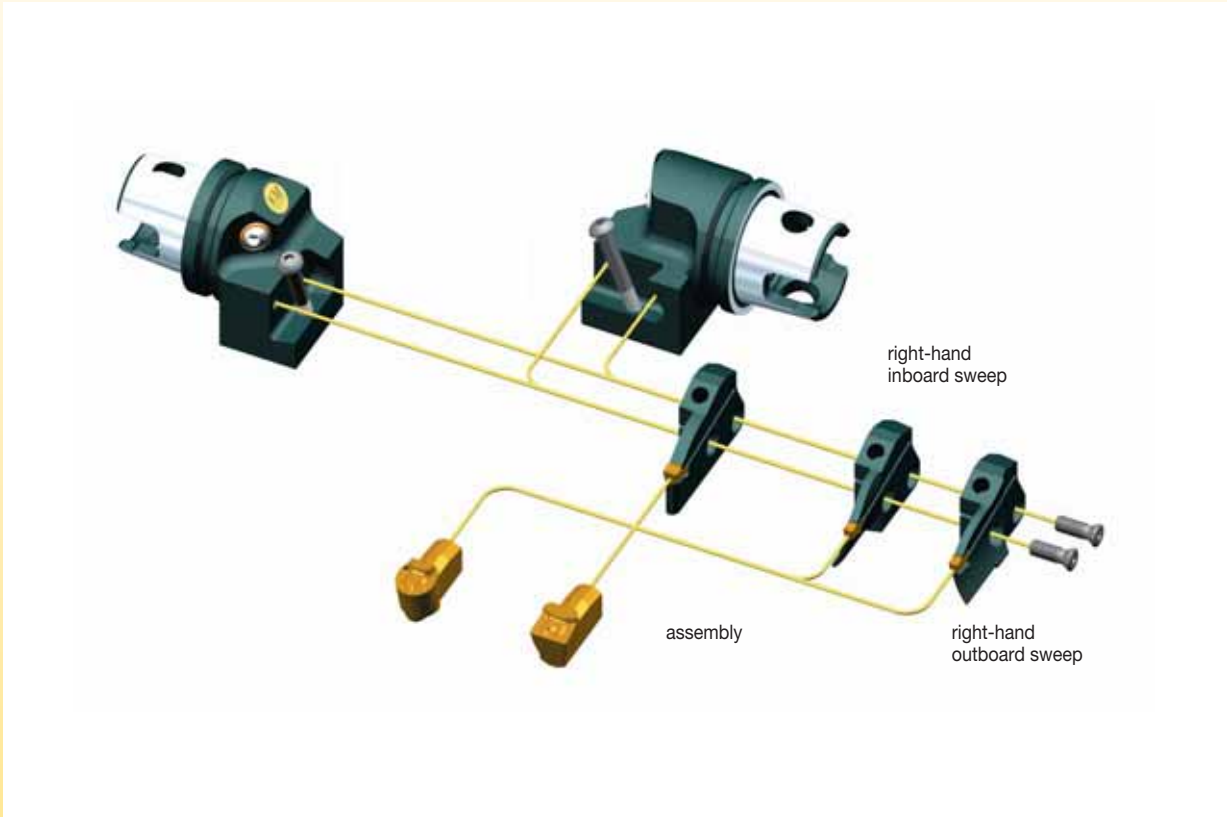
■ C-KGME

order number	catalog number	D		L1		F		blade screw (2 required)	Torx	clamp screw	Torx
		mm	in	mm	in	mm	in				
	right hand										
1756579	C4KGMER50	40	1.57	33,0	1.30	21	.81	MS1162	T25	MS2002	T25
1756587	C5KGMER50	50	1.97	43,0	1.69	26	1.00	MS1162	T25	MS2002	T25
	left hand										
1756583	C4KGME L50	40	1.57	33,0	1.30	21	.81	MS1162	T25	MS2002	T25
1756589	C5KGME L50	50	1.97	43,0	1.69	26	1.00	MS1162	T25	MS2002	T25

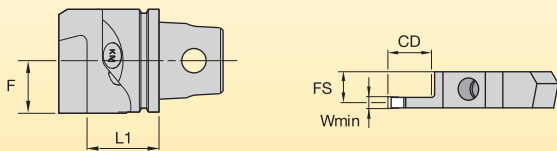
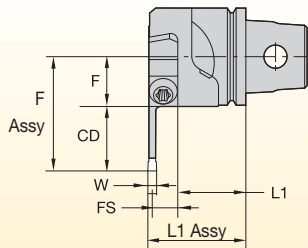
NOTE: KGMS...: Right-hand holder uses right-hand blades.
 KGME...: Right-hand holder uses left-hand blades.
 Blade and clamp screw torque equals 8–10 Nm (71–88 in. lbs.).
 See Modular Blade Assembly Diagrams on pages D118–D119.

■ A3™ and A4™ Modular Blade Assemblies

Kennametal's A3 and A4 grooving systems are the best choice for high-productivity with outstanding application flexibility.

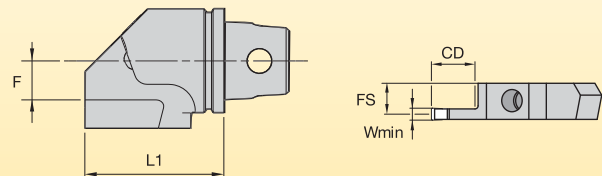
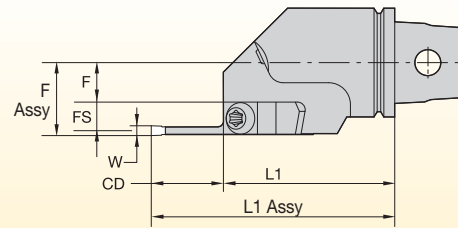


Grooving and Cut-Off



$$F \text{ Assy} = F (\text{Holder}) + FS (\text{Blade}) + W/2$$

$$L1 \text{ Assy} = L1 (\text{Holder}) + CD (\text{Blade})$$

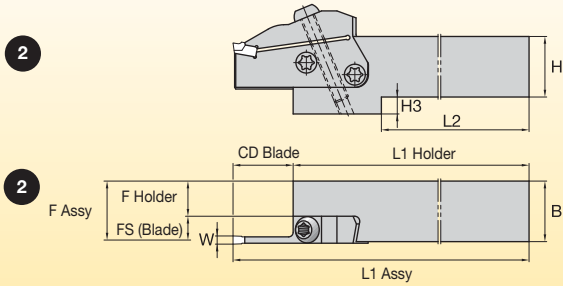


$$F \text{ Assy} = F (\text{Holder}) + CD (\text{Blade})$$

$$L1 \text{ Assy} = L1 (\text{Holder}) + FS (\text{Blade}) + W/2$$

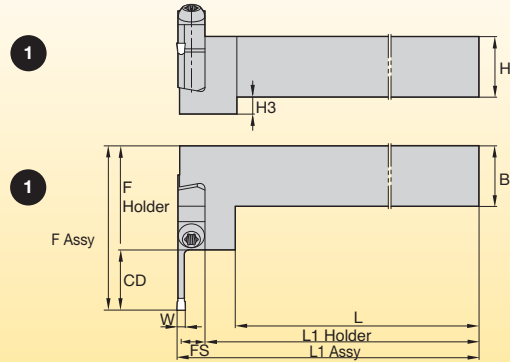
■ A3™ Modular Blades Assemblies

KGMS Toolholder with Modular Blade Assemblies



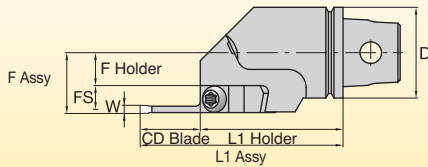
2 $F \text{ Assy} = F \text{ (Holder)} + FS \text{ (Blade)} + W/2$
 2 $L1 \text{ Assy} = L1 \text{ (Holder)} + CD \text{ (Blade)}$

KGME Toolholder with Modular Blade Assemblies



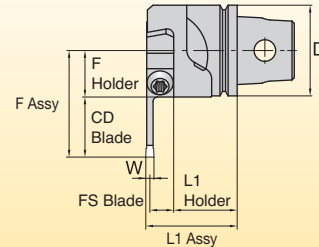
1 $F \text{ Assy} = F \text{ (Holder)} + CD \text{ (Blade)}$
 1 $L1 \text{ Assy} = L1 \text{ (Holder)} + FS \text{ (Blade)} + W/2$

KM-KGMS



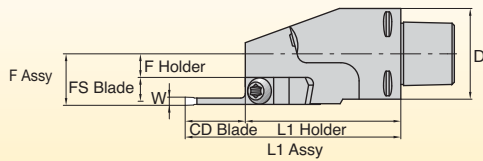
$F \text{ Assy} = F \text{ (Holder)} + FS \text{ (Blade)} + W/2$
 $L1 \text{ Assy} = L1 \text{ (Holder)} + CD \text{ (Blade)}$

KM-KGME



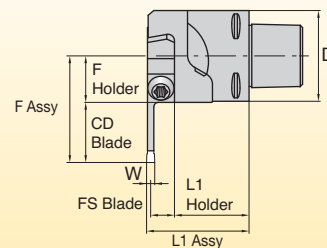
$F \text{ Assy} = F \text{ (Holder)} + CD \text{ (Blade)}$
 $L1 \text{ Assy} = L1 \text{ (Holder)} + FS \text{ (Blade)} + W/2$

C-KGMS



$F \text{ Assy} = F \text{ (Holder)} + FS \text{ (Blade)} + W/2$
 $L1 \text{ Assy} = L1 \text{ (Holder)} + CD \text{ (Blade)}$

C-KGME

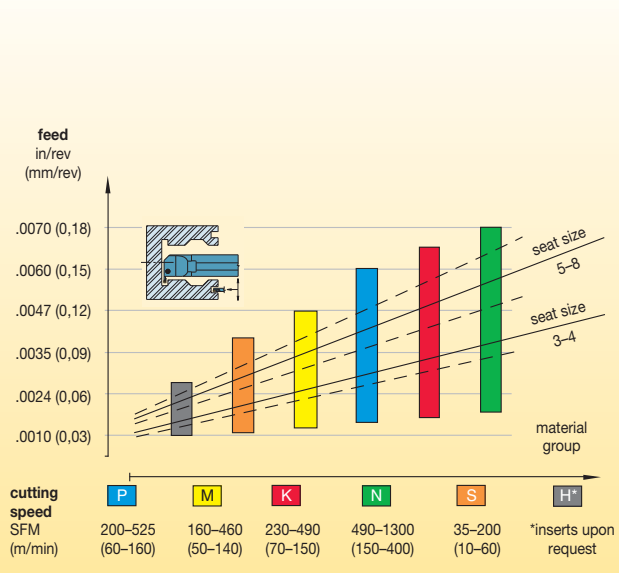


$F \text{ Assy} = F \text{ (Holder)} + CD \text{ (Blade)}$
 $L1 \text{ Assy} = L1 \text{ (Holder)} + FS \text{ (Blade)} + W/2$

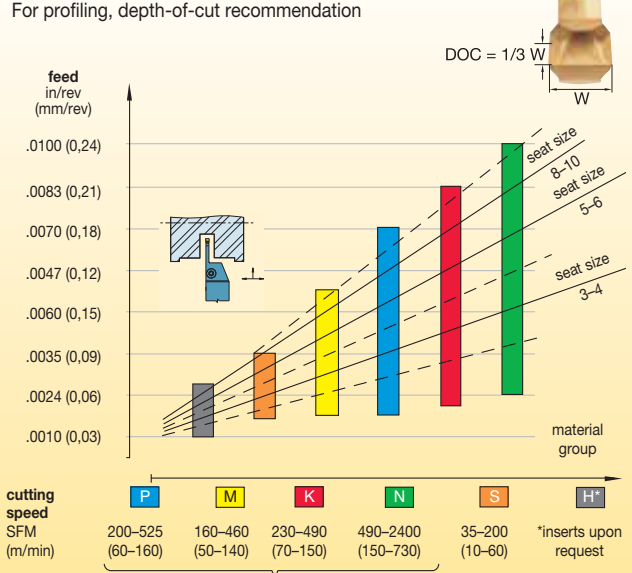
Grooving and Cut-Off

■ Application Guidelines

Speed and Feed Selection for I.D. and Face Grooving



Speed and Feed Selection for O.D. Grooving

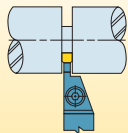


For radial grooving under stable conditions, feed can be increased by up to 50%.

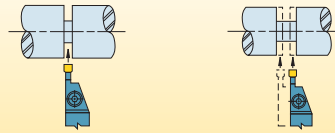
Tool Application Guidelines

- Always use good general machining practices.
- Make the machine and workpiece setup as rigid as possible.
- Integral shank toolholders offer the best rigidity. They should be your first toolholder choice, when possible.
- Use the toolholder with the shortest possible depth of cut for the application ("CD" dimension).
- When changing inserts, make sure the new insert locates securely against the toolholder's positive stop.
- Never tighten the clamping screw without an insert in the pocket.
- Toolholder projection out of the tool block should be as short as possible.
- Inserts should cut as close to center as possible.
- Dwell time in bottom of groove should be less than three revolutions.
- Recommended cutting speeds and feeds are a starting point. Adjust, as necessary, for optimum tool life and chip control.

Deep Grooves

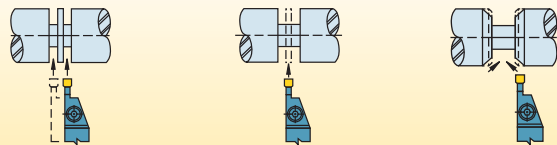


Deep Grooves Slightly Wider than the Tool



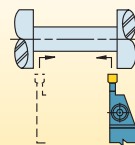
1. Plunge the center of the groove.
2. Plunge each side of the groove to get the specified width. Use a slower feed rate when cutting groove sides.

Extra-Wide Deep Grooves



1. Plunge out both sides of the groove width.
2. Plunge center area to remove web of remaining material.
3. Plunge both sides of groove at the required angle, using approximately one-half the width of the grooving tool for maximum width of cut.

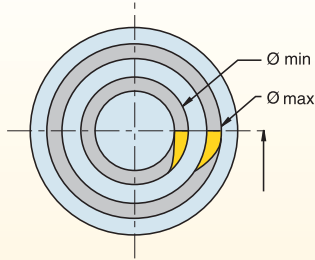
Finish Turning of the Groove/Light Profiling



1. Follow recommendations explained above.
2. To avoid insert chipping and to achieve groove wall perpendicularity, follow the tool path shown here.
3. Use the lightest depth of cut possible while still maintaining good chip breaking, tool life, and surface finish.

Grooving Tool Failure and Solution Guide

Face Grooving Application Guidelines



Tool Selection

- When selecting the toolholder, always start at the largest diameter possible and work toward the smaller diameter. This will allow the strongest tool to be used.

Cutting the First Groove

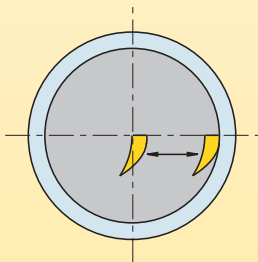
- The outside diameter of the first groove must be between the diameter minimum and diameter maximum capability of the face grooving tool (see illustration above). This creates clearance for the toolholder.

Chip Control

- Adjust speed and feed for good chip control and evacuation from the groove. Chip compaction can cause poor surface finish, tool breakage, and reduced tool life.

Tool Setting

- The tool should be set as close to the center as possible to avoid extreme formation of burrs.
- Align the cutting edge square to the workpiece.




Widening a Face Groove

- After the first groove has been cut, the groove width can be widened in either direction using the same tool. The best practice is to work from the O.D. to the I.D.

Practical Solutions to Grooving Problems

problem	remedy
burr	<ol style="list-style-type: none"> 1. Verify tool center height. 2. Use sharp tools (index more often). 3. Use positive rake PVD coated insert. 4. Use correct grade for workpiece material. 5. Use correct geometry (e.g., positive rake for workhardening material). 6. Change tool path.
poor surface finish	<ol style="list-style-type: none"> 1. Increase speed. 2. Use sharp tools (index more often). 3. Dwell time in bottom 1-3 revolutions (max). 4. Use proper chip control geometry. 5. Increase coolant flow. 6. Verify proper setup (overhang, shank size). 7. Use correct geometry (e.g., positive rake for workhardening material).
groove bottom not flat	<ol style="list-style-type: none"> 1. Use sharp tools (index more often). 2. Dwell time in bottom 1-3 revolutions (max). 3. Reduce tool overhang (increase rigidity). 4. Reduce feed rate at groove bottom. 5. Use a wider insert. 6. Verify tool center height.
poor chip control	<ol style="list-style-type: none"> 1. Use sharp tools (index more often). 2. Increase coolant concentration. 3. Adjust feed rate (usually increase first).
chatter	<ol style="list-style-type: none"> 1. Reduce tool and workpiece overhang. 2. Adjust speed (usually increase first). 3. Adjust feed (usually increase first). 4. Verify tool center height.
insert chipping	<ol style="list-style-type: none"> 1. Use correct grade for workpiece material. 2. Increase speed. 3. Reduce feed. 4. Use a stronger grade. 5. Increase tool and setup rigidity.
built-up edge	<ol style="list-style-type: none"> 1. Use positive rake PVD coated insert. 2. Increase speed. 3. Reduce feed. 4. Increase coolant flow/concentration. 5. Use cermets.
side walls not straight	<ol style="list-style-type: none"> 1. Check tool alignment for square. 2. Reduce workpiece and tool overhang. 3. Use sharp inserts (index more often).



Top Notch™ Grooving Tools and Beyond™ Inserts for Your Shallow Groove and Turn Operations

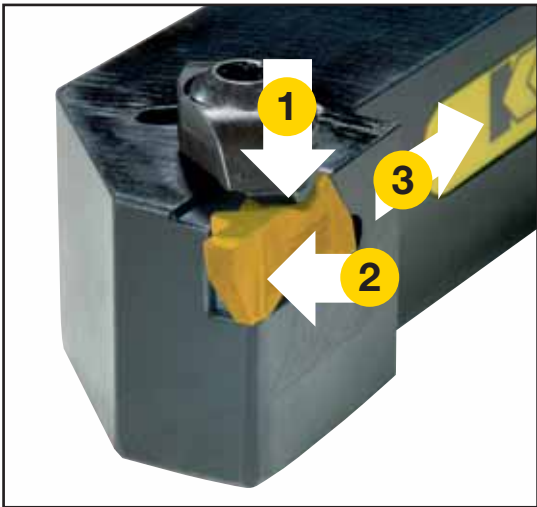
Primary Application

Top Notch Grooving is the proven solution for high productivity. The Top Notch system provides consistent tool performance, accurate indexing, and superior clamping to provide excellent surface finishing and superior tool life.

Features and Benefits

- The Beyond PVD coated grades are designed to cut a variety of workpiece materials.
- Rigid clamping securely locks insert in place through the toughest cuts.
- Versatile design enables one system to handle O.D. and I.D. grooving, face grooving, back turning, undercutting, and even threading operations.
- Chip control inserts provide excellent chip evacuation in grooving, and offer better chip control in multidirectional turning.





Our rigid clamping design prevents insert movement during high-feed rate applications. This benefit ensures excellent surface finish, improved productivity, and superior tool life and promotes perfect concentricity. The rugged bridge clamp generates locking forces in three directions to provide superior resistance to side thrust and tangential forces.

■ Step 1 • Select system based on the required groove depth

What you need to know:

- Groove depth, width, and profile.
- Material to be machined.
- Application to be performed (face, O.D., or I.D. grooving).
- Toolholder requirements (e.g., KM™, square shank, right/left).

Top Notch™



Grooving

For grooving depth $\leq 1.5x$ grooving width, review system capability chart and proceed to Step 2.

A3™ or A4™



Deep Grooving

For grooving depth $\geq 1.5x$ grooving width, see A3 Deep Grooving page D26 or A4 Grooving and Turning page D70.

Grooving and Cut-Off

Top Notch Grooving for Internal, External, and Face Grooving Applications

system capabilities		minimum in (mm)	maximum in (mm)
O.D./I.D. grooving	width	.031 (0,79)	.375 (9,53)
	depth	.050 (1,27)	.375 (9,53)
face grooving	width	.125 (3,18)	.375 (9,53)
	depth	.150 (3,81)	.250 (6,35)
internal grooving	diameter	.440 (11,2)	—
face grooving diameter	standard	.940 (23,9)	—
	deep	1.875 (47,6)	—
deep O.D./I.D. grooving	width	.062 (1,57)	.250 (6,35)
	depth	.125 (3,18)	.500 (12,70)
deep face grooving	width	.125 (3,18)	.250 (6,35)
	depth	.250 (6,35)	.500 (12,70)



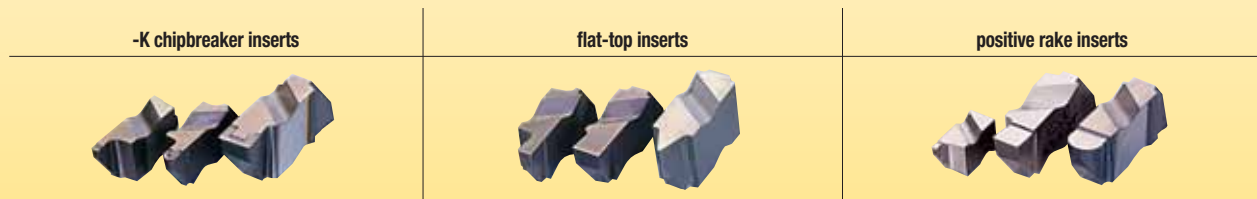
■ Step 2 • Select toolholder based on the application

NOTE: Toolholders are available as conventional square shank versions as well as quick-change versions. The insert size must match the gage insert of your toolholder selection.

O.D. and face grooving applicationssee pages D146–D149
 I.D. grooving applicationssee pages D150–D154

Step 3 • Select chipbreaker style and feed rate
Chipbreaker and Feed Rates • in/rev (mm/rev)


workpiece material and application	P	M	K	N	S	H
first choice	NG-K .003-.011 (0,08-0,28)	NG-K .0025-.008 (0,07-0,20)	NG .004-.012 (0,01-0,30)	NGP .004-.012 (0,01-0,30)	NG-K .0025-.008 (0,07-0,20)	NG-ST CBN tipped .002-.004 (0,05-0,10)
alternate choice	NG .004-.012 (0,10-0,30)	NGP .004-.009 (0,10-0,23)	NG-K .003-.011 (0,08-0,28)	NG-K .003-.012 (0,08-0,30)	NGP .004-.008 (0,10-0,20)	—


Step 4 • Select grade and speed
Recommendations for Grade and Speed Selection • SFM (m/min)

machining condition	workpiece material					
	P	M	K	N	S	H
high-performance for optimal conditions (clean cuts, good machine condition, higher speed capability)	KC9110 400-1200 (120-370)	KCU10/KC5010 250-750 (80-230)	KC9320 400-1200 (120-370)	KD1425 800-10000 (240-3050)	KCU10/KC5010 50-400 (20-120)	KB5625 250-500 (80-150)
	KT315 330-750 (100-230)	KT315 230-650 (70-200)	KC5010 250-750 (80-230)	—	—	—
general purpose (first choice for general machining)	KC9110 400-1000 (120-300)	KCU25/KC5025 160-400 (50-120)	KC9110 400-1000 (120-300)	KC5410 500-3000 (150-910)	KCU25/KC5025 35-200 (10-60)	KB5625 250-500 (80-150)
unfavorable conditions (roughing, poor machine condition, interrupted cuts, low speed, I.D. grooving)	KCU25/KC5025 180-450 (50-140)	KCU25/KC5025 130-300 (40-90)	KC5025 200-500 (60-300)	KCU25/KC5025 200-1000 (60-300)	KCU25/KC5025 35-150 (10-50)	KB1630 200-350 (60-110)

Step 5 • Select insert and holder from catalog page

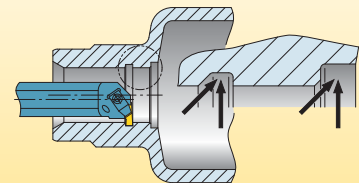
NOTE: The insert size must match the gage insert size of your toolholder selection.

Example for Top Notch • Grooving

 Material.....low-alloyed steel
 Groove depth079" (2mm)
 Groove width118" (3mm)
 OperationI.D. cut, limited speed capability,
 plunge groove and chamfer

Recommendation

 Insert.....NG2M300RK
 GradeKC5025
 Insert width118" (3mm)
 Insert size2

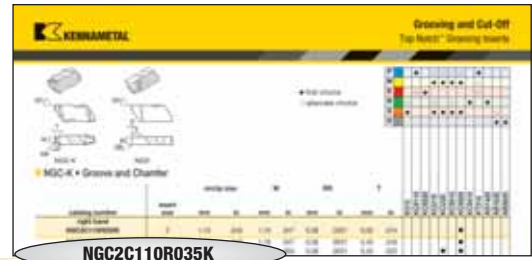
 Toolholder.....A20QNN2L2 (metric)
 A12NEL2 (inch)
 Gage insertN.2R

 Speed: 400 SFM (120 m/min)
 Feed: .006 in/rev (0,15 mm/rev)

Congratulations!

You have successfully maximized your productivity by selecting the best Top Notch insert geometry, grade, and cutting specifications for your application!

How Do Catalog Numbers Work?

Each character in our catalog number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.



NGC2C110R035K

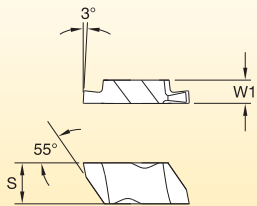
Grooving and Cut-Off

Metric																													
N	G	C	2	C	110	R	035	K																					
Type of Insert	Insert Style	Additional Information	Insert Size	Size Identification	Groove Size**	Hand of Insert	Cutting Depth	Chipbreaker Design	Definition of Inserts																				
<p>N = Top Notch</p>		<p>D = Deep grooving</p> <p>P = Positive</p> <p>C = Groove and chamfer</p>		<p>M = Metric insert groove width</p> <p>C = Circlip groove insert width is nominal circlip size</p> <p>□ = Blank indicates inch width insert</p>		<p>L = Left hand</p> <p>R = Right hand</p>	<p>Shown for groove and chamfer inserts in 0,01mm increments</p>	<p>E = Hone only</p> <p>K = Standard chip control</p> <p>S = T Land and Hone</p> <p>ST = STD Tip (PCBN)</p>	<p>Groove size "J" or "L" for Poly-Vee inserts "I" indicates internal face grooving insert</p>																				
<p>B = Blank (for special forms)</p> <p>F = Face grooving</p> <p>G = Grooving</p> <p>P = Back turning</p> <p>R = Full radius</p> <p>U = Undercutting (or relieving)</p> <p>V = Poly-Vee</p>		<table border="1"> <thead> <tr> <th>insert number</th> <th>W1 (in)</th> <th>W1 (mm)</th> </tr> </thead> <tbody> <tr><td>1</td><td>.100</td><td>2,54</td></tr> <tr><td>2</td><td>.150</td><td>3,81</td></tr> <tr><td>3</td><td>.195</td><td>4,95</td></tr> <tr><td>4</td><td>.255</td><td>6,48</td></tr> <tr><td>5</td><td>.380</td><td>9,65</td></tr> <tr><td>6</td><td>.383</td><td>9,73</td></tr> </tbody> </table>			insert number	W1 (in)	W1 (mm)	1	.100	2,54	2	.150	3,81	3	.195	4,95	4	.255	6,48	5	.380	9,65	6	.383	9,73	<p>Position pertains to groove width for F-, G-, and U-style inserts; radii for R-style grooving inserts; and circlip size for groove and chamfer inserts. Dimension in .001" or 0,01mm.</p> <p>Inch example: 1/32" width groove or radius equals "031" catalog position number.</p> <p>Metric example: 3,25mm width groove or radius equals "325" catalog position number.</p> <p>Width tolerance: ± .001" (± 0,025mm) unless otherwise specified</p>			
insert number	W1 (in)	W1 (mm)																											
1	.100	2,54																											
2	.150	3,81																											
3	.195	4,95																											
4	.255	6,48																											
5	.380	9,65																											
6	.383	9,73																											

*Kennametal proprietary identification system.

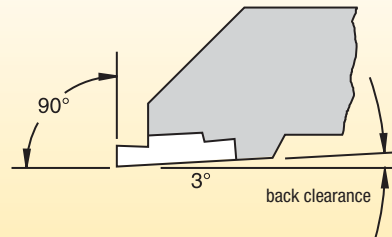
**Omit position for Top Notch NB-style blanks.

Top Notch Threading and Grooving Insert Dimensions







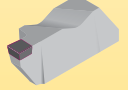














insert size	S		W1	
	mm	inch	mm	inch
1	2,54	.100	2,54	.100
2	5,56	.219	3,81	.150
3	8,74	.344	4,95	.195
4	11,51	.453	6,48	.255
5	17,48	.688	9,65	.380
6	11,51	.453	9,73	.383
8	7,93	.312	11,13	.438

Top Notch Holder Design

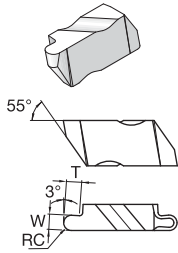


NOTE: Holders are designed to locate insert inclined to 3° to provide back clearance down open side.

Kennametal and Top Notch tooling technology combine to bring you the very best threading and grooving system available in the world today.

insert style	application	rake angle	page(s)	insert style	application	rake angle	page(s)
NG 	<ul style="list-style-type: none"> • General-purpose grooving. • O-ring grooving. • Circlip grooving. 	neutral	D128	NFD-KI 	<ul style="list-style-type: none"> • Internal deep face grooving with chip control. • For use in boring bars for internal face grooves. 	10° positive	D136
NG-K 	<ul style="list-style-type: none"> • Chip control geometry. • General-purpose grooving. • O-ring grooving. • Circlip grooving. • Light turning. 	10° positive	D130	NP-K NPD-K 	<ul style="list-style-type: none"> • Turning. • Back turning positive. • Profiling with chip control. 	10° positive	D137
NG-ST 	<ul style="list-style-type: none"> • Hard turning. 	neutral	D142	NR 	<ul style="list-style-type: none"> • Full radius grooving. • Turning profiling. 	neutral	D138
NGC-K 	<ul style="list-style-type: none"> • Combined groove and chamfered edge break in one positive plunge with chip control. • Designed for DIN 471/472 standard circlip grooves. 	10° positive	D133	NR-K 	<ul style="list-style-type: none"> • Chip control geometry. • Full radius grooving turning profiling. 	10° positive	D140
NGD 	<ul style="list-style-type: none"> • Deep grooving. 	neutral	D133	NRD 	<ul style="list-style-type: none"> • Deep grooving. • Full radius endform. 	neutral	D141
NGD-K 	<ul style="list-style-type: none"> • Chip control geometry. • Deep grooving. • Light turning. 	10° positive	D134	NRP 	<ul style="list-style-type: none"> • Full radius grooving. • Light-turning profiling. 	5° positive	D140
NGP 	<ul style="list-style-type: none"> • General-purpose grooving. • O-ring grooving. • Circlip grooving. 	5° positive	D135	NU 	<ul style="list-style-type: none"> • Undercutting. 	neutral	D141
NF 	<ul style="list-style-type: none"> • Face grooving. • Additional side clearance. 	neutral	D135	NV 	<ul style="list-style-type: none"> • Poly Vee grooving. 	neutral	D141
NF-K 	<ul style="list-style-type: none"> • Face grooving with chip control. • Additional side clearance. 	10° positive	D136	NB/NBD 	<ul style="list-style-type: none"> • Blanks. • Blanks for deep grooving. • Available only in uncoated grades. 	—	D142
NFD-K 	<ul style="list-style-type: none"> • Deep face grooving with chip control. • Additional side clearance. 	10° positive	D136				

(NR • Full Radius Inserts continued)



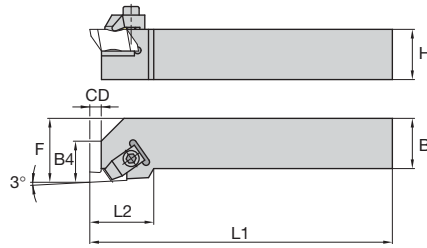
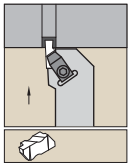
● first choice
○ alternate choice

	P	M	K	N	S	H	K313	KC9110	KC9320	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KD1425	KB1630	KB5625
	●		○	○	○	○												
		●		○	○	○												
			●	○	○	○												
				○	○	○												
					●	○												
						●												

catalog number	insert size	W		Ap max		RC		T		K313	KC9110	KC9320	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KD1425	KB1630	KB5625	
		mm	in	mm	in	mm	in	mm	in													
left hand																						
NR2M050L	2	1,00	.039	—	—	0,50	.0197	1,27	.050			●	●	●	●	●						
NR2M075L	2	1,50	.059	—	—	0,75	.0295	2,79	.110			●										
NR2031L	2	1,58	.062	—	—	0,79	.0310	2,79	.110				●	●	●	●						
NR2M100L	2	2,00	.079	—	—	1,00	.0394	2,79	.110			●				●						
NR2047L	2	2,39	.094	—	—	1,19	.0470	2,79	.110					●		●						
NR2M125L	2	2,50	.098	—	—	1,25	.0492	2,79	.110			●				●						
NR2M150L	2	3,00	.118	—	—	1,50	.0591	2,79	.110			●				●						
NR2062L	2	3,18	.125	—	—	1,59	.0625	2,79	.110				●	●	●	●						
NR2M175L	2	3,50	.138	—	—	1,75	.0689	2,79	.110				●		●							
NR3031L	3	1,58	.062	—	—	0,79	.0310	2,39	.094	●		●	●	●	●	●						
NR3M100L	3	2,00	.079	—	—	1,00	.0394	2,39	.094			●				●						
NR3047L	3	2,39	.094	—	—	1,19	.0470	3,81	.150	●			●	●	●	●						
NR3M125L	3	2,50	.098	—	—	1,25	.0492	3,81	.150			●										
NR3M150L	3	3,00	.118	—	—	1,50	.0591	3,81	.150			●	●	●	●	●						
NR3062L	3	3,18	.125	—	—	1,59	.0625	3,81	.150	●			●	●	●	●						
NR3M175L	3	3,50	.138	—	—	1,75	.0689	3,81	.150			●										
NR3M200L	3	4,00	.157	—	—	2,00	.0787	3,81	.150			●				●						
NR3M225L	3	4,50	.177	—	—	2,25	.0886	3,81	.150			●				●						
NR3094L	3	4,78	.188	—	—	2,39	.0940	3,81	.150	●			●	●	●	●						
NR4M200L	4	4,00	.157	—	—	2,00	.0787	6,35	.250			●										
NR4M225L	4	4,50	.177	—	—	2,25	.0886	6,35	.250			●										
NR4M250L	4	5,00	.197	—	—	2,50	.0984	6,35	.250			●										
NR4125L	4	6,35	.250	—	—	3,18	.1250	6,35	.250				●	●	●	●						

NOTE: Right-hand insert shown; left-hand insert is mirror image.





■ NS

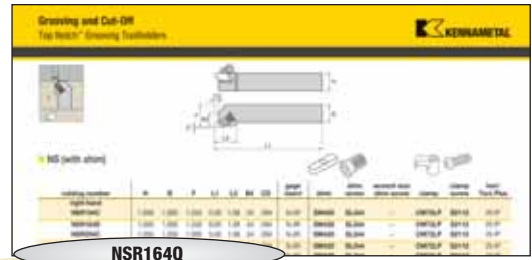


catalog number	H	B	F	L1	L2	B4	CD	gage insert	clamp	clamp screw	hex/ Torx Plus
right hand											
NSR062	.375	.375	.562	2.50	.75	.35	.138	N.2R	CM74	S310	7/64
NSR082V	.500	.500	.750	3.50	.75	.35	.138	N.2R	CM74	S310	7/64
NSR102B	.625	.625	.875	4.50	.75	.35	.138	N.2R	CM74	S310	7/64
NSR122B	.750	.750	1.000	4.50	.75	.35	.138	N.2R	CM74	S310	7/64
NSR162C	1.000	1.000	1.250	5.00	.75	.35	.138	N.2R	CM74	S310	7/64
NSR123A	.750	.750	1.000	4.00	1.25	.50	.210	N.3R	CM72LP	S2112	25 IP
NSR123B	.750	.750	1.000	4.50	1.25	.50	.210	N.3R	CM72LP	S2112	25 IP
NSR163C	1.000	1.000	1.250	5.00	1.25	.50	.210	N.3R	CM72LP	S2112	25 IP
NSR163D	1.000	1.000	1.250	6.00	1.25	.50	.210	N.3R	CM72LP	S2112	25 IP
NSR203D	1.250	1.250	1.500	6.00	1.25	.50	.210	N.3R	CM72LP	S2112	25 IP
NSR243D	1.500	1.500	2.000	6.00	1.38	.50	.210	N.3R	CM72LP	S2112	25 IP
NSR243E	1.500	1.500	2.000	7.00	1.38	.50	.210	N.3R	CM72LP	S2112	25 IP
NSR853D	1.250	1.000	1.250	6.00	1.25	.50	.210	N.3R	CM72LP	S2112	25 IP
NSR205D	1.250	1.250	1.500	6.00	2.00	.61	.415	N.5R	CM80	S352	1/4
NSR245D	1.500	1.500	2.000	6.00	2.00	.61	.415	N.5R	CM80	S352	1/4
left hand											
NSL062	.375	.375	.562	2.50	.75	.35	.138	N.2L	CM75	S310	7/64
NSL082V	.500	.500	.750	3.50	.75	.35	.138	N.2L	CM75	S310	7/64
NSL102B	.625	.625	.875	4.50	.75	.35	.138	N.2L	CM75	S310	7/64
NSL122B	.750	.750	1.000	4.50	.75	.35	.138	N.2L	CM75	S310	7/64
NSL162C	1.000	1.000	1.250	5.00	.75	.35	.138	N.2L	CM75	S310	7/64
NSL123A	.750	.750	1.000	4.00	1.25	.50	.210	N.3L	CM73LP	S2112	25 IP
NSL123B	.750	.750	1.000	4.50	1.25	.50	.210	N.3L	CM73LP	S2112	25 IP
NSL163C	1.000	1.000	1.250	5.00	1.25	.50	.210	N.3L	CM73LP	S2112	25 IP
NSL163D	1.000	1.000	1.250	6.00	1.25	.50	.210	N.3L	CM73LP	S2112	25 IP
NSL203D	1.250	1.250	1.500	6.00	1.25	.50	.210	N.3L	CM73LP	S2112	25 IP
NSL243D	1.500	1.500	2.000	6.00	1.38	.50	.210	N.3L	CM73LP	S2112	25 IP
NSL243E	1.500	1.500	2.000	7.00	1.38	.50	.210	N.3L	CM73LP	S2112	25 IP
NSL853D	1.250	1.000	1.250	6.00	1.25	.50	.210	N.3L	CM73LP	S2112	25 IP
NSL205D	1.250	1.250	1.500	6.00	2.00	.61	.415	N.5L	CM81	S352	1/4

Grooving and Cut-Off

How Do Catalog Numbers Work?

Each character in our catalog number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.

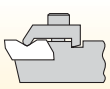


NSR164Q

Grooving and Cut-Off

N

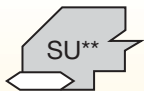
Insert Holding Method



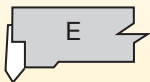
N = Top Notch*

S

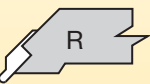
Insert Mounting Location



SU = Side mount utility**



E = End



R = Undercut



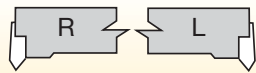
S = Side mount, offset



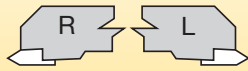
AS = side mount, no offset

R

Hand of Tool



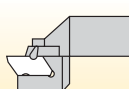
End mount



Side mount

DH

Drop Head



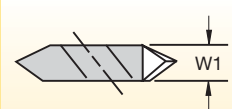
DH = Drop Head

16

Shank Size

4

Insert Size



insert size	W1	
	inch	mm
2	.150	3,81
3	.195	4,95
4	.255	6,98
5	.380	9,65
6	.383	9,73
8	.438	11,13

D

Qualified Surface and Length

- A** = Qualified back and end, 4" long
- B** = Qualified back and end, 4.5" long
- C** = Qualified back and end, 5" long
- D** = Qualified back and end, 6" long
- E** = Qualified back and end, 7" long
- V** = Qualified back and end, 3.5" long*
- Q** = Qualified metric holder

inch:

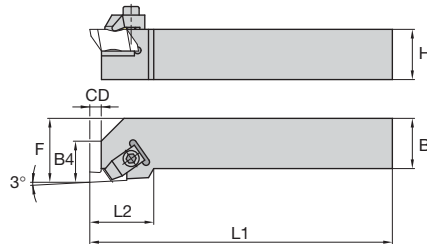
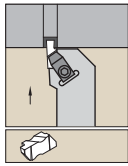
This position will show a significant two-digit number that indicates the holder cross section. For shanks 5/8" square and larger, the number will represent the number of sixteenths of width and height. For shanks under 5/8" square, the number of sixteenths of cross section will be preceded by a zero. For rectangular holders, the first digit represents the number of eighths of width and the second digit the number of quarters of height, except for a toolholder 1-1/4" x 1-1/2", which is given the number 91.

metric:

Shank height and width in mm and holder length according to ISO standard.

* Kennametal proprietary standard only.

**Side mount utility holder can only use NTU inserts.

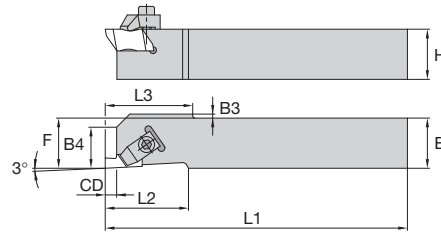
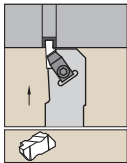


■ NS (with shim)



Grooving and Cut-Off

catalog number	H	B	F	L1	L2	B4	CD	gage insert	shim	shim screw	wrench size shim screw	clamp	clamp screw	hex/Torx Plus
right hand														
NSR164C	1.000	1.000	1.250	5.00	1.38	.54	.294	N.4R	SM420	SL344	—	CM72LP	S2112	25 IP
NSR164D	1.000	1.000	1.250	6.00	1.38	.54	.294	N.4R	SM420	SL344	—	CM72LP	S2112	25 IP
NSR204C	1.250	1.250	1.500	5.00	1.38	.54	.294	N.4R	SM420	SL344	—	CM72LP	S2112	25 IP
NSR204D	1.250	1.250	1.500	6.00	1.38	.54	.294	N.4R	SM420	SL344	—	CM72LP	S2112	25 IP
NSR244D	1.500	1.500	2.000	6.00	1.50	.54	.294	N.4R	SM420	SL344	—	CM72LP	S2112	25 IP
NSR244E	1.500	1.500	2.000	7.00	1.50	.54	.294	N.4R	SM420	SL344	—	CM72LP	S2112	25 IP
NSR854D	1.250	1.000	1.250	6.00	1.38	.54	.294	N.4R	SM420	SL344	—	CM72LP	S2112	25 IP
NSR864E	1.500	1.000	1.250	7.00	1.38	.54	.294	N.4R	SM420	SL344	—	CM72LP	S2112	25 IP
NSR166D	1.000	1.000	1.250	6.00	1.38	.67	.334	N.6R	SM416	S111	1/16	CM120	S412	5/32
NSR206D	1.250	1.250	1.500	6.00	1.38	.67	.334	N.6R	SM416	S111	1/16	CM120	S412	5/32
NSR246D	1.500	1.500	2.000	6.00	1.50	.67	.334	N.6R	SM416	S111	1/16	CM120	S412	5/32
NSR168D	1.000	1.000	1.250	6.00	1.25	.72	.225	N.8R	SM419	S112	1/16	CM144	S422	3/16
left hand														
NSL164C	1.000	1.000	1.250	5.00	1.38	.54	.294	N.4L	SM420	SL344	—	CM73LP	S2112	25 IP
NSL164D	1.000	1.000	1.250	6.00	1.38	.54	.294	N.4L	SM420	SL344	—	CM73LP	S2112	25 IP
NSL204C	1.250	1.250	1.500	5.00	1.38	.54	.294	N.4L	SM420	SL344	—	CM73LP	S2112	25 IP
NSL204D	1.250	1.250	1.500	6.00	1.38	.54	.294	N.4L	SM420	SL344	—	CM73LP	S2112	25 IP
NSL244D	1.500	1.500	2.000	6.00	1.50	.54	.294	N.4L	SM420	SL344	—	CM73LP	S2112	25 IP
NSL244E	1.500	1.500	2.000	7.00	1.50	.54	.294	N.4L	SM420	SL344	—	CM73LP	S2112	25 IP
NSL854D	1.250	1.000	1.250	6.00	1.38	.54	.294	N.4L	SM420	SL344	—	CM73LP	S2112	25 IP
NSL864E	1.500	1.000	1.250	7.00	1.38	.54	.294	N.4L	SM420	SL344	—	CM73LP	S2112	25 IP
NSL166D	1.000	1.000	1.250	6.00	1.38	.67	.334	N.6L	SM416	S111	1/16	CM121	S412	5/32
NSL206D	1.250	1.250	1.500	6.00	1.38	.67	.334	N.6L	SM416	S111	1/16	CM121	S412	5/32
NSL246D	1.500	1.500	2.000	6.00	1.50	.67	.334	N.6L	SM416	S111	1/16	CM121	S412	5/32

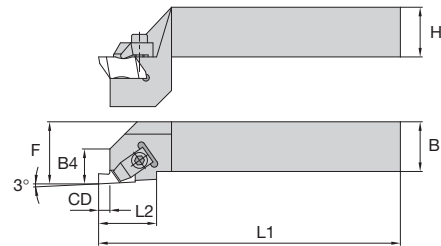
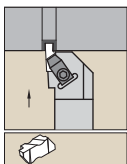


■ NAS



catalog number	H	B	F	L1	L2	B4	CD	B3	L3	gage insert	clamp	clamp screw	hex/Torx Plus
right hand													
NASR062D	.375	.375	.375	6.00	.75	.35	.138	.070	.88	N.2R	CM182	S310	7/64
NASR082D	.500	.500	.500	6.00	.75	.35	.138	—	—	N.2R	CM182	S310	7/64
NASR102B	.625	.625	.625	4.50	.75	.35	.138	—	—	N.2R	CM74	S310	7/64
NASR083D	.500	.500	.500	6.00	1.25	.50	.210	.125	1.32	N.3R	CM184LP	S2112	25 IP
NASR103B	.625	.625	.625	4.50	1.30	—	.210	—	—	N.3R	CM184LP	S2112	25 IP
left hand													
NASL062D	.375	.375	.375	6.00	.75	.35	.138	.070	.88	N.2L	CM183	S310	7/64
NASL082D	.500	.500	.500	6.00	.75	.35	.138	—	—	N.2L	CM183	S310	7/64
NASL102B	.625	.625	.625	4.50	.75	.35	.138	—	—	N.2L	CM75	S310	7/64
NASL083D	.500	.500	.500	6.00	1.25	.50	.210	.125	1.32	N.3L	CM185LP	S2112	25 IP
NASL103B	.625	.625	.625	4.50	1.30	—	.210	—	—	N.3L	CM185LP	S2112	25 IP

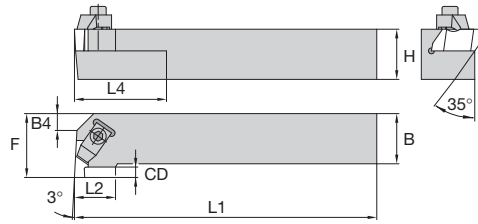
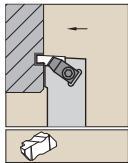
Grooving and Cut-Off



■ NS-DH



catalog number	H	B	F	L1	L2	B4	CD	gage insert	clamp	clamp screw	hex/Torx Plus	wrench size jack screw
right hand												
NSRDH122B	.750	.750	1.000	4.50	.75	.40	.138	N.2R	CM74	S310	7/64	1/8
NSRDH162C	1.000	1.000	1.250	5.00	.75	.40	.138	N.2R	CM74	S310	7/64	1/8
NSRDH123A	.750	.750	1.250	4.00	1.25	.58	.210	N.3R	CM72LP	S2112	25 IP	—
NSRDH163C	1.000	1.000	1.250	5.00	1.25	.58	.210	N.3R	CM72LP	S2112	25 IP	—
NSRDH163D	1.000	1.000	1.250	6.00	1.25	.58	.210	N.3R	CM72LP	S2112	25 IP	—
NSRDH203D	1.250	1.250	1.500	6.00	1.25	.62	.210	N.3R	CM72LP	S2112	25 IP	3/16
NSRDH204D	1.250	1.250	1.500	6.00	1.38	.62	.294	N.4R	CM72LP	S2112	25 IP	3/16
left hand												
NSLDH203D	1.250	1.250	1.500	6.00	1.25	.62	.210	N.3L	CM73LP	S2112	25 IP	3/16

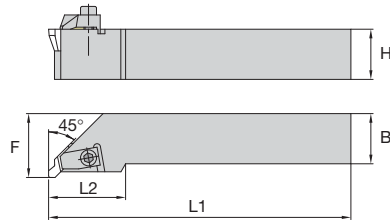
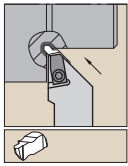


■ NE



Grooving and Cut-Off

catalog number	H	B	F	L1	L2	B4	CD	L4	gage insert	clamp	clamp screw	hex/ Torx Plus
right hand												
NER062	.375	.375	.750	2.50	.50	—	.138	1.0	N.2L	CM75	S310	7/64
NER082V	.500	.500	.750	3.50	.50	—	.138	1.0	N.2L	CM75	S310	7/64
NER102B	.625	.625	.750	4.50	—	—	.138	1.0	N.2L	CM75	S310	7/64
NER122B	.750	.750	1.000	4.50	.50	.29	.138	1.0	N.2L	CM75	S310	7/64
NER162C	1.000	1.000	1.250	5.00	.50	.41	.138	1.0	N.2L	CM75	S310	7/64
NER123B	.750	.750	1.125	4.50	.75	—	.210	2.0	N.3L	CM73LP	S2112	25 IP
NER163C	1.000	1.000	1.250	5.00	.75	—	.210	2.0	N.3L	CM73LP	S2112	25 IP
NER163D	1.000	1.000	1.250	6.00	.75	—	.210	2.0	N.3L	CM73LP	S2112	25 IP
NER203D	1.250	1.250	1.500	6.00	.75	.26	.210	2.0	N.3L	CM73LP	S2112	25 IP
NER243D	1.500	1.500	2.000	6.00	.75	.76	.210	2.0	N.3L	CM73LP	S2112	25 IP
NER853D	1.250	1.000	1.250	6.00	.75	—	.210	2.0	N.3L	CM73LP	S2112	25 IP
NER164C	1.000	1.000	1.375	5.00	.75	—	.294	2.0	N.4L	CM73LP	S2112	25 IP
NER164D	1.000	1.000	1.375	6.00	.75	—	.294	2.0	N.4L	CM73LP	S2112	25 IP
NER204D	1.250	1.250	1.625	6.00	.75	.27	.294	2.0	N.4L	CM73LP	S2112	25 IP
NER244D	1.500	1.500	2.000	6.00	.75	.65	.294	2.0	N.4L	CM73LP	S2112	25 IP
NER205D	1.250	1.250	2.000	6.00	1.44	—	.415	2.0	N.5L	CM81	S352	1/4
NER206D	1.250	1.250	1.625	6.00	.75	.27	.300	2.0	N.6L	CM121	S412	5/32
left hand												
NEL062	.375	.375	.750	2.50	.50	—	.138	1.0	N.2R	CM74	S310	7/64
NEL082V	.500	.500	.750	3.50	.50	—	.138	1.0	N.2R	CM74	S310	7/64
NEL102B	.625	.625	.750	4.50	—	—	.138	1.0	N.2R	CM74	S310	7/64
NEL122B	.750	.750	1.000	4.50	.50	.29	.138	1.0	N.2R	CM74	S310	7/64
NEL162C	1.000	1.000	1.250	5.00	.50	.41	.138	1.0	N.2R	CM74	S310	7/64
NEL123B	.750	.750	1.125	4.50	.75	—	.210	2.0	N.3R	CM72LP	S2112	25 IP
NEL163C	1.000	1.000	1.250	5.00	.75	—	.210	2.0	N.3R	CM72LP	S2112	25 IP
NEL163D	1.000	1.000	1.250	6.00	.75	—	.210	2.0	N.3R	CM72LP	S2112	25 IP
NEL203D	1.250	1.250	1.500	6.00	.75	.26	.210	2.0	N.3R	CM72LP	S2112	25 IP
NEL243D	1.500	1.500	2.000	6.00	.75	.76	.210	2.0	N.3R	CM72LP	S2112	25 IP
NEL853D	1.250	1.000	1.250	6.00	.75	—	.210	2.0	N.3R	CM72LP	S2112	25 IP
NEL164C	1.000	1.000	1.375	5.00	.75	—	.294	2.0	N.4R	CM72LP	S2112	25 IP
NEL164D	1.000	1.000	1.375	6.00	.75	—	.294	2.0	N.4R	CM72LP	S2112	25 IP
NEL204D	1.250	1.250	1.625	6.00	.75	.27	.294	2.0	N.4R	CM72LP	S2112	25 IP
NEL244D	1.500	1.500	2.000	6.00	.75	.65	.294	2.0	N.4R	CM72LP	S2112	25 IP
NEL205D	1.250	1.250	2.000	6.00	1.44	—	.415	2.0	N.5R	CM80	S352	1/4
NEL206D	1.250	1.250	1.625	6.00	.75	.27	.300	2.0	N.6R	CM120	S412	5/32

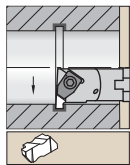


■ NR

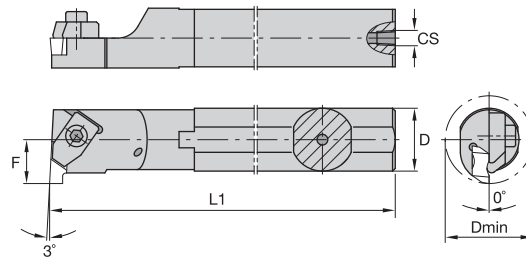


catalog number	H	B	F	L1	L2	gage insert	clamp	clamp screw	hex/Torx Plus
right hand									
NRR123B	.750	.750	1.000	4.50	1.25	NU3L	CM73LP	S2112	25 IP
NRR163C	1.000	1.000	1.250	5.00	1.25	NU3L	CM73LP	S2112	25 IP
NRR163D	1.000	1.000	1.250	6.00	1.25	NU3L	CM73LP	S2112	25 IP
NRR203D	1.250	1.250	1.500	6.00	1.25	NU3L	CM73LP	S2112	25 IP
NRR243D	1.500	1.500	2.000	6.00	1.38	NU3L	CM73LP	S2112	25 IP
left hand									
NRL123B	.750	.750	1.000	4.50	1.25	NU3R	CM72LP	S2112	25 IP
NRL163C	1.000	1.000	1.250	5.00	1.25	NU3R	CM72LP	S2112	25 IP
NRL163D	1.000	1.000	1.250	6.00	1.25	NU3R	CM72LP	S2112	25 IP
NRL203D	1.250	1.250	1.500	6.00	1.25	NU3R	CM72LP	S2112	25 IP

Grooving and Cut-Off



Steel shank with through coolant.



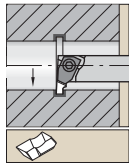
■ A-NE



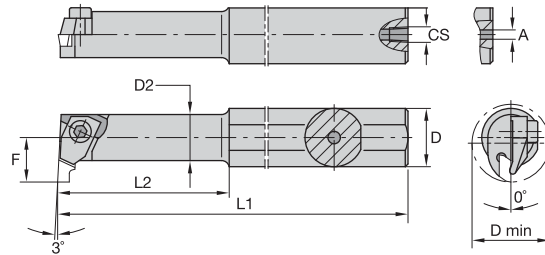
Grooving and Cut-Off

catalog number	D min	D	L1	F	CS	gage insert	clamp	clamp screw	hex (inch)/ Torx Plus
right hand									
A08NER2	.730	.500	8	.437	1/16-27 NPT	N.2L	CM147	S39	7/64
A10NER2	1.000	.625	10	.500	1/8-27 NPT	N.2L	CM75	S310	7/64
A12NER2	1.125	.750	10	.562	1/8-27 NPT	N.2L	CM75	S310	7/64
A16NER2	1.375	1.000	12	.688	1/4-18 NPT	N.2L	CM75	S310	7/64
A16NER3	1.375	1.000	12	.688	1/4-18 NPT	N.3L	CM73LP	S2112	25 IP
A20NER3	1.750	1.250	14	.875	1/4-18 NPT	N.3L	CM73LP	S2112	25 IP
A24NER3	2.000	1.500	14	1.000	1/4-18 NPT	N.3L	CM73LP	S2112	25 IP
A28NER3	2.250	1.750	14	1.125	1/4-18 NPT	N.3L	CM73LP	S2112	25 IP
A32NER3	2.500	2.000	16	1.250	1/4-18 NPT	N.3L	CM73LP	S2112	25 IP
A40NER3	3.000	2.500	16	1.500	1/4-18 NPT	N.3L	CM73LP	S2112	25 IP
A28NER4	2.500	1.750	14	1.250	1/4-18 NPT	N.4L	CM73LP	S2112	25 IP
A32NER4	2.750	2.000	16	1.375	1/4-18 NPT	N.4L	CM73LP	S2112	25 IP
A40NER4	3.250	2.500	16	1.625	1/4-18 NPT	N.4L	CM73LP	S2112	25 IP
A32NER5	2.812	2.000	16	1.406	1/4-18 NPT	N.5L	CM81	S352	1/4
A32NER6	2.750	2.000	16	1.375	1/4-18 NPT	N.6L	CM121	S2112	5/32
A40NER6	3.250	2.500	16	1.625	1/4-18 NPT	N.6L	CM121	S2112	5/32
left hand									
A08NEL2	.730	.500	8	.437	1/16-27 NPT	N.2R	CM146	S39	7/64
A10NEL2	1.000	.625	10	.500	1/8-27 NPT	N.2R	CM74	S310	7/64
A12NEL2	1.125	.750	10	.562	1/8-27 NPT	N.2R	CM74	S310	7/64
A16NEL2	1.375	1.000	12	.688	1/4-18 NPT	N.2R	CM74	S310	7/64
A16NEL3	1.375	1.000	12	.688	1/4-18 NPT	N.3R	CM72LP	S2112	25 IP
A20NEL3	1.750	1.250	14	.875	1/4-18 NPT	N.3R	CM72LP	S2112	25 IP
A24NEL3	2.000	1.500	14	1.000	1/4-18 NPT	N.3R	CM72LP	S2112	25 IP
A28NEL3	2.250	1.750	14	1.125	1/4-18 NPT	N.3R	CM72LP	S2112	25 IP
A32NEL3	2.500	2.000	16	1.250	1/4-18 NPT	N.3R	CM72LP	S2112	25 IP
A40NEL3	3.000	2.500	16	1.500	1/4-18 NPT	N.3R	CM72LP	S2112	25 IP
A28NEL4	2.500	1.750	14	1.250	1/4-18 NPT	N.4R	CM72LP	S2112	25 IP
A32NEL4	2.750	2.000	16	1.375	1/4-18 NPT	N.4R	CM72LP	S2112	25 IP
A40NEL4	3.250	2.500	16	1.625	1/4-18 NPT	N.4R	CM72LP	S2112	25 IP
A32NEL5	2.812	2.000	16	1.406	1/4-18 NPT	N.5R	CM80	S352	1/4
A32NEL6	2.750	2.000	16	1.375	1/4-18 NPT	N.6R	CM120	S2112	5/32

NOTE: Minimum bore capability varies with depth of groove. See page D160 for details.



Necked steel shank with through coolant.

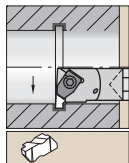


A-NE -1

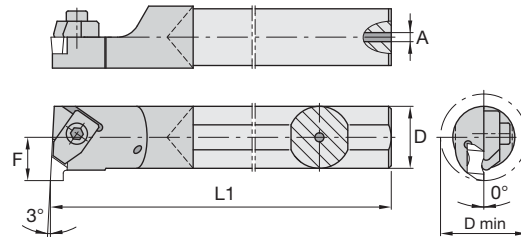


catalog number	D min	D	L1	L2	F	A	CS	gage insert	clamp	clamp screw	hex (inch)/ Torx Plus
right hand											
A06NER1	.440	.375	6.000	1	.26	.125	—	N.1L	CM109	S304	5/64
A08NER1	.440	.500	8.000	1	.26	—	1/16-27 NPT	N.1L	CM109	S304	5/64
A10NER1	.800	.625	10.000	—	.41	—	1/8-27 NPT	N.1L	CM109	S304	5/64

NOTE: Minimum bore capability varies with depth of groove. See page D156 for details.



Carbide shank with through coolant.

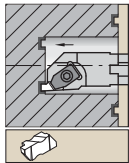


E-NE

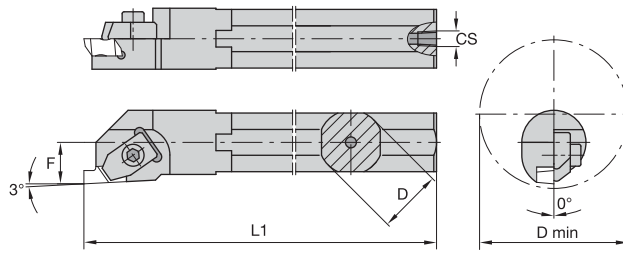


catalog number	D min	D	L1	F	A	gage insert	clamp	clamp screw	hex (inch)/ Torx Plus
right hand									
E08NER2	.730	.500	8.0000	.437	.19	N.2L	CM147	S39	7/64
E10NER2	1.000	.625	10.0000	.500	.22	N.2L	CM75	S310	7/64
E12NER2	1.125	.750	10.0000	.562	.28	N.2L	CM75	S310	7/64
E16NER3	1.375	1.000	12.0000	.688	.31	N.3L	CM73	S412	25 IP
left hand									
E08NEL2	.730	.500	8.0000	.437	.19	N.2R	CM146	S39	7/64
E10NEL2	1.000	.625	10.0000	.500	.22	N.2R	CM74	S310	7/64
E12NEL2	1.125	.750	10.0000	.562	.28	N.2R	CM74	S310	7/64
E16NEL3	1.375	1.000	12.0000	.688	.31	N.3R	CM72	S412	25 IP

NOTE: Minimum bore capability varies with depth of groove. See page D156 for details.



Steel shank with through coolant.



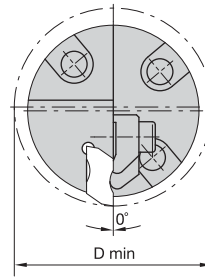
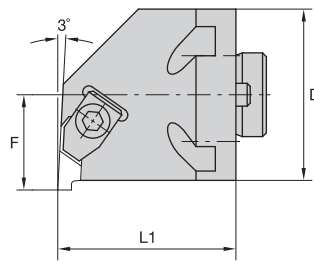
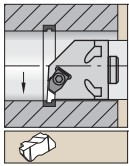
■ A-NS



Grooving and Cut-Off

catalog number	D min	D	L1	F	CS	gage insert	clamp	clamp screw	hex (inch)/ Torx Plus
right hand									
A16TNSR3	2.250	1.000	12	.640	1/4-18 NPT	N.3R	CM72LP	S2112	25 IP
A20UNSR3	2.250	1.250	14	.765	1/4-18 NPT	N.3R	CM72LP	S2112	25 IP
A24UNSR3	2.250	1.500	14	.890	1/4-18 NPT	N.3R	CM72LP	S2112	25 IP
A28UNSR3	2.250	1.750	14	1.015	1/4-18 NPT	N.3R	CM72LP	S2112	25 IP
A32VNSR3	2.375	2.000	16	1.281	1/4-18 NPT	N.3R	CM72LP	S2112	25 IP
A40VNSR3	2.875	2.500	16	1.531	1/4-18 NPT	N.3R	CM72LP	S2112	25 IP
left hand									
A16TNSL3	2.250	1.000	12	.640	1/4-18 NPT	N.3L	CM73LP	S2112	25 IP
A20UNSL3	2.250	1.250	14	.765	1/4-18 NPT	N.3L	CM73LP	S2112	25 IP
A24UNSL3	2.250	1.500	14	.890	1/4-18 NPT	N.3L	CM73LP	S2112	25 IP
A32VNSL3	2.375	2.000	16	1.281	1/4-18 NPT	N.3L	CM73LP	S2112	25 IP

NOTE: Minimum bore applicable only when used with NFD-KI inserts on internal face grooves. See page D156 for machining guidelines when face grooving.



H-NE



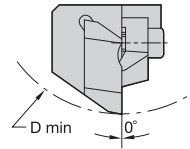
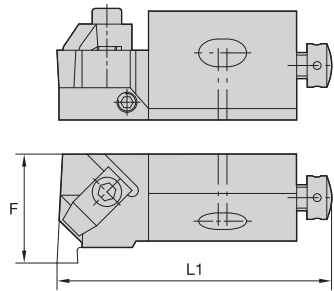
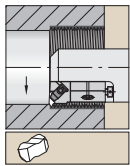
catalog number	D	D min	F	L1	gage insert	clamp	clamp screw	Torx Plus
right hand								
H20NER3W	1.250	1.750	.875	1.625	N.3L	CM73LP	S2112	25 IP
H24NER3W	1.500	2.000	1.000	1.625	N.3L	CM73LP	S2112	25 IP
H28NER3W	1.750	2.250	1.125	1.625	N.3L	CM73LP	S2112	25 IP
H32NER3W	2.000	2.500	1.250	1.625	N.3L	CM73LP	S2112	25 IP
H40NER3W	2.500	3.000	1.500	1.625	N.3L	CM73LP	S2112	25 IP
H28NER4W	1.750	2.500	1.250	1.625	N.4L	CM73LP	S2112	25 IP
H32NER4W	2.000	2.750	1.375	1.625	N.4L	CM73LP	S2112	25 IP
H36NER4W	2.250	3.000	1.500	1.625	N.4L	CM73LP	S2112	25 IP
H40NER4W	2.500	3.250	1.625	1.625	N.4L	CM73LP	S2112	25 IP
H28NER6W	1.750	2.500	1.250	1.625	N.6L	CM121	S412	5/32
H32NER6W	2.000	2.750	1.375	1.625	N.6L	CM121	S412	5/32
H40NER6W	2.500	3.250	1.625	1.625	N.6L	CM121	S412	5/32
H24NER8W	1.500	2.000	1.000	1.625	N.8L	CM145	S422	3/16
H32NER8W	2.000	2.500	1.250	1.625	N.8L	CM145	S422	3/16
left hand								
H20NEL3W	1.250	1.750	.875	1.625	N.3R	CM72LP	S2112	25 IP
H24NEL3W	1.500	2.000	1.000	1.625	N.3R	CM72LP	S2112	25 IP
H28NEL3W	1.750	2.250	1.125	1.625	N.3R	CM72LP	S2112	25 IP
H32NEL3W	2.000	2.500	1.250	1.625	N.3R	CM72LP	S2112	25 IP
H40NEL3W	2.500	3.000	1.500	1.625	N.3R	CM72LP	S2112	25 IP
H28NEL4W	1.750	2.500	1.250	1.625	N.4R	CM72LP	S2112	25 IP
H32NEL4W	2.000	2.750	1.375	1.625	N.4R	CM72LP	S2112	25 IP
H36NEL4W	2.250	3.000	1.500	1.625	N.4R	CM72LP	S2112	25 IP
H40NEL4W	2.500	3.250	1.625	1.625	N.4R	CM72LP	S2112	25 IP
H28NEL6W	1.750	2.500	1.250	1.625	N.6R	CM120	S412	5/32
H32NEL6W	2.000	2.750	1.375	1.625	N.6R	CM120	S412	5/32
H40NEL6W	2.500	3.250	1.625	1.625	N.6R	CM120	S412	5/32

NOTE: For boring adapters, see pages C119–C120.
Minimum bore capability varies with depth of groove. See page D156 for details.

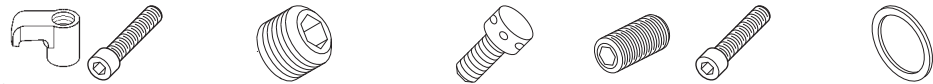
Grooving and Cut-Off

Grooving and Cut-Off

Top Notch™ Grooving Boring Heads and Cartridges




NE



Grooving and Cut-Off

catalog number	D min	F	L1	gage insert	clamp	clamp screw	hex	radial adjusting screw	hex	axial adjusting screw	hold down screw	clamp screw	hex	washer
right hand														
NER12CA2	1.969	.787	2.19	N.2L	CM75	MS1025	2.5 mm	KUAM23	2.5 mm	KUAM31	—	MS1025	4 mm	CSWM 060 050
NER20CA2	2.756	.984	2.76	N.2L	CM75	MS1025	2.5 mm	KUAM25	2.5 mm	KUAM33	—	MS1025	5 mm	CSWM 080 050
NER25CA3	3.937	1.260	3.94	N.3L	CM73LP	MS364	4 mm	KUAM27	4 mm	KUAM33	—	MS364	6 mm	CSWM 100 080
NER25CA4	3.937	1.260	3.94	N.4L	CM73LP	MS364	4 mm	KUAM27	4 mm	KUAM33	—	MS364	6 mm	CSWM 100 080
left hand														
NEL12CA2	1.969	.787	2.17	N.2R	CM74	MS1025	2.5 mm	KUAM23	2.5 mm	KUAM31	—	MS1025	4 mm	CSWM 060 050
NEL25CA3	3.937	1.260	3.94	N.3R	CM72LP	MS364	4 mm	KUAM26	4 mm	KUAM33	—	MS364	6 mm	CSWM 100 080

NOTE: Minimum bore capability varies with depth of groove. See page D156 for details.



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■ **Machining Guidelines for Chip Control • Grooving**

- Center height of insert should be positioned at the center of the workpiece, or up to .005" (0,13mm) above.
- Dwell time in the bottom of the groove, more than three revolutions, is not recommended.
- Chip control is feed rate related and should be adjusted to fit the particular situation. Recommended feed range is .003–0.012 IPR (0,08–0,3 mm/rev).

■ **Groove Limits (Maximum Internal Groove Depth vs. Minimum Bore Diameter)**

insert	maximum groove depth		minimum bore diameter	
	inch	mm	inch	mm
NG-1094L	.075	1,91	.800	20,32
	.040	1,02	.440	11,18
NG-2031R/L	.050	1,27	.730	18,54
NG-2041R/L				
NG-2047R/L				
NG-2058R/L				
	.110	2,79	2.500	63,50
NG-2062R/L	.102	2,59	1.750	44,45
NG-2094R/L	.098	2,49	1.500	38,10
NG-2125R/L	.080	2,03	1.000	25,40
	.055	1,40	.730	18,54
NG-3047R/L				
NG-3062R/L	.094	2,39	1.750	44,45
NG-3072R/L	.090	2,29	1.625	41,28
NG-3078R/L	.075	1,91	1.375	34,93
NG-3088R/L				
NG-3094R/L				
NG-3097R/L	.150	3,81	2.375	60,33
NG-3105R/L				
NG-3110R/L	.145	3,68	2.125	53,98
NG-3122R/L				
NG-3125R/L	.138	3,51	1.875	47,63
NG-3142R/L				
NG-3156R/L	.125	3,18	1.625	41,28
NG-3178R/L				
NG-3185R/L	.110	2,79	1.375	34,93
NG-3189R/L				
NG-4125R/L	.150	3,81	2.750	69,85
	.250	6,35	5.750	146,05
NG-4189R/L	.245	6,22	5.000	127,00
NG-4213R/L	.240	6,10	4.500	114,30
NG-4219R/L	.218	5,54	3.250	82,55
NG-4250R/L	.200	5,08	2.500	63,50

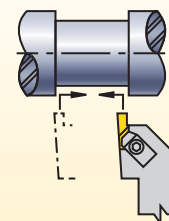
NOTE: The same maximum groove depth and minimum bore diameter values also apply to metric, NG-K (chip control), and NR (full radius) inserts of similar size.

■ **Machining Guidelines for Chip Control • Turning/Profiling**

- Maximum depth of cut for side cutting (turning/profiling) depends upon material being cut and width of the tool. However, some general guidelines are:
 - 1) .031–.062" (0,79–1,6mm) wide insert can cut up to .025" (0,6mm) deep.
 - 2) .067–.128" (1,7–3,3mm) wide insert can cut up to .040" (1mm) deep.
 - 3) .138–.189" (3,5–4,8mm) wide insert can cut up to .080" (2mm) deep.
 - 4) .197–.375" (5–9,5mm) wide insert can cut up to .120" (3mm) deep.

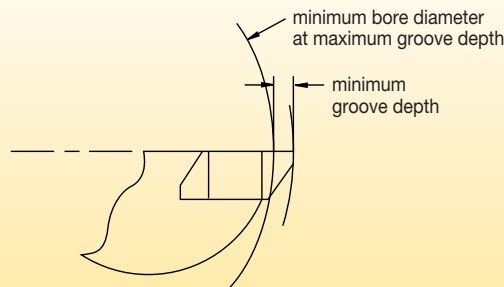
■ **Finish Turning the Groove**

1. Plunge both sides of groove width.
2. Plunge center area to remove web of material remaining.
3. To avoid insert chipping and to achieve groove wall perpendicularity, follow the tool path outlined here.
4. Use the lightest depth of cut that still allows good chip breaking, tool life, and surface finish.



insert	maximum groove depth		minimum bore diameter	
	inch	mm	inch	mm
	.375	9,53	28.812	731,82
NG-5250R/L	.361	9,17	15.812	401,62
NG-5281R/L	.344	8,74	10.812	274,62
NG-5312R/L	.327	8,31	7.312	185,72
NG-5344R/L	.294	7,47	4.812	122,22
NG-5375R/L	.257	6,53	3.562	90,47
	.215	5,46	2.812	71,42
NG-6250R/L	.250	6,35	5.750	146,05
NG-6281R/L	.245	6,22	5.000	127,00
NG-6312R/L	.240	6,10	4.500	114,30
NG-6344R/L	.218	5,54	3.250	82,55
NG-6375R/L	.200	5,08	2.500	63,50

■ **Internal Groove Depth vs. Bar Interference**

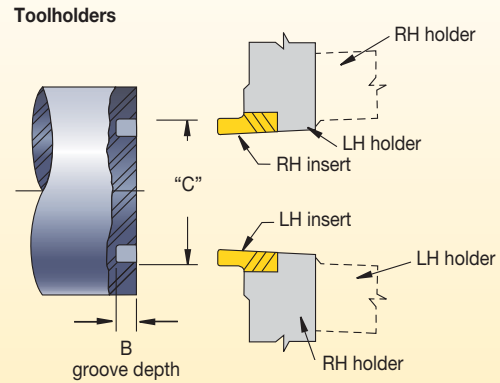


NOTE: Internal grooving depth limits are a function of bar clearance versus bore diameters.

■ Machining Guidelines for Face Grooving Operations • External

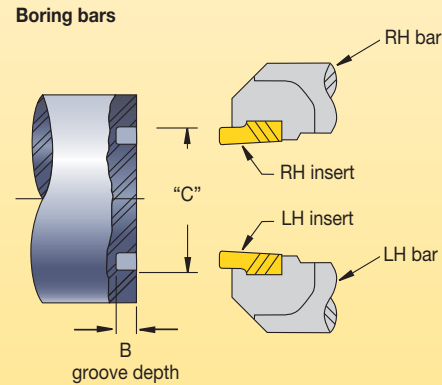
Standard NF/NFD Inserts

insert family	maximum groove depth "B"		minimum groove diameter "C"	
	inch	mm	inch	mm
NF-3	.060	1,52	.94	23,9
NF-3	.094	2,39	1.20	30,5
NF-3	.125	3,18	1.42	36,1
NF-3	.150	3,81	1.63	41,3
NFD-3	.250	6,35	1.88	47,6
NF-4/6	.060	1,52	.94	23,9
NF-4/6	.094	2,39	1.20	30,5
NF-4/6	.125	3,18	1.42	36,1
NF-4/6	.150	3,81	1.63	41,3
NF-4/6	.188	4,78	1.88	47,6
NF-4/6	.250	6,35	2.25	57,2
NFD-4	.375	9,53	2.25	57,2
NFD-4	.500	12,70	2.25	57,2



Standard NG/NGD Inserts

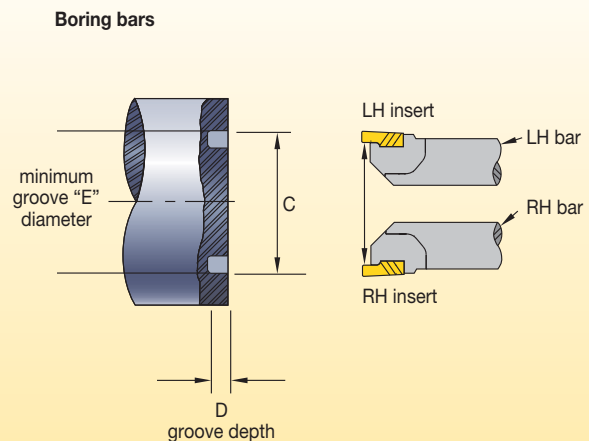
insert family	maximum groove depth "B"		minimum groove diameter "C"	
	inch	mm	inch	mm
NG-2	.050	1,27	2.13	54,0
NG-2	.110	2,79	3.50	88,9
NG-3	.094	2,39	4.00	101,6
NG-3	.125	3,18	5.00	127,0
NG-3	.150	3,81	5.50	139,7
NGD-3	.250	6,35	6.88	174,6
NG-4	.150	3,81	6.00	152,4
NG-4	.250	6,35	8.25	209,6
NGD-4	.375	9,53	8.75	222,3
NGD-4	.500	12,70	8.75	222,3
NG-5	.375	9,53	13.00	333,0



■ Machining Guidelines for Face Grooving Operations • Internal

insert family	maximum groove depth "D"		minimum groove diameter "E"	
	inch	mm	inch	mm
NFD-3-KI	.250	6,35	2.25	57,2

NOTE: For internal applications, use only NFD-KI inserts.





KGF and KGT Cut-Off Inserts

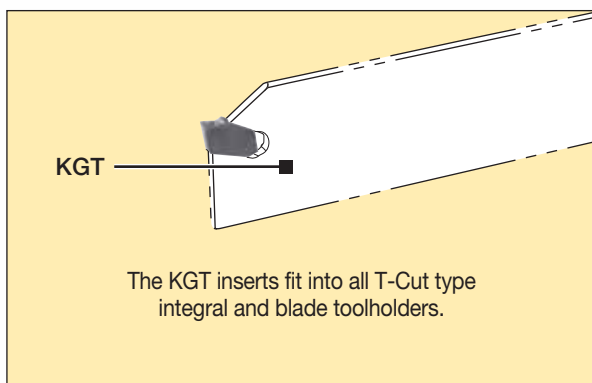
Primary Application

KGT and KGF inserts specifically designed to fit SELF-GRIP® toolholders available from Iscar®. For traditional cut-off applications, the original KGT-style inserts are available in widths ranging from 2,25–4,80mm. For increased stability in large diameter cut-off applications, the KGF geometry is available in widths ranging from 1,60–9,50mm.

Features and Benefits

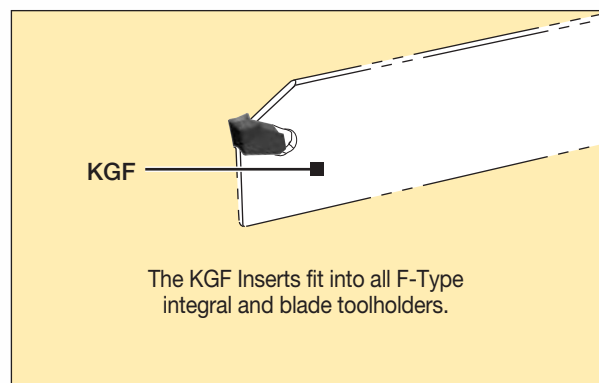
KGT Inserts

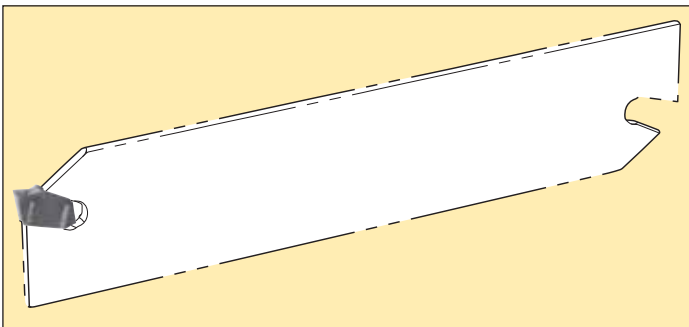
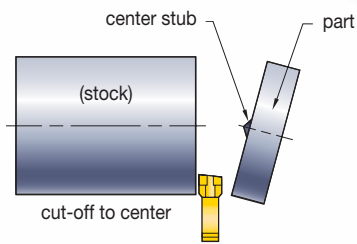
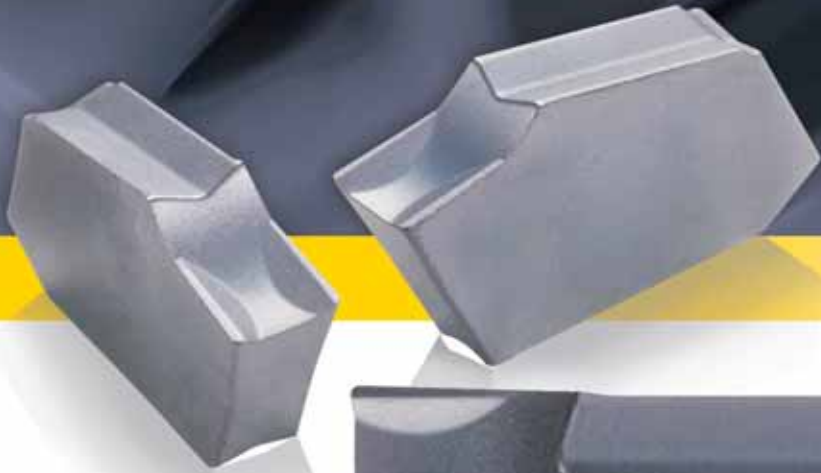
- KGT inserts are T-Type with no stopper. The KGT inserts replace single-end cutting inserts.

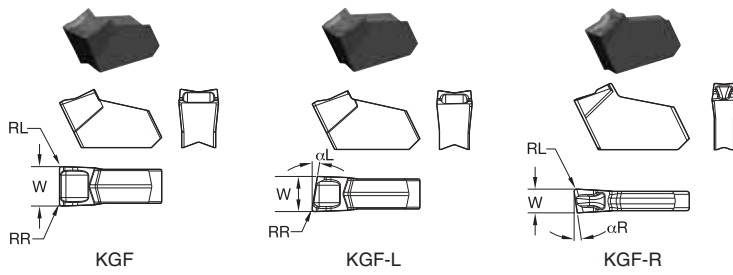


KGF Inserts

- Single-side insert for cut-off applications. This insert has a hard stop that seats insert securely into the pocket.







● first choice
○ alternate choice

P	■	○
M	■	○
K	■	○
N	■	○
S	■	○
H	■	○

Grooving and Cut-Off

■ KGF

catalog number	W		RL		KC5025
	mm	in	mm	in	
KGFN16	1,60	.063	0,16	.006	●
KGFN2J	2,00	.079	0,16	.006	●
KGFN2	2,20	.087	0,16	.006	●
KGFN24	2,40	.095	0,16	.006	●
KGFN3	3,00	.118	0,25	.010	●
KGFN3J	3,00	.118	0,25	.010	●
KGFN3M	3,03	.119	0,20	.008	●
KGFN4J	4,00	.157	0,25	.010	●
KGFN4	4,10	.161	0,28	.011	●
KGFN4B	4,10	.161	0,40	.016	●
KGFN48	4,80	.189	0,28	.011	●
KGFN6	6,39	.251	0,35	.014	●
KGFN9	9,50	.374	0,47	.019	●

NOTE: RR = RL on neutral inserts.

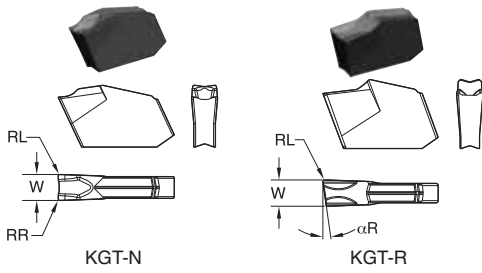
■ KGF-L

catalog number	W		αL	RR		
	mm	in		mm	in	
KGFL38D	3,00	.118	8	0,25	.010	●
KGFL48D	4,09	.161	8	0,28	.011	●

NOTE: RR = RL on neutral inserts.

■ KGF-R

catalog number	W		αR	RL		
	mm	in		mm	in	
KGFR168D	1,60	.063	8	0,16	.006	●
KGFR248D	2,39	.094	8	0,16	.006	●
KGFR315D	3,00	.118	15	0,25	.010	●
KGFR38D	3,00	.118	8	0,25	.010	●
KGFR34D	3,00	.118	4	0,25	.010	●



● first choice
○ alternate choice

P	■	○
M	■	○
K	■	○
N	■	○
S	■	○
H	■	○

■ KGT-N

catalog number	W		RL		KC5025
	mm	in	mm	in	
KGTN2	2,25	.089	0,18	.007	●
KGTN24	2,40	.095	0,18	.007	●
KGTN3J	3,05	.120	0,22	.009	●
KGTN3	3,05	.120	0,22	.009	●
KGTN3W	3,05	.120	0,22	.009	●
KGTN4	4,05	.159	0,24	.009	●
KGTN48	4,80	.189	0,26	.010	●
KGTN5	5,05	.199	0,26	.010	●
KGTN6	6,45	.254	0,28	.011	●

NOTE: RR = RL on neutral inserts.

■ KGT-R

catalog number	W		αR	RL		
	mm	in		mm	in	
KGTR28D	2,25	.089	8	0,18	.007	●
KGTR24D	2,25	.089	4	0,18	.007	●
KGTR248D	2,40	.095	8	0,18	.007	●
KGTR244D	2,40	.095	4	0,18	.007	●
KGTR38D	3,05	.120	8	0,22	.009	●
KGTR34D	3,05	.120	4	0,22	.009	●
KGTR44D	4,05	.159	4	0,24	.009	●

Grooving and Cut-Off



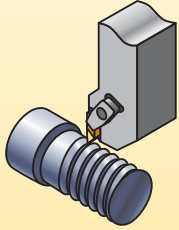
Threading

Threading Application Guide	E2-E3
Top Notch Threading	E4-E39
LT Threading	E40-E80
Technical Information	E82-E107



Threading

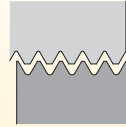
Top Notch™ External Threading



Square Shank Toolholder Sizes:

- Inch — .375–1.5"
- Metric — 10–32mm

Fine Pitch

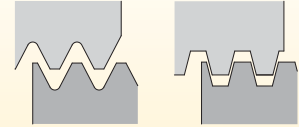


Cresting (Full Profile):
UN maximum TPI of 32
ISO minimum pitch of 1,5mm

**Partial Profile —
Flat Top (NTF and NTK):**
UN maximum TPI of 44
ISO minimum pitch of 0,6mm

**Partial Profile —
Chip Control (NT-K):**
UN maximum TPI of 36
ISO minimum pitch of 0,7mm

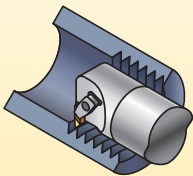
Coarse Pitch/Heavy Duty



Cresting (Full Profile):
UN minimum TPI of 7
ISO maximum pitch of 3mm

**Partial Profile —
Flat Top and Chip Control
(NT-C and NT-CK):**
UN minimum TPI of 4.5
ISO maximum pitch of 5,5mm

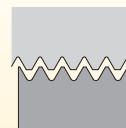
Top Notch Internal Threading



Boring Bar Diameters:

- Inch — .312–2.5"
- Metric — 10–50mm
- Minimum bore — .440" (11,5mm)
- Steel

Fine Pitch

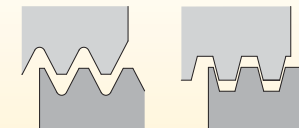


Cresting (Full Profile):
UN maximum TPI of 16
ISO minimum pitch of 1,5mm

**Partial Profile —
Flat Top (NT-1L, NTF and NTK):**
UN maximum TPI of 24
ISO minimum pitch of 1mm

**Partial Profile —
Chip Control (NT-K):**
UN maximum TPI of 20
ISO minimum pitch of 1,25mm

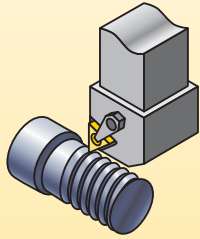
Coarse Pitch/Heavy Duty



Cresting (Full Profile):
UN minimum TPI of 8
ISO maximum pitch of 3mm

**Partial Profile —
Flat Top and Chip Control
(NT-C and NT-CK):**
UN minimum TPI of 4,5
ISO maximum pitch of 5,5mm

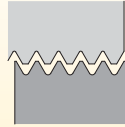
LT Laydown External Threading



Square Shank Toolholder Sizes:

- Inch — .500–1.25" available
- Metric — 8–40mm available

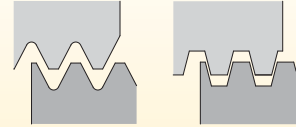
Fine Pitch



Cresting (Full Profile) and Partial Profile:

- UN maximum TPI of 48
- ISO minimum pitch of 0,5mm

Coarse Pitch/Heavy Duty



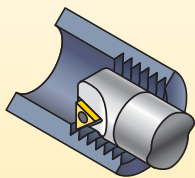
Cresting (Full Profile):

- UN minimum TPI of 8
- ISO maximum pitch of 5mm

Partial Profile:

- UN minimum TPI of 5
- ISO maximum pitch of 5mm

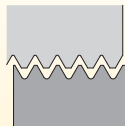
LT Laydown Internal Threading



Boring Bar Diameters:

- Inch — .375–1.25"
- Metric — 12–50mm
- Minimum bore — .500" (13mm)
- Steel and carbide

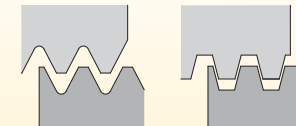
Fine Pitch



Cresting (Full Profile) and Partial Profile:

- UN maximum TPI of 48
- ISO minimum pitch of 0,5mm

Coarse Pitch/Heavy Duty



Cresting (Full Profile):

- UN minimum TPI of 8
- ISO maximum pitch of 5mm

Partial Profile:

- UN minimum TPI of 5
- ISO maximum pitch of 5mm



Top Notch™ Thread Tooling Is the Proven High-Productivity Threading Solution!

Primary Application

Top Notch Threading with Beyond™ Insert technology provides consistent tool performance and superior clamping thread to almost any operation. With the largest selection of grades and geometries in the industry, the Top Notch Threading system is a proven solution.

Features and Benefits

Choosing the Top Notch Threading System

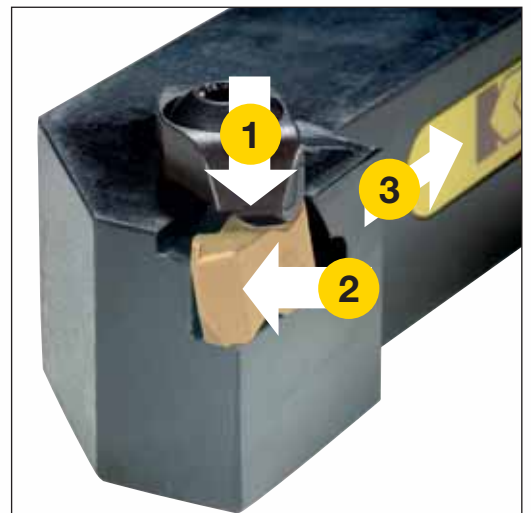
- A superior choice for heavy-duty applications like machining of Acme, Buttress, and API threads. Top Notch is also the best system for coarse pitch and multitooth threading applications.
- Largest selection of insert geometries and grades in the industry.
- A very rigid insert clamping design ensures best tool life, surface finish, and workpiece quality.
- Simplicity of the Top Notch design does not require shim selection for thread helix angles. This helps to avoid mistakes on the shop floor.
- Reduces inventory by using the same Top Notch toolholders and boring bars with either threading or grooving inserts.
- Top Notch chipbreaker inserts eliminate long troublesome coils.
- An excellent choice for special thread forms and toolholder designs.

Precision-Ground Thread Form

- Minimizes built-up edge.
- Precisely cuts most common materials.
- Reduces cutting forces.
- Ensures accurate high-quality threads.

Superior Chip Control

- Eliminates long, troublesome coils.
- Excellent for internal threading operations.
- Available in partial profile inserts for 60° thread forms.



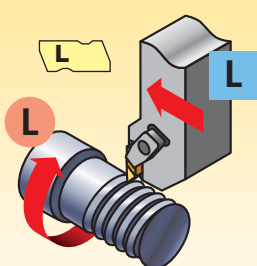
■ Step 1 • Select threading method and hand of tooling

What you need to know:

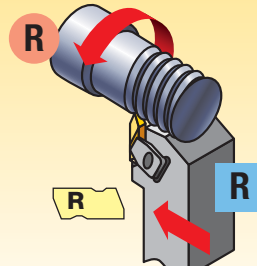
- External/internal operation.
- Spindle rotation/hand of thread.
- Feed direction.



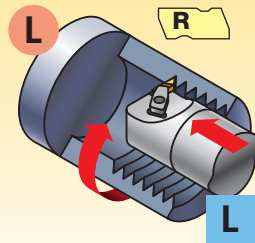
Feed Direction Toward the Chuck • Standard Helix



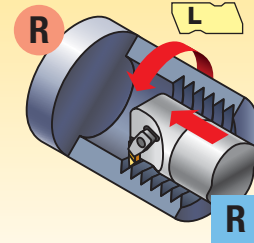
external left-hand thread



external right-hand thread

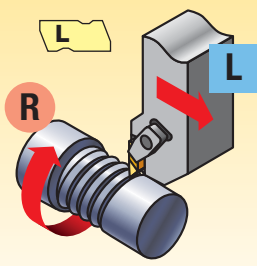


internal left-hand thread

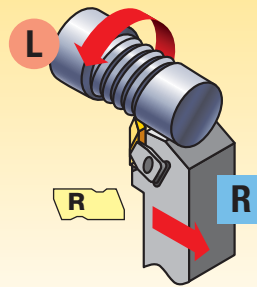


internal right-hand thread

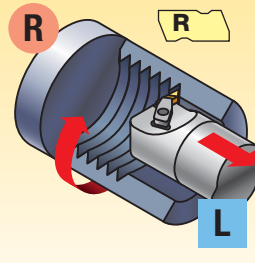
Feed Direction Away from the Chuck • Reverse Helix



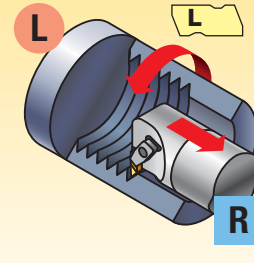
external right-hand thread



external left-hand thread



internal right-hand thread



internal left-hand thread

NOTE: Top Notch threading bars require opposite hand insert and clamp.
 Right-hand bar requires left-hand insert and clamp.
 Left-hand bar requires right-hand insert and clamp.

■ Step 2 • Select insert for application

- See threading insert overview on page E9.
- Select cresting inserts for fully controlled thread form including diameter control. Cresting inserts eliminate the need for deburring.
- Non-cresting partial profile inserts can cut a variety of thread pitches. Chip control is only available with partial profile inserts.
- Note insert size for toolholder selection.

	insert size	catalog number	KCU25/KC5025	KCU10/KC5010
	2	NT-2RK	•	•
	3	NT-3RK	•	•
	4	NT-4RK	•	•

■ **Step 3 • Select grade and speed**

Recommendations for Grade and Speed Selection • SFM (m/min)

workpiece material	P	M	K	N	S
insert style	chip control or neutral	chip control or positive	neutral	positive	positive
optimum cutting conditions	KCU10/KC5010 160-750 (50-230)	KCU10/KC5010 160-600 (50-185)	KCU10/KC5010 230-700 (70-210)	KC5410 230-1300 (70-390)	KCU10/KC5010 65-400 (20-120)
first choice	KCU25/KC5025 130-650 (40-200)	KCU25/KC5025 130-450 (40-135)	KCU25/KC5025 200-475 (60-145)	KCU25/KC5025 160-1150 (50-360)	KCU25/KC5025 35-330 (10-100)

Example

Chip controlNT-K or NT-CK (partial profile only)
 NeutralNT, NT-C, NTF, NTC, NJ, NJF, NDC-V, NA, NDC, NTB-A/B
 PositiveNTP, NTK, NJP, NJK

■ **Step 4 • Select holder from catalog page**

What you need to know:

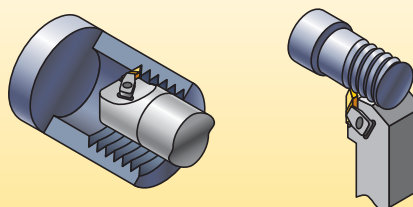
- External/internal operation.
- Minimum bore diameter (for internal operations).
- Hand of tool.
- Insert size (gage insert).

NOTE: The insert size must match the gage insert size of your toolholder selection.

catalog number	gage insert
NSR-163D	N.3R
NSR-164D	N.4R

NOTE: Top Notch toolholders and boring bars are listed with a gage insert to indicate the size and hand required. They are compatible with both grooving and threading inserts of the same size.

Select the Appropriate Holder for the Insert Size and Hand:



NOTE: Optimize your threading operation by using the proper infeed angle and the recommended infeed values.

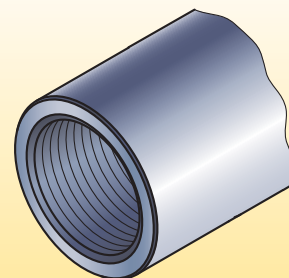
■ **Step 5 • Select insert and holder from catalog page**

Top Notch Threading Example

Application8 TPI Acme internal
 right-hand thread
 Materialalloy steel
 Workpiece diameter4.5" (114,3mm)
 good cutting conditions
 feed toward the chuck

Recommendation

InsertNA3L8
 GradeKC5010
 Insert size3
 Boring barA40NER3 (inch)
 A50UNNTOR4 (metric)
 Gage insert.....N.3L
 Speed500 SFM (150 m/min)
 Infeed passes12 passes



How Do Catalog Numbers Work?

Each character in our catalog number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.



NTC3R10E

Threading

N	T	C	3	R	10	E																								
Type of Insert	Insert Style	Additional Information	Insert Size	Industry Thread Identification	Hand of Insert	Definition of Insert	Additional Information																							
N = Top Notch*	A = Acme D = API or NPT J = UNJ thread T = 60° V thread W = 55° V Whitworth	B = Buttress F = Fine pitch S = Stub Acme C = Cresting P = Positive rake K = Fine pitch, positive U = Utility**			R = Right hand L = Left hand																									
	<table border="1"> <thead> <tr> <th>insert size</th> <th>T (inch)</th> <th>T (mm)</th> </tr> </thead> <tbody> <tr><td>1</td><td>.100</td><td>2,54</td></tr> <tr><td>2</td><td>.150</td><td>3,81</td></tr> <tr><td>3</td><td>.195</td><td>4,95</td></tr> <tr><td>4</td><td>.255</td><td>6,48</td></tr> <tr><td>5</td><td>.380</td><td>9,65</td></tr> <tr><td>6</td><td>.383</td><td>9,73</td></tr> <tr><td>8</td><td>.438</td><td>11,13</td></tr> </tbody> </table> <p>See full dimension chart below</p>		insert size	T (inch)	T (mm)	1	.100	2,54	2	.150	3,81	3	.195	4,95	4	.255	6,48	5	.380	9,65	6	.383	9,73	8	.438	11,13	Position indicates API or drilling industry form designation (e.g., 10RD, 8RD, .038) or Controlled root radius threading inserts indicate the root radius in .001" increments (NJ, NJF, NJP, NJK) or M indicates metric ISO thread	<ul style="list-style-type: none"> • Threads per inch or pitch (for metric) • "A" or "B" type Buttress insert • Taper per foot — API threads 	I = Internal thread E = External thread (used only if internal and external thread forms are different)	M = Multiple tooth K = Standard chip control C = Coarse pitch D = Dryseal
insert size	T (inch)	T (mm)																												
1	.100	2,54																												
2	.150	3,81																												
3	.195	4,95																												
4	.255	6,48																												
5	.380	9,65																												
6	.383	9,73																												
8	.438	11,13																												

*Kennametal proprietary standard only.
 **Utility threading insert can only be used in NSUR/L utility holders.

Top Notch Threading and Grooving Insert Dimensions

insert size	S		T	
	inch	mm	inch	mm
1	.100	2,54	.100	2,54
2	.219	5,56	.150	3,81
3	.344	8,74	.195	4,95
4	.453	11,51	.255	6,48
5	.688	17,48	.380	9,65
6	.453	11,51	.383	9,73
8	.312	7,93	.438	11,13

NJF

NDC-V-M

NTC

NA

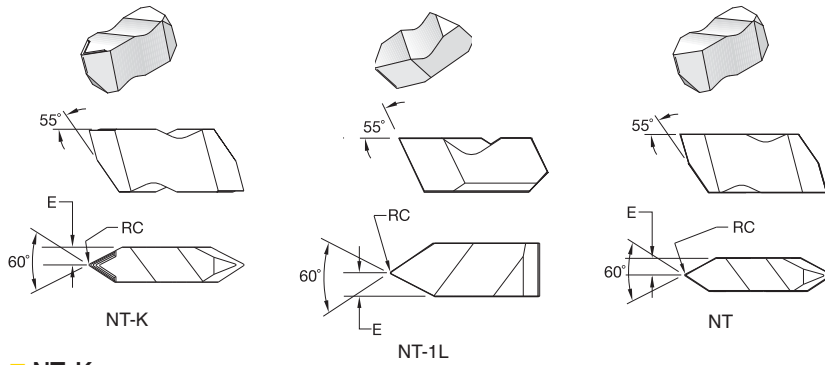
NT

NT-K

E8

www.kennametal.com

style			thread profile	standard	tolerance class	cresting	application	page(s)
chip control — K	neutral	positive						
 NT-K	 NT	 NTP	Partial Profile 60°	—	—	N	General use for 60° thread forms such as ISO and UN where non-cresting inserts are desired to cut a variety of pitches	E10–E11
 NT-CK			Partial Profile 60° — coarse pitch	—	—	N	Coarse pitch 60° thread forms such as ISO and UN where non-cresting inserts are desired to cut a variety of pitches	E11
	 NTF	 NTK	Partial Profile 60° — fine pitch	—	—	N	Fine pitch 60° thread forms such as ISO and UN where non-cresting inserts are desired to cut a variety of pitches — able to thread close to shoulders	E11–E12
	 NTU		Partial Profile 60° — four-edged insert	—	—	N	Four-edged insert for 60° partial profile threading — requires NSU-style toolholder for size 4U insert	E12
	 NTC-M		Metric ISO	ISO R262, DIN 13	6g/6H	Y	Widely used metric 60° V-form for all industries	E12
	 NTC		American UN	ANSI B1.1:03	2A/2B	Y	Widely used inch-based 60° V-form for all industries	E12–E13
	 NJ	 NJP	UNJ	MIL-S-8879C	3A/3B	N	Controlled root radius on external threads for military and aerospace industries	E14
	 NJF	 NJK	UNJ — fine pitch	MIL-S-8879C	3A/3B	N	Controlled root radius on external threads for military and aerospace industries — able to thread close to shoulders	E15
	 NDC-V		NPT	ANSI B2.1:83	Standard NPT	Y	National Pipe Thread standard forms for pipe fittings	E16
	 NDC-V-M		NPT — multitooth	ANSI B2.1:83	Standard NPT	Y	High productivity multitooth threading inserts for NPT threads	E16
	 NWC		Whitworth, BSW, BSP	BS 84:1956, ISO 228/1:1982, DIN 259	Medium Class A	Y	Widely used 55° form for gas and water connections	E17
	 ND		API Rotary Shoulder Connections — partial profile	API SPEC. 7:1990	Standard API	N	60° V-form used for rotary shoulder pipe connections in the oil and gas industry including V-.038R, V-.040, and V-.050 forms	E17
	 NDC		API Rotary Shoulder Connections — cresting	API SPEC. 7:1990	Standard API	Y	60° V-form used for rotary shoulder pipe connections in the oil and gas industry including V-.038R, V-.040, and V-.050 forms — complete cresting form including taper	E18
	 NDC-RD		API Round	API STD. 5B:1979	Standard API RD	Y	60° V-form with large radius for casing, tubing, and line pipe in the oil and gas industry including 8 and 10 round forms	E18
	 NDC-RD-M		API Round — multitooth	API STD. 5B:1979	Standard API RD	Y	High productivity multitooth threading inserts for API round threads	E18
	 NA		Acme	ANSI B1.5:1988	3G	N	29° truncated thread form for motion applications in a wide variety of industries	E19
	 NAS		Stub Acme	ANSI B1.8:1988	2G	N	Shallow depth 29° truncated thread form for motion applications in a wide variety of industries	E20
	 NTB-A		American Buttress 7° pressure flank leading (Push)	ANSI B1.9:1973	Class 2	N	Sawtooth form for axial load bearing applications in a variety of industries — use the “A” style when the 7° pressure flank is the leading edge	E20
	 NTB-B		American Buttress 45° clearance flank leading (Pull)	ANSI B1.9:1973	Class 2	N	Sawtooth form for axial load bearing applications in a variety of industries — use the “B” style when the 45° clearance flank is the leading edge	E21



● first choice
○ alternate choice

P	●	●	●	●	●	●	●
M	●	●	●	●	●	●	●
K	○	●	●	●	●	●	●
N	●	●	●	●	●	●	●
S	●	○	○	○	○	○	○
H	○	○	○	○	○	○	○

■ NT-K

catalog number	insert size	RC		E		external thread pitch mm	internal thread pitch mm	external TPI	internal TPI	K68	KCU10	KCU25	KC5010	KC5025	KC5410
		mm	in	mm	in										
right hand															
NT2RK	2	0,10	.0040	1,91	.075	0,70-3,00	1,25-3,50	8-36	7-20	●	●	●	●	●	●
NT3RK	3	0,17	.0065	2,49	.098	1,25-4,00	2,00-5,00	6-20	5-12	●	●	●	●	●	●
NT4RK	4	0,17	.0065	3,25	.128	1,25-6,25	2,00-6,25	4-20	4-12	●	●	●	●	●	●
left hand															
NT2LK	2	0,10	.0040	1,91	.075	0,70-3,00	1,25-3,50	8-36	7-20	●	●	●	●	●	●
NT3LK	3	0,17	.0065	2,49	.098	1,25-4,00	2,00-5,00	6-20	5-12	●	●	●	●	●	●
NT4LK	4	0,17	.0065	3,25	.128	1,25-6,25	2,00-6,25	4-20	4-12	●	●	●	●	●	●

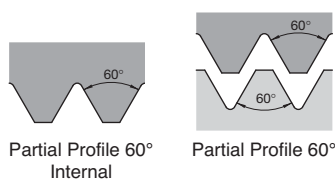
■ NT-1L

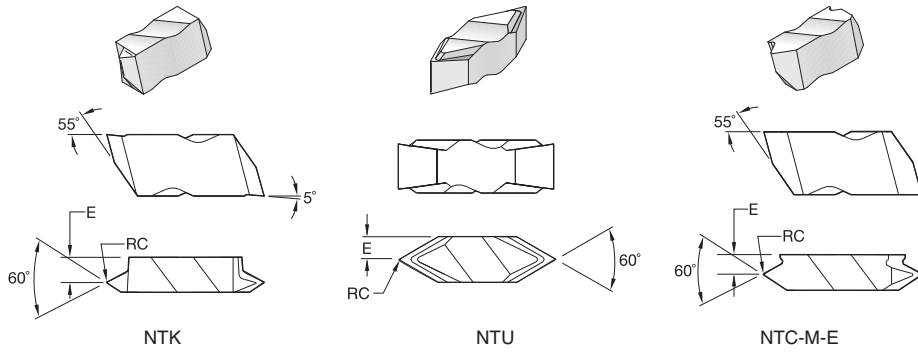
catalog number	insert size	RC		E		external thread pitch mm	internal thread pitch mm	external TPI	internal TPI	K68	KCU10	KCU25	KC5010	KC5025	KC5410
		mm	in	mm	in										
left hand															
NT1L	1	0,08	.0030	1,09	.043	—	1,00-2,00	—	12-24	●	●	●	●	●	●

■ NT

catalog number	insert size	RC		E		external thread pitch mm	internal thread pitch mm	external TPI	internal TPI	K68	KCU10	KCU25	KC5010	KC5025	KC5410
		mm	in	mm	in										
right hand															
NT2R	2	0,10	.0040	1,91	.075	0,70-3,00	1,25-3,50	8-36	7-20	●	●	●	●	●	●
NT3R	3	0,17	.0065	2,49	.098	1,25-4,00	2,00-5,00	6-20	5-12	●	●	●	●	●	●
NT4R	4	0,17	.0065	3,25	.128	1,25-6,25	2,00-6,25	4-20	4-12	●	●	●	●	●	●
left hand															
NT2L	2	0,10	.0040	1,91	.075	0,70-3,00	1,25-3,50	8-36	7-20	●	●	●	●	●	●
NT3L	3	0,17	.0065	2,49	.098	1,25-4,0	2,0-5,0	6-20	5-12	●	●	●	●	●	●
NT4L	4	0,17	.0065	3,25	.128	1,25-6,25	2,0-6,25	4-20	4-12	●	●	●	●	●	●

Thread Forms





● first choice
○ alternate choice

P	●	●	●	●	●	●	●	●	●
M	●	●	●	●	●	●	●	●	●
K	○	●	●	●	●	●	●	●	●
N	●	●	●	●	●	●	●	●	●
S	●	●	●	●	●	●	●	●	●
H	○	○	○	○	○	○	○	○	○

■ **NTK**

catalog number	insert size	RC		E		external thread pitch mm	internal thread pitch mm	external TPI	internal TPI	K68	KCU10	KCU25	KC5010	KC5025	KC5410
		mm	in	mm	in										
right hand NTK2R	2	0,08	.0030	2,79	.110	0,60-1,75	1,00-2,00	14-44	12-24	●	●	●	●	●	●
left hand NTK3R	3	0,08	.0030	3,58	.141	0,60-2,50	1,00-2,50	10-44	9-24	●	●	●	●	●	●
NTK2L	2	0,08	.0030	2,79	.110	0,60-1,75	1,00-2,00	14-44	12-24	●	●	●	●	●	●
NTK3L	3	0,08	.0030	3,58	.141	0,60-2,50	1,00-2,50	10-44	9-24	●	●	●	●	●	●

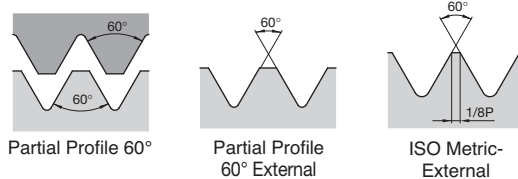
■ **NTU**

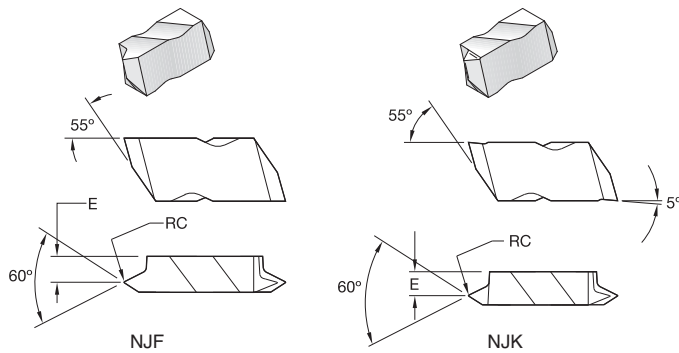
catalog number	insert size	RC		E		external thread pitch mm	internal thread pitch mm	external TPI	internal TPI	K68	KCU10	KCU25	KC5010	KC5025	KC5410
		mm	in	mm	in										
right hand NTU4R	4U	0,11	.0045	3,18	.125	1,25-6,25	—	4-20	—	●	●	●	●	●	●

■ **NTC-M-E**

catalog number	insert size	RC		E		external thread pitch mm	internal thread pitch mm	external TPI	internal TPI	K68	KCU10	KCU25	KC5010	KC5025	KC5410
		mm	in	mm	in										
right hand NTC3MR150E	3	0,20	.0080	3,68	.145	1,50	—	—	—	●	●	●	●	●	●
NTC3MR200E	3	0,27	.0106	3,68	.145	2,00	—	—	—	●	●	●	●	●	●

Thread Forms





● first choice
○ alternate choice

P	●	●	●	●	●	●	●	●	●	●
M	●	●	●	●	●	●	●	●	●	●
K	○	●	●	●	●	●	●	●	●	●
N	●	●	○	○	○	○	○	○	○	○
S	●	●	●	●	●	●	●	●	●	●
H	○	○	○	○	○	○	○	○	○	○

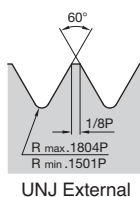
NJF

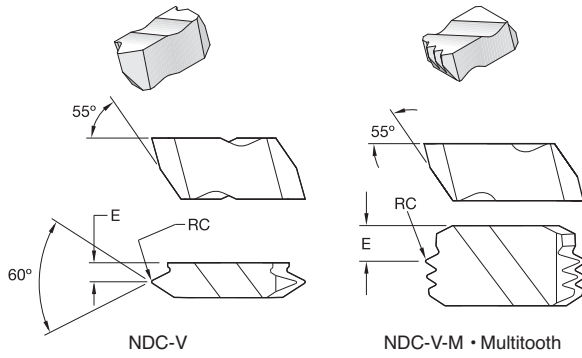
catalog number	insert size	RC		E		external thread pitch mm	internal thread pitch mm	external TPI	internal TPI	K68	KCU10	KCU25	KCS010	KCS025	KCS410
		mm	in	mm	in										
right hand															
NJF3005R32	3	0,13	.0052	3,58	.141	—	—	32	—	●	●	●	●	●	●
NJF3006R28	3	0,15	.0059	3,58	.141	—	—	28	—	●	●	●	●	●	●
NJF3007R24	3	0,17	.0068	3,58	.141	—	—	24	—	●	●	●	●	●	●
NJF3008R20	3	0,20	.0078	3,58	.141	—	—	20	—	●	●	●	●	●	●
NJF3009R18	3	0,22	.0088	3,58	.141	—	—	18	—	●	●	●	●	●	●
NJF3010R16	3	0,25	.0099	3,58	.141	—	—	16	—	●	●	●	●	●	●
NJF3012R14	3	0,28	.0112	3,58	.141	—	—	14	—	●	●	●	●	●	●
left hand															
NJF3007L24	3	0,17	.0068	3,58	.141	—	—	24	—	●	●	●	●	●	●
NJF3008L20	3	0,20	.0078	3,58	.141	—	—	20	—	●	●	●	●	●	●
NJF3009L18	3	0,22	.0088	3,58	.141	—	—	18	—	●	●	●	●	●	●

NJK

catalog number	insert size	RC		E		external thread pitch mm	internal thread pitch mm	external TPI	internal TPI	K68	KCU10	KCU25	KCS010	KCS025	KCS410
		mm	in	mm	in										
right hand															
NJK3005R32	3	0,13	.0052	3,58	.141	—	—	32	—	●	●	●	●	●	●
NJK3006R28	3	0,15	.0059	3,58	.141	—	—	28	—	●	●	●	●	●	●
NJK3007R24	3	0,17	.0068	3,58	.141	—	—	24	—	●	●	●	●	●	●
NJK3008R20	3	0,20	.0078	3,58	.141	—	—	20	—	●	●	●	●	●	●
NJK3009R18	3	0,22	.0088	3,58	.141	—	—	18	—	●	●	●	●	●	●
NJK3010R16	3	0,25	.0099	3,58	.141	—	—	16	—	●	●	●	●	●	●
NJK3012R14	3	0,28	.0112	3,58	.141	—	—	14	—	●	●	●	●	●	●
left hand															
NJK3005L32	3	0,13	.0052	3,58	.141	—	—	32	—	●	●	●	●	●	●
NJK3006L28	3	0,15	.0059	3,58	.141	—	—	28	—	●	●	●	●	●	●
NJK3008L20	3	0,20	.0078	3,58	.141	—	—	20	—	●	●	●	●	●	●
NJK3012L14	3	0,28	.0112	3,58	.141	—	—	14	—	●	●	●	●	●	●

Thread Forms





● first choice
○ alternate choice

P	●	●	●	●	●	●	●
M	●	●	●	●	●	●	●
K	○	●	●	●	●	●	●
N	●	●	●	●	●	●	●
S	●	●	●	●	●	●	○
H	○	○	○	○	○	○	○

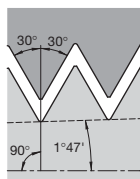
■ **NDC-V**

catalog number	insert size	RC		E		TPI	TPF	K68	KCU10	KCU25	KC5010	KC5025	KC5410
		mm	in	mm	in								
right hand NDC3115VR75	3	0,10	.0040	3,66	.144	11.5	.750		●		●		
NDC314VR75	3	0,08	.0030	3,66	.144	14	.750		●		●		
NDC327VR75	3	0,05	.0020	3,66	.144	27	.750		●		●		
left hand NDC38VR75	3	0,13	.0050	2,54	.100	8	.750		●		●		
NDC3115VL75	3	0,10	.0040	3,66	.144	11.5	.750		●		●		
NDC38VL75	3	0,13	.0050	2,54	.100	8	.750		●		●		

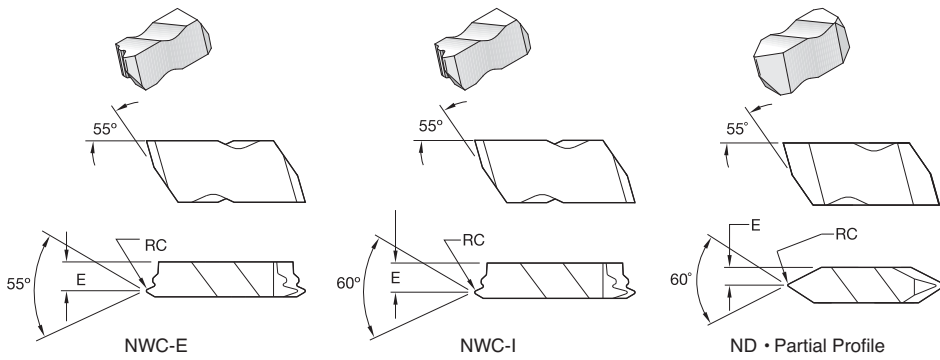
■ **NDC-V-M • Multitooth**

catalog number	insert size	RC		E		TPI	TPF	K68	KCU10	KCU25	KC5010	KC5025	KC5410
		mm	in	mm	in								
right hand NDC8115VR75M	8	0,10	.0040	2,59	.102	11.5	.750		●		●		
NDC88VR75M	8	0,13	.0050	2,41	.095	8	.750		●		●		
left hand NDC8115VL75M	8	0,10	.0040	2,59	.102	11.5	.750		●		●		
NDC88VL75M	8	0,13	.0050	2,41	.095	8	.750		●		●		

Thread Forms



NPT



● first choice
○ alternate choice

P	●	●	●	●	●	●	●	●	●
M	●	●	●	●	●	●	●	●	●
K	○	●	●	●	●	●	●	●	●
N	●	○	○	○	○	○	○	○	○
S	●	●	●	●	●	●	●	●	●
H	○	○	○	○	○	○	○	○	○

NWC-E

catalog number	insert size	RC		E		TPI	TPF	K68	KCU10	KCU25	KC5010	KC5025	KC5410
		mm	in	mm	in								
right hand NWC3R11E	3	0,30	.0118	3,43	.135	11	—		●	●	●	●	
NWC3R14E	3	0,24	.0093	3,43	.135	14	—			●	●	●	

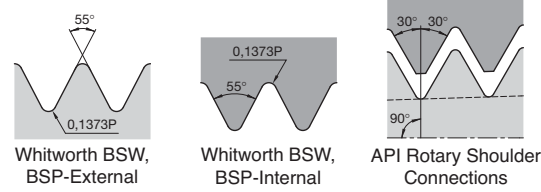
NWC-I

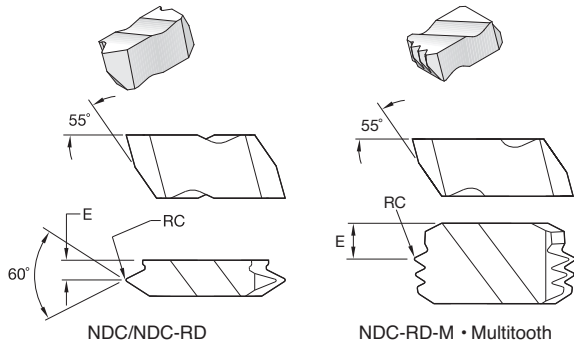
catalog number	insert size	RC		E		TPI	TPF	K68	KCU10	KCU25	KC5010	KC5025	KC5410
		mm	in	mm	in								
left hand NWC3L11I	3	0,30	.0118	3,43	.135	11	—				●	●	

ND • Partial Profile

catalog number	insert size	RC		E		TPI	TPF	K68	KCU10	KCU25	KC5010	KC5025	KC5410
		mm	in	mm	in								
right hand ND3038R	3	0,90	.0355	2,08	.082	4	—				●	●	
ND3040R	3	0,45	.0175	2,08	.082	5	—					●	
ND4050R	4	0,57	.0225	3,25	.128	4	—			●		●	
left hand ND3038L	3	0,90	.0355	2,08	.082	4	—				●	●	●
ND3040L	3	0,45	.0175	2,08	.082	5	—					●	
ND4040L	4	0,45	.0175	3,25	.128	5	—					●	
ND4050L	4	0,57	.0225	3,25	.128	4	—					●	

Thread Forms





● first choice
○ alternate choice

P	●	●	●	●	●	●	●	●	●
M	●	●	●	●	●	●	●	●	●
K	○	○	○	○	○	○	○	○	○
N	●	●	●	●	●	●	●	●	●
S	○	○	○	○	○	○	○	○	○
H	○	○	○	○	○	○	○	○	○

■ **NDC • Cresting**

catalog number	insert size	RC		E		TPI	TPF	K68	KCU10	KCU25	KC5010	KC5025	KC5410
		mm	in	mm	in								
right hand NDC3040R3	3	0,45	.0175	3,73	.147	5	3.000			●	●	●	
NDC4038R2	4	0,90	.0355	4,65	.183	4	2.000	●	●	●	●	●	
NDC4040R3	4	0,45	.0175	3,73	.147	5	3.000					●	
NDC4050R2	4	0,57	.0225	4,65	.183	4	2.000	●	●	●	●	●	
NDC4050R3	4	0,57	.0225	4,65	.183	4	3.000			●	●	●	
left hand NDC3040L3	3	0,45	.0175	3,73	.147	5	3.000		●		●		
NDC4038L2	4	0,90	.0355	4,65	.183	4	2.000	●	●	●	●	●	
NDC4040L3	4	0,45	.0175	3,73	.147	5	3.000					●	
NDC4050L2	4	0,57	.0225	4,65	.183	4	2.000			●		●	
NDC4050L3	4	0,57	.0225	4,65	.183	4	3.000	●			●		

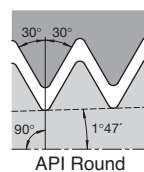
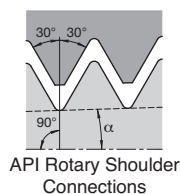
■ **NDC-RD**

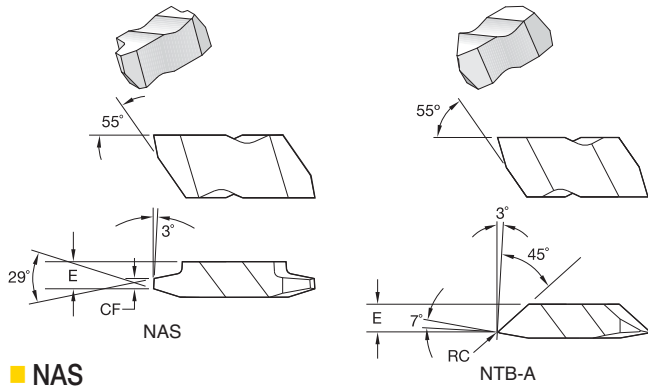
catalog number	insert size	RC		E		TPI	TPF	K68	KCU10	KCU25	KC5010	KC5025	KC5410
		mm	in	mm	in								
right hand NDC310RDR75	3	0,36	.0140	3,18	.125	10	.750		●	●	●	●	
NDC38RDR75	3	0,43	.0170	3,18	.125	8	.750	●	●	●	●	●	
left hand NDC310RDL75	3	0,36	.0140	3,18	.125	10	.750			●	●	●	
NDC38RDL75	3	0,43	.0170	3,18	.125	8	.750	●	●	●	●	●	

■ **NDC-RD-M • Multitooth**

catalog number	insert size	RC		E		TPI	TPF	K68	KCU10	KCU25	KC5010	KC5025	KC5410
		mm	in	mm	in								
right hand NDC68RDR75M	6	0,41	.0160	2,62	.103	8	.750		●		●		
left hand NDC68RDL75M	6	0,41	.0160	2,62	.103	8	.750	●			●		

Thread Forms





● first choice
○ alternate choice

P	●	●	●	●	●	●
M	●	●	●	●	●	●
K	○	●	●	●	●	●
N	●	○	○	○	○	○
S	●	○	○	○	○	○
H	○	○	○	○	○	○

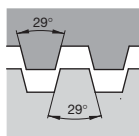
NAS

catalog number	insert size	RC		CF		E		TPI	TPF	K68	KCU10	KCU25	KC5010	KC5025	KC5410
		mm	in	mm	in	mm	in								
right hand															
NAS3R10	3	—	—	0,940	.0370	3,79	.149	10	—	●	●	●	●	●	●
NAS3R12	3	—	—	0,828	.0326	3,79	.149	12	—	●	●	●	●	●	●
NAS3R14	3	—	—	0,701	.0276	3,79	.149	14	—	●	●	●	●	●	●
NAS3R16	3	—	—	0,605	.0238	3,79	.149	16	—	●	●	●	●	●	●
NAS3R4	3	—	—	2,550	.1004	3,79	.149	—	—	●	●	●	●	●	●
NAS3R5	3	—	—	2,014	.0793	3,79	.149	5	—	●	●	●	●	●	●
NAS3R6	3	—	—	1,656	.0652	3,79	.149	6	—	●	●	●	●	●	●
NAS3R8	3	—	—	1,209	.0476	3,79	.149	8	—	●	●	●	●	●	●
left hand															
NAS3L10	3	—	—	0,940	.0370	3,79	.149	10	—	●	●	●	●	●	●
NAS3L12	3	—	—	0,828	.0326	3,79	.149	12	—	●	●	●	●	●	●
NAS3L16	3	—	—	0,605	.0238	3,79	.149	16	—	●	●	●	●	●	●
NAS3L4	3	—	—	2,550	.1004	3,79	.149	—	—	●	●	●	●	●	●
NAS3L5	3	—	—	2,014	.0793	3,79	.149	5	—	●	●	●	●	●	●
NAS3L6	3	—	—	1,656	.0652	3,79	.149	6	—	●	●	●	●	●	●
NAS3L8	3	—	—	1,209	.0476	3,79	.149	8	—	●	●	●	●	●	●

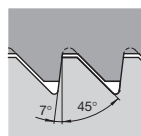
NTB-A

catalog number	insert size	RC		E		TPI	TPF	K68	KCU10	KCU25	KC5010	KC5025	KC5410	
		mm	in	mm	in									
right hand														
NTB2RA	2	0,08	.0030	3,20	.126	16-20	—	●	●	●	●	●	●	●
NTB3RA	3	0,17	.0065	4,17	.164	8-16	—	●	●	●	●	●	●	●
NTB4RA	4	0,25	.0100	5,23	.206	4-6	—	●	●	●	●	●	●	●
left hand														
NTB2LA	2	0,08	.0030	3,20	.126	16-20	—	●	●	●	●	●	●	●
NTB3LA	3	0,17	.0065	4,17	.164	8-16	—	●	●	●	●	●	●	●
NTB4LA	4	0,25	.0100	5,23	.206	4-6	—	●	●	●	●	●	●	●

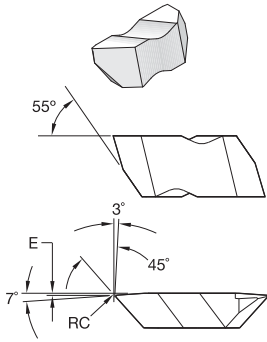
Thread Forms



Stub Acme



American Buttress-Push



■ NTB-B

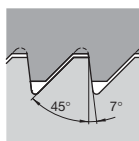
● first choice
○ alternate choice

	P	M	K	N	S	H
K68	●	○	○	○	○	○
KCU10	●	○	○	○	○	○
KCU25	●	○	○	○	○	○
KC5010	●	○	○	○	○	○
KC5025	●	○	○	○	○	○
KC5410	●	○	○	○	○	○

catalog number	insert size	RC		E		TPI	TPF	K68	KCU10	KCU25	KC5010	KC5025	KC5410
		mm	in	mm	in								
right hand													
NTB2RB	2	0,08	.0030	0,25	.010	16-20	—	●	●	●	●	●	●
NTB3RB	3	0,17	.0065	0,31	.012	8-16	—	●	●	●	●	●	●
NTB4RB	4	0,25	.0100	0,41	.016	4-6	—	●	●	●	●	●	●
left hand													
NTB2LB	2	0,08	.0030	0,25	.010	16-20	—	●	●	●	●	●	●
NTB3LB	3	0,17	.0065	0,31	.012	8-16	—	●	●	●	●	●	●
NTB4LB	4	0,25	.0100	0,41	.016	4-6	—	●	●	●	●	●	●



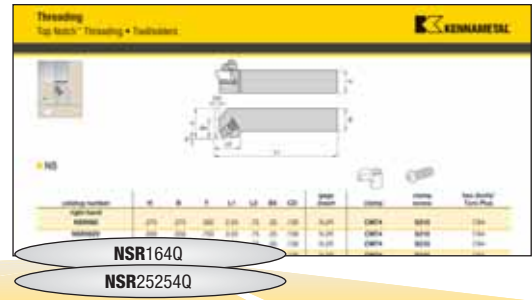
Thread Forms



American Buttress-Pull

How Do Catalog Numbers Work?

Each character in our catalog number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.

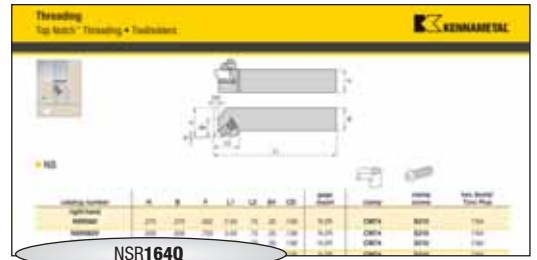


Threading

Inch	S	R	
N	S	R	
Metric			
N	S	R	
Insert Holding Location	Insert Mounting Location	Hand of Tool	Drop Head
<p>N = Top Notch*</p>	<p>SU** = Side mount utility</p> <p>E = End</p> <p>S = Side mount, offset</p> <p>R = Undercut</p> <p>AS = Side mount, no offset</p>	<p>R L end mount</p> <p>R L side mount</p>	<p>DH</p>

*Kennametal proprietary standard only.
 **Side mount utility holder can only use NTU inserts.

By referencing this easy-to-use guide, you can identify the correct product to meet your needs.



NSR164Q
NSR25254Q

Inch

16

4

Q

Metric

2525

4

Q

Shank
Size

Insert
Size

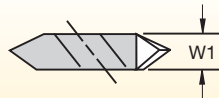
Qualified Surface
and Length

inch:

This position will show a significant two-digit number that indicates the holder cross section. For shanks 5/8" square and larger, the number will represent the number of sixteenths of width and height. For shanks under 5/8" square, the number of sixteenths of cross section will be preceded by a zero. For rectangular holders, the first digit represents the number of eighths of width and the second digit the number of quarters of height, except for a toolholder 1-1/4" x 1-1/2", which is given the number 91.

metric:

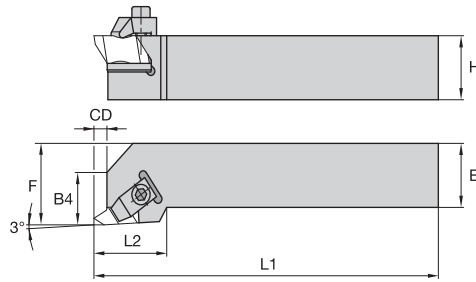
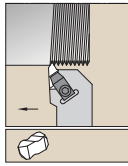
Shank height and width in mm and holder length according to ISO standard.



insert size	W1
2	.150"
3	.195"
4	.255"
5	.380"
6	.383"
8	.438"

- A** = Qualified back and end, 4" long
- B** = Qualified back and end, 4.5" long
- C** = Qualified back and end, 5" long
- D** = Qualified back and end, 6" long
- E** = Qualified back and end, 7" long
- V** = Qualified back and end, 3.5" long
- Q** = Qualified metric holder

Threading



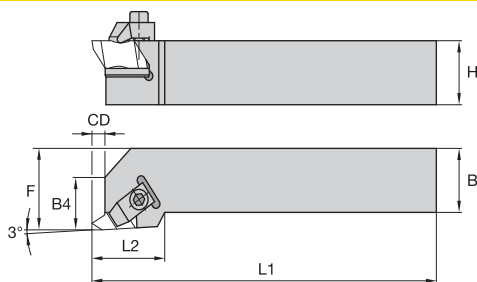
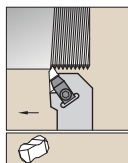
■ NS



Threading

catalog number	H	B	F	L1	L2	B4	CD	gage insert	clamp	clamp screw	hex (inch)/ Torx Plus
right hand											
NSR062	.375	.375	.562	2.50	.75	.35	.138	N.2R	CM74	S310	7/64
NSR082V	.500	.500	.750	3.50	.75	.35	.138	N.2R	CM74	S310	7/64
NSR102B	.625	.625	.875	4.50	.75	.35	.138	N.2R	CM74	S310	7/64
NSR122B	.750	.750	1.000	4.50	.75	.35	.138	N.2R	CM74	S310	7/64
NSR162C	1.000	1.000	1.250	5.00	.75	.35	.138	N.2R	CM74	S310	7/64
NSR123A	.750	.750	1.000	4.00	1.25	.50	.210	N.3R	CM72LP	S2112	25 IP
NSR123B	.750	.750	1.000	4.50	1.25	.50	.210	N.3R	CM72LP	S2112	25 IP
NSR163C	1.000	1.000	1.250	5.00	1.25	.50	.210	N.3R	CM72LP	S2112	25 IP
NSR163D	1.000	1.000	1.250	6.00	1.25	.50	.210	N.3R	CM72LP	S2112	25 IP
NSR203D	1.250	1.250	1.500	6.00	1.25	.50	.210	N.3R	CM72LP	S2112	25 IP
NSR853D	1.250	1.000	1.250	6.00	1.25	.50	.210	N.3R	CM72LP	S2112	25 IP
NSR243D	1.500	1.500	2.000	6.00	1.38	.50	.210	N.3R	CM72LP	S2112	25 IP
NSR243E	1.500	1.500	2.000	7.00	1.38	.50	.210	N.3R	CM72LP	S2112	25 IP
NSR205D	1.250	1.250	1.500	6.00	2.00	.61	.415	N.5R	CM80	S352	1/4
NSR245D	1.500	1.500	2.000	6.00	2.00	.61	.415	N.5R	CM80	S352	1/4
left hand											
NSL062	.375	.375	.562	2.50	.75	.35	.138	N.2L	CM75	S310	7/64
NSL082V	.500	.500	.750	3.50	.75	.35	.138	N.2L	CM75	S310	7/64
NSL102B	.625	.625	.875	4.50	.75	.35	.138	N.2L	CM75	S310	7/64
NSL122B	.750	.750	1.000	4.50	.75	.35	.138	N.2L	CM75	S310	7/64
NSL162C	1.000	1.000	1.250	5.00	.75	.35	.138	N.2L	CM75	S310	7/64
NSL123A	.750	.750	1.000	4.00	1.25	.50	.210	N.3L	CM73LP	S2112	25 IP
NSL123B	.750	.750	1.000	4.50	1.25	.50	.210	N.3L	CM73LP	S2112	25 IP
NSL163C	1.000	1.000	1.250	5.00	1.25	.50	.210	N.3L	CM73LP	S2112	25 IP
NSL163D	1.000	1.000	1.250	6.00	1.25	.50	.210	N.3L	CM73LP	S2112	25 IP
NSL853D	1.250	1.000	1.250	6.00	1.25	.50	.210	N.3L	CM73LP	S2112	25 IP
NSL203D	1.250	1.250	1.500	6.00	1.25	.50	.210	N.3L	CM73LP	S2112	25 IP
NSL243D	1.500	1.500	2.000	6.00	1.38	.50	.210	N.3L	CM73LP	S2112	25 IP
NSL243E	1.500	1.500	2.000	7.00	1.38	.50	.210	N.3L	CM73LP	S2112	25 IP
NSL205D	1.250	1.250	1.500	6.00	2.00	.61	.415	N.5L	CM81	S352	1/4

NOTE: F dimension measured over sharp point of N-style threading insert.



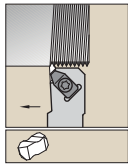
■ NS (with shim)



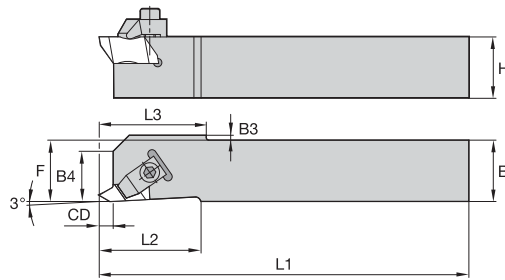
catalog number	H	B	F	L1	L2	B4	CD	gage insert	shim	shim screw	clamp	clamp screw	hex (inch)/ Torx Plus
right hand													
NSR164C	1.000	1.000	1.250	5.00	1.38	.54	.294	N.4R	SM420	SL344	CM72LP	S2112	25 IP
NSR164D	1.000	1.000	1.250	6.00	1.38	.54	.294	N.4R	SM420	SL344	CM72LP	S2112	25 IP
NSR854D	1.250	1.000	1.250	6.00	1.38	.54	.294	N.4R	SM420	SL344	CM72LP	S2112	25 IP
NSR204C	1.250	1.250	1.500	5.00	1.38	.54	.294	N.4R	SM420	SL344	CM72LP	S2112	25 IP
NSR204D	1.250	1.250	1.500	6.00	1.38	.54	.294	N.4R	SM420	SL344	CM72LP	S2112	25 IP
NSR864E	1.500	1.000	1.250	7.00	1.38	.54	.294	N.4R	SM420	SL344	CM72LP	S2112	25 IP
NSR244D	1.500	1.500	2.000	6.00	1.50	.54	.294	N.4R	SM420	SL344	CM72LP	S2112	25 IP
NSR244E	1.500	1.500	2.000	7.00	1.50	.54	.294	N.4R	SM420	SL344	CM72LP	S2112	25 IP
NSR166D	1.000	1.000	1.250	6.00	1.38	.67	.334	N.6R	SM416	S111	CM120	S412	5/32
NSR206D	1.250	1.250	1.500	6.00	1.38	.67	.334	N.6R	SM416	S111	CM120	S412	5/32
NSR246D	1.500	1.500	2.000	6.00	1.50	.67	.334	N.6R	SM416	S111	CM120	S412	5/32
NSR168D	1.000	1.000	1.250	6.00	1.25	.72	.225	N.8R	SM419	S112	CM144	S422	3/16
left hand													
NSL164C	1.000	1.000	1.250	5.00	1.38	.54	.294	N.4L	SM420	SL344	CM73LP	S2112	25 IP
NSL164D	1.000	1.000	1.250	6.00	1.38	.54	.294	N.4L	SM420	SL344	CM73LP	S2112	25 IP
NSL854D	1.250	1.000	1.250	6.00	1.38	.54	.294	N.4L	SM420	SL344	CM73LP	S2112	25 IP
NSL204C	1.250	1.250	1.500	5.00	1.38	.54	.294	N.4L	SM420	SL344	CM73LP	S2112	25 IP
NSL204D	1.250	1.250	1.500	6.00	1.38	.54	.294	N.4L	SM420	SL344	CM73LP	S2112	25 IP
NSL864E	1.500	1.000	1.250	7.00	1.38	.54	.294	N.4L	SM420	SL344	CM73LP	S2112	25 IP
NSL244D	1.500	1.500	2.000	6.00	1.50	.54	.294	N.4L	SM420	SL344	CM73LP	S2112	25 IP
NSL244E	1.500	1.500	2.000	7.00	1.50	.54	.294	N.4L	SM420	SL344	CM73LP	S2112	25 IP
NSL166D	1.000	1.000	1.250	6.00	1.38	.67	.334	N.6L	SM416	S111	CM121	S412	5/32
NSL206D	1.250	1.250	1.500	6.00	1.38	.67	.334	N.6L	SM416	S111	CM121	S412	5/32
NSL246D	1.500	1.500	2.000	6.00	1.50	.67	.334	N.6L	SM416	S111	CM121	S412	5/32

NOTE: F dimension measured over sharp point of N-style threading insert.





See page E10 for inserts.

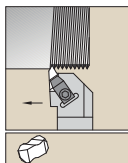


NAS

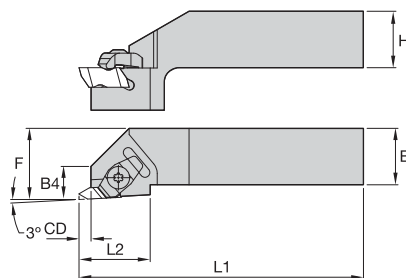


catalog number	H	B	F	L1	L2	B4	CD	B3	L3	gage insert	clamp	clamp screw	hex (inch)/ Torx Plus
right hand													
NASR062D	.375	.375	.375	6.00	.75	.35	.138	.070	.88	N.2R	CM182	S310	7/64
NASR082D	.500	.500	.500	6.00	.75	.35	.138	—	—	N.2R	CM182	S310	7/64
NASR102B	.625	.625	.625	4.50	.75	.35	.138	—	—	N.2R	CM74	S310	7/64
NASR083D	.500	.500	.500	6.00	1.25	.50	.210	.125	1.32	N.3R	CM184LP	S2112	25 IP
NASR103B	.625	.625	.625	4.50	1.30	—	.210	—	—	N.3R	CM184LP	S2112	25 IP
left hand													
NASL062D	.375	.375	.375	6.00	.75	.35	.138	.070	.88	N.2L	CM183	S310	7/64
NASL082D	.500	.500	.500	6.00	.75	.35	.138	—	—	N.2L	CM183	S310	7/64
NASL102B	.625	.625	.625	4.50	.75	.35	.138	—	—	N.2L	CM75	S310	7/64
NASL083D	.500	.500	.500	6.00	1.25	.50	.210	.125	1.32	N.3L	CM185LP	S2112	25 IP
NASL103B	.625	.625	.625	4.50	1.30	—	.210	—	—	N.3L	CM185LP	S2112	25 IP

NOTE: F dimension measured over sharp point of N-style threading insert.



See page E10 for inserts.

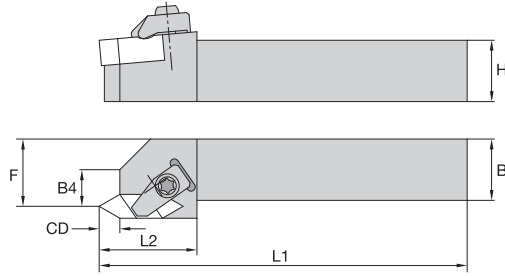
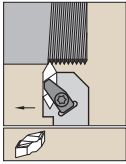


NS-DH



catalog number	H	B	F	L1	L2	B4	CD	gage insert	clamp	clamp screw	hex (inch)/ Torx Plus	jack screw	hex (inch)
right hand													
NSRDH122B	.750	.750	1.000	4.500	.75	.40	.138	N.2R	CM74	S310	7/64	S1020	1/8
NSRDH162C	1.000	1.000	1.250	5.000	.75	.40	.138	N.2R	CM74	S310	7/64	S1020	1/8
NSRDH123A	.750	.750	1.250	4.000	1.25	.58	.210	N.3R	CM72LP	S2112	25 IP	—	—
NSRDH163C	1.000	1.000	1.250	5.000	1.25	.58	.210	N.3R	CM72LP	S2112	25 IP	—	—
NSRDH163D	1.000	1.000	1.250	6.000	1.25	.58	.210	N.3R	CM72LP	S2112	25 IP	—	—
NSRDH203D	1.250	1.250	1.500	6.000	1.25	.62	.210	N.3R	CM72LP	S2112	25 IP	S965	3/16
NSRDH204D	1.250	1.250	1.500	6.000	1.38	.62	.294	N.4R	CM72LP	S2112	25 IP	S965	3/16
left hand													
NSLDH203D	1.250	1.250	1.500	6.000	1.25	.62	.210	N.3L	CM73LP	S2112	25 IP	S965	3/16

NOTE: F dimension measured over sharp point of N-style threading insert.



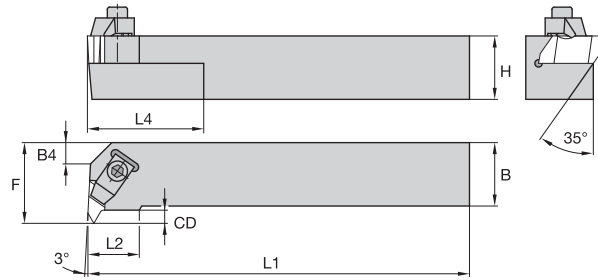
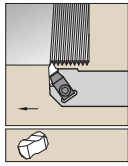
■ NSU



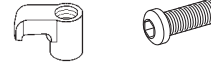
catalog number	H	B	F	L1	L2	B4	CD	gage insert	clamp	clamp screw	Torx Plus
right hand NSUR124C	.750	.750	.875	5.00	1.25	.50	.240	NTU4R	CM72LP	S2112	25 IP
left hand NSUR164D	1.000	1.000	1.125	6.00	1.25	.50	.240	NTU4R	CM72LP	S2112	25 IP
NSUL124C	.750	.750	.875	5.00	1.25	.50	.240	NTU4L	CM73LP	S2112	25 IP
NSUL164D	1.000	1.000	1.125	6.00	1.25	.50	.240	NTU4L	CM73LP	S2112	25 IP



NOTE: Toolholders only for threading inserts NTU4...
F dimension measured over sharp point of Top Notch-style threading insert.



■ NE



Threading

catalog number	H	B	F	L1	L2	B4	CD	L4	gage insert	clamp	clamp screw	hex (inch)/ Torx Plus
right hand												
NER062	.375	.375	.750	2.50	.50	—	.138	1.000	N.2L	CM75	S310	7/64
NER082V	.500	.500	.750	3.50	.50	—	.138	1.000	N.2L	CM75	S310	7/64
NER102B	.625	.625	.750	4.50	—	—	.138	1.000	N.2L	CM75	S310	7/64
NER122B	.750	.750	1.000	4.50	.50	.29	.138	1.000	N.2L	CM75	S310	7/64
NER162C	1.000	1.000	1.250	5.00	.50	.41	.138	1.000	N.2L	CM75	S310	7/64
NER123B	.750	.750	1.125	4.50	.75	—	.210	2.000	N.3L	CM73LP	S2112	25 IP
NER163C	1.000	1.000	1.250	5.00	.75	—	.210	2.000	N.3L	CM73LP	S2112	25 IP
NER163D	1.000	1.000	1.250	6.00	.75	—	.210	2.000	N.3L	CM73LP	S2112	25 IP
NER853D	1.250	1.000	1.250	6.00	.75	—	.210	2.000	N.3L	CM73LP	S2112	25 IP
NER203D	1.250	1.250	1.500	6.00	.75	.26	.210	2.000	N.3L	CM73LP	S2112	25 IP
NER243D	1.500	1.500	2.000	6.00	.75	.76	.210	2.000	N.3L	CM73LP	S2112	25 IP
NER164C	1.000	1.000	1.375	5.00	.75	—	.294	2.000	N.4L	CM73LP	S2112	25 IP
NER164D	1.000	1.000	1.375	6.00	.75	—	.294	2.000	N.4L	CM73LP	S2112	25 IP
NER204D	1.250	1.250	1.625	6.00	.75	.27	.294	2.000	N.4L	CM73LP	S2112	25 IP
NER244D	1.500	1.500	2.000	6.00	.75	.65	.294	2.000	N.4L	CM73LP	S2112	25 IP
NER205D	1.250	1.250	2.000	6.00	1.44	—	.415	2.000	N.5L	CM81	S352	1/4
NER206D	1.250	1.250	1.625	6.00	.75	.27	.300	2.000	N.6L	CM121	S412	5/32
left hand												
NEL062	.375	.375	.750	2.50	.50	—	.138	1.000	N.2R	CM74	S310	7/64
NEL082V	.500	.500	.750	3.50	.50	—	.138	1.000	N.2R	CM74	S310	7/64
NEL102B	.625	.625	.750	4.50	—	—	.138	1.000	N.2R	CM74	S310	7/64
NEL122B	.750	.750	1.000	4.50	.50	.29	.138	1.000	N.2R	CM74	S310	7/64
NEL162C	1.000	1.000	1.250	5.00	.50	.41	.138	1.000	N.2R	CM74	S310	7/64
NEL123B	.750	.750	1.125	4.50	.75	—	.210	2.000	N.3R	CM72LP	S2112	25 IP
NEL163C	1.000	1.000	1.250	5.00	.75	—	.210	2.000	N.3R	CM72LP	S2112	25 IP
NEL163D	1.000	1.000	1.250	6.00	.75	—	.210	2.000	N.3R	CM72LP	S2112	25 IP
NEL853D	1.250	1.000	1.250	6.00	.75	—	.210	2.000	N.3R	CM72LP	S2112	25 IP
NEL203D	1.250	1.250	1.500	6.00	.75	.26	.210	2.000	N.3R	CM72LP	S2112	25 IP
NEL243D	1.500	1.500	2.000	6.00	.75	.76	.210	2.000	N.3R	CM72LP	S2112	25 IP
NEL164C	1.000	1.000	1.375	5.00	.75	—	.294	2.000	N.4R	CM72LP	S2112	25 IP
NEL164D	1.000	1.000	1.375	6.00	.75	—	.294	2.000	N.4R	CM72LP	S2112	25 IP
NEL204D	1.250	1.250	1.625	6.00	.75	.27	.294	2.000	N.4R	CM72LP	S2112	25 IP
NEL244D	1.500	1.500	2.000	6.00	.75	.65	.294	2.000	N.4R	CM72LP	S2112	25 IP
NEL205D	1.250	1.250	2.000	6.00	1.44	—	.415	2.000	N.5R	CM80	S352	1/4
NEL206D	1.250	1.250	1.625	6.00	.75	.27	.300	2.000	N.6R	CM120	S412	5/32

NOTE: F dimension measured over sharp point of N-style threading insert.



The LT — Laydown Threading System

Triangle threading inserts and tools that provide the highest accuracy and quality level for daily production needs.

- LT is the system of choice for fine-pitch threads, high-helix/multistart threads, and single-point threading in small-diameter bores.
- Variable shim angles enable proper cutting geometry for high-helix angle and reverse helix angle threading. This maximizes tool life and improves thread quality.
- Increase productivity by outperforming conventional PVD grades with up to a 30% advantage in cutting speeds.

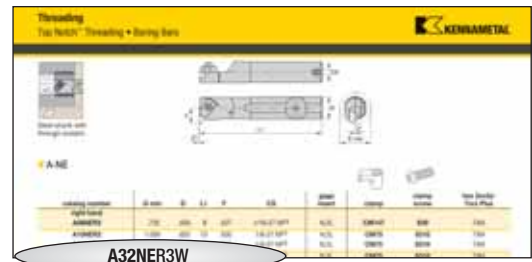
Experience the advantages at your Authorized Kennametal Distributor or at www.kennametal.com.

www.kennametal.com

 **KENNAMETAL®**

How Do Catalog Numbers Work?

Each character in our catalog number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.

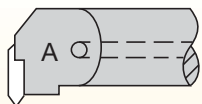


Threading

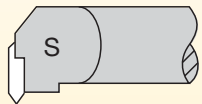
Inch

A

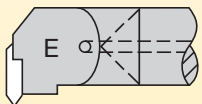
Bar Type



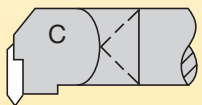
A = Steel with coolant



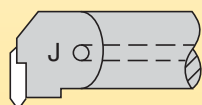
S = Steel without coolant



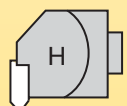
E = Carbide with coolant



C = Carbide without coolant



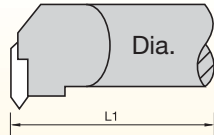
J = Heavy metal with coolant



H = Interchangeable head

32

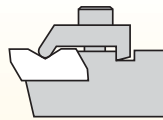
Bar Diameter



A two-digit number that increases the bar diameter in 1/16" increments

N

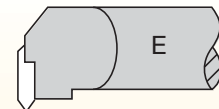
Insert Holding Method



N* = Top Notch

E

Insert Location



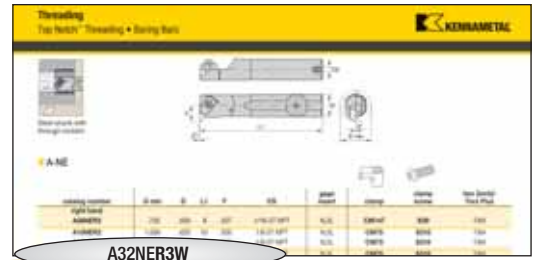
E = End mount

*Kennametal standard only.

NOTE: Right-hand bars use left-hand inserts and clamps.

Left-hand bars use right-hand inserts and clamps.

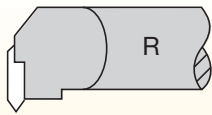
By referencing this easy-to-use guide, you can identify the correct product to meet your needs.



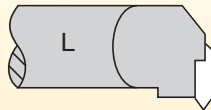
Inch

R

Hand of Bar



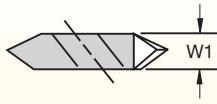
R = Right hand



L = Left hand

3

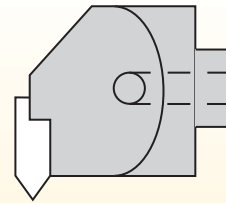
Insert Size



insert size	W1
1	.100"
2	.150"
3	.195"
4	.255"
5	.380"
6	.383"
8	.438"

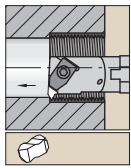
W

Additional Information

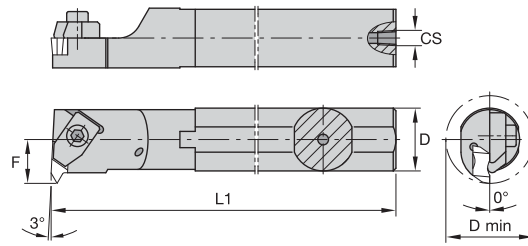


W = through-coolant interchangeable head





Steel shank with through coolant.



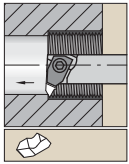
■ A-NE



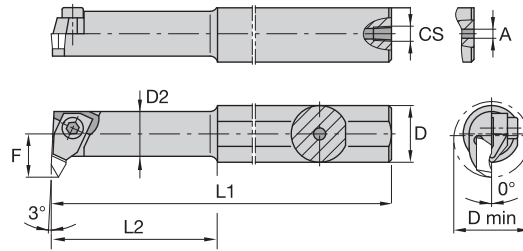
Threading

catalog number	D min	D	L1	F	CS	gage insert	clamp	clamp screw	hex (inch)/ Torx Plus
right hand									
A08NER2	.730	.500	8	.437	1/16-27 NPT	N.2L	CM147	S39	7/64
A10NER2	1.000	.625	10	.500	1/8-27 NPT	N.2L	CM75	S310	7/64
A12NER2	1.125	.750	10	.562	1/8-27 NPT	N.2L	CM75	S310	7/64
A16NER2	1.375	1.000	12	.688	1/4-18 NPT	N.2L	CM75	S310	7/64
A16NER3	1.375	1.000	12	.688	1/4-18 NPT	N.3L	CM73LP	S2112	25 IP
A20NER3	1.750	1.250	14	.875	1/4-18 NPT	N.3L	CM73LP	S2112	25 IP
A24NER3	2.000	1.500	14	1.000	1/4-18 NPT	N.3L	CM73LP	S2112	25 IP
A28NER3	2.250	1.750	14	1.125	1/4-18 NPT	N.3L	CM73LP	S2112	25 IP
A32NER3	2.500	2.000	16	1.250	1/4-18 NPT	N.3L	CM73LP	S2112	25 IP
A40NER3	3.000	2.500	16	1.500	1/4-18 NPT	N.3L	CM73LP	S2112	25 IP
A28NER4	2.500	1.750	14	1.250	1/4-18 NPT	N.4L	CM73LP	S2112	25 IP
A32NER4	2.750	2.000	16	1.375	1/4-18 NPT	N.4L	CM73LP	S2112	25 IP
A40NER4	3.250	2.500	16	1.625	1/4-18 NPT	N.4L	CM73LP	S2112	25 IP
A32NER5	2.812	2.000	16	1.406	1/4-18 NPT	N.5L	CM81	S352	1/4
A32NER6	2.750	2.000	16	1.375	1/4-18 NPT	N.6L	CM121	S2112	5/32
A40NER6	3.250	2.500	16	1.625	1/4-18 NPT	N.6L	CM121	S2112	5/32
left hand									
A08NEL2	.730	.500	8	.437	1/16-27 NPT	N.2R	CM146	S39	7/64
A10NEL2	1.000	.625	10	.500	1/8-27 NPT	N.2R	CM74	S310	7/64
A12NEL2	1.125	.750	10	.562	1/8-27 NPT	N.2R	CM74	S310	7/64
A16NEL2	1.375	1.000	12	.688	1/4-18 NPT	N.2R	CM74	S310	7/64
A16NEL3	1.375	1.000	12	.688	1/4-18 NPT	N.3R	CM72LP	S2112	25 IP
A20NEL3	1.750	1.250	14	.875	1/4-18 NPT	N.3R	CM72LP	S2112	25 IP
A24NEL3	2.000	1.500	14	1.000	1/4-18 NPT	N.3R	CM72LP	S2112	25 IP
A28NEL3	2.250	1.750	14	1.125	1/4-18 NPT	N.3R	CM72LP	S2112	25 IP
A32NEL3	2.500	2.000	16	1.250	1/4-18 NPT	N.3R	CM72LP	S2112	25 IP
A40NEL3	3.000	2.500	16	1.500	1/4-18 NPT	N.3R	CM72LP	S2112	25 IP
A28NEL4	2.500	1.750	14	1.250	1/4-18 NPT	N.4R	CM72LP	S2112	25 IP
A32NEL4	2.750	2.000	16	1.375	1/4-18 NPT	N.4R	CM72LP	S2112	25 IP
A40NEL4	3.250	2.500	16	1.625	1/4-18 NPT	N.4R	CM72LP	S2112	25 IP
A32NEL5	2.812	2.000	16	1.406	1/4-18 NPT	N.5R	CM80	S352	1/4
A32NEL6	2.750	2.000	16	1.375	1/4-18 NPT	N.6R	CM120	S2112	5/32

NOTE: Minimum bore diameter (D min) capability varies with thread type and pitch. See page E96 for details.
F dimension measured over sharp point of N-style threading insert.



Necked steel shank with through coolant.

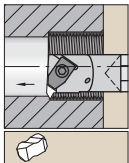


A-NE -1

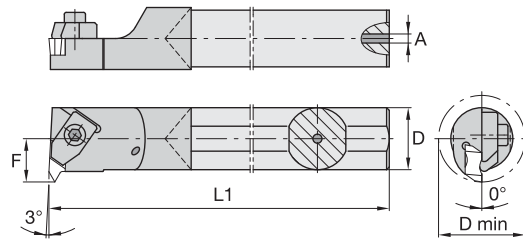


catalog number	D min	D	D2	L1	L2	F	A	CS	gage insert	clamp	clamp screw	hex (inch)
right hand												
A06NER1	.440	.375	—	6	1.25	.258	.13	—	N.1L	CM109	S304	5/64
A08NER1	.440	.500	.310	8	1.29	.258	.09	1/16-27 NPT	N.1L	CM109	S304	5/64
A10NER1	.800	.625	—	10	—	.406	—	1/8-27 NPT	N.1L	CM109	S304	5/64

NOTE: Minimum bore diameter (D min) capability varies with thread type and pitch. See page E96 for details.
F dimension measured over sharp point of N-style threading insert.



Carbide shank with through coolant.

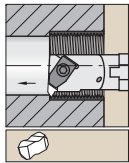


E-NE

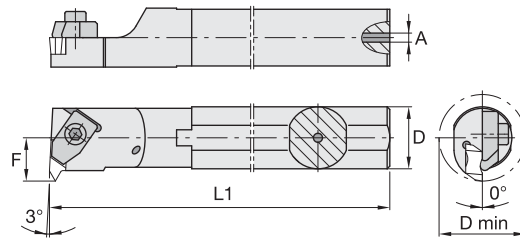


catalog number	D min	D	L1	F	A	gage insert	clamp	clamp screw	hex (inch)/ Torx Plus
right hand									
E08NER2	.730	.500	8	.437	.19	N.2L	CM147	S39	7/64
E10NER2	1.000	.625	10	.500	.22	N.2L	CM75	S310	7/64
E12NER2	1.125	.750	10	.562	.28	N.2L	CM75	S310	7/64
E16NER3	1.375	1.000	12	.688	.31	N.3L	CM73LP	S2112	25 IP
left hand									
E08NEL2	.730	.500	8	.437	.19	N.2R	CM146	S39	7/64
E10NEL2	1.000	.625	10	.500	.22	N.2R	CM74	S310	7/64
E12NEL2	1.125	.750	10	.562	.28	N.2R	CM74	S310	7/64
E16NEL3	1.375	1.000	12	.688	.31	N.3R	CM72LP	S2112	25 IP

NOTE: Minimum bore diameter (D min) capability varies with thread type and pitch. See page E96 for details.
F dimension measured over sharp point of N-style threading insert.



Heavy metal shank with through coolant.



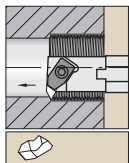
■ L-NE

Threading

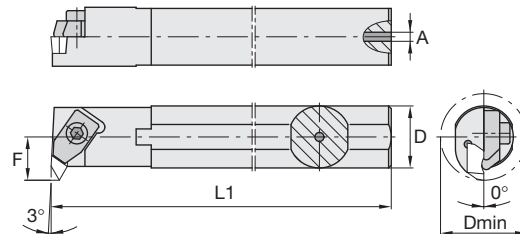


catalog number	D min	D	L1	F	A	gage insert	clamp	clamp screw	hex (inch)/ Torx Plus
right hand									
L08RNER2	.730	.500	8	.432	.16	N.2L	CM147	S39	7/64
L10RNER2	1.000	.625	8	.495	.16	N.2L	CM75	S310	7/64
L12RNER2	1.125	.750	8	.557	.16	N.2L	CM75	S310	7/64
L16SNER2	1.375	1.000	10	.683	.25	N.2L	CM75	S310	7/64
L16SNER3	1.375	1.000	10	.683	.25	N.3L	CM73LP	S2112	25 IP
left hand									
L08RNEL2	.730	.500	8	.432	.16	N.2R	CM146	S39	7/64
L10RNEL2	1.000	.625	8	.495	.16	N.2R	CM74	S310	7/64
L12RNEL2	1.125	.750	8	.557	.16	N.2R	CM74	S310	7/64
L16SNEL3	1.375	1.000	10	.683	.25	N.3R	CM72LP	S2112	25 IP

NOTE: Minimum bore diameter (D min) capability varies with thread type and pitch. See page E96 for details. F dimension measured over sharp point of N-style threading insert.



Heavy metal shank with through coolant.

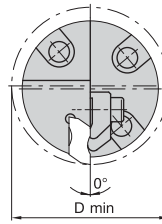
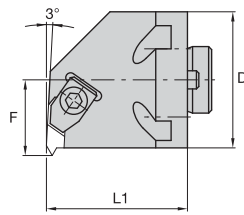
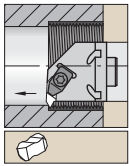


■ L-NE-S



catalog number	D min	D	L1	F	A	gage insert	clamp	clamp screw	hex (inch)/ Torx Plus
right hand									
L05MNER1S	.440	.313	3	.258	.09	N.1L	CM109	S304	5/64
L06MNER1S	.480	.375	6	.265	.13	N.1L	CM109	S304	5/64
L08RNER1S	.600	.500	8	.325	.16	N.1L	CM109	S304	5/64
L08RNER2	.730	.500	8	.432	.16	N.2L	CM147	S39	7/64
L10RNER2	1.000	.625	8	.495	.16	N.2L	CM75	S310	7/64
L12RNER2	1.125	.750	8	.557	.16	N.2L	CM75	S310	7/64
L16SNER2	1.375	1.000	10	.683	.25	N.2L	CM75	S310	7/64
L16SNER3	1.375	1.000	10	.683	.25	N.3L	CM73LP	S2112	25 IP
left hand									
L08RNEL2	.730	.500	8	.432	.16	N.2R	CM146	S39	7/64
L10RNEL2	1.000	.625	8	.495	.16	N.2R	CM74	S310	7/64
L12RNEL2	1.125	.750	8	.557	.16	N.2R	CM74	S310	7/64
L16SNEL3	1.375	1.000	10	.683	.25	N.3R	CM72LP	S2112	25 IP

NOTE: Minimum bore diameter (D min) capability varies with thread type and pitch. See page E96 for details. F dimension measured over sharp point of N-style threading insert.



■ H-NE



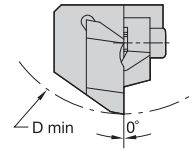
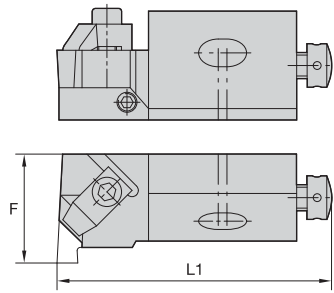
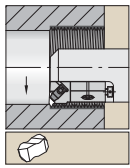
catalog number	D min	D	F	L1	gage insert	shim	shim screw	hex (inch)	clamp	clamp screw	hex (inch)/ Torx Plus
right hand											
H20NER3W	1.750	1.250	.875	1.625	N.3L	—	—	—	CM73LP	S2112	25 IP
H24NER3W	2.000	1.500	1.000	1.625	N.3L	—	—	—	CM73LP	S2112	25 IP
H28NER3W	2.250	1.750	1.125	1.625	N.3L	—	—	—	CM73LP	S2112	25 IP
H32NER3W	2.500	2.000	1.250	1.625	N.3L	—	—	—	CM73LP	S2112	25 IP
H40NER3W	3.000	2.500	1.500	1.625	N.3L	—	—	—	CM73LP	S2112	25 IP
H28NER4W	2.500	1.750	1.250	1.625	N.4L	—	—	—	CM73LP	S2112	25 IP
H32NER4W	2.750	2.000	1.375	1.625	N.4L	—	—	—	CM73LP	S2112	25 IP
H36NER4W	3.000	2.250	1.500	1.625	N.4L	—	—	—	CM73LP	S2112	25 IP
H40NER4W	3.250	2.500	1.625	1.625	N.4L	—	—	—	CM73LP	S2112	25 IP
H28NER6W	2.500	1.750	1.250	1.625	N.6L	—	—	—	CM121	S412	5/32
H32NER6W	2.750	2.000	1.375	1.625	N.6L	—	—	—	CM121	S412	5/32
H40NER6W	3.250	2.500	1.625	1.625	N.6L	—	—	—	CM121	S412	5/32
H24NER8W	2.000	1.500	1.000	1.625	N.8L	SM427	S111	1/16	CM145	S422	3/16
H32NER8W	2.500	2.000	1.250	1.625	N.8L	SM427	S111	1/16	CM145	S422	3/16
left hand											
H20NEL3W	1.750	1.250	.875	1.625	N.3R	—	—	—	CM72LP	S2112	25 IP
H24NEL3W	2.000	1.500	1.000	1.625	N.3R	—	—	—	CM72LP	S2112	25 IP
H28NEL3W	2.250	1.750	1.125	1.625	N.3R	—	—	—	CM72LP	S2112	25 IP
H32NEL3W	2.500	2.000	1.250	1.625	N.3R	—	—	—	CM72LP	S2112	25 IP
H40NEL3W	3.000	2.500	1.500	1.625	N.3R	—	—	—	CM72LP	S2112	25 IP
H28NEL4W	2.500	1.750	1.250	1.625	N.4R	—	—	—	CM72LP	S2112	25 IP
H32NEL4W	2.750	2.000	1.375	1.625	N.4R	—	—	—	CM72LP	S2112	25 IP
H36NEL4W	3.000	2.250	1.500	1.625	N.4R	—	—	—	CM72LP	S2112	25 IP
H40NEL4W	3.250	2.500	1.625	1.625	N.4R	—	—	—	CM72LP	S2112	25 IP
H28NEL6W	2.500	1.750	1.250	1.625	N.6R	—	—	—	CM120	S412	5/32
H32NEL6W	2.750	2.000	1.375	1.625	N.6R	—	—	—	CM120	S412	5/32
H40NEL6W	3.250	2.500	1.625	1.625	N.6R	—	—	—	CM120	S412	5/32

NOTE: For boring adapters, see pages C119–C121.

Minimum bore diameter (D min) capability varies with thread type and pitch. See page E96 for details.

F dimension measured over sharp point of N-style threading insert.

Threading



■ NE-CA

catalog number	D min	F	L1	gage insert
right hand				
NER12CA2	1.969	.787	2.19	N.2L
NER20CA2	2.756	.984	2.76	N.2L
NER25CA3	3.937	1.260	3.94	N.3L
NER25CA4	3.937	1.260	3.94	N.4L
left hand				
NEL12CA2	1.969	.787	2.17	N.2R
NEL25CA3	3.937	1.260	3.94	N.3R

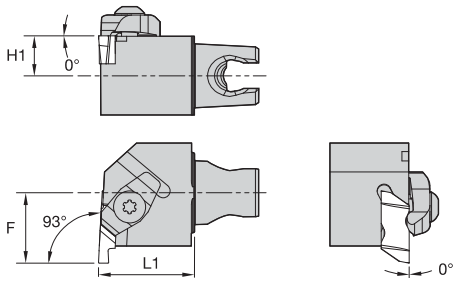
Threading

■ Spare Parts



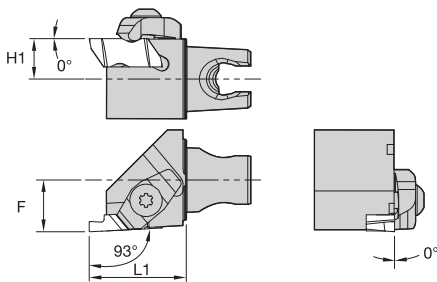
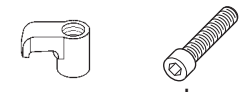
D min	clamp	clamp screw	hex (mm)	radial adjusting screw	hex (mm)	axial screw	hex (mm)	hold down screw	hex (mm)	washer
1.969	CM75	MS1025	2.5 mm	KUAM23	2.5 mm	KUAM31	2.5 mm	191.406	4 mm	CSWM 060 050
2.756	CM75	MS1025	2.5 mm	KUAM25	2.5 mm	KUAM33	2.5 mm	191.407	5 mm	CSWM 080 050
3.937	CM73LP	MS412	4 mm	KUAM27	4 mm	KUAM33	4 mm	—	6 mm	CSWM 100 080
3.937	CM73LP	MS412	4 mm	KUAM27	4 mm	KUAM33	4 mm	—	6 mm	CSWM 100 080
1.969	CM74	MS1025	2.5 mm	KUAM23	2.5 mm	KUAM31	2.5 mm	191.406	4 mm	CSWM 060 050
3.937	CM72LP	MS412	4 mm	KUAM26	4 mm	KUAM33	4 mm	—	6 mm	CSWM 100 080

NOTE: Minimum bore capability varies with depth of groove. See page E97 for details.



■ NE 93°

order number	catalog number	L1		F		H1		gage insert	clamp	clamp screw
		mm	in	mm	in	mm	in			
right hand										
3483036	KM20NER225	25	.984	17	.669	9,5	.375	NG2L	CM75	MS1200
3483034	KM20NER325	25	.984	17	.669	9,5	.375	NG3L	CM73LP	—
2399462	KM25NER230	30	1.181	22	.866	12,5	.492	NG2L	CM75	MS1200
2399494	KM25NER330	30	1.181	22	.866	12,5	.492	NG3L	CM73LP	—
2399496	KM25NER430	30	1.181	24	.945	12,5	.492	NG4L	CM73LP	—
left hand										
3483035	KM20NEL225	25	.984	17	.669	9,5	.375	NG2R	CM74	MS1200
3483033	KM20NEL325	25	.984	17	.669	9,5	.375	NG3R	CM72LP	—
2399493	KM25NEL230	30	1.181	22	.866	12,5	.492	NG2R	CM74	MS1200
2399495	KM25NEL330	30	1.181	22	.866	12,5	.492	NG3R	CM72LP	—
2399497	KM25NEL430	30	1.181	24	.945	12,5	.492	NG4R	CM72LP	—



■ NS 93°

order number	catalog number	L1		F		H1		gage insert	clamp	clamp screw
		mm	in	mm	in	mm	in			
right hand										
3483030	KM20NSR230	30	1.181	12,50	.492	9,5	.375	NG2R	CM74	MS1200
3483028	KM20NSR330	30	1.181	12,50	.492	9,5	.375	NG3R	CM72LP	MS524
2399498	KM25NSR230	30	1.181	16,00	.630	12,5	.492	NG2R	CM74	MS1200
2399500	KM25NSR330	30	1.181	16,00	.630	12,5	.492	NG3R	CM72LP	MS2111
2399502	KM25NSR430	30	1.181	16,00	.630	12,5	.492	NG4R	CM212LP	MS2111
left hand										
3483029	KM20NSL230	30	1.181	12,50	.492	9,5	.375	NG2L	CM75	MS1200
3483027	KM20NSL330	30	1.181	12,50	.492	9,5	.375	NG3L	CM73LP	MS524
2399499	KM25NSL230	30	1.181	16,00	.630	12,5	.492	NG2L	CM75	MS1200
2399501	KM25NSL330	30	1.181	16,00	.630	12,5	.492	NG3L	CM73LP	MS2111
2399503	KM25NSL430	30	1.181	16,00	.630	12,5	.492	NG4L	CM213LP	MS2111

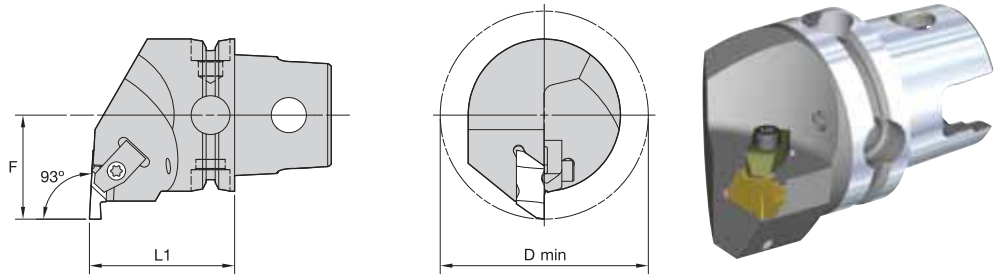


Threading

Top Notch™ Threading and Grooving • KM40TS™ Cutting Units



■ NE 93°

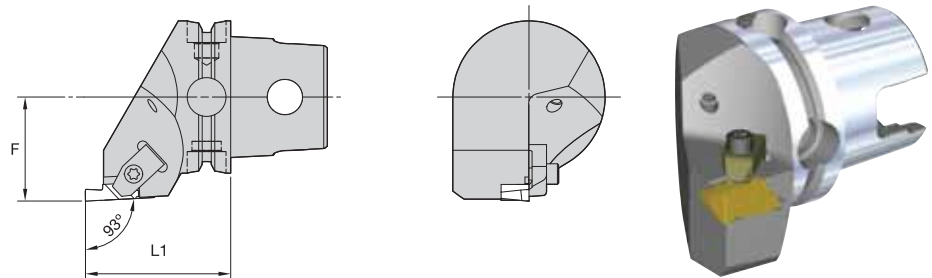


Threading

order number	catalog number	L1		F		D min		gage insert	clamp	clamp screw	kg	lbs
		mm	in	mm	in	mm	in					
right hand												
3902285	KM40TSNER2	40	1.575	27	1.063	54	2.126	NG2L	CM75	MS1488	0,31	.68
3902286	KM40TSNER3	40	1.575	27	1.063	54	2.126	NG3L	CM73	MS1489	0,30	.67
3902287	KM40TSNER4	40	1.575	27	1.063	54	2.126	NG4L	CM73	MS1489	0,30	.66
left hand												
3902132	KM40TSNEL2	40	1.575	27	1.063	54	2.126	NG2R	CM74	MS1488	0,31	.68
3902283	KM40TSNEL3	40	1.575	27	1.063	54	2.126	NG3R	CM72	MS1489	0,31	.67
3902284	KM40TSNEL4	40	1.575	27	1.063	54	2.126	NG4R	CM72	MS1489	0,30	.66



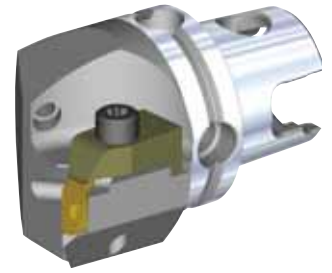
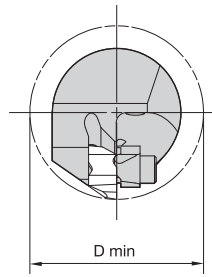
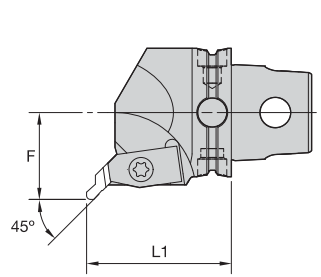
■ NS 93°



order number	catalog number	L1		F		gage insert	clamp	clamp screw	kg	lbs
		mm	in	mm	in					
right hand										
3902293	KM40TSNSR2	40	1.575	27	1.063	NG2R	CM74	MS1488	0,32	.70
3902294	KM40TSNSR3	47	1.850	27	1.063	NG3R	CM72	MS1489	0,32	.71
3902295	KM40TSNSR4	47	1.850	27	1.063	NG4R	CM72	MS1489	0,31	.68
left hand										
3902290	KM40TSNSL2	40	1.575	27	1.063	NG2L	CM75	MS1488	0,32	.70
3902291	KM40TSNSL3	47	1.850	27	1.063	NG3L	CM73	MS1489	0,33	.72
3902292	KM40TSNSL4	47	1.850	27	1.063	NG4L	CM73	MS1489	0,31	.68



■ NR 45°



order number	catalog number	L1		F		D min		gage insert	clamp	clamping screw	kg	lbs
		mm	in	mm	in	mm	in					
	right hand											
3902289	KM40TSNRR3045M	45	1.772	27	1.063	54	2.126	NU3L	CM73	MS1489	0,34	.75
	left hand											
3902288	KM40TSNRL3045M	45	1.772	27	1.063	54	2.126	NU3R	CM72	MS1489	0,33	.74

Threading



LT • Laydown Triangle Threading

Primary Application

LT Laydown triangle threading is the system of choice for fine-pitch threads, high-helix/multistart threads, and single-point threading in small-diameter bores. With a wide selection of CB-style chip control inserts, you will receive superior chip management for excellent surface finishes and minimal operator intervention. The low-profile design enables unrestricted chip flow — ideal for I.D. threads, and variable shim angles enable proper cutting geometry for high-helix angle and reverse helix angle threading, maximizing tool life and improving thread quality.

Features and Benefits

Precision-Ground Thread Form on LT and LT-CB

- Minimizes built-up edge.
- Precisely cuts most common materials.
- Reduces cutting forces.
- Ensures accurate, high-quality threads.

Superior Chip Control

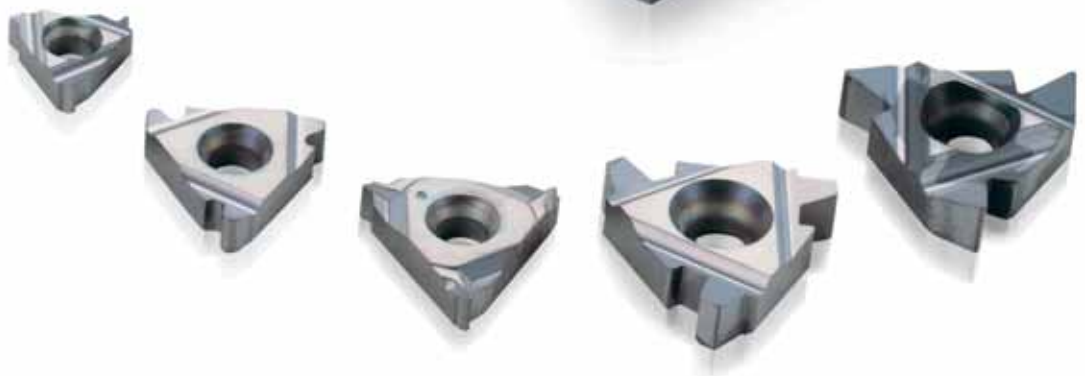
- Eliminates long, troublesome coils.
- Excellent for internal threading operations.
- Available in both partial and full profile inserts for all common thread forms.

KC5010™ and KC5025™ Premium PVD TiAlN-Coated Grades

- Increase tool life at existing machining conditions.
- Increase productivity by outperforming conventional PVD grades with up to a 30% advantage in cutting speeds.

Kenna Universal™ Inserts

- Precision molded LT-K thread form provides outstanding utility and value.
- Excellent chip control combined with the new KU25T™ grade enables trouble-free threading on a variety of workpiece materials.



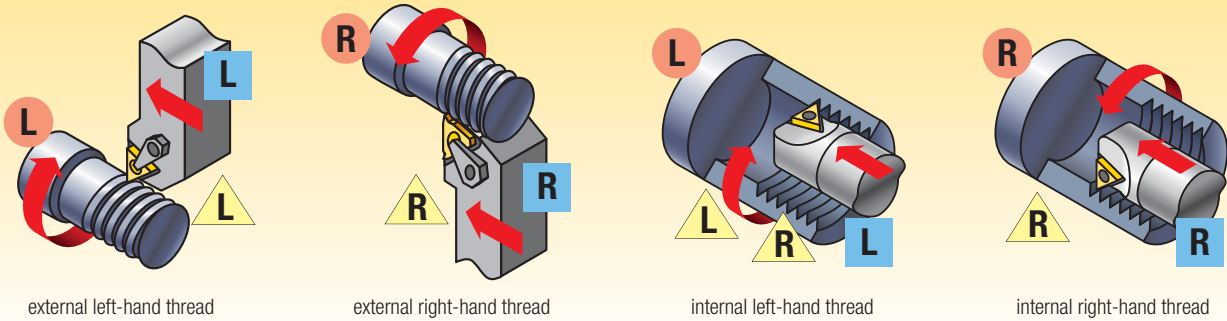
Step 1 • Select threading method and hand of tooling

Required Information:

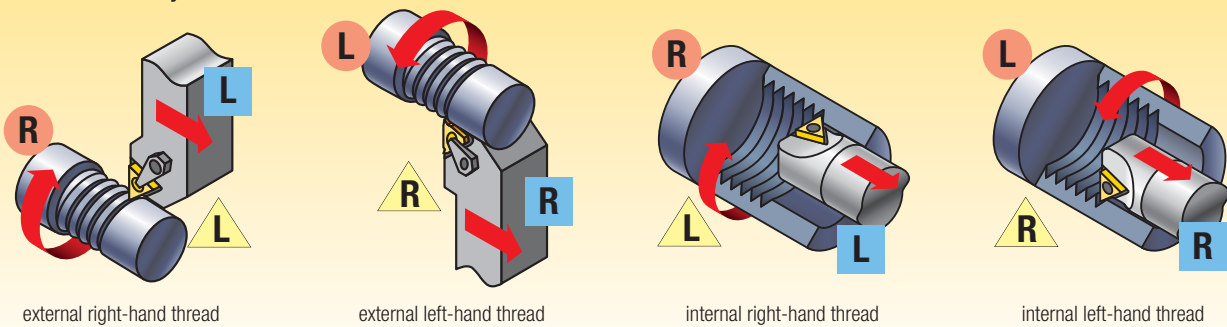
- External/internal operation.
- Spindle rotation/hand of thread.
- Feed direction.



Feed Direction Toward the Chuck • Standard Helix



Feed Direction Away from the Chuck • Reverse Helix



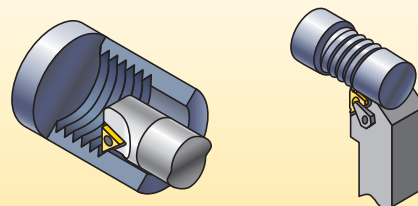
Threading

Step 2 • Select threading method and hand of tooling

Required Information:

- External/internal operation.
- Minimum bore diameter (for internal operations).
- Hand of tool.
- Insert size (gage insert).

Select the Appropriate Holder for the Insert Size and Hand:



The insert size must match the gage insert size of your toolholder selection:

catalog number	gage insert	minimum bore diameter	shim
S1212LSER3	LT16NR	.90"	SM-Y13
A2020LSER16	LT16NR	16mm	SM-Y13

Step 3 • Choose insert for application

- Select cresting inserts for fully controlled thread form including diameter.
- Cresting inserts eliminate the need for deburring and are optimized for the best tool life at that pitch.
- Non-cresting partial profile inserts offer the flexibility to cut a variety of thread pitches with one insert.
- Note insert size for toolholder selection.

NOTE: See Threading Insert Overview on page E45.

insert size	catalog number	TN6025
11	LT11NRA60	•
16	LT6NRAG60	•

Step 4 • Select grade and speed

Recommendations for Grade and Speed Selection • SFM (m/min)

workpiece material	P	M	K	N	S	
Kenna Perfect™	insert style	CB chipbreaker		Flat Top	CB Chipbreaker	
	optimum cutting conditions	KC5010 160–750 (50–230)	KC5010 160–600 (50–185)	KC5010 230–700 (70–210)	KC5010 230–1300 (70–390)	KC5010 65–400 (20–120)
	first choice	KC5025 130–650 (40–200)	KC5025 130–450 (40–135)	KC5025 200–475 (60–145)	KC5025 160–1150 (50–360)	KC5025 35–330 (10–100)
Kenna Universal™	insert style	-K chipbreaker				
	selection	KU25T 80–450 (25–140)	KU25T 80–350 (25–100)	KU25T 100–360 (30–110)	KU25T 100–1000 (30–300)	KU25T 35–280 (10–85)

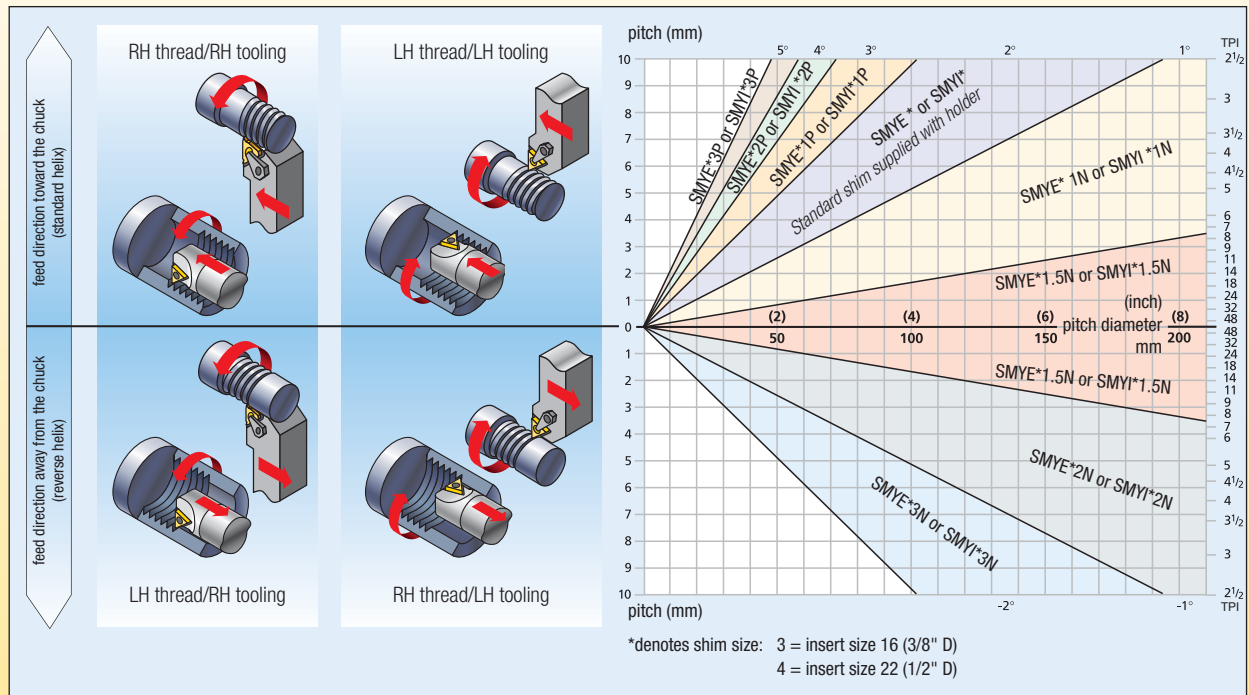
NOTE: CB-style chip control inserts are not available with some thread forms. In those cases, flat top inserts can be substituted.

Step 5 • Select appropriate shim

Required Information:

- Thread form (TPI or pitch).
- Pitch diameter.
- Helix method (hand of tool, feed direction, hand of thread).

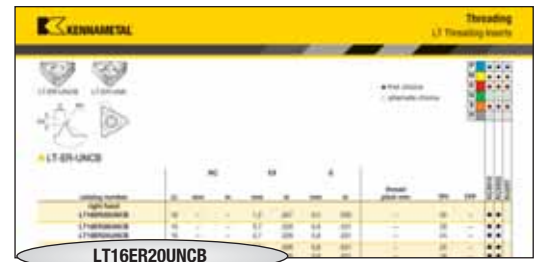
Select the proper shim: SMYE... for external RH or internal LH
SMYL... for internal RH or external LH



NOTE: If recommended shim is different from shim supplied with toolholder, order shim separately. Optimize your threading operation by using the proper infeed angle and the recommended infeed values. See the Technical Section on pages E85–E87. Also see detailed shim selection information on pages E105–E107.

How Do Catalog Numbers Work?

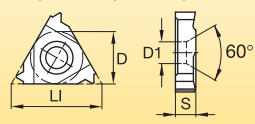
Each character in our catalog number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.



Inch

LT Type of Insert LT = Laydown triangle threading	16 Cutting Edge Length (Size)	ER Hand of Insert ER = External right hand EL = External left hand NR = Internal right hand NL = Internal left hand	20 Thread Pitch	UN Thread Profile	CB Chip Control □ = Flat top CB = Chipbreaker K = Kenna Universal™ chipbreaker
--	---	---	---------------------------	-----------------------------	---

insert size	LI (mm)	D (inch)	D (mm)	S (inch)	S (mm)	D1 (inch)	D1 (mm)
11	11,0	.250	6,35	.126	3,20	.128	3,25
16	16,5	.375	9,52	.143	3,63	.155	3,94
22	22,0	.500	12,70	.188	4,78	.192	4,88



- ISO = ISO metric 60°
- UN = American UN 60°
- 60 = Partial profile non-cresting 60°
- 55 = Partial profile non-cresting 55°
- W = Whitworth 55°
- BSPT = British Standard Pipe Thread 55°
- NPT = American National Pipe Thread 60°
- ACME = American Acme
- STACME = American Stub Acme
- TR = Trapez DIN 103
- RD = Round DIN 405
- UNJ = Controlled root radius 60°
- NPTF = Dryseal 60°
- API = American Petroleum Institute Threads
- BUT = API Buttress Casing
- APIRD = API Round

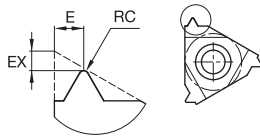
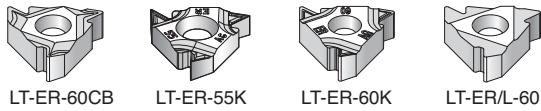
partial profile		
designation	thread pitch (mm)	TPI
A	0,50-1,5	48-16
AG	0,50-3,0	48-8
G	1,75-3,0	14-8
N	3,50-5,0	7-5
full profile		
actual TPI or pitch in mm is designated	0,5-4,0	48-8



The Kennametal LT Advantage

Every box of 10 inserts includes a free Torx wrench and spare locking screw, except LT-K inserts.

style			thread profile	standard	tolerance class	cresting	application	page(s)
CB	K	flat top						
 LT-60CB	 LT-60K	 LT-60	Partial Profile 60°	—	—	N	General use for 60° thread forms such as ISO and UN where non-cresting inserts are desired to cut a variety of pitches	E46
 LT-ISOCB	 LT-ISOK	 LT-ISO	Metric ISO	ISO R262, DIN 13	6g / 6H	Y	Widely used metric 60° V-form for all industries	E49–E51
 LT-UNCB	 LT-UNK	 LT-UN	American UN	ANSI B1.1:74	2A / 2B	Y	Widely used inch-based 60° V-form for all industries	E52–E53
		 LT-UNJ	UNJ	MIL-S-8879C	3A / 3B	Y	Controlled root radius on external threads for military and aerospace industries, 60° thread form	E55
 LT-NPTCB		 LT-NPT	NPT	USAS B2.1:1968	Standard NPT	Y	National Pipe thread standard 60° thread form for pipe fittings	E56
 LT-NPTFCB		 LT-NPTF	NPTF	ANSI B1.20.3-1976	Class 2	Y	Dryseal-type NPT 60° thread form for pipe fittings	E57
	 LT-55K	 LT-55	Partial Profile 55°	—	—	N	General use for 55° thread forms such as Whitworth, BSW, and BSP where non-cresting inserts are desired to cut a variety of pitches	E46, E58
		 LT-BSPT	BSPT	BS 21:1985	Standard BSPT	Y	55° form for pipe fittings	E61
 LT-WCB	 LT-WK	 LT-W	Whitworth, BSW, BSF, BSP	BS 84:1956, ISO 228/1:1982, DIN 259	Medium Class A	Y	Widely used 55° form for gas and water connections	E59–E60
		 LT-API	API Rotary Shoulder Connections	API SPEC. 7:1990	Standard API	Y	60° V-form used for rotary shoulder pipe connections in the oil and gas industry including V-.038R, V-.040, and V-.050 forms	E62
		 LT-APIRD	API Round	API STD. 5B:1979	Standard API RD	Y	60° V-form with large radius for casing, tubing, and line pipe in the oil and gas industry including 8 and 10 round forms	E63–E64
		 LT-BUT	API Buttress Casing	API SPEC. 7:1990	Standard API	Y	45° buttress-style form used for pipe casing connections in the oil and gas industry	E63
		 LT-ACME	Acme	ANSI B1.5:1988	3G	N	29° truncated thread form for motion applications in a wide variety of industries	E64–E65
		 LT-STACME	Stub Acme	ANSI B1.8:1988	2G	N	Shallow depth 29° truncated thread form for motion applications in a wide variety of industries	E65–E66
		 LT-RD	Round	DIN 405	7h / 7H	Y	Round thread form for tube fittings in the chemical and food industries	E67
		 LT-TR	Trapez	DIN 103	7e / 7H	N	30° truncated metric thread form for motion applications	E66



● first choice
○ alternate choice

P	●	●	●
M	●	●	●
K	●	●	●
N	○	○	○
S	●	●	●
H	○	○	○

Threading

■ LT-ER-60CB

catalog number	insert size	RC		EX		E		thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
		mm	in	mm	in	mm	in						
right hand LT16ERAG60CB	16	0,08	.003	0,9	.035	1,5	.059	0,50-3,0	48-8	—	●	●	

■ LT-ER-55K

catalog number	insert size	RC		EX		E		thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
		mm	in	mm	in	mm	in						
right hand LT16ERAG55K	16	0,07	.003	1,2	.047	1,7	.067	0,50-3,0	48-8	—			●

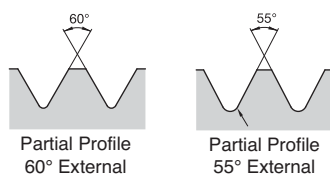
■ LT-ER-60K

catalog number	insert size	RC		EX		E		thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
		mm	in	mm	in	mm	in						
right hand LT16ERAG60K	16	0,08	.003	1,2	.047	1,7	.067	0,50-3,0	48-8	—			●
LT16ERG60K	16	0,18	.007	1,2	.047	1,7	.067	1,75-3,0	14-8	—			●

■ LT-ER/L-60

catalog number	insert size	RC		EX		E		thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
		mm	in	mm	in	mm	in						
right hand LT16ERA60	16	0,05	.002	0,8	.031	0,9	.035	0,50-1,5	48-16	—	●	●	
LT16ERAG60	16	0,08	.003	1,2	.047	1,7	.067	0,50-3,0	48-8	—	●	●	
LT16ERG60	16	0,28	.011	1,2	.047	1,7	.067	1,75-3,0	14-8	—	●	●	
left hand LT22ERN60	22	0,53	.021	1,7	.067	2,5	.098	3,5-5,0	7-5	—			●
LT16ELA60	16	0,05	.002	0,8	.031	0,9	.035	0,50-1,5	48-16	—			●
LT16ELAG60	16	0,08	.003	1,2	.047	1,7	.067	0,50-3,0	48-8	—			●
LT16ELG60	16	0,28	.011	1,2	.047	1,7	.067	1,75-3,0	14-8	—			●
LT22ELN60	22	0,53	.021	1,7	.067	2,5	.098	3,5-5,0	7-5	—			●

Thread Forms





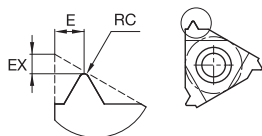
LT-NR-60CB



LT-NR-55K



LT-NR-60K



● first choice
○ alternate choice

P	●	●	●
M	●	●	●
K	●	●	●
N	○	○	○
S	○	○	○
H	○	○	○

LT-NR-60CB

catalog number	insert size	RC		EX		E		thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
		mm	in	mm	in	mm	in						
right hand													
LT11NRA60CB	11	0,05	.002	0,6	.024	0,8	.031	0,50-1,5	48-16	—	●		
LT16NRAG60CB	16	0,05	.002	0,9	.035	1,5	.059	0,50-3,0	48-8	—	●		
LT16NRG60CB	16	0,16	.006	1,0	.039	1,5	.059	1,75-3,0	14-8	—	●		

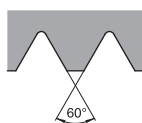
LT-NR-55K

catalog number	insert size	RC		EX		E		thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
		mm	in	mm	in	mm	in						
right hand													
LT16NRAG55K	16	0,07	.003	1,2	.047	1,7	.067	0,50-3,0	48-8	—			●

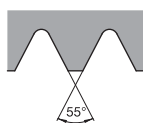
LT-NR-60K

catalog number	insert size	RC		EX		E		thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
		mm	in	mm	in	mm	in						
right hand													
LT11NRA60K	11	0,03	.001	0,8	.031	0,9	.035	0,50-1,5	48-16	—			●
LT16NRAG60K	16	0,04	.002	1,2	.047	1,7	.067	0,50-3,0	48-8	—			●
LT16NRG60K	16	0,08	.003	1,2	.047	1,7	.067	1,75-3,0	14-8	—			●

Thread Forms

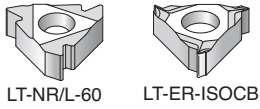


Partial Profile
60° Internal

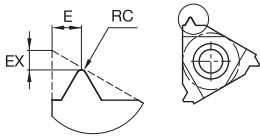


Partial Profile
55° Internal





LT-NR/L-60 LT-ER-ISOCB



P	●	●	●
M	●	●	●
K	●	●	●
N	○	○	○
S	○	○	○
H	○	○	○

● first choice
○ alternate choice

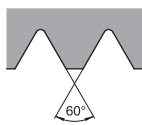
■ LT-NR/L-60

catalog number	insert size	RC		EX		E		thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
		mm	in	mm	in	mm	in						
right hand													
LT11NRA60	11	0,05	.002	0,8	.031	0,9	.035	0,50-1,5	48-16	—	●	●	
LT16NRA60	16	0,05	.002	0,8	.031	0,9	.035	0,50-1,5	48-16	—	●	●	
LT16NRAG60	16	0,05	.002	1,2	.047	1,7	.067	0,50-3,0	48-8	—	●	●	
left hand													
LT16NRG60	16	0,15	.006	1,2	.047	1,7	.067	1,75-3,0	14-8	—	●	●	
LT22NRN60	22	0,31	.012	1,7	.067	2,5	.098	3,5-5,0	7-5	—	●	●	
LT11NLA60	11	0,05	.002	0,8	.031	0,9	.035	0,50-1,5	48-16	—		●	
LT16NLA60	16	0,05	.002	0,8	.031	0,9	.035	0,50-1,5	48-16	—		●	
LT16NLAG60	16	0,05	.002	1,2	.047	1,7	.067	0,50-3,0	48-8	—		●	
LT16NLAG60	16	0,05	.002	1,2	.047	1,7	.067	0,50-3,0	48-8	—		●	
LT16NLAG60	16	0,05	.002	1,2	.047	1,7	.067	0,50-3,0	48-8	—		●	
LT16NLG60	16	0,15	.006	1,2	.047	1,7	.067	1,75-3,0	14-8	—		●	
LT22NLN60	22	0,31	.012	1,7	.067	2,5	.098	3,5-5,0	7-5	—		●	

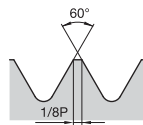
■ LT-ER-ISOCB

catalog number	insert size	RC		EX		E		thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
		mm	in	mm	in	mm	in						
right hand													
LT16ER05ISOCB	16	—	—	1,2	.047	0,5	.020	0,50	—	—	●	●	
LT16ER075ISOCB	16	—	—	1,2	.047	0,6	.024	0,75	—	—	●	●	
LT16ER10ISOCB	16	—	—	0,7	.028	0,8	.031	1,0	—	—	●	●	
LT16ER125ISOCB	16	—	—	0,7	.028	0,8	.031	1,25	—	—	●	●	
LT16ER15ISOCB	16	—	—	0,7	.028	0,8	.031	1,5	—	—	●	●	
LT16ER175ISOCB	16	—	—	1,2	.047	1,5	.059	1,75	—	—	●	●	
LT16ER20ISOCB	16	—	—	1,2	.047	1,5	.059	2,0	—	—	●	●	
LT16ER25ISOCB	16	—	—	1,2	.047	1,5	.059	2,5	—	—	●	●	
LT16ER30ISOCB	16	—	—	1,3	.051	1,5	.059	3,0	—	—	●	●	

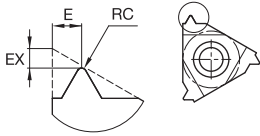
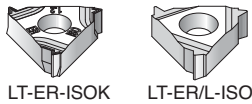
Thread Forms



Partial Profile
60° Internal



ISO Metric-
External



● first choice
○ alternate choice

P	●	●	●
M	●	●	●
K	●	●	●
N	○	○	○
S	●	●	●
H	○	○	○

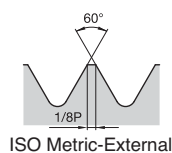
LT-ER-ISOK

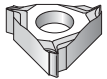
catalog number	insert size	RC		EX		E		thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
		mm	in	mm	in	mm	in						
right hand													
LT16ER10ISOK	16	0,14	.005	0,7	.028	0,7	.028	1,0	—	—			●
LT16ER125ISOK	16	0,16	.006	1,1	.043	0,8	.031	1,25	—	—			●
LT16ER15ISOK	16	0,20	.008	0,8	.031	1,0	.039	1,5	—	—			●
LT16ER175ISOK	16	0,22	.009	1,2	.047	1,5	.059	1,75	—	—			●
LT16ER20ISOK	16	0,27	.011	1,0	.039	1,3	.051	2,0	—	—			●
LT16ER25ISOK	16	0,32	.013	1,2	.047	1,5	.059	2,5	—	—			●
LT16ER30ISOK	16	0,38	.015	1,3	.051	1,5	.059	3,0	—	—			●

LT-ER/L-ISO

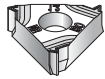
catalog number	insert size	RC		EX		E		thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
		mm	in	mm	in	mm	in						
right hand													
LT16ER05ISO	16	—	—	0,6	.024	0,4	.016	0,50	—	—			●
LT16ER075ISO	16	—	—	0,6	.024	0,6	.024	0,75	—	—			●
LT16ER10ISO	16	—	—	0,7	.027	0,7	.027	1,0	—	—			●
LT16ER125ISO	16	—	—	0,8	.031	0,9	.035	1,25	—	—			●
LT16ER15ISO	16	—	—	0,8	.031	1,0	.039	1,5	—	—			●
LT16ER175ISO	16	—	—	0,9	.035	1,2	.047	1,75	—	—			●
LT16ER20ISO	16	—	—	1,0	.039	1,3	.051	2,0	—	—			●
LT16ER25ISO	16	—	—	1,1	.043	1,5	.059	2,5	—	—			●
LT16ER30ISO	16	—	—	1,2	.047	1,6	.063	3,0	—	—			●
LT22ER35ISO	22	—	—	1,6	.063	2,3	.090	3,5	—	—			●
LT22ER40ISO	22	—	—	1,6	.063	2,3	.090	4,0	—	—			●
LT22ER45ISO	22	—	—	1,7	.067	2,4	.094	4,5	—	—			●
LT22ER50ISO	22	—	—	1,7	.067	2,5	.098	5,0	—	—			●
left hand													
LT16EL05ISO	16	—	—	0,6	.024	0,4	.016	0,50	—	—			●
LT16EL075ISO	16	—	—	0,6	.024	0,6	.024	0,75	—	—			●
LT16EL10ISO	16	—	—	0,7	.027	0,7	.027	1,0	—	—			●
LT16EL125ISO	16	—	—	0,8	.031	0,9	.035	1,25	—	—			●
LT16EL15ISO	16	—	—	0,8	.031	1,0	.039	1,5	—	—			●
LT16EL175ISO	16	—	—	0,9	.035	1,2	.047	1,75	—	—			●
LT16EL20ISO	16	—	—	1,0	.039	1,3	.051	2,0	—	—			●
LT16EL25ISO	16	—	—	1,1	.043	1,5	.059	2,5	—	—			●
LT16EL30ISO	16	—	—	1,2	.047	1,6	.063	3,0	—	—			●
LT22EL35ISO	22	—	—	1,6	.063	2,3	.090	3,5	—	—			●

Thread Forms

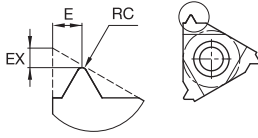




LT-NR-ISOCB



LT-NR-ISOK



P	●	●	●
M	●	●	●
K	●	●	●
N	○	○	○
S	●	●	●
H	○	○	○

● first choice
○ alternate choice

■ **LT-NR-ISOCB**

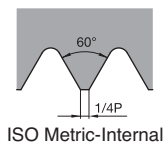
catalog number	insert size	RC		EX		E		thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
		mm	in	mm	in	mm	in						
right hand													
LT11NR075ISOCB	11	—	—	1,194	.0	0,500	.0	0,75	—	—	●	●	●
LT11NR10ISOCB	11	—	—	0,711	.0	0,787	.0	1,0	—	—	●	●	●
LT16NR10ISOCB	16	—	—	0,711	.0	0,787	.0	1,0	—	—	●	●	●
LT11NR125ISOCB	11	—	—	0,711	.0	0,787	.0	1,25	—	—	●	●	●
LT11NR15ISOCB	11	—	—	0,711	.0	0,787	.0	1,5	—	—	●	●	●
LT16NR15ISOCB	16	—	—	0,711	.0	0,787	.0	1,5	—	—	●	●	●
LT16NR20ISOCB	16	—	—	1,100	.0	1,499	.1	2,0	—	—	●	●	●
LT16NR25ISOCB	16	—	—	1,100	.0	1,499	.1	2,5	—	—	●	●	●

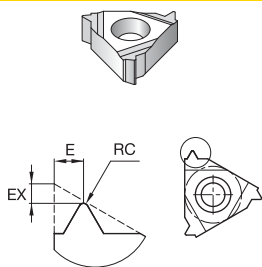
Threading

■ **LT-NR-ISOK**

catalog number	insert size	RC		EX		E		thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
		mm	in	mm	in	mm	in						
right hand													
LT11NR10ISOK	11	0,06	.002	0,7	.028	0,8	.031	1,0	—	—	●	●	●
LT16NR10ISOK	16	0,05	.002	0,7	.028	0,7	.028	1,0	—	—	●	●	●
LT16NR15ISOK	16	0,08	.003	0,8	.031	1,0	.039	1,5	—	—	●	●	●
LT16NR175ISOK	16	0,10	.004	1,2	.047	1,5	.059	1,75	—	—	●	●	●
LT16NR20ISOK	16	0,10	.004	1,0	.039	1,3	.051	2,0	—	—	●	●	●
LT16NR25ISOK	16	0,14	.005	1,2	.047	1,5	.059	2,5	—	—	●	●	●
LT16NR30ISOK	16	0,17	.007	1,3	.051	1,5	.059	3,0	—	—	●	●	●

Thread Forms





● first choice
○ alternate choice

P	●	●	●
M	●	●	●
K	●	●	●
N	○	○	○
S	○	○	○
H	○	○	○

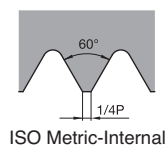
LT-NR/L-ISO

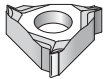
catalog number	insert size	RC		EX		E		thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
		mm	in	mm	in	mm	in						
right hand													
LT11NR05ISO	11	—	—	0,6	.024	0,4	.016	0,50	—	—	●	●	●
LT16NR05ISO	16	—	—	0,6	.024	0,4	.016	0,50	—	—	●	●	●
LT11NR075ISO	11	—	—	0,6	.024	0,6	.024	0,75	—	—	●	●	●
LT16NR075ISO	16	—	—	0,6	.024	0,6	.024	0,75	—	—	●	●	●
LT11NR10ISO	11	—	—	0,6	.024	0,7	.027	1,0	—	—	●	●	●
LT16NR10ISO	16	—	—	0,6	.024	0,7	.027	1,0	—	—	●	●	●
LT11NR125ISO	11	—	—	0,8	.031	0,9	.035	1,25	—	—	●	●	●
LT16NR125ISO	16	—	—	0,8	.031	0,9	.035	1,25	—	—	●	●	●
LT11NR15ISO	11	—	—	0,8	.031	1,0	.039	1,5	—	—	●	●	●
LT16NR15ISO	16	—	—	0,8	.031	1,0	.039	1,5	—	—	●	●	●
LT11NR175ISO	11	—	—	0,9	.035	1,1	.043	1,75	—	—	●	●	●
LT16NR175ISO	16	—	—	0,9	.035	1,2	.047	1,75	—	—	●	●	●
LT11NR20ISO	11	—	—	0,9	.035	1,1	.043	2,0	—	—	●	●	●
LT16NR20ISO	16	—	—	1,0	.039	1,3	.051	2,0	—	—	●	●	●
LT16NR25ISO	16	—	—	1,1	.043	1,5	.059	2,5	—	—	●	●	●
LT16NR30ISO	16	—	—	1,1	.043	1,5	.059	3,0	—	—	●	●	●
LT22NR35ISO	22	—	—	1,6	.063	2,3	.090	3,5	—	—	●	●	●
LT22NR40ISO	22	—	—	1,6	.063	2,3	.090	4,0	—	—	●	●	●
LT22NR45ISO	22	—	—	1,6	.063	2,4	.094	4,5	—	—	●	●	●
LT22NR50ISO	22	—	—	1,6	.063	2,3	.090	5,0	—	—	●	●	●
left hand													
LT11NL10ISO	11	—	—	0,6	.024	0,7	.027	1,0	—	—	●	●	●
LT16NL10ISO	16	—	—	0,6	.024	0,7	.027	1,0	—	—	●	●	●
LT11NL15ISO	11	—	—	0,8	.031	1,0	.039	1,5	—	—	●	●	●
LT16NL15ISO	16	—	—	0,8	.031	1,0	.039	1,5	—	—	●	●	●
LT16NL20ISO	16	—	—	1,0	.039	1,3	.051	2,0	—	—	●	●	●
LT16NL25ISO	16	—	—	1,1	.043	1,5	.059	2,5	—	—	●	●	●
LT16NL30ISO	16	—	—	1,1	.043	1,5	.059	3,0	—	—	●	●	●
LT22NL40ISO	22	—	—	1,6	.063	2,3	.090	4,0	—	—	●	●	●



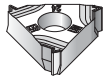
Threading

Thread Forms

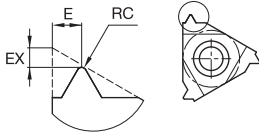




LT-ER-UNCB



LT-ER-UNK



P	●	●	●
M	●	●	●
K	●	●	●
N	○	○	○
S	●	●	●
H	○	○	○

● first choice
○ alternate choice

■ **LT-ER-UNCB**

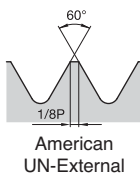
catalog number	insert size	RC		EX		E		thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
		mm	in	mm	in	mm	in						
right hand													
LT16ER32UNCB	16	—	—	1,2	.047	0,5	.020	—	32	—	●	●	
LT16ER28UNCB	16	—	—	0,7	.028	0,8	.031	—	28	—	●	●	
LT16ER24UNCB	16	—	—	0,7	.028	0,8	.031	—	24	—	●	●	
LT16ER20UNCB	16	—	—	0,7	.028	0,8	.031	—	20	—	●	●	
LT16ER18UNCB	16	—	—	0,7	.028	0,8	.031	—	18	—	●	●	
LT16ER16UNCB	16	—	—	0,8	.032	0,8	.031	—	16	—	●	●	
LT16ER14UNCB	16	—	—	1,2	.047	1,5	.059	—	14	—	●	●	
LT16ER12UNCB	16	—	—	1,2	.047	1,5	.059	—	12	—	●	●	
LT16ER10UNCB	16	—	—	1,2	.047	1,5	.059	—	10	—	●	●	
LT16ER8UNCB	16	—	—	1,3	.051	1,5	.059	—	8	—	●	●	

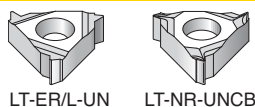
■ **LT-ER-UNK**

catalog number	insert size	RC		EX		E		thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
		mm	in	mm	in	mm	in						
right hand													
LT16ER24UNK	16	0,14	.005	0,7	.028	0,8	.031	—	24	—			●
LT16ER20UNK	16	0,16	.006	0,7	.028	0,8	.031	—	20	—			●
LT16ER18UNK	16	0,18	.007	0,7	.028	0,8	.031	—	18	—			●
LT16ER16UNK	16	0,19	.008	0,9	.035	1,1	.043	—	16	—			●
LT16ER14UNK	16	0,23	.009	1,2	.047	1,5	.059	—	14	—			●
LT16ER12UNK	16	0,25	.010	1,1	.043	1,4	.055	—	12	—			●
LT16ER8UNK	16	0,40	.016	1,3	.051	1,5	.059	—	8	—			●

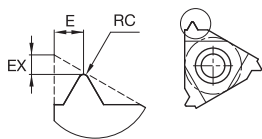
Threading

Thread Forms





LT-ER/L-UN LT-NR-UNCB



● first choice
○ alternate choice

P	●	●	●
M	●	●	●
K	●	●	●
N	○	○	○
S	●	●	●
H	○	○	○

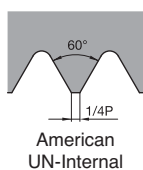
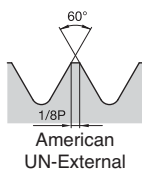
LT-ER/L-UN

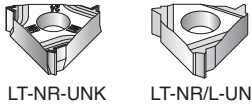
catalog number	insert size	RC		EX		E		thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
		mm	in	mm	in	mm	in						
right hand													
LT16ER48UN	16	—	—	0,6	.024	0,6	.024	—	48	—	●	●	●
LT16ER40UN	16	—	—	0,6	.024	0,6	.024	—	40	—	●	●	●
LT16ER36UN	16	—	—	0,6	.024	0,6	.024	—	36	—	●	●	●
left hand													
LT16ER32UN	16	—	—	0,6	.024	0,6	.024	—	32	—	●	●	●
LT16ER28UN	16	—	—	0,6	.024	0,7	.027	—	28	—	●	●	●
LT16ER24UN	16	—	—	0,7	.027	0,8	.031	—	24	—	●	●	●
LT16ER20UN	16	—	—	0,8	.031	0,9	.035	—	20	—	●	●	●
LT16ER18UN	16	—	—	0,8	.031	1,0	.039	—	18	—	●	●	●
LT16ER16UN	16	—	—	0,9	.035	1,1	.043	—	16	—	●	●	●
LT16ER14UN	16	—	—	1,0	.039	1,2	.047	—	14	—	●	●	●
LT16ER12UN	16	—	—	1,1	.043	1,4	.055	—	12	—	●	●	●
LT16ER10UN	16	—	—	1,1	.043	1,5	.059	—	10	—	●	●	●
LT16ER8UN	16	—	—	1,2	.047	1,6	.063	—	8	—	●	●	●
left hand													
LT16EL28UN	16	—	—	0,6	.024	0,7	.027	—	28	—	●	●	●
LT16EL24UN	16	—	—	0,7	.027	0,8	.031	—	24	—	●	●	●
LT16EL20UN	16	—	—	0,8	.031	0,9	.035	—	20	—	●	●	●
LT16EL18UN	16	—	—	0,8	.031	1,0	.039	—	18	—	●	●	●
LT16EL16UN	16	—	—	0,9	.035	1,1	.043	—	16	—	●	●	●
LT16EL14UN	16	—	—	1,0	.039	1,2	.047	—	14	—	●	●	●
LT16EL12UN	16	—	—	1,1	.043	1,4	.055	—	12	—	●	●	●
LT16EL11UN	16	—	—	1,1	.043	1,4	.057	—	11	—	●	●	●
LT16EL8UN	16	—	—	1,2	.047	1,6	.063	—	8	—	●	●	●

LT-NR-UNCB

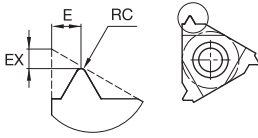
catalog number	insert size	RC		EX		E		thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
		mm	in	mm	in	mm	in						
right hand													
LT11NR32UNCB	11	—	—	1,2	.047	0,5	.020	—	32	—	●	●	●
LT11NR24UNCB	11	—	—	0,7	.028	0,8	.031	—	24	—	●	●	●
LT16NR20UNCB	16	—	—	0,7	.028	0,6	.024	—	20	—	●	●	●
LT11NR20UNCB	11	—	—	0,6	.024	0,8	.031	—	20	—	●	●	●
LT16NR18UNCB	16	—	—	0,6	.024	0,8	.031	—	18	—	●	●	●
LT11NR18UNCB	11	—	—	0,6	.024	0,8	.031	—	18	—	●	●	●
LT11NR16UNCB	11	—	—	0,7	.028	0,8	.031	—	16	—	●	●	●
LT16NR16UNCB	16	—	—	0,7	.028	0,8	.031	—	16	—	●	●	●
LT16NR14UNCB	16	—	—	1,1	.043	1,5	.059	—	14	—	●	●	●
LT16NR12UNCB	16	—	—	1,1	.043	1,5	.059	—	12	—	●	●	●
LT16NR10UNCB	16	—	—	1,1	.043	1,5	.059	—	10	—	●	●	●
LT16NR8UNCB	16	—	—	1,1	.043	1,5	.059	—	8	—	●	●	●

Thread Forms





LT-NR-UNK LT-NR/L-UN



P	●	●	●	●
M	●	●	●	●
K	●	●	●	●
N	○	○	○	○
S	●	●	●	●
H	○	○	○	○

● first choice
○ alternate choice

■ LT-NR-UNK

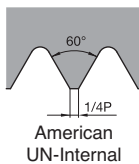
catalog number	insert size	RC		EX		E		thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
		mm	in	mm	in	mm	in						
right hand LT16NR16UNK	16	0,08	.003	0,9	.035	1,1	.043	—	16	—			●
LT16NR12UNK	16	0,10	.004	1,1	.043	1,4	.055	—	12	—			●
LT16NR8UNK	16	0,17	.007	1,3	.051	1,5	.059	—	8	—			●

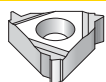
Threading

■ LT-NR/L-UN

catalog number	insert size	RC		EX		E		thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
		mm	in	mm	in	mm	in						
right hand LT11NR40UN	11	—	—	0,6	.024	0,6	.024	—	40	—			●
LT11NR32UN	11	—	—	0,6	.024	0,6	.024	—	32	—			●
LT11NR28UN	11	—	—	0,6	.024	0,7	.027	—	28	—			●
LT11NR24UN	11	—	—	0,7	.027	0,8	.031	—	24	—			●
LT11NR20UN	11	—	—	0,8	.031	0,9	.035	—	20	—			●
LT11NR18UN	11	—	—	0,8	.031	1,0	.039	—	18	—			●
LT11NR16UN	11	—	—	0,9	.035	1,1	.043	—	16	—	●		●
LT16NR28UN	16	—	—	0,6	.024	0,7	.027	—	28	—			●
LT16NR32UN	16	—	—	0,6	.024	0,6	.024	—	32	—			●
LT16NR24UN	16	—	—	0,7	.027	0,8	.031	—	24	—			●
LT16NR20UN	16	—	—	0,8	.031	0,9	.035	—	20	—			●
LT16NR18UN	16	—	—	0,8	.031	1,0	.039	—	18	—			●
LT16NR16UN	16	—	—	0,9	.035	1,1	.043	—	16	—			●
LT16NR14UN	16	—	—	0,9	.035	1,2	.047	—	14	—			●
LT16NR12UN	16	—	—	1,1	.043	1,4	.055	—	12	—	●		●
LT16NR10UN	16	—	—	1,1	.043	1,5	.059	—	10	—			●
LT16NR8UN	16	—	—	1,1	.043	1,5	.059	—	8	—			●
left hand LT11NL32UN	11	—	—	0,6	.024	0,6	.024	—	32	—			●
LT16NL16UN	16	—	—	0,9	.035	1,1	.043	—	16	—			●
LT16NL12UN	16	—	—	1,1	.043	1,4	.055	—	12	—			●
LT16NL10UN	16	—	—	1,1	.043	1,5	.059	—	10	—			●
LT16NL8UN	16	—	—	1,1	.043	1,5	.059	—	8	—			●

Thread Forms

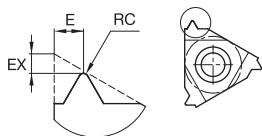




LT-ER/L-UNJ



LT-NR/L-UNJ



● first choice
○ alternate choice

P	●	●	●
M	●	●	●
K	●	●	●
N	○	○	○
S	●	●	●
H	○	○	○

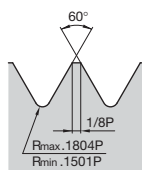
LT-ER/L-UNJ

catalog number	insert size	RC		EX		E		thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
		mm	in	mm	in	mm	in						
right hand													
LT16ER32UNJ	16	—	—	0,6	.024	0,7	.027	—	32	—	●		
LT16ER28UNJ	16	—	—	0,7	.027	0,7	.027	—	28	—	●		
LT16ER24UNJ	16	—	—	0,7	.027	0,8	.031	—	24	—	●		
LT16ER20UNJ	16	—	—	0,8	.031	0,9	.035	—	20	—	●		
LT16ER18UNJ	16	—	—	0,8	.031	1,0	.039	—	18	—	●		
LT16ER16UNJ	16	—	—	0,9	.035	1,1	.043	—	16	—	●		
LT16ER14UNJ	16	—	—	1,0	.039	1,2	.047	—	14	—	●		
LT16ER12UNJ	16	—	—	1,1	.043	1,3	.051	—	12	—	●		
left hand													
LT16EL16UNJ	16	—	—	0,9	.035	1,1	.043	—	16	—	●		

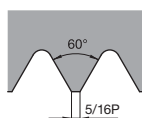
LT-NR/L-UNJ

catalog number	insert size	RC		EX		E		thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
		mm	in	mm	in	mm	in						
right hand													
LT11NR18UNJ	11	—	—	0,8	.031	1,0	.039	—	18	—	●		
LT11NR16UNJ	11	—	—	0,9	.035	1,1	.043	—	16	—	●		
LT16NR16UNJ	16	—	—	0,9	.035	1,1	.043	—	16	—	●		
LT11NR14UNJ	11	—	—	1,0	.039	1,2	.047	—	14	—	●		
LT16NR12UNJ	16	—	—	1,1	.043	1,3	.051	—	12	—	●		

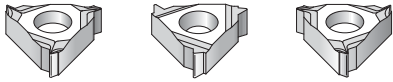
Thread Forms



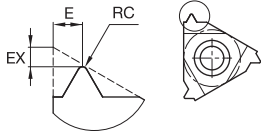
UNJ-External



UNJ-Internal



LT-ER-NPTCB LT-ER/L-NPT LT-NR-NPTCB



● first choice
○ alternate choice

P	●	●	●
M	●	●	●
K	●	●	●
N	○	○	○
S	●	●	●
H	○	○	○

■ **LT-ER-NPTCB**

catalog number right hand	insert size	RC		EX		E		thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
		mm	in	mm	in	mm	in						
LT16ER14NPTCB	16	—	—	1,1	.043	1,5	.059	—	14	.7500	●	●	

Threading

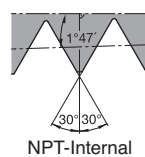
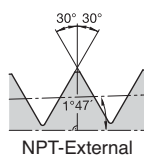
■ **LT-ER/L-NPT**

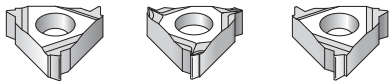
catalog number right hand	insert size	RC		EX		E		thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
		mm	in	mm	in	mm	in						
LT16ER27NPT	16	—	—	0,7	.027	0,8	.031	—	27	.7500			●
LT16ER18NPT	16	—	—	0,8	.031	1,0	.039	—	18	.7500	●	●	
LT16ER14NPT	16	—	—	0,9	.035	1,2	.047	—	14	.7500	●	●	
LT16ER115NPT	16	—	—	1,1	.043	1,5	.059	—	11.5	.7500	●	●	
LT16ER8NPT	16	—	—	1,3	.051	1,8	.071	—	8	.7500			●

■ **LT-NR-NPTCB**

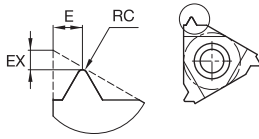
catalog number right hand	insert size	RC		EX		E		thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
		mm	in	mm	in	mm	in						
LT16NR14NPTCB	16	—	—	1,35	.053	1,20	.047	—	14	.7500			●
LT16NR115NPTCB	16	—	—	1,10	.043	1,50	.059	—	11.5	.7500			●

Thread Forms





LT-NR/L-NPT LT-ER-NPTFCB LT-ER/L-NPTF



● first choice
○ alternate choice

P	●	●	●
M	●	●	●
K	●	●	●
N	○	○	○
S	●	●	●
H	○	○	○

LT-NR/L-NPT

catalog number right hand	insert size	RC		EX		E		thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
		mm	in	mm	in	mm	in						
LT11NR18NPT	11	—	—	0,8	.031	1,0	.039	—	18	.7500	●	●	●
LT11NR14NPT	11	—	—	0,8	.031	1,0	.039	—	14	.7500	●	●	●
LT16NR14NPT	16	—	—	0,9	.035	1,2	.047	—	14	.7500	●	●	●
LT16NR115NPT	16	—	—	1,1	.043	1,5	.059	—	11.5	.7500	●	●	●
LT16NR8NPT	16	—	—	1,3	.051	1,8	.071	—	8	.7500	●	●	●

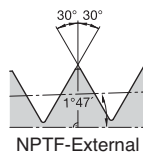
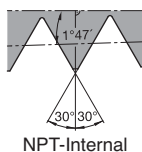
LT-ER-NPTFCB

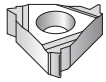
catalog number	insert size	RC		EX		E		thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
		mm	in	mm	in	mm	in						
LT16ER115NPTFCB	16	—	—	1,1	.043	1,5	.059	—	11.5	.7500	●	●	●

LT-ER/L-NPTF

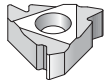
catalog number right hand	insert size	RC		EX		E		thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
		mm	in	mm	in	mm	in						
LT16ER14NPTF	16	—	—	0,9	.035	1,2	.047	—	14	.7500	●	●	●
LT16ER115NPTF	16	—	—	1,1	.043	1,5	.059	—	11.5	.7500	●	●	●

Thread Forms





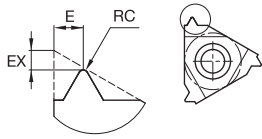
LT-NR/L-NPTF



LT-ER/L-55



LT-NR/L-55



● first choice
○ alternate choice

P	●	●	●	●
M	●	●	●	●
K	●	●	●	●
N	○	○	○	○
S	●	●	●	●
H	○	○	○	○

■ LT-NR/L-NPTF

catalog number	insert size	RC		EX		E		thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
		mm	in	mm	in	mm	in						
right hand													
LT11NR14NPTF	11	—	—	0,8	.031	1,0	.039	—	14	.7500	●		
LT16NR14NPTF	16	—	—	0,9	.035	1,2	.047	—	14	.7500	●		
LT16NR115NPTF	16	—	—	1,1	.043	1,5	.059	—	11.5	.7500	●		

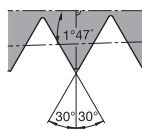
■ LT-ER/L-55

catalog number	insert size	RC		EX		E		thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
		mm	in	mm	in	mm	in						
right hand													
LT16ERA55	16	0,05	.002	0,8	.031	0,9	.035	0,50-1,50	48-16	—	●		
LT16ERAG55	16	0,08	.003	1,2	.047	1,7	.067	0,50-3,00	48-8	—	●	●	
LT16ERAG55	16	0,20	.008	1,2	.047	1,7	.067	1,75-3,00	14-8	—	●	●	
left hand													
LT22ERN55	22	0,43	.017	1,7	.067	2,5	.098	3,50-5,00	7-5	—	●		
LT16ELAG55	16	0,08	.003	1,2	.047	1,7	.067	0,50-3,00	48-8	—	●		

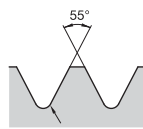
■ LT-NR/L-55

catalog number	insert size	RC		EX		E		thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
		mm	in	mm	in	mm	in						
right hand													
LT11NRA55	11	0,05	.002	0,8	.031	0,9	.035	0,50-1,50	48-16	—	●		
LT16NRA55	16	0,05	.002	0,8	.031	0,9	.035	0,50-1,50	48-16	—	●		
LT16NRAG55	16	0,07	.003	1,2	.047	1,7	.067	0,50-3,00	48-8	—	●	●	
LT16NRG55	16	0,21	.008	1,2	.047	1,7	.067	1,75-3,00	14-8	—	●	●	
LT22NRN55	22	0,43	.017	1,7	.067	2,5	.098	3,50-5,00	7-5	—	●		

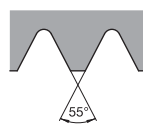
Thread Forms



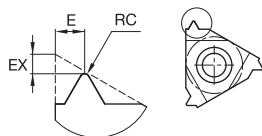
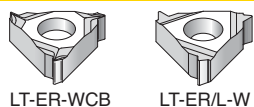
NPTF-Internal



Partial Profile
55° External



Partial Profile
55° Internal



● first choice
○ alternate choice

P	●	●	●
M	●	●	●
K	●	●	●
N	○	○	○
S	○	○	○
H	○	○	○

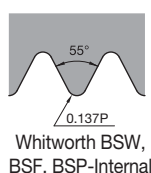
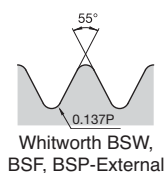
LT-ER-WCB

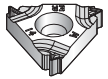
catalog number	insert size	RC		EX		E		thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
		mm	in	mm	in	mm	in						
right hand													
LT16ER14WCB	16	—	—	1,3	.051	1,5	.059	—	14	—	●	●	
LT16ER11WCB	16	—	—	1,3	.051	1,5	.059	—	11	—		●	

LT-ER/L-W

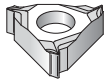
catalog number	insert size	RC		EX		E		thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
		mm	in	mm	in	mm	in						
right hand													
LT16ER28W	16	—	—	0,6	.024	0,7	.027	—	28	—		●	
LT16ER24W	16	—	—	0,7	.028	0,8	.031	—	24	—		●	
LT16ER20W	16	—	—	0,8	.031	0,9	.035	—	20	—		●	
LT16ER19W	16	—	—	0,8	.031	1,0	.039	—	19	—	●	●	
LT16ER18W	16	—	—	0,8	.031	1,0	.039	—	18	—		●	
LT16ER16W	16	—	—	0,9	.035	1,1	.043	—	16	—		●	
LT16ER14W	16	—	—	1,0	.039	1,2	.047	—	14	—	●	●	
LT16ER12W	16	—	—	1,1	.043	1,4	.055	—	12	—		●	
LT16ER11W	16	—	—	1,1	.043	1,5	.059	—	11	—	●	●	
LT16ER10W	16	—	—	1,1	.043	1,5	.059	—	10	—		●	
LT16ER9W	16	—	—	1,2	.047	1,7	.067	—	9	—		●	
LT16ER8W	16	—	—	1,2	.047	1,5	.059	—	8	—		●	
LT22ER6W	22	—	—	1,6	.063	2,3	.090	—	6	—		●	
LT22ER7W	22	—	—	1,6	.063	2,3	.090	—	7	—		●	
left hand													
LT16EL14W	16	—	—	1,0	.039	1,2	.047	—	14	—		●	
LT16EL11W	16	—	—	1,1	.043	1,5	.059	—	11	—		●	

Thread Forms

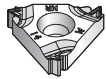




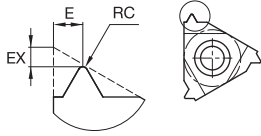
LT-ER/L-WK



LT-NR-WCB



LT-NR/L-WK



● first choice
○ alternate choice

P	●	●	●
M	●	●	●
K	●	●	●
N	○	○	○
S	●	●	●
H	○	○	○

■ **LT-ER/L-WK**

catalog number	insert size	RC		EX		E		thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
		mm	in	mm	in	mm	in						
right hand LT16ER11WK	16	0,29	.012	1,1	.043	1,5	.059	—	11	—			●

Threading

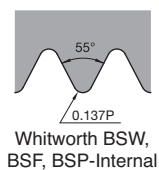
■ **LT-NR-WCB**

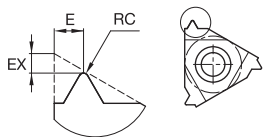
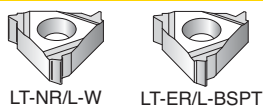
catalog number	insert size	RC		EX		E		thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
		mm	in	mm	in	mm	in						
right hand LT16NR14WCB	16	—	—	1,3	.051	1,5	.059	—	14	—			●
LT16NR11WCB	16	—	—	1,3	.051	1,5	.059	—	11	—			●

■ **LT-NR/L-WK**

catalog number	insert size	RC		EX		E		thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
		mm	in	mm	in	mm	in						
right hand LT16NR11WK	16	0,28	.011	1,1	.043	1,5	.059	—	11	—			●

Thread Forms





P	●	●	●
M	●	●	●
K	●	●	●
N	○	○	○
S	●	●	●
H	○	○	○

● first choice
○ alternate choice

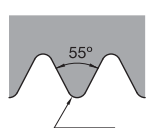
LT-NR/L-W

catalog number	insert size	RC		EX		E		thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
		mm	in	mm	in	mm	in						
right hand													
LT16NR20W	16	—	—	0,8	.031	0,9	.035	—	20	—	●	●	●
LT11NR19W	11	—	—	0,8	.031	1,0	.039	—	19	—	●	●	●
LT16NR19W	16	—	—	0,8	.031	1,0	.039	—	19	—	●	●	●
LT16NR16W	16	—	—	0,9	.035	1,1	.043	—	16	—	●	●	●
LT11NR14W	11	—	—	0,9	.035	1,1	.043	—	14	—	●	●	●
LT16NR14W	16	—	—	1,0	.039	1,2	.047	—	14	—	●	●	●
LT16NR12W	16	—	—	1,1	.043	1,4	.055	—	12	—	●	●	●
LT16NR11W	16	—	—	1,1	.043	1,5	.059	—	11	—	●	●	●
LT16NR10W	16	—	—	1,1	.043	1,5	.059	—	10	—	●	●	●
LT16NR8W	16	—	—	1,2	.047	1,5	.059	—	8	—	●	●	●
LT22NR6W	22	—	—	1,6	.063	2,3	.090	—	6	—	●	●	●
left hand													
LT22NR7W	22	—	—	1,6	.063	2,3	.090	—	7	—	●	●	●
LT16NL11W	16	—	—	1,1	.043	1,5	.059	—	11	—	●	●	●

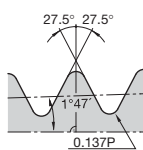
LT-ER/L-BSPT

catalog number	insert size	RC		EX		E		thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
		mm	in	mm	in	mm	in						
right hand													
LT16ER14BSPT	16	—	—	1,0	.039	1,2	.047	—	14	.7500	●	●	●
LT16ER11BSPT	16	—	—	1,1	.043	1,5	.059	—	11	.7500	●	●	●

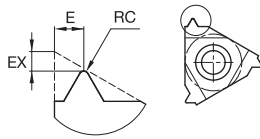
Thread Forms



Whitworth BSW, BSF, BSP-Internal



BSPT-External



● first choice
○ alternate choice

P	●	●	●
M	●	●	●
K	●	●	●
N	○	○	○
S	○	○	○
H	○	○	○

■ LT-NR/L-BSPT

catalog number right hand	insert size	RC		EX		E		thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
		mm	in	mm	in	mm	in						
LT11NR14BSPT	11	—	—	0,9	.035	1,0	.039	—	14	.7500			●
LT16NR14BSPT	16	—	—	1,0	.039	1,2	.047	—	14	.7500			●
LT16NR11BSPT	16	—	—	1,1	.043	1,5	.059	—	11	.7500			●

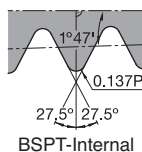
■ LT-ER/L-API

catalog number right hand	insert size	RC		EX		E		thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
		mm	in	mm	in	mm	in						
LT27ER5API403	28	0,51	.020	2,0	.080	2,8	.110	—	5	—			●
LT22ER5API403	22	—	—	1,8	.071	2,6	.102	—	5	3.0000	●		
LT27ER4API383	28	0,97	.038	2,0	.080	2,8	.110	—	4	—			●
LT27ER4API382	28	0,97	.038	2,0	.080	2,8	.110	—	4	—			●
LT22ER4API382	22	—	—	2,1	.083	2,8	.110	—	4	2.0000			●
LT27ER4API503	28	0,64	.025	2,0	.080	2,8	.110	—	4	—			●
LT27ER4API502	28	0,64	.025	2,0	.080	2,8	.110	—	4	—			●
LT22ER4API503	22	—	—	2,0	.079	2,9	.114	—	4	3.0000	●		
LT22ER4API502	22	—	—	2,0	.079	2,9	.114	—	4	2.0000	●		●

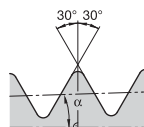
■ LT-NR/L-API

catalog number right hand	insert size	RC		EX		E		thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
		mm	in	mm	in	mm	in						
LT27NR5API403	28	0,52	.020	2,0	.080	2,8	.110	—	5	—			●
LT27NR4API383	28	0,99	.039	2,0	.080	2,8	.110	—	4	—			●
LT27NR4API382	28	0,99	.039	2,0	.080	2,8	.110	—	4	—			●
LT22NR5API403	22	—	—	1,8	.071	2,6	.102	—	5	3.0000			●
LT22NR4API382	22	—	—	2,1	.083	2,8	.110	—	4	2.0000			●
LT27NR4API503	28	0,65	.026	2,0	.080	2,8	.114	—	4	—			●
LT27NR4API502	28	0,65	.026	2,0	.080	3,8	.110	—	4	—			●
LT22NR4API502	22	—	—	2,1	.083	3,1	.122	—	4	2.0000			●

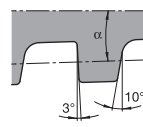
Thread Forms



BSPT-Internal



API Rotary Shoulder Connections-External



API Rotary Shoulder Connections-Internal

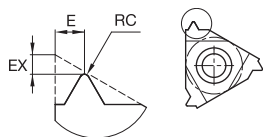
$a = 1/2 \arctan (TPF/12)$ $a = 1/2 \arctan (TPF/12)$



LT-ER/L-BUT

LT-NR/L-BUT

LT-ER/L-APIRD



● first choice
○ alternate choice

P	●	●	●
M	●	●	●
K	●	●	●
N	○	○	○
S	●	●	●
H	○	○	○

LT-ER/L-BUT

catalog number	insert size	RC		EX		E		thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
		mm	in	mm	in	mm	in						
right hand LT22ER5BUT75	22	—	—	3,10	.122	1,9	.075	—	5	.7500	●		

LT-NR/L-BUT

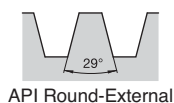
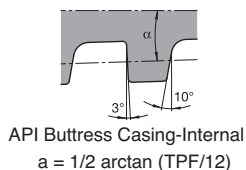
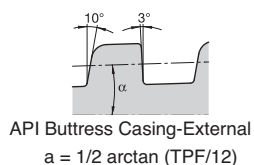
catalog number	insert size	RC		EX		E		thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
		mm	in	mm	in	mm	in						
right hand LT22NR5BUT1	22	—	—	2,8	.110	1,9	.075	—	5	1.0000	●		
LT22NR5BUT75	22	—	—	2,8	.110	1,9	.075	—	5	.7500	●		

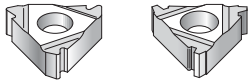
LT-ER/L-APIRD

catalog number	insert size	RC		EX		E		thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
		mm	in	mm	in	mm	in						
right hand LT16ER10APIRD	16	—	—	1,2	.047	1,4	.055	—	10	.7500	●		
left hand LT16ER8APIRD	16	—	—	1,3	.051	1,5	.059	—	8	.7500	●		
LT16EL8APIRD	16	—	—	1,3	.051	1,5	.059	—	8	.7500	●		

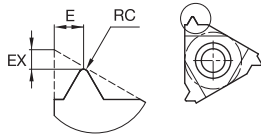


Thread Forms





LT-NR/L-APIRD LT-ER/L-ACME



P	●	●	●	●
M	●	●	●	●
K	●	●	●	●
N	○	○	○	○
S	●	●	●	●
H	○	○	○	○

● first choice
○ alternate choice

■ LT-NR/L-APIRD

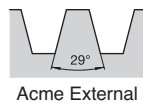
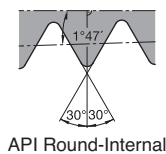
catalog number right hand	insert size	RC		EX		E		thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
		mm	in	mm	in	mm	in						
LT16NR10APIRD	16	—	—	1,2	.047	1,4	.055	—	10	.7500	●		
LT16NR8APIRD	16	—	—	1,3	.051	1,5	.059	—	8	.7500	●		

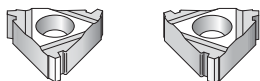
■ LT-ER/L-ACME

catalog number right hand	insert size	RC		EX		E		thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
		mm	in	mm	in	mm	in						
LT16ER16ACME	16	—	—	1,0	.039	1,1	.043	—	16	—		●	
LT16ER12ACME	16	—	—	1,1	.043	1,2	.047	—	12	—		●	
LT16ER10ACME	16	—	—	1,3	.051	1,4	.055	—	10	—		●	
LT16ER8ACME	16	—	—	1,4	.055	1,5	.059	—	8	—		●	
LT22ER6ACME	22	—	—	1,8	.071	2,1	.083	—	6	—		●	
LT22ER5ACME	22	—	—	2,0	.079	2,3	.090	—	5	—		●	
LT27ER4ACME	—	—	—	—	—	—	—	—	—	—		●	

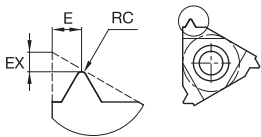
Threading

Thread Forms





LT-NR/L-ACME LT-ER/L-STACME



● first choice
○ alternate choice

P	●	●	●
M	●	●	●
K	●	●	●
N	○	○	○
S	●	●	●
H	○	○	○

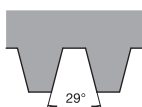
LT-NR/L-ACME

catalog number	insert size	RC		EX		E		thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
		mm	in	mm	in	mm	in						
right hand													
LT16NR12ACME	16	—	—	1,2	.047	1,3	.051	—	12	—	●	●	●
LT16NR10ACME	16	—	—	1,2	.047	1,3	.051	—	10	—	●	●	●
LT16NR8ACME	16	—	—	1,4	.055	1,5	.059	—	8	—	●	●	●
left hand													
LT16NL10ACME	16	—	—	1,2	.047	1,3	.051	—	10	—	●	●	●
LT16NL8ACME	16	—	—	1,4	.055	1,5	.059	—	8	—	●	●	●

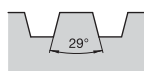
LT-ER/L-STACME

catalog number	insert size	RC		EX		E		thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
		mm	in	mm	in	mm	in						
right hand													
LT16ER16STACME	16	—	—	1,0	.039	1,0	.039	—	16	—	●	●	●
LT16ER12STACME	16	—	—	1,2	.047	1,2	.047	—	12	—	●	●	●
LT16ER10STACME	16	—	—	1,2	.047	1,3	.051	—	10	—	●	●	●
LT16ER8STACME	16	—	—	1,4	.055	1,5	.059	—	8	—	●	●	●
LT16ER6STACME	16	—	—	1,7	.067	1,8	.071	—	6	—	●	●	●
LT22ER5STACME	22	—	—	2,1	.083	2,3	.090	—	5	—	●	●	●
LT27ER4STACME	—	—	—	—	—	—	—	—	—	—	●	●	●
LT27EL4STACME	—	—	—	—	—	—	—	—	—	—	●	●	●

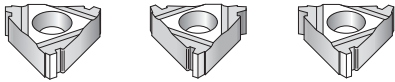
Thread Forms



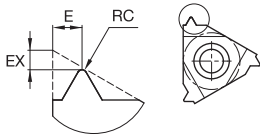
Acme Internal



Stub Acme-External



LT-NR/L-STACME LT-ER/L-TR LT-NR/L-TR



● first choice
○ alternate choice

P	●	●	●
M	●	●	●
K	●	●	●
N	○	○	○
S	○	○	○
H	○	○	○

■ LT-NR/L-STACME

catalog number	insert size	RC		EX		E		thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
		mm	in	mm	in	mm	in						
right hand													
LT16NR16STACME	16	—	—	1,0	.039	1,0	.039	—	16	—	●		
LT16NR14STACME	16	—	—	1,1	.043	1,1	.043	—	14	—	●		
LT16NR12STACME	16	—	—	1,1	.043	1,2	.047	—	12	—	●		
LT16NR10STACME	16	—	—	1,2	.047	1,3	.051	—	10	—	●		
LT16NR8STACME	16	—	—	1,4	.055	1,5	.059	—	8	—	●		
LT16NR6STACME	16	—	—	1,7	.067	1,8	.071	—	6	—	●		
LT22NR6STACME	22	—	—	1,8	.071	1,8	.071	—	6	—	●		
LT27NL4STACME	—	—	—	—	—	—	—	—	—	—	●		
LT27NR4STACME	—	—	—	—	—	—	—	—	—	—	●		

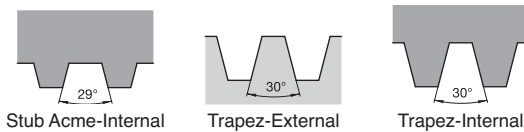
■ LT-ER/L-TR

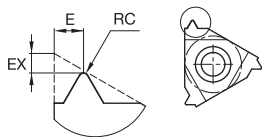
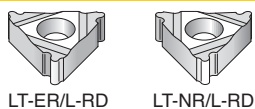
catalog number	insert size	RC		EX		E		thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
		mm	in	mm	in	mm	in						
right hand													
LT16ER2TR	16	—	—	1,1	.043	1,3	.051	2,0	—	—	●		
LT16ER3TR	16	—	—	1,3	.051	1,5	.059	3,0	—	—	●		
LT22ER4TR	22	—	—	1,7	.067	1,9	.075	4,0	—	—	●		
LT22ER5TR	22	—	—	2,1	.083	2,5	.098	5,0	—	—	●		

■ LT-NR/L-TR

catalog number	insert size	RC		EX		E		thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
		mm	in	mm	in	mm	in						
right hand													
LT16NR2TR	16	—	—	1,1	.043	1,3	.051	2,0	—	—	●		
LT16NR3TR	16	—	—	1,3	.051	1,5	.059	3,0	—	—	●		
LT22NR4TR	22	—	—	1,7	.067	1,9	.075	4,0	—	—	●		
LT22NR5TR	22	—	—	2,1	.083	2,5	.098	5,0	—	—	●		

Thread Forms





● first choice
○ alternate choice

P	●	●	●
M	●	●	●
K	●	●	●
N	○	○	○
S	●	●	●
H	○	○	○

LT-ER/L-RD

catalog number right hand	insert size	RC		EX		E		thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
		mm	in	mm	in	mm	in						
LT16ER8RD	16	0,76	.030	1,4	.055	1,3	.051	—	8	—	●	○	○
LT22ER6RD	22	1,01	.040	1,5	.059	1,7	.067	—	6	—	●	○	○

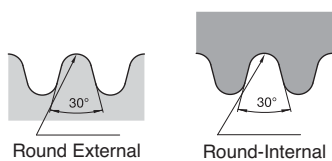
LT-NR/L-RD

catalog number right hand	insert size	RC		EX		E		thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
		mm	in	mm	in	mm	in						
LT16NR8RD	16	0,70	.028	1,4	.055	1,4	.055	—	8	—	●	○	○
LT22NR6RD	22	0,93	.037	1,5	.059	1,7	.067	—	6	—	●	○	○



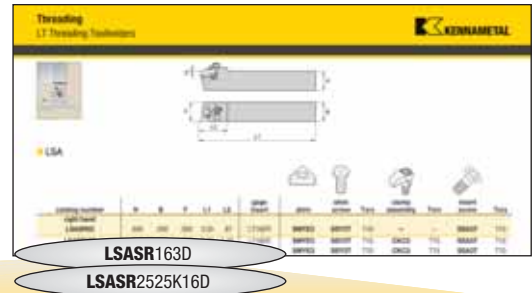
Threading

Thread Forms



How Do Catalog Numbers Work?

Each character in our catalog number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.



Threading

Inch	L	S	AS	R
Metric	L Insert Style	S Insert Holding Method	AS Tool Style	R Hand of Tool
	<p>L = Laydown triangle</p>	<p>S = Insert screw or clamp only</p>	<p>AS = Straight shank</p> <p>S = Offset shank</p>	<p>L = Left hand</p> <p>R = Right hand</p>

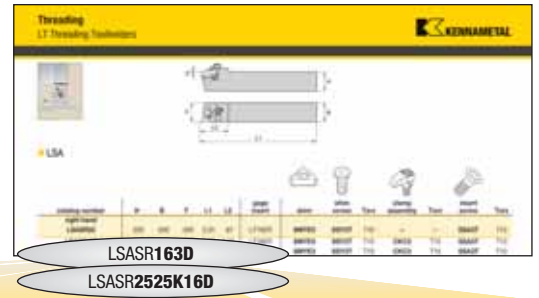
NOTE: Toolholders with primary shank sizes larger than 1/2" or 12mm are supplied with clamp and insert screw. Secure the insert with either the clamp or insert screw. **Do not use both.**

LT Threading Shim Catalog Numbering System

SM Shim	Y Shim for LT Standard Inserts	E Insert Threading E = External I = Internal	3 Insert Size D value in 1/8"	2P Shim Angle 2P = 2° positive 1P = 1° positive — = 0° neutral 1N = 1° negative 2N = 2° negative 3N = 3° negative
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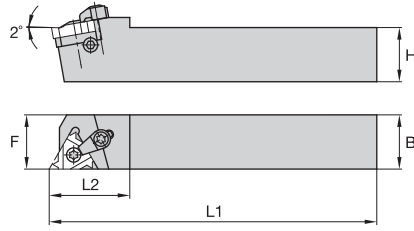
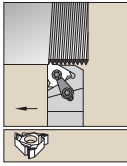
NOTE: For shims and shim kits, see pages E105–E107.

By referencing this easy-to-use guide, you can identify the correct product to meet your needs.



<p>Inch</p>	<p>16</p>	<p>3</p>	<p>D</p>																
<p>Metric</p>	<p>2525K</p>	<p>16</p>	<p>D</p>																
<p>Drop Head</p>	<p>Shank Size</p>	<p>Insert Size</p>	<p>Qualified Surface and Length</p>																
	<p>inch: This position will show a significant two-digit number that indicates the holder cross section. For shanks 5/8" square and over, the number will represent the number of sixteenths of width and height. For shanks under 5/8" square, the number of sixteenths of cross section will be preceded by a zero. For rectangular holders, the first digit represents the number of eighths of width, and the second digit the number of quarters of height, except for a toolholder 1-1/4" x 1-1/2", which is given the number 91.</p> <p>metric: Shank height and width in mm and holder length according to ISO standard.</p>	<p>Size equals number of 1/8" increments of IC.</p> <table border="1"> <thead> <tr> <th>insert size (inch)</th> <th>insert size (mm)</th> <th>D (inch)</th> <th>L1 (mm)</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>11</td> <td>1/4</td> <td>11,0</td> </tr> <tr> <td>3</td> <td>16</td> <td>3/8</td> <td>16,5</td> </tr> <tr> <td>4</td> <td>22</td> <td>1/2</td> <td>22,0</td> </tr> </tbody> </table>	insert size (inch)	insert size (mm)	D (inch)	L1 (mm)	2	11	1/4	11,0	3	16	3/8	16,5	4	22	1/2	22,0	<p>C = Qualified back and end, 5" long D = Qualified back and end, 6" long E = Qualified back and end, 7" long T = Qualified back and end, 3.250" long Q = Qualified metric holder</p>
insert size (inch)	insert size (mm)	D (inch)	L1 (mm)																
2	11	1/4	11,0																
3	16	3/8	16,5																
4	22	1/2	22,0																



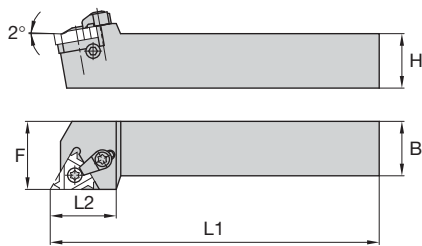
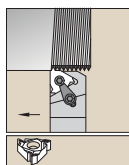


■ LSA



Threading

catalog number	H	B	F	L1	L2	gage insert	shim	shim screw	Torx	clamp assembly	Torx	insert screw	Torx
right hand LSASR83	.500	.500	.500	3.25	.87	LT16ER	SMYE3	SSY3T	T10	—	—	SSA3T	T10
LSASR103	.625	.625	.630	5.00	1.20	LT16ER	SMYE3	SSY3T	T10	CKC3	T15	SSA3T	T10
LSASR123	.750	.750	.750	5.00	1.20	LT16ER	SMYE3	SSY3T	T10	CKC3	T15	SSA3T	T10
LSASR163	1.000	1.000	1.000	6.00	1.20	LT16ER	SMYE3	SSY3T	T10	CKC3	T15	SSA3T	T10
LSASR203	1.250	1.250	1.250	7.00	1.18	LT16ER	SMYE3	SSY3T	T10	CKC3	T15	SSA3T	T10
LSASR164 left hand	1.000	1.000	1.000	6.00	1.42	LT22ER	SMYE4	SSY4T	T20	CKC4	T20	SSA4T	T20
LSASL83	.500	.500	.500	3.25	.87	LT16EL	SMYI3	SSY3T	T10	—	—	SSA3T	T10
LSASL103	.625	.625	.630	5.00	1.20	LT16EL	SMYI3	SSY3T	T10	CKC3	T15	SSA3T	T10
LSASL123	.750	.750	.750	5.00	1.20	LT16EL	SMYI3	SSY3T	T10	CKC3	T15	SSA3T	T10
LSASL163	1.000	1.000	1.000	6.00	1.20	LT16EL	SMYI3	SSY3T	T10	CKC3	T15	SSA3T	T10
LSASL164	1.000	1.000	1.000	6.00	1.42	LT22EL	SMYI4	SSY4T	T20	CKC4	T20	SSA4T	T20

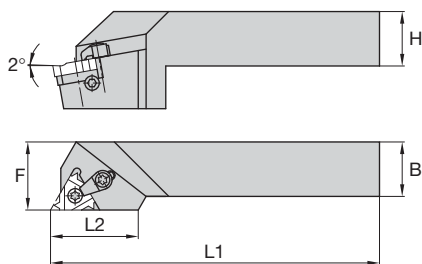
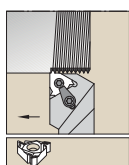


LSS



catalog number	H	B	F	L1	L2	gage insert	shim	shim screw	Torx	clamp assembly	Torx	insert screw	Torx
right hand													
LSSR123D	.750	.750	1.000	6.00	1.00	LT16ER	SMYE3	SSY3T	T10	CKC3	T15	SSA3T	T10
LSSR163D	1.000	1.000	1.250	6.00	1.00	LT16ER	SMYE3	SSY3T	T10	CKC3	T15	SSA3T	T10
LSSR203D	1.250	1.250	1.500	6.00	1.00	LT16ER	SMYE3	SSY3T	T10	CKC3	T15	SSA3T	T10
LSSR164D	1.000	1.000	1.250	6.00	1.20	LT22ER	SMYE4	SSY4T	T20	CKC4	T20	SSA4T	T20
LSSR204D	1.250	1.250	1.500	6.00	1.20	LT22ER	SMYE4	SSY4T	T20	CKC4	T20	SSA4T	T20
left hand													
LSSL123D	.750	.750	1.000	6.00	1.00	LT16EL	SMYI3	SSY3T	T10	CKC3	T15	SSA3T	T10
LSSL163D	1.000	1.000	1.250	6.00	1.00	LT16EL	SMYI3	SSY3T	T10	CKC3	T15	SSA3T	T10
LSSL164D	1.000	1.000	1.250	6.00	1.20	LT22EL	SMYI4	SSY4T	T20	CKC4	T20	SSA4T	T20

Threading



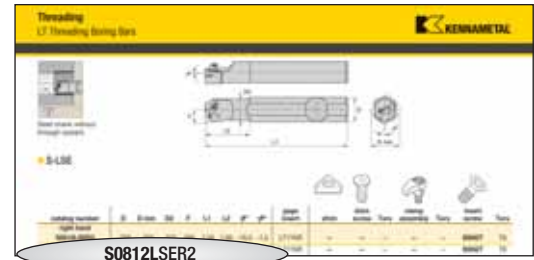
LSS-DH



catalog number	H	B	F	L1	L2	gage insert	shim	shim screw	Torx	clamp assembly	Torx	insert screw	Torx
right hand													
LSSRDH123C	.750	.750	1.000	5.00	1.50	LT16ER	SMYE3	SSY3T	T10	CKC3	T15	SSA3T	T10
LSSRDH164D	1.000	1.000	1.250	6.00	1.50	LT22ER	SMYE4	SSY4T	T20	CKC4	T20	SSA4T	T20

How Do Catalog Numbers Work?

Each character in our catalog number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.



S	08	12	L
Bar Type	Primary Necked Shank Bar Diameter	Secondary (Mounting) Bar Diameter	Insert Style
	<p>A two-digit number that indicates the primary bar diameter in 1/16" increments. Metric diameter in mm.</p>	<p>A two-digit number that indicates the secondary bar diameter in 1/16" increments. Metric diameter in mm.</p>	<p>L = Laydown triangle</p>
<p>A = Steel with coolant S = Steel without coolant E = Carbide with coolant H = Interchangeable head with coolant</p>			

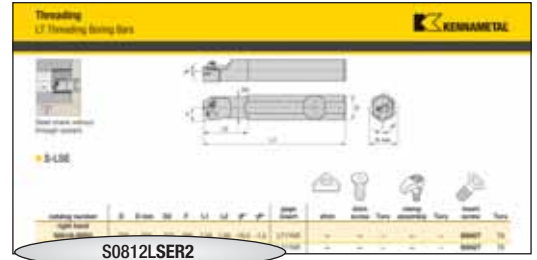
NOTE: Boring bars with primary bar diameters larger than 5/8" or 16mm are supplied with clamp and insert screw. Secure the insert with either the clamp or insert screw. **Do not use both.**

■ LT Threading Shim Catalog Numbering System

SM	Y	E	3	2P
Shim	Shim for LT Standard Inserts	Insert Threading	Insert Size	Shim Angle
		E = External I = Internal	D value in 1/8"	2P = 2° positive 1P = 1° positive — = 0° neutral 1N = 1° negative 2N = 2° negative 3N = 3° negative

NOTE: For shims and shim kits, see pages E105–E107.

By referencing this easy-to-use guide, you can identify the correct product to meet your needs.

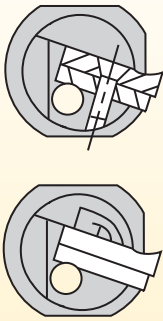


S0812LSER2

S

Insert Holding Method

S = Insert screw or clamp



E

Bar Style

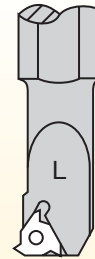


E = End cutting edge mount

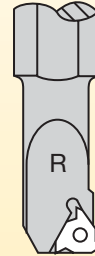
R

Hand of Bar

L = Left hand



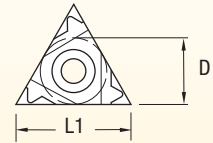
R = Right hand



2

Insert Size

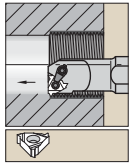
Size equals number of 1/8" increments of IC.



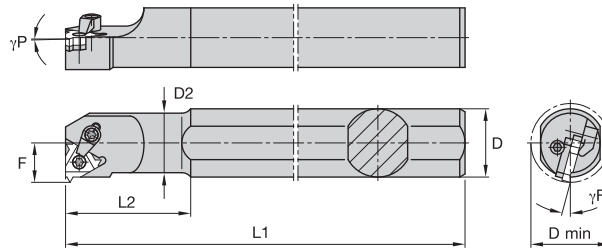
insert size (inch)	insert size (mm)	D (inch)	L1 (mm)
2	11	1/4	11,0
3	16	3/8	16,5
4	22	1/2	22,0

Threading

NOTE: Boring bars with primary bar diameters larger than 5/8" or 16mm are supplied with clamp and insert screw. Secure the insert with either the clamp or insert screw. **Do not use both.**



Steel shank without through coolant.



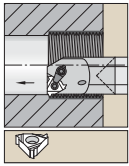
■ S-LSE

Threading

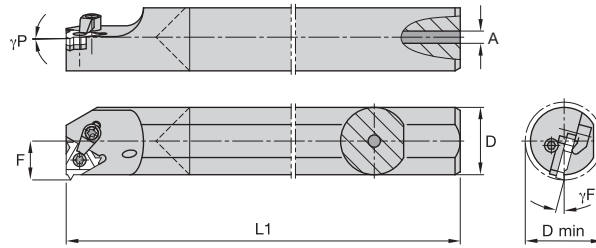


catalog number	D	D min	D2	F	L1	L2	γF°	γP°	gage insert	shim	shim screw	Torx	clamp assembly	Torx	insert screw	Torx
right hand																
S0612LSER2	.750	.500	.375	.280	7.00	1.00	-15.0	-1.5	LT11NR	—	—	—	—	—	SSN2T	T8
S0812LSER2	.750	.650	.500	.350	7.00	1.25	-15.0	-1.5	LT11NR	—	—	—	—	—	SSN2T	T8
S1012LSER3	.750	.800	.625	.460	7.00	1.50	-15.0	-1.5	LT16NR	—	—	—	—	—	SN3TPKG	T10
S1212LSER3	.750	.900	—	.510	7.00	—	-15.0	-1.5	LT16NR	SMYI3	SSY3T	T10	CKC3	T15	SSA3T	T10
S1620LSER3	1.250	1.200	1.000	.650	10.00	2.50	-15.0	-1.5	LT16NR	SMYI3	SSY3T	T10	CKC3	T15	SSA3T	T10
S2020LSER3	1.250	1.450	—	.770	10.00	—	-15.0	-1.5	LT16NR	SMYI3	SSY3T	T10	CKC3	T15	SSA3T	T10
S1620LSER4	1.250	1.250	1.000	.710	10.00	2.50	-15.0	-1.5	LT22NR	SMYI4	SSY4T	T20	CKC4	T20	SSA4T	T20
S2020LSER4	1.250	1.500	—	.850	10.00	—	-15.0	-1.5	LT22NR	SMYI4	SSY4T	T20	CKC4	T20	SSA4T	T20
left hand																
S0612LSEL2	.750	.500	.375	.280	7.00	1.00	-15.0	-1.5	LT11NL	—	—	—	—	—	SSN2T	T8
S0812LSEL2	.750	.650	.500	.350	7.00	1.25	-15.0	-1.5	LT11NL	—	—	—	—	—	SSN2T	T8
S1012LSEL3	.750	.800	.625	.460	7.00	1.50	-15.0	-1.5	LT16NL	—	—	—	—	—	SN3TPKG	T10
S1212LSEL3	.750	.900	—	.510	7.00	—	-15.0	-1.5	LT16NL	SMYE3	SSY3T	T10	CKC3	T15	SSA3T	T10
S1620LSEL3	1.250	1.200	1.000	.650	10.00	2.50	-15.0	-1.5	LT16NL	SMYE3	SSY3T	T10	CKC3	T15	SSA3T	T10
S1620LSEL4	1.250	1.250	1.000	.710	10.00	2.50	-15.0	-1.5	LT22NL	SMYE4	SSY4T	T20	CKC4	T20	SSA4T	T20

NOTE: Items listed without a shim are designed for a 1.5° inclination angle.



Carbide shank with through coolant.



E-LSE



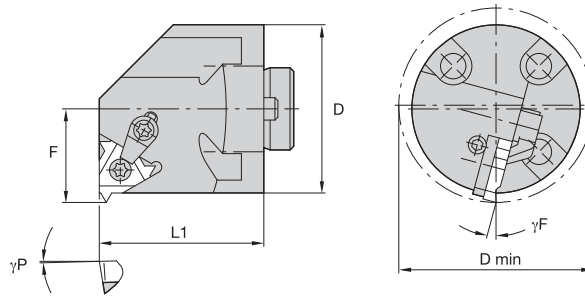
catalog number	D	D min	F	L1	A	γF°	γP°	gage insert	shim	shim screw	Torx	clamp assembly	Torx	insert screw	Torx
right hand															
E06LSER2	.375	.500	.280	6.00	.13	-15.0	-1.5	LT11NR	—	—	—	—	—	SSN2T	T8
E08LSER2	.500	.650	.350	8.00	.19	-15.0	-1.5	LT11NR	—	—	—	—	—	SSN2T	T8
E10LSER3	.625	.800	.460	10.00	.22	-15.0	-1.5	LT16NR	—	—	—	—	—	SN3TPKG	T10
E12LSER3	.750	.900	.510	10.00	.28	-15.0	-1.5	LT16NR	SMYI3	SSY3T	T10	CKC3	T15	SSA3T	T10
E16LSER3	1.000	1.200	.650	12.00	.31	-15.0	-1.5	LT16NR	SMYI3	SSY3T	T10	CKC3	T15	SSA3T	T10
E16LSER4	1.000	1.250	.710	12.00	.31	-15.0	-1.5	LT22NR	SMYI4	SSY4T	T20	CKC4	T20	SSA4T	T20
left hand															
E06LSEL2	.375	.500	.280	6.00	.13	-15.0	-1.5	LT11NL	—	—	—	—	—	SSN2T	T8
E08LSEL2	.500	.650	.350	8.00	.19	-15.0	-1.5	LT11NL	—	—	—	—	—	SSN2T	T8
E10LSEL3	.625	.800	.460	10.00	.22	-15.0	-1.5	LT16NL	—	—	—	—	—	SN3TPKG	T10
E12LSEL3	.750	.900	.510	10.00	.28	-15.0	-1.5	LT16NL	SMYE3	SSY3T	T10	CKC3	T15	SSA3T	T10
E16LSEL3	1.000	1.200	.650	12.00	.31	-15.0	-1.5	LT16NL	SMYE3	SSY3T	T10	CKC3	T15	SSA3T	T10
E16LSEL4	1.000	1.250	.710	12.00	.31	-15.0	-1.5	LT22NL	SMYE4	SSY4T	T20	CKC4	T20	SSA4T	T20

NOTE: Items listed without a shim are designed for a 1.5° inclination angle.

Threading



With through coolant.



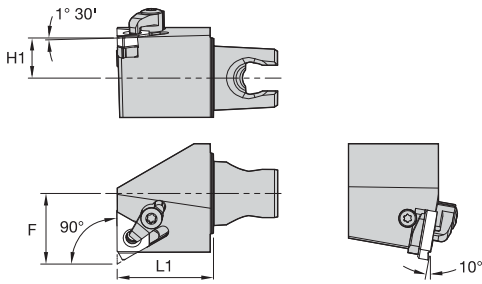
■ H-LSE



Threading

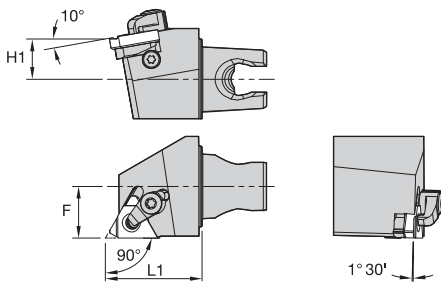
catalog number	D	D min	L1	F	γF°	γP°	gage insert	shim	shim screw	Torx	clamp assembly	Torx	insert screw	Torx
right hand														
H16LSER3	1.000	1.200	1.63	.645	-15.0	-1.5	LT16NR	SMYI3	SSY3T	T10	CKC3	T15	SSA3T	T10
H20LSER3	1.250	1.450	1.63	.760	-15.0	-1.5	LT16NR	SMYI3	SSY3T	T10	CKC3	T15	SSA3T	T10
H24LSER3	1.500	1.760	1.63	.885	-15.0	-1.5	LT16NR	SMYI3	SSY3T	T10	CKC3	T15	SSA3T	T10
H32LSER3	2.000	2.400	1.63	1.276	-15.0	-1.5	LT16NR	SMYI3	SSY3T	T10	CKC3	T15	SSA3T	T10
H24LSER4	1.500	1.782	1.63	.973	-15.0	-1.5	LT22NR	SMYI4	SSY4T	T20	CKC4	T20	SSA4T	T20
H32LSER4	2.000	2.400	1.63	1.276	-15.0	-1.5	LT22NR	SMYI4	SSY4T	T20	CKC4	T20	SSA4T	T20
H32LSER5	2.000	2.400	1.63	1.281	-15.0	-1.5	LT27NR	SMYI5	SSY5T	T25	CKC5	—	SSA5T	—
H40LSER5	2.500	3.030	1.63	1.531	-15.0	-1.5	LT27NR	SMYI5	SSY5T	T25	CKC5	—	SSA5T	—
left hand														
H16LSEL3	1.000	1.200	1.63	.645	-15.0	-1.5	LT16NL	SMYE3	SSY3T	T10	CKC3	T15	SSA3T	T10
H20LSEL3	1.250	1.450	1.63	.760	-15.0	-1.5	LT16NL	SMYE3	SSY3T	T10	CKC3	T15	SSA3T	T10
H24LSEL3	1.500	1.760	1.63	.885	-15.0	-1.5	LT16NL	SMYE3	SSY3T	T10	CKC3	T15	SSA3T	T10
H24LSEL4	1.500	1.782	1.63	.973	-15.0	-1.5	LT22NL	SMYE4	SSY4T	T20	CKC4	T20	SSA4T	T20
H32LSEL4	2.000	2.400	1.63	1.276	-15.0	-1.5	LT22NL	SMYE4	SSY4T	T20	CKC4	T20	SSA4T	T20
H32LSEL5	2.000	2.400	1.63	1.281	-15.0	-1.5	LT27NL	SMYE5	SSY5T	T25	CKC5	—	SSA5T	—
H40LSEL5	2.500	3.030	1.63	1.531	-15.0	-1.5	LT27NL	SMYE5	SSY5T	T25	CKC5	—	SSA5T	—

NOTE: For boring adapters, see pages C119–C121.



■ LSE • End Mount

order number	catalog number	L1		F		H1		gage insert	insert screw	shim	shim screw	clamp assembly
		mm	in	mm	in	mm	in					
right hand												
3482966	KM20LSER1625	25	.984	17	.669	9,5	.375	LT16EL	SSA3T	SMYI3	SSY3T	CKC3
2399506	KM25LSER1630	30	1.181	22	.866	12,5	.492	LT16EL	SSA3T	SMYI3	SSY3T	CKC3
left hand												
3482965	KM20LSEL1625	25	.984	17	.669	9,5	.375	LT16ER	SSA3T	SMYE3	SSY3T	CKC3
2399507	KM25LSEL1630	30	1.181	22	.866	12,5	.492	LT16ER	SSA3T	SMYE3	SSY3T	CKC3

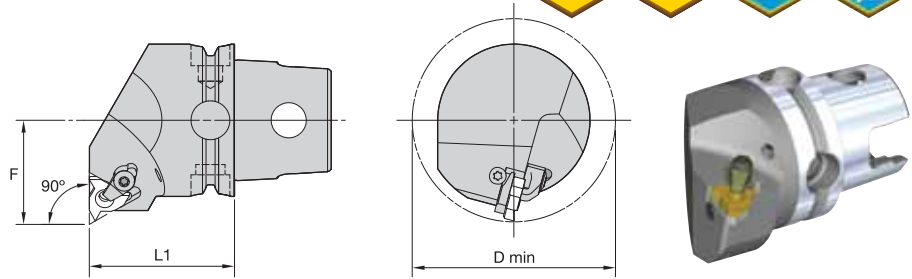


■ LSS • Side Mount

order number	catalog number	L1		F		H1		gage insert	insert screw	shim	shim screw	clamp assembly
		mm	in	mm	in	mm	in					
right hand												
3482968	KM20LSSR1625	25	.984	12,50	.492	9,5	.375	LT16ER	SSA3T	SMYE3	SSY3T	CKC3
2399504	KM25LSSR1630	30	1.181	16,00	.630	12,5	.492	LT16ER	SSA3T	SMYE3	SSY3T	CKC3
3176219	KM25LSSR2230	30	1.181	16,00	.630	12,5	.492	LT22ER	SSA4T	SMYE4	SSY4T	CKC4
left hand												
3482967	KM20LSSL1625	25	.984	12,50	.492	9,5	.375	LT16EL	SSA3T	SMYI3	SSY3T	CKC3
2399505	KM25LSSL1630	30	1.181	16,00	.630	12,5	.492	LT16EL	SSA3T	SMYI3	SSY3T	CKC3
3176220	KM25LSSL2230	30	1.181	16,00	.630	12,5	.492	LT22EL	SSA4T	SMYI4	SSY4T	CKC4



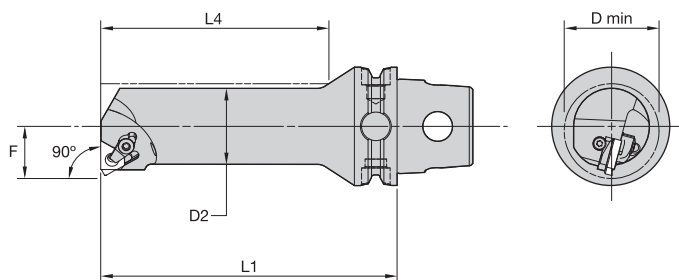
■ LSE-N 90° • Internal Only



Threading

order number	catalog number	L1		F		D min		gage insert	insert screw	shim	shim screw	clamp assembly	kg	lbs
		mm	in	mm	in	mm	in							
right hand														
3950832	KM40TSLSER16N	40	1.575	27	1.063	54	2.126	LT16NR	SSA3T	SMYI3	SSY3T	CKC3	0,35	.77
3950854	KM40TSLSER22N	40	1.575	27	1.063	54	2.126	LT22NR	SSA4T	SMYI4	SSY4T	CKC4	0,35	.77
3959399	KM40TSLSER27N	45	1.772	27	1.063	54	2.126	LT27NR	SSA5T	SMYI5	SSY5T	CKC5	0,39	.86
left hand														
3950831	KM40TSLSEL16N	40	1.575	27	1.063	54	2.126	LT16NL	SSA3T	SMYE3	SSY3T	CKC3	0,35	.77
3950853	KM40TSLSEL22N	40	1.575	27	1.063	54	2.126	LT22NL	SSA4T	SMYE4	SSY4T	CKC4	0,35	.77
3959398	KM40TSLSEL27N	45	1.772	27	1.063	54	2.126	LT27NL	SSA5T	SMYE5	SSY5T	CKC5	0,39	.86

NOTE: Cutting units are supplied with insert screw and clamp assembly. However, tools are designed to use either the insert screw or the clamp assembly, not both.



■ LSE 90°

order number	catalog number	D2		D min		F		L4		L1		gage insert	kg	lbs
		mm	in	mm	in	mm	in	mm	in	mm	in			
right hand														
3955464	KM40TSS10DLSER11	10	.39	13	.51	7	.276	35	1.38	60	2.362	LT11NR	0,22	.49
3955466	KM40TSS12ELSER11	12	.47	16	.63	9	.354	42	1.66	70	2.756	LT11NR	0,25	.56
3955468	KM40TSS16FLSER16	16	.63	20	.79	11	.433	56	2.21	80	3.150	LT16NR	0,28	.61
3955470	KM40TSS20GLSER16	20	.79	25	.98	13	.512	70	2.76	90	3.543	LT16NR	0,34	.75
3955472	KM40TSS25HLSER16	25	.98	32	1.26	17	.669	75	2.95	100	3.937	LT16NR	0,50	1.11
3955474	KM40TSS32JLSER16	32	1.26	40	1.57	22	.866	96	3.78	110	4.331	LT16NR	0,72	1.58
3955476	KM40TSS32JLSER22	32	1.26	40	1.57	22	.866	96	3.78	110	4.331	LT22NR	0,71	1.56
left hand														
3955463	KM40TSS10DLSEL11	10	.39	13	.51	7	.276	35	1.38	60	2.362	LT11NL	0,22	.49
3955465	KM40TSS12ELSEL11	12	.47	16	.63	9	.354	42	1.65	70	2.756	LT11NL	0,25	.55
3955467	KM40TSS16FLSEL16	16	.63	20	.79	11	.433	56	2.21	80	3.150	LT16NL	0,28	.61
3955469	KM40TSS20GLSEL16	20	.79	25	.98	13	.512	70	2.76	90	3.543	LT16NL	0,34	.75
3955471	KM40TSS25HLSSEL16	25	.98	32	1.26	17	.669	75	2.95	100	3.937	LT16NL	0,50	1.11
3955473	KM40TSS32JLSEL16	32	1.26	40	1.57	22	.866	96	3.78	110	4.331	LT16NL	0,72	1.58
3955475	KM40TSS32JLSEL22	32	1.26	40	1.57	22	.866	96	3.78	110	4.331	LT22NL	0,71	1.56

Threading

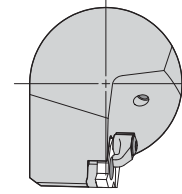
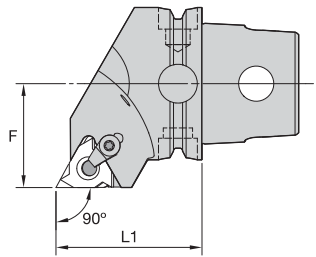
■ Spare Parts

catalog number	insert screw	shim	shim screw	clamp assembly
right hand				
KM40TSS10DLSER11	SSN2T	—	—	—
KM40TSS12ELSER11	SSN2T	—	—	—
KM40TSS16FLSER16	SN3TPKG	—	—	—
KM40TSS20GLSER16	SSA3T	SMYI3	SSY3T	CKC3
KM40TSS25HLSER16	SSA3T	SMYI3	SSY3T	CKC3
KM40TSS32JLSER16	SSA3T	SMYI3	SSY3T	CKC3
KM40TSS32JLSER22	SSA4T	SMYI4	SSY4T	CKC4
left hand				
KM40TSS10DLSEL11	SSN2T	—	—	—
KM40TSS12ELSEL11	SSN2T	—	—	—
KM40TSS16FLSEL16	SN3TPKG	—	—	—
KM40TSS20GLSEL16	SSA3T	SMYE3	SSY3T	CKC3
KM40TSS25HLSSEL16	SSA3T	SMYE3	SSY3T	CKC3
KM40TSS32JLSEL16	SSA3T	SMYE3	SSY3T	CKC3
KM40TSS32JLSEL22	SSA4T	SMYE4	SSY4T	CKC4

NOTE: Items listed without a shim are designed for a 1.5° inclination angle.
Cutting units are supplied with insert screw and clamp assembly. However, tools are designed to use either the insert screw or the clamp assembly, not both.




■ LSS 90°



Threading

order number	catalog number	L1		F		gage insert	insert screw	shim	shim screw	clamp assembly	kg	lbs
		mm	in	mm	in							
right hand												
3950857	KM40TSLSSR16	40	1.575	27	1.063	LT16ER	SSA3T	SMYE3	SSY3T	CKC3	0,31	.68
3950858	KM40TSLSSR22	40	1.575	27	1.063	LT22ER	SSA4T	SMYE4	SSY4T	CKC4	0,30	.66
3959401	KM40TSLSSR27	45	1.772	27	1.063	LT27ER	SSA5T	SMYE5	SSY5T	CKC5	0,37	.82
left hand												
3950855	KM40TSLSSL16	40	1.575	27	1.063	LT16EL	SSA3T	SMYI3	SSY3T	CKC3	0,32	.70
3950856	KM40TSLSSL22	40	1.575	27	1.063	LT22EL	SSA4T	SMYI4	SSY4T	CKC4	0,31	.68
3959400	KM40TSLSSL27	45	1.772	27	1.063	LT27EL	SSA5T	SMYI5	SSY5T	CKC5	0,37	.82

NOTE: Cutting units are supplied with insert screw and clamp assembly. However, tools are designed to use either the insert screw or the clamp assembly, not both.

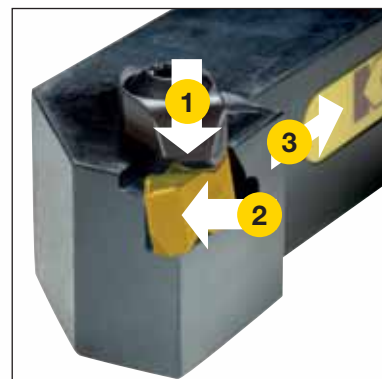


Top Notch™ Thread Tooling

Is the proven high productivity threading solution.

Top Notch Threading with Beyond™ Insert technology provides consistent tool performance and superior clamping thread to almost any operation. With the largest selection of grades and geometries in the industry, the Top Notch Threading system is a proven solution.

- Superior choice for heavy-duty applications.
- Rigid insert clamping design ensures best tool life, surface finish, and workpiece quality.
- Excellent choice for special thread forms and toolholder designs.
- Minimizes built-up edge.
- Precisely cuts most common materials.
- Ensures accurate high-quality threads.
- Eliminates long, troublesome coils.
- Excellent for internal threading operations.
- Available in partial profile inserts for 60° thread forms.



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 **KENNAMETAL®**

■ Suggested Grade and Speeds for Threading Various Workpiece Materials








workpiece group	workpiece material	recommendations surface speed – SFM				
		uncoated	PVD coated			
		K68	KC5010	KC5025	KC5410	KU25T
free-machining carbon steel	10L18, 10L45, 1213, 12L13, 12L14, 1140, 1141, 11L44, 1151, 10L50	—	300–650	150–650	—	300–450
plain carbon steel	10063, 1008, 1010, 1015, 1018, 1020, 1025, 1026, 1108, 1117	—	250–650	150–575	—	250–400
alloy steels/tool steels 150–325 HB (up to 35 HRC)	1042, 1045, 1070, 1080, 1085, 1090, 1095, 1541, 1561, 1572, 5140, 8620, W1, O1, S1, P20, H13, D2, A6, H13, L6	—	250–650	125–550	—	250–400
alloy steels/tool steels 330–450 HB (36–47 HRC)		—	200–525	—	—	200–350
martensitic/ferritic stainless/precipitation hardening	416, 420F, 440F, 405, 409, 429, 430, 434, 436, 442, PH	—	150–525	100–400	—	80–200
austenitic stainless steel	201, 202, 301, 302, 303, 304, 304, 305, 321, 347, 348, 310, 314, 316, 316L, 330	200–350	200–350	150–450	—	80–350
gray cast iron 135–270 HB	class 20, 30, 35, 45	200–300	200–780	150–400	—	100–355
gray cast iron 275–450 HB	class 50, 55, 60	150–250	150–575	50–250	—	100–355
alloy/ductile iron	A536, J434C, 60-40-18, 80-55-06, 100-70-03	150–250	150–650	100–525	—	100–355
free-machining aluminum alloys	2024-T4, 2014-T6, 6061-T6, 2011-T3, 3003-H18, A2, Alcan, Alcoa 510, Duralumin	400–800	400–1200	—	500–1500	100–1000
high-silicon aluminum alloys	A380, A390, A380-1, A390-1, A380-2	—	—	—	—	—
copper/zinc/brass		250–600	250–1000	150–775	—	100–800
non-metallics	Graphite, Nylon, Plastics, Rubbers, Phenolics, Carbon	400–1500	400–1300	150–1000	—	100–1000
high-temperature alloys 125–269 HB (up to 27 HRC)	Nickel 200, Monel, R405, Monel K500, INCONEL 600, INCONEL 625/901x750/718, Waspaloy, Hastelloy C	80–120	80–400	40–250	—	45–270
high-temperature alloys 260–450 HB (26–47 HRC)	Rene 95, Waspaloy A286, Incoloy 800, Haynes 188, Stellite F, Haynes 25	80–100	100–250	20–200	—	45–200
titanium alloys	Ti-6Al-4V, Ti-5Al-2.5Sn	110–180	110–325	—	—	45–250

Threading

NOTE: When workpiece hardness levels are at the top of a range, starting SFM should be at the lower end. Regularly inspect insert clamps for worn flats.

Edge preparation:
Uncoated – sharp
PVD coated – light hone except positive top rake, top rake-sharp

■ Tool Detective

problem	cause	possible solution
<p>thread with torn finish</p> 	<ul style="list-style-type: none"> • Burrs. • Torn finish. • Steps. 	<ul style="list-style-type: none"> • Use positive rake or full profile insert. • Increase coolant concentration. • Alter infeed. • Increases SFM. • Check machine "Z" travel axis. • Check insert form. • Check for correct shim in LT system.
<p>chatter</p> 	<ul style="list-style-type: none"> • Poor rigidity. • Incorrect speed. • Insert movement. • Improper infeed. • Off centerline. • Wrong edge prep. 	<ul style="list-style-type: none"> • Minimize tool overhang. • Check for workpiece deflection. • Adjust SFM. • Check insert and clamp. • Use modified feed angle. • Verify that tool cutting position is at workpiece centerline. • Adjust hone level by ordering special insert.
<p>built-up edge</p> 	<ul style="list-style-type: none"> • Speed too low. • Insufficient coolant. • Chip load. • Wrong edge prep. 	<ul style="list-style-type: none"> • Increase SFM. • Increase coolant concentration and/or flow. • Adjust infeed angle. • Increase depth of cut per pass. • Adjust hone level by ordering special insert.
<p>deformation</p> 	<ul style="list-style-type: none"> • Wrong grade. • Speed too high. • Improper infeed angle. • Insufficient coolant. 	<ul style="list-style-type: none"> • Use a more wear-resistant grade (e.g., KC5010™). • Reduce SFM. • Alter infeed method/angle. • Increase coolant flow.
<p>chipping</p> 	<ul style="list-style-type: none"> • Improper infeed. • Chip load. • Wrong grade. • Incorrect speed. • Poor rigidity. • Wrong edge prep. 	<ul style="list-style-type: none"> • Alter infeed to modified flank. • Adjust chip load. • Increase or decrease number of passes. • Eliminate spring passes. • Use tougher grade (e.g., KC5025™). • Increase SFM if chipping on trailing edge. • Decrease SFM if chipping on leading edge. • Minimize tool overhang. • Check for insert movement/check clamp. • Check for possible part deflection. • Adjust hone size by ordering special insert.
<p>broken nose</p> 	<ul style="list-style-type: none"> • Heavy chip load. • Small nose radius. • Wrong grade. • Improper infeed. • Wrong edge prep. 	<ul style="list-style-type: none"> • Decrease chip load. • Use large nose radius if allowable. • Use tougher grade (e.g., KC5025). • Alter infeed to modified flank. • Adjust hone size by ordering special insert.
<p>flank wear</p> 	<ul style="list-style-type: none"> • Wrong grade. • Insufficient coolant. • Off centerline. 	<ul style="list-style-type: none"> • Use a more wear-resistant grade (e.g., KC5025). • Increase coolant flow. • Check the centerline height of the tool. (The smaller the diameter, the more critical the need for centerline accuracy.)

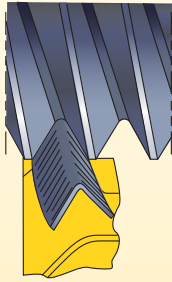
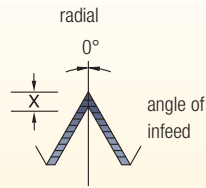
Threading

■ Troubleshooting Matrix

Threading

problem	possible solutions																
	increase SFM	reduce SFM	increase chip load	decrease chip load where failure occurs	use tougher carbide grade	use harder carbide grade	apply coolant	use coated carbide	use topping insert	change infeed angle	check for insert movement and reset	reduce tool overhang	reselect shim	apply chipbreaker style	reduce DOC	adjust center height	begin cutting threads 12mm before workpiece
chatter	●			●							●	●				●	
burr on crest	●								●								
short tool life		●	●	●		●		●									
chipped leading edge			●	●	●												
chipped trailing edge					●					●							
broken nose (first pass)	●														●	●	
broken nose (after first pass)				●	●					●			●				
built-up on cutting edge	●		●					●	●								
premature topping													●				
splitting threads																	●
poor chip evacuation													●				

Radial



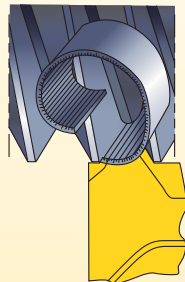
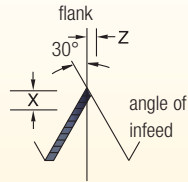
Advantage —

- Cutting on both sides of the thread form places all of the cutting edge in the cut and protects edge from chipping.
- Even wear on the insert.

Disadvantage —

- Tool develops a channel chip that may be difficult to handle.
- Tip chipping occurs when cutting high-tensile materials.
- Burr condition is increased.
- Entire cutting edge is engaged at finish of thread, causing increased tendency to chatter.

Flank



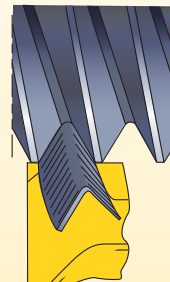
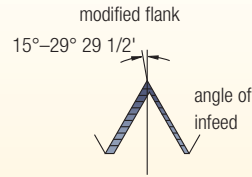
Advantage —

- Cutting with the leading edge of the threading tool gives the chip a definite flow out of the thread form area. This reduces the burr problem on the trailing edge of the tool. To avoid bad surface finish, chipping, or excessive flank wear due to rubbing of the trailing edge, the infeed angle should be 3° to 5° smaller than the angle of the thread. This is a type of modified flank.

Disadvantage —

- Trailing edge of threading insert may drag or rub and tends to chip.
- Torn or poor surface finish threads result when cutting soft, gummy materials like low-carbon steels, aluminum, and stainless steels.

Modified flank



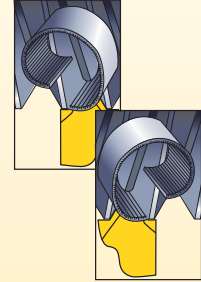
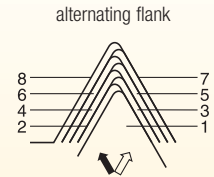
Advantage —

- Tool cuts both sides of thread form, so it is protected from chipping similar to 0° infeed. Channel-type chip develops, but uneven chip thickness helps remove the chip similar to flank infeed.
- This is the preferred method, especially when used with a chip control insert.
- Combined radial and/or alternating flank infeed.
- Results in good tool life, with wear evenly distributed over both flanks.

Disadvantage —

- Similar disadvantages as with 0° infeed, although reduced somewhat in magnitude as cutting forces are better equalized and chip flow is much less of a problem.

Alternating flank



Advantage —

- Increased tool life because both edges are used equally.
- NOTE: Some machine tools may require special programming techniques to achieve this method of infeed.

Disadvantage —

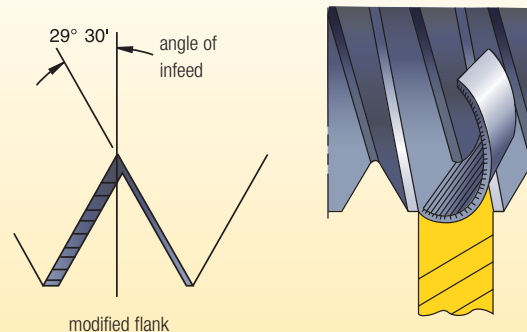
- Difficult to cut on conventional machinery.

Machining Guidelines When Using Chop Control Inserts

Kennametal insert technology brings chip control to your threading operations with the Top Notch™ platform. The proprietary Kennametal recessed chip groove, when used according to our recommendations, breaks the chip in most applications. Our positive rake design lowers cutting pressures, which in turn lowers damaging heat generation thus providing better tool life. Long, stringy chips no longer mar the workpiece surface finish. The danger to operators when removing long chips from the workpiece and chuck is eliminated. All of these benefits combine to improve the productivity of your threading operations.

Machine Programming

Modern CNC controls allow the programmer to easily adjust infeed angle, the number of passes, and depth of cut for each pass. The chip control threading insert performs best at an infeed angle of 29° 30', although 15° to 30° is acceptable. Also, it is important to maintain a minimum of .005" (0,127mm) depth of cut on every pass. In most applications, use of CNC canned cycles produce only marginally successful results. Custom written programs are better and are recommended.



The Last Pass

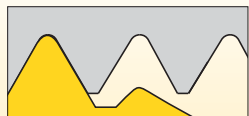
Some CNC controls require the last pass to be at a 0° infeed angle because the chip will not break on the last pass. On most carbon and alloy steels, the last pass can remain at .005" (0,127mm) depth of cut and produce an acceptable finish. For some materials, a .001" (0,025mm) to .003" (0,076mm) (spring) pass may be used to improve surface finish, however, chip breaking action may be compromised.

Infeed Angle

In order to effectively and consistently break the chip, it is important to use an infeed angle between 28° and 29° 30'. Do not apply chip control inserts at infeed angles less than 15°.

Threading

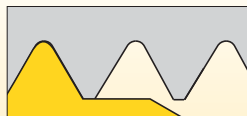
Partial Profile



Tooth profile with universal profile shape:

- 55° or 60° without cutting edges for the tooth tapers.
- Reduced inventory.
- For various pitches in a limited range.
- Preferably one time production.
- Outside/core diameters must be accurately pre-turned.

Full Profile



Tooth profile with full profile shape including tooth height:

- For burr-free, precise threads in the specified pitch.
- General application.
- Machining allowance for outside/core diameter around 0.004–0.006".

Multitooth Profile



Multitooth full profile generally with 2–3 teeth:

- Highly productive threading with fewer passes and longer tool life.
- Requires a rigid setup and long thread runoff.
- Minimum clearance width approximately 1.25 x E as per indexable insert dimensions table.

Formulas

inch formula		
to find	given	formula
SFM	D (inch) RPM	$SFM = \frac{\pi \times D}{12"} \times RPM$
RPM	D (inch) SFM	$RPM = \frac{SFM \times 12"}{D \times \pi}$
metric formula		
to find	given	formula
m/min	D (mm) RPM	$m/min = \frac{\pi \times D}{1000} \times RPM$
RPM	D (mm) m/min	$RPM = \frac{m/min \times 1000}{D \times \pi}$

Legend

IPM = inch per minute RPM = revolutions per minute
SFM = surface feet per minute D = part diameter
m/min = meters per minute π = 3.1416

Maximum Cutting Speeds

Maximum cutting speed is often limited by the maximum travel speed (IPM or mm/min) of the tool allowed by the machine. Check your maximum speed with the following formulas:

inch formula: maximum cutting speed (SFM) =

$$\text{part diameter (inch)} \times 3.14 \times TPI \times \frac{\text{max IPM}}{12"}$$

metric formula: maximum cutting speed (m/min) =

$$\text{part diameter (mm)} \times 3.14 \times (1/\text{pitch}) \times \frac{\text{max mm/min}}{1000\text{mm}}$$

■ Recommendation for Threading Infeed Passes

TPI	48-32	28-24	20-16	14-12	11.5-9	8-6	5-4	3-2
metric pitch (mm)	0,50-0,75	0,80-1,0	1,25-1,5	1,75-2,0	2,5-3,0	3,5-4,0	4,5-6,0	8,0

thread type	recommended number of passes							
Common V-thread forms ISO, UN, UNJ, NPT, Whitworth, BSPT, API Rotary Shoulder	4-5	5-6	6-8	8-10	9-12	12-15	14-16	15-25
Acme, Trapez, Round, API Round	—	—	5-6	7-8	10-11	12-13	13-15	18-20
Stub Acme, API Buttress	—	—	5	5-6	7-8	8-10	10-12	14-16
American Buttress	—	—	7-8	9-10	11-12	13-15	17-19	22-24

NOTE: Maintain minimum .002" (0,05mm) infeed on last passes to avoid workhardening and excessive abrasion of the threading tool.

Constant Volume Infeed Values for Threading Operations

In most applications, use of CNC canned cycles produces only marginally successful results. This is the case as these programs do not satisfy the .002" (0,05mm) minimum depth of cut specification recommended.

Example:

Infeed per pass formula: accumulated depth = initial DOC x $\sqrt{\#}$ pass
 For example, an 8-pitch external thread has a depth of .0789" (2mm).
 25% of .0789" (2mm) = approximately .0197" (0,50mm)
 (This is the infeed/DOC for the first pass.)

.0197" (0,500mm) x $\sqrt{2}$ = .0278" (0,708mm)

.0278" (0,708) - .0197" (0,500mm) = .0082" (0,207mm)
 (This is the infeed/DOC for the second pass.)

.0197" (0,500mm) x $\sqrt{3}$ = .0341" (0,867mm)

.0341" (0,867mm) - .0278" (0,708mm) = .0063" (0,159mm)
 (This is the infeed/DOC for the third pass.)

.0197" (0,500mm) x $\sqrt{4}$ = .0394" (1,001mm)

.0394" (1,001mm) - .0341" (0,867mm) = .0053" (0,134mm)
 (This is the infeed/DOC for the fourth pass.)

Using Radial Infeed

Bending stress on the cutting edge caused by V-shaped chips from long-chipping steel workpiece materials.

High cutting forces with small cutting thicknesses require sharp edges with high strength.

Its application is recommended for tough and hard, wear-resistant carbides with good resistance to thermal and mechanical shocks.

Using Flank Infeed

Lower bending stress and stabilized cutting edges produce more favorable chip shapes and larger cutting thicknesses.

Carbides with high hardness, good wear resistance, and temperature stability are advantageous.

When turning short threads with short engagement times, there is a good resistance to thermal and mechanical shocks.

Guidelines for Infeeds:

How to Determine the Number and the Size of Passes

The number of passes "s" per thread is decisive for successful threading and crest turning. The following tables give standard values for the application condition when machining steel. The proper number of passes must be determined empirically.

If insert breakage occurs, the number of passes must be increased. With increased wear, we recommend decreasing the number of passes. The chip thickness should not be less than .0019" (0,05mm). The allowance at the diameter should not exceed .0078" (0,2mm).



Threading

Metric ISO, External Thread Cutting

thread pitch P (mm)	0,50	0,75	1,00	1,25	1,50	1,75	2,00	2,50	3,00	3,50	4,00	4,50	5,00
depth h1	.012	.018	.024	.030	.036	.042	.048	.060	.072	.085	.097	.109	.121
number of passes	4	4	5	6	6	8	8	10	12	14	15	15	16
values for flank infeed (X/Z)													
order of passes	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z
1	.005/-	.007/-	.008/-	.008/-	.01/-	.009/-	.01/-	.009/-	.009/-	.008/-	.008/-	.009/-	.009/-
2	.003/.002	.005/.003	.006/.003	.006/.004	.008/.004	.008/.004	.009/.005	.01/.006	.011/.006	.012/.007	.013/.007	.014/.008	.015/.009
3	.002/.001	.004/.002	.004/.002	.005/.003	.006/.003	.006/.039	.007/.004	.007/.004	.008/.005	.009/.005	.01/.006	.011/.006	.012/.007
4	.002/.001	.003/.002	.004/.002	.004/.002	.005/.003	.005/.003	.006/.003	.006/.004	.007/.004	.007/.004	.008/.005	.009/.005	.01/.006
5			.003/.002	.004/.002	.004/.002	.004/.003	.005/.003	.006/.003	.006/.004	.007/.004	.007/.004	.008/.005	.009/.005
6				.003/.002	.004/.002	.004/.002	.004/.003	.005/.003	.006/0.003	.006/.003	.007/.004	.007/.004	.008/.005
7						.004/.002	.004/.002	.005/.003	.005/0.003	.005/.003	.006/.004	.007/.004	.007/.004
8						.003/.002	.004/.002	.004/.002	.005/.003	.005/.003	.006/.003	.006/.004	.007/.004
9								.004/.002	.004/.003	.005/.003	.005/.003	.006/.003	.006/.004
10								.004/.002	.004/.002	.005/.003	.005/.003	.006/.003	.006/.004
11									.004/.002	.004/.002	.005/.003	.005/.003	.006/.003
12									.004/.002	.004/.002	.005/.003	.005/.003	.006/.003
13										.004/.002	.004/.003	.005/.003	.005/.003
14										.004/.002	.004/.002	.005/.003	.005/.003
15											.004/.002	.005/.003	.005/.003
16													.005/.003

Threading

Metric ISO, Internal Thread Cutting

thread pitch P (mm)	0,50	0,75	1,00	1,25	1,50	1,75	2,00	2,50	3,00	3,50	4,00	4,50	5,00
depth h1	.011	.016	.021	.027	.032	.037	.043	.053	.064	.075	.085	.096	.107
number of passes	4	4	5	6	6	8	8	10	11	12	14	15	16
values for flank infeed (X/Z)													
order of passes	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z
1	.004/-	.006/-	.007/-	.008/-	.009/-	.008/-	.01/-	.01/-	.01/-	.011/-	.01/-	.011/-	.011/-
2	.003/.002	.004/.002	.005/.003	.005/.003	.006/.004	.007/.004	.007/.004	.008/.005	.01/.006	.011/.006	.011/.007	.012/.007	.013/.008
3	.002/.001	.003/.002	.004/.002	.004/.002	.005/.003	.005/.003	.006/.003	.006/.004	.007/.004	.008/.005	.009/.005	.009/.005	.01/.006
4	.002/.001	.003/.001	.003/.002	.004/.002	.004/.002	.004/.002	.005/.003	.005/.003	.006/.004	.007/.004	.007/.004	.008/.005	.009/.005
5			.003/.002	.003/.002	.037/.002	.004/.002	.004/.002	.005/.003	.005/.003	.006/.004	.006/.004	.007/.004	.008/.004
6				.003/.002	.003/.002	.003/.002	.004/.002	.004/.002	.005/.003	.006/.003	.006/.003	.006/.004	.007/.004
7						.003/.002	.004/.002	.004/.002	.005/.003	.005/.003	.005/.003	.006/.003	.006/.004
8						.003/.002	.003/.002	.004/.002	.004/.002	.005/.003	.005/.003	.005/.003	.006/.003
9								.003/.002	.004/.002	.004/.002	.005/.003	.005/.003	.005/.003
10								.003/.002	.004/.002	.004/.002	.004/.003	.005/.003	.005/.003
11									.004/.002	.004/.002	.004/.002	.005/.003	.005/.003
12										.004/.002	.004/.002	.005/.003	.005/.003
13											.004/.002	.004/.002	.005/.003
14											.004/.002	.004/.002	.004/.003
15												.004/.002	.004/.002
16													.004/.002

UN Thread, External Thread Cutting

TPI	24	20	18	16	14	12	11	10	9	8	7	6	5
depth	.026	.031	.034	.038	.044	.051	.056	.061	.068	.077	.088	.102	.123
number of passes	5	6	6	7	9	9	10	11	12	13	14	15	16
values for flank infeed (X/Z)													
order of passes	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z
1	.008/-	.008/-	.009/-	.009/-	.008/-	.009/-	.009/-	.008/-	.008/-	.008/-	.008/-	.009/-	.009/-
2	.006/.003	.006/.004	.007/.004	.007/.004	.007/.004	.009/.005	.009/.005	.009/.005	.01/.006	.011/.006	.012/.007	.014/.008	.016/.009
3	.004/.003	.005/.003	.005/.003	.006/.003	.006/.003	.007/.004	.007/.004	.007/.004	.008/.004	.008/.005	.009/.005	.01/.006	.012/.007
4	.004/.002	.004/.002	.005/.003	.005/.003	.005/.003	.006/.003	.006/.003	.006/.004	.006/.004	.007/.004	.008/.004	.009/.005	.01/.006
5	.003/.002	.004/.002	.004/.002	.004/.002	.004/.002	.005/.003	.005/.003	.005/.003	.006/.003	.006/.004	.007/.004	.008/.004	.009/.005
6		.003/.002	.004/.002	.004/.002	.004/.002	.004/.003	.005/.003	.005/.003	.005/.003	.006/.003	.006/.004	.007/.004	.008/.005
7				.004/.002	.004/.002	.004/.002	.004/.002	.004/.003	.005/.003	.005/.003	.006/.003	.006/.004	.007/.004
8					.003/.002	.004/.002	.004/.002	.004/.002	.004/.003	.005/.003	.005/.003	.006/.003	.007/.004
9					.003/.002	.004/.002	.004/.002	.004/.002	.004/.002	.004/.003	.005/.003	.006/.003	.006/.004
10							.004/.002	.004/.002	.004/.002	.004/.002	.005/.003	.005/.003	.006/.004
11								.004/.002	.004/.002	.004/.002	.004/.003	.005/.003	.006/.003
12									.004/.002	.004/.002	.004/.002	.005/.003	.006/.003
13										.004/.002	.004/.002	.005/.003	.005/.003
14											.004/.002	.004/.003	.005/.003
15												.004/.002	.005/.003
16													.005/.003

UN Thread, Internal Thread Cutting

TPI	24	20	18	16	14	12	11	10	9	8	7	6	5
depth	.023	.027	.030	.034	.039	.045	.049	.054	.060	0.68	.077	.090	.108
number of passes	5	6	6	7	8	9	9	10	11	12	13	14	15
values for flank infeed (X/Z)													
order of passes	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z
1	.008/-	.008/-	.009/-	.009/-	.009/-	.009/-	.01/-	.01/-	.01/-	.01/-	.01/-	.011/-	.012/-
2	.005/.003	.009/.003	.006/.004	.006/.004	.007/.004	.007/.004	.008/.005	.009/.005	.009/.005	.01/.006	.011/.006	.012/.007	.014/.008
3	.004/.002	.004/.002	.005/.003	.005/.003	.005/.003	.006/.003	.006/.004	.007/.004	.007/.004	.007/.004	.008/.005	.009/.005	.011/.006
4	.003/.002	.004/.002	.004/.002	.004/.002	.004/.003	.005/.003	.005/.003	.006/.003	.006/.003	.006/.004	.007/.004	.008/.004	.009/.005
5	.003/.002	.003/.002	.003/.002	.004/.002	.004/.002	.004/.002	.005/.003	.005/.003	.005/.003	.006/.003	.006/.004	.007/.004	.008/.005
6			.003/.002	.003/.002	.004/.002	.004/.002	.004/.002	.004/.003	.005/.003	.005/.003	.006/.003	.006/.004	.007/.004
7				.003/.002	.003/.002	.004/.002	.004/.002	.004/.002	.004/.002	.005/.003	.005/.003	.006/.003	.007/.004
8					.003/.002	.003/.002	.004/.002	.004/.002	.004/.002	.004/.002	.005/.003	.005/.003	.006/.004
9						.003/.002	.003/.002	.004/.002	.004/.002	.004/.002	.004/.003	.005/.003	.006/.003
10								.003/.002	.004/.002	.004/.002	.004/.002	.005/.003	.005/.003
11									.003/.002	.004/.002	.004/.002	.004/.003	.005/.003
12										.003/.002	.004/.002	.004/.002	.005/.003
13											.004/.002	.004/.002	.005/.003
14												.004/.002	.005/.003
15													.004/.003



NPT Thread, External, and Internal Machining

pitch, Gg/Z	27.0	18.0	14.0	11.5	8.0
depth	.003	.044	.057	.070	.100
number of passes	6	8	10	12	14
values for flank infeed (X/Z)					
order of passes	X/Z	X/Z	X/Z	X/Z	X/Z
1	.007/-	.009/-	.009/-	.009/-	.01/-
2	.006/.003	.007/.004	.008/.005	.008/.005	.01/.006
3	.005/.003	.006/.003	.007/.004	.007/.004	.01/.006
4	.004/.002	.006/.003	.006/.003	.007/.004	.009/.005
5	.004/.002	.005/.003	.006/.003	.006/.004	.008/.005
6	.003/.002	.005/.003	.005/.003	.006/.003	.008/.004
7		.004/.002	.005/.003	.005/.003	.007/.004
8		.003/.002	.004/.002	.005/.003	.007/.004
9			.004/.002	.005/.003	.007/.004
10			.004/.002	.004/.002	.006/.004
11				.004/.002	.006/.003
12				.004/.002	.005/.003
13					.004/.002
14					.004/.002

BSPT Thread, External, and Internal Machining

pitch, Gg/Z	28	19	14	11
depth	.023	.034	.046	BSPT thread
number of passes	5	6	8	10
values for flank infeed (X/Z)				
order of passes	X/Z	X/Z	X/Z	X/Z
1	.007/-	.009/-	.009/-	.008/-
2	.005/.003	.007/.004	.008/.004	.01/.005
3	.004/.002	.005/.003	.006/.003	.007/.004
4	.003/.002	.005/.002	.005/.003	.006/.003
5	.003/.002	.004/.002	.005/.002	.005/.003
6		.004/.002	.004/.002	.005/.003
7			.004/.002	.005/.002
8			.004/.002	.004/.002
9				.004/.002
10				.004/.002

Threading

Trapezoid Thread to DIN 103, External, and Internal Machining

pitch	1.5	2.0	3.0	4.0	5.0
depth	.004	.049	.069	.089	.108
number of passes	6	8	10	12	14
values for flank infeed (X/Z)					
order of passes	X/Z	X/Z	X/Z	X/Z	X/Z
1	.009/-	.01/-	.01/-	.01/-	.011/-
2	.007/.002	.009/.002	.01/.003	.011/.003	.012/.003
3	.005/.001	.007/.002	.009/.002	.01/.003	.011/.003
4	.005/.001	.006/.002	.008/.002	.009/.002	.01/.003
5	.004/.001	.005/.001	.007/.002	.008/.002	.009/.002
6	.004/.001	.004/.001	.006/.002	.007/.002	.008/.002
7		.004/.001	.006/.002	.007/.002	.008/.002
8		.004/.001	.004/.001	.006/.002	.007/.002
9			.005/.001	.006/.002	.007/.002
10			.004/.001	.005/.001	.006/.002
11				.005/.001	.006/.001
12				.004/.001	.005/.001
13					.005/.001
14					.004/.001

Round Thread to DIN 405, External, and Internal Machining

pitch, Gg/Z	10	8	6
depth	.052	.064	.085
number of passes	8	10	12
values for flank infeed (X/Z)			
order of passes	X/Z	X/Z	X/Z
1	.008/-	.009/-	.008/-
2	.008/.002	.008/.002	.01/.003
3	.008/.002	.008/.002	.001/.003
4	.007/.002	.007/.002	.009/.002
5	.006/.002	.007/.002	.008/.002
6	.006/.001	.006/.002	.008/.002
7	.005/.001	.006/.002	.007/.002
8	.004/.001	.005/.001	.006/.002
9		.004/.001	.006/.001
10		.006/.001	.005/.001
11			.004/.001
12			.003/.001

Whitworth, External, and Internal Thread Cutting

pitch, TPI	28	20	19	16	14	12	11	10	9	8	7	6	5
depth	.023	.032	.032	.034	.040	.053	.058	.064	.071	.080	.091	.107	0.128
number of passes	5	6	6	8	8	9	9	10	11	12	14	15	16
	values for flank infeed (X/Z)												
order of passes	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z
1	.007/-	.008/-	.009/-	.008/-	.009/-	.009/-	.01/-	.009/-	.009/-	.01/-	.008/-	.008/-	.008/-
2	.005/.003	.007/.004	.007/-	.007/.004	.008/.004	.009/.005	.01/5.236	.01/.005	.011/.006	.012/.006	.013/.007	.014/.007	.017/.009
3	.004/.002	.005/.003	.005/.003	.006/.003	.006/.003	.007/.004	.008/.004	.008/.004	.009/.004	.009/.004	.010/.005	.011/.006	.013/.007
4	.003/.002	.004/.002	.005/.002	.005/.002	.005/.003	.006/.003	.006/.003	.007/.004	.007/.004	.008/.004	.008/.004	.009/.005	.011/.006
5	.003/.002	.004/.002	.004/.002	.006/.002	.005/.002	.005/.003	.006/.003	.006/.003	.006/.003	.007/.004	.007/.004	.008/.004	.009/.005
6		.004/.002	.004/.002	.004/.002	.004/.002	.005/.002	.005/.003	.005/.003	.006/.003	.006/.003	.007/.003	.007/.004	.009/.004
7				.003/.002	.004/.002	.004/.002	.005/.002	.005/.003	.005/.003	.006/.003	.006/.003	.007/.004	.008/.004
8				.003/.002	.004/.002	.004/.002	.004/.002	.005/.002	.005/0	.005/.003	.006/.003	.006/.003	.007/.004
9						.038/.002	.004/.002	.004/.002	.005/.002	.005/.003	.005/.003	.006/.003	.007/.004
10								.004/.002	.004/.002	.005/.002	.005/.003	.005/.003	.006/.003
11									.004/.002	.004/.002	.005/.002	.005/.003	.006/.003
12										.004/.002	.004/.002	.005/.003	.006/.003
13											.004/.002	.005/.003	.006/.003
14											.004/.002	.005/.002	.005/.003
15												.005/.002	.005/.003
16													.005/.003

Multitooth Threads, Internal

type	ISO metric						ISO UN					Whitworth	NPT		
	3M	2M	3M	2M	3M	2M	2M	3M	2M	3M	2M	2M	2M	3M	2M
pitch (mm)	1.0	1.5	1.5	2.0	2.0	3.0	—	—	—	—	—	—	—	—	—
TPI	—	—	—	—	—	—	16	16	12	12	8	11	11.5	11.5	8
total depth	.024	.033	.033	.460	.460	.070	.037	.037	.490	.490	.740	.620	.690	.690	.100
1	.013	.015	.020	.020	.028	.022	.017	.022	.022	.030	.023	.029	.023	.032	.035
2	.011	.010	.013	.015	.018	.019	.012	.015	.016	.019	.020	.019	.020	.022	.025
3	—	.008	—	.011	—	.017	.008	—	.011	—	.017	.014	.014	.015	.022
4	—	—	—	—	—	.012	—	—	—	—	.014	—	.012	—	.018

Recommendations for Steel Workpieces (<300 BHN)

catalog number	insert size	TPI profile	total depth — on radius		
			1st pass	2nd pass	3rd pass
NTC-8R/L8EM	8	8 UN	.048	.064	.079
NTC-8R/L8IM	8	8 UN	.047	.061	.074
NTC-8R/L10EM	8	10 UN	.036	.050	.063
NTC-8R/L10IM	8	10 UN	.035	.048	.060
NTC-8R/L12EM	8	12 UN	.030	.041	.052
NTC-8R/L12IM	8	12 UN	.030	.037	.047
NTC-8R/L14EM	8	14 UN	.027	.037	.044
NTC-8R/L14IM	8	14 UN	.024	.031	.041
NTC-8R/L16EM	8	16 UN	.023	.032	.038
NTC-8R/L16IM	8	16 UN	.020	.027	.037
NTC-8R/L18EM	8	18 UN	.019	.026	.034
NTC-8R/L18IM	8	18 UN	.019	.024	.033
NDC-68RDR/L-75M	8	8 round	.058	.065	.073
NDC-61RDR/L-75M	8	10 round	.044	.051	.057
NDC-88RDRD/L-75M	8	8 round	.051	.069	.073
NDC-88VR/L-75M	8	8 NPT	.040	.068	.096
NDC-8115VR/L-75M	8	11.5 NPT	.038	.054	.067
NDN-814VR/L-75M	8	14 NPT	.038	.048	.054



Recommendations for Steel Workpieces (<300 BHN)

catalog number	insert size	TPI profile	total depth — on radius		
			1st pass	2nd pass	3rd pass
NTC-8R/L8EM	8	8 UN	0.05	0.06	0.08
NTC-8R/L8IM	8	8 UN	0.05	0.06	0.07
NTC-8R/L10EM	8	10 UN	0.04	0.05	0.06
NTC-8R/L10IM	8	10 UN	0.04	0.04	0.06
NTC-8R/L12EM	8	12 UN	0.03	0.04	0.05
NTC-8R/L12IM	8	12 UN	0.03	0.04	0.05
NTC-8R/L14EM	8	14 UN	0.03	0.04	0.04
NTC-8R/L14IM	8	14 UN	0.02	0.03	0.04
NTC-8R/L16EM	8	16 UN	0.02	0.03	0.04
NTC-8R/L16IM	8	16 UN	0.02	0.03	0.04
NTC-8R/L18EM	8	18 UN	0.02	0.03	0.03
NTC-8R/L18IM	8	18 UN	0.02	0.02	0.03
NDC-68RDR/L-75M	8	8 round	0.06	0.06	0.07
NDC-61RDR/L-75M	8	10 round	0.04	0.05	0.06
NDC-88RDR/L-75M	8	8 round	0.05	0.07	0.07
NDC-88VR/L-75M	8	8 NPT	0.04	0.07	0.10
NDC-8115VR/L-75M	8	11.5 NPT	0.04	0.05	0.07
NDN-814VR/L-75M	8	14 NPT	0.04	0.05	0.05

Threading

ACME, External

pitch, TPI	28	20	19	16	14	12	11	10	9	8	7	6	5
depth	.023	.032	.032	.034	.040	.053	.058	.064	.071	.080	.091	.107	0.128
number of passes	5	6	6	8	8	9	9	10	11	12	14	15	16
	values for flank infeed (X/Z)												
order of passes	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z
1	.039	.041	.050	.063	.074	.095	.112	.138	.180	.265	.008/-	.008/-	.008/-
2	.009	.008	.009	.010	.010	.011	.012	.013	.019	.028	.013/.007	.014/.007	.017/.009
3	.009	.008	.009	.009	.010	.011	.011	.012	.018	.026	.011/.005	.011/.006	.013/.007
4	.007	.007	.007	.009	.009	.010	.010	.011	.016	.023	.008/.004	.009/.005	.011/.006
5	.006	.006	.007	.007	.007	.009	.010	.011	.015	.022	.007/.004	.008/.004	.009/.005
6	.005	.005	.005	.006	.006	.008	.009	.010	.013	.019	.007/.003	.007/.004	.009/.004
7	.003	.004	.005	.005	.005	.007	.008	.010	.011	.017	.006/.003	.007/.004	.008/.004
8		.003	.004	.005	.005	.006	.007	.009	.011	.015	.006/.003	.006/.003	.007/.004
9			.004	.004	.005	.006	.007	.008	.009	.013	.005/.003	.006/.003	.007/.004
10				.004	.005	.006	.007	.008	.009	.013	.005/.003	.005/.003	.006/.003
11				.004	.004	.006	.006	.007	.009	.011	.005/.002	.005/.003	.006/.003
12					.004	.006	.006	.007	.008	.011	.004/.002	.005/.003	.006/.003
13					.004	.005	.006	.006	.007	.010	.004/.002	.005/.003	.006/.003
14						.004	.005	.006	.007	.009	.004/.002	.005/.002	.005/.003
15							.004	.006	.007	.009		.005/.002	.005/.003
16							.004	.006	.006	.008			.005/.003
17								.004	.005	.007	.004/.002	.005/.003	.006/.003
18								.004	.005	.007	.004/.002	.005/.002	.005/.003
19									.005	.006		.005/.002	.005/.003
20										.006			.005/.003

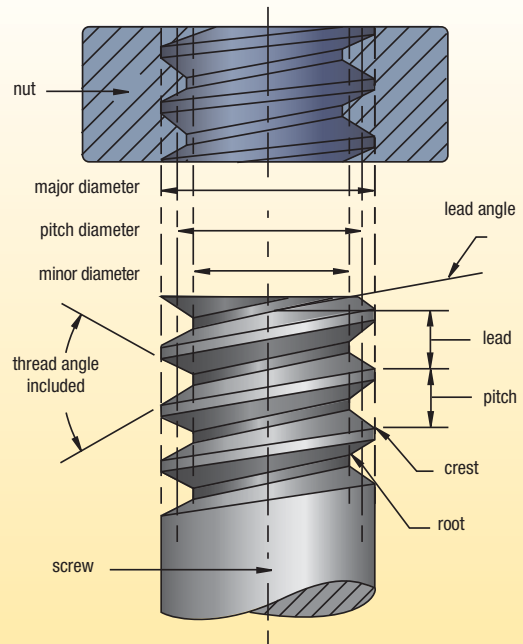
ACME, Internal

pitch, TPI	28	20	19	16	14	12	11	10	9	8	7	6	5
depth	.023	.032	.032	.034	.040	.053	.058	.064	.071	.080	.091	.107	0.128
number of passes	5	6	6	8	8	9	9	10	11	12	14	15	16
	values for flank infeed (X/Z)												
order of passes	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z
1	.039	.041	.050	.063	.074	.095	.112	.138	.180	.265	.008/-	.008/-	.008/-
2	.009	.008	.009	.010	.010	.011	.012	.013	.019	.028	.013/.007	.014/.007	.017/.009
3	.009	.008	.009	.009	.010	.011	.011	.012	.018	.026	.01/.005	.011/.006	.013/.007
4	.007	.007	.007	.009	.009	.010	.010	.011	.016	.023	.008/.004	.009/.005	.011/.006
5	.006	.006	.007	.007	.007	.009	.010	.011	.015	.022	.007/.004	.008/.004	.009/.005
6	.005	.005	.005	.006	.006	.008	.009	.010	.013	.019	.007/.003	.007/.004	.009/.004
7	.003	.004	.005	.005	.005	.007	.008	.010	.011	.017	.006/.003	.007/.004	.008/.004
8		.003	.004	.005	.005	.006	.007	.009	.011	.015	.006/.003	.006/.003	.007/.004
9			.004	.004	.005	.006	.007	.008	.009	.013	.005/.003	.006/.003	.007/.004
10				.004	.005	.006	.007	.008	.009	.013	.005/.003	.005/.003	.006/.003
11				.004	.004	.006	.006	.007	.009	.011	.005/.002	.005/.003	.006/.003
12					.004	.006	.006	.007	.008	.011	.004/.002	.005/.003	.006/.003
13					.004	.005	.006	.006	.007	.010	.004/.002	.005/.003	.006/.003
14						.004	.005	.006	.007	.009	.004/.002	.005/.002	.005/.003
15							.004	.006	.007	.009		.005/.002	.005/.003
16							.004	.006	.006	.008			.005/.003
17								.004	.005	.007	.004/.002	.005/.003	.006/.003
18								.004	.005	.007	.004/.002	.005/.002	.005/.003
19									.005	.006		.005/.002	.005/.003
20										.006			.005/.003



■ Screw Thread Definitions

1. **Major diameter** — The largest diameter of a straight screw thread. This applies to both internal and external threads.
2. **Pitch diameter** — On a straight thread, it is the diameter which passes through the thread profiles at such points which make the thread width of the groove equal to one-half of the basic pitch. On a “perfect thread,” this occurs at the point where the widths of the thread and groove are equal.
3. **Thread angle (included)** — The included angle between the individual flanks of the thread form.
4. **Minor diameter** — The smallest diameter of a straight screw thread. This applies to both internal and external threads.
5. **Lead angle** — On a straight thread, the lead angle is the angle created by the helix of the thread at the pitch diameter with a plane perpendicular to the axis.
6. **Lead** — The distance a screw thread advances axially in one revolution. On a single start, the pitch and lead are identical. The lead is equal to the pitch times the number of starts.
7. **Pitch** — The distance from a point on a screw thread to a corresponding point on the next thread measured parallel to the thread axis.
8. **Crest** — The outer most surface of the thread form which joins the flanks.
9. **Root** — The inner most surface of the thread form which joins the flanks.



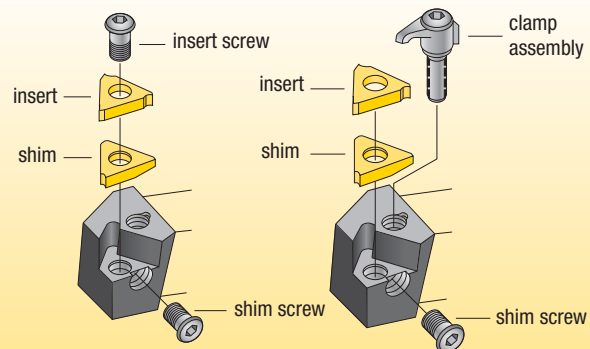
NOTE: Threads per inch (TPI) not shown.
The number of threads per inch measured axially.
The terms pitch and TPI are often used interchangeably.
TPI = 1/pitch

Threading

■ LT Threading Toolholders

In all cases, the proper shim selection is important.

Kennametal toolholders are supplied with a shim for a 1.5° lead angle. Change the shim if your thread is more than 1° different. For more details on proper shim selections, see pages E105–E107.



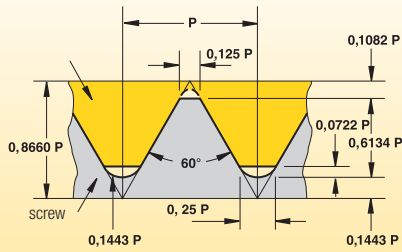
■ LT Threading Shim Catalog Numbering System

1-1/4 Thread Size	8 Number of threads per inch	UNX	2 Thread Class	A	LH	(21) Thread Gaging System
Thread form, series, and tolerance formulation symbol			1 = Allowance and tolerance 2 = Allowance and tolerance 3 = Tolerance only 4 = Interference fit	A = External thread B = Internal thread	LH = Left-hand thread (threads are right hand unless specified)	
21 = 22 = Per ANSI B1.3 23 =						

NOTE: For shims and shim kits, see pages E105–E107.

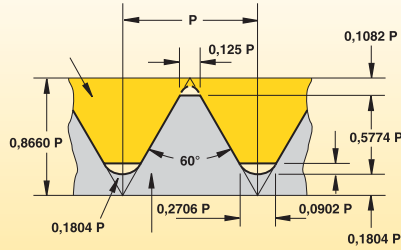
Common Thread Forms

ISO M (Metric) and UN (Unified National)



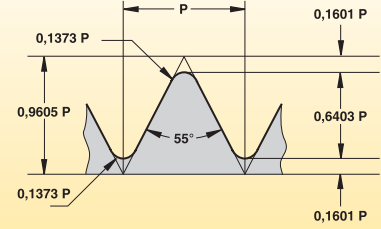
Use: All branches of mechanical industry.

UNJ (controlled root radius)



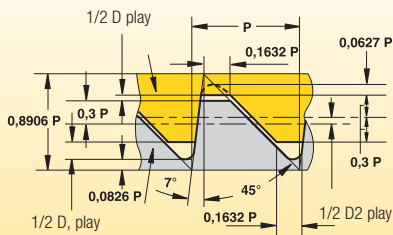
Use: Aircraft and space industry.

Whitworth (BSW)



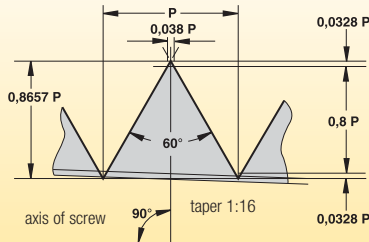
Use: Fittings and pipe couplings for gas, water, and sewer lines (replaced by ISO).

American Buttress



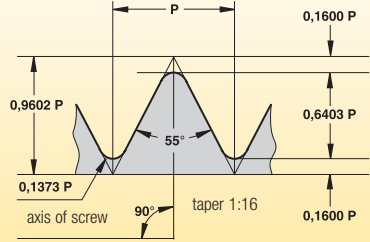
Use: Fittings and pipe couplings.

NPT (American National Pipe Thread)



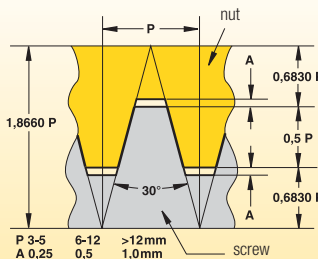
Use: Fittings and pipe couplings.

BSPT (British Standard Pipe Thread)



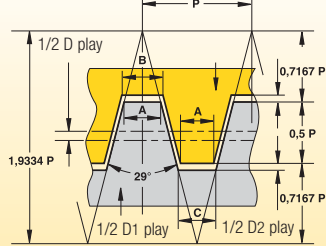
Use: Pipe thread for steam, gas, and water lines.

TR DIN 103



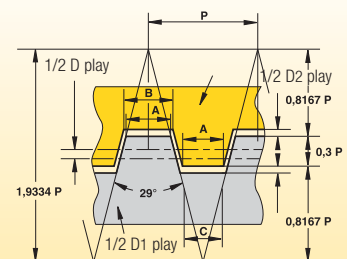
Use: Mechanical industry for motion transmission screws.

Acme



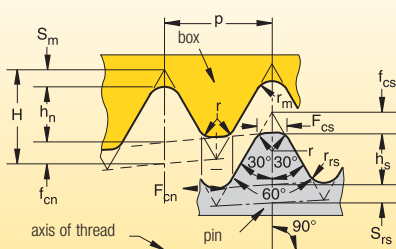
A = 0,0307 P
B = 0,3707 P—x D play
C = 0,3707 P—(D1 play—D2 play)
Use: Acme-General is used in mechanical industry for motion transmission screws.

Acme, truncated (Stub)



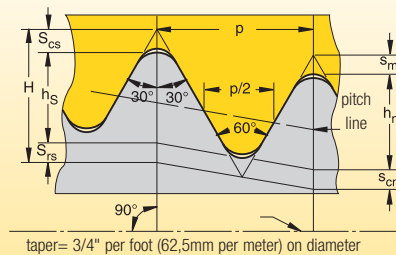
A = 0,4224 P
B = 0,4224 P—x D play
C = 0,4224 P—(D1 play—D2 play)
Use: Where normal Acme is too deep.

API Rotary Shoulder Connection



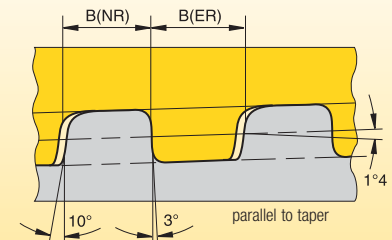
NOTE: Taper shown exaggerated.

API Casing and Tubing Round Thread Form



NOTE: Taper shown exaggerated.

API Buttress



■ Threading Method and Hand of Tooling

Required Information:

- External/internal operation.
- Spindle rotation/hand of thread.
- Feed direction.



hand of thread

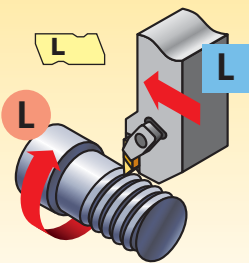


hand of toolholder

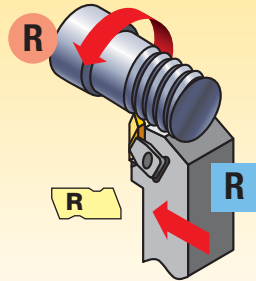


hand of insert

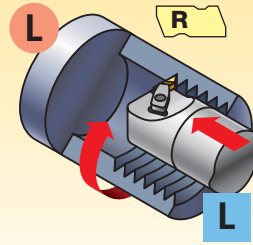
Feed Direction Toward the Chuck • Standard Helix



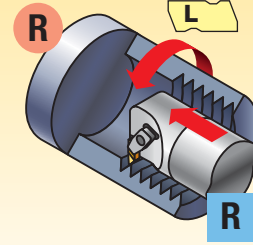
external left-hand thread



external right-hand thread

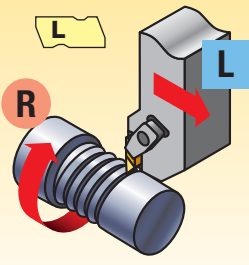


internal left-hand thread

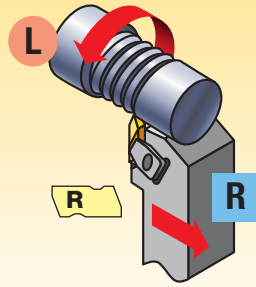


internal right-hand thread

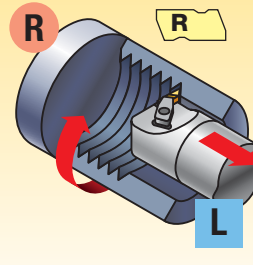
Feed Direction Away from the Chuck • Reverse Helix



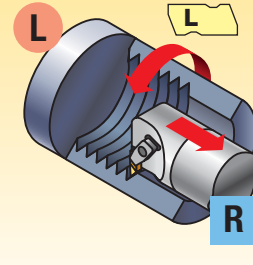
external right-hand thread



external left-hand thread



internal right-hand thread

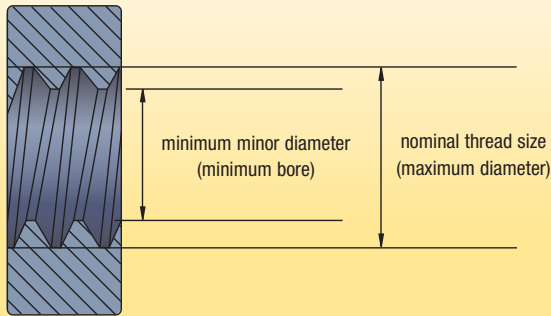


internal left-hand thread

NOTE: Top Notch threading bars require opposite hand insert and clamp.
Right-hand bar requires left-hand insert and clamp.
Left-hand bar requires right-hand insert and clamp.

Threading

The following charts list the largest thread pitch that can be applied on internal applications using Top Notch threading inserts for 60° V-threading and Acme threading.



Inch-Sized 60° V-Threading Limits

internal threading limitations
NT-1, NT-2 V-threading inserts

TPI	nominal thread size		minimum minor diameter (inch)	
	NT-1	NT-2	NT-1	NT-2
6	1-7/8	—	1.695	—
7	1-3/4	—	1.595	—
8	1-5/8	—	1.490	—
9	1-9/16	—	1.442	—
10	1-1/2	15/16	1.392	.830
11	1-7/16	15/16	1.339	.830
11-1/2	1-3/8	15/16	1.281	.830
12	1-3/8	9/16	1.285	.472
13	1-5/16	9/16	1.229	.472
14	1-1/4	9/16	1.173	.472
16	1-1/4	9/16	1.182	.472
18	1-1/8	9/16	1.065	.472
20	1-1/8	1/2	1.071	.440
24*	1-1/16	1/2	1.017	.440

*Twenty-four threads per inch and finer can be cut with an NT-2 insert provided the minor diameter is 1.000" or larger (.440" or larger with NT-1).

internal threading limitations
NT-3, NT-4 V-threading inserts

TPI	nominal thread size	minimum minor diameter (inch)
4-1/2**	2-7/8	2.634
5	2-3/4	2.534
6	2-1/2	2.320
7	2-1/4	2.095
8	2	1.865
9	1-15/16	1.817
10	1-7/8	1.767
11	1-13/16	1.714
11-1/2	1-3/4	1.656
12	1-3/4	1.660
13	1-5/8	1.542
14	1-9/16	1.485
16*	1-7/16	1.370

*Sixteen threads per inch and finer can be cut provided minor diameter is 1.370" or larger.

**NT-4 insert only.

Metric-sized 60° V-Threading Limits

internal threading limitations
NT-1, NT-2 60° V-threading inserts

TPI	nominal thread size		minimum thread diameter (mm)	
	NT-1	NT-2	NT-1	NT-2
4,00	M48 x 4.00	—	43,67	—
3,00	M42 x 3.00	—	38,75	—
2,50	M39 x 2.50	M24 x 2,50	36,29	21,29
2,00	M33 x 2.00	M15 x 2,00	30,84	12,84
1,75	M32 x 1.75	M15 x 1,75	30,11	13,11
1,50	M32 x 1.50	M15 x 1,50	30,38	13,38
1,25	M29 x 1.29	M14 x 1,25	27,65	12,65
1,00*	M27 x 1.00	M14 x 1,00	25,92	12,92
0,75	M22 x 0.75	M12 x 0,75	21,19	11,19

*Thread pitch of 1mm and less can be cut with an NT-2 insert provided the core thread diameter is 25mm or larger (11mm or larger with NT-1).

internal threading limitations
NT-3, NT-4 60° V-threading inserts

TP	nominal thread size	minimum thread diameter (mm)
5,50**	M73 x 5.50	67,05
5,00	M70 x 5.00	64,59
4,00	M64 x 4.00	59,67
3,00	M52 x 3.00	48,75
2,50	M48 x 2.50	45,29
2,00	M42 x 2.00	39,84
1,75	M40 x 1.75	38,11
1,50*	M38 x 1.50	36,38

*Thread pitch of 1,5mm and less can be cut provided core thread diameter is 35mm or larger.

**NT-4-insert only.

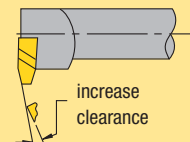
Acme Threading Limits

internal threading limitations
NA and NAS-2, -3, -4, and -6 Acme threading inserts

TPI	nominal thread size	minimum thread diameter	
		NT-1	NT-2
2**	5	4.500	114,3
2-1/2**	4-1/2	4.100	104,1
3**	4	3.665	93,1
4	3-1/2	3.250	82,6
5	3	2.800	71,1
6	2-1/2	2.333	59,3
8	2-1/4	2.125	54,0
10	2	1.900	48,3
12	1-3/4	1.667	42,4
14	1-5/8	1.554	39,5
16*	1-1/2	1.438	36,5

*Sixteen threads per inch and finer can be cut provided minor diameter is 36,5mm (1.438") or larger.

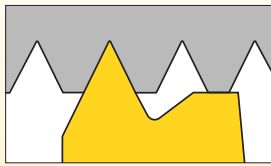
**NA-6 insert only.



Additional secondary clearance can be ground on leading edge of insert to provide sufficient helical clearance for machining coarser threads and multistart threads. Modified standard inserts may be furnished for machining threads outside of the limits shown.

Threading

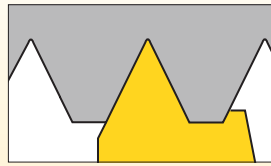
60° V-Thread Crest Turning Application Data



feed direction



NTC crest turning insert for 12 threads per inch and finer ($P \leq 2\text{mm}$)



feed direction



NTC crest turning insert for 11 threads per inch and coarser ($P \geq 3\text{mm}$)

“J” thread note for catalog

The controlled root radius thread form (SAE8879C) is defined for the external thread only. To machine the corresponding internal thread, choose any insert that will cut a unified class 2B thread, then bore the minor diameter to size. Refer to SAE8879C and MIL-S-8879C and SAEAS8879D for the correct “J” thread minor diameter values.

Controlled Root Radius Specifications for UNJ Threads

insert catalog number	nose radius on insert	thread radius per MIL-S-8879A
NJ-3020R/L8 NJP-3020R/L8	.0188/.0198	.0188/.0226
NJ-3014R/L12 NJP-3014R/L12	.0125/.0135	.0125/.0150
NJ-3010R/L16 NJP-3010R/L16	.0094/.0104	.0094/.0113
NJF-3012R/L14 NJK-3012R/L14	.0107/.0117	.0107/.0129
NJF-3010R/L16 NJK-3010R/L16	.0094/.0104	.0094/.0113
NJF-3009R/L18 NJK-3009R/L18	.0083/.0093	.0083/.0100
NJF-3008R/L20 NJK-3008R/L20	.0075/.0085	.0075/.0090
NJF-3007R/L24 NJK-3007R/L24	.0063/.0073	.0063/.0075
NJF-3006R/L28 NJK-3006R/L28	.0054/.0064	.0054/.0064
NJF-3005R/L32 NJK-3005R/L32	.0047/.0056	.0047/.0056

NOTE: NTC inserts automatically control root to crest dimensions. Therefore, in setting up threading operations with NTC inserts, check the O.D. or I.D. at the thread crest for correct dimensions.

Threading

60° V-Thread Application Data

insert description	insert	D** (inch)	E** (inch)	recommended TPI*		recommended TP*	
				external	internal	external	internal
<p>NT-1 NT-2 NT-2-K NTF-2 NTK-2 NTP-2 NT-3 NT-3-K NT-3-C</p>	NT-1	.075	.044	—	24-12	—	1,00-2,00
	NT-2	.113	.075	36-8	20-7	0,70-3,00	1,25-3,50
	NT-2-K	.113	.075	36-8	20-7	0,70-3,00	1,25-3,50
	NTF-2	.062	.040	44-14	24-12	0,60-1,75	1,00-2,00
	NTK-2	.062	.040	44-14	24-12	0,60-1,75	1,00-2,00
	NTP-2	.113	.075	36-8	20-7	0,70-3,0	1,25-3,50
	NT-3	.148	.097	20-6	12-5	1,25-4,00	2,00-5,00
	NT-3-K	.148	.097	20-6	12-5	1,25-4,00	2,00-5,00
	NT-3-C	.148	.097	11-6	6 (only)	2,50-4,00	4,00 (only)
	NT-3-CK	.148	.097	11-6	6 (only)	2,50-4,00	4,00 (only)
<p>NTF-3 NTK-3 NTP-3 NT-4 NT-4-K NT-4-C NTF-4 NTK-4 NTP-4</p>	NTF-3	.083	.054	44-10	24-9	0,60-2,50	1,00-2,50
	NTK-3	.083	.054	44-10	24-9	0,60-2,50	1,00-2,50
	NTP-3	.148	.097	20-6	12-5	1,25-4,00	2,00-5,00
	NT-4	.196	.127	20-4	12-4	1,25-6,25	2,00-6,25
	NT-4-K	.196	.127	20-4	12-4	1,25-6,25	2,00-6,25
	NT-4-C	.196	.127	11-4-1/2	6-4-1/2	2,50-5,50	4,00-5,50
	NTF-4	.083	.054	44-10	24-9	0,60-2,50	1,00-2,50
	NTK-4	.083	.054	44-10	24-9	0,60-2,50	1,00-2,50
	NTP-4	.196	.127	20-4	12-4	1,25-6,25	2,00-6,25

*Based on maximum insert radius size and class 2A and 2B thread specifications.
**For metric D and E dimensions, multiply by 25,4.

■ API Thread Forms • Insert Applications Chart for API Rotary Shouldered Connections

thread form	Kennametal insert		tool joint application	minimum box size*
	cresting	non-cresting		
V-.038R 2" TPF 4 TPI	NDC-4038R/L2 4-E/IR4API382	ND-3038R/L	2-3/8 API internal flush 2-7/8 API internal flush 3-1/2 API internal flush 4 API internal flush 4-1/2 API internal flush 5-1/2 API internal flush 6-5/8 API internal flush 4 API full hole API #23, API #26, API #31, API #35, API #38, API #40, API #44, API #46, API #50	API #31 2-7/8 IF
V-.038R 3" TPF 4 TPI	NDC-4038R/L3 4-E/IR4API383	ND-3038R/L	API #56 API #61 API #70 API #77	API #56
V-.050 2" TPF 4 TPI	NDC-4050R/L2 4-E/IRAPI502	ND-4050R/L	5-1/2 API full hole 6-5/8 API regular 6-5/8 API full hole	5-1/2 API full hole
V-.050 3" TPF 4 TPI	NDC-4050R/L3 4-E/IR4API503	ND-4050R/L	5-1/2 API regular 7-5/8 API regular 8-5/8 API regular	5-1/2 API regular
V-.040 3" TPF 5 TPI	NDC-3040R/L3 NDC-4040R/L3 4-E/IR5API403	ND-3040R/L ND-4040R/L	2-3/8 API regular 2-7/8 API regular 3-1/2 API regular 4-1/2 API regular	3-1/2 API regular

*Minimum box size that can be threaded with a standard Top Notch insert due to minimum bore equipment.

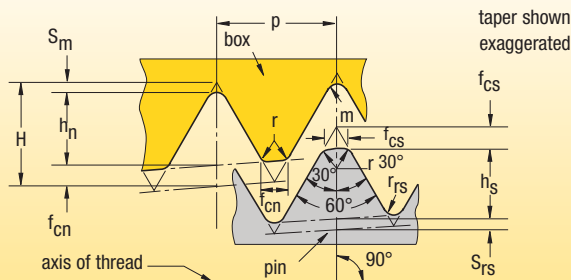


■ API Thread Forms • Product Thread Dimensions • Rotary Shouldered Connections (Inch)

thread form	taper inch per ft	thread height, not truncated H	thread height, truncated $h_n=h_s$	root truncation $S_m=S_{rs}$ $f_m=f_{rs}$	crest truncation $f_{cn}=f_{cs}$	width of flat		root radius $r_m=r_{rs}$	radius at thread corners r	pitch p
						crest $f_{cn}=f_{cs}$	crest $f_m=f_{rs}$			
V-.038R	2	.216005	.121844	.038000	.056161	.065	—	.038	.015	.250
V-.038R	3	.215379	.121381	.038000	.055998	.065	—	.038	.015	.250
V-.040	3	.172303	.117842	.020000	.034461	.040	—	.020	.015	.250
V-.050	3	.215379	.147303	.025000	.043076	.050	—	.025	.015	.250
V-.050	2	.216005	.147804	.025000	.043201	.050	—	.025	.015	.250

NOTE: All dimensions in inches.

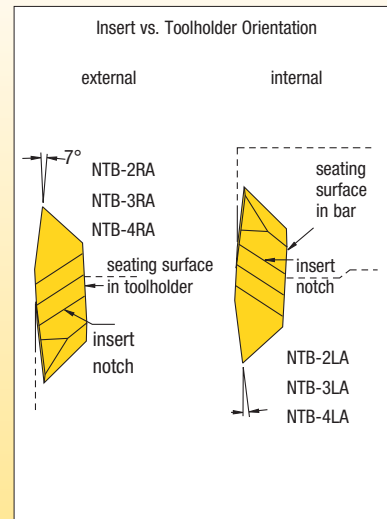
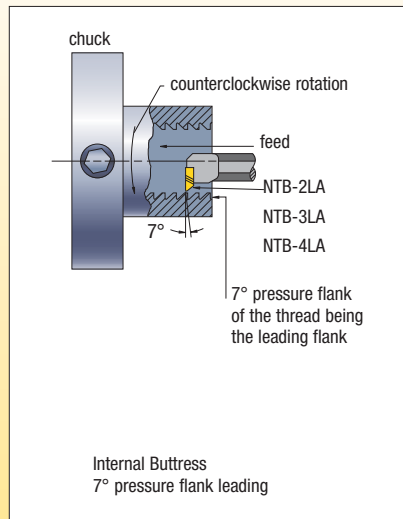
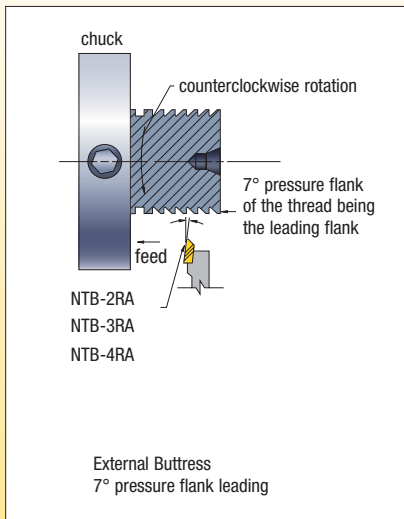
V-.040 and V-.050 Product Thread Form



Casing and Tubing Round Thread (Height Dimensions)

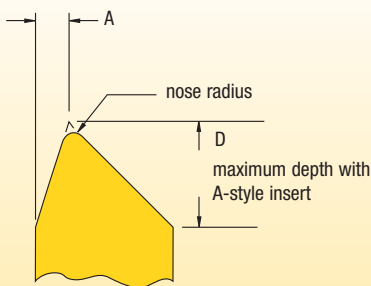
thread element	10 TPI p=.1000	8 TPI p=.1250
H	=.866p	.08660
$H_s = h_n$	=.626p-.007	.05560
$S_{rs} = S_m$	=.120p+.002	.01400
$S_{cs} = S_{cn}$	=.120p+.005	.01700
		.02000

American Buttress (7° Pressure Flank Leading) NTB-A Inserts • Push Type

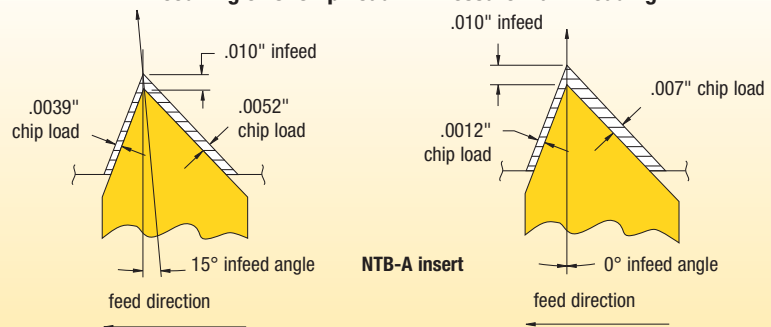


Threading

Reference Dimensions



Infeed Angle vs. Chip Load: 7° Pressure Flank Leading



insert	D (inch)	A (inch)	nose radius (inch)	pitch based on maximum radius
NTB-2A	.133	.024	.002-.004	16-20 TPI
NTB-3A	.171	.031	.005-.008	8-16 TPI
NTB-4A	.218	.049	.008-.012	4-6 TPI

NOTE: For balanced chip load, 15° infeed angle is suggested.

Internal Threading Limitations

internal threading limitations NTB-2A Buttress threading inserts		
TPI	nominal thread size	minimum minor diameter (inch)
8	1-3/4	1.600
10	1-5/8	1.505
12	1-1/2	1.400
16	1-1/4	1.175
20	1-1/16	1.002

internal threading limitations NTB-3 and NTB-4A Buttress threading inserts		
TPI	nominal thread size	minimum minor diameter (inch)
4*	2-1/2	2.200
5	2-1/4	2.010
6	2	1.800
8	1-3/4	1.600
10	1-5/8	1.505
12**	1-1/2	1.400

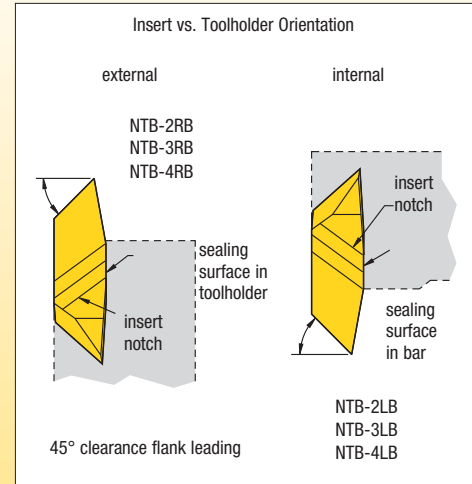
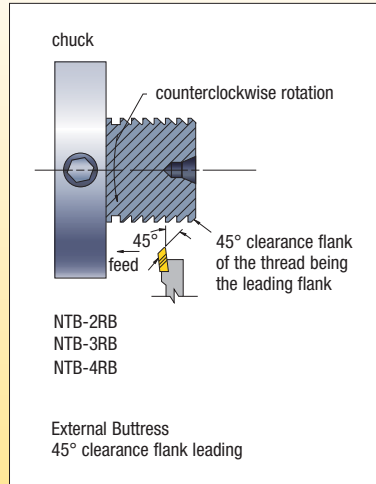
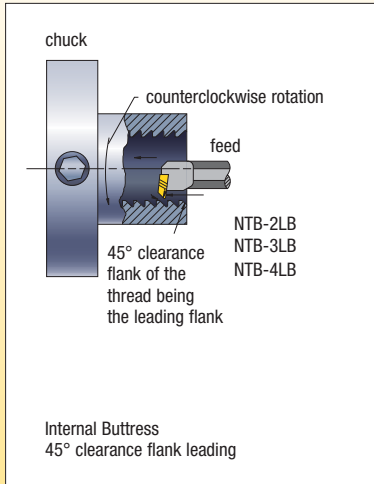
*NTB-4A insert only.
**Can cut 16 or 20 threads per inch provided minor diameter is 1.375" or larger.

Threads per Inch vs. Maximum Root Radius Chart (Inch)

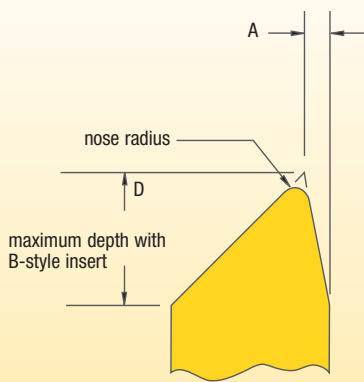
TPI	20	16	12	10	8	6	5	4	3	2-1/2	2	1-1/2	1-1/4	1
maximum root radius	.0036	.0045	.0059	.0071	.0089	0.119	.0143	.0179	.0238	.0286	0.375	.0476	.0572	.0714

NOTE: Special Buttress forms are available upon request.

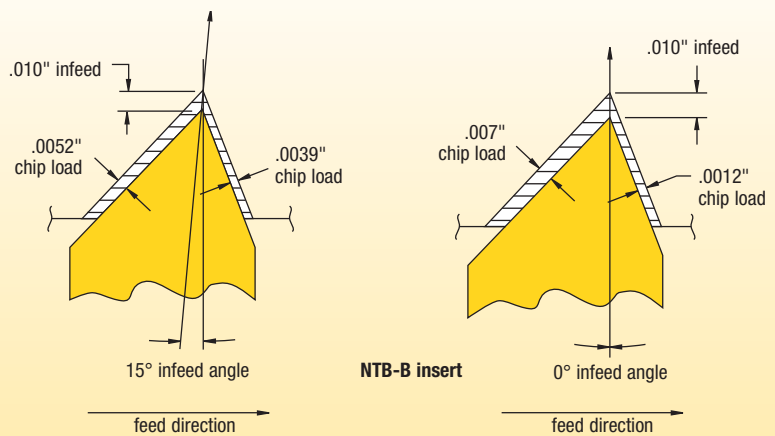
■ American Buttress (45° Clearance Flank Leading): NTB-B Inserts • PULL-type



Reference Dimensions



Infeed Angle vs. Chip Load: 45° Clearance Flank Leading



insert	D (inch)	A (inch)	nose radius (inch)	pitch based on maximum radius
NTB-2B	.133	.024	.002-.004	16-20 TPI
NTB-3B	.171	.031	.005-.008	8-16 TPI
NTB-4B	.218	.049	.008-.012	4-6 TPI

NOTE: For balanced chip load, a reverse 15° infeed angle is suggested.

Internal Threading Limitations

internal threading limitations NTB-2B Buttress threading inserts		
TPI	nominal thread size	minimum minor diameter (inch)
8	1-3/4	1.600
10	1-5/8	1.505
12	1-1/2	1.400
16	1-1/4	1.175
20	1-1/16	1.002

internal threading limitations NTB-3 and NTB-4B Buttress threading inserts		
TPI	nominal thread size	minimum minor diameter (inch)
4*	2-7/8	2.575
5	2-3/4	2.510
6	2-3/8	2.175
8	2-1/8	1.975
10	1-7/8	1.755
12	1-5/8	1.525
16	1-1/2	1.407
20	1-7/16	1.378

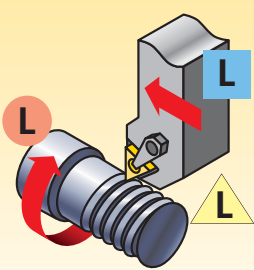
*NTB-4B insert only.

Required Information:

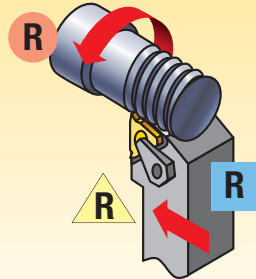
- External/internal operation.
- Spindle rotation/hand of thread.
- Feed direction.



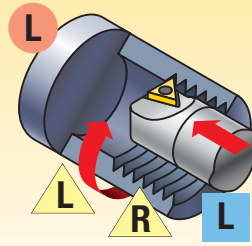
Feed Direction Toward the Chuck • Standard Helix



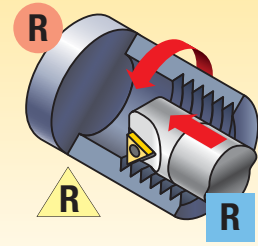
external left-hand thread



external right-hand thread

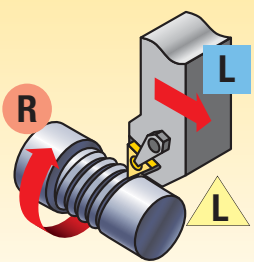


internal left-hand thread

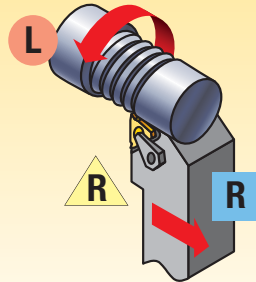


internal right-hand thread

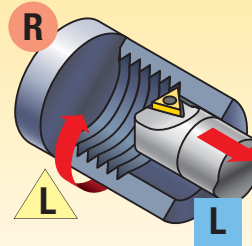
Feed Direction Away from the Chuck • Reverse Helix



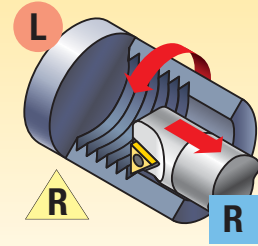
external right-hand thread



external left-hand thread



internal right-hand thread



internal left-hand thread

NOTE: Right-hand toolholders and bars use right-hand inserts.
 Left-hand toolholders and bars use left-hand inserts.

Threading

External Threading Operation Example

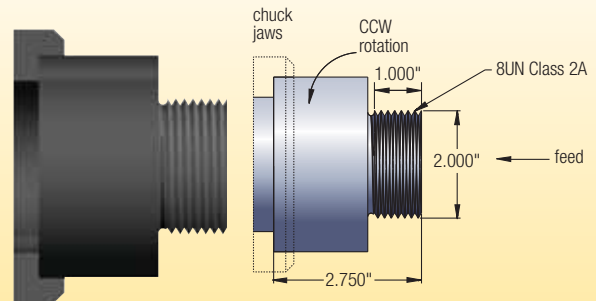
Required Information

From Part Drawing:

material: 316SS, 200 HB
thread form: 8UN Class 2A
operation: external threading
pitch diameter: 2.00" x 1.00" deep

From Machine Setup Data:

tooling: .750" x .750"
spindle rotation: counterclockwise
feed: toward chuck



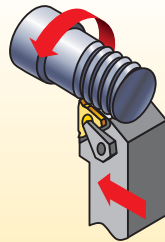
Steps for a Successful Threading Operation

Step 1 •

Determine Threading Method

Need to Know:

- Operation (external).
- Spindle rotation (CCW).
Counterclockwise rotation.
- Feed direction (toward chuck).
- Right-hand toolholder.
- Right-hand insert (ER).
- Standard helix method.



Step 2 •

Select Insert



Need to Know:

- Thread form (8 UN Class 2A).
- Hand of insert (right hand — ER).

Choose the High-Performance Solution

catalog number	insert size	KC5010
3ER8UN	3"	●

High-Performance Selection

NOTE: Use insert with largest IC available.

insert: LT-16ER-8UNCB
grade: KC5010
speed: 500 SFM

Step 3 •

Select the Grade and Speed

Need to Know:

- Workpiece material (316SS-200HB).
- Operation (external).

Options: Grade and Speed
Selection Guidelines

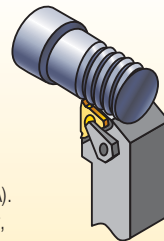
threading operation	stainless steel	
	general purpose	style
external	KC5025	CB
	150–450 SFM	
	high-performance	style
	KC5010	CB
	200–650 SFM	

Step 4 •

Select Toolholder

Need to Know:

- External or internal operation (external).
- Pitch diameter to determine minimum bore diameter (N/A).
- Type of tooling — toolholder, boring bar (toolholder).
- Hand of tool (right hand).
- Insert size (3/8").



Options:

catalog number	gage insert	shim
LSASR-123	LT-16ER	SM-YE3
LSSR-123	LT-16ER	SM-YE3

First choice: LSASR-123 holder

Step 5 •

Select Shim

Need to Know:

- Thread form — TPI or pitch (8 TPI).
- Pitch diameter (2").
- Helix method (standard).
See LT shim selection chart.

Select SM-YE3 shim

NOTE: The SM-YE3 shim is supplied with the selected toolholder.

NOTE: Optimize your operation by using a constant infeed or the constant volume method with a minimum infeed of .005 and an infeed angle of 29-1/2°.

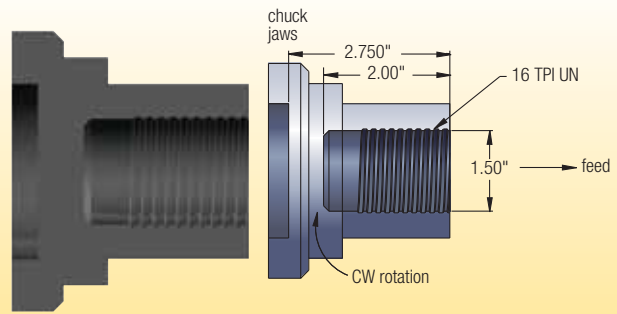
Required Information

From Part Drawing:

material: 4140 steel
thread form: 16 TPI UN
operation: internal threading
pitch diameter: 1.5" x 2" deep

From Machine Setup Data:

tooling: .075" boring bar
spindle rotation: clockwise
feed: away from chuck

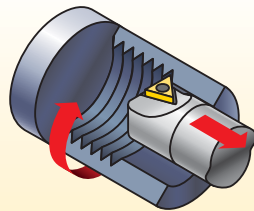


Steps for a Successful Threading Operation

Step 1 • Determine Threading Method

Need to Know:

- Operation (internal).
- Spindle rotation (CW).
Clockwise rotation.
- Feed direction (away from chuck).
- Left-hand toolholder.
- Left-hand insert (NL).
- Reverse helix method.



Step 2 • Select Insert

Need to Know:

- Thread form (16UN Class 2A).
- Hand of insert (left hand — NL).

Choose the High-Performance Solution

catalog number	insert size	KC5025
LT-11NL-16UN	1/4"	●
LT-16NL-16UN	3/8"	●

High-Performance Selection

NOTE: Use insert with largest possible IC to go into the bore.

insert: LT-16NL-16UN
grade: KC5025
speed: 450 SFM

Step 3 • Select the Grade and Speed

Need to Know:

- Workpiece material (4010 steel).
- Operation (internal).

Options: Grade and Speed
Selection Guidelines

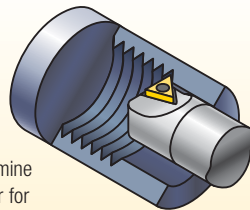
threading operation	steel
internal	general purpose and high performance
	KC5025
	100–550 SFM

Optimize your operation by using a constant infeed or the constant volume method with a minimum infeed of .005 and an infeed angle of 29-1/2°.

Step 4 • Select Toolholder

Need to Know:

- External or internal operation (internal).
- Pitch diameter to determine minimum bore diameter for internal operations (1.5").
- Type of tooling — toolholder, boring bar (boring bar).
- Hand of tool (left hand).
- Insert size (3/8").



Options:

catalog number	insert size	minimum bore diameter	shim
S1212-LSEL3	3"	.90	SM-YE3
S0812-LSEL2	2"	.65	—

First choice: S1212-LSEL3 bar

Step 5 • Select Shim

Need to Know:

- Thread form — TPI or pitch (16 TPI).
- Pitch diameter (1.5").
- Helix method (reverse).
See LT shim selection chart.

Select SM-YE3-2N shim

NOTE: Shim supplied with selected boring bar is not correct; order correct shim.

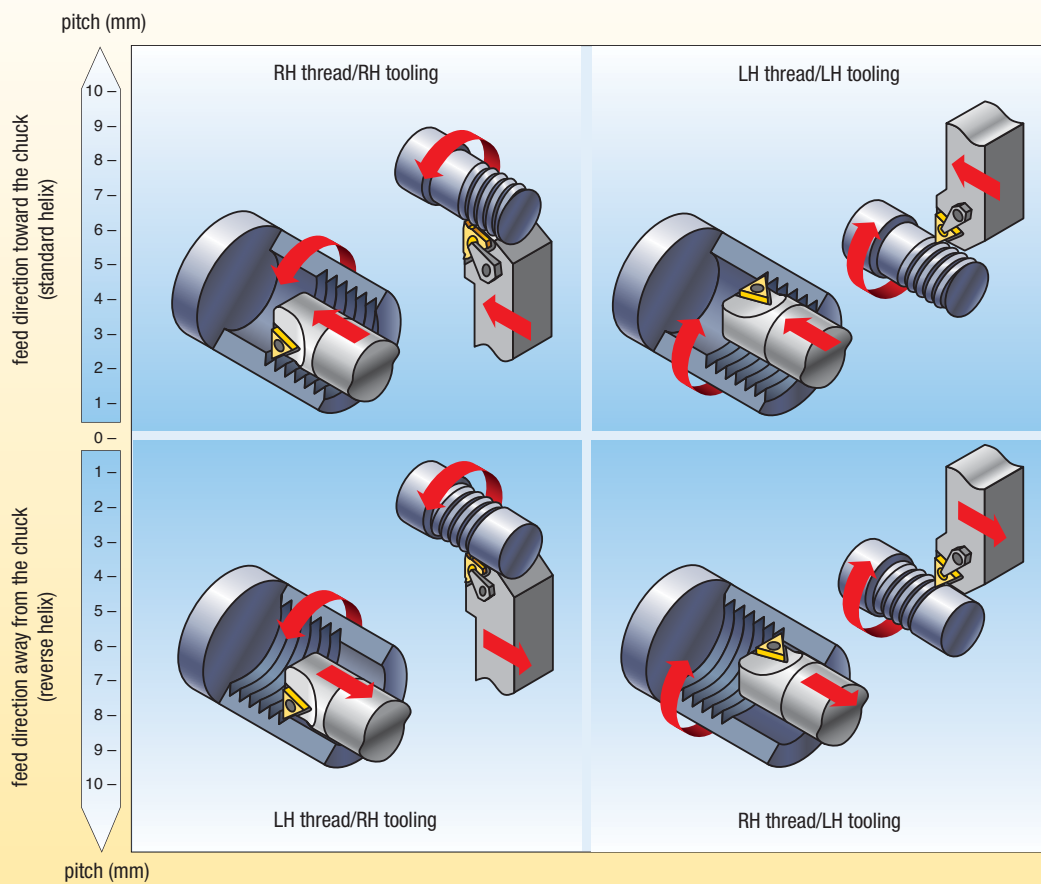
■ LT Threading Shim Selection Guidelines

The following questions must be answered before a successful threading operation can begin:

- | | |
|---|--|
| <p>A — Select your method of thread cutting:</p> <ul style="list-style-type: none"> • Machining toward the chuck (standard helix). • Machining away from the chuck (reverse helix). <p>B — Select lead angle and choose shim.</p> <p>C — Select insert and toolholder size.</p> | <p>D — Select insert grade.</p> <p>E — Select speed.</p> <p>F — Select number of thread passes.</p> <p>G — Select infeed method.</p> |
|---|--|

NOTE: When considering method of thread cutting, the part's shape and stability and the flow of chips are determining factors in your decision.

LT Selection Chart



NOTE: For multistart threads, use the lead value instead of the pitch.

Threading

Diagram of Thread Lead Angles

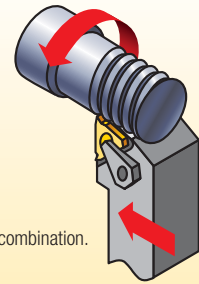
To calculate the lead angle of a given thread, use this formula:

$$\beta = \text{Arctan} \frac{P \cdot S}{\pi D_e}$$

β = thread lead angle
 D_e = effective pitch diameter of thread wear
 P = 1/TPI
 S = number of starts
 single-start, lead = pitch
 multistart, lead = pitch (x) number of starts

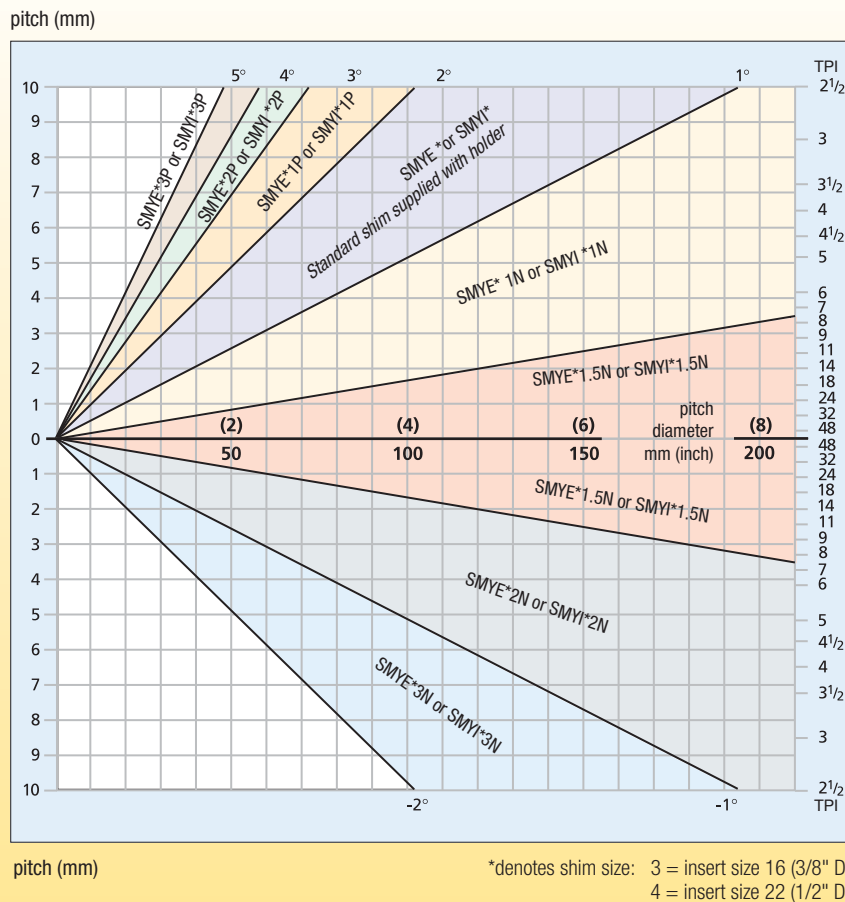
All toolholders are designed with an inclination angle = 1.5°. When turning standard threads with a lead angle of 1–2°, this guarantees adequate clearance at the flanks of the insert's thread tooth. The thread lead angle and the required inclination angle of the insert are given by β .

Cutting edge height is constant at every shim and insert combination. All toolholders are supplied with 1-1/2° lead angle.



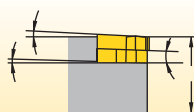
NOTE: Arctan equals Tan-1 (see chart below for approximate lead angles).

LT Selection Chart



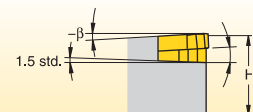
Standard Helix Method:

Used when RH thread is cut with RH tool or LH thread with LH tool.



Reverse Helix Method:

Used when RH thread is cut with LH tool or when LH thread is cut with RH tool. Dimension "H" is constant at every shim and insert combination. All toolholders are supplied with 1.5° lead angle.



■ LT Threading Shim Selection Table • Inch

insert size	toolholder		shim ordering code (inch)								
	external	internal	SM-YE3-3P		SM-YE3-2P	SM-YE3-1P	standard	SM-YE3-1N	SM-YE3-1.5N	SM-YE3-2N	SM-YE3-3N
LT-16 (3/8")	RH	LH	SM-YE3-3P	SM-YE3-2P	SM-YE3-1P	SM-YE3	SM-YE3-1N	SM-YE3-1.5N	SM-YE3-2N	SM-YE3-3N	
LT-16 (3/8")	LH	RH	SM-YI3-3P	SM-YI3-2P	SM-YI3-1P	SM-YI3	SM-YI3-1N	SM-YI3-1.5N	SM-YI3-2N	SM-YI3-3N	
LT-22 (1/2")	RH	LH	SM-YE4-3P	SM-YE4-2P	SM-YE4-1P	SM-YE4	SM-YE4-1N	SM-YE4-1.5N	SM-YE4-2N	SM-YE4-3N	
LT-22 (1/2")	LH	RH	SM-YI4-3P	SM-YI4-2P	SM-YI4-1P	SM-YI4	SM-YI4-1N	SM-YI4-1.5N	SM-YI4-2N	SM-YI4-3N	
TPI	pitch (mm)		pitch diameter (inch)								
72	—	—	—	—	—	0.12-0.31	0.32-0.84	>0.84	0.84-0.32	0.31-0.12	
—	0,35	—	—	—	—	0.12-0.3	0.31-0.84	>0.84	0.84-0.31	0.3-0.12	
64	—	—	—	—	—	0.14-0.35	0.36-0.95	>0.95	0.95-0.36	0.35-0.14	
—	0,40	—	—	—	—	0.14-0.35	0.36-0.96	>0.96	0.96-0.36	0.35-0.14	
56	0,45	—	—	—	—	0.16-0.4	0.41-1.09	>1.09	1.09-0.41	0.4-0.16	
—	0,50	—	—	—	0.11-0.16	0.17-0.44	0.45-1.2	>1.20	1.2-0.45	0.44-0.17	
48	—	—	—	—	0.12-0.17	0.18-0.46	0.47-1.27	>1.27	1.27-0.47	0.46-0.18	
44	—	—	—	—	0.13-0.19	0.2-0.51	0.52-1.38	>1.38	1.38-0.52	0.51-0.2	
—	0,60	—	0.1-0.12	0.13-0.2	0.21-0.53	0.54-1.44	>1.44	1.44-0.54	0.53-0.21		
40	—	—	0.11-0.13	0.14-0.21	0.22-0.56	0.57-1.52	>1.52	1.52-0.57	0.56-0.22		
—	0,70	—	0.12-0.15	0.16-0.23	0.24-0.62	0.63-1.68	>1.68	1.68-0.63	0.62-0.24		
36	—	—	0.12-0.15	0.16-0.23	0.24-0.62	0.63-1.69	>1.69	1.69-0.63	0.62-0.24		
—	0,75	0.11-0.12	0.13-0.16	0.17-0.25	0.26-0.66	0.67-1.8	>1.80	1.8-0.67	0.66-0.26		
32	—	0.12-0.13	0.14-0.17	0.18-0.26	0.27-0.7	0.71-1.9	>1.90	1.9-0.71	0.7-0.27		
—	0,80	0.12-0.13	0.14-0.17	0.18-0.26	0.27-0.71	0.72-1.91	>1.91	1.91-0.72	0.71-0.27		
28	—	0.14-0.14	0.15-0.19	0.2-0.3	0.31-0.8	0.81-2.17	>2.17	2.17-0.81	0.8-0.31		
27	—	0.14-0.15	0.16-0.2	0.21-0.31	0.32-0.83	0.84-2.25	>2.25	2.25-0.84	0.83-0.32		
—	1,00	0.15-0.16	0.17-0.21	0.22-0.33	0.34-0.89	0.9-2.39	>2.39	2.39-0.9	0.89-0.34		
24	—	0.16-0.17	0.18-0.23	0.24-0.35	0.36-0.94	0.95-2.53	>2.53	2.53-0.95	0.94-0.36		
—	1,25	0.19-0.2	0.21-0.27	0.28-0.42	0.43-1.11	1.12-2.99	>2.99	2.99-1.12	1.11-0.43		
20	—	0.19-0.21	0.22-0.27	0.28-0.42	0.43-1.13	1.14-3.04	>3.04	3.04-1.14	1.13-0.43		
18	—	0.21-0.23	0.24-0.31	0.32-0.47	0.48-1.26	1.277-3.38	>3.38	3.38-1.27	1.26-0.48		
—	1,50	0.22-0.25	0.26-0.33	0.34-0.5	0.51-1.34	1.35-3.59	>3.59	3.59-1.35	1.34-0.51		
16	—	0.24-0.26	0.27-0.35	0.36-0.53	0.54-1.41	1.42-3.8	>3.80	3.8-1.42	1.41-0.54		
—	1,75	0.26-0.29	0.3-0.38	0.39-0.59	0.6-1.56	1.57-4.19	>4.19	4.19-1.57	1.56-0.6		
14	—	0.27-0.3	0.31-0.4	0.41-0.61	0.62-1.62	1.63-4.34	>4.34	4.34-1.63	1.62-0.62		
13	—	0.29-0.32	0.33-0.43	0.44-0.66	0.67-1.74	1.75-4.68	>4.68	4.68-1.75	1.74-0.67		
—	2,00	0.3-0.33	0.34-0.44	0.45-0.67	0.68-1.78	1.79-4.79	>4.79	4.79-1.79	1.78-0.68		
12	—	0.32-0.35	0.36-0.46	0.47-0.71	0.72-1.89	1.9-5.07	>5.07	5.07-1.9	1.89-0.72		
11.5	—	0.33-0.37	0.38-0.49	0.5-0.74	0.75-1.97	1.98-5.29	>5.29	5.29-1.98	1.97-0.75		
11	—	0.34-0.38	0.39-0.51	0.52-0.78	0.79-2.06	2.07-5.53	>5.53	5.53-2.07	2.06-0.79		
—	2,50	0.37-0.42	0.43-0.55	0.56-0.84	0.85-2.23	2.24-5.98	>5.98	5.98-2.24	2.23-0.85		
10	—	0.38-0.42	0.43-0.56	0.57-0.86	0.87-2.27	2.28-6.08	>6.08	6.08-2.28	2.27-0.87		
9	—	0.42-0.47	0.48-0.62	0.63-0.95	0.96-2.52	2.53-6.75	>6.75	6.75-2.53	2.52-0.96		
—	3,00	0.45-0.5	0.51-0.66	0.67-1.02	1.03-2.68	2.69-7.18	>7.18	7.18-2.69	2.68-1.03		
8	—	0.47-0.53	0.54-0.7	0.71-1.08	1.09-2.84	2.85-7.6	>7.60	7.6-2.85	2.84-1.09		
—	3,50	0.52-0.59	0.6-0.77	0.78-1.19	1.2-3.13	3.14-8.38	>8.38	8.38-3.14	3.13-1.2		
7	—	0.524-0.61	0.62-0.8	0.81-1.23	1.24-3.25	3.26-8.68	>8.68	8.68-3.26	3.25-1.24		
—	4,00	0.6-0.67	0.68-0.89	0.9-1.36	1.37-3.58	3.59-9.57	>9.57	9.57-3.59	3.58-1.37		
6	—	0.63-0.71	0.72-0.94	0.95-1.44	1.45-3.79	3.8-10.13	>10.13	10.13-3.8	3.79-1.45		
—	5,00	0.75-0.84	0.85-1.11	1.12-1.7	1.71-4.48	4.49-11.97	>11.97	11.97-4.49	4.48-1.71		
5	—	0.76-0.86	0.87-1.13	1.14-1.73	1.74-4.55	4.56-12.16	>12.16	12.16-4.56	4.55-1.74		
4.5	—	0.84-0.95	0.96-1.26	1.27-1.92	1.93-5.06	5.07-13.51	>13.51	13.51-5.07	5.06-1.93		
—	6,00	0.9-1.01	1.02-1.33	1.34-2.04	2.05-5.37	5.38-14.36	>14.36	14.36-5.38	5.37-2.05		
4	—	0.95-1.07	1.08-1.41	1.42-2.16	2.17-5.69	5.7-15.2	>15.20	15.2-5.7	5.69-2.17		
inclination angle			4.5	3.5	2.5	1.5	0.5	0.0	-0.5	-1.5	
feed direction			standard helix (feed toward the chuck)					reverse helix (feed away from the chuck)			

1. Select TPI or pitch from the left-hand columns.
2. Follow row to specified pitch diameter and the correct feed direction.
3. Follow the column to the top for the required shim based on the toolholder and insert size.





Application Specific

Beyond BLAST	F2–F12
Fix-Perfect	F14–F41
Top Notch Profiling	F42–F59
K-Lock	F60–F64
Kendex Mini	F66–F69
Wheel Reprofilng/Wheelset Truing	F70–F87
Axle and Wheel Reconditioning	F88–F94
Beyond RU and UP Geometries	F95
Wheel and Axle Tooling	F96–F97
New Railroad Wheel Manufacturing Tooling	F98–F109
Kennametal Select	F110–F134



Beyond BLAST™ • The First Through-Insert Coolant Delivery System from Kennametal



We didn't just improve metalcutting technology. We reinvented it.

Introducing Beyond BLAST, a revolutionary insert platform that delivers many of the benefits of high-pressure systems at conventional coolant pressures. Advanced coolant-application technology makes cutting more efficient and effective — while extending tool life. This tool is specifically designed for working with titanium and other high-temp alloys.

Features and Benefits

Higher Productivity, Extended Tool Life

- Increased tool life up to 300%, depending on the insert geometry and cutting conditions.
- Significant productivity and tool life increase in titanium machining.
- Higher metal removal rates and reduced cycle time.
- Chipbreaker design in combination with Precision Coolant Technology (PCT) provides excellent chip control and workpiece finish.

Versatility

- Ideal for applications where productivity or tool life is limited due to excess generated heat.
- Offered as a standard item with engineered solution capabilities.
- Provides increased performance with high-pressure or low-pressure coolant delivery systems.

More than just the right tool — the ultimate solution. That's **Beyond BLAST™**



That's **Different Thinking.**



A Simple Observation, a Revolutionary Concept

We took an entirely different approach to machining high-temperature alloys. We determined that the most effective way to deliver coolant would be to channel it through the insert — ensuring that it hits exactly where it does the most good. That means more efficient coolant delivery at a fraction of the cost of high-pressure coolant systems.

By precisely controlling coolant application, Beyond BLAST™ allows you to lower your energy consumption, saving you even more money and reducing your impact on the environment.

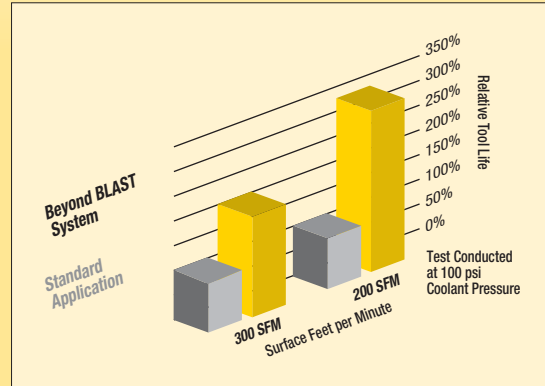
*To learn more, [scan here](#).
For instructions on how to scan, please see page xxix.*



Beyond BLAST System

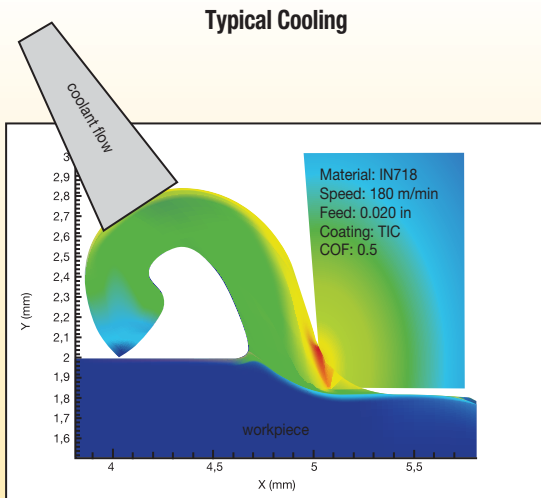
- Beyond BLAST delivers coolant directly and precisely to the cutting edge.
- Effective thermal management, higher speeds and reduced cycle times can be achieved.
- Delivers many of the benefits of high-pressure systems at low pressure.
- Provides increased performance with high-pressure or low-pressure coolant delivery systems.

Beyond BLAST for turning increases tool life by up to 300% compared with conventional coolant delivery systems.

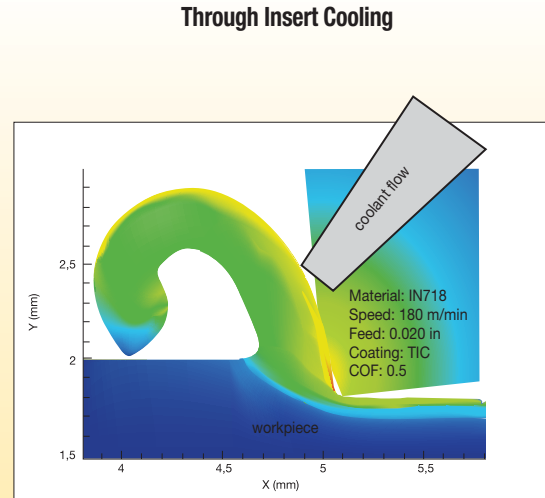


Application Specific

Coolant Application



Typical cooling applications often miss the point of highest heat, generated where the tool shears the material. Hitting chips after they have formed proves typical cooling applications can even work at cross-purposes by forcing chips back into the cut, accelerating tool wear. Part of the problem is that the coolant-delivering nozzle is located relatively far from the workpiece.



Beyond BLAST with Precision Coolant Technology (PCT)

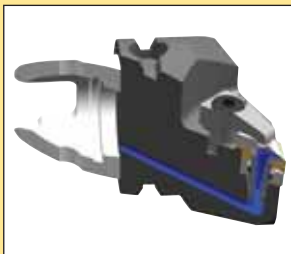
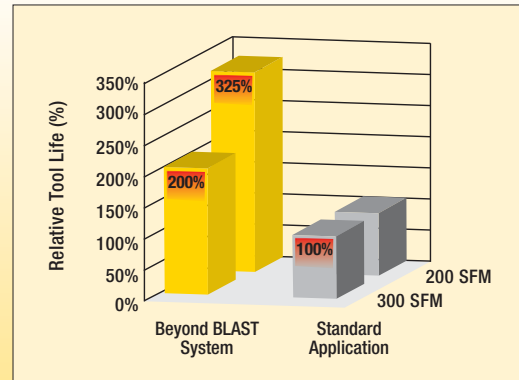
With Beyond BLAST, coolant is delivered through the insert, at the interface of the tool and the workpiece material, offering the best of both worlds.

Beyond BLAST with Precision Coolant Technology (PCT) features through-insert cooling. It delivers coolant much closer to the tool/chip interface. Coolant pressure remains adjustable. Since the coolant is delivered through the insert, coolant delivery is more reliable and controlled, significantly reducing temperatures at the point of the cut.

Application Data

The illustrations below show Beyond BLAST turning inserts and the coolant delivery path through the turning holder and insert.

In tests involving titanium turning, Beyond BLAST inserts at 100 psi showed 75% improvement in tool life over the same inserts with flood coolant at 100 psi. In a different test to evaluate the influence of coolant pressure, tool life for Beyond BLAST at 100 psi was nearly that of identical insert geometries at 1,000 psi, delivering cutting conditions and longer tool life on par with expensive, custom high-pressure coolant delivery systems at significantly lower cost.



Test 1
62 m/min (200 SFM)

Test 2
93 m/min (300 SFM)

Cutting Conditions and Parameters • CNMG432MBB • KCU10™

Workpiece	Ti6Al4V (Titanium)	Ti6Al4V (Titanium)
Hardness	42–46 Rc hardness	42–46 Rc hardness
Cutting fluid (100 psi)	Water-based synthetic	Water-based synthetic
Cutting speed (vc)	62 m/min (200 SFM)	93 m/min (300 SFM)
Feed rate (f)	0,2 mm/rev (.008 IPR)	0,2 mm/rev (.008 IPR)
Depth of cut	1,27mm (.05")	1,27mm (.05")
Tool life Beyond BLAST versus Standard	3,2x	2x
Result:	Over 3x tool life	Double the tool life

Product Portfolio

- KM50TS holders.
- Inch and metric square shanks.
- C- and R-shaped inserts.
- Geometries: FBB, MBB, RBB, ELF.
- Grades: KU10, KCU10.

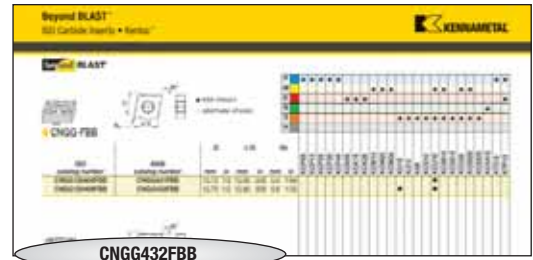
C-Style



R-Style



Beyond BLAST Identification System



CNGG432FBB
RCGX64ELF

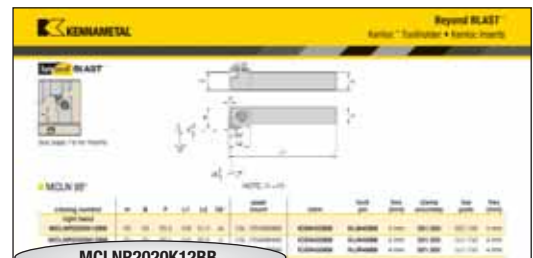
Inserts • C-Style

C Insert Shape	N Clearance Angle	G Tolerance Class	G Insert Features	4 Size	3 Thickness	2 Corner Radius "Re"	F Chip Control	BB Beyond BLAST
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Inserts • R-Style

R Insert Shape	C Clearance Angle	G Tolerance Class	X Geometry and Clamping Type	6 Size	4 Thickness	EL Corner Configuration	F Cutting Edge Form	
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Application Specific



MCLNR2020K12BB
MCLNR16DBB

Toolholders • ISO

M Insert Holding Method	C Insert Shape	L Tool Style	N Clearance Angle	R Hand of Tool	2020 Shank Dimensions	K Tool Length	12 Insert Size	BB Beyond BLAST
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Toolholders • ANSI

M Insert Holding Method	C Insert Shape	L Tool Style	N Clearance Angle	R Hand of Tool	16 Shank Dimensions	D Qualified Surface Length	BB Beyond BLAST	
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■ Step 1 • Select the insert geometry



Negative Inserts



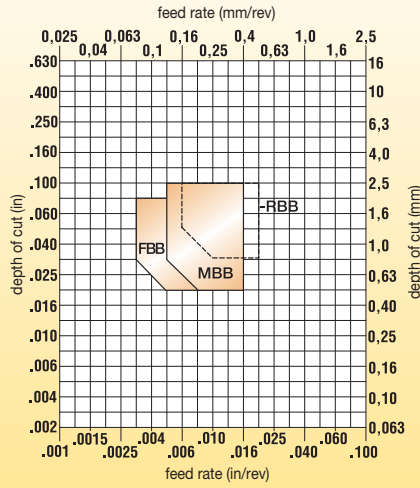
-RBB
Roughing



-MBB
Medium Machining



-FBB
Finishing



NOTE: Maximum depth of cut is 2,5mm (.100").

■ Step 2 • Select the grade

cutting condition	Negative Insert Geometry		
	-RBB	-MBB	-FBB
heavily interrupted cut	KCU10	KCU10	KCU10
lightly interrupted cut	KCU10	KCU10	KCU10
varying depth of cut, casting, or forging skin	KU10/KCU10	KU10/KCU10	KU10/KCU10
smooth cut, pre-turned surface	KU10/KCU10	KU10/KCU10	KU10/KCU10

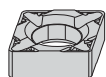
■ Step 3 • Select the cutting speed

Nickel-Based, Heat-Resistant Alloys (140–475 HB) (≤48 HRC)		speed — m/min (SFM)									starting conditions	
material group	grade	15 (50)	45 (150)	75 (250)	105 (350)	140 (450)	170 (550)	200 (650)	230 (750)	260 (850)	m/min	SFM
S3	KU10										40	125
	KCU10										70	225

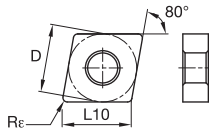
Titanium and Titanium Alloys (110–450 HB) (≤48 HRC)		speed — m/min (SFM)									starting conditions	
material group	grade	15 (50)	45 (150)	75 (250)	105 (350)	140 (450)	170 (550)	200 (650)	230 (750)	260 (850)	m/min	SFM
S4	KU10										45	150
	KCU10										70	225

Application Specific

beyond BLAST™

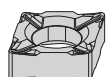


■ CNGG-FBB

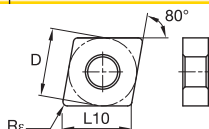


● first choice
○ alternate choice

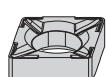
ISO catalog number	ANSI catalog number	D		L10		Re	
		mm	in	mm	in	mm	in
CNGG120404FBB	CNGG431FBB	12,70	1/2	12,90	.508	0,4	1/64
CNGG120408FBB	CNGG432FBB	12,70	1/2	12,90	.508	0,8	1/32



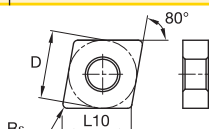
■ CNMG-MBB



ISO catalog number	ANSI catalog number	D		L10		Re	
		mm	in	mm	in	mm	in
CNMG120404MBB	CNMG431MBB	12,70	1/2	12,90	.508	0,4	1/64
CNMG120408MBB	CNMG432MBB	12,70	1/2	12,90	.508	0,8	1/32



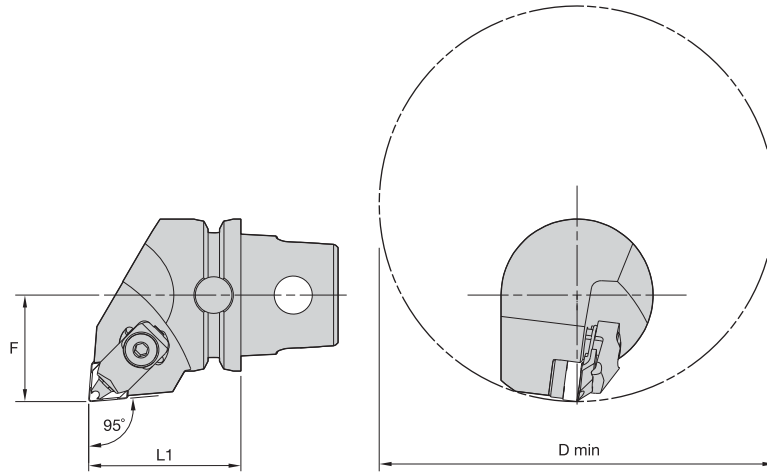
■ CNMG-RBB



ISO catalog number	ANSI catalog number	D		L10		Re	
		mm	in	mm	in	mm	in
CNMG120408RBB	CNMG432RBB	12,70	1/2	12,90	.508	0,8	1/32

	P	M	K	N	S	H	KCP05	KCP10	KCP25	KCP30	KCP40	KCK05	KCK15	KCK20	KCM15	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KC5010	KC5510	KCU25	KC5025	KC5525	KC5410	KT315	KTP10	
CNGG120404FBB	●	●	●	●	●	●																									
CNGG120408FBB																		●				●									
CNMG120404MBB																						●									
CNMG120408MBB																		●				●									
CNMG120408RBB																		●				●									

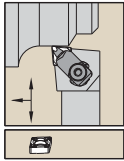
Application Specific



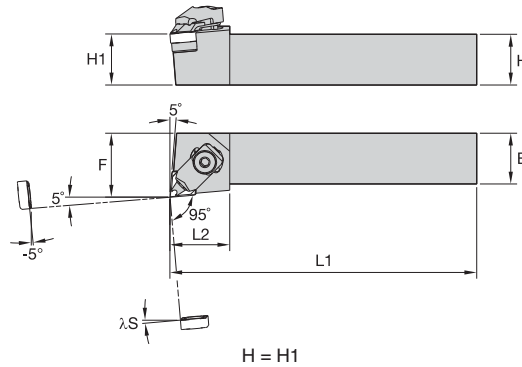
■ MCLN 95°

order number	catalog number	L1		F		D min		gage insert	shim	lock pin	clamp assembly	top plate	kg	lbs
		mm	in	mm	in	mm	in							
	right hand													
4098740	KM50TSMCLNR12BB	50	1.969	35	1.378	130	5.118	CN..120408RBB/CN..432RBB	ICSN433BB	KLM48BB	551.350	557.150	0,33	1.45
	left hand													
4098741	KM50TSMCLNL12BB	50	1.969	35	1.378	130	5.118	CN..120408RBB/CN..432RBB	ICSN433BB	KLM48BB	551.350	557.150	0,33	1.45

Application Specific



See page F8 for inserts.

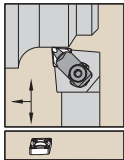


H = H1

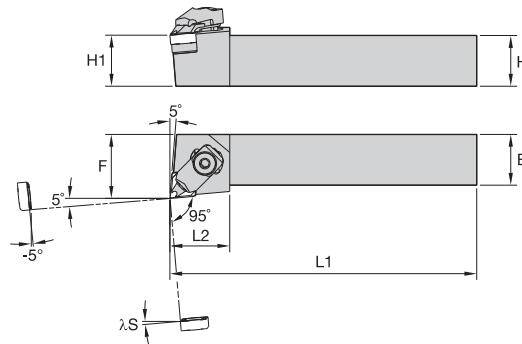
beyond BLAST™

■ MCLN 95°

catalog number	H	B	F	L1	L2	λS°	gage insert	shim	lock pin	hex (mm)	clamp assembly	top plate	hex (mm)
right hand													
MCLNR2020K12BB	20	20	25,5	128	31,2	-6	CN..120408RBB	ICSN433BB	KLM48BB	4 mm	551.350	557.150	4 mm
MCLNR2525M12BB	25	25	32,5	153	32,0	-5	CN..120408RBB	ICSN433BB	KLM48BB	4 mm	551.350	557.150	4 mm
MCLNR3232P12BB	32	32	40,5	173	37,2	-6	CN..120408RBB	ICSN433BB	KLM48BB	4 mm	551.350	557.150	4 mm
left hand													
MCLNL2020K12BB	20	20	25,5	128	31,2	-6	CN..120408RBB	ICSN433BB	KLM48BB	4 mm	551.350	557.150	4 mm
MCLNL2525M12BB	25	25	32,5	153	32,0	-5	CN..120408RBB	ICSN433BB	KLM48BB	4 mm	551.350	557.150	4 mm
MCLNL3232P12BB	32	32	40,5	173	37,2	-6	CN..120408RBB	ICSN433BB	KLM48BB	4 mm	551.350	557.150	4 mm



See page F8 for inserts.

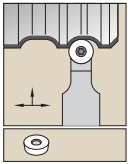


H = H1

■ MCLN -5°

catalog number	H	B	F	L1	L2	λS°	gage insert	shim	lock pin	hex (mm)	clamp assembly	top plate	hex (mm)
right hand													
MCLNR164DBB	1.00	1.00	1.250	6.00	1.17	-5	CN..432RBB	ICSN433BB	KLM48BB	4 mm	551.350	557.150	4 mm
MCLNR204DBB	1.25	1.25	1.500	6.00	1.17	-6	CN..432RBB	ICSN433BB	KLM48BB	4 mm	551.350	557.150	4 mm
left hand													
MCLNL164DBB	1.00	1.00	1.250	6.00	1.17	-5	CN..432RBB	ICSN433BB	KLM48BB	4 mm	551.350	557.150	4 mm
MCLNL204DBB	1.25	1.25	1.500	6.00	1.17	-6	CN..432RBB	ICSN433BB	KLM48BB	4 mm	551.350	557.150	4 mm

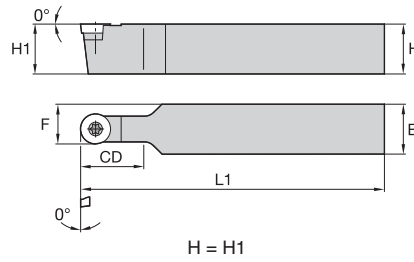
Application Specific



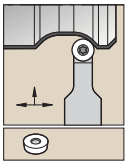
See page F9 for inserts.

beyond BLAST™

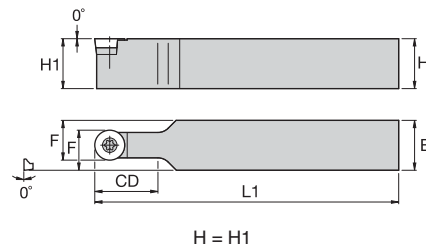
■ **SRDC**



catalog number	H	B	F	L1	CD	gage insert	shim	insert screw	wrench size insert screw
left hand SRDCN3232P19BB	32	32	25,5	173	50,8	RCGX190600ELF	SM907	MS2246	T25



See page F9 for inserts.



■ **SROC**

catalog number	H	B	F	L1	CD	gage insert	shim	insert screw	wrench size insert screw
left hand SROCN206BB	1.25	1.25	1.000	6.00	2.00	RCGX64ELF	SM907	MS2246	T25

Application Specific

Looking for a product that's not shown in this catalog?
Check the Kennametal website!



Turning

Online product catalog available 24/7

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The Fix-Perfect™ Precision Ground Insert Program Goes Above and Beyond™!



Primary Application

The breakthrough performance characteristics of these precision ground inserts enable outstanding indexing accuracy and excellent chip flow when machining steel, cast iron, and stainless steel workpiece materials.

Fix-Perfect Beyond Inserts are the ideal solution to machining operations in a multitude of industries, including fluid power, energy, automotive, heavy equipment, and general engineering applications.

Features and Benefits

Features	Functions
Tangential design.	Stable system.
Rigid clamping system.	Very stable clamping system and quick and easy cutting edge switch.
Up to eight cutting edges (protected by pocket seat).	Use up to eight edges per insert.
Positive geometry.	Very low cutting forces and excellent chip control.
Precision ground insert.	Better indexing accuracy.



Benefits

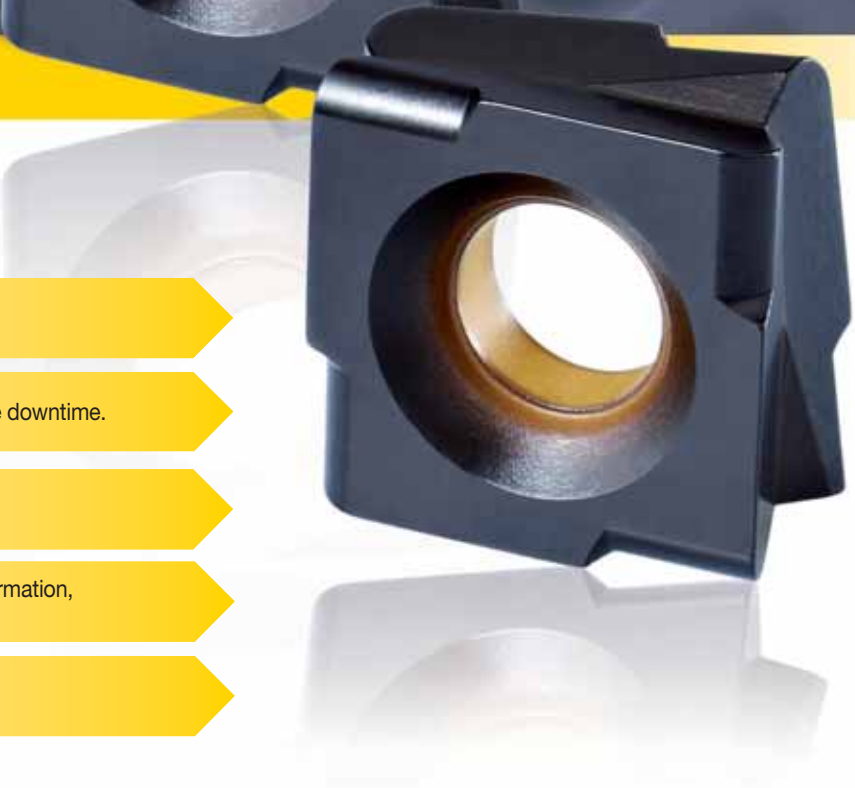
Process reliability and high productivity.

Process reliability, high productivity, and reduced machine downtime.

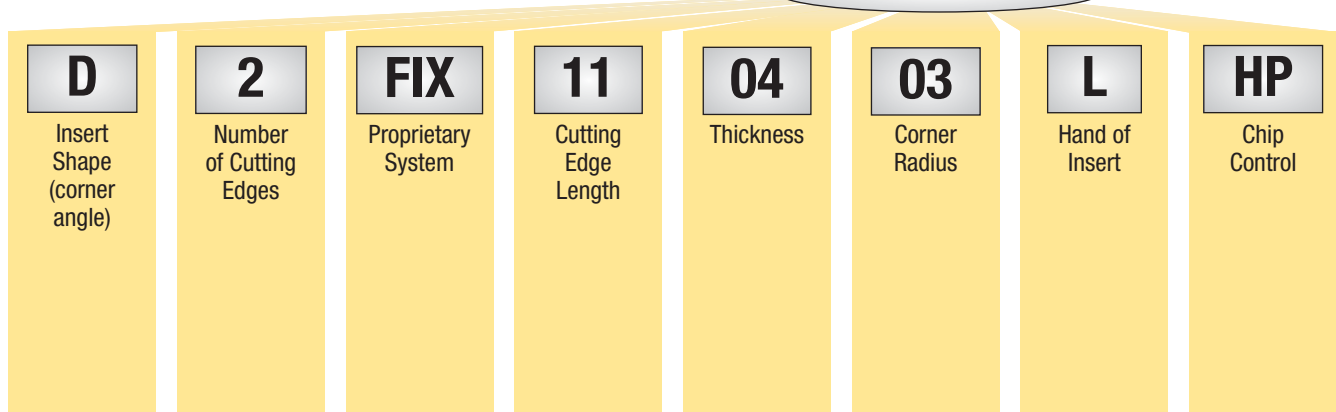
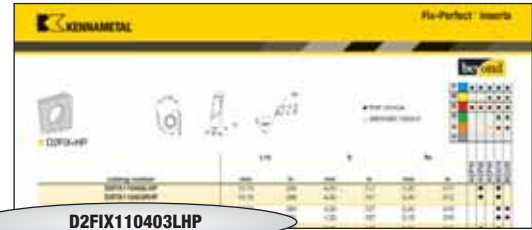
Higher productivity.

Low vibrations, smooth cut, silent cut, no workpiece deformation, and high surface quality.

Process reliability.



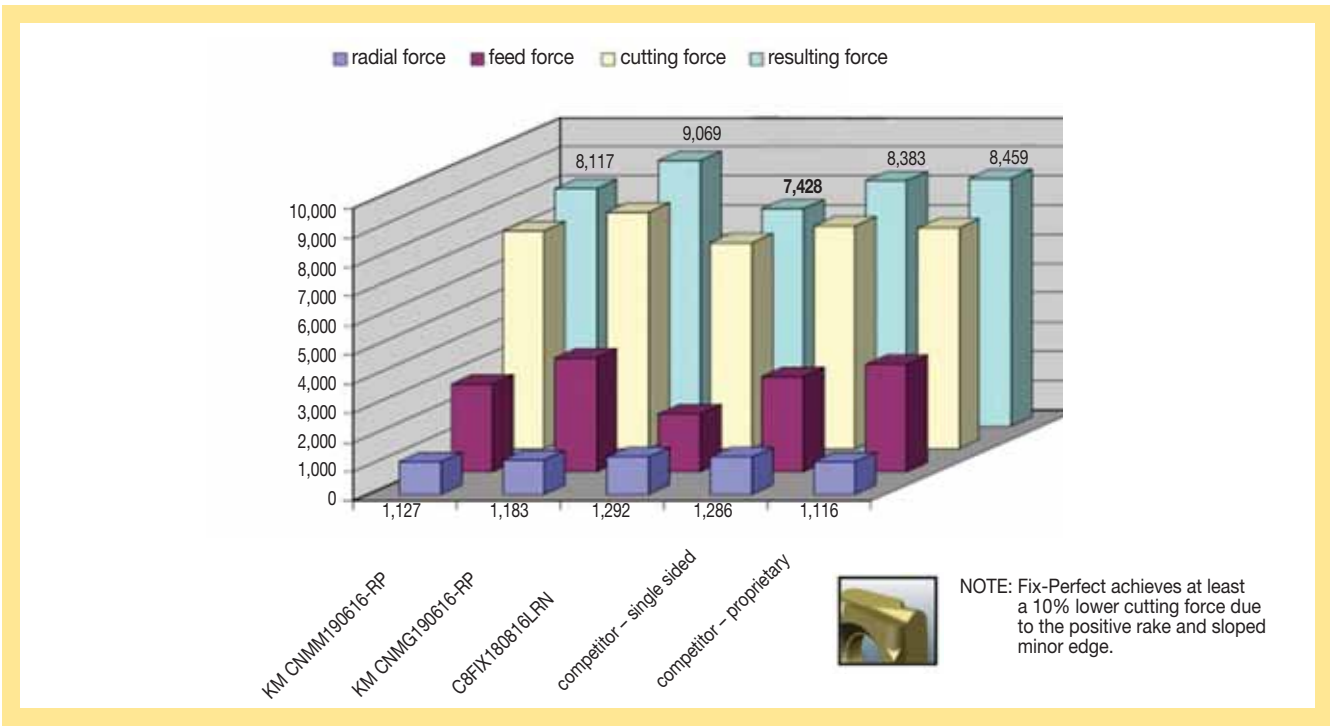
Beyond™ Identification System

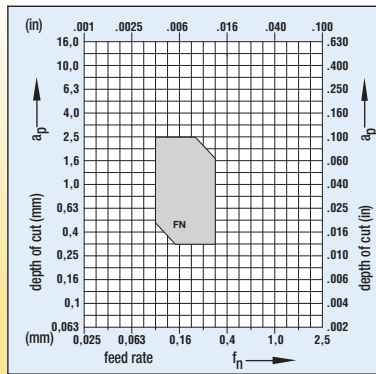
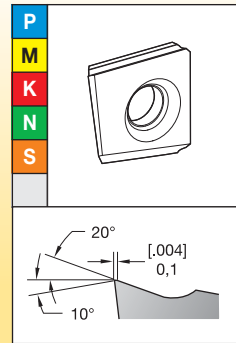


Application Specific

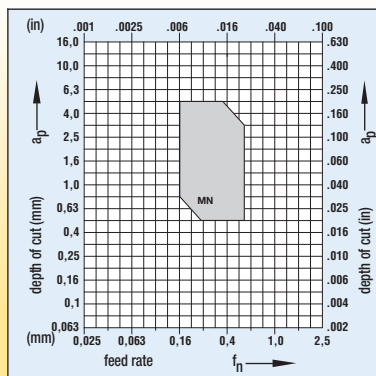
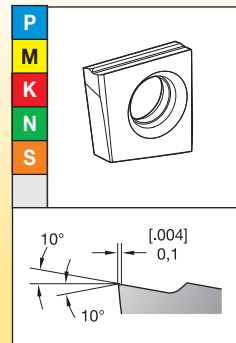
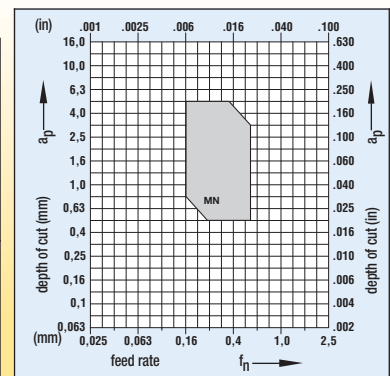
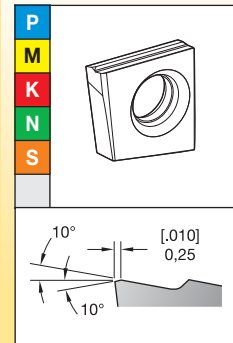
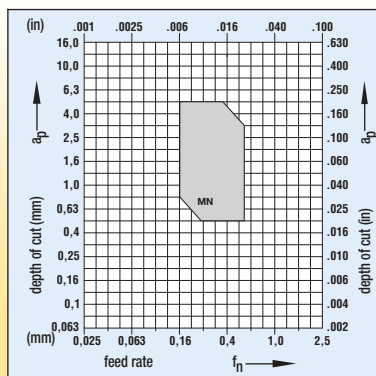
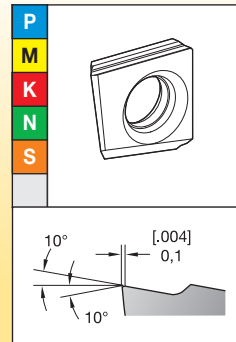
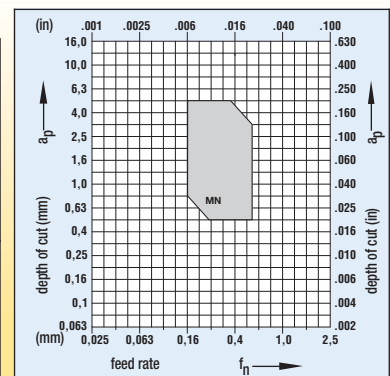
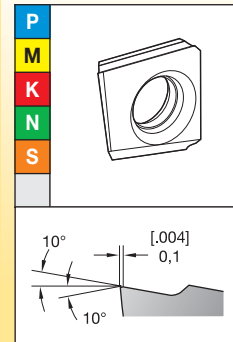
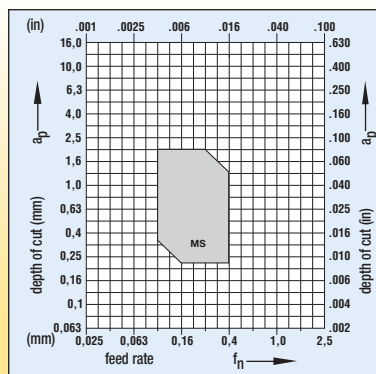
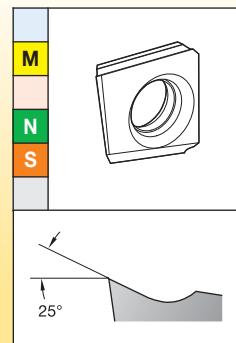
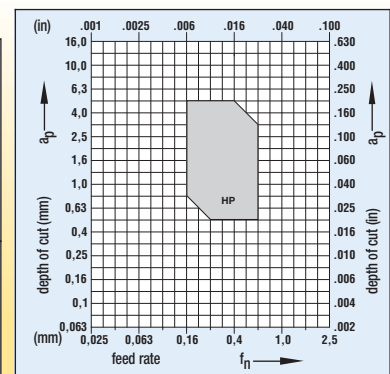
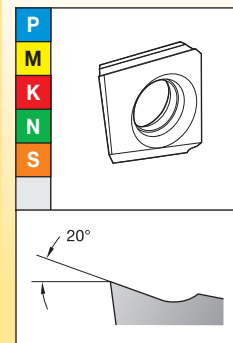
New Beyond Fix-Perfect Naming System

old catalog number	description	new catalog number
1.21101R151	insert with 2 positive cutting edges, corner radius $r = 56^\circ$	D2FIX110403RMS



Finishing
D2FIX-FN


P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous Materials
S	High-Temp Alloys
H	Hardened Materials

Medium Machining
C2FIX15-MN

C2FIX18-MN

D2FIX-MN

K2FIX-MN

D2FIX-MS

D2FIX-HP


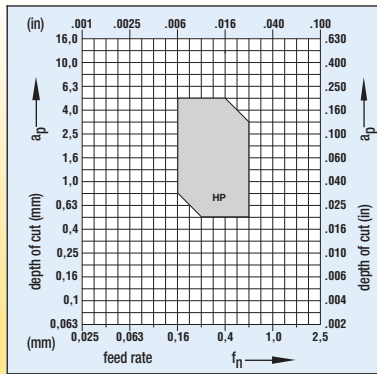
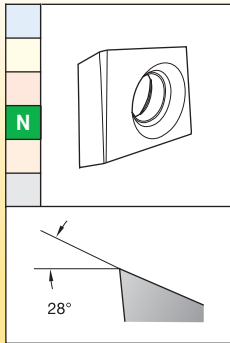
(continued)

Application Specific

(continued)

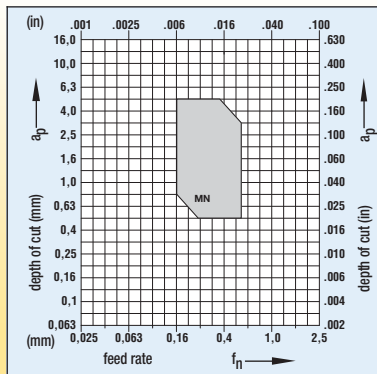
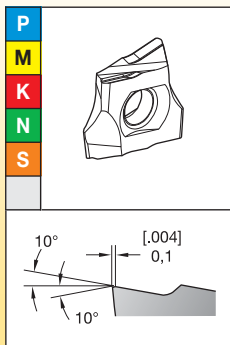
Medium Machining

E2FIX-HP

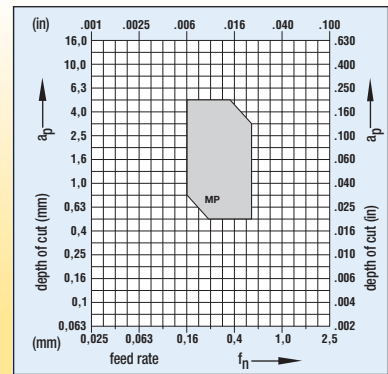
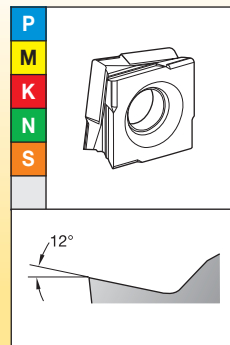


P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous Materials
S	High-Temp Alloys
H	Hardened Materials

D4FIX-MN



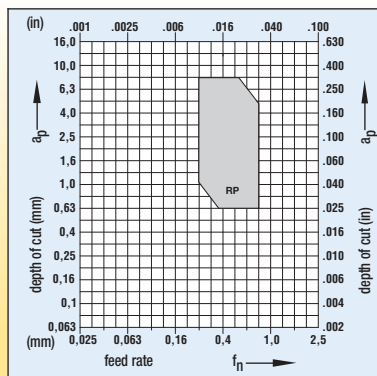
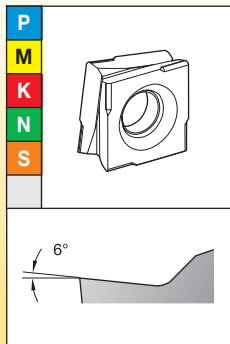
C8FIX-MP



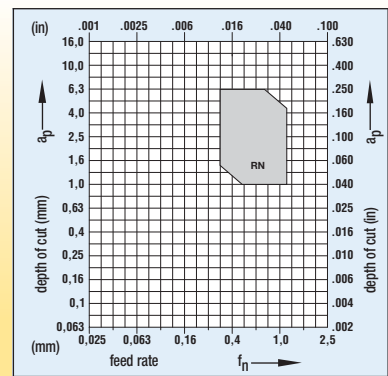
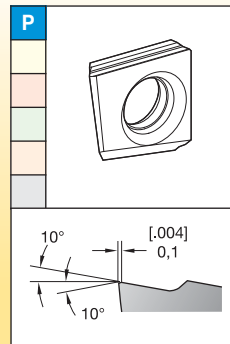
Application Specific

Roughing

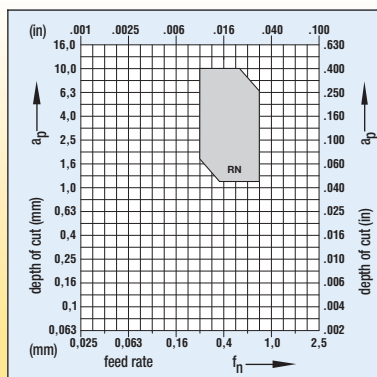
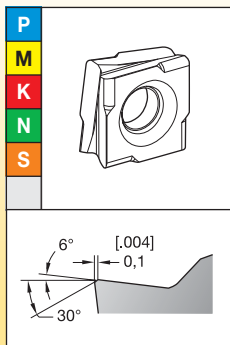
C8FIX-RP



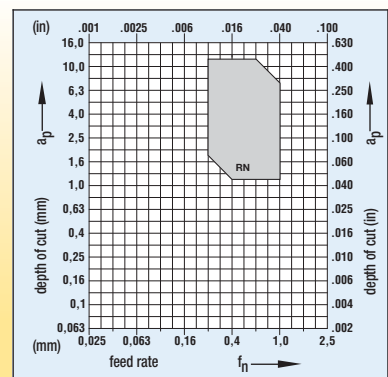
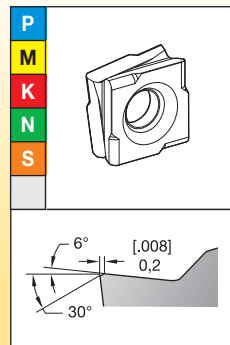
D2FIX-RN



C8FIX15-RN



C8FIX18-RN

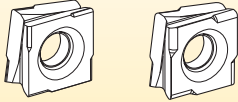


Select the Insert Geometry

8-Edged Inserts

Roughing

Interrupted cut and/or heavy scale
USE: -RP OR -RN



-RP

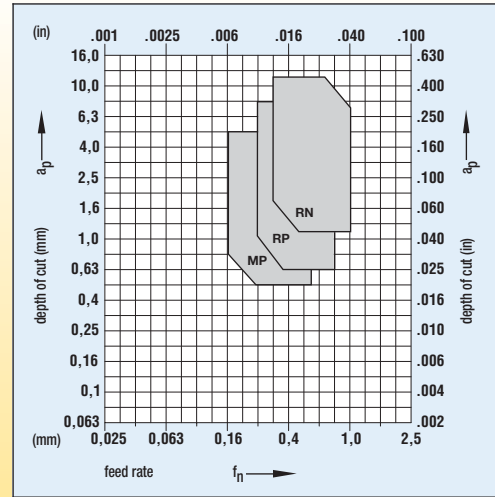
-RN

Medium Turning

Slightly interrupted cut and/or slight scale
USE: -MP



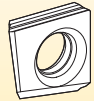
-MP



2- and 4-Edged Inserts

Roughing

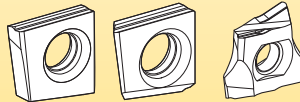
Interrupted cut and/or heavy scale
USE: -RN



-RN

Medium Turning

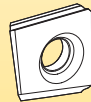
Slightly interrupted cut and/or slight scale
USE: -MN



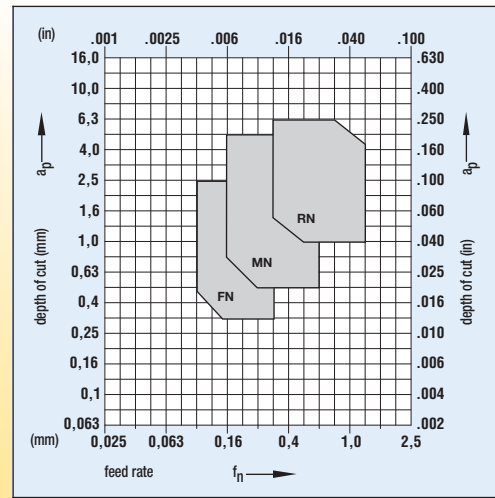
-MN

Finishing

Non-interrupted cut, no scale
USE: -FN



-FN



2-Edged Inserts, High Positive

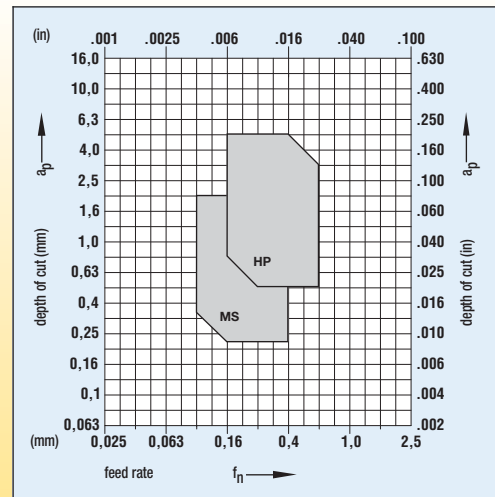
Medium Turning

Slightly interrupted cut and/or slight scale
USE: -HP OR -MS



-HP

-MS



Application Specific

■ Select the Grade

	P	M	K	N	S	H
heavy interrupted	KCP40/KCU25	KCU25	KCP25/KCU25	KCU25	KCU25	—
lightly interrupted	KCP25/KCU25	KCU25	KCP25/KCU25	KCU25	KCU25	—
varying depths of cut	KCP10/KCU10	KCU10	KCP10/KCU10	KCU10	KCU10	KCU10
smooth	KCP10/KCU10	KCU10	KCP10/KCU10	KCU10	KCU10	KCU10

■ Select the Cutting Speed

Steel speed — m/min (SFM) starting conditions

material group	grade	60 (200)	90 (300)	120 (400)	150 (500)	185 (617)	215 (717)	245 (800)	275 (900)	300 (1000)	m/min	SFM
P	KCP40										150	500
	KCU10										200	650
	KCP25										200	650
	KCP10										250	800

Stainless Steel speed — m/min (SFM) starting conditions

material group	grade	45 (150)	70 (233)	90 (300)	115 (383)	140 (467)	165 (550)	185 (617)	210 (700)	230 (767)	m/min	SFM
M	KCP40										140	450
	KCU25										165	500
	KCU10										185	600

Cast Iron speed — m/min (SFM) starting conditions

material group	grade	90 (300)	135 (450)	180 (600)	225 (750)	275 (900)	320 (1050)	360 (1200)	410 (1350)	460 (1500)	m/min	SFM
K	KCU25										165	500
	KCU10										180	600
	KCP25										230	750
	KCP10										260	850

Non-Ferrous speed — m/min (SFM) starting conditions

material group	grade	150 (500)	225 (750)	300 (1000)	380 (1267)	460 (1533)	535 (1783)	610 (2033)	685 (2283)	760 (2533)	m/min	SFM
N	KCU10										460	1500

High-Temperature Alloys speed — m/min (SFM) starting conditions

material group	grade	35 (117)	45 (150)	55 (183)	65 (217)	75 (250)	85 (283)	95 (317)	120 (400)	140 (467)	m/min	SFM
S	KCU25										45	150
	KCU10										60	200

Hardened Steel speed — m/min (SFM) starting conditions

material group	grade	5 (17)	15 (50)	25 (83)	35 (117)	45 (150)	55 (183)	65 (217)	75 (250)	85 (283)	m/min	SFM
H	KCU10										30	100

Application Specific

Fix-Perfect Tool System



With 2, 4, or 8 edges, this tool system is the ideal supplement to ISO tools.

The examples on the following page show the range of possible applications.



Use of the Fix-Perfect system results in:

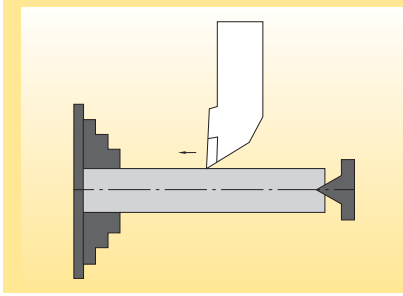
- Lower cutting forces.
- Smooth, open chips.
- Larger feed rates and depths of cut.



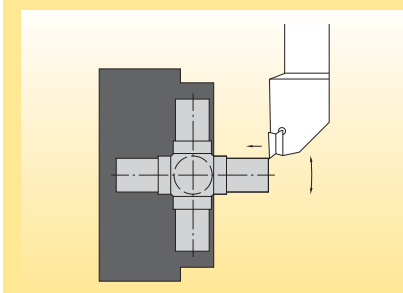
Application Specific

(continued)

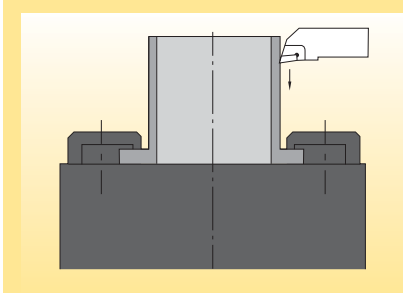
(continued)



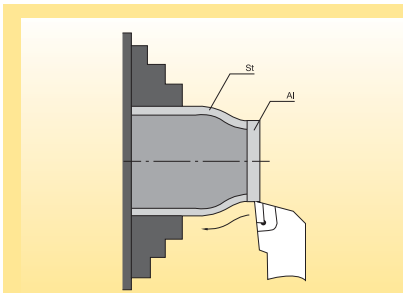
Turning slender shafts (clamping on one side also possible) with a workpiece length outside the chuck $>8 \times D$ with high geometric accuracy and surface finish.



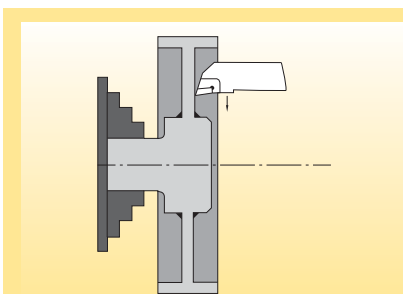
Machining of unstably chucked workpieces (e.g., in a swivel chuck).



External machining of thin-walled workpieces.

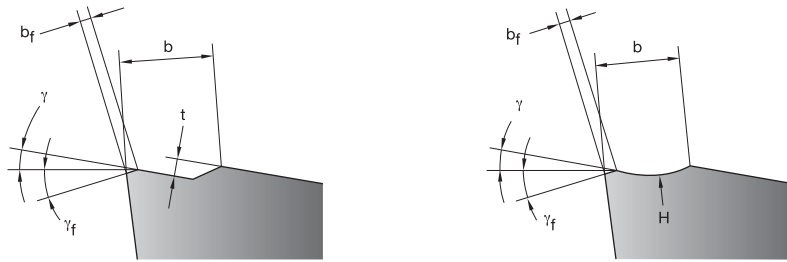


Turning material combinations of varying machinability, for example, aluminum combined with stainless and acid-proof steels.



Smoothing of welding seams with interrupted cuts.

Application Specific



old catalog number	new catalog number	b		t		γ°	b_f		γ_f°
		mm	inch	mm	inch		mm	inch	
NEW	C2FIX110404LMN	2,2	0.087	0,4	0.016	10	0,1	0.004	10
NEW	C2FIX110404RMN	2,2	0.087	0,4	0.016	10	0,1	0.004	10
1.21103L171	C2FIX110405LMN	2,2	0.087	0,4	0.016	10	0,1	0.004	10
1.21103R171	C2FIX110405RMN	2,2	0.087	0,4	0.016	10	0,1	0.004	10
NEW	C2FIX110408LMN	2,2	0.087	0,4	0.016	10	0,1	0.004	10
NEW	C2FIX110408RMN	2,2	0.087	0,4	0.016	10	0,1	0.004	10
NEW	C2FIX150504LMN	2,6	0.102	0,4	0.016	10	0,1	0.004	10
NEW	C2FIX150504RMN	2,6	0.102	0,4	0.016	10	0,1	0.004	10
1.21503L171	C2FIX150505LMN	2,6	0.102	0,4	0.016	10	0,1	0.004	10
1.21503R171	C2FIX150505RMN	2,6	0.102	0,4	0.016	10	0,1	0.004	10
NEW	C2FIX150508LMN	2,6	0.102	0,4	0.016	10	0,1	0.004	10
NEW	C2FIX150508RMN	2,6	0.102	0,4	0.016	10	0,1	0.004	10
1.21503L172	C2FIX150510LMN	3,2	0.126	0,5	0.020	10	0,2	0.008	10
1.21503R172	C2FIX150510RMN	3,2	0.126	0,5	0.020	10	0,2	0.008	10
NEW	C2FIX150512LMN	3,2	0.126	0,5	0.020	10	0,2	0.008	10
NEW	C2FIX150512RMN	3,2	0.126	0,5	0.020	10	0,2	0.008	10
1.21803L171	C2FIX180610LMN	3,2	0.126	0,5	0.020	10	0,2	0.008	10
1.21803R171	C2FIX180610RMN	3,2	0.126	0,5	0.020	10	0,2	0.008	10
1.21803L172	C2FIX180615LMN	4,0	0.157	0,6	0.024	10	0,3	0.012	10
1.21803R172	C2FIX180615RMN	4,0	0.157	0,6	0.024	10	0,3	0.012	10
1.21501L152	D2FIX150505LFN	3,2	0.126	H	H	20	0,1	0.004	10
1.21501R152	D2FIX150505RFN	3,2	0.126	H	H	20	0,1	0.004	10
1.21101L173	D2FIX110403LMN	2,2	0.087	0,4	0.016	10	0,1	0.004	10
1.21101R173	D2FIX110403RMN	2,2	0.087	0,4	0.016	10	0,1	0.004	10
NEW	D2FIX110404LMN	2,2	0.087	0,4	0.016	10	0,1	0.004	10
NEW	D2FIX110404RMN	2,2	0.087	0,4	0.016	10	0,1	0.004	10
1.21101L171	D2FIX110405LMN	2,2	0.087	0,4	0.016	10	0,1	0.004	10
1.21101R171	D2FIX110405RMN	2,2	0.087	0,4	0.016	10	0,1	0.004	10
1.21501R175	D2FIX150503RMN	2,2*	0.087	0,4	0.016	10	0,1	0.004	10
NEW	D2FIX150504LMN	2,2	0.087	0,4	0.016	10	0,1	0.004	10
NEW	D2FIX150504RMN	2,2	0.087	0,4	0.016	10	0,1	0.004	10
1.21501L171	D2FIX150505LMN	2,2	0.087	0,4	0.016	10	0,1	0.004	10
1.21501R171	D2FIX150505RMN	2,2	0.087	0,4	0.016	10	0,1	0.004	10
NEW	D2FIX150508LMN	2,6	0.102	0,4	0.016	10	0,1	0.004	10
NEW	D2FIX150508RMN	2,6	0.102	0,4	0.016	10	0,1	0.004	10
1.21501L173	D2FIX150510LMN	3,2	0.126	0,5	0.020	10	0,2	0.008	10
1.21501R173	D2FIX150510RMN	3,2	0.126	0,5	0.020	10	0,2	0.008	10
1.21801L171	D2FIX180610LMN	3,2	0.126	0,5	0.020	10	0,2	0.008	10
1.21801R171	D2FIX180610RMN	3,2	0.126	0,5	0.020	10	0,2	0.008	10
1.21501L172	D2FIX150505LRN	2,6	0.102	0,4	0.016	10	0,1	0.004	10
1.21501R172	D2FIX150505RRN	2,6	0.102	0,4	0.016	10	0,1	0.004	10
1.21501L154	D2FIX150503LMS	3,0	0.118	H	H	25**	Sharp	Sharp	Sharp
1.21501R154	D2FIX150503RMS	3,0	0.118	H	H	25**	Sharp	Sharp	Sharp
1.21501L155	D2FIX150505LMS	3,0*	0.118	H	H	25**	Sharp	Sharp	Sharp

Application Specific

H – Hollow-ground.

* – Deviation from old catalog number.

 ** – At mounting angle (clearance) 7°. Also 12° mounting angle possible (dependent on toolholder), then $\gamma = 20^\circ$.

(continued)

(continued)

Application Specific

old catalog number	new catalog number	b		t		γ°	b _r		γ_r°
		mm	inch	mm	inch		mm	inch	
1.21501R155	D2FIX150505RMS	3,0*	0.118	H	H	25**	Sharp	Sharp	Sharp
1.21101L151	D2FIX110403LHP	2,6	0.102	H	H	20	Sharp	Sharp	Sharp
1.21101R151	D2FIX110403RHP	2,6	0.102	H	H	20	Sharp	Sharp	Sharp
NEW	D2FIX110404LHP	2,6	0.102	H	H	20	Sharp	Sharp	Sharp
NEW	D2FIX110404RHP	2,6	0.102	H	H	20	Sharp	Sharp	Sharp
1.21501L151	D2FIX150503LHP	3,0	0.118	H	H	20	Sharp	Sharp	Sharp
1.21501R151	D2FIX150503RHP	3,0	0.118	H	H	20	Sharp	Sharp	Sharp
NEW	D2FIX150504LHP	3,0	0.118	H	H	20	Sharp	Sharp	Sharp
NEW	D2FIX150504RHP	3,0	0.118	H	H	20	Sharp	Sharp	Sharp
NEW	D2FIX150508LHP	3,0	0.118	H	H	20	Sharp	Sharp	Sharp
NEW	D2FIX150508RHP	3,0	0.118	H	H	20	Sharp	Sharp	Sharp
1.21500L145	E2FIX100505LHP	—	—	—	—	28	Sharp	Sharp	Sharp
1.21500R145	E2FIX100505RHP	—	—	—	—	28	Sharp	Sharp	Sharp
1.21500L171	K2FIX150505LMN	2,2	0.087	0,4	0.016	10	0,1	0.004	10
1.21500R171	K2FIX150505RMN	2,2	0.087	0,4	0.016	10	0,1	0.004	10
1.42002L173	D4FIX140603LMN	2,2	0.087	0,4	0.016	10	0,1	0.004	10
1.42002R173	D4FIX140603RMN	2,2	0.087	0,4	0.016	10	0,1	0.004	10
NEW	D4FIX140604LMN	2,2	0.087	0,4	0.016	10	0,1	0.004	10
NEW	D4FIX140604RMN	2,2	0.087	0,4	0.016	10	0,1	0.004	10
1.42002L171	D4FIX140605LMN	2,2	0.087	0,4	0.016	10	0,1	0.004	10
1.42002R171	D4FIX140605RMN	2,2	0.087	0,4	0.016	10	0,1	0.004	10
NEW	D4FIX140608LMN	2,2	0.087	0,4	0.016	10	0,1	0.004	10
NEW	D4FIX140608RMN	2,2	0.087	0,4	0.016	10	0,1	0.004	10
1.81202L171	C8FIX120503LMP	1,6	0.063	0,3	0.012	12	—	—	—
1.81202R171	C8FIX120503RMP	1,6	0.063	0,3	0.012	12	—	—	—
1.81502L171	C8FIX150603LMP	2,0	0.079	0,3	0.012	12	—	—	—
1.81502R171	C8FIX150603RMP	2,0	0.079	0,3	0.012	12	—	—	—
1.81802L171	C8FIX180805LMP	2,3	0.091	0,4	0.016	12	—	—	—
1.81802R171	C8FIX180805RMP	2,3	0.091	0,4	0.016	12	—	—	—
1.81201L121	C8FIX120503LRP	—	—	—	—	6	—	—	—
1.81201R121	C8FIX120503RRP	—	—	—	—	6	—	—	—
NEW	C8FIX120504LRP	—	—	—	—	6	—	—	—
NEW	C8FIX120504RRP	—	—	—	—	6	—	—	—
1.81201L122	C8FIX120505LRP	—	—	—	—	6	—	—	—
1.81201R122	C8FIX120505RRP	—	—	—	—	6	—	—	—
NEW	C8FIX120508LRP	—	—	—	—	6	—	—	—
NEW	C8FIX120508RRP	—	—	—	—	6	—	—	—
NEW	C8FIX120512LRP	—	—	—	—	6	—	—	—
NEW	C8FIX120512RRP	—	—	—	—	6	—	—	—
1.81501L121	C8FIX150605LRN	—	—	—	—	6	0,1	0.004	30
1.81501R121	C8FIX150605RRN	—	—	—	—	6	0,1	0.004	30
1.81501L122	C8FIX150608LRN	—	—	—	—	6	0,1	0.004	30
1.81501R122	C8FIX150608RRN	—	—	—	—	6	0,1	0.004	30
NEW	C8FIX150612LRN	—	—	—	—	6	0,1	0.004	30
NEW	C8FIX150612RRN	—	—	—	—	6	0,1	0.004	30
1.81801L121	C8FIX180808LRN	—	—	—	—	6	0,2	0.008	30
1.81801R121	C8FIX180808RRN	—	—	—	—	6	0,2	0.008	30
1.81801L122	C8FIX180812LRN	—	—	—	—	6	0,2	0.008	30
1.81801R122	C8FIX180812RRN	—	—	—	—	6	0,2	0.008	30

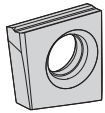
H – Hollow-ground.

* – Deviation from old catalog number.

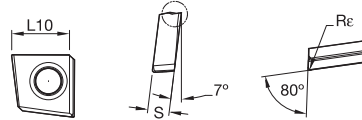
** – At mounting angle (clearance) 7°. Also 12° mounting angle possible (dependent on toolholder), then $\gamma = 20^\circ$.

P	●	●	●	●	●	●
M	○	○	○	○	○	○
K	●	●	●	●	●	●
N	●	●	●	●	●	●
S	○	○	○	○	○	○
H	●	●	●	●	●	●

● first choice
○ alternate choice



■ C2FIX-MN



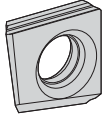
catalog number	L10		S		Rε		KCP10	KCP25	KCP40	KCU10	KCU25
	mm	in	mm	in	mm	in					
C2FIX110404LMN	10,70	.423	4,00	.157	0,40	.016	●	●	●	●	●
C2FIX110404RMN	10,70	.423	4,00	.157	0,40	.016	●	●	●	●	●
C2FIX110405LMN	10,70	.423	4,00	.157	0,50	.020	●	●	●	●	●
C2FIX110405RMN	10,70	.432	4,00	.157	0,50	.020	●	●	●	●	●
C2FIX110408LMN	10,70	.419	4,00	.157	0,80	.032	●	●	●	●	●
C2FIX110408RMN	10,70	.419	4,00	.157	0,80	.032	●	●	●	●	●
C2FIX150504LMN	14,70	.578	5,00	.197	0,40	.016	●	●	●	●	●
C2FIX150504RMN	14,70	.578	5,00	.197	0,40	.016	●	●	●	●	●
C2FIX150505LMN	14,70	.578	5,00	.197	0,50	.020	●	●	●	●	●
C2FIX150505RMN	14,70	.578	5,00	.197	0,50	.020	●	●	●	●	●
C2FIX150508LMN	14,60	.574	5,00	.197	0,80	.032	●	●	●	●	●
C2FIX150508RMN	14,60	.574	5,00	.197	0,80	.032	●	●	●	●	●
C2FIX150510LMN	14,50	.571	5,00	.197	1,00	.039	●	●	●	●	●
C2FIX150510RMN	14,50	.572	5,00	.197	1,00	.039	●	●	●	●	●
C2FIX150512LMN	14,50	.571	5,00	.197	1,20	.048	●	●	●	●	●
C2FIX150512RMN	14,50	.571	5,00	.197	1,20	.048	●	●	●	●	●
C2FIX180610LMN	17,50	.689	6,00	.236	1,00	.039	●	●	●	●	●
C2FIX180610RMN	17,50	.689	6,00	.236	1,00	.039	●	●	●	●	●
C2FIX180615LMN	17,50	.689	6,00	.236	1,50	.059	●	●	●	●	●
C2FIX180615RMN	17,50	.689	6,00	.236	1,50	.059	●	●	●	●	●

Application Specific

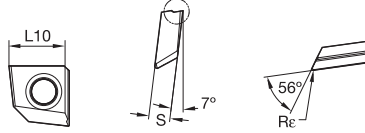
beyond

P	●	●	●	●	●	●
M	○	○	○	○	○	○
K	●	●	●	●	●	●
N	○	○	○	○	○	○
S	○	○	○	○	○	○
H	○	○	○	○	○	○

● first choice
○ alternate choice



D2FIX-MN

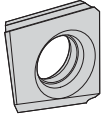
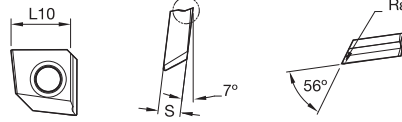


catalog number	L10		S		Re		KCP10	KCP25	KCP40	KCU10	KCU25
	mm	in	mm	in	mm	in					
D2FIX110403LMN	10,70	.420	4,00	.157	0,30	.012	●	●	○	○	○
D2FIX110403RMN	10,70	.420	4,00	.157	0,30	.012	●	●	○	○	○
D2FIX110404LMN	10,60	.417	4,00	.157	0,40	.016	●	●	○	○	○
D2FIX110404RMN	10,60	.417	4,00	.157	0,40	.016	●	●	○	○	○
D2FIX110405LMN	10,50	.413	4,00	.157	0,50	.020	●	●	○	○	○
D2FIX110405RMN	10,50	.413	4,00	.157	0,50	.020	●	●	○	○	○
D2FIX150503RMN	14,70	.579	5,00	.197	0,30	.012	●	●	○	○	○
D2FIX150504LMN	14,60	.575	5,00	.197	0,40	.016	●	●	○	○	○
D2FIX150504RMN	14,60	.575	5,00	.197	0,40	.016	●	●	○	○	○
D2FIX150505LMN	14,50	.571	5,00	.197	0,50	.020	●	●	○	○	○
D2FIX150505RMN	14,50	.571	5,00	.197	0,50	.020	●	●	○	○	○
D2FIX150508LMN	14,20	.560	5,00	.197	0,80	.032	●	●	○	○	○
D2FIX150508RMN	14,20	.560	5,00	.197	0,80	.032	●	●	○	○	○
D2FIX150510LMN	14,00	.551	5,00	.197	1,00	.039	●	●	○	○	○
D2FIX150510RMN	14,00	.551	5,00	.197	1,00	.039	●	●	○	○	○
D2FIX180610LMN	17,00	.669	6,00	.236	1,00	.039	●	●	○	○	○
D2FIX180610RMN	17,00	.669	6,00	.236	1,00	.039	●	●	○	○	○

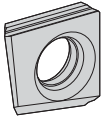
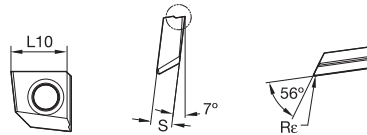
Application Specific

P	●	●	●	●	●	●
M	○	○	○	○	○	○
K	●	●	●	●	●	●
N	○	○	○	○	○	○
S	○	○	○	○	○	○
H	○	○	○	○	○	○

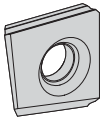
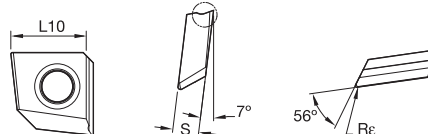
● first choice
○ alternate choice


D2FIX-HP


catalog number	L10		S		Rε		KCP10	KCP25	KCP40	KCU10	KCU25
	mm	in	mm	in	mm	in					
D2FIX110403LHP	10,10	.396	4,00	.157	0,30	.012	●	●	●	●	●
D2FIX110403RHP	10,10	.396	4,00	.157	0,30	.012	●	●	●	●	●
D2FIX110404LHP	10,00	.394	4,00	.157	0,40	.016				●	●
D2FIX110404RHP	10,00	.394	4,00	.157	0,40	.016				●	●
D2FIX150503LHP	14,10	.554	5,00	.197	0,30	.012	●	●	●	●	●
D2FIX150503RHP	14,10	.554	5,00	.197	0,30	.012	●	●	●	●	●
D2FIX150504LHP	14,00	.551	5,00	.197	0,40	.016				●	●
D2FIX150504RHP	14,00	.551	5,00	.197	0,40	.016				●	●
D2FIX150508LHP	13,60	.535	5,00	.197	0,80	.032				●	●
D2FIX150508RHP	13,60	.535	5,00	.197	0,80	.032				●	●


D2FIX-MS


catalog number	L10		S		Rε		KCP10	KCP25	KCP40	KCU10	KCU25
	mm	in	mm	in	mm	in					
D2FIX150505RMS	13,90	.549	5,00	.197	0,50	.020				●	●
D2FIX150505LMS	13,90	.549	5,00	.197	0,50	.020				●	●
D2FIX150503RMS	14,10	.554	5,00	.197	0,30	.012				●	●
D2FIX150503LMS	14,10	.554	5,00	.197	0,30	.012				●	●


D2FIX-FN


catalog number	L10		S		Rε		KCP10	KCP25	KCP40	KCU10	KCU25
	mm	in	mm	in	mm	in					
D2FIX150505RFN	13,90	.549	5,00	.197	0,50	.020	●	●	●	●	●
D2FIX150505LFN	13,90	.549	5,00	.197	0,50	.020	●	●	●	●	●

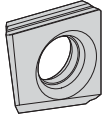


Application Specific

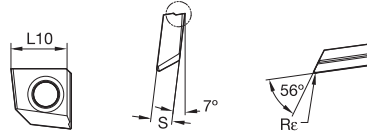
beyond

P	●	●	●	●	●	●
M	○	○	○	○	○	○
K	●	●	●	●	●	●
N	●	●	●	●	●	●
S	○	○	○	○	○	○
H	●	●	●	●	●	●

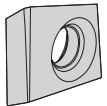
● first choice
○ alternate choice



■ D2FIX-RN



catalog number	L10		S		Rε		KCP10	KCP25	KCP40	KCU10	KCU25
	mm	in	mm	in	mm	in					
D2FIX150505LRN	14,50	.571	5,00	.197	0,50	.020	●	●	●	○	○
D2FIX150505RRN	14,50	.571	5,00	.197	0,50	.020	●	●	○	○	○



■ E2FIX-HP



catalog number	L10		S		Rε		KCP10	KCP25	KCP40	KCU10	KCU25
	mm	in	mm	in	mm	in					
E2FIX100505RHP	10,50	.413	5,00	.197	0,50	.020	○	○	○	○	○
E2FIX100505LHP	10,50	.413	5,00	.197	0,50	.020	○	○	○	○	○

Application Specific

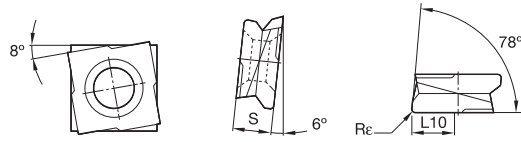
beyond

P	●	●	●	●	●	●	●
M	○	○	○	○	○	○	○
K	●	●	●	●	●	●	●
N	○	○	○	○	○	○	○
S	○	○	○	○	○	○	○
H	○	○	○	○	○	○	○

● first choice
○ alternate choice

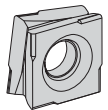


■ C8FIX-RN

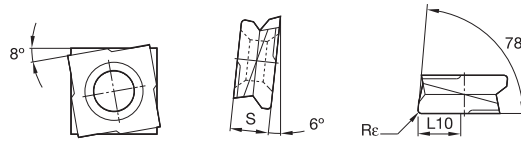


catalog number	L10		S		Rε		KCP10	KCP25	KCP40	KCU10	KCU25
	mm	in	mm	in	mm	in					
C8FIX150605LRN	9,10	.358	6,60	.260	0,50	.020	●	●	●	●	●
C8FIX150605RRN	9,10	.358	6,60	.260	0,50	.020	●	●	●	●	●
C8FIX150608LRN	8,90	.350	6,60	.260	0,80	.031	●	●	●	●	●
C8FIX150608RRN	8,90	.350	6,60	.260	0,80	.031	●	●	●	●	●
C8FIX150612LRN	8,60	.339	6,60	.260	1,20	.047	●	●	●	●	●
C8FIX150612RRN	8,60	.339	6,60	.260	1,20	.047	●	●	●	●	●
C8FIX180808LRN	10,90	.429	7,90	.311	0,80	.031	●	●	●	●	●
C8FIX180808RRN	10,90	.429	7,90	.311	0,80	.031	●	●	●	●	●
C8FIX180812LRN	10,60	.417	7,90	.311	1,20	.047	●	●	●	●	●
C8FIX180812RRN	10,60	.417	7,90	.311	1,20	.047	●	●	●	●	●

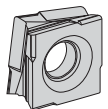
Application Specific



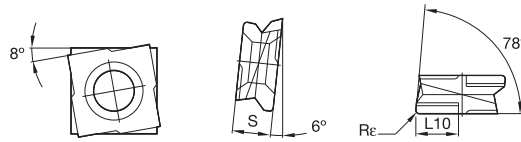
■ C8FIX-RP



catalog number	L10		S		Rε		KCP10	KCP25	KCP40	KCU10	KCU25
	mm	in	mm	in	mm	in					
C8FIX120503LRP	7,30	.287	5,50	.217	0,30	.012	●	●	●	●	●
C8FIX120503RRP	7,30	.287	5,50	.217	0,30	.012	●	●	●	●	●
C8FIX120504LRP	7,20	.283	5,50	.217	0,40	.016	●	●	●	●	●
C8FIX120504RRP	7,20	.283	5,50	.217	0,40	.016	●	●	●	●	●
C8FIX120505LRP	7,10	.280	5,50	.217	0,50	.020	●	●	●	●	●
C8FIX120505RRP	7,10	.280	5,50	.217	0,50	.020	●	●	●	●	●
C8FIX120508LRP	6,90	.272	5,50	.217	0,80	.031	●	●	●	●	●
C8FIX120508RRP	6,90	.272	5,50	.217	0,80	.031	●	●	●	●	●



■ C8FIX-MP



catalog number	L10		S		Rε		KCP10	KCP25	KCP40	KCU10	KCU25
	mm	in	mm	in	mm	in					
C8FIX120503LMP	7,30	.287	5,50	.217	0,30	.012	●	●	●	●	●
C8FIX120503RMP	7,30	.287	5,50	.217	0,30	.012	●	●	●	●	●
C8FIX150603LMP	9,30	.366	6,60	.260	0,30	.012	●	●	●	●	●
C8FIX150603RMP	9,30	.366	6,60	.260	0,30	.012	●	●	●	●	●
C8FIX180805LMP	11,10	.437	7,90	.311	0,50	.020	●	●	●	●	●
C8FIX180805RMP	11,10	.437	7,90	.311	0,80	.031	●	●	●	●	●



Carbide Recycling

Help preserve and protect our planet!

It's easy for your company to be environmentally conscious with the Kennametal Carbide Recycling Program.

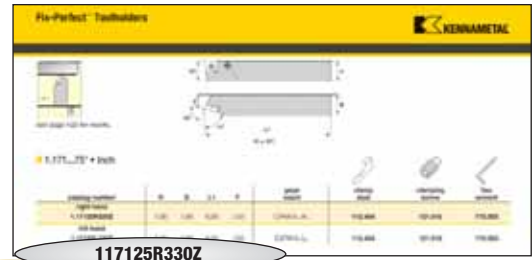
By sending us your used carbide tools, you help preserve and protect the environment and ensure that these products are recycled responsibly. Kennametal accepts any coated or non-coated carbide items, including inserts, drills, reamers, and taps.

By using the Kennametal Carbide Recycling Program, you will receive:

- A partner who cares about a sustainable environment.
- Easy-to-use web portal to value your used carbide.
- Access to our popular Green Box™ options for carbide collection.
- Systematic and efficient disposal of carbide materials.
- Improved profitability.



Program is not currently available in all geographical areas.
For more information, please visit www.kennametal.com/carbiderecycling.



117125R330Z

Application Specific

Metric/Inch

1

Turning Program

1 =
Fix-Perfect

1

Number of Cutters

1 = Inserts with 2 cutting edges
3 = Inserts with 4 cutting edges
7 = Inserts with 8 cutting edges

71

Version

08 = 90° or 93° setting, for machining aluminum
16 = 92° setting angle
20 = 92° setting angle
22 = 92° setting angle
30 = 75° setting angle
71 = 75° setting angle
72 = 45° setting angle
77 = 90° setting angle
80 = 90° or 93° setting angle

25

Shaft Dimensions

R

Direction of Working

R = Right
L = Left

3

Insert Size and Type

3

Insert Shape

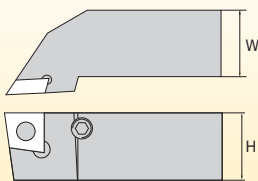
0

Clamping Screw Support

0 = Activated from main cutting edge
1 = Minor cutting edge
2 = Above
5 = Main cutting edge with sharp-edged full cartridge
6 = Minor cutting edge with sharp-edged full cartridge

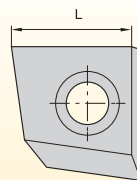
Z

Inch Toolholder

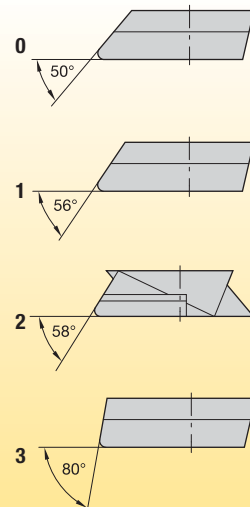


Toolholder

10 = 10 x 10mm
11 = 40 x 40mm
16 = 16 x 16mm
20 = 20 x 20mm
21 = 50 x 50mm
25 = 25 x 25mm
32 = 32 x 25mm
32 x 32mm
40 = 40 x 32mm

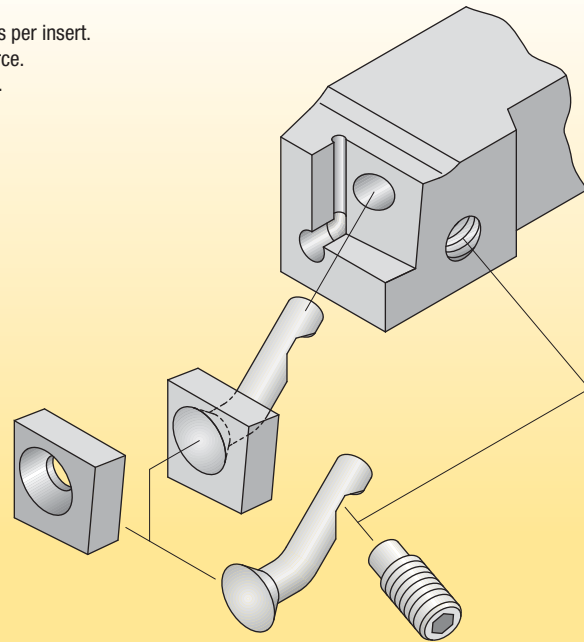


	L	cutting edges
0	8mm	4
	20mm	4
	25mm	4
1	10,5mm	2
	12mm	8
3	14,5mm	2
	15mm	8
4	17,5mm	2
	18mm	8
5	23,5mm	2
	21mm	8
7	10,5mm	2 Alu

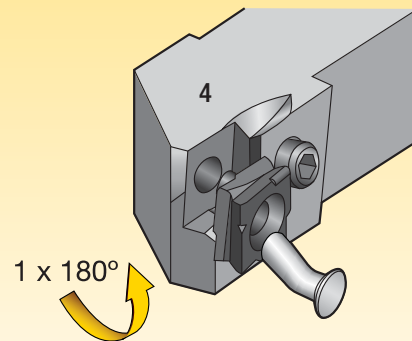
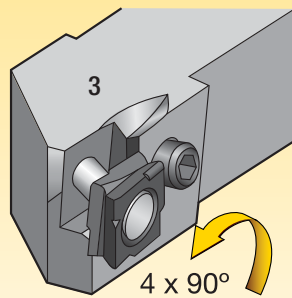
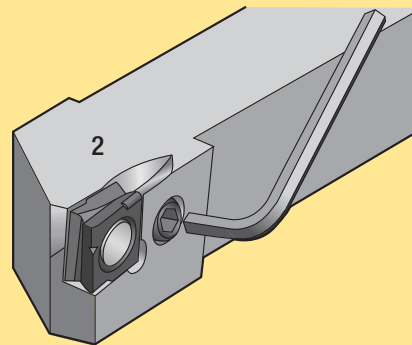
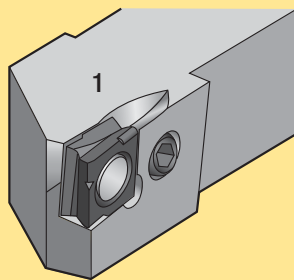


Features of the Fix-Perfect lathe tool system:

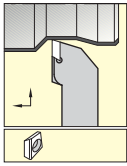
- Cost-effective use of inserts with up to eight positive cutting edges per insert.
- Indexable insert ground on all sides, thus requiring less cutting force.
- High stability due to upright insert for roughing and profiling tasks.
- Guaranteed rigid clamping of inserts.
- Optimum chip evacuation guaranteed.
- Cutting edges protected by insert seat.



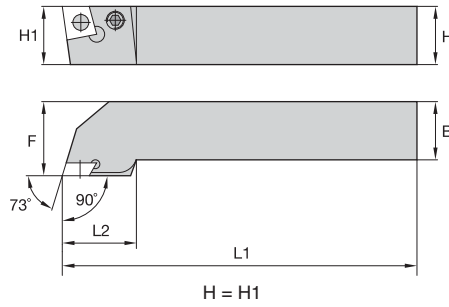
Quick and easy cutting edge switch —
just loosen the pin, no need to remove it.



Application Specific



See page F28 for inserts.



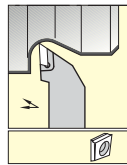
■ 1.108...90° • Metric



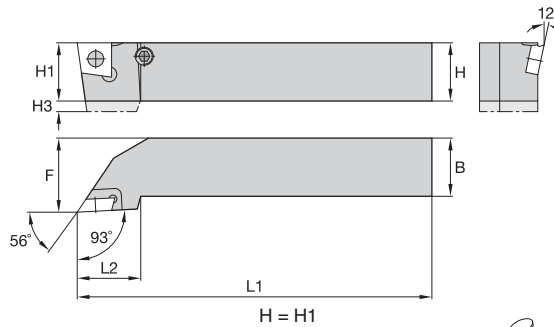
catalog number	H	B	L1	L2	F	gage insert	clamp stud	clamping screw	hex wrench
right hand 1.10825R700	25	25	150,0	36	32,0	E2FIX10..R..	410.081	121.616	170.003
left hand 1.10825L700	25	25	150,0	36	32,0	E2FIX10..L..	410.081	121.616	170.003



Application Specific



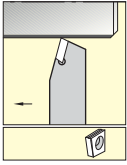
See page F27 for inserts.



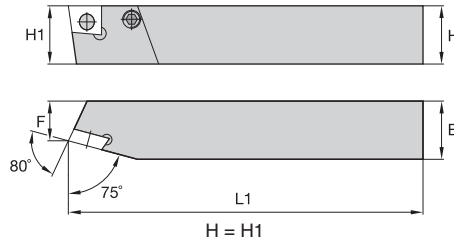
■ 1.108...93° • Metric



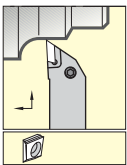
catalog number	H	H3	B	L1	L2	F	gage insert	clamp stud	clamping screw	hex wrench
right hand 1.10820R310	20	5	20	125,0	26	25,0	D2FIX15..RHP/FN/MS	112.403	121.612	170.003
1.10825R310	25	—	25	150,0	26	32,0	D2FIX15..RHP/FN/MS	112.404	121.616	170.003
left hand 1.10820L310	20	5	20	125,0	26	25,0	D2FIX15..LHP/FN/MS	112.403	121.612	170.003
1.10825L310	25	—	25	150,0	26	32,0	D2FIX15..LHP/FN/MS	112.404	121.616	170.003



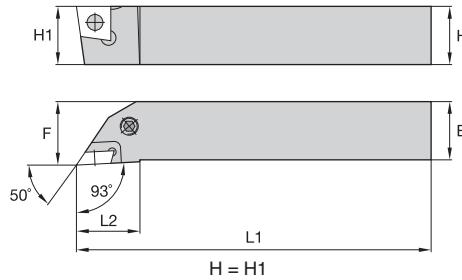
See page F25 for inserts.


1.171...75° • Metric


catalog number	H	B	L1	F	gage insert	clamp stud	clamping screw	hex wrench
right hand								
1.17120R130	20	20	125,0	15,0	C2FIX11..R..	112.244	121.612	170.003
1.17125R330	25	25	150,0	17,0	C2FIX15..R..	112.404	121.616	170.003
left hand								
1.17120L130	20	20	125,0	15,0	C2FIX11..L..	112.244	121.612	170.003
1.17125L330	25	25	150,0	17,0	C2FIX15..L..	112.404	121.616	170.003



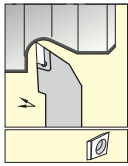
See page F29 for inserts.


1.180...93° • Metric

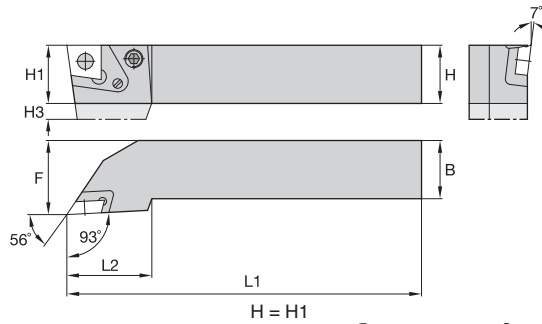

catalog number	H	B	L1	L2	F	gage insert	clamp stud	clamping screw	hex wrench
right hand									
1.18025R302	25	20	150,0	36	26,0	K2FIX15..R..	112.423	121.612	170.003
left hand									
1.18025L302	25	20	150,0	36	26,0	K2FIX15..L..	112.423	121.612	170.003



Application Specific



See page F27 for inserts.

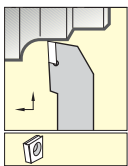


■ 1.18 • Metric

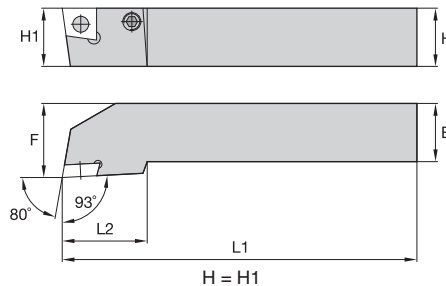


catalog number	H	H3	B	L1	L2	F	gage insert	clamp stud	clamping screw	hex wrench	steel nest assembly
right hand											
1.18016R110	16	4	16	100,0	28	24,0	D2FIX11..R..	112.244	121.612	170.003	—
1.18020R110	20	—	20	125,0	26	25,0	D2FIX11..R..	112.244	121.612	170.003	—
1.18020R310	20	5	20	125,0	26	26,0	D2FIX15..R..	112.403	121.612	170.003	—
1.18025R110	25	—	25	150,0	26	32,0	D2FIX11..R..	112.244	121.612	170.003	—
1.18025R310	25	—	25	150,0	26	32,0	D2FIX15..R..	112.404	121.616	170.003	—
1.18025R315	25	7	25	150,0	36	32,0	D2FIX15..R..	112.505	121.616	170.003	132.151
1.18032R315	32	—	25	170,0	36	32,0	D2FIX15..R..	112.505	121.616	170.003	132.151
1.18032R410	32	—	25	170,0	36	32,0	D2FIX18..R..	112.604	121.816	170.004	—
left hand											
1.18016L110	16	4	16	100,0	28	24,0	D2FIX11..L..	112.244	121.612	170.003	—
1.18020L110	20	—	20	125,0	26	25,0	D2FIX11..L..	112.244	121.612	170.003	—
1.18020L310	20	5	20	125,0	26	26,0	D2FIX15..L..	112.403	121.612	170.003	—
1.18025L110	25	—	25	150,0	26	32,0	D2FIX11..L..	112.244	121.612	170.003	—
1.18025L310	25	—	25	150,0	26	32,0	D2FIX15..L..	112.404	121.616	170.003	—
1.18025L315	25	7	25	150,0	36	32,0	D2FIX15..L..	112.505	121.616	170.003	132.156
1.18032L315	32	—	25	170,0	36	32,0	D2FIX15..L..	112.505	121.616	170.003	132.156
1.18032L410	32	—	25	170,0	36	32,0	D2FIX18..L..	112.604	121.816	170.004	—

Application Specific



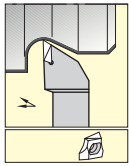
See page F25 for inserts.



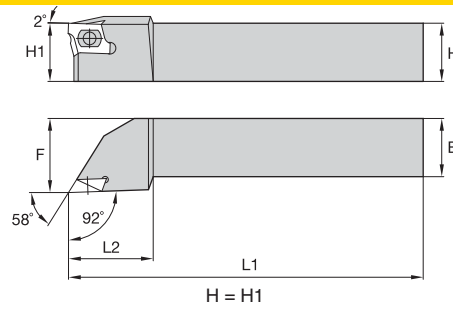
■ 1.180...93° • Metric



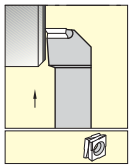
catalog number	H	B	L1	L2	F	gage insert	clamp stud	clamping screw	hex wrench
right hand									
1.18020R130	20	20	125,0	26	26,0	C2FIX11..R..	112.244	121.612	170.003
1.18025R130	25	25	150,0	26	32,0	C2FIX11..R..	112.244	121.612	170.003
1.18025R330	25	25	150,0	36	32,0	C2FIX15..R..	112.404	121.616	170.003
1.18032R430	32	25	170,0	36	32,0	C2FIX18..R..	112.604	121.816	170.004
left hand									
1.18020L130	20	20	125,0	26	26,0	C2FIX11..L..	112.244	121.612	170.003
1.18025L130	25	25	150,0	26	32,0	C2FIX11..L..	112.244	121.612	170.003
1.18025L330	25	25	150,0	36	32,0	C2FIX15..L..	112.404	121.616	170.003
1.18032L430	32	25	170,0	36	32,0	C2FIX18..L..	112.604	121.816	170.004



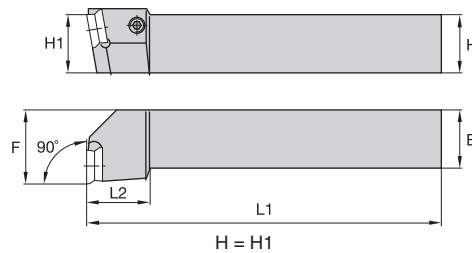
See page F29 for inserts.


1.380...92° • Metric

catalog number	H	B	L1	L2	F	gage insert	clamp stud	clamping screw	hex wrench
right hand									
1.38020R021	20	20	125,0	35	25,0	D4FIX..R..	114.111	121.812	170.004
1.38025R021	25	25	150,0	36	32,0	D4FIX..R..	114.111	121.816	170.004
left hand									
1.38020L021	20	20	125,0	35	25,0	D4FIX..L..	114.111	121.812	170.004
1.38025L021	25	25	150,0	36	32,0	D4FIX..L..	114.111	121.816	170.004

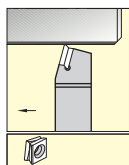


See page F30 for inserts.

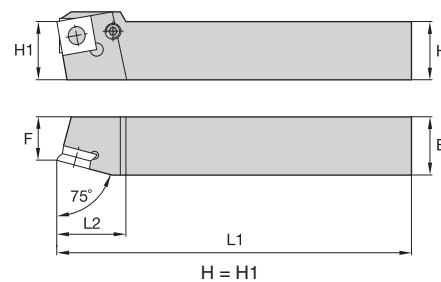

1.777...90° • Metric

catalog number	H	B	L1	L2	F	gage insert	clamp stud	clamping screw	hex wrench
right hand									
1.77720R101	20	20	125,0	26	25,5	1.81201L9	118.214	121.612	170.003
1.77725R301	25	25	150,0	26	32,0	C8FIX15..L..	118.314	121.816	170.004
left hand									
1.77720L101	20	20	125,0	26	25,5	1.81201R9	118.214	121.612	170.003

NOTE: Right-hand tool requires left-hand insert.






See page F30 for inserts.

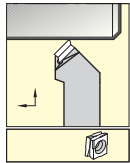

1.771...75° • Metric

catalog number	H	B	L1	L2	F	gage insert	clamp stud	clamping screw	hex wrench
right hand									
1.77120R100	20	20	125,0	20	17,0	C8FIX12..R..	118.204	121.612	170.003
1.77125R300	25	25	150,0	26	21,0	C8FIX15..R..	410.084	121.816	170.004
1.77132R400	32	32	170,0	38	27,0	C8FIX18..R..	118.404	121.820	170.004

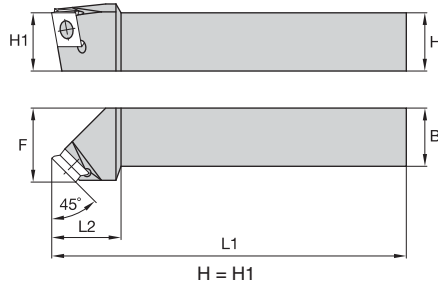
(continued)

(1.771...75° • Metric continued)

catalog number	H	B	L1	L2	F	gage insert	 clamp stud	 clamping screw	 hex wrench
left hand									
1.77120L100	20	20	125,0	20	17,0	C8FIX12..L..	118.204	121.612	170.003
1.77132L400	32	32	170,0	38	27,5	C8FIX18..L..	118.404	121.820	170.004






See page F30 for inserts.

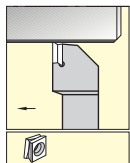


1.772...45° • Metric

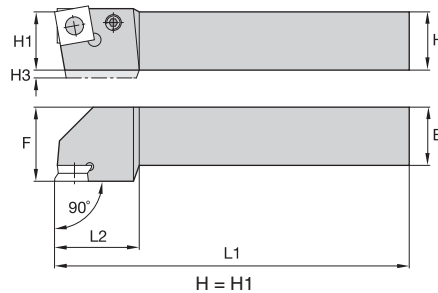
Application Specific

catalog number	H	B	L1	L2	F	gage insert	 clamp stud	 clamping screw	 hex wrench
right hand									
1.77225R301	25	25	150,0	26	32,0	C8FIX15..L..	118.314	121.816	170.004





NOTE: C8FIX15..L.. is usable just for plunging.
For both plunging and turning C4FIX15..L.. has to be used.

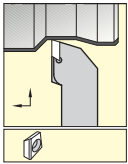


See page F30 for inserts.

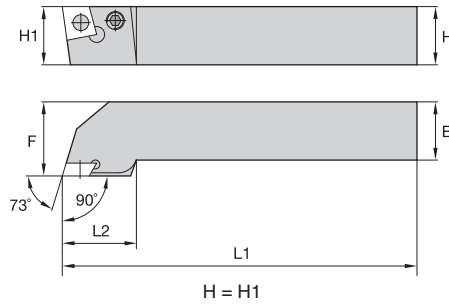


1.780...90° • Metric

catalog number	H	H3	B	L1	L2	F	gage insert	 clamp stud	 clamping screw	 screw	 hex wrench
right hand											
1.78012R103	12	—	12	80,0	20	14,0	C8FIX12..R..	—	—	122.511	170.003
1.78016R100	16	4	16	100,0	28	25,0	C8FIX12..R..	118.204	121.616	—	170.003
1.78020R100	20	—	20	125,0	26	25,0	C8FIX12..R..	118.204	121.616	—	170.003
1.78025R100	25	—	25	150,0	26	32,0	1.81201R...	118.214	121.616	—	170.003
1.78025R300	25	—	25	150,0	36	32,0	C8FIX15..R..	410.084	121.816	—	170.004
1.78032R400	32	—	32	170,0	36	40,0	C8FIX18..R..	118.404	121.825	—	170.004
left hand											
1.78025L100	25	—	25	150,0	26	32,0	1.81201L...	118.214	121.616	—	170.003
1.78025L300	25	—	25	150,0	36	32,0	C8FIX15..L..	410.084	121.816	—	170.004
1.78032L400	32	—	32	170,0	36	40,0	C8FIX18..L..	118.404	121.825	—	170.004



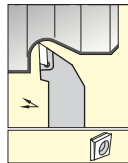
See page F28 for inserts.



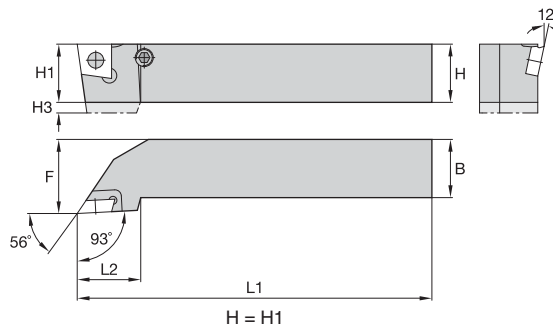
■ 1.108...90° • Inch



catalog number	H	B	L1	L2	F	gage insert	clamp stud	clamping screw	hex wrench
right hand 1.10825R700Z	1.00	1.00	6.00	1.42	1.250	E2FIX10..R..	410.081	121.616	170.003
left hand 1.10825L700Z	1.00	1.00	6.00	1.42	1.250	E2FIX10..L..	410.081	121.616	170.003



See page F27 for inserts.



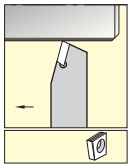
■ 1.108...93° • Inch



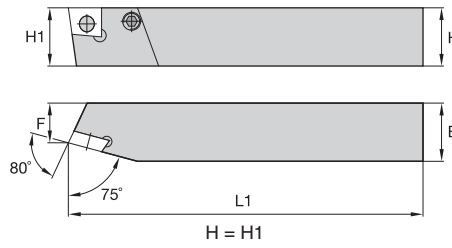
catalog number	H	B	L1	L2	F	gage insert	clamp stud	clamping screw	hex wrench
right hand 1.10825R310Z	1.00	1.00	6.00	1.18	1.250	D2FIX15..RHP/FN/MS	112.404	121.616	170.003
left hand 1.10825L310Z	1.00	1.00	6.00	1.18	1.250	D2FIX15..LHP/FN/MS	112.404	121.616	170.003



Application Specific



See page F25 for inserts.

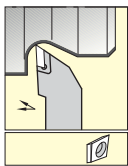


■ 1.171...75° • Inch

catalog number	H	B	L1	F	gage insert	clamp stud	clamping screw	hex wrench
right hand 1.17125R330Z	1.00	1.00	6.00	.750	C2FIX15..R..	112.404	121.616	170.003
left hand 1.17125L330Z	1.00	1.00	6.00	.750	C2FIX15..L..	112.404	121.616	170.003

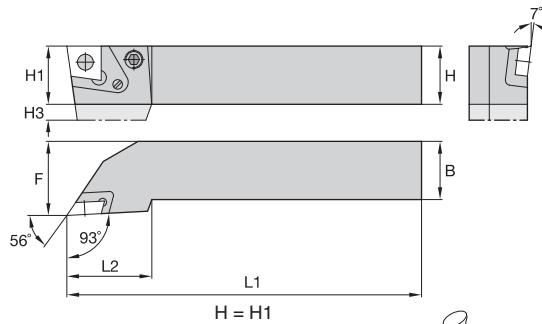


Application Specific

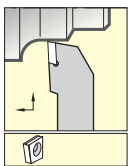


See page F26 for inserts.

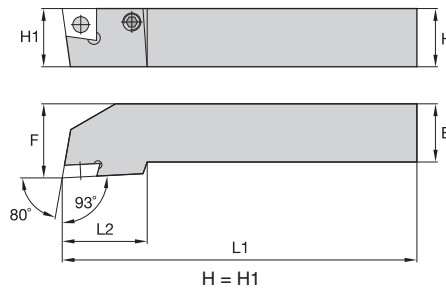
■ 1.18 • Inch



catalog number	H	H3	B	L1	L2	F	gage insert	clamp stud	clamping screw	hex wrench	steel nest assembly
right hand 1.18025R310Z	1.00	—	1.00	6.00	1.18	1.250	D2FIX15..L..	112.404	121.616	170.003	—
right hand 1.18025R315Z	1.00	.28	1.00	6.00	1.46	1.250	D2FIX15..L..	112.505	121.616	170.003	132.156
left hand 1.18025L310Z	1.00	—	1.00	6.00	1.18	1.250	D2FIX15..L..	112.404	121.616	170.003	—
left hand 1.18025L315Z	1.00	.28	1.00	6.00	1.46	1.250	D2FIX15..L..	112.505	121.616	170.003	132.156



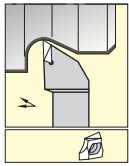
See page F25 for inserts.



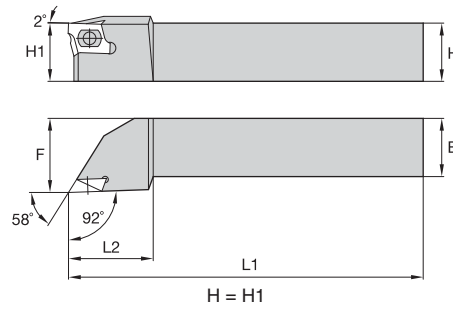
■ 1.180...93° • Inch

catalog number	H	B	L1	L2	F	gage insert	clamp stud	clamping screw	hex wrench
right hand 1.18025R330Z	1.00	1.00	6.00	1.42	1.250	C2FIX15..L..	112.404	121.616	170.003
left hand 1.18025L330Z	1.00	1.00	6.00	1.42	1.250	C2FIX15..L..	112.404	121.616	170.003

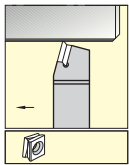




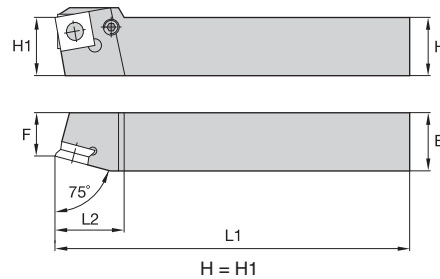
See page F29 for inserts.


■ 1.380...92° • Inch

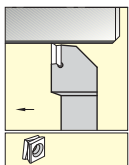
catalog number	H	B	L1	L2	F	gage insert	clamp stud	clamping screw	hex wrench
right hand 1.38025R021Z	1.00	1.00	6.00	1.42	1.250	D4FIX..R..	114.114	121.816	170.004
left hand 1.38025L021Z	1.00	1.00	6.00	1.42	1.250	D4FIX..L..	114.114	121.816	170.004



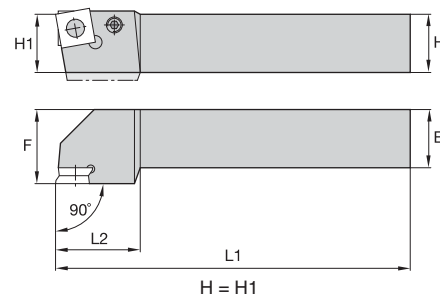
See page F30 for inserts.


■ 1.771...75° • Inch

catalog number	H	B	L1	L2	F	gage insert	clamp stud	clamping screw	hex wrench
right hand 1.77125R300Z	1.00	1.00	6.00	1.18	.875	C8FIX15..R..	410.084	121.816	170.004
right hand 1.77132R400Z	1.25	1.25	7.00	1.50	1.073	C8FIX18..R..	118.404	121.820	170.004
left hand 1.77125L300Z	1.00	1.00	6.00	1.18	.875	C8FIX15..L..	410.084	121.816	170.004
left hand 1.77132L400Z	1.25	1.25	7.00	1.50	1.073	C8FIX18..L..	118.404	121.820	170.004



See page F30 for inserts.


■ 1.78...90° • Inch

catalog number	H	B	L1	L2	F	gage insert	clamp stud	clamping screw	hex wrench
right hand 1.78025R300Z	1.00	1.00	6.00	1.42	1.250	C8FIX15..R..	410.084	121.816	170.004
right hand 1.78032R400Z	1.25	1.25	7.00	1.42	1.500	C8FIX18..R..	118.404	121.825	170.004
left hand 1.78025L300Z	1.00	1.00	6.00	1.42	1.250	C8FIX15..L..	410.084	121.816	170.004
left hand 1.78032L400Z	1.25	1.25	7.00	1.42	1.500	C8FIX18..L..	118.404	121.825	170.004



Application Specific

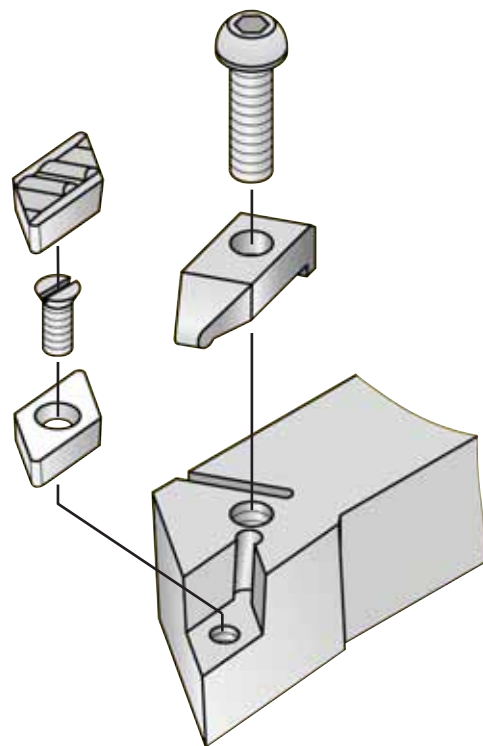
Top Notch™ Profiling

Primary Application

Top Notch is the proven solution for high productivity. The Top Notch system provides consistent tool performance, accurate indexing, and superior clamping to provide excellent surface finishing and superior tool life.

Features and Benefits

- Top Notch guarantees that the insert is rigidly held.
- Stable against alternating cutting force directions, compared with customary clamping methods.
- Second cutting edge well protected against chipping.
- Precision-ground inserts guarantee high precision indexing and lower cutting forces.



■ Select the geometry —
based on feed rate and depth of cut

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous Materials
S	High-Temp Alloys
H	Hardened Materials

operation	insert style application	insert geometry	profile	feed rate — in (mm)											
				.0015 (0,04)	.0025 (0,063)	.004 (0,01)	.006 (0,16)	.010 (0,25)	.016 (0,4)	.025 (0,63)	.040 (1,0)	.060 (1,6)	.100 (2,5)	.200 (5,0)	
				depth of cut — in (mm)											
finishing	DCGR			.004-.012 (0,1-0,3)											
				.010-.070 (0,3-1,8)											
finishing	KCGR			.004-.012 (0,1-0,3)											
				.010-.070 (0,3-1,8)											
finishing	VBMR			.004-.014 (0,1-0,4)											
				.010-.080 (0,3-2,0)											
finishing	VCGR			.004-.014 (0,1-0,4)											
				.010-.080 (0,3-2,0)											
finishing	KNGX-15			.006-.016 (0,2-0,4)											
				.030-.110 (0,8-2,8)											
medium machining	KNGX-20			.008-.018 (0,2-0,5)											
				.040-.120 (1,0-3,0)											
medium machining	KNGX-25			.010-.022 (0,3-0,6)											
				.045-.140 (1,1-3,6)											
roughing	KNGX-32			.012-.026 (0,3-0,7)											
				.060-.200 (1,5-5,1)											



Step 1 • Select the insert geometry

Negative Inserts



-K...X-32
Roughing



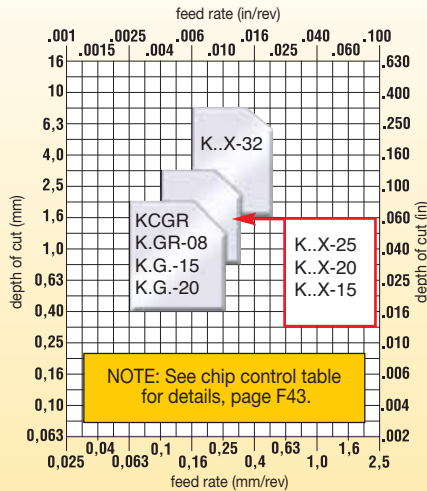
-K...X-25 – K...X-15,
Medium Machining



-KCGR
Finishing



-K. GR-08, K.G.-15,
K.G.-20
Finishing



Positive Inserts



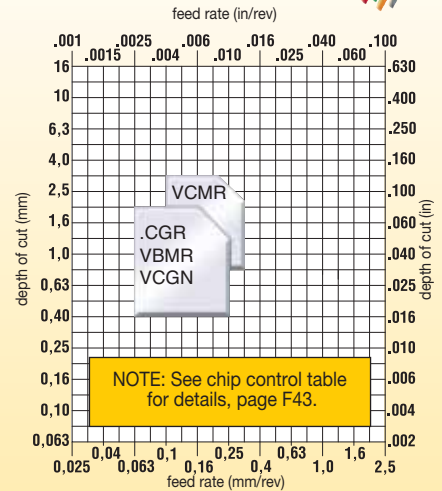
-VCMR
Medium Machining



-.CGR, VBMR
Finishing



-VCGN
Finishing



Application Specific

Step 2 • Select the grade

cutting condition		Steel			Stainless Steel		
		Finishing	Medium Machining	Roughing	Finishing	Medium Machining	Roughing
heavily interrupted cut	⚙️	KC9125	KC8050	KC8050	KC9225	KC8050	KC8050
lightly interrupted cut	⚙️	KC9110	KC9125	KC8050	KC5010	KC5025	KC5025
varying depth of cut, casting, or forging skin	⚙️	KT315	KC9125	KC9125	KT315	KC9225	KC9225
smooth cut, pre-turned surface	⚙️	KT315	KC9110	KC9110	KT315	KC5010	KC9225

cutting condition		Cast Iron			Non-Ferrous		
		Finishing	Medium Machining	Roughing	Finishing	Medium Machining	Roughing
heavily interrupted cut	⚙️	KC8050	KC8050	KC8050	KC5010	KC5010	KC5010
lightly interrupted cut	⚙️	KC9315	KC8050	KC8050	KC5410 KD1425	KC5010	KC5010
varying depth of cut, casting, or forging skin	⚙️	KC9315	KC9315	KC9315	KD1425	KC5410	KC5410
smooth cut, pre-turned surface	⚙️	KC5010	KC5010	KC5010	KD1425	KC5410	KC5410

High-Temperature Alloys

cutting condition		Finishing	Medium Machining	
			Roughing	
heavily interrupted cut	⚙️	KC5025	K68	K68
lightly interrupted cut	⚙️	KC5010	KC5010	KC8050
varying depth of cut, casting, or forging skin	⚙️	KC5010	KC5010	KC5010
smooth cut, pre-turned surface	⚙️	KC5010	KC9110	KC5010

■ Step 3 • Select the cutting speed

Steel speed — m/min (SFM) starting conditions

material group	grade	50 (170)	100 (330)	150 (490)	200 (655)	250 (820)	300 (980)	350 (1150)	400 (1300)	m/min	SFM
P	KT315									260	850
	KC9110									340	800
	KC9125									180	600
	KC8050									165	550

Stainless Steel speed — m/min (SFM) starting conditions

material group	grade	50 (170)	100 (330)	150 (490)	200 (655)	250 (820)	300 (980)	350 (1150)	400 (1300)	m/min	SFM
M	KT315									230	750
	KC5010/KCU10									180	600
	KC5025/KCU25									120	400
	KC9225									170	550
	KC8050									150	500

Cast Iron speed — m/min (SFM) starting conditions

material group	grade	150 (490)	200 (655)	250 (820)	300 (980)	350 (1150)	400 (1300)	500 (1600)	750 (2400)	m/min	SFM
K	KB1345									760	2520
	KT315									275	900
	KC5010/KCU10									245	800
	KC9315									245	800
	KC8050									230	750

Non-Ferrous speed — m/min (SFM) starting conditions

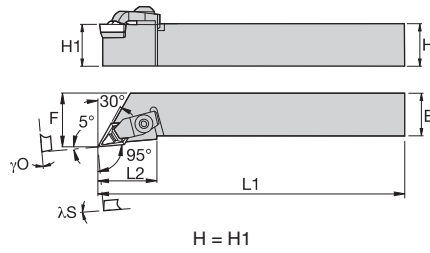
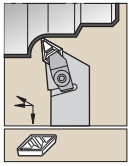
material group	grade	250 (800)	500 (1600)	750 (2400)	1000 (3200)	1250 (4000)	1500 (4800)	1750 (5600)	2000 (6400)	m/min	SFM
N	KO1425									765	2500
	KC5410									550	1800
	KC5010/KCU10									460	1500
	K68									150	500

High-Temperature Alloys speed — m/min (SFM) starting conditions

material group	grade	15 (50)	40 (120)	55 (180)	80 (250)	100 (330)	170 (550)	200 (655)	230 (750)	m/min	SFM
S	KC5010/KCU10									60	200
	KC5025/KCU25									50	170
	KC8050									70	230
	K68									30	100

◊ Represents the recommended starting conditions. Optimize for your specific application.

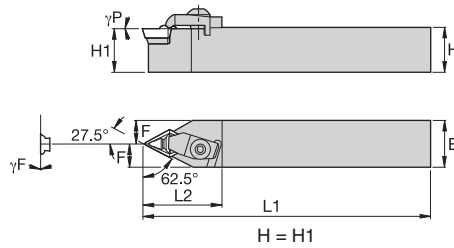
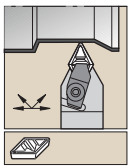
Application Specific



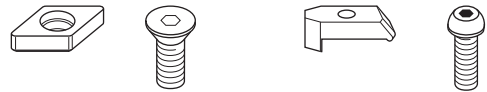
■ NDLP -5°



catalog number	H	B	F	L1	L2	B3	λS°	γO°	gage insert	shim	shim screw	hex (inch)	clamp	clamp screw	hex (inch)
right hand															
NDLPR164C	1.000	1.000	1.250	5.00	1.38	—	0.0	0.0	DP..432	SM414	S111	1/16	CM116	S532	5/32
NDLPR164D	1.000	1.000	1.250	6.00	1.38	—	0.0	0.0	DP..432	SM414	S111	1/16	CM116	S532	5/32
NDLPR204D	1.250	1.250	1.500	6.00	1.38	—	0.0	0.0	DP..432	SM414	S111	1/16	CM116	S532	5/32
left hand															
NDLPL164C	1.000	1.000	1.250	5.00	1.38	—	0.0	0.0	DP..432	SM414	S111	1/16	CM117	S532	5/32
NDLPL164D	1.000	1.000	1.250	6.00	1.38	—	0.0	0.0	DP..432	SM414	S111	1/16	CM117	S532	5/32
NDLPL204D	1.250	1.250	1.500	6.00	1.38	—	0.0	0.0	DP..432	SM414	S111	1/16	CM117	S532	5/32

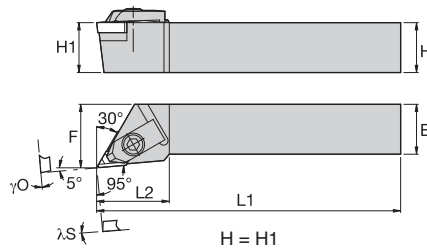
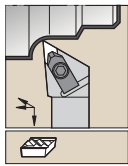


■ NDPP 27.5°



catalog number	H	B	F	L1	L2	B3	γF°	γP°	gage insert	shim	shim screw	hex (inch)	clamp	clamp screw	hex (inch)
NDPPN164D	1.000	1.000	.500	6.00	1.59	—	0.0	0.0	DP..432	SM414	S111	1/16	CM116	S532	5/32
NDPPN204D	1.250	1.250	.625	6.00	1.59	—	0.0	0.0	DP..432	SM414	S111	1/16	CM116	S532	5/32

Application Specific



■ **NKLC -5°**



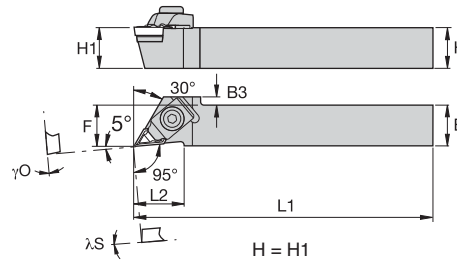
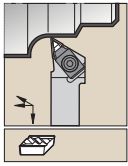
catalog number	H	B	F	L1	L2	B3	λS°	γO°	gage insert	shim	shim screw	hex (inch)	clamp	clamp screw	hex (inch)
right hand															
NKLCR0805V	.500	.500	.750	3.50	.88	—	0.0	0.0	NP..51R	SM285	S959	—	CM79	S524	1/8
NKLCR1005B	.625	.625	.750	4.50	.88	—	0.0	0.0	NP..51R	SM285	S959	—	CM79	S524	1/8
NKLCR1205A	.750	.750	1.000	4.00	.88	—	0.0	0.0	NP..51R	SM285	S959	—	CM68	S524	1/8
NKLCR1205B	.750	.750	1.000	4.50	.88	—	0.0	0.0	NP..51R	SM285	S959	—	CM68	S524	1/8
NKLCR1605C	1.000	1.000	1.250	5.00	.88	—	0.0	0.0	NP..51R	SM285	S959	—	CM68	S524	1/8
left hand															
NKLCL0805V	.500	.500	.750	3.50	.88	—	0.0	0.0	NP..51L	SM286	S959	—	CM71	S524	1/8
NKLCL1005B	.625	.625	.750	4.50	.88	—	0.0	0.0	NP..51L	SM286	S959	—	CM71	S524	1/8
NKLCL1205A	.750	.750	1.000	4.00	.88	—	0.0	0.0	NP..51L	SM286	S959	—	CM68	S524	1/8
NKLCL1205B	.750	.750	1.000	4.50	.88	—	0.0	0.0	NP..51L	SM286	S959	—	CM68	S524	1/8
NKLCL1605C	1.000	1.000	1.250	5.00	.88	—	0.0	0.0	NP..51L	SM286	S959	—	CM68	S524	1/8

Application Specific

■ **NKLN -5°**



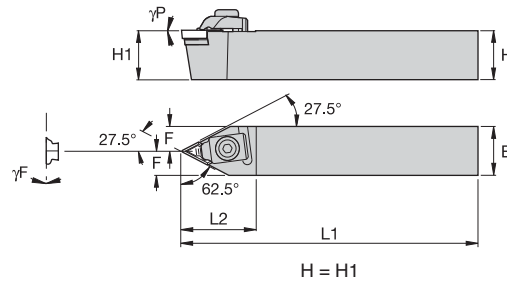
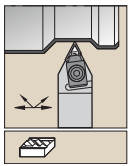
catalog number	H	B	F	L1	L2	B3	λS°	γO°	gage insert	shim	shim screw	hex (inch)	clamp	clamp screw	hex (inch)
right hand															
NKLN121B	.750	.750	1.000	4.50	1.25	—	-2.0	-5.0	NPR132	SM272	SL344	—	CM66	S625	5/32
NKLN161C	1.000	1.000	1.250	5.00	1.25	—	-2.0	-5.0	NPR132	SM272	SL344	—	CM66	S625	5/32
NKLN163D	1.000	1.000	1.250	6.00	1.44	—	-2.0	-5.0	NPR332	SM268	SL344	—	CM65	S625	5/32
left hand															
NKLN121B	.750	.750	1.000	4.50	1.25	—	-2.0	-5.0	NPL132	SM271	SL344	—	CM66	S625	5/32
NKLN161C	1.000	1.000	1.250	5.00	1.25	—	-2.0	-5.0	NPL132	SM271	SL344	—	CM66	S625	5/32
NKLN163D	1.000	1.000	1.250	6.00	1.44	—	-2.0	-5.0	NPL332	SM267	SL344	—	CM65	S625	5/32



■ NKLC-F -5°



catalog number	H	B	F	L1	L2	B3	λS°	γO°	gage insert	shim	shim screw	hex (mm)	clamp	clamp screw	hex (mm)
right hand															
NKLCRF0805D	.500	.500	.500	6.00	.75	.15	0.0	0.0	NP..51R	SM285	S959	—	CM180	S524	1/8
NKLCRF1005B	.625	.625	.625	4.50	.75	—	0.0	0.0	NP..51R	SM285	S959	—	CM180	S524	1/8
left hand															
NKLCFL0805D	.500	.500	.500	6.00	.75	.15	0.0	0.0	NP..51L	SM286	S959	—	CM181	S524	1/8
NKLCFL1005B	.625	.625	.625	4.50	.75	—	0.0	0.0	NP..51L	SM286	S959	—	CM181	S524	1/8

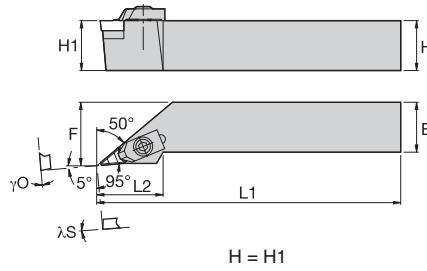
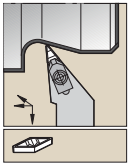


■ NKPC 27.5°



catalog number	H	B	F	L1	L2	B3	γF°	γP°	gage insert	shim	shim screw	hex (inch)	clamp	clamp screw	hex (inch)
NKPCN0805V	.500	.500	.250	3.50	1.13	—	0.0	0.0	NP..51R	SM285	S959	—	CM79	S524	1/8
NKPCN1205B	.750	.750	.375	4.50	1.13	—	0.0	0.0	NP..51R	SM285	S959	—	CM68	S524	1/8

Application Specific

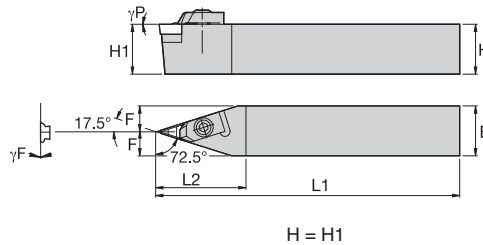
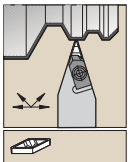


■ NVLC -5°



catalog number	H	B	F	L1	L2	B3	γO°	λS°	gage insert	shim	shim screw	hex (inch)	clamp	clamp screw	hex (inch)
right hand															
NVLCR123B	.750	.750	1.000	4.50	1.44	—	0.0	0.0	VP..332	SM412	S959	—	CM113	S412	5/32
NVLCR163D	1.000	1.000	1.250	6.00	1.44	—	0.0	0.0	VP..332	SM412	S959	—	CM113	S412	5/32
NVLCR203D	1.250	1.250	1.500	6.00	1.44	—	0.0	0.0	VP..332	SM412	S959	—	CM113	S412	5/32
NVLCR243D	1.500	1.500	2.000	6.00	1.44	—	0.0	0.0	VP..332	SM412	S959	—	CM113	S412	5/32
left hand															
NVLCR123B	.750	.750	1.000	4.50	1.44	—	0.0	0.0	VP..332	SM412	S959	—	CM114	S412	5/32
NVLCR163D	1.000	1.000	1.250	6.00	1.44	—	0.0	0.0	VP..332	SM412	S959	—	CM114	S412	5/32
NVLCR203D	1.250	1.250	1.500	6.00	1.44	—	0.0	0.0	VP..332	SM412	S959	—	CM114	S412	5/32
NVLCR243D	1.500	1.500	2.000	6.00	1.44	—	0.0	0.0	VP..332	SM412	S959	—	CM114	S412	5/32

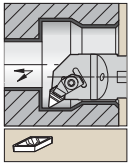
Application Specific



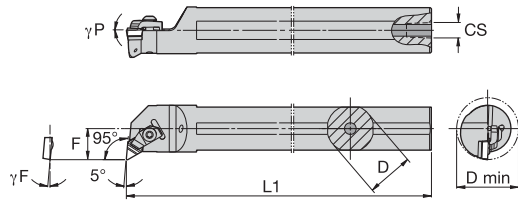
■ NVVC 17.5°



catalog number	H	B	F	L1	L2	B3	γF°	γP°	gage insert	shim	shim screw	hex (inch)	clamp	clamp screw	hex (inch)
NVVCN163D	1.000	1.000	.497	6.00	1.62	—	0.0	0.0	VP..332	SM412	S959	—	CM113	S412	5/32
NVVCN203D	1.250	1.250	.622	6.00	1.62	—	0.0	0.0	VP..332	SM412	S959	—	CM113	S412	5/32
NVVCN243D	1.500	1.500	.747	6.00	1.62	—	0.0	0.0	VP..332	SM412	S959	—	CM113	S412	5/32



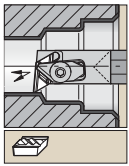
Steel shank with through coolant.



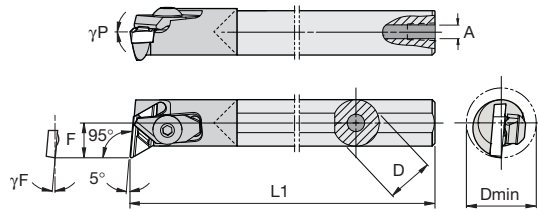
■ A-NDLP -5°



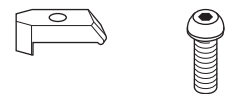
catalog number	D	D min	F	L1	L	CD	A	CS	γF°	γP°	gage insert	shim	shim screw	hex (inch)	clamp	clamp screw	hex (inch)
right hand																	
A20NDLPR4	1.250	1.585	.875	14.00	—	—	—	1/4-18 NPT	-3.0	0.0	DP..432	SM414	S111	1/16	CM118	S532	5/32
A24NDLPR4	1.500	1.835	1.000	14.00	—	—	—	1/4-18 NPT	-2.0	0.0	DP..432	SM414	S111	1/16	CM118	S532	5/32
A32NDLPR4	2.000	2.400	1.250	16.00	—	—	—	1/4-18 NPT	-2.0	0.0	DP..432	SM414	S111	1/16	CM118	S532	5/32
left hand																	
A20NDLPL4	1.250	1.585	.875	14.00	—	—	—	1/4-18 NPT	-3.0	0.0	DP..432	SM414	S111	1/16	CM119	S532	5/32
A24NDLPL4	1.500	1.835	1.000	14.00	—	—	—	1/4-18 NPT	-2.0	0.0	DP..432	SM414	S111	1/16	CM119	S532	5/32
A32NDLPL4	2.000	2.400	1.250	16.00	—	—	—	1/4-18 NPT	-2.0	0.0	DP..432	SM414	S111	1/16	CM119	S532	5/32



Carbide shank with through coolant.

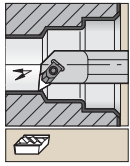


■ E-NEL -5°

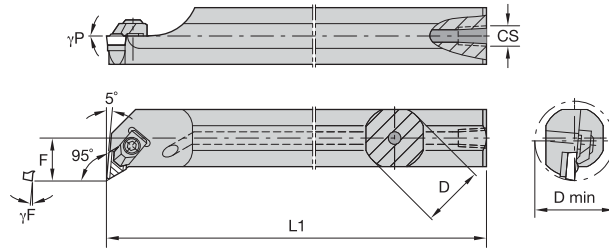


catalog number	D	D min	F	L1	L	CD	A	CS	γF°	γP°	gage insert	clamp	clamp screw	hex (inch)
right hand														
E08NELR05	.500	.750	.375	8.15	—	—	.187	—	-5.0	0.0	NPL51	CM106	S518	3/32
left hand														
E08NELLO5	.500	.750	.375	8.15	—	—	.187	—	-5.0	0.0	NPR51	CM105	S518	3/32

Application Specific



Steel shank with through coolant.

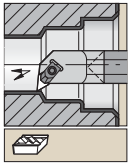


■ **A-NKLC -5°**

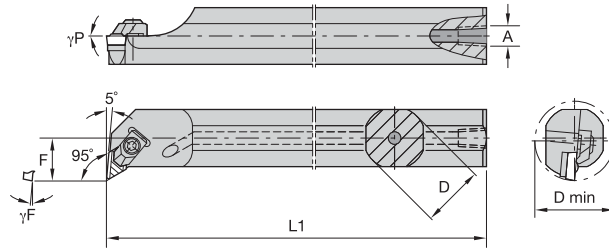


catalog number	D	D min	F	L1	CS	γF°	γP°	gage insert	shim	shim screw	hex (inch)	clamp	clamp screw	hex (inch)
right hand														
A10NKLCR05	.625	.900	.500	10.00	1/8-27 NPT	-5.00	0.0	NP..51L	SM286	S959	—	CM79	S524	1/8
A12NKLCR05	.750	.980	.562	10.00	1/8-27 NPT	-5.00	0.0	NP..51L	SM286	S959	—	CM68	S524	1/8
A16NKLCR05	1.000	1.300	.750	12.00	1/4-18 NPT	-3.00	0.0	NP..51L	SM286	S959	—	CM68	S524	1/8
A20NKLCR05	1.250	1.580	.875	14.00	1/4-18 NPT	-3.00	0.0	NP..51L	SM286	S959	—	CM68	S524	1/8
A24NKLCR05	1.500	1.870	1.000	14.00	1/4-18 NPT	-2.00	0.0	NP..51L	SM286	S959	—	CM68	S524	1/8
A32NKLCR05	2.000	2.370	1.250	16.00	1/4-18 NPT	-2.00	0.0	NP..51L	SM286	S959	—	CM68	S524	1/8
left hand														
A10NKLCL05	.625	.900	.500	10.00	1/8-27 NPT	-5.00	0.0	NP..51R	SM285	S959	—	CM71	S524	1/8
A12NKLCL05	.750	.980	.562	10.00	1/8-27 NPT	-5.00	0.0	NP..51R	SM285	S959	—	CM68	S524	1/8
A16NKLCL05	1.000	1.300	.750	12.00	1/4-18 NPT	-3.00	0.0	NP..51R	SM285	S959	—	CM68	S524	1/8
A24NKLCL05	1.500	1.870	1.000	14.00	1/4-18 NPT	-2.00	0.0	NP..51R	SM285	S959	—	CM68	S524	1/8
A32NKLCL05	2.000	2.370	1.250	16.00	1/4-18 NPT	-2.00	0.0	NP..51R	SM285	S959	—	CM68	S524	1/8

Application Specific



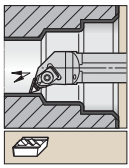
Carbide shank with through coolant.



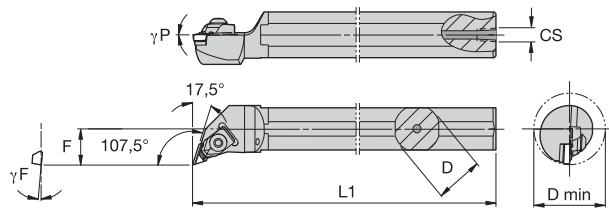
■ E-NKLC -5°



catalog number	D	D min	F	L1	A	γF°	γP°	gage insert	shim	shim screw	hex (mm)	clamp	clamp screw	hex (mm)
right hand														
E08NKLCR05	.500	.660	.375	8.00	.187	-5.0	0.0	NP..51L	—	—	—	CM106	S518	3/32
E10NKLCR05	.625	.900	.500	10.00	.218	-5.0	0.0	NP..51L	SM286	S959	—	CM79	S524	1/8
E12NKLCR05	.750	.980	.562	10.00	.281	-5.0	0.0	NP..51L	SM286	S959	—	CM68	S524	1/8
left hand														
E08NKLCL05	.500	.660	.375	8.00	.187	-5.0	0.0	NP..51R	—	—	—	CM105	S518	3/32
E10NKLCL05	.625	.900	.500	10.00	.218	-5.0	0.0	NP..51R	SM285	S959	—	CM71	S524	1/8
E12NKLCL05	.750	.980	.562	10.00	.281	-5.0	0.0	NP..51R	SM285	S959	—	CM68	S524	1/8



Steel shank with through coolant.

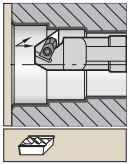


■ A-NKQC -17.5°

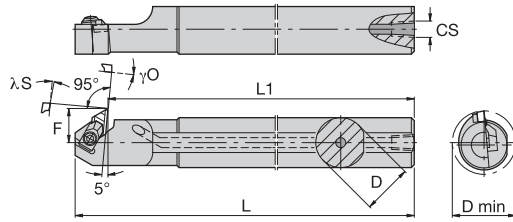


catalog number	D	D min	F	L1	CS	γF°	γP°	gage insert	shim	shim screw	hex (mm)	clamp	clamp screw	hex (mm)
right hand														
A08NKQCR05	.500	.670	.375	8.00	1/16-27 NPT	-6.0	0.0	NP..51L	—	—	—	CM112	S518	3/32
A12NKQCR05	.750	.980	.562	10.00	1/8-27 NPT	-6.0	0.0	NP..51L	SM286	S959	—	CM68	S524	1/8
A16NKQCR05	1.000	1.300	.750	12.00	1/4-18 NPT	-3.0	0.0	NP..51L	SM286	S959	—	CM68	S524	1/8
left hand														
A08NKQCL05	.500	.670	.375	8.00	1/16-27 NPT	-6.0	0.0	NP..51R	—	—	—	CM111	S518	3/32
A12NKQCL05	.750	.980	.562	10.00	1/8-27 NPT	-6.0	0.0	NP..51R	SM285	S959	—	CM68	S524	1/8
A16NKQCL05	1.000	1.300	.750	12.00	1/4-18 NPT	-3.0	0.0	NP..51R	SM285	S959	—	CM68	S524	1/8

Application Specific



Steel shank with through coolant.



■ **A-NKXC -5°**

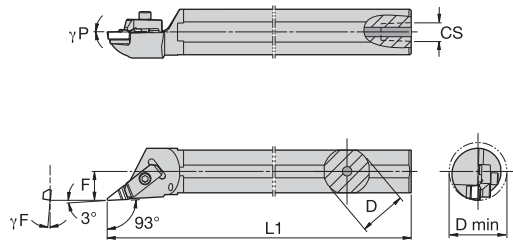


catalog number	D	D min	F	L1	L	CS	λS°	γO°	gage insert	shim	shim screw	hex (mm)	clamp	clamp screw	hex (mm)
right hand A12NKXCR05	.750	1.060	.625	10.00	10.69	1/8-27 NPT	-5.0	0.0	NP..51R	SM285	S959	—	CM79	S524	1/8
A16NKXCR05	1.000	1.300	.750	12.00	12.69	1/4-18 NPT	-5.0	0.0	NP..51R	SM285	S959	—	CM79	S524	1/8
left hand A12NKXCL05	.750	1.060	.625	10.00	10.69	1/8-27 NPT	-5.0	0.0	NP..51L	SM286	S959	—	CM71	S524	1/8
A16NKXCL05	1.000	1.300	.750	12.00	12.69	1/4-18 NPT	-5.0	0.0	NP..51L	SM286	S959	—	CM71	S524	1/8

Application Specific



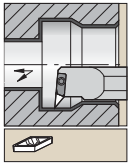
Steel shank with through coolant.



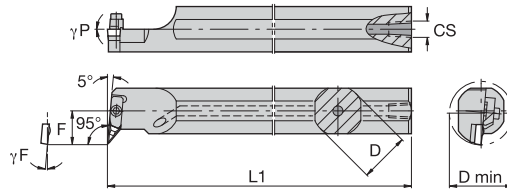
■ **A-NVJC -3°**



catalog number	D	D min	F	L1	CS	γF°	γP°	gage insert	shim	shim screw	hex (inch)	clamp	clamp screw	hex (inch)
right hand A20NVJCR3	1.250	1.774	.765	14.00	1/4-18 NPT	-2.0	0.0	VP..332	SM412	S959	—	CM113	S412	5/32



Steel shank with through coolant.

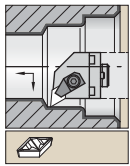


■ A-NVLC -5°

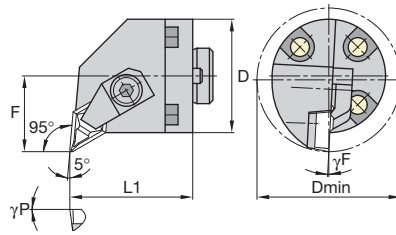


catalog number	D	D min	F	L1	CS	γF°	γP°	gage insert	shim	shim screw	hex (inch)	clamp	clamp screw	hex (inch)
right hand														
A20NVLCR3	1.250	1.830	1.125	14.00	1/4-18 NPT	-2.0	0.0	VP..332	SM412	S959	—	CM113	S412	5/32
A24NVLCR3	1.500	2.120	1.250	14.00	1/4-18 NPT	-2.0	0.0	VP..332	SM412	S959	—	CM113	S412	5/32
A32NVLCR3	2.000	2.620	1.500	16.00	1/4-18 NPT	-2.0	0.0	VP..332	SM412	S959	—	CM113	S412	5/32
left hand														
A20NVLC3	1.250	1.830	1.125	14.00	1/4-18 NPT	-2.0	0.0	VP..332	SM412	S959	—	CM114	S412	5/32
A24NVLC3	1.500	2.120	1.250	14.00	1/4-18 NPT	-2.0	0.0	VP..332	SM412	S959	—	CM114	S412	5/32
A32NVLC3	2.000	2.620	1.500	16.00	1/4-18 NPT	-2.0	0.0	VP..332	SM412	S959	—	CM114	S412	5/32

Application Specific



With through coolant.

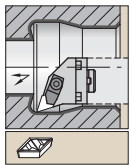


■ **H-NDLP -5°**

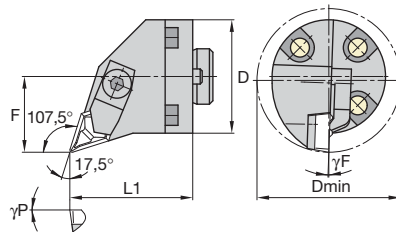


catalog number	D	D min	F	L1	L	γF°	γP°	gage insert	shim	shim screw	hex (inch)	clamp	clamp screw	hex (inch)
right hand														
H20NDLPR4W	1.250	1.580	.875	1.625	—	-3.0	0.0	DP..432	SM414	S111	1/16	CM118	S532	5/32
H24NDLPR4W	1.500	1.870	1.000	1.625	—	-2.0	0.0	DP..432	SM414	S111	1/16	CM118	S532	5/32
H32NDLPR4W	2.000	2.370	1.250	1.625	—	-2.0	0.0	DP..432	SM414	S111	1/16	CM118	S532	5/32
H40NDLPR4W	2.500	3.125	1.625	1.625	—	0.0	0.0	DP..432	SM414	S111	1/16	CM118	S532	5/32
left hand														
H20NDLPL4W	1.250	1.580	.875	1.625	—	-3.0	0.0	DP..432	SM414	S111	1/16	CM119	S532	5/32
H24NDLPL4W	1.500	1.870	1.000	1.625	—	-2.0	0.0	DP..432	SM414	S111	1/16	CM119	S532	5/32
H28NDLPL4W	1.750	2.125	1.125	1.625	—	-2.0	0.0	DP..432	SM414	S111	1/16	CM119	S532	5/32
H32NDLPL4W	2.000	2.370	1.250	1.625	—	-2.0	0.0	DP..432	SM414	S111	1/16	CM119	S532	5/32
H40NDLPL4W	2.500	3.125	1.625	1.625	—	0.0	0.0	DP..432	SM414	S111	1/16	CM119	S532	5/32

Application Specific



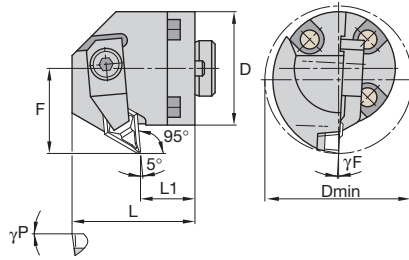
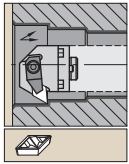
With through coolant.



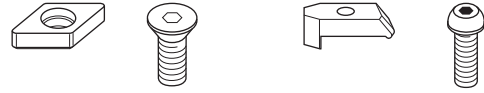
■ **H-NDQP -17.5°**



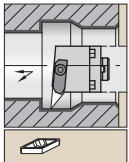
catalog number	D	D min	F	L1	L	γF°	γP°	gage insert	shim	shim screw	hex (inch)	clamp	clamp screw	hex (inch)
right hand														
H20NDQPR4W	1.250	1.585	.875	1.625	—	-3.0	0.0	DP..432	SM414	S111	1/16	CM117	S530	5/32
H24NDQPR4W	1.500	1.835	1.000	1.625	—	-2.0	0.0	DP..432	SM414	S111	1/16	CM117	S532	5/32
H32NDQPR4W	2.000	2.500	1.375	1.625	—	0.0	0.0	DP..432	SM414	S111	1/16	CM117	S532	5/32
H40NDQPR4W	2.500	3.125	1.625	1.625	—	0.0	0.0	DP..432	SM414	S111	1/16	CM117	S532	5/32
left hand														
H20NDQPL4W	1.250	1.585	.875	1.625	—	-3.0	0.0	DP..432	SM414	S111	1/16	CM116	S530	5/32
H24NDQPL4W	1.500	1.835	1.000	1.625	—	-2.0	0.0	DP..432	SM414	S111	1/16	CM116	S532	5/32
H32NDQPL4W	2.000	2.500	1.375	1.625	—	0.0	0.0	DP..432	SM414	S111	1/16	CM116	S532	5/32
H40NDQPL4W	2.500	3.125	1.625	1.625	—	0.0	0.0	DP..432	SM414	S111	1/16	CM116	S532	5/32



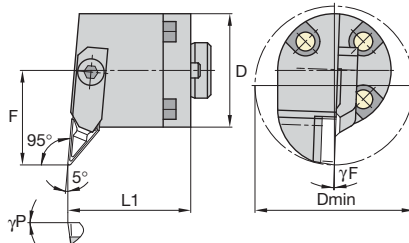
■ H-NDXP -5°



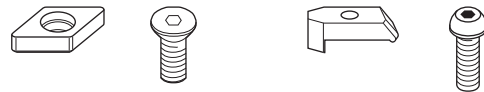
catalog number	D	D min	F	L1	L	γF°	γP°	gage insert	shim	shim screw	hex (inch)	clamp	clamp screw	hex (inch)	
right hand															
H20NDXPR4W	1.250	1.705	1.000	.750	1.62	-3.0	0.0	DP..432	SM414	S111	1/16	CM118	S532	5/32	
H24NDXPR4W	1.500	2.000	1.125	.750	1.62	0.0	0.0	DP..432	SM414	S111	1/16	CM118	S532	5/32	
H32NDXPR4W	2.000	2.500	1.375	.750	1.62	0.0	0.0	DP..432	SM414	S111	1/16	CM118	S532	5/32	
H40NDXPR4W	2.500	3.125	1.625	.750	1.62	0.0	0.0	DP..432	SM414	S111	1/16	CM118	S532	5/32	
left hand															
H20NDXPL4W	1.250	1.705	1.000	.750	1.62	-3.0	0.0	DP..432	SM414	S111	1/16	CM119	S532	5/32	
H24NDXPL4W	1.500	2.000	1.125	.750	1.62	0.0	0.0	DP..432	SM414	S111	1/16	CM119	S532	5/32	
H32NDXPL4W	2.000	2.500	1.375	.750	1.62	0.0	0.0	DP..432	SM414	S111	1/16	CM119	S532	5/32	
H40NDXPL4W	2.500	3.125	1.625	.750	1.62	0.0	0.0	DP..432	SM414	S111	1/16	CM119	S532	5/32	



With through coolant.



■ H-NVLP -5°



catalog number	D	D min	F	L1	L	γF°	γP°	gage insert	shim	shim screw	hex (inch)	clamp	clamp screw	hex (inch)	
right hand															
H20NVLPR3W	1.250	1.830	1.125	1.625	—	-2.0	0.0	VP..332	SM412	S959	—	CM113	S412	5/32	
H24NVLPR3W	1.500	2.120	1.250	1.625	—	-2.0	0.0	VP..332	SM412	S959	—	CM113	S412	5/32	
H32NVLPR3W	2.000	2.620	1.500	1.625	—	-2.0	0.0	VP..332	SM412	S959	—	CM113	S412	5/32	
H40NVLPR3W	2.500	3.500	2.000	1.625	—	-2.0	0.0	VP..332	SM412	S959	—	CM113	S412	5/32	
left hand															
H20NVLPL3W	1.250	1.830	1.125	1.625	—	-2.0	0.0	VP..332	SM412	S959	—	CM114	S412	5/32	
H24NVLPL3W	1.500	2.120	1.250	1.625	—	-2.0	0.0	VP..332	SM412	S959	—	CM114	S412	5/32	
H32NVLPL3W	2.000	2.620	1.500	1.625	—	-2.0	0.0	VP..332	SM412	S959	—	CM114	S412	5/32	
H40NVLPL3W	2.500	3.500	2.000	1.625	—	-2.0	0.0	VP..332	SM412	S959	—	CM114	S412	5/32	

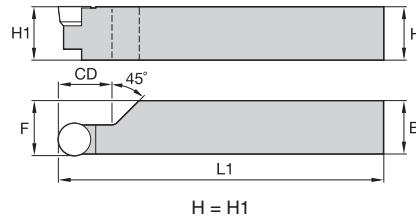
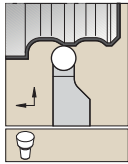
Application Specific

K-Lock™ Inserts

Features and Benefits

- K-Lock inserts are ideal for deep grooving and profiling.
- A unique insert clamping system enables unimpeded chip flow.
- Available in molded and ground peripheries.

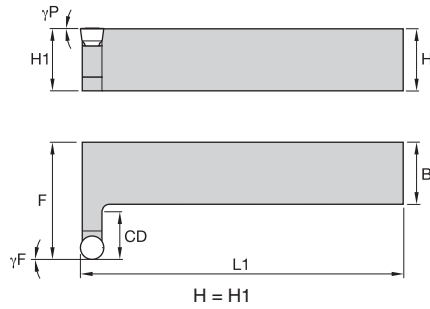
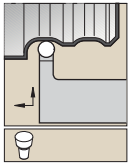




■ **TRAO**

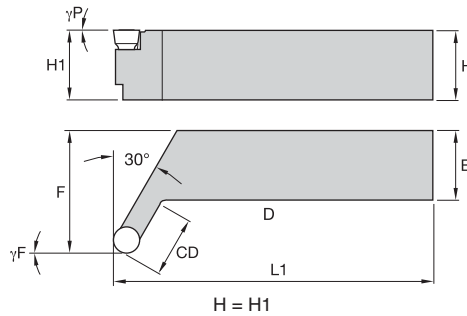
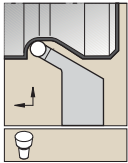
catalog number	H1	B	F	L1	CD	γF°	γP°	gage insert
right hand								
TRAOR1615D	1.00	1.00	1.003	6.00	.50	0.0	0.0	RC..152
TRAOR2015D	1.25	1.25	1.253	6.00	.50	0.0	0.0	RC..152
TRAOR2415E	1.50	1.50	1.503	7.00	.50	0.0	0.0	RC..152
TRAOR162D	1.00	1.00	1.016	6.00	.75	0.0	0.0	RC..23
TRAOR202D	1.25	1.25	1.266	6.00	.75	0.0	0.0	RC..23
TRAOR242E	1.50	1.50	1.516	7.00	.75	0.0	0.0	RC..23
TRAOR163D	1.00	1.00	1.020	6.00	.75	0.0	0.0	RC..35
TRAOR203D	1.25	1.25	1.270	6.00	.75	0.0	0.0	RC..35
TRAOR243E	1.50	1.50	1.520	7.00	.75	0.0	0.0	RC..35
TRAOR164D	1.00	1.00	1.032	6.00	1.00	0.0	0.0	RC..46
TRAOR204D	1.25	1.25	1.282	6.00	1.00	0.0	0.0	RC..46
TRAOR244E	1.50	1.50	1.532	7.00	1.00	0.0	0.0	RC..46
left hand								
TRAOL1615D	1.00	1.00	1.003	6.00	.50	0.0	0.0	RC..152
TRAOL2015D	1.25	1.25	1.253	6.00	.50	0.0	0.0	RC..152
TRAOL2415E	1.50	1.50	1.503	7.00	.50	0.0	0.0	RC..152
TRAOL162D	1.00	1.00	1.016	6.00	.75	0.0	0.0	RC..23
TRAOL202D	1.25	1.25	1.266	6.00	.75	0.0	0.0	RC..23
TRAOL242E	1.50	1.50	1.516	7.00	.75	0.0	0.0	RC..23
TRAOL163D	1.00	1.00	1.020	6.00	.75	0.0	0.0	RC..35
TRAOL203D	1.25	1.25	1.270	6.00	.75	0.0	0.0	RC..35
TRAOL243E	1.50	1.50	1.520	7.00	.75	0.0	0.0	RC..35
TRAOL164D	1.00	1.00	1.032	6.00	1.00	0.0	0.0	RC..46
TRAOL204D	1.25	1.25	1.282	6.00	1.00	0.0	0.0	RC..46
TRAOL244E	1.50	1.50	1.532	7.00	1.00	0.0	0.0	RC..46

Application Specific


TRHO

catalog number	H1	B	F	L1	CD	γF°	γP°	gage insert
right hand								
TRHOR1615D	1.00	1.00	1.625	6.00	.50	0.0	0.0	RC..152
TRHOR2015D	1.25	1.25	1.875	6.00	.50	0.0	0.0	RC..152
TRHOR162D	1.00	1.00	1.875	6.00	.75	0.0	0.0	RC..23
TRHOR203D	1.25	1.25	2.125	6.00	.75	0.0	0.0	RC..35
TRHOR243E	1.50	1.50	2.375	7.00	.75	0.0	0.0	RC..35
TRHOR204D	1.25	1.25	2.125	6.00	.75	0.0	0.0	RC..46
TRHOR244E	1.50	1.50	2.375	7.00	.75	0.0	0.0	RC..46

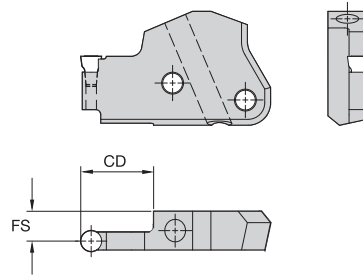
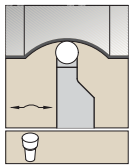
NOTE: Left-hand holders are available as specials.


TRTO

catalog number	H1	B	F	L1	CD	γF°	γP°	gage insert
right hand								
TRTOR1615D	1.00	1.00	1.500	6.00	.55	0.0	0.0	RC..152
TRTOR2015D	1.25	1.25	1.750	6.00	.55	0.0	0.0	RC..152
TRTOR162D	1.00	1.00	1.750	6.00	.84	0.0	0.0	RC..23
TRTOR163D	1.00	1.00	1.750	6.00	.87	0.0	0.0	RC..35
TRTOR203D	1.25	1.25	2.000	6.00	.87	0.0	0.0	RC..35
TRTOR204D	1.25	1.25	2.000	6.00	.89	0.0	0.0	RC..46
TRTOR244E	1.50	1.50	2.250	7.00	.89	0.0	0.0	RC..46

NOTE: Left-hand holders are available as specials.

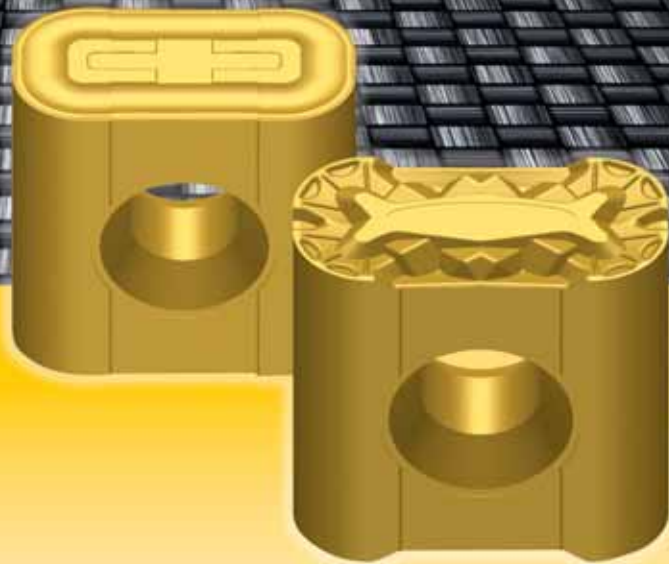
Application Specific



■ TRM

Application Specific

catalog number	CD		FS		cartridge size	gage insert
	mm	in	mm	in		
right hand						
TRM50R0432M	32	1.25	9,62	.379	50	RCMK152
TRM50R0620M	19	.75	8,98	.354	50	RCMK23
TRM50R0632M	32	1.25	8,98	.354	50	RCMK-23
TRM50R0640M	38	1.50	8,98	.354	50	RCGK23
TRM50R0657M	57	2.25	8,98	.354	50	RCMK-23
TRM50R0720M	19	.75	8,42	.332	50	RCMK-2.55
TRM50R0725M	25	1.00	8,42	.332	50	RCMK-2.55
TRM50R0732M	32	1.25	8,42	.332	50	RCMK-2.55
TRM50R0920M	19	.75	7,64	.301	50	RC_K35
TRM50R0932M	32	1.25	7,65	.301	50	RCMK-35
TRM50R0940M	38	1.50	7,64	.301	50	RC_K35
TRM50R0950M	50	1.95	7,65	.301	50	RCMK-35
TRM50R0957M	57	2.25	7,65	.301	50	RCMK-35
TRM50R1250M	51	2.00	6,25	.246	50	RC_K46
left hand						
TRM50L0432M	32	1.25	9,62	.379	50	RCMK152
TRM50L0620M	19	.75	8,98	.354	50	RCMK23
TRM50L0632M	32	1.25	8,98	.354	50	RCMK-23
TRM50L0640M	38	1.50	8,98	.354	50	RCGK23
TRM50L0657M	57	2.25	8,98	.354	50	RCMK-23
TRM50L0720M	19	.75	8,42	.332	50	RCMK-2.55
TRM50L0725M	25	1.00	8,42	.332	50	RCMK-2.55
TRM50L0732M	32	1.25	8,42	.332	50	RCMK-2.55
TRM50L0920M	19	.75	7,64	.301	50	RC_K35
TRM50L0932M	32	1.25	7,65	.301	50	RCMK-35
TRM50L0940M	38	1.50	7,64	.301	50	RC_K35
TRM50L0950M	50	1.95	7,65	.301	50	RCMK-35
TRM50L0957M	57	2.25	7,65	.301	50	RCMK-35
TRM50L1250M	51	2.00	6,25	.246	50	RC_K46



Kennametal™ Tools for Railways and Wheel Machining

Kennametal offers a complete line of tooling for wheel and axle maintenance in railroad shops. All tools incorporate the latest in tooling technology for maximum metal removal and higher productivity. All tools are proven performers in actual use over extended periods of time, under a wide range of operating conditions. Standard off-the-shelf inserts and fewer pieces of hardware reduce inventory and operating costs. Included in this range are tools for reconditioning mounted wheel sets, wheel boring, wheel truing, axle turning, and journal burnishing.

Visit www.kennametal.com or contact your local Authorized Kennametal Distributor.

www.kennametal.com

 **KENNAMETAL®**



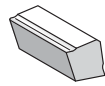
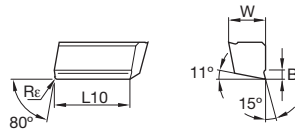
Kendex™ Mini Boring Bars

Primary Application

Ground inserts in their neutral position and the precision insert pocket combine to ensure superior surface finishes. The unique system design protects the second cutting edge from damage while the first edge is in operation.

Features and Benefits

- Kendex mini boring bars are specially designed to finish bore diameters as small as .250".
- Kendex mini inserts contain two precision ground cutting edges.
- Inserts are available in uncoated and PVD coated grades.

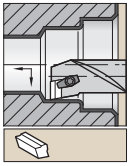

BPGF


● first choice
 ○ alternate choice

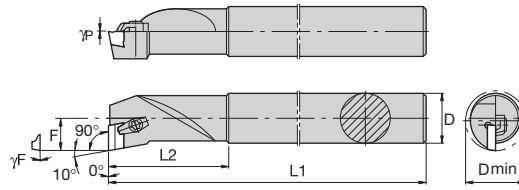
P	●	○
M	●	○
K	○	○
N	●	○
S	●	○
H	○	○

ISO catalog number	ANSI catalog number	L10		W		Rε		B		K68	KC720
		mm	in	mm	in	mm	in	mm	in		
right hand BPGF030202R14	BPGF030202R	3,00	.118	2,00	.079	0,20	.008	1,40	.055	●	●
left hand BPGF050302R12	BPGF050302R	4,50	.177	2,50	.098	0,20	.008	1,20	.047	●	●
BPGF030201L14	BPGF030201L	3,00	.118	2,00	.079	0,05	.002	1,40	.055	●	●
BPGF030202L14	BPGF030202L	3,00	.118	2,00	.079	0,20	.008	1,40	.055	●	●
BPGF050301L12	BPGF050301L	4,50	.177	2,50	.098	0,05	.002	1,20	.047	●	●
BPGF050302L12	BPGF050302L	4,50	.177	2,50	.098	0,20	.008	1,20	.047	●	●
BPGF050304L16	BPGF050304L	4,50	.177	2,50	.098	0,40	.016	1,60	.063	●	●
BPGF070304L18	BPGF070304L	7,00	.276	2,50	.098	0,40	.016	1,80	.071	●	●
BPGF080404L22	BPGF080404L	8,00	.315	4,00	.157	0,40	.016	2,20	.087	●	●





Steel shank without through coolant.



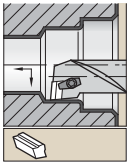
■ **S-KBFP 0°**



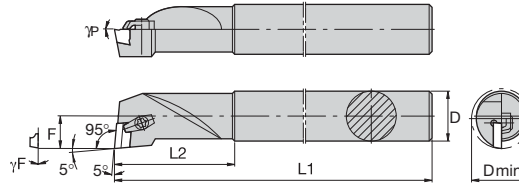
catalog number	D	D min	F	L1	L2	γF°	γP°	gage insert	clamp assembly	wrench size clamp screw
right hand										
S04KBFP03	.250	.250	.128	2.375	.625	0.0	0.0	BP..030202L	CE1031	T6
S04KBFP05	.250	.315	.177	2.375	.625	0.0	0.0	BP..050302L	CE1014	T8
S05KBFP05	.313	.394	.216	3.125	.750	0.0	0.0	BP..050302L	CE1014	T8



Application Specific



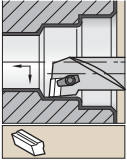
Steel Shank without through coolant.



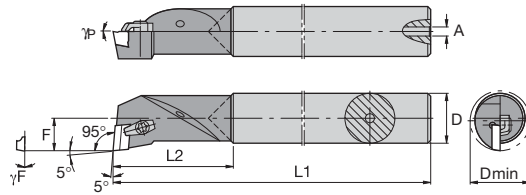
■ **S-KBLP -5°**



catalog number	D	D min	F	L1	L2	γF°	γP°	gage insert	clamp assembly	wrench size clamp screw
right hand										
S04KBLPR03	.250	.250	.128	2.375	.625	0.0	0.0	BP..030202L	CE1031	T6
S04KBLPR05	.250	.315	.177	2.375	.625	0.0	0.0	BP..050302L	CE1014	T8
S05KBLPR05	.313	.394	.216	3.125	.750	0.0	0.0	BP..050302L	CE1014	T8
left hand										
S04KBLPL03	.250	.250	.128	2.375	.625	0.0	0.0	BP..030202R	CE1031	T6
S04KBLPL05	.250	.315	.177	2.375	.625	0.0	0.0	BP..050302R	CE1014	T8
S05KBLPL05	.313	.394	.216	3.125	.750	0.0	0.0	BP..050302R	CE1014	T8



Carbide shank with through coolant.



■ E-KBLP -5°



catalog number	D	D min	F	L1	L2	A	γF°	γP°	gage insert	clamp assembly	wrench size clamp screw
right hand											
E04KBLPR03	.250	.250	.128	3.938	1.220	.06	0.0	0.0	BP..030202L	CE1031	T6
E04KBLPR05	.250	.315	.177	3.938	.630	.06	0.0	0.0	BP..050302L	CE1014	T8
E05KBLPR05	.313	.394	.216	4.922	.787	.08	0.0	0.0	BP..050302L	CE1014	T8
left hand											
E04KBLPL05	.250	.315	.177	3.938	.630	.06	0.0	0.0	BP..050302R	CE1014	T8
E05KBLPL05	.313	.394	.216	4.922	.787	.08	0.0	0.0	BP..050302R	CE1014	T8



Application Specific

Wheel Reprofilng/Wheelset Truing

Primary Application

Kennametal offers a complete line of tooling for wheel and axle maintenance in railroad shops. All tools incorporate the latest in tooling technology for maximum metal removal and higher productivity. All tools are proven performers in actual use over extended periods of time, under a wide range of operating conditions. Standard off-the-shelf inserts and fewer pieces of hardware reduce inventory and operating costs.

Features and Benefits

Versatility

Included in the new expanded line are tools for reconditioning mounted wheel sets, wheel boring, wheel turning, wheel truing, axle turning, and journal burnishing.

Advantages

Machining conditions for these tools vary with the type of service the wheel has seen. Among the problems encountered are skid flat areas, overheating of spinning wheels, accidental torch burns, excessive mushroom and rollovers that are hardened by unusual hump retarder pressure and mismatched wheels that cause excessive wear on the side of the flange. Each of these conditions require a different machining speed and depth of cut. Even under these tough conditions, Kennametal tools have produced superior results through reduced production time and lower maintenance costs.

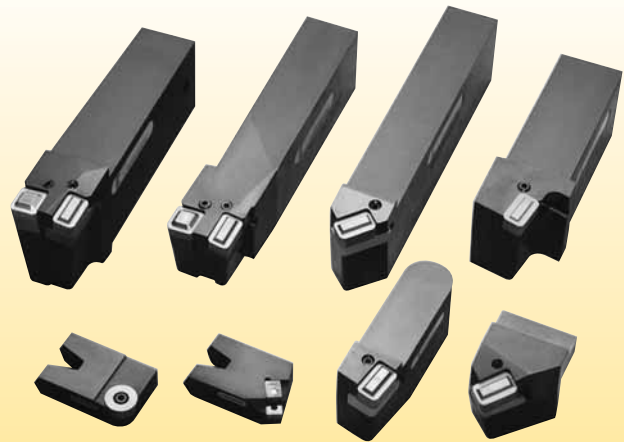


■ Wheel Lathe Tooling

Kennametal railroad tooling incorporates a unique locking unit design developed through years of testing on all types of wheel lathes and machining wheels with all types of tread surfaces.

This heavy-duty, rugged design has proven to be effective in reducing machining costs on tread turning applications, the most severe machining operation encountered in wheel and axle shops.

Strong inserts, with raised chipbreaker land and honed cutting edges, offer more effective chip control and a stronger cutting edge. Combining this tool geometry with Kennametal's grade selection delivers higher wheel turning productivity.



■ Wheelset Reconditioning

Advantages of Kennametal Wheel Lathe Tools:

- No top clamp to wear out or interfere with chip flow.
- Insert locks against two walls in the toolholder to prevent insert movement under heavy cutting loads.
- Hardened steel locking unit provides positive insert seating and holder protection.
- Fast, trouble-free insert indexing — just unlock one screw to release the insert.
- Quick removal of the steel locking unit and insert for cleaning or replacement.
- Heavy-duty steel locking unit design ensures longer life and helps reduce operating costs.
- Fewer parts to inventory.
- Toolholders and steel locking units, made from heat-treated alloy steel, provide support to withstand severe roughing cuts on work-hardened wheels.



LNUX-RRH



LNUX-RRP



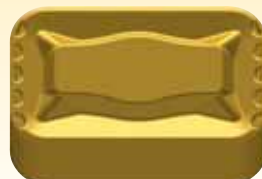
KRR6586-71



KRR6586-75



LNUX-RRSM



KRR6586-65

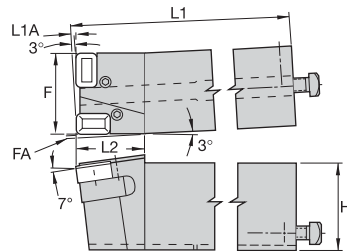
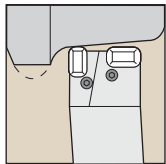


KRR6586-52



KRR6586-50

- Portal-type wheel lathe is a fully automatic, heavy-duty wheel lathe. An integrated measuring device determines wheel set profile wear to establish minimum stock removal.
- The portal-type machine bed enables roll-through operation.
- This tooling is suitable for economical machining of wheel sets for locomotives, transit, passenger, and freight cars.



Tread Profile Turning

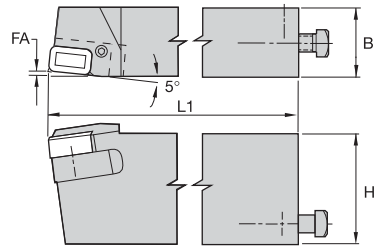
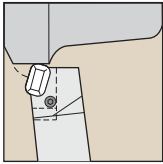
order number	catalog number	H		F		L1		L2		FA		L1A		insert 1
		mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	
1015754	HUWTCL	80,00	3.150	76,20	3.000	275,00	10.827	63,50	2.500	3,00	.118	3,00	.118	KRR6586__
1015723	HUWTCR	80,00	3.150	76,20	3.000	275,00	10.827	63,50	2.500	3,00	.118	3,00	.118	KRR6586__

Spare Parts

catalog number	shim	shim	lock screw	cup point socket set screw	brass plug	heavy-duty clamp screw
HUWTCL	SU7	SU8	S1006PKG	S751	S1033	S1014
HUWTCR	SU6	SU8	S1006PKG	S751	S1033	S1014

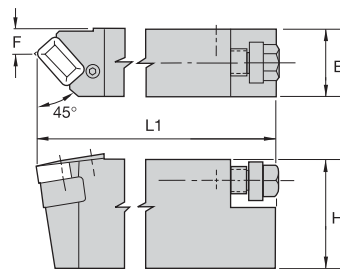
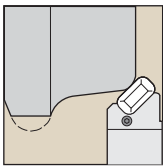
NOTE: Requires two inserts.
See page F84 for insert selection.

Application Specific



■ Flange Topping

order number	catalog number	H		B		L1		FA		insert 1
		mm	in	mm	in	mm	in	mm	in	
1015755	HUWFTR	80,00	3.150	50,00	1.969	265,00	10.433	3,53	.139	KRR6586_
1015756	HUWFTL	80,00	3.150	50,00	1.969	265,00	10.433	3,53	.139	KRR6586_



■ Mushroom Removal

order number	catalog number	H		B		F		L1		insert 1
		mm	in	mm	in	mm	in	mm	in	
1015685	HUMRR	80,00	3.150	50,00	1.969	19,50	.768	265,00	10.433	KRR6586_
1015686	HUMRL	80,00	3.150	50,00	1.969	19,50	.768	265,00	10.433	KRR6586_

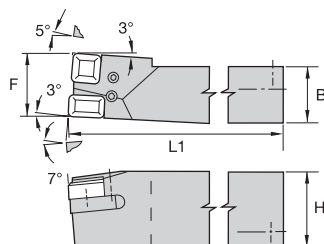
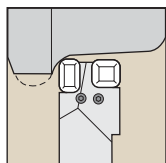
NOTE: See page F84 for insert selection.

Application Specific

- Tools and inserts are specifically designed for the feeds and speeds normally used on this type of lathe.
- Style HUTC is used for profiling the tread contours on the wheel, and style HUFT is used for normal flange topping.
- For heavy flange topping it may be necessary to use two flange-topping tools, styles HUFT-A and HUFT-B.



Hegenscheidt Portal-Type Wheel Lathe

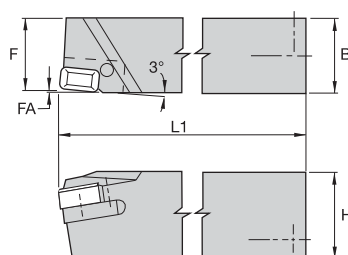
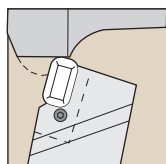


Tread Profile Turning

order number	catalog number	H		B		F		L1		insert 1	insert 2
		mm	in	mm	in	mm	in	mm	in		
1015757	HUTCR	69,85	2.750	50,00	1.969	57,15	2.250	275,00	10.827	KRR6586_	KRR86650
1015758	HUTCL	69,85	2.750	50,00	1.969	57,15	2.250	275,00	10.827	KRR6586_	KRR86650

NOTE: Requires 2 inserts.

Application Specific



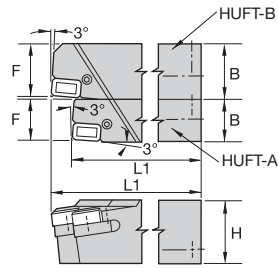
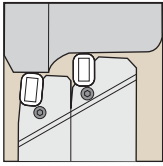
Flange Topping

order number	catalog number	H		B		F		L1		FA		insert 1
		mm	in	mm	in	mm	in	mm	in	mm	in	
1015717	HUFTR	69,85	2.750	60,00	2.362	58,17	2.290	250,00	9.843	1,70	.067	KRR6586_
1015718	HUFTL	69,85	2.750	60,00	2.362	58,17	2.290	250,00	9.843	1,70	.067	KRR6586_

Spare Parts

catalog number	steel locking unit	cone point screw	optional set screw	optional brass slug	optional square head bolt
HUFTR	SU2	S1006PKG	S1015	S1033	S1014
HUFTL	SU3	S1006PKG	S1015	S1033	S1014

NOTE: See page F84 for insert selection.



■ Heavy Flange Topping

order number	catalog number	H		B		F		L1		insert 1
		mm	in	mm	in	mm	in	mm	in	
1015719	HUFTRA	69,85	2.750	47,00	1.850	45,21	1.780	228,60	9.000	KRR6586_
3385736	HUFTRB	69,85	2.750	60,00	2.362	55,12	2.170	250,00	9.843	KRR6586_
3385735	HUFTLA	69,85	2.750	47,00	1.850	45,21	1.780	228,60	9.000	KRR6586_
3385737	HUFTLB	69,85	2.750	60,00	2.362	55,12	2.170	250,00	9.843	KRR6586_

NOTE: See page F84 for insert selection.

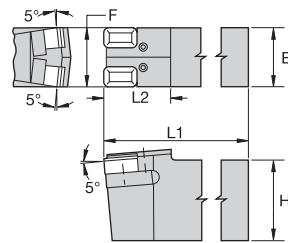
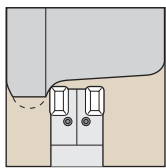


Application Specific

- Delivers maximum productivity at minimum operating costs.
- Fast insert indexing is possible with the tool mounted in the tool block.
- Individual steel locking units make it easy to index and lock each insert separately.
- Gage location on tool, over insert, is held to +/- .003" (0,08mm).
- No top clamp is used so it won't wear out or interfere with chip flow.
- Replaceable steel locking unit protects toolholder from damage.
- Indexable inserts with pre-formed chipbreakers deliver chip control at optimum feeds and speeds.



Simmons-Niles Wheel Turning Lathe

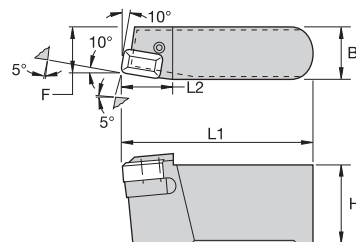
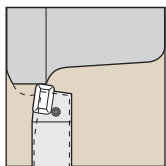


Wheel Tread Contouring

Application Specific

order number	catalog number	H		B		F		L1		L2		insert 1	steel locking unit	lock screw
		mm	in	mm	in	mm	in	mm	in	mm	in			
1015684	NUWTC	76,20	3.000	57,15	2.250	57,15	2.250	412,75	16.250	95,25	3.750	KRR6586__	SU3	S1006PKG

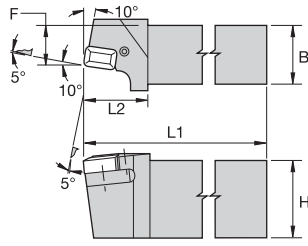
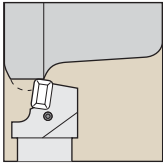
NOTE: Requires two inserts.
See page F84 for insert selection.



Wheel Flange Topping

order number	catalog number	H		B		F		L1		L2		insert 1
		mm	in	mm	in	mm	in	mm	in	mm	in	
1015689	NUFRR	63,50	2.500	41,28	1.625	36,53	1.438	152,40	6.000	39,62	1.560	KRR6586__
1015690	NUFRL	63,50	2.500	41,28	1.625	36,53	1.438	152,40	6.000	39,62	1.560	KRR6586__

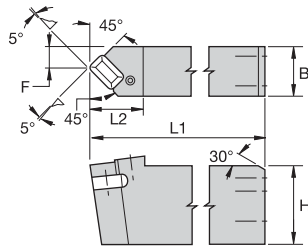
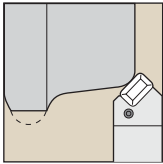
NOTE: See page F84 for insert selection.



■ Wheel Flange Roughing

order number	catalog number	H		B		F		L1		L2		insert 1
		mm	in	mm	in	mm	in	mm	in	mm	in	
1015693	NUFRAR	76,20	3.000	57,15	2.250	38,10	1.500	212,85	8.380	63,50	2.500	KRR6586__
1015714	NUFRAL	76,20	3.000	57,15	2.250	38,10	1.500	212,85	8.380	63,50	2.500	KRR6586__

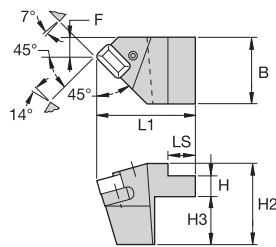
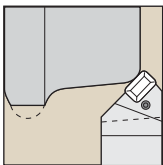
NOTE: See page F84 for insert selection.



■ Mushroom Removal

order number	catalog number	H		B		F		L1		L2		insert 1
		mm	in	mm	in	mm	in	mm	in	mm	in	
3385765	NUMRAR	76,20	3.000	47,63	1.875	19,51	.768	311,15	12.250	50,80	2.000	KRR6586__
3385766	NUMRAL	76,20	3.000	47,63	1.875	19,51	.768	311,15	12.250	50,80	2.000	KRR6586__

NOTE: See page F84 for insert selection.



■ Mushroom Removal

order number	catalog number	H		H2		H3		B		F		L1		LS		insert 1
		mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	
3385767	NUMRR	19,05	.750	76,20	3.000	45,21	1.780	63,50	2.500	19,05	.750	93,52	3.682	25,40	1.000	KRR6586__
3385768	NUMRL	19,05	.750	76,20	3.000	45,21	1.780	63,50	2.500	19,05	.750	93,52	3.682	25,40	1.000	KRR6586__

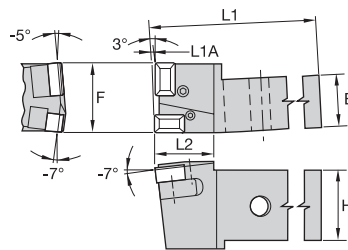
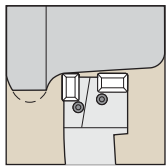
NOTE: See page F84 for insert selection.



- Delivers maximum productivity at minimum operating costs.
- Fast insert indexing is possible with the tool mounted in the tool block.
- Individual steel locking units make it easy to index and lock each insert separately.
- Gage location on tool, over insert, is held to +/- .003" (0,08mm).
- No top clamp is used to wear out or interfere with chip flow.
- Replaceable steel locking unit protects toolholder from damage.
- Improved inserts with chip control are offered.



Simmons-Farrel CNC Portal Wheel Lathe



Application Specific

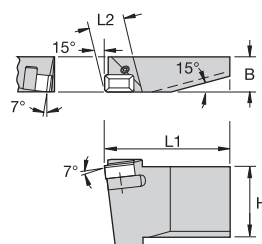
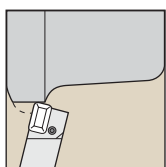
Wheel Tread Contouring

order number	catalog number	H		B		F		L1		L2		L1A		insert 1
		mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	
1015687	FUWTCR	76,20	3.000	57,15	2.250	76,20	3.000	254,00	10.000	66,55	2.620	3,05	.120	KRR6586__
1015688	FUWTCL	76,20	3.000	57,15	2.250	76,20	3.000	254,00	10.000	66,55	2.620	3,05	.120	KRR6586__

Spare Parts

catalog number	steel locking unit	steel locking unit	lock screw
FUWTCR	SU6	SU8	S1006PKG
FUWTCL	SU6	SU8	S1006PKG

NOTE: Requires two inserts.
See page F84 for insert selection.

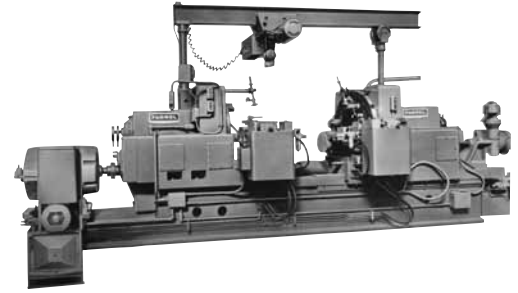


Wheel Flange Topping

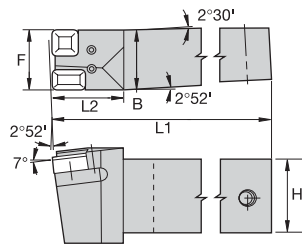
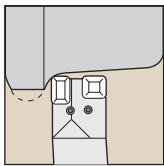
order number	catalog number	H		B		L1		L2		insert 1	steel locking unit	set screw
		mm	in	mm	in	mm	in	mm	in			
1015662	FUWFTR	76,20	3.000	38,10	1.500	133,35	5.250	38,10	1.500	KRR6586__	SU4	S1006PKG
1015663	FUWFTL	76,20	3.000	38,10	1.500	133,35	5.250	38,10	1.500	KRR6586__	SU4	S1006PKG

NOTE: See page F84 for insert selection.

- Delivers maximum productivity at minimum operating costs.
- Fast insert indexing is possible with the tool mounted in the tool block.
- Individual steel locking units make it easy to index and lock each insert separately.
- Minimum parts for lower inventory.
- No top clamp is used to wear out or interfere with chip flow.
- Replaceable steel locking unit protects toolholder from damage.
- Indexable inserts with pre-formed chipbreakers deliver chip control at optimum feeds and speeds.



Simmons-Farrel (Sellers) Tracer Wheel Lathe



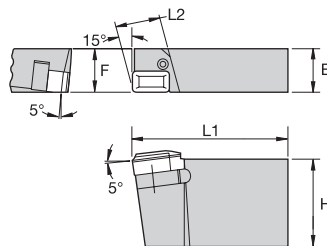
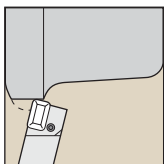
■ Wheel Tread Contouring

order number	catalog number	H		B		F		L1		L2		insert 1	insert 2
		mm	in	mm	in	mm	in	mm	in	mm	in		
1015658	SUWTCR	76,20	3.000	57,15	2.250	57,15	2.250	254,00	10.000	66,55	2.620	KRR6586__	KRR86650
1015659	SUWTCL	76,20	3.000	57,15	2.250	57,15	2.250	254,00	10.000	66,55	2.620	KRR6586__	KRR86650

■ Spare Parts

catalog number	shim	shim	cone point socket set screw	lock screw
SUWTCR	SU2	SU11	S939	S1006PKG
SUWTCL	SU3	SU10	S939	S1006PKG

NOTE: Requires two inserts.
See page F84 for insert selection.



■ Wheel Flange Topping

order number	catalog number	H		B		F		L1		L2		insert 1	steel locking unit	cone point set screw
		mm	in	mm	in	mm	in	mm	in	mm	in			
1864582	SUWFTR	76,20	3.000	38,10	1.500	38,10	1.500	133,35	5.250	37,72	1.485	KRR6586__	—	—
1015661	SUWFTL	76,20	3.000	38,10	1.500	38,10	1.500	133,35	5.250	37,72	1.485	KRR6586__	SU5	S1006PKG

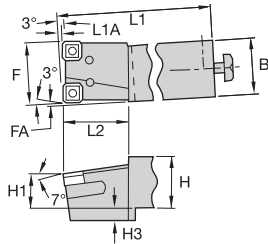
NOTE: See page F84 for insert selection.

Application Specific

- Kennametal tooling for underfloor wheel lathes features a steel sliding shim unit. The sliding shim unit holds the insert securely in the pocket, ensures easy insert indexing, and is simple and economical to replace.
- The insert used in these holders, KRR-6610, features improved chip control for safer and easier chip disposal.



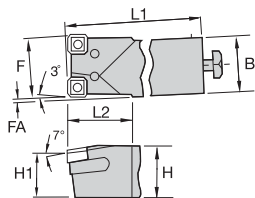
Hegenscheidt Underfloor Wheel Lathe



Model 104 Tread Profile Turning

order number	catalog number	H		H1		H3		B		F		L1		L2		FA		L1A		insert 1
		mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	
1015759	H104R55	49,91	1.965	31,88	1.255	12,00	.472	54,86	2.160	54,86	2.160	250,00	9.843	63,50	2.500	3,00	.118	3,00	.118	KRR6610
1015760	H104R60	49,91	1.965	31,88	1.255	12,00	.472	54,86	2.160	59,87	2.357	250,00	9.843	63,50	2.500	3,00	.118	3,00	.118	KRR6610
1015761	H104L55	49,91	1.965	31,88	1.255	12,00	.472	54,86	2.160	54,86	2.160	250,00	9.843	63,50	2.500	3,00	.118	3,00	.118	KRR6610
1015762	H104L60	49,91	1.965	31,88	1.255	12,00	.472	54,86	2.160	59,87	2.357	250,00	9.843	63,50	2.500	3,00	.118	3,00	.118	KRR6610

Application Specific



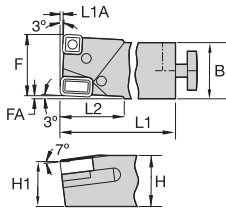
Model 106 Tread Profile Turning

order number	catalog number	H		H1		B		F		L1		L2		FA		insert 1
		mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	
3385769	H106R55	49,91	1.965	43,87	1.727	54,86	2.160	54,86	2.160	225,00	8.858	63,50	2.500	3,00	.118	KRR6610
1015763	H106R60	49,91	1.965	43,87	1.727	54,86	2.160	59,87	2.357	225,00	8.858	63,50	2.500	3,00	.118	KRR6610
3385770	H106L55	49,91	1.965	43,87	1.727	54,86	2.160	54,86	2.160	225,00	8.858	63,50	2.500	3,00	.118	KRR6610
1015784	H106L60	49,91	1.965	43,87	1.727	54,86	2.160	59,87	2.357	225,00	8.858	63,50	2.500	3,00	.118	KRR6610

Spare Parts

catalog number	steel locking unit	steel locking unit	cone point set screw	optional socket set screw	optional brass slug	optional square head bolt
H106R55	SU12	SU13	S1006PKG	S749	S1033	S1014
H106R60	SU12	SU13	S1006PKG	S749	S1033	S1014
H106L60	SU12	SU13	S1006PKG	S749	S1033	S1014
H106L60	SU12	SU13	S1006PKG	S749	S1033	S1014

NOTE: Requires two inserts.
See page F84 for insert selection.



■ Model 106 Tread Profile Turning • Carbide Shim

order number	catalog number	H		H1		B		F		L1		L2		FA		L1A		insert 1	insert 2
		mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in		
1015557	H106R60H	50,00	1.969	43,87	1.727	54,86	2.160	59,87	2.357	225,00	8.858	63,50	2.500	3,00	.118	3,00	.118	KRR658671	KRR6610
1015558	H106L60H	50,00	1.969	43,87	1.727	54,86	2.160	59,87	2.357	225,00	8.858	63,50	2.500	3,00	.118	3,00	.118	KRR658671	KRR6610

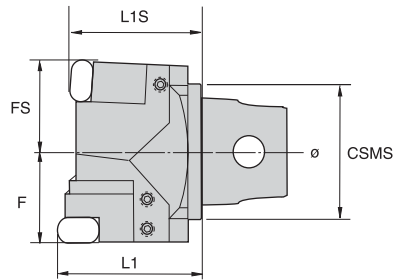
■ Spare Parts

catalog number	steel locking unit	cone point set screw	optional socket set screw	optional brass slug	optional square head bolt
H106R60H	SU6B	S1006PKG	S751	S1033	S1014
H106L60H	SU7B	S1006PKG	S751	S1033	S1014

NOTE: Requires two inserts.
See page F84 for insert selection.



Application Specific



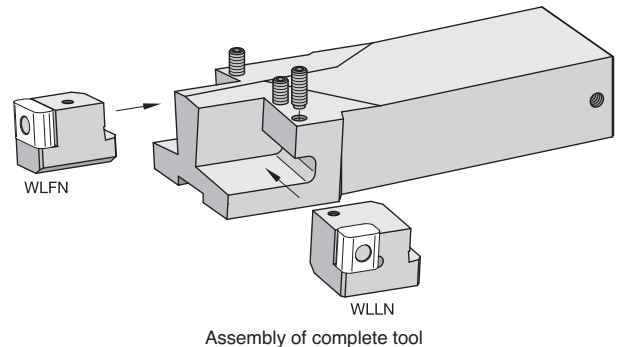
■ TK

order number	catalog number	CSMS system size	F		FS		L1		L1S	
			mm	in	mm	in	mm	in	mm	in
1781756	TK01339D	KM63	42,50	1.673	42,50	1.673	66,00	2.598	60,00	2.362
1781755	TK01338D	KM63	42,50	1.673	42,50	1.673	66,00	2.598	60,00	2.362

NOTE: See page F86 for insert selection.

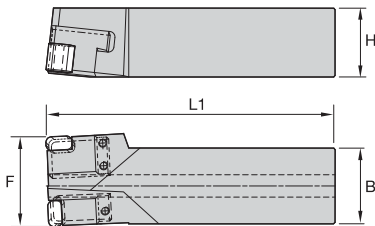
Assembly Instructions

basic/KM shank	cartridge WLLN..	cartridge WLFN..
right	right	left
left	left	right



Assembly of complete tool

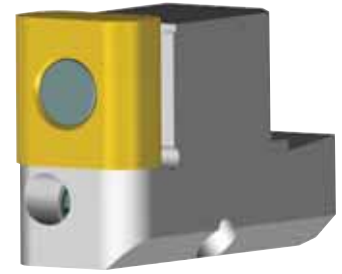
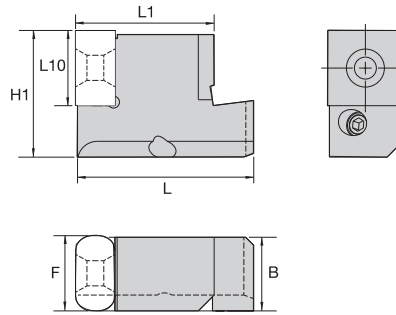
Application Specific



■ Basic Shank WXXN

order number	catalog number	H		B		F assembly		L1 assembly		clamp screw
		mm	in	mm	in	mm	in	mm	in	
1251262	WXXNR4455X-FL	50,00	1.969	55,00	2.165	65,00	2.559	210,00	8.268	PT00163
1251261	WXXNL4455X-FL	50,00	1.969	55,00	2.165	65,00	2.559	210,00	8.268	PT00163

NOTE: See page F86 for insert selection.



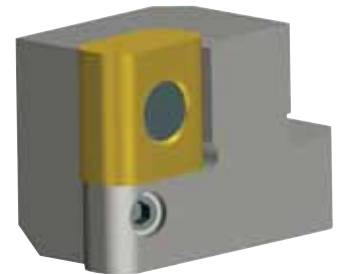
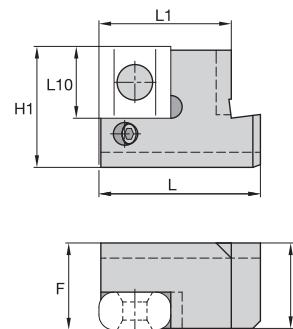
■ Cartridge WLFN

order number	catalog number	H1		B		F		L10		L1		L		gage insert
		mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	
2435187	WLFNR32CA19S	32,00	1.260	18,60	.732	19,00	.748	19,00	.748	35,00	1.378	45,00	1.772	LNUX191940...
2435188	WLFNL32CA19S	32,00	1.260	18,60	.732	19,00	.748	19,00	.748	35,00	1.378	45,00	1.772	LNUX191940...

■ Spare Parts

catalog number	clamp stud	clamp screw	hex wrench
WLFNR32CA19S	114.305	121.616	170.003
WLFNL32CA19S	114.305	121.616	170.003

NOTE: See page F86 for insert selection.



Application Specific

■ Cartridge WLLN

order number	catalog number	H1		B		F		L10		L1		L		gage insert
		mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	
2435183	WLLNR32CA19S	32,00	1.260	22,60	.890	23,00	.906	19,00	.748	35,00	1.378	45,00	1.772	LNUX191940...
2435185	WLLNR32CA30S	32,00	1.260	22,60	.890	23,00	.906	30,00	1.181	35,00	1.378	45,00	1.772	LNUX301940...
2435184	WLLNL32CA19S	32,00	1.260	22,60	.890	23,00	.906	19,00	.748	35,00	1.378	45,00	1.772	LNUX191940...
2435186	WLLNL32CA30S	32,00	1.260	22,60	.890	23,00	.906	30,00	1.181	35,00	1.378	45,00	1.772	LNUX301940...

■ Spare Parts

catalog number	clamp stud	clamp screw	hex wrench
WLLNR32CA19S	114.305	121.616	170.003
WLLNR32CA30S	114.305	121.616	170.003
WLLNL32CA19S	114.305	121.616	170.003
WLLNL32CA30S	114.305	121.616	170.003

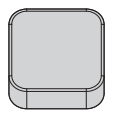
NOTE: See page F86 for insert selection.

Kennametal stocks a complete line of standard inserts for wheel and axle machining. Inserts are available in various styles, sizes, and grades.

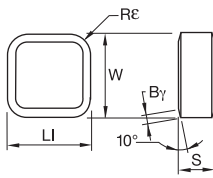
- **Wheel boring** – molded chipbreaker inserts in round, square, octagon, and grindable inserts.
- **Axle turning** – triangle- and diamond-shaped inserts with chipbreakers.
- **Wheel turning** – rectangular and square styles, with or without molded chipbreakers.
- **Wheel truing** – round buttons with center hole for locking.



Application Specific

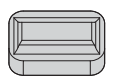


■ KRR-K

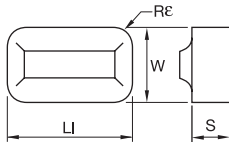


● first choice
○ alternate choice

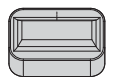
ISO catalog number	ANSI catalog number	W		LI		S		Re		D1		By		K40	KC9110	KC9125	KCP10	KCP25	KC9110RR	KC9115RR	KC9125RR	KC5115RR	KC5125RR	KCK20	
		mm	in	mm	in	mm	in	mm	in	mm	in	mm	in												
KRR16K	KRR16K	25,40	1.000	25,40	1.000	9,53	3/8	4,76	3/16	—	—	0,76	.030	●											



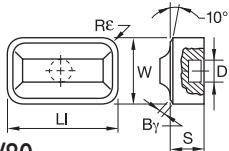
■ KRR-6566



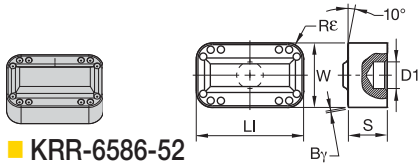
ISO catalog number	ANSI catalog number	W		LI		S		Re		D1		By		K40	KC9110	KC9125	KCP10	KCP25	KC9110RR	KC9115RR	KC9125RR	KC5115RR	KC5125RR	KCK20	
		mm	in	mm	in	mm	in	mm	in	mm	in	mm	in												
KRR6566	KRR6566	19,05	.750	31,75	1.250	9,53	3/8	4,76	3/16	—	—	—	—	●											



■ KRR-6586-50/80



ISO catalog number	ANSI catalog number	W		LI		S		Re		D1		By		K40	KC9110	KC9125	KCP10	KCP25	KC9110RR	KC9115RR	KC9125RR	KC5115RR	KC5125RR	KCK20	
		mm	in	mm	in	mm	in	mm	in	mm	in	mm	in												
KRR658650	KRR658650	19,05	.750	31,75	1.250	12,70	1/2	4,76	3/16	7,87	.310	0,51	.020	●					●						
KRR658680	KRR658680	19,05	.750	31,75	1.250	12,70	1/2	4,76	3/16	7,87	.310	0,51	.020						●						

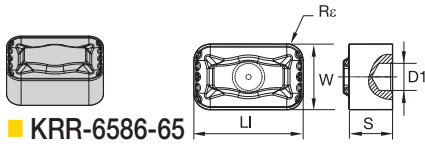


■ KRR-6586-52

● first choice
○ alternate choice

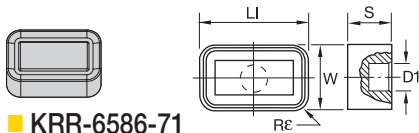
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K	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
N	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
S	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
H	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

ISO catalog number	ANSI catalog number	W		LI		S		Re		D1		By		K40	KC9110	KC9125	KCP10	KCP25	KC9110RR	KC9115RR	KC9125RR	KC5115RR	KC5125RR	KCK20	
		mm	in	mm	in	mm	in	mm	in	mm	in	mm	in												
KRR658652	KRR658652	19,05	.750	31,75	1.250	12,70	1/2	4,76	3/16	7,87	.310	0,51	.020							●	●	●	●	●	



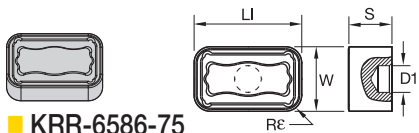
■ KRR-6586-65

ISO catalog number	ANSI catalog number	W		LI		S		Re		D1		By		K40	KC9110	KC9125	KCP10	KCP25	KC9110RR	KC9115RR	KC9125RR	KC5115RR	KC5125RR	KCK20
		mm	in	mm	in	mm	in	mm	in	mm	in	mm	in											
KRR658665	KRR658665	19,05	.750	31,75	1.250	12,70	1/2	4,76	3/16	7,87	.310	—	—											●



■ KRR-6586-71

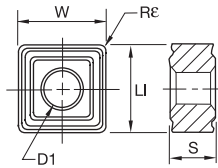
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		mm	in	mm	in	mm	in	mm	in	mm	in	mm	in											
KRR658671	KRR658671	19,05	.750	31,75	1.250	12,70	1/2	4,76	3/16	7,87	.310	—	—	●					●					



■ KRR-6586-75

ISO catalog number	ANSI catalog number	W		LI		S		Re		D1		By		K40	KC9110	KC9125	KCP10	KCP25	KC9110RR	KC9115RR	KC9125RR	KC5115RR	KC5125RR	KCK20
		mm	in	mm	in	mm	in	mm	in	mm	in	mm	in											
KRR4210R	KRR4210R	12,70	.500	12,70	.500	3,18	1/8	—	—	—	—	—	—		●									
KRR6566	KRR6566	19,05	.750	31,75	1.250	9,53	3/8	4,76	3/16	—	—	—	—	●										●
KRR658650	KRR658650	19,05	.750	31,75	1.250	12,70	1/2	4,76	3/16	7,87	.310	0,51	.020	●				●			●	●	●	●
KRR658652	KRR658652	19,05	.750	31,75	1.250	12,70	1/2	4,76	3/16	7,87	.310	0,51	.020	●							●	●	●	●
KRR658665	KRR658665	19,05	.750	31,75	1.250	12,70	1/2	4,76	3/16	7,87	.310	—	—							●				●
KRR658671	KRR658671	19,05	.750	31,75	1.250	12,70	1/2	4,76	3/16	7,87	.310	—	—	●						●				
KRR658680	KRR658680	19,05	.750	31,75	1.250	12,70	1/2	4,76	3/16	7,87	.310	0,51	.020							●		●		
KRR6610	KRR6610	19,05	.750	19,05	.750	9,53	3/8	4,00	5/32	7,87	.310	—	—	●										●
KRR86650	KRR86650	25,40	1.000	25,40	1.000	9,53	3/8	4,76	3/16	7,87	.310	0,51	.020	●										

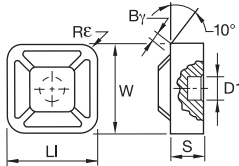




● first choice
○ alternate choice

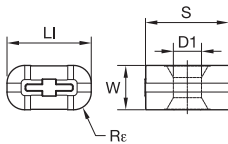
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K	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
N	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
S	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
H	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

ISO catalog number	ANSI catalog number	W		LI		S		Re		D1		By		K40	KC9110	KC9125	KCP10	KCP25	KC9110RR	KC9115RR	KC9125RR	KC5115RR	KC5125RR	KCK20	
		mm	in	mm	in	mm	in	mm	in	mm	in	mm	in												
KRR6610	KRR6610	19,05	.750	19,05	.750	9,53	3/8	4,00	5/32	7,87	.310	—	—	●										●	



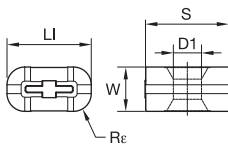
ISO catalog number	ANSI catalog number	W		LI		S		Re		D1		By		K40	KC9110	KC9125	KCP10	KCP25	KC9110RR	KC9115RR	KC9125RR	KC5115RR	KC5125RR	KCK20	
		mm	in	mm	in	mm	in	mm	in	mm	in	mm	in												
KRR86650	KRR86650	25,40	1.000	25,40	1.000	9,53	3/8	4,76	3/16	7,87	.310	0,51	.020	●											

Application Specific



ISO catalog number	ANSI catalog number	W		LI		S		Re		D1		By		K40	KC9110	KC9125	KCP10	KCP25	KC9110RR	KC9115RR	KC9125RR	KC5115RR	KC5125RR	KCK20	
		mm	in	mm	in	mm	in	mm	in	mm	in	mm	in												
LNUX191940RRF	LNUX191940RRF	10,00	.394	19,00	.748	19,05	3/4	4,00	5/32	6,35	.250	—	—				●	●							
LNUX301940RRF	LNUX301940RRF	12,00	.472	30,00	1.181	19,05	3/4	4,00	5/32	6,35	.250	—	—				●	●							

NOTE: Also available in KC9105.

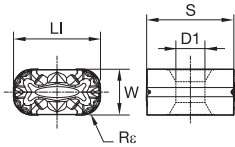


ISO catalog number	ANSI catalog number	W		LI		S		Re		D1		By		K40	KC9110	KC9125	KCP10	KCP25	KC9110RR	KC9115RR	KC9125RR	KC5115RR	KC5125RR	KCK20	
		mm	in	mm	in	mm	in	mm	in	mm	in	mm	in												
LNUX191940RRH	LNUX191940RRH	10,00	.394	19,00	.748	19,05	3/4	4,00	5/32	6,35	.250	—	—	●	●	●	●								
LNUX301940RRH	LNUX301940RRH	12,00	.472	30,00	1.181	19,05	3/4	4,00	5/32	6,35	.250	—	—	●	●	●	●								

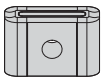
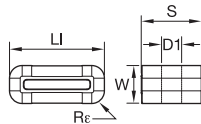
NOTE: Also available in KC9105.

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K	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
N	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
S	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
H	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

● first choice
○ alternate choice

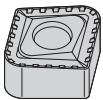
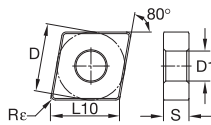

LNUX-RRP


ISO catalog number	ANSI catalog number	W		LI		S		Rε		D1		By		K40	KC9110	KC9125	KCP10	KCP25	KC9110RR	KC9115RR	KC9125RR	KC5115RR	KC5125RR	KCK20
		mm	in	mm	in	mm	in	mm	in	mm	in	mm	in											
LNUX191940RRP	LNUX191940RRP	10,00	.394	19,00	.748	19,05	3/4	4,00	5/32	6,35	.250	—	—	●	●	●	●	●	●	●	●	●	●	●
LNUX301940RRP	LNUX301940RRP	12,00	.472	30,00	1.181	19,05	3/4	4,00	5/32	6,35	.250	—	—	●	●	●	●	●	●	●	●	●	●	●

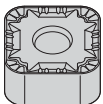
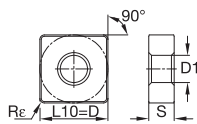

LNUX-RRSM


ISO catalog number	ANSI catalog number	W		LI		S		Rε		D1		By		K40	KC9110	KC9125	KCP10	KCP25	KC9110RR	KC9115RR	KC9125RR	KC5115RR	KC5125RR	KCK20
		mm	in	mm	in	mm	in	mm	in	mm	in	mm	in											
LNUX191940RRSM	LNUX191940RRSM	10,00	.394	19,00	.748	19,05	3/4	4,00	5/32	6,35	.250	—	—	●	●	●	●	●	●	●	●	●	●	●
LNUX301940RRSM	LNUX301940RRSM	12,00	.472	30,00	1.181	19,05	3/4	4,00	5/32	6,35	.250	—	—	●	●	●	●	●	●	●	●	●	●	●

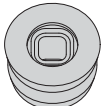
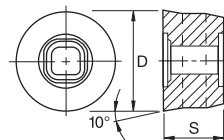
NOTE: Also available in KC9105™.


CNMM-RRP


ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		By		K40	KC9110	KC9125	KCP10	KCP25	KC9110RR	KC9115RR	KC9125RR	KC5115RR	KC5125RR	KCK20
		mm	in	mm	in	mm	in	mm	in	mm	in	mm	in											
CNMM190740RRP	CNMM190740RRP	19,05	3/4	19,34	.762	7,94	5/16	4,00	5/32	7,93	.313	—	—	●	●	●	●	●	●	●	●	●	●	●


SNMX-RRP


ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		By		K40	KC9110	KC9125	KCP10	KCP25	KC9110RR	KC9115RR	KC9125RR	KC5115RR	KC5125RR	KCK20
		mm	in	mm	in	mm	in	mm	in	mm	in	mm	in											
SNMX190640RRP	SNMX190640RRP	19,05	3/4	19,05	.750	6,350	1/4	4,000	5/32	6,35	.250	—	—	●	●	●	●	●	●	●	●	●	●	●


WTS-P


ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		By		K40	KC9110	KC9125	KCP10	KCP25	KC9110RR	KC9115RR	KC9125RR	KC5115RR	KC5125RR	KCK20
		mm	in	mm	in	mm	in	mm	in	mm	in	mm	in											
WTS10P	WTS10P	15,82	.623	—	—	9,525	3/8	—	—	—	—	—	—	●	●	●	●	●	●	●	●	●	●	●

Application Specific

Kennametal Tools for Railways and Wheel Machining

Primary Application

Kennametal offers a complete line of tooling that incorporates the latest technology for maximum metal removal and higher productivity. All tools perform in actual use over extended periods of time, under a wide range of operating conditions. Standard off-the-shelf inserts and fewer pieces of hardware reduce inventory and operating costs. Tools in this range are for reconditioning mounted wheel sets, wheel boring, wheel truing, axle turning and journal burnishing.

Features and Benefits

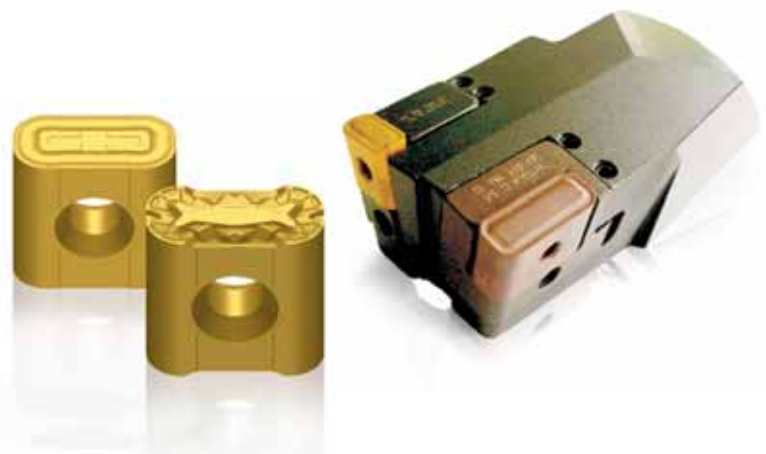
Machining conditions vary with the wheel's type of service. Reduced production time and lower maintenance costs produce superior results even under these tough conditions.

- Skid flat areas.
- Accidental torch burns.
- Overheating of spinning wheels.
- Excessive mushroom and rollovers that are hardened by unusual hump retarder pressure.
- Mismatched wheels that cause excessive wear on the side of the flange.

Each of these conditions requires a different machining speed and depth of cut.

Advantages of Wheelset Reconditioning with Kennametal Wheel Lathe Tools.

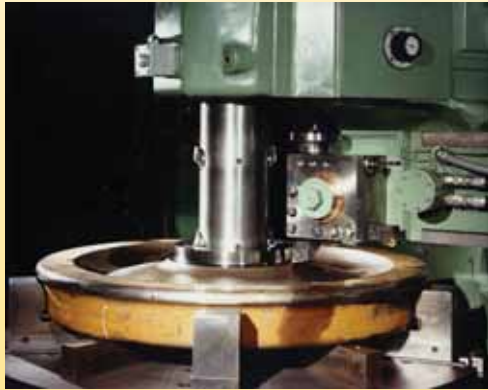
- Heavy-duty steel locking unit ensures longer life and reduces operating costs.
- No top clamp to wear out or interfere with chip flow.
- Hardened-steel locking unit locks the insert against two walls in the toolholder to prevent insert movement under heavy cutting loads.
- Quick removal of the steel locking unit.
- Fast trouble free insert indexing.
- Made from heat-treated alloy steel to withstand severe roughing cuts on work-hardened wheels.



■ **L-Type Boring Bars**

Railroad wheels are wrought steel and cast steel made in a number of designs. Steel wheels are classified as multiple-wear, two-wear, or one-wear wheels.

Composition and specifications of wheels include Class A, a relatively low carbon steel wheel; Class L, a lower carbon content than Class A; Class B, an intermediate carbon steel; and Class C, a relatively high-carbon steel wheel.

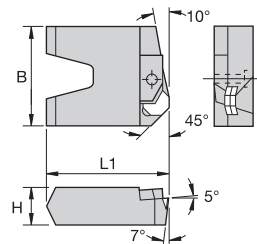
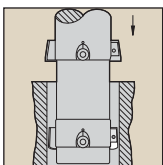


Kennametal provides L-type bar tooling to bore wheels to match journal sizes from 4 1/2" x 8" to 8" x 16".

- Tools are precision ground and hardened for maximum life.
- Lower profile permits use in L-type bars without modification.
- Fast insert indexing reduces tool changing downtime.
- Enables free cutting action at higher feed rates.
- Delivers good chip control under a wide range of conditions.
- Inserts are available in both coated and uncoated grades.
- Kennametal also provides cartridges to fit Kennametal-supplied bars to run on CNC boring machines.
- Most bars and cartridges are supplied as specials per machine manufacturers' specifications.

Application Specific

- Uses OPG-524 positive rake, octagonal inserts for free cutting action while finish boring.
- Tool positions the insert parallel to the bore in the operation.
- Consistently produces bore finishes to specifications.
- Inserts have eight indexable cutting edges.
- Available in 11 sizes to fit L-type boring bars.

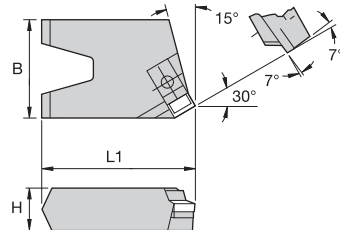
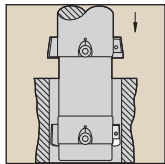


■ **OWF-Style Tools for Roughing**

order number	catalog number	min wheel bore		H		B		L1		journal size	insert 1	shim	shim screw	clamp	clamp screw
		mm	in	mm	in	mm	in	mm	in						
1015785	OWF744SET	139,70	5.500	22,23	.875	50,80	2.000	69,06	2.719	4 1/2 X 8	OPG524	SM159	S125	CMR15	S472
1015793	OWF863SET	200,03	7.875	25,40	1.000	57,15	2.250	99,21	3.906	6 1/2 X 12	OPG524	SM159	S125	CMR15	S421

NOTE: Tool sets contain a ground matched pair of toolholders.
See page F97 for insert selection.

- Uses SNMG-style molded chipbreaker inserts with eight cutting edges.
- Available in 11 sizes to fit L-type boring bars.
- Employs a low-profile design.
- Delivers fast insert indexing while maintaining bore size.
- Tools have a protective insert seat.



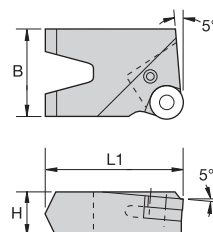
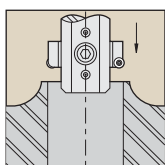
■ SWR-Style Tools for Roughing

Application Specific

order number	catalog number	min wheel bore		H		B		L1		journal size	insert 1
		mm	in	mm	in	mm	in	mm	in		
1015559	SWR744SET	234,95	9.250	22,23	.875	50,80	2.000	69,06	2.719	4 1/2 X 8	SNMG433
1015560	SWR750SET	158,75	6.250	22,23	.875	50,80	2.000	78,59	3.094	5 X 9	SNMG433
1015561	SWR754SET	171,45	6.750	22,23	.875	50,80	2.000	84,94	3.344	5 1/2 X 10	SNMG433
1015562	SWR759SET	187,33	7.375	22,23	.875	50,80	2.000	92,86	3.656	6 X 11	SNMG433
1015563	SWR763SET	200,03	7.875	22,23	.875	50,80	2.000	99,21	3.906	6 1/2 X 12	SNMG433
1015584	SWR770SET	222,25	8.750	22,23	.875	50,80	2.000	107,16	4.219	7 X 14	SNMG433
1015585	SWR854SET	171,45	6.750	25,40	1.000	57,15	2.250	84,94	3.344	5 1/2 X 10	SNMG433
1015586	SWR859SET	187,33	7.375	25,40	1.000	57,15	2.250	92,86	3.656	6 X 11	SNMG433
1015587	SWR863SET	200,03	7.875	25,40	1.000	57,15	2.250	99,21	3.906	6 1/2 X 12	SNMG433
1015588	SWR870SET	222,25	8.750	25,40	1.000	57,15	2.250	107,16	4.219	7 X 14	SNMG433
1015589	SWR874SET	234,95	9.250	25,40	1.000	57,15	2.250	116,69	4.594	8 X 16	SNMG433

NOTE: Tool sets contain a ground matched pair of toolholders.
See page F96 for insert selection.

- Available in the rugged unit locking design for operating at higher feed ranges.
- Unit locking design ensures maximum insert locking by pulling the insert down and back into the pocket.
- Locking unit protects the holder and properly seats the insert.
- Insert can be released quickly for fast indexing, minimizing downtime.
- Available in 11 sizes to fit L-type boring bars.



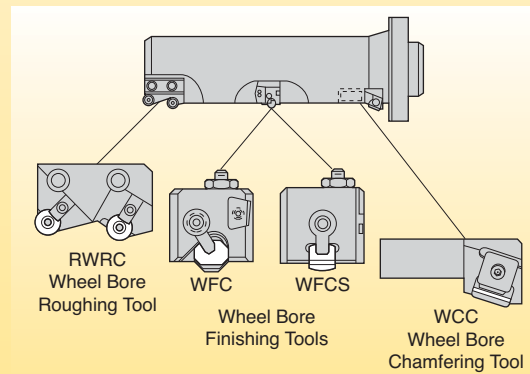
■ RUWR-Style Tools for Roughing

order number	catalog number	min wheel bore		H		B		L1		journal size	insert 1
		mm	in	mm	in	mm	in	mm	in		
1015656	RUWR870SET	222,25	8.750	25,40	1.000	57,15	2.250	107,16	4.219	7 X 14	RNMG64

NOTE: Tool sets contain a ground matched pair of toolholders.
See page F96 for insert selection.

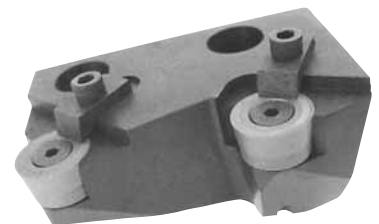
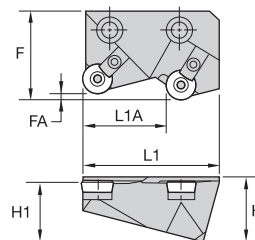
■ **Advantages of Kennametal Wheel Boring Tools**

- Available in several styles for rough and finish boring.
- Tools are available for finishing KRR- or OPG-style inserts.
- Rough boring tools use RCMH round inserts.
- Tools keep the insert parallel to the bore during operation to ensure a smooth cut within established finish specifications.
- All styles of tools are designed with insert locking confined within the shank height. This enables the tools to be retracted to bore the smaller sizes without modifying the standard bar.
- Check the catalog number and dimensions of your cartridges before ordering. Bars and cartridges on older machines may not be the same. Call Kennametal's Customer Application Support team for assistance.



Application Specific

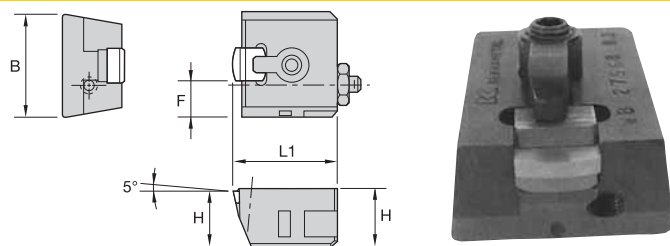
- Uses RCMH-style inserts for free cutting action while rough boring.
- This is a double-pocket cartridge and requires two inserts and two sets of hardware.
- Cartridges are easily replaceable.



■ **RWRC-Style Tools for Roughing**

order number	catalog number	H		H1		F		L1		FA		L1A		insert 1	insert screw	shim	clamp	clamp screw
		mm	in	mm	in	mm	in	mm	in	mm	in	mm	in					
1015616	RWRC	41,15	1.620	38,10	1.500	57,11	2.249	85,85	3.380	4,75	.187	52,38	2.062	RCMH64	S1001	SM381	S412	S412

NOTE: See page F95 for insert selection.



■ **WFCs-Style Tools for Finishing**

order number	catalog number	H		B		F		L1		H1		insert 1
		mm	in	mm	in	mm	in	mm	in	mm	in	
1015615	WFCs	23,88	.940	39,68	1.562	14,28	.562	41,15	1.620	22,23	.875	KRR4210R

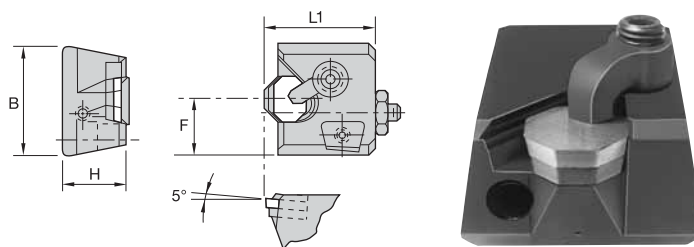
■ **Spare Parts**

catalog number	adjusting screw	jam nut	chipbreaker	shim	shim screw	clamp	clamp screw
WFCs	S846	S936	CBS16	SRR4210R	S111	CK13	STC4

NOTE: See page F97 for insert selection.



Application Specific



■ **WFC-Style Tools for Finishing**

order number	catalog number	H		B		F		L1		insert 1
		mm	in	mm	in	mm	in	mm	in	
1177582	WFC	23,80	.937	39,68	1.562	20,63	.812	41,15	1.620	OPG524

■ **Spare Parts**

catalog number	adjusting screw	jam nut	chipbreaker	shim	shim screw	clamp	clamp screw
WFC	S846	S936	CBO560	SM159	S125	CK13	STC4

NOTE: See page F97 for insert selection.

■ Axle Turning Tools

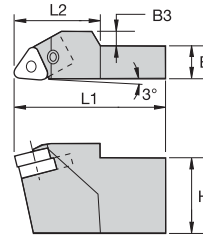
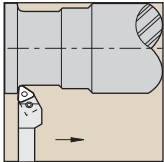
Freight car and passenger car axles are usually made of carbon steel and may be heat treated or untreated. Locomotive axles, electric transit axles, and industrial-use axles are made of a variety of carbon and alloy steels. The alloy steel axles are heat treated, while the carbon steel axles are either heat treated or untreated.

Kennametal offers two styles of holders to suit user needs for re-machining journal surfaces on car axles.

- These two standard designs use indexable inserts and have a 3° lead built into the holder to conform to the AAR standards.
- To use these tools in some dual-end-drive axle lathes, a slight modification to the existing tool block is necessary. This is required to clear the head portion of the tool to generate the required radius on the axle.
- Kennametal offers a wide variety of standard off-the-shelf tooling as well as special tooling for all types of machining applications on various machines for reconditioning axles.



- Steel locking unit design ensures maximum insert locking pressure.
- Insert locks firmly in place against the one-wall pocket for fast insert indexing.
- Locking unit protects holders and provides secure seating for the insert.
- Indexable inserts eliminate regrinding.
- Uses 1/2" IC triangular inserts that provide up to six cutting edges.

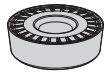


JTU-Style Tools

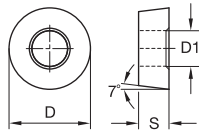
order number	catalog number	H		B		B3		L1		L2		insert 1	lock screw	steel locking unit
		mm	in	mm	in	mm	in	mm	in	mm	in			
1015592	JTU56R	38,10	1.500	15,88	.625	6,35	.250	73,03	2.875	41,15	1.620	TNMP438_/KRRT438	S1007PKG	SU9
1015593	JTU56L	38,10	1.500	15,88	.625	6,35	.250	73,03	2.875	41,15	1.620	TNMP438_/KRRT438	S1007PKG	SU9

NOTE: See page F97 for insert selection.

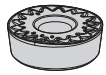
Application Specific



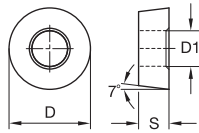
RCMH-UP



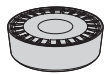
ISO catalog number	ANSI catalog number	D		D1		S		KCP10	KCP25	KCK20	KCU10	KC9110	KC9125
		mm	in	mm	in	mm	in						
RCMH2507M0TUP	RCMH2507M0TUP	25	.984	7,55	.297	7,94	.313	●	●	●	○	○	●
RCMH3209M0TUP	RCMH3209M0TUP	32	1.260	10,35	.407	9,53	.375	●	●	●	○	○	●



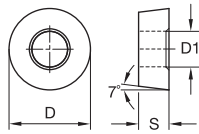
RCMH-RU



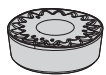
ISO catalog number	ANSI catalog number	D		D1		S		KCP10	KCP25	KCK20	KCU10	KC9110	KC9125
		mm	in	mm	in	mm	in						
RCMH2507M0RU	RCMH2507M0RU	25	.984	7,55	.297	7,94	.313	●	●	●	○	○	●
RCMH3209M0RU	RCMH3209M0RU	32	1.260	10,35	.407	9,53	.375	●	●	●	○	○	●



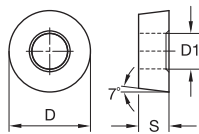
RCMX-UP



ISO catalog number	ANSI catalog number	D		D1		S		KCP10	KCP25	KCK20	KCU10	KC9110	KC9125
		mm	in	mm	in	mm	in						
RCMX2507M0TUP	RCMX2507M0TUP	25	.984	7,19	.283	7,94	.313	●	●	●	○	○	●
RCMX3209M0TUP	RCMX3209M0TUP	32	1.260	9,78	.385	9,53	.375	●	●	●	○	○	●



RCMX-RU



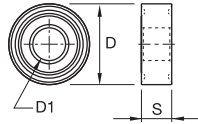
ISO catalog number	ANSI catalog number	D		D1		S		KCP10	KCP25	KCK20	KCU10	KC9110	KC9125
		mm	in	mm	in	mm	in						
RCMX2507M0RU	RCMX2507M0RU	25	.984	7,19	.283	7,94	.313	●	●	●	○	○	●
RCMX3209M0RU	RCMX3209M0RU	32	1.260	9,78	.385	9,53	.375	●	●	●	○	○	●

P	●	●	○	○	●	●
M	●	○	○	○	○	○
K	○	○	○	○	○	○
N	○	○	○	○	○	○
S	○	○	○	○	○	○
H	○	○	○	○	○	○

● first choice
○ alternate choice



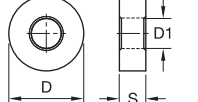
Application Specific



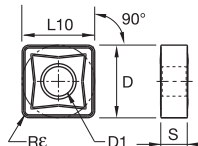
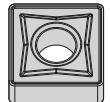
● first choice
○ alternate choice

P	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
M	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
K	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
N	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
S	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
H	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

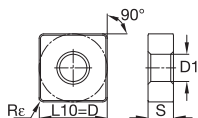
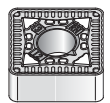
ISO catalog number	ANSI catalog number	D		L10		S		R _e		D1		K40	KC9110	KC9125	KCP10	KCP25	KC9110RR	KC9115RR	KC9125RR	KC5115RR	KC5125RR	KCK20	
		mm	in	mm	in	mm	in	mm	in	mm	in												
		RNMG4009M0	RNMG4009M0	40,00	1.57	—	—	9,52	3/8	—	—												12,70
RNMG190600	RNMG64	19,05	3/4	—	—	6,35	1/4	—	—	7,93	.313				●		●						



ISO catalog number	ANSI catalog number	D		L10		S		R _e		D1		K40	KC9110	KC9125	KCP10	KCP25	KC9110RR	KC9115RR	KC9125RR	KC5115RR	KC5125RR	KCK20	
		mm	in	mm	in	mm	in	mm	in	mm	in												
		RNMG090300RN	RNMG32RN	9,53	3/8	—	—	3,18	1/8	—	—												3,81
RNMG120400RN	RNMG43RN	12,70	1/2	—	—	4,76	3/16	—	—	5,16	.203	●											
RNMG150600RN	RNMG54RN	15,88	5/8	—	—	6,35	1/4	—	—	6,35	.250		●	●	●	●							
RNMG190600RN	RNMG64RN	19,05	3/4	—	—	6,35	1/4	—	—	7,93	.313	●											
RNMG190900RN	RNMG66RN	19,05	3/4	—	—	9,52	3/8	—	—	7,93	.313		●										
RNMG250900RN	RNMG86RN	25,40	1	—	—	9,53	3/8	—	—	9,12	.359		●	●	●								



ISO catalog number	ANSI catalog number	D		L10		S		R _e		D1		K40	KC9110	KC9125	KCP10	KCP25	KC9110RR	KC9115RR	KC9125RR	KC5115RR	KC5125RR	KCK20
		mm	in	mm	in	mm	in	mm	in	mm	in											
		SNMG120412	SNMG433	12,70	1/2	12,70	.500	4,76	3/16	1,20	3/64											
SNMG190612	SNMG643	19,05	3/4	19,05	.750	6,35	1/4	1,20	3/64	7,93	.312					●						
SNMG190616	SNMG644	19,05	3/4	19,05	.750	6,35	1/4	1,60	1/16	7,93	.313					●						
SNMG250924	SNMG866	25,40	1	25,40	1.000	9,53	3/8	2,40	3/32	9,12	.359					●						



ISO catalog number	ANSI catalog number	D		L10		S		R _e		D1		K40	KC9110	KC9125	KCP10	KCP25	KC9110RR	KC9115RR	KC9125RR	KC5115RR	KC5125RR	KCK20
		mm	in	mm	in	mm	in	mm	in	mm	in											
		SNMG090412RN	SNMG333RN	9,53	3/8	9,53	.375	4,76	3/16	1,20	3/64											
SNMG120408RN	SNMG432RN	12,70	1/2	12,70	.500	4,76	3/16	0,80	1/32	5,16	.203	●	●	●	●							
SNMG120412RN	SNMG433RN	12,70	1/2	12,70	.500	4,76	3/16	1,20	3/64	5,16	.203	●	●	●	●							
SNMG120416RN	SNMG434RN	12,70	1/2	12,70	.500	4,76	3/16	1,60	1/16	5,16	.203	●	●	●	●							
SNMG150608RN	SNMG542RN	15,88	5/8	15,88	.625	6,35	1/4	0,80	1/32	6,35	.250	●			●							
SNMG150612RN	SNMG543RN	15,88	5/8	15,88	.625	6,35	1/4	1,20	3/64	6,35	.250	●			●							
SNMG150616RN	SNMG544RN	15,88	5/8	15,88	.625	6,35	1/4	1,60	1/16	6,35	.250	●			●							
SNMG190608RN	SNMG642RN	19,05	3/4	19,05	.750	6,35	1/4	0,80	1/32	7,93	.313	●	●		●							
SNMG190612RN	SNMG643RN	19,05	3/4	19,05	.750	6,35	1/4	1,20	3/64	7,93	.313	●	●	●	●							
SNMG190616RN	SNMG644RN	19,05	3/4	19,05	.750	6,35	1/4	1,60	1/16	7,93	.313	●	●	●	●							
SNMG190624RN	SNMG646RN	19,05	3/4	19,05	.750	6,35	1/4	2,40	3/32	7,93	.313	●	●		●							

Application Specific

New Railroad Wheel Manufacturing Tooling

Features and Benefits

Wheel Production

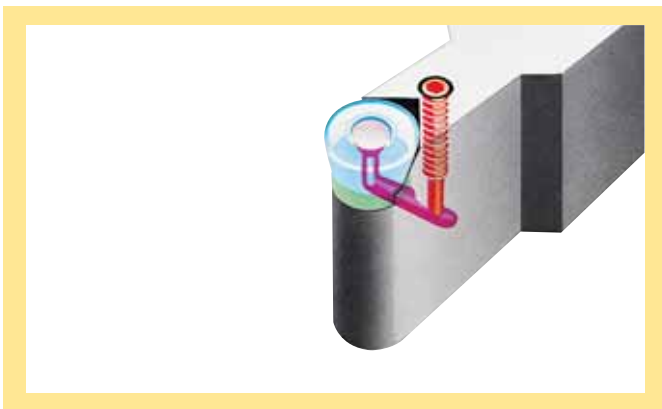
In wheel production, the forged blanks are mainly machined using RC.. inserts.

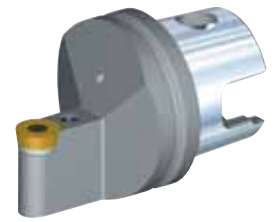
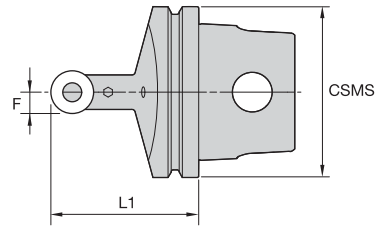
For this, Kennametal offers a comprehensive range of high-performance indexable inserts. Proprietary coatings combined with application-specific chipbreakers make these inserts well suited for new wheel production.

Together with the KM™ quick change tooling system, high stability, repeatability, and process security are ensured.

Clamping System

Our Fix-Perfect™ clamping system will provide optimum security during the most arduous machining process. With just a few revolutions of the clamping screw, the complete insert set (insert, shim, and clamping stud) can be changed.

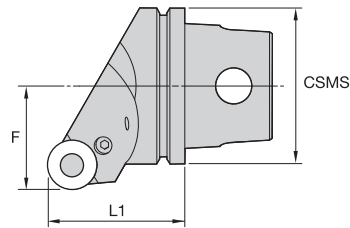




■ KM-PRDCN

order number	catalog number	CSMS system size	F		L1		insert 1	shim	clamp stud	set screw
			mm	in	mm	in				
3662606	KM80SPRDCN20	KM80TS	10,00	.394	70,00	2.756	RCMT2006M0	169.333	119.073	121.820
3662607	KM80SPRDCN25	KM80TS	12,50	.492	70,00	2.756	RCMX2507M0RP	169.337	118.404	121.820

NOTE: Engineered solutions available.
KM100 units are made to order.
KM80 units require torque wrench TWH60R, which must be purchased separately.
See page F107 for insert selection.

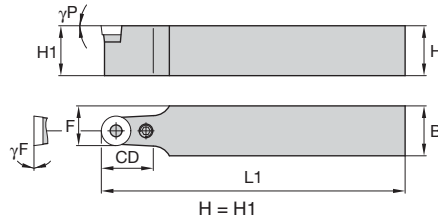
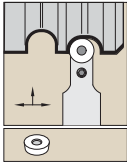


Application Specific

■ KM-PRGC

order number	catalog number	CSMS system size	F		L1		insert 1	shim	clamp stud	set screw
			mm	in	mm	in				
1238702	KM80PRGCL32	KM80	53,00	2.087	80,00	3.150	RC..3209M0	169.339	118.604	121.030
1238697	KM80PRGCR20	KM80	53,00	2.087	70,00	2.756	RC..2006M0	169.333	119.073	121.820

NOTE: Engineered solutions available.
KM100 units are made to order.
KM80 units require torque wrench TWH60R, which must be purchased separately.
See page F107 for insert selection.



■ PRCC

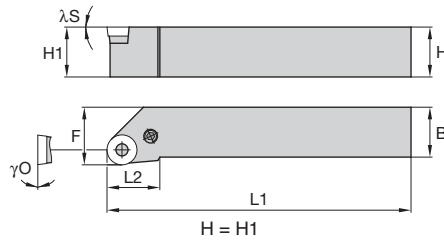
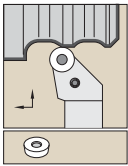
order number	catalog number	H		B		F		L1		CD		γF°	γP°	insert 1
		mm	in	mm	in	mm	in	mm	in	mm	in			
1244761	PRCCN2020K08H1	20,00	.787	20,00	.787	14,00	.551	125,00	4.921	16,00	.630	0.0	0.0	RC..0803M0
1244762	PRCCN2020K10H1	20,00	.787	20,00	.787	15,00	.591	125,00	4.921	24,00	.945	0.0	0.0	RC..1003M0
1244826	PRCCN2525M08H1	25,00	.984	25,00	.984	16,50	.650	150,00	5.906	16,00	.630	0.0	0.0	RC..0803M0
1244827	PRCCN2525M10H1	25,00	.984	25,00	.984	17,50	.689	150,00	5.906	24,00	.945	0.0	0.0	RC..1003M0
1244828	PRCCN2525M12H1	25,00	.984	25,00	.984	18,50	.728	150,00	5.906	24,00	.945	0.0	0.0	RC..1204M0
5002098	PRCCN2020M0H1	31,75	1.250	31,75	1.250	25,62	1.009	152,40	6.000	31,80	1.250	0.0	0.0	RCMT2006M0
1192388	PRCCN3225P16H1	32,00	1.260	25,00	.984	20,50	.807	170,00	6.693	33,00	1.299	0.0	0.0	RC..1606M0
1192389	PRCCN3232P20H1	32,00	1.260	32,00	1.260	26,00	1.024	170,00	6.693	32,00	1.260	0.0	0.0	RC..2006M0
5002099	PRCCN2425M0H1	38,10	1.500	38,10	1.500	31,30	1.232	177,80	7.000	38,10	1.500	0.0	0.0	RCMX2507M0-RP
1228888	PRCCN4040S25H1	40,00	1.575	40,00	1.575	32,50	1.280	250,00	9.843	78,00	3.071	0.0	0.0	RC..2507M0

Application Specific

■ Spare Parts

catalog number	shim	clamp stud	clamp screw	hex wrench
PRCCN2020K08H1	—	119.069	—	170.001
PRCCN2020K10H1	169.325	119.069	—	170.001
PRCCN2525M08H1	—	119.069	—	170.001
PRCCN2525M10H1	169.325	119.069	—	170.001
PRCCN2525M12H1	169.322	119.071	—	170.002
PRCCN2020M0H1	169.333	119.073	121.820	—
PRCCN3225P16H1	169.327	410.081	—	170.003
PRCCN3232P20H1	169.333	119.073	121.820	170.004
PRCCN2425M0H1	169.337	118.404	121.820	—
PRCCN4040S25H1	169.337	118.404	121.820	170.004

NOTE: Engineered solutions available.
See page F107 for insert selection.



■ PRGC

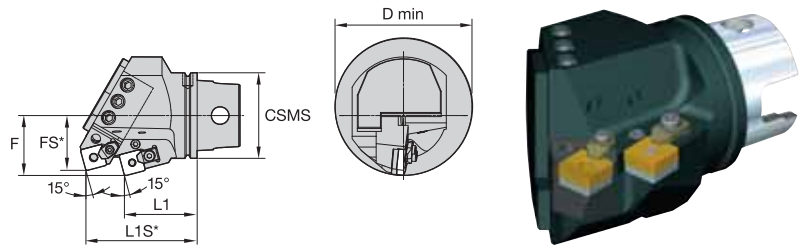
order number	catalog number	H		B		F		L1		L2		λS°	γO°	insert 1
		mm	in	mm	in	mm	in	mm	in	mm	in			
1244829	PRGCL4040S25H1	40,00	1.575	40,00	1.575	50,00	1.969	250,00	9.843	47,00	1.850	0.0	0.0	RC..2507M0
1192390	PRGCL6050U32H1	60,00	2.362	50,00	1.969	60,00	2.362	350,00	13.780	75,00	2.953	0.0	0.0	RC..3209M0
1192391	PRGCR6050U32H1	60,00	2.362	50,00	1.969	60,00	2.362	350,00	13.780	75,00	2.953	0.0	0.0	RC..3209M0
1197549	PRGCR4040S25H1	40,00	1.575	40,00	1.575	50,00	1.969	250,00	9.843	47,00	1.850	0.0	0.0	RC..2507M0

■ Spare Parts

catalog number	shim	clamp stud	clamp screw	hex wrench
PRGCL4040S25H1	169.337	118.404	121.820	170.004
PRGCL6050U32H1	169.339	118.604	121.030	170.005
PRGCR6050U32H1	169.339	118.604	121.030	170.005
PRGCR4040S25H1	169.337	118.404	121.820	170.004

NOTE: See page F107 for insert selection.

Application Specific



■ **KM-PSDN 95° with Adjustable Cartridge**

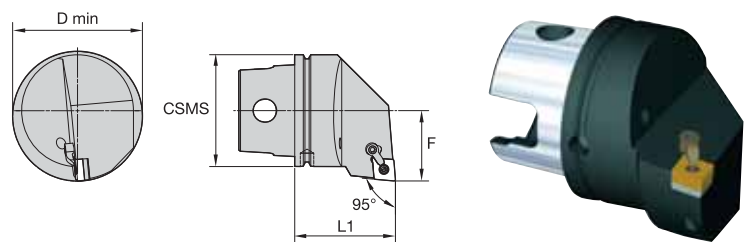
order number	catalog number	CSMS system size	F		FS		L1		L1S		D min		insert 1
			mm	in	mm	in	mm	in	mm	in	mm	in	
1152381	KM100-TK00055D	KM100	70,00	2.756	64,00	2.520	85,00	3.347	130,00	5.118	160,00	6.299	SN..250724/SN..856

■ **Cartridge • PSDN 95°**

order number	catalog number	CSMS system size	F		L1		gage insert
			mm	in	mm	in	
1178625	PSDNN3240X25-01	—	21,00	.827	120,00	4.724	SN..250724/SN..856

NOTE: Adjustable top cartridge.
Made to order.
See page F107 for insert selection.

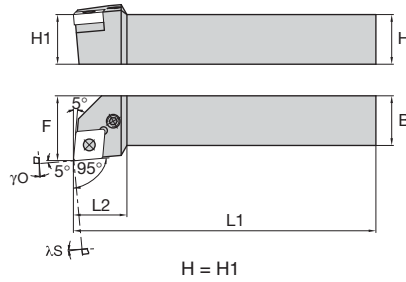
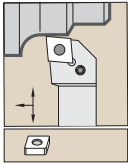
Application Specific



■ **KM • MCLN 95°**

order number	catalog number	CSMS system size	D min		F		L1		insert 1
			mm	in	mm	in	mm	in	
1151977	KM100-TK00344D	KM100	116,00	4.567	63,00	2.480	90,00	3.543	CN..190612/CN..643

NOTE: Made to order.
See page F107 for insert selection.



■ PCLN 95°

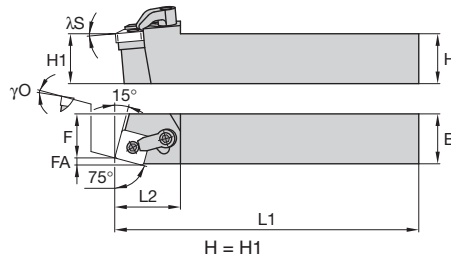
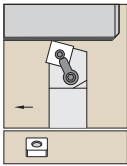
order number	catalog number	H		B		F		L1		L2		λS°	γO°	insert 1
		mm	in	mm	in	mm	in	mm	in	mm	in			
1192379	PCLNR4040S19	40,00	1.575	40,00	1.575	50,00	1.969	250,00	9.843	36,00	1.417	-6.000	-6.000	CN..190612
1192377	PCLNL4040S19	40,00	1.575	40,00	1.575	50,00	1.969	250,00	9.843	36,00	1.417	-6.000	-6.000	CN..190612

■ Spare Parts

catalog number	shim	shim pin	toggle lever	clamp screw	punch
right hand PCLNR4040S19	512.123	513.033	511.033	514.133	515.022
left hand PCLNL4040S19	512.123	513.033	511.033	514.133	515.022

NOTE: Engineered solutions available.
See page F107 for insert selection.

Application Specific



■ MSBN 75°

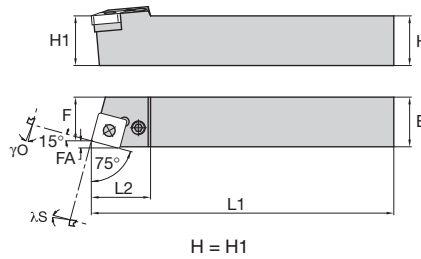
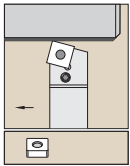
order number	catalog number	H		B		F		L1		L2		FA		λS°	γO°	insert 1
		mm	in	mm	in	mm	in	mm	in	mm	in	mm	in			
1101954	MSBNR4040R19	40,00	1.575	40,00	1.575	35,00	1.378	200,00	7.874	40,00	1.575	4,60	.181	-5.000	-5.000	SN..190612
1099148	MSBNL4040R19	40,00	1.575	40,00	1.575	35,00	1.378	200,00	7.874	40,00	1.575	4,60	.181	-5.000	-5.000	SN..190612

■ Spare Parts

catalog number	shim	lock pin	clamp	clamp screw
MSBNR4040R19	ISSN633	KLM68	CKM12	STCM4
MSBNL4040R19	ISSN633	KLM68	CKM12	STCM4

NOTE: Engineered solutions available.
See page F108 for insert selection.

Application Specific



■ PSBN 75°

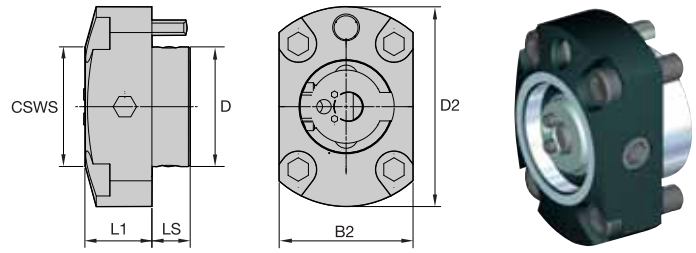
order number	catalog number	H		B		F		L1		L2		FA		λS°	γO°	insert 1
		mm	in	mm	in	mm	in	mm	in	mm	in	mm	in			
1244682	PSBNR4040S19	40,00	1.575	40,00	1.575	35,00	1.378	250,00	9.843	38,00	1.496	4,60	.181	-6.000	-6.000	SN..190612
1244683	PSBNR4040S25	40,00	1.575	40,00	1.575	35,00	1.378	250,00	9.843	47,00	1.850	5,90	.232	-6.000	-6.000	SN..250724
1244674	PSBNL4040S19	40,00	1.575	40,00	1.575	35,00	1.378	250,00	9.843	38,00	1.496	4,60	.181	-6.000	-6.000	SN..190612
1244675	PSBNL4040S25	40,00	1.575	40,00	1.575	35,00	1.378	250,00	9.843	47,00	1.850	5,90	.232	-6.000	-6.000	SN..250724

■ Spare Parts

catalog number	shim	shim pin	toggle lever	clamp screw	punch
PSBNR4040S19	512.083	513.033	511.033	514.133	515.022
PSBNR4040S25	512.092	513.038	511.038	514.138	515.028
PSBNL4040S19	512.083	513.033	511.033	514.133	515.022
PSBNL4040S25	512.092	513.038	511.038	514.138	515.028

NOTE: Engineered solutions available.
See page F108 for insert selection.

Application Specific



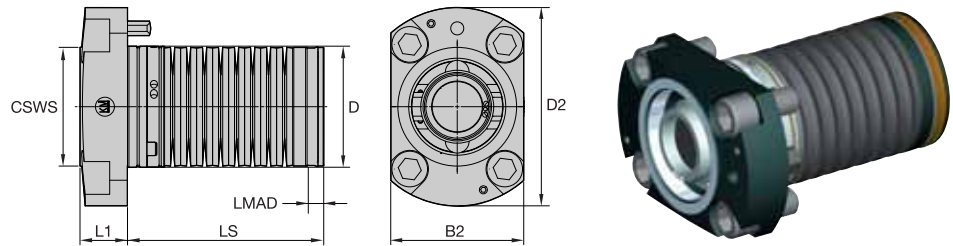
■ KM-NCM-EF

order number	catalog number	CSWS system size	L1		LS		B2		D		D2		KM spare parts package	screw
			mm	in	mm	in	mm	in	mm	in	mm	in		
2420366	KM100NCMEF	KM100	56,00	2.205	32,00	1.260	112,00	4.409	100,00	3.937	167,00	6.575	—	—
1021576	KM32NCMEF	KM32	20,00	.787	12,00	.472	36,00	1.417	32,00	1.260	54,00	2.126	KM32PKG3L	—
1021642	KM40NCMEF	KM40	25,00	.984	15,00	.591	44,00	1.732	40,00	1.575	68,00	2.677	KM40PKG3L	MS1217
1021749	KM50NCMEF	KM50	30,00	1.181	20,00	.787	55,00	2.165	50,00	1.969	84,00	3.307	KM50PKG3L	MS1361
1021753	KM63NCMEF	KM63	40,00	1.575	20,00	.787	72,00	2.835	63,00	2.480	102,00	4.016	KM63PKG3L	MS1460
1144799	KM80NCMEF	KM80	50,00	1.969	25,00	.984	90,00	3.543	80,00	3.150	132,00	5.197	KM80PKG3L	DWG MS1599

NOTE: KM100 clamping units are made to order.



Application Specific



■ KM100-Spring Packs

order number	catalog number	CSWS system size	L1		LS		LMAD travel		B2		D		D2		KM spare parts package	screw
			mm	in	mm	in	mm	in	mm	in	mm	in	mm	in		
1178668	KM100-PK00001D	KM100	40,00	1.575	165,25	6.506	13,00	.512	112,00	4.409	101,98	4.015	167,00	6.575	KM80PKG3L	MS1566

NOTE: KM100 clamping units are made to order.



Kennametal Select • The Inserts You Want at a Price You'll Love



Introducing Kennametal Select inserts — the cost-effective line from the brand you already know and trust for quality. Each insert is engineered and manufactured by Kennametal to outperform competitive inserts when cutting steel, stainless steel, cast iron, and high-temperature alloys. These inserts can be used in an incredible 80% of all applications. This versatility, along with the simple grade selection method and great price, make Kennametal Select inserts perfect for small and midsize turning operations.

Features and Benefits



Getting the Most from Every Insert

Kennametal Select products make it simple to get the most out of your inserts, and your money. Every insert is gold, which exposes wear as the tool continues to be used — making it easy to detect when an insert is ready to be changed — maximizing the product's value and protecting the workpiece. Also, because Kennametal Select inserts can be used in most applications, a single insert can take on any number of tasks, thus reducing your inventory. Kennametal Select products are also reliable enough to cut steel, stainless steel, cast iron, and high-temperature alloys, enabling quick changes in workpiece materials without the need to swap inserts, saving time and money.

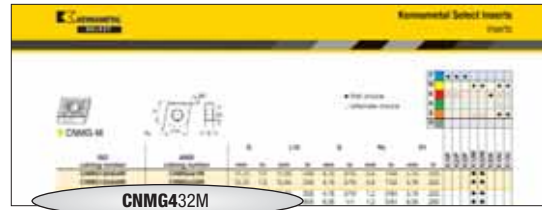


Best Way to Save

Kennametal Select inserts were developed to make it easy for small and midsize turning operations to utilize an affordable, quality product with greater durability than competitively listed products. Kennametal Select inserts ensure an overall reduction of tooling costs. Purchasing Kennametal Select inserts through one of our distributor partners or online, can save as much as 50%.

How Do Catalog Numbers Work?

Each character in our catalog number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.



CNMG432M

Application Specific

C

Insert Shape

H	Hexagon 120°	
O	Octagon 135°	
P	Pentagon 108°	
R	Round	
S	Square 90°	
T	Triangular 60°	
C	Rhomboid 80° 55° 75° 86° 35°	
D		
E		
M		
V		
W	Trigon 80° with enlarged corner angles	
L	Rectangular 90°	
A	Parallelogram 85° 82° 55°	
B		
N/K		

N

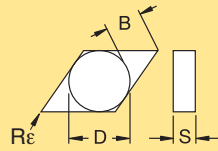
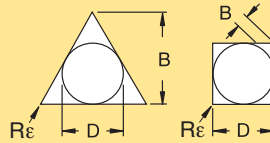
Insert Clearance Angle

A	3°	
B	5°	
C	7°	
D	15°	
E	20°	
F	25°	
G	30°	
N	0°	
P	11°	
O	Indicated for other clearance angles requiring descriptions.	

M

Tolerance Class

Tolerances apply prior to edge prep and coating



D = Theoretical diameter of the insert inscribed circle
S = Thickness
B = See figures below

G

Insert Features

N	
R	
F	
A	
M	
G	
W	
T	
Q	
U	
B	
H	
C	
J	
X	Special Design

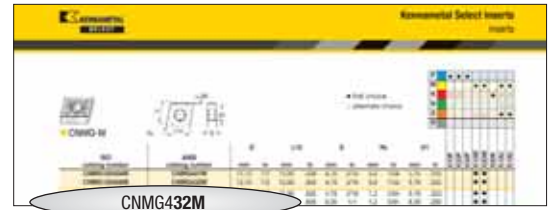
4

Size

		Code for inch cutting edge length "L10"						
inch	"D"	C	D	R	S	T	V	W
1.2 (5)	5/32	S4	04	03	03	06	-	-
1.5 (6)	3/16	04	05	04	04	08	S3	-
1.8 (7)	7/32	05	06	05	05	09	09	03
-	.236	-	-	06	-	-	-	-
2	1/4	06	07	06	06	11	11	04
2.5	5/16	08	09	07	07	13	13	05
-	.315	-	-	08	-	-	-	-
3	3/8	09	11	09	09	16	16	06
-	.394	-	-	10	-	-	-	-
3.5	7/16	11	13	11	11	19	19	07
-	.472	-	-	12	-	-	-	-
4	1/2	12	15	12	12	22	22	08
4.5	9/16	14	17	14	14	24	24	09
5	5/8	16	19	15	15	27	27	10
-	.630	-	-	16	-	-	-	-
5.5	11/16	17	21	17	17	30	30	11
6	3/4	19	23	19	19	33	33	13
-	.787	-	-	20	-	-	-	-
7	7/8	22	27	22	22	38	38	15
-	.984	-	-	25	-	-	-	-
8	1	25	31	25	25	44	44	17
10	1-1/4	32	38	31	31	54	54	21
-	1.260	-	-	32	-	-	-	-

tolerance class	tolerance on "D"	tolerance on "B"	tolerance on "S"
C	±.0010"	±.0005"	±.001"
H	±.0005"	±.0005"	±.001"
E	±.0010"	±.0010"	±.001"
G	±.0010"	±.0010"	±.005"
M	See tables in size column		±.005"
U	See tables in size column		±.005"

By referencing this easy-to-use guide, you can identify the correct product to meet your needs.



3

Thickness
S

symbol inch	thickness inch
.5 (1)	1/32
.6	.040
1 (2)	1/16
1.2	5.64
1.5 (3)	3/32
2	1/8
2.5	5/32
3	3/16
3.5	7/32
4	1/4
5	5/16
6	3/8
7	7/16
18	1/2

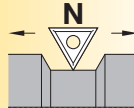
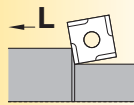
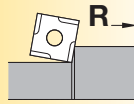
2

Corner
Radius "R_c"

symbol inch	corner radius inch
X0	.0015
0	.004
.5	.008
1	1/64
2	1/32
3	3/64
4	1/16
5	5/64
6	3/32
7	7/64
8	1/8
-	round insert

Hand of Insert (optional)

R = Right hand
L = Left hand
N = Neutral



Cutting Edge (optional)

- F** Sharp
- E** Rounded
- T** Chamfered
- S** Chamfered and Rounded
- K** Double-Chamfered
- P** Double-Chamfered and Rounded

M

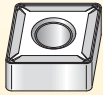
Chipbreaker
(optional)

GT-F Finishing	M Medium Machining
MT-F Finishing	R Medium Roughing
F Finishing	..MA Roughing
..GP Medium Machining	H Heavy Roughing

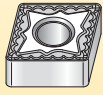
Application Specific

■ Step 1 • Select the insert geometry

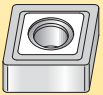
Negative Inserts



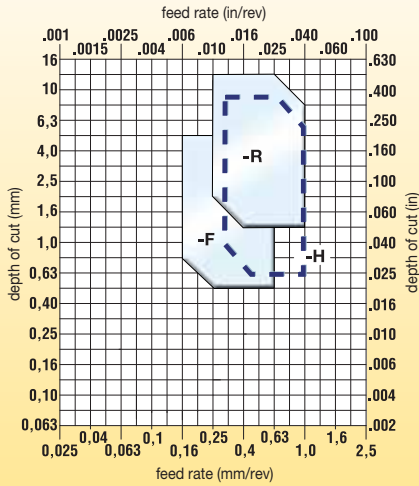
-F
Finishing



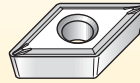
-R
Roughing



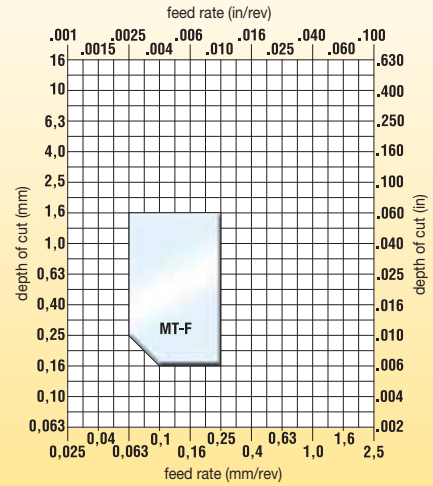
-H
Heavy Roughing



Positive Inserts



MT-F
Finishing



Application Specific

■ Step 2 • Select the grade

cutting condition	Negative Insert Geometry			Positive Insert Geometry
	-F	-R	-H	MT-F
heavily interrupted cut	K35P	K35P	K35P	K35P
lightly interrupted cut	K25P/K35P	K25P/K35P	K25P/K35P	K25P
varying depth of cut, casting, or forging skin	K10P	K10P	K10P	K10P
smooth cut, pre-turned surface	K10P	K10P	K10P	K10P

■ Step 3 • Select the cutting speed

Low-Carbon (<0.3% C) and Free-Machining Steel

		speed — m/min (SFM)									starting conditions ◀	
material group	grade	135 (450)	180 (600)	225 (800)	275 (900)	320 (1050)	360 (1200)	410 (1350)	455 (1500)	495 (1650)	m/min	SFM
P0/P1	K10P										316	1056
	K25P										248	833
	K35P										189	630

Medium- and High-Carbon Steels (<0.3% C)

		speed — m/min (SFM)									starting conditions ◀	
material group	grade	135 (450)	180 (600)	225 (800)	275 (900)	320 (1050)	360 (1200)	410 (1350)	455 (1500)	495 (1650)	m/min	SFM
P2	K10P										212	704
	K25P										176	585
	K35P										135	450

Alloy Steels and Tool Steels (≤330 HB) (≤35 HRC)

		speed — m/min (SFM)									starting conditions ◀	
material group	grade	135 (450)	180 (600)	225 (800)	275 (900)	320 (1050)	360 (1200)	410 (1350)	455 (1500)	495 (1650)	m/min	SFM
P3	K10P										152	504
	K25P										140	459
	K35P										108	360

Alloy Steels and Tool Steels (340–450 HB) (36–48 HRC)

		speed — m/min (SFM)									starting conditions ◀	
material group	grade	60 (200)	90 (300)	120 (400)	150 (500)	180 (600)	210 (700)	240 (800)	270 (900)	300 (1000)	m/min	SFM
P4	K10P										116	384
	K25P										95	324
	K35P										86	293

Ferritic, Martensitic, and PH Stainless Steels (≤330 HB) (≤35 HRC)

		speed — m/min (SFM)									starting conditions ◀	
material group	grade	120 (400)	150 (500)	180 (600)	210 (700)	240 (800)	270 (900)	300 (1000)	330 (1100)	360 (1200)	m/min	SFM
P5	K10P										172	576
	K25P										176	585
	K35P										122	405

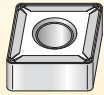
Ferritic, Martensitic, and PH Stainless Steels (340–450 HB) (36–48 HRC)

		speed — m/min (SFM)									starting conditions ◀	
material group	grade	105 (350)	135 (450)	165 (550)	195 (650)	225 (750)	255 (850)	285 (950)	315 (1050)	345 (1150)	m/min	SFM
P6	K10P										144	480
	K25P										135	450
	K35P										95	315

Application Specific

Step 1 • Select the insert geometry

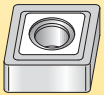
Negative Inserts



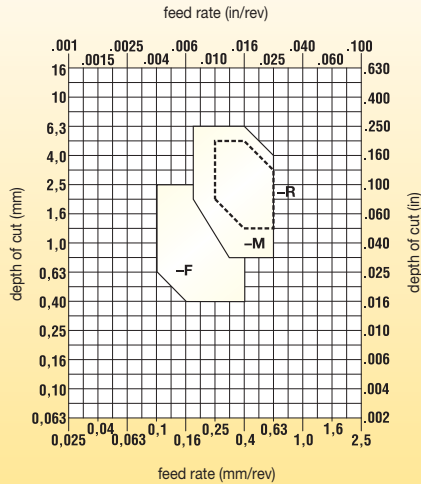
-F
Finishing



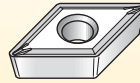
-M
Medium



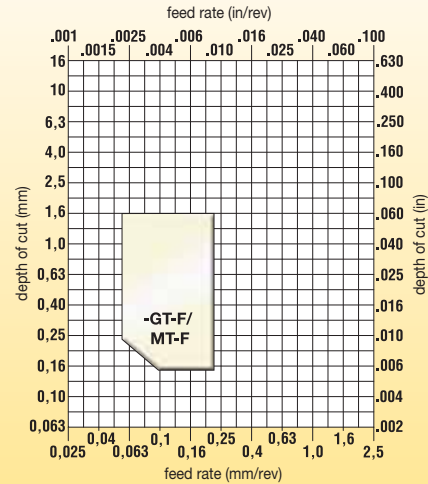
-R
Roughing



Positive Inserts



-GT-F/MT-F
Finishing



Application Specific

Step 2 • Select the grade

cutting condition	Negative Insert Geometry			Positive Insert Geometry	
	-M	-R	-F	GT-F	MT-F
heavily interrupted cut	K25M	K25M	K10M	K25M	K25M
lightly interrupted cut	K25M	K25M	K10M	K25M	K25M
varying depth of cut, casting, or forging skin	K10M/K25M	K10M/K25M	K10M	K10M/K25M	K10M/K25M
smooth cut, pre-turned surface	K10M	K10M	K10M	K10M	K10M

Step 3 • Select the cutting speed

Austenitic Stainless Steel speed — m/min (SFM) starting conditions

material group	grade	90 (300)	135 (450)	180 (600)	225 (800)	270 (900)	315 (1050)	360 (1200)	405 (1350)	450 (1500)	m/min	SFM
M1	K10M										162	540
	K25M										135	450
	K10U										194	630
	K15U										129	420

Austenitic Stainless Steel speed — m/min (SFM) starting conditions

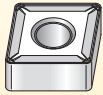
material group	grade	90 (300)	135 (450)	180 (600)	225 (800)	270 (900)	315 (1050)	360 (1200)	405 (1350)	450 (1500)	m/min	SFM
M2	K10M										149	495
	K25M										135	450
	K10U										180	585
	K15U										120	390

Austenitic Stainless Steel: Duplex (Ferritic and Austenitic Mixture) speed — m/min (SFM) starting conditions

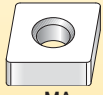
material group	grade	90 (300)	135 (450)	180 (600)	225 (800)	270 (900)	315 (1050)	360 (1200)	405 (1350)	450 (1500)	m/min	SFM
M3	K10M										135	450
	K25M										108	360
	K10U										167	540
	K15U										111	360

■ Step 1 • Select the insert geometry

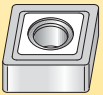
Negative Inserts



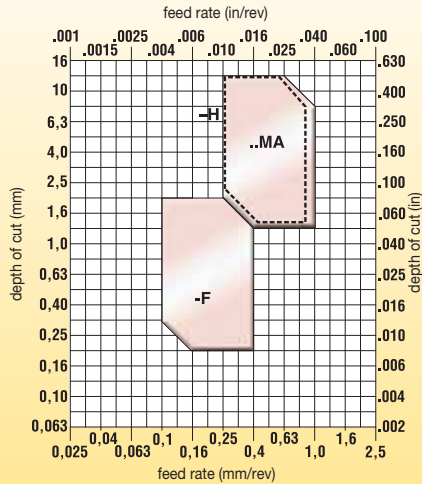
-F
Finishing



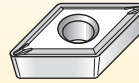
..MA
Heavy Roughing



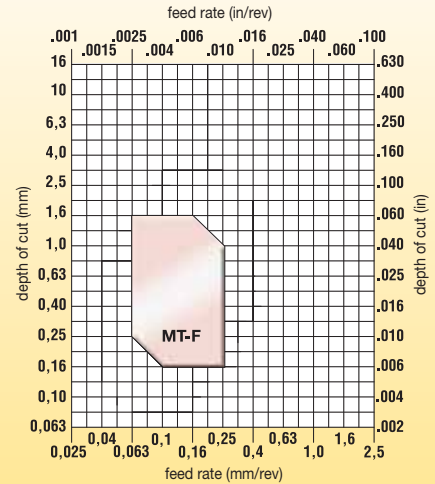
-H
Heavy Roughing



Positive Inserts



MT-F
Finishing



■ Step 2 • Select the grade

cutting condition	Negative Insert Geometry			Positive Insert Geometry
	..MA	-H	-F	MT-F
heavily interrupted cut	K20K	K20K	K20K	K20K
lightly interrupted cut	K20K	K20K	K20K	K20K
varying depth of cut, casting, or forging skin	K20K	K20K	K20K	K20K
smooth cut, pre-turned surface	K20K	K20K	K20K	K20K

■ Step 3 • Select the cutting speed

Gray Cast Iron		speed — m/min (SFM)									starting conditions	
material group	grade	60 (200)	150 (500)	240 (800)	330 (1100)	420 (1400)	510 (1700)	600 (2000)	690 (2300)	780 (2600)	m/min	SFM
K1	K20K										270	900

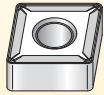
Ductile, Compacted Graphite, and Malleable Cast Irons (<80 KSI tensile strength)		speed — m/min (SFM)									starting conditions	
material group	grade	60 (200)	150 (500)	240 (800)	330 (1100)	420 (1400)	510 (1700)	600 (2000)	690 (2300)	780 (2600)	m/min	SFM
K2	K20K										216	720

Ductile, Compacted Graphite, and Malleable Cast Irons (>80 KSI tensile strength)		speed — m/min (SFM)									starting conditions	
material group	grade	60 (200)	150 (500)	240 (800)	330 (1100)	420 (1400)	510 (1700)	600 (2000)	690 (2300)	780 (2600)	m/min	SFM
K3	K20K										189	630

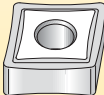
Application Specific

Step 1 • Select the insert geometry

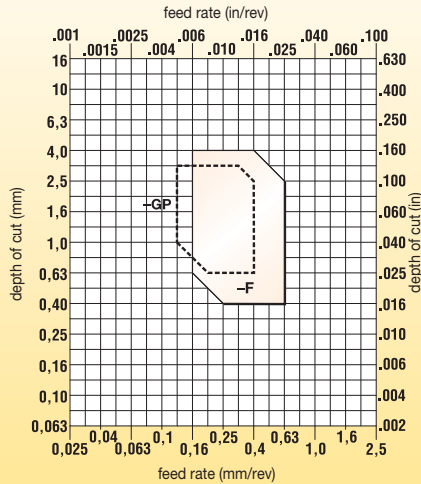
Negative Inserts



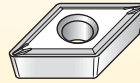
-F
Finishing



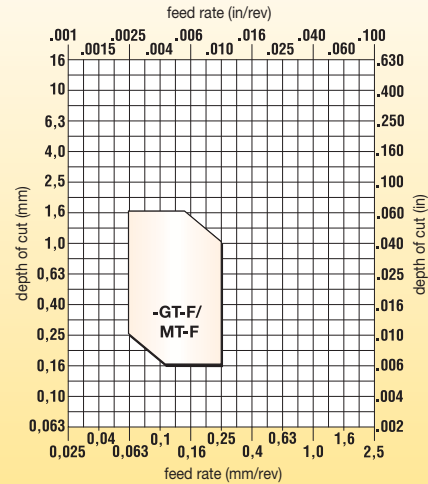
..GP
Medium



Positive Inserts



GT-F/MT-F
Finishing



Application Specific

Step 2 • Select the grade

cutting condition	Negative Insert Geometry	Positive Insert Geometry			
		..GP	-F	GT-F	MT-F
heavily interrupted cut	⊗	—	K15U	K15U	K15U
lightly interrupted cut	⊙	K10U	K10U	K15U	K15U
varying depth of cut, casting, or forging skin	⊖	K10U	K10U	K10U	K10U
smooth cut, pre-turned surface	⊙	K10U	K10U	K10U	K10U

Step 3 • Select the cutting speed

Iron-Based, Heat-Resistant Alloys (135–320 HB) (≤34 HRC) speed — m/min (SFM) starting conditions

material group	grade	15 (50)	45 (150)	75 (250)	105 (350)	140 (450)	170 (550)	200 (650)	230 (750)	260 (850)	m/min	SFM
S1	K10U		◁								50	162
	K15U		◁								33	108

Cobalt-Based, Heat-Resistant Alloys (150–425 HB) (≤45 HRC) speed — m/min (SFM) starting conditions

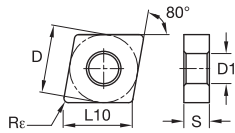
material group	grade	15 (50)	45 (150)	75 (250)	105 (350)	140 (450)	170 (550)	200 (650)	230 (750)	260 (850)	m/min	SFM
S2	K10U		◁								54	176
	K15U		◁								36	117

Nickel-Based, Heat-Resistant Alloys (140–475 HB) (≤48 HRC) speed — m/min (SFM) starting conditions

material group	grade	15 (50)	45 (150)	75 (250)	105 (350)	140 (450)	170 (550)	200 (650)	230 (750)	260 (850)	m/min	SFM
S3	K10U		◁								63	203
	K15U		◁								42	135

Titanium and Titanium Alloys (110–450 HB) (≤48 HRC) speed — m/min (SFM) starting conditions

material group	grade	15 (50)	45 (150)	75 (250)	105 (350)	140 (450)	170 (550)	200 (650)	230 (750)	260 (850)	m/min	SFM
S4	K10U		◁								63	203
	K15U		◁								42	135

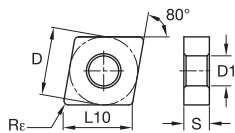


● first choice
○ alternate choice

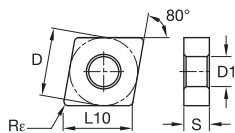
P	●	●	○	○	○	○	○	○	○	○
M	●	●	○	○	○	○	○	○	○	○
K	○	○	○	○	○	○	○	○	○	○
N	○	○	○	○	○	○	○	○	○	○
S	○	○	○	○	○	○	○	○	○	○
H	○	○	○	○	○	○	○	○	○	○

ISO catalog number	ANSI catalog number	D		L10		S		Re		D1		K10P	K25P	K35P	K10M	K25M	K20K	K10U	K15U	
		mm	in	mm	in	mm	in	mm	in	mm	in									
CNMA120404	CNMA431	12,70	1/2	12,90	.508	4,76	3/16	0,4	1/64	5,16	.203									
CNMA120408	CNMA432	12,70	1/2	12,90	.508	4,76	3/16	0,8	1/32	5,16	.203						●			
CNMA120412	CNMA433	12,70	1/2	12,90	.508	4,76	3/16	1,2	3/64	5,16	.203						●			
CNMA120416	CNMA434	12,70	1/2	12,90	.508	4,76	3/16	1,6	1/16	5,16	.203						●			
CNMA160612	CNMA543	15,88	5/8	16,12	.635	6,35	1/4	1,2	3/64	6,35	.250						●			
CNMA160616	CNMA544	15,88	5/8	16,12	.635	6,35	1/4	1,6	1/16	6,35	.250						●			
CNMA190612	CNMA643	19,05	3/4	19,34	.762	6,35	1/4	1,2	3/64	7,93	.313						●			
CNMA190616	CNMA644	19,05	3/4	19,34	.762	6,35	1/4	1,6	1/16	7,93	.313						●			

Application Specific



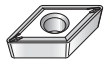
ISO catalog number	ANSI catalog number	D		L10		S		Re		D1		K10P	K25P	K35P	K10M	K25M	K20K	K10U	K15U	
		mm	in	mm	in	mm	in	mm	in	mm	in									
CNMG120404F	CNMG431F	12,70	1/2	12,90	.508	4,76	3/16	0,4	1/64	5,16	.203	●	●				●	●	●	●
CNMG120408F	CNMG432F	12,70	1/2	12,90	.508	4,76	3/16	0,8	1/32	5,16	.203	●	●				●	●	●	●
CNMG120412F	CNMG433F	12,70	1/2	12,90	.508	4,76	3/16	1,2	3/64	5,16	.203	●	●				●	●		



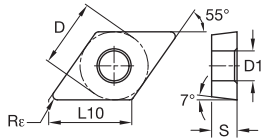
ISO catalog number	ANSI catalog number	D		L10		S		Re		D1		K10P	K25P	K35P	K10M	K25M	K20K	K10U	K15U	
		mm	in	mm	in	mm	in	mm	in	mm	in									
CNMG120404H	CNMG431H	12,70	1/2	12,90	.508	4,76	3/16	0,4	1/64	5,16	.203	●	●				●			
CNMG120408H	CNMG432H	12,70	1/2	12,90	.508	4,76	3/16	0,8	1/32	5,16	.203	●	●				●			
CNMG120412H	CNMG433H	12,70	1/2	12,90	.508	4,76	3/16	1,2	3/64	5,16	.203	●	●				●			
CNMG120416H	CNMG434H	12,70	1/2	12,90	.508	4,76	3/16	1,6	1/16	5,16	.203	●	●				●			
CNMG160612H	CNMG543H	15,88	5/8	16,12	.635	6,35	1/4	1,2	3/64	6,35	.250	●	●				●			
CNMG160616H	CNMG544H	15,88	5/8	16,12	.635	6,35	1/4	1,6	1/16	6,35	.250	●	●				●			
CNMG190608H	CNMG642H	19,05	3/4	19,34	.762	6,35	1/4	0,8	1/32	7,93	.313	●	●				●			
CNMG190612H	CNMG643H	19,05	3/4	19,34	.762	6,35	1/4	1,2	3/64	7,93	.313	●	●				●			
CNMG190616H	CNMG644H	19,05	3/4	19,34	.762	6,35	1/4	1,6	1/16	7,93	.313	●	●				●			
CNMG250924H	CNMG866H	25,40	1	25,79	1.015	9,53	3/8	2,4	3/32	9,12	.359						●			

P	●	●	●	○	○	○	○	○	○	○	○
M	●	●	●	●	●	●	●	●	●	●	●
K	○	○	○	○	○	○	○	○	○	○	○
N	○	○	○	○	○	○	○	○	○	○	○
S	○	○	○	○	○	○	○	○	○	○	○
H	○	○	○	○	○	○	○	○	○	○	○

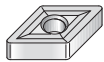
● first choice
○ alternate choice



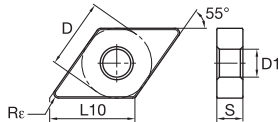
■ DCMT-F



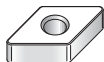
ISO catalog number	ANSI catalog number	D		L10		S		Re		D1		K10P	K25P	K35P	K10M	K25M	K20K	K10U	K15U	
		mm	in	mm	in	mm	in	mm	in	mm	in									
DCMT070202F	DCMT21505F	6,35	1/4	7,75	.305	2,38	3/32	0,2	.008	2,80	.110	●	●	●	●	●	●	●	●	●
DCMT070204F	DCMT2151F	6,35	1/4	7,75	.305	2,38	3/32	0,4	1/64	2,80	.110	●	●	●	●	●	●	●	●	●
DCMT11T302F	DCMT32505F	9,53	3/8	11,63	.458	3,97	5/32	0,2	.008	4,40	.173	●	●	●	●	●	●	●	●	●
DCMT11T304F	DCMT3251F	9,53	3/8	11,63	.458	3,97	5/32	0,4	1/64	4,40	.173	●	●	●	●	●	●	●	●	●
DCMT11T308F	DCMT3252F	9,53	3/8	11,63	.458	3,97	5/32	0,8	1/32	4,40	.173	●	●	●	●	●	●	●	●	●
DCMT11T312F	DCMT3253F	9,53	3/8	11,63	.458	3,97	5/32	1,2	3/64	4,40	.173	●	●	●	●	●	●	●	●	●
DCMT150404F	DCMT431F	12,70	1/2	15,50	.610	4,76	3/16	0,4	1/64	5,50	.217	●	●	●	●	●	●	●	●	●
DCMT150408F	DCMT432F	12,70	1/2	15,50	.610	4,76	3/16	0,8	1/32	5,50	.217	●	●	●	●	●	●	●	●	●



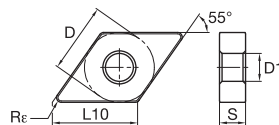
■ DNGP



ISO catalog number	ANSI catalog number	D		L10		S		Re		D1		K10P	K25P	K35P	K10M	K25M	K20K	K10U	K15U	
		mm	in	mm	in	mm	in	mm	in	mm	in									
DNGP150401	DNGP430	12,70	1/2	15,50	.610	4,76	3/16	0,1	.004	5,16	.203	●	●	●	●	●	●	●	●	●
DNGP150402	DNGP4305	12,70	1/2	15,50	.610	4,76	3/16	0,2	.008	5,16	.203	●	●	●	●	●	●	●	●	●
DNGP150404	DNGP431	12,70	1/2	15,50	.610	4,76	3/16	0,4	1/64	5,16	.203	●	●	●	●	●	●	●	●	●
DNGP150408	DNGP432	12,70	1/2	15,50	.610	4,76	3/16	0,8	1/32	5,16	.203	●	●	●	●	●	●	●	●	●



■ DNMA

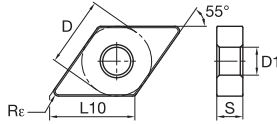


ISO catalog number	ANSI catalog number	D		L10		S		Re		D1		K10P	K25P	K35P	K10M	K25M	K20K	K10U	K15U	
		mm	in	mm	in	mm	in	mm	in	mm	in									
DNMA150408	DNMA432	12,70	1/2	15,50	.610	4,76	3/16	0,8	1/32	5,16	.203	●	●	●	●	●	●	●	●	●
DNMA150412	DNMA433	12,70	1/2	15,50	.610	4,76	3/16	1,2	3/64	5,16	.203	●	●	●	●	●	●	●	●	●
DNMA150608	DNMA442	12,70	1/2	15,50	.610	6,35	1/4	0,8	1/32	5,16	.203	●	●	●	●	●	●	●	●	●
DNMA150612	DNMA443	12,70	1/2	15,50	.610	6,35	1/4	1,2	3/64	5,16	.203	●	●	●	●	●	●	●	●	●

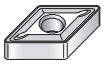
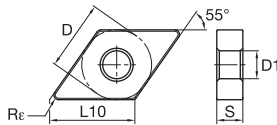
Application Specific

P	●	●	●	○	○	○	○	○	○	○	○
M	●	●	●	●	●	●	●	●	●	●	●
K	○	○	○	○	○	○	○	○	○	○	○
N	○	○	○	○	○	○	○	○	○	○	○
S	○	○	○	○	○	○	○	○	○	○	○
H	○	○	○	○	○	○	○	○	○	○	○

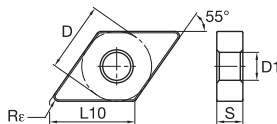
● first choice
○ alternate choice


■ DNMG-F


ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		K10P	K25P	K35P	K10M	K25M	K20K	K10U	K15U	
		mm	in	mm	in	mm	in	mm	in	mm	in									
DNMG150404F	DNMG431F	12,70	1/2	15,50	.610	4,76	3/16	0,4	1/64	5,16	.203	●	●	●	○	○	○	○	○	○
DNMG150408F	DNMG432F	12,70	1/2	15,50	.610	4,76	3/16	0,8	1/32	5,16	.203	●	●	●	○	○	○	○	○	○
DNMG150604F	DNMG441F	12,70	1/2	15,50	.610	6,35	1/4	0,4	1/64	5,16	.203	●	●	●	○	○	○	○	○	○
DNMG150608F	DNMG442F	12,70	1/2	15,50	.610	6,35	1/4	0,8	1/32	5,16	.203	●	●	●	○	○	○	○	○	○
DNMG150612F	DNMG443F	12,70	1/2	15,50	.610	6,35	1/4	1,2	3/64	5,16	.203	●	●	●	○	○	○	○	○	○

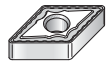

■ DNMG-H


ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		K10P	K25P	K35P	K10M	K25M	K20K	K10U	K15U	
		mm	in	mm	in	mm	in	mm	in	mm	in									
DNMG150404H	DNMG431H	12,70	1/2	15,50	.610	4,76	3/16	0,4	1/64	5,16	.203	●	●	●	○	○	○	○	○	○
DNMG150408H	DNMG432H	12,70	1/2	15,50	.610	4,76	3/16	0,8	1/32	5,16	.203	●	●	●	○	○	○	○	○	○
DNMG150412H	DNMG433H	12,70	1/2	15,50	.610	4,76	3/16	1,2	3/64	5,16	.203	●	●	●	○	○	○	○	○	○
DNMG150608H	DNMG442H	12,70	1/2	15,50	.610	6,35	1/4	0,8	1/32	5,16	.203	●	●	●	○	○	○	○	○	○
DNMG150612H	DNMG443H	12,70	1/2	15,50	.610	6,35	1/4	1,2	3/64	5,16	.203	●	●	●	○	○	○	○	○	○
DNMG190612H	DNMG543H	15,88	5/8	19,38	.763	6,35	1/4	1,2	3/64	6,35	.250	●	●	●	○	○	○	○	○	○

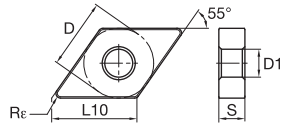

■ DNMG-M


ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		K10P	K25P	K35P	K10M	K25M	K20K	K10U	K15U	
		mm	in	mm	in	mm	in	mm	in	mm	in									
DNMG150404M	DNMG431M	12,70	1/2	15,50	.610	4,76	3/16	0,4	1/64	5,16	.203	○	○	○	○	○	○	○	○	○
DNMG150408M	DNMG432M	12,70	1/2	15,50	.610	4,76	3/16	0,8	1/32	5,16	.203	○	○	○	○	○	○	○	○	○
DNMG150604M	DNMG441M	12,70	1/2	15,50	.610	6,35	1/4	0,4	1/64	5,16	.203	○	○	○	○	○	○	○	○	○
DNMG150608M	DNMG442M	12,70	1/2	15,50	.610	6,35	1/4	0,8	1/32	5,16	.203	○	○	○	○	○	○	○	○	○
DNMG150612M	DNMG443M	12,70	1/2	15,50	.610	6,35	1/4	1,2	3/64	5,16	.203	○	○	○	○	○	○	○	○	○

Application Specific



■ DNMG-R



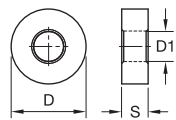
● first choice
○ alternate choice

P	●	●	●	○	○	○	○	○	○	○	○
M	●	●	●	●	●	●	●	●	●	●	●
K	○	○	○	○	○	○	○	○	○	○	○
N	○	○	○	○	○	○	○	○	○	○	○
S	○	○	○	○	○	○	○	○	○	○	○
H	○	○	○	○	○	○	○	○	○	○	○

ISO catalog number	ANSI catalog number	D		L10		S		Re		D1		K10P	K25P	K35P	K10M	K25M	K20K	K10U	K15U	
		mm	in	mm	in	mm	in	mm	in	mm	in									
DNMG110408R	DNMG332R	9,53	3/8	11,63	.458	4,76	3/16	0,8	1/32	3,81	.150	●	●	○	○	○	○	○	○	○
DNMG150404R	DNMG431R	12,70	1/2	15,50	.610	4,76	3/16	0,4	1/64	5,16	.203	●	●	○	○	○	○	○	○	○
DNMG150408R	DNMG432R	12,70	1/2	15,50	.610	4,76	3/16	0,8	1/32	5,16	.203	●	●	○	○	○	○	○	○	○
DNMG150412R	DNMG433R	12,70	1/2	15,50	.610	4,76	3/16	1,2	3/64	5,16	.203	●	●	○	○	○	○	○	○	○
DNMG150604R	DNMG441R	12,70	1/2	15,50	.610	6,35	1/4	0,4	1/64	5,16	.203	●	●	○	○	○	○	○	○	○
DNMG150608R	DNMG442R	12,70	1/2	15,50	.610	6,35	1/4	0,8	1/32	5,16	.203	●	●	○	○	○	○	○	○	○
DNMG150612R	DNMG443R	12,70	1/2	15,50	.610	6,35	1/4	1,2	3/64	5,16	.203	●	●	○	○	○	○	○	○	○
DNMG190612R	DNMG543R	15,88	5/8	19,38	.763	6,35	1/4	1,2	3/64	6,35	.250	●	●	○	○	○	○	○	○	○



■ RNMG-H

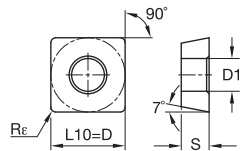


Application Specific

ISO catalog number	ANSI catalog number	D		L10		S		Re		D1		K10P	K25P	K35P	K10M	K25M	K20K	K10U	K15U	
		mm	in	mm	in	mm	in	mm	in	mm	in									
RNMG1204H	RNMG43H	12,70	1/2	—	—	4,76	3/16	—	—	5,16	.203	●	●	○	○	○	○	○	○	○
RNMG1906H	RNMG64H	19,05	3/4	—	—	6,35	1/4	—	—	7,93	.313	●	●	○	○	○	○	○	○	○



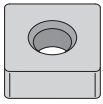
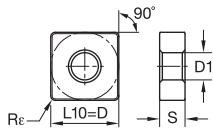
■ SCMT-F



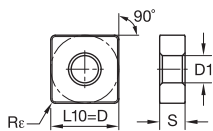
ISO catalog number	ANSI catalog number	D		L10		S		Re		D1		K10P	K25P	K35P	K10M	K25M	K20K	K10U	K15U	
		mm	in	mm	in	mm	in	mm	in	mm	in									
SCMT09T304F	SCMT3251F	9,53	3/8	9,53	.375	3,97	5/32	0,4	1/64	4,40	.173	●	●	○	○	○	○	○	○	○
SCMT09T308F	SCMT3252F	9,53	3/8	9,53	.375	3,97	5/32	0,8	1/32	4,40	.173	●	●	○	○	○	○	○	○	○
SCMT120404F	SCMT431F	12,70	1/2	12,70	.500	4,76	3/16	0,4	1/64	5,50	.217	●	●	○	○	○	○	○	○	○
SCMT120408F	SCMT432F	12,70	1/2	12,70	.500	4,76	3/16	0,8	1/32	5,50	.217	●	●	○	○	○	○	○	○	○

P	●	●	●	○	○	○	○	○	○	○	○
M	●	●	●	●	●	●	●	●	●	●	●
K	○	○	○	○	○	○	○	○	○	○	○
N	○	○	○	○	○	○	○	○	○	○	○
S	○	○	○	○	○	○	○	○	○	○	○
H	○	○	○	○	○	○	○	○	○	○	○

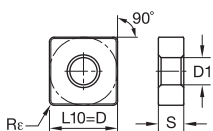
● first choice
○ alternate choice


SNMA


ISO catalog number	ANSI catalog number	D		L10		S		R _ε		D1		K10P	K25P	K35P	K10M	K25M	K20K	K10U	K15U	
		mm	in	mm	in	mm	in	mm	in	mm	in									
SNMA120408	SNMA432	12,70	1/2	12,70	.500	4,76	3/16	0,8	1/32	5,16	.203						●	●		
SNMA120412	SNMA433	12,70	1/2	12,70	.500	4,76	3/16	1,2	3/64	5,16	.203						●	●		
SNMA150612	SNMA543	15,88	5/8	15,88	.625	6,35	1/4	1,2	3/64	6,35	.250						●	●		
SNMA190612	SNMA643	19,05	3/4	19,05	.750	6,35	1/4	1,2	3/64	7,93	.313						●	●		


SNMG-F


ISO catalog number	ANSI catalog number	D		L10		S		R _ε		D1		K10P	K25P	K35P	K10M	K25M	K20K	K10U	K15U	
		mm	in	mm	in	mm	in	mm	in	mm	in									
SNMG090308F	SNMG322F	9,53	3/8	9,53	.375	3,18	1/8	0,8	1/32	3,81	.150	●	●				●	●		
SNMG120408F	SNMG432F	12,70	1/2	12,70	.500	4,76	3/16	0,8	1/32	5,16	.203	●	●			●	●	●	●	


SNMG-H


ISO catalog number	ANSI catalog number	D		L10		S		R _ε		D1		K10P	K25P	K35P	K10M	K25M	K20K	K10U	K15U	
		mm	in	mm	in	mm	in	mm	in	mm	in									
SNMG120408H	SNMG432H	12,70	1/2	12,70	.500	4,76	3/16	0,8	1/32	5,16	.203	●	●				●	●		
SNMG120412H	SNMG433H	12,70	1/2	12,70	.500	4,76	3/16	1,2	3/64	5,16	.203	●	●				●	●		
SNMG120416H	SNMG434H	12,70	1/2	12,70	.500	4,76	3/16	1,6	1/16	5,16	.203	●	●				●	●		
SNMG150612H	SNMG543H	15,88	5/8	15,88	.625	6,35	1/4	1,2	3/64	6,35	.250	●	●				●	●		
SNMG150616H	SNMG544H	15,88	5/8	15,88	.625	6,35	1/4	1,6	1/16	6,35	.250	●	●				●	●		
SNMG190612H	SNMG643H	19,05	3/4	19,05	.750	6,35	1/4	1,2	3/64	7,93	.313	●	●				●	●		
SNMG190616H	SNMG644H	19,05	3/4	19,05	.750	6,35	1/4	1,6	1/16	7,93	.313	●	●				●	●		

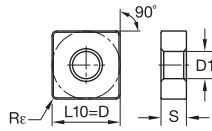
Application Specific

P	●	●	●	○	○	○	○	○	○	○	○
M	●	●	●	●	●	●	●	●	●	●	●
K	○	○	○	○	○	○	○	○	○	○	○
N	○	○	○	○	○	○	○	○	○	○	○
S	○	○	○	○	○	○	○	○	○	○	○
H	○	○	○	○	○	○	○	○	○	○	○

● first choice
○ alternate choice



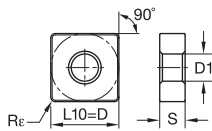
■ SNMG-M



ISO catalog number	ANSI catalog number	D		L10		S		Re		D1		K10P	K25P	K35P	K10M	K25M	K20K	K10U	K15U	
		mm	in	mm	in	mm	in	mm	in	mm	in									
SNMG120408M	SNMG432M	12,70	1/2	12,70	.500	4,76	3/16	0,8	1/32	5,16	.203				●	●				
SNMG120412M	SNMG433M	12,70	1/2	12,70	.500	4,76	3/16	1,2	3/64	5,16	.203				●	●				

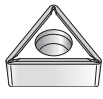


■ SNMG-R

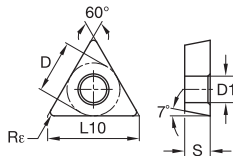


ISO catalog number	ANSI catalog number	D		L10		S		Re		D1		K10P	K25P	K35P	K10M	K25M	K20K	K10U	K15U	
		mm	in	mm	in	mm	in	mm	in	mm	in									
SNMG090308R	SNMG322R	9,53	3/8	9,53	.375	3,18	1/8	0,8	1/32	3,81	.150	●	●							
SNMG120404R	SNMG431R	12,70	1/2	12,70	.500	4,76	3/16	0,4	1/64	5,16	.203	●	●		●	●				
SNMG120408R	SNMG432R	12,70	1/2	12,70	.500	4,76	3/16	0,8	1/32	5,16	.203	●	●	●	●	●				
SNMG120412R	SNMG433R	12,70	1/2	12,70	.500	4,76	3/16	1,2	3/64	5,16	.203	●	●	●	●	●				
SNMG190612R	SNMG643R	19,05	3/4	19,05	.750	6,35	1/4	1,2	3/64	7,93	.313	●	●	●	●					

Application Specific



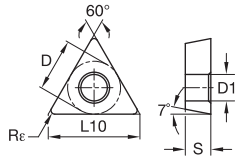
■ TCGT-F



ISO catalog number	ANSI catalog number	D		L10		S		Re		D1		K10P	K25P	K35P	K10M	K25M	K20K	K10U	K15U	
		mm	in	mm	in	mm	in	mm	in	mm	in									
TCGT110201F	TCGT2150F	6,35	1/4	11,00	.433	2,38	3/32	0,1	.004	2,80	.110								●	●
TCGT110204F	TCGT2151F	6,35	1/4	11,00	.433	2,38	3/32	0,4	1/64	2,80	.110								●	●
TCGT16T302F	TCGT32505F	9,53	3/8	16,50	.650	3,97	5/32	0,2	.008	4,40	.173								●	●
TCGT16T304F	TCGT3251F	9,53	3/8	16,50	.650	3,97	5/32	0,4	1/64	4,40	.173								●	●
TCGT16T308F	TCGT3252F	9,53	3/8	16,50	.650	3,97	5/32	0,8	1/32	4,40	.173								●	●



TCMT-F



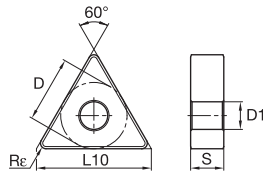
● first choice
○ alternate choice

P	●	●	●	○	○	○	○	○	○	○
M	●	○	○	○	○	○	○	○	○	○
K	○	○	○	○	○	○	○	○	○	○
N	○	○	○	○	○	○	○	○	○	○
S	○	○	○	○	○	○	○	○	○	○
H	○	○	○	○	○	○	○	○	○	○

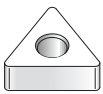
ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		K10P	K25P	K35P	K10M	K25M	K20K	K10U	K15U	
		mm	in	mm	in	mm	in	mm	in	mm	in									
TCMT110202F	TCMT21505F	6,35	1/4	11,00	.433	2,38	3/32	0,2	.008	2,90	.114	●	●	○	○	○	○	○	○	○
TCMT110204F	TCMT2151F	6,35	1/4	11,00	.433	2,38	3/32	0,4	1/64	2,80	.110	●	●	○	○	○	○	○	○	○
TCMT110208F	TCMT2152F	6,35	1/4	11,00	.433	2,38	3/32	0,8	1/32	2,80	.110	●	●	○	○	○	○	○	○	○
TCMT16T302F	TCMT32505F	9,53	3/8	16,50	.650	3,97	5/32	0,2	.008	4,40	.173	●	●	○	○	○	○	○	○	○
TCMT16T304F	TCMT3251F	9,53	3/8	16,50	.650	3,97	5/32	0,4	1/64	4,40	.173	●	●	○	○	○	○	○	○	○
TCMT16T308F	TCMT3252F	9,53	3/8	16,50	.650	3,97	5/32	0,8	1/32	4,40	.173	●	●	○	○	○	○	○	○	○
TCMT16T312F	TCMT3253F	9,53	3/8	16,50	.650	3,97	5/32	1,2	3/64	4,40	.173	●	●	○	○	○	○	○	○	○
TCMT220408F	TCMT432F	12,70	1/2	22,00	.866	4,76	3/16	0,8	1/32	5,50	.217	●	●	○	○	○	○	○	○	○



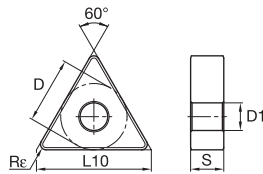
TNGP



ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		K10P	K25P	K35P	K10M	K25M	K20K	K10U	K15U	
		mm	in	mm	in	mm	in	mm	in	mm	in									
TNGP160402	TNGP3305	9,53	3/8	16,50	.650	4,76	3/16	0,2	.008	3,81	.150	○	○	○	○	○	○	○	○	○
TNGP160404	TNGP331	9,53	3/8	16,50	.650	4,76	3/16	0,4	1/64	3,81	.150	○	○	○	○	○	○	○	○	○
TNGP160408	TNGP332	9,53	3/8	16,50	.650	4,76	3/16	0,8	1/32	3,81	.150	○	○	○	○	○	○	○	○	○



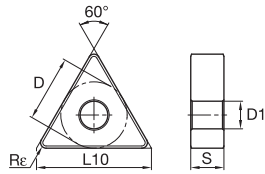
TNMA



ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		K10P	K25P	K35P	K10M	K25M	K20K	K10U	K15U	
		mm	in	mm	in	mm	in	mm	in	mm	in									
TNMA160408	TNMA332	9,53	3/8	16,50	.650	4,76	3/16	0,8	1/32	3,81	.150	○	○	○	○	○	○	○	○	○
TNMA160412	TNMA333	9,53	3/8	16,50	.650	4,76	3/16	1,2	3/64	3,81	.150	○	○	○	○	○	○	○	○	○
TNMA220408	TNMA432	12,70	1/2	22,00	.866	4,76	3/16	0,8	1/32	5,16	.203	○	○	○	○	○	○	○	○	○

Application Specific

TNMG-F

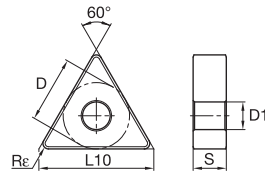


● first choice
○ alternate choice

P	●	●	●	○	○	○	○	○	○	○	○
M	●	●	●	●	●	●	●	●	●	●	●
K	○	○	○	○	○	○	○	○	○	○	○
N	○	○	○	○	○	○	○	○	○	○	○
S	○	○	○	○	○	○	○	○	○	○	○
H	○	○	○	○	○	○	○	○	○	○	○

ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		K10P	K25P	K35P	K10M	K25M	K20K	K10U	K15U	
		mm	in	mm	in	mm	in	mm	in	mm	in									
TNMG160404F	TNMG331F	9,53	3/8	16,50	.650	4,76	3/16	0,4	1/64	3,81	.150	●	●	●	●	●	●	●	●	●
TNMG160408F	TNMG332F	9,53	3/8	16,50	.650	4,76	3/16	0,8	1/32	3,81	.150	●	●	●	●	●	●	●	●	●
TNMG160412F	TNMG333F	9,53	3/8	16,50	.650	4,76	3/16	1,2	3/64	3,81	.150	●	●	●	●	●	●	●	●	●
TNMG220408F	TNMG432F	12,70	1/2	22,00	.866	4,76	3/16	0,8	1/32	5,16	.203	●	●	●	●	●	●	●	●	●

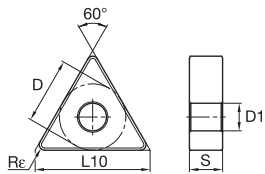
TNMG-H



Application Specific

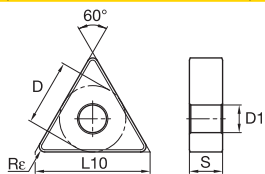
ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		K10P	K25P	K35P	K10M	K25M	K20K	K10U	K15U	
		mm	in	mm	in	mm	in	mm	in	mm	in									
TNMG160404H	TNMG331H	9,53	3/8	16,50	.650	4,76	3/16	0,4	1/64	3,81	.150	●	●	●	●	●	●	●	●	●
TNMG160408H	TNMG332H	9,53	3/8	16,50	.650	4,76	3/16	0,8	1/32	3,81	.150	●	●	●	●	●	●	●	●	●
TNMG160412H	TNMG333H	9,53	3/8	16,50	.650	4,76	3/16	1,2	3/64	3,81	.150	●	●	●	●	●	●	●	●	●
TNMG220404H	TNMG431H	12,70	1/2	22,00	.866	4,76	3/16	0,4	1/64	5,16	.203	●	●	●	●	●	●	●	●	●
TNMG220408H	TNMG432H	12,70	1/2	22,00	.866	4,76	3/16	0,8	1/32	5,16	.203	●	●	●	●	●	●	●	●	●
TNMG220412H	TNMG433H	12,70	1/2	22,00	.866	4,76	3/16	1,2	3/64	5,16	.203	●	●	●	●	●	●	●	●	●
TNMG270612H	TNMG543H	15,88	5/8	27,50	1.083	6,35	1/4	1,2	3/64	6,35	.250	●	●	●	●	●	●	●	●	●
TNMG330924H	TNMG666H	19,05	3/4	33,00	1.299	9,53	3/8	2,4	3/32	7,93	.313	●	●	●	●	●	●	●	●	●

TNMG-M



ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		K10P	K25P	K35P	K10M	K25M	K20K	K10U	K15U	
		mm	in	mm	in	mm	in	mm	in	mm	in									
TNMG160404M	TNMG331M	9,53	3/8	16,50	.650	4,76	3/16	0,4	1/64	3,81	.150	●	●	●	●	●	●	●	●	●
TNMG160408M	TNMG332M	9,53	3/8	16,50	.650	4,76	3/16	0,8	1/32	3,81	.150	●	●	●	●	●	●	●	●	●
TNMG160412M	TNMG333M	9,53	3/8	16,50	.650	4,76	3/16	1,2	3/64	3,81	.150	●	●	●	●	●	●	●	●	●
TNMG220404M	TNMG431M	12,70	1/2	22,00	.866	4,76	3/16	0,4	1/64	5,16	.203	●	●	●	●	●	●	●	●	●
TNMG220408M	TNMG432M	12,70	1/2	22,00	.866	4,76	3/16	0,8	1/32	5,16	.203	●	●	●	●	●	●	●	●	●

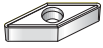
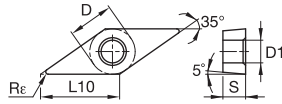
TNMG-R



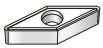
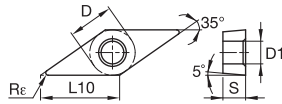
ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		K10P	K25P	K35P	K10M	K25M	K20K	K10U	K15U	
		mm	in	mm	in	mm	in	mm	in	mm	in									
TNMG160404R	TNMG331R	9,53	3/8	16,50	.650	4,76	3/16	0,4	1/64	3,81	.150	●	●	●	●	●	●	●	●	●
TNMG160408R	TNMG332R	9,53	3/8	16,50	.650	4,76	3/16	0,8	1/32	3,81	.150	●	●	●	●	●	●	●	●	●
TNMG160412R	TNMG333R	9,53	3/8	16,50	.650	4,76	3/16	1,2	3/64	3,81	.150	●	●	●	●	●	●	●	●	●
TNMG220404R	TNMG431R	12,70	1/2	22,00	.866	4,76	3/16	0,4	1/64	5,16	.203	●	●	●	●	●	●	●	●	●
TNMG220408R	TNMG432R	12,70	1/2	22,00	.866	4,76	3/16	0,8	1/32	5,16	.203	●	●	●	●	●	●	●	●	●

P	●	●	●	○	○	○	○	○	○	○	○
M	●	●	●	○	○	○	○	○	○	○	○
K	○	○	○	○	○	○	○	○	○	○	○
N	○	○	○	○	○	○	○	○	○	○	○
S	○	○	○	○	○	○	○	○	○	○	○
H	○	○	○	○	○	○	○	○	○	○	○

● first choice
○ alternate choice


VBGT-F


ISO catalog number	ANSI catalog number	D		L10		S		Re		D1		K10P	K25P	K35P	K10M	K25M	K20K	K10U	K15U	
		mm	in	mm	in	mm	in	mm	in	mm	in									
VBGT110302F	VBGT2205F	6,35	1/4	11,07	.436	3,18	1/8	0,2	.008	2,80	.110							●	●	●
VBGT110301F	VBGT220F	6,35	1/4	11,07	.436	3,18	1/8	0,1	.004	2,80	.110							●	●	●
VBGT110304F	VBGT221F	6,35	1/4	11,07	.436	3,18	1/8	0,4	1/64	2,80	.110							●	●	●
VBGT160402F	VBGT3305F	9,53	3/8	16,61	.654	4,76	3/16	0,2	.008	4,40	.173							●	●	●
VBGT160401F	VBGT330F	9,53	3/8	16,61	.654	4,76	3/16	0,1	.004	4,40	.173							●	●	●
VBGT160404F	VBGT331F	9,53	3/8	16,61	.654	4,76	3/16	0,4	1/64	4,40	.173							●	●	●


VBMT-F


ISO catalog number	ANSI catalog number	D		L10		S		Re		D1		K10P	K25P	K35P	K10M	K25M	K20K	K10U	K15U	
		mm	in	mm	in	mm	in	mm	in	mm	in									
VBMT110302F	VBMT2205F	6,35	1/4	11,07	.436	3,18	1/8	0,2	.008	2,80	.110							●	●	●
VBMT110304F	VBMT221F	6,35	1/4	11,07	.436	3,18	1/8	0,4	1/64	2,80	.110	●	●					●	●	●
VBMT110308F	VBMT222F	6,35	1/4	11,07	.436	3,18	1/8	0,8	1/32	2,80	.110	●	●					●	●	●
VBMT160402F	VBMT3305F	9,53	3/8	16,61	.654	4,76	3/16	0,2	.008	4,40	.173	●	●					●	●	●
VBMT160404F	VBMT331F	9,53	3/8	16,61	.654	4,76	3/16	0,4	1/64	4,40	.173	●	●					●	●	●
VBMT160408F	VBMT332F	9,53	3/8	16,61	.654	4,76	3/16	0,8	1/32	4,40	.173	●	●					●	●	●

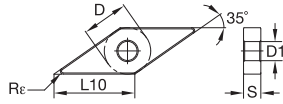
Application Specific

P	●	●	●	○	○	○	○	○	○	○	○
M	●	●	●	●	●	●	●	●	●	●	●
K	○	○	○	○	○	○	○	○	○	○	○
N	○	○	○	○	○	○	○	○	○	○	○
S	○	○	○	○	○	○	○	○	○	○	○
H	○	○	○	○	○	○	○	○	○	○	○

● first choice
○ alternate choice



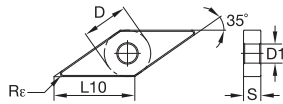
VNMG-M



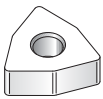
ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		K10P	K25P	K35P	K10M	K25M	K20K	K10U	K15U	
		mm	in	mm	in	mm	in	mm	in	mm	in									
VNMG160404M	VNMG331M	9,53	3/8	16,61	.654	4,76	3/16	0,4	1/64	3,81	.150				●	●				
VNMG160408M	VNMG332M	9,53	3/8	16,61	.654	4,76	3/16	0,8	1/32	3,81	.150				●	●				



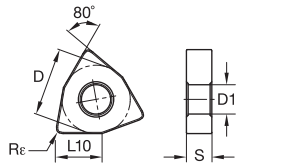
VNMG-R



ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		K10P	K25P	K35P	K10M	K25M	K20K	K10U	K15U	
		mm	in	mm	in	mm	in	mm	in	mm	in									
VNMG160408R	VNMG332R	9,53	3/8	16,61	.654	4,76	3/16	0,8	1/32	3,81	.150	●	●		●	●				



WNMA

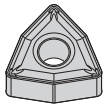


ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		K10P	K25P	K35P	K10M	K25M	K20K	K10U	K15U	
		mm	in	mm	in	mm	in	mm	in	mm	in									
WNMA060408	WNMA332	9,53	3/8	6,52	.257	4,76	3/16	0,8	1/32	3,81	.150								●	
WNMA080408	WNMA432	12,70	1/2	8,69	.342	4,76	3/16	0,8	1/32	5,16	.203								●	
WNMA080412	WNMA433	12,70	1/2	8,69	.342	4,76	3/16	1,2	3/64	5,16	.203								●	

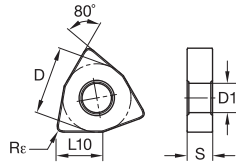
Application Specific

P	●	●	●	○	○	○	○	○	○	○	○
M	●	●	●	●	●	●	●	●	●	●	●
K	○	○	○	○	○	○	○	○	○	○	○
N	○	○	○	○	○	○	○	○	○	○	○
S	○	○	○	○	○	○	○	○	○	○	○
H	○	○	○	○	○	○	○	○	○	○	○

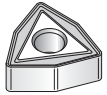
● first choice
○ alternate choice



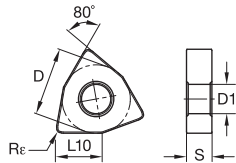
■ WNMG-F



ISO catalog number	ANSI catalog number	D		L10		S		Re		D1		K10P	K25P	K35P	K10M	K25M	K20K	K10U	K15U	
		mm	in	mm	in	mm	in	mm	in	mm	in									
WNMG080404F	WNMG431F	12,70	1/2	8,69	.342	4,76	3/16	0,4	1/64	5,16	.203	●	●	●	●	●	●	●	●	●
WNMG080408F	WNMG432F	12,70	1/2	8,69	.342	4,76	3/16	0,8	1/32	5,16	.203	●	●	●	●	●	●	●	●	●

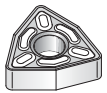


■ WNMG-H

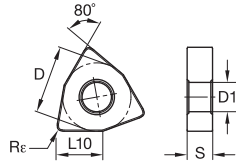


ISO catalog number	ANSI catalog number	D		L10		S		Re		D1		K10P	K25P	K35P	K10M	K25M	K20K	K10U	K15U	
		mm	in	mm	in	mm	in	mm	in	mm	in									
WNMG080408H	WNMG432H	12,70	1/2	8,69	.342	4,76	3/16	0,8	1/32	5,16	.203	●	●	●	●	●	●	●	●	●
WNMG080412H	WNMG433H	12,70	1/2	8,69	.342	4,76	3/16	1,2	3/64	5,16	.203	●	●	●	●	●	●	●	●	●
WNMG080416H	WNMG434H	12,70	1/2	8,69	.342	4,76	3/16	1,6	1/16	5,16	.203	●	●	●	●	●	●	●	●	●

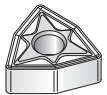
Application Specific



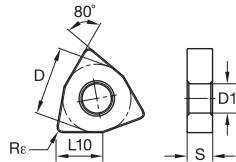
■ WNMG-M



ISO catalog number	ANSI catalog number	D		L10		S		Re		D1		K10P	K25P	K35P	K10M	K25M	K20K	K10U	K15U	
		mm	in	mm	in	mm	in	mm	in	mm	in									
WNMG080404M	WNMG431M	12,70	1/2	8,69	.342	4,76	3/16	0,4	1/64	5,16	.203	●	●	●	●	●	●	●	●	●
WNMG080408M	WNMG432M	12,70	1/2	8,69	.342	4,76	3/16	0,8	1/32	5,16	.203	●	●	●	●	●	●	●	●	●
WNMG080412M	WNMG433M	12,70	1/2	8,69	.342	4,76	3/16	1,2	3/64	5,16	.203	●	●	●	●	●	●	●	●	●



■ WNMG-R



ISO catalog number	ANSI catalog number	D		L10		S		Re		D1		K10P	K25P	K35P	K10M	K25M	K20K	K10U	K15U	
		mm	in	mm	in	mm	in	mm	in	mm	in									
WNMG060408R	WNMG332R	9,53	3/8	6,52	.257	4,76	3/16	0,8	1/32	3,81	.150	●	●	●	●	●	●	●	●	●
WNMG080408R	WNMG432R	12,70	1/2	8,69	.342	4,76	3/16	0,8	1/32	5,16	.203	●	●	●	●	●	●	●	●	●
WNMG080412R	WNMG433R	12,70	1/2	8,69	.342	4,76	3/16	1,2	3/64	5,16	.203	●	●	●	●	●	●	●	●	●



Carbide Recycling

Help preserve and protect our planet!

It's easy for your company to be environmentally conscious with the Kennametal Carbide Recycling Program.

By sending us your used carbide tools, you help preserve and protect the environment and ensure that these products are recycled responsibly. Kennametal accepts any coated or non-coated carbide items, including inserts, drills, reamers, and taps.

By using the Kennametal Carbide Recycling Program, you will receive:

- A partner who cares about a sustainable environment.
- Easy-to-use web portal to value your used carbide.
- Access to our popular Green Box™ options for carbide collection.
- Systematic and efficient disposal of carbide materials.
- Improved profitability.



Program is not currently available in all geographical areas.
For more information, please visit www.kennametal.com/carbiderecycling.



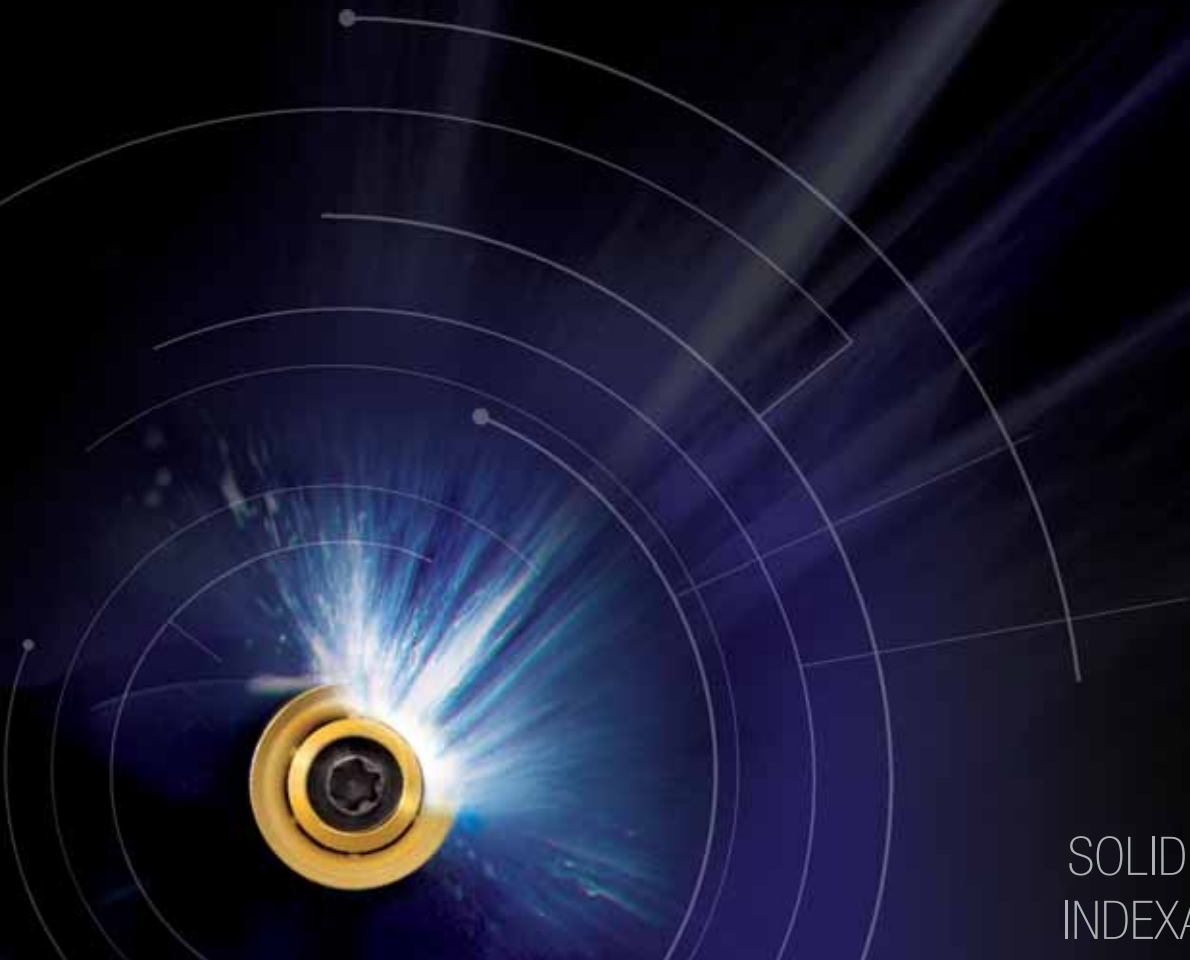








ROTATING TOOLS



HOLEMAKING
SOLID END MILLING
INDEXABLE MILLING

www.kennametal.com



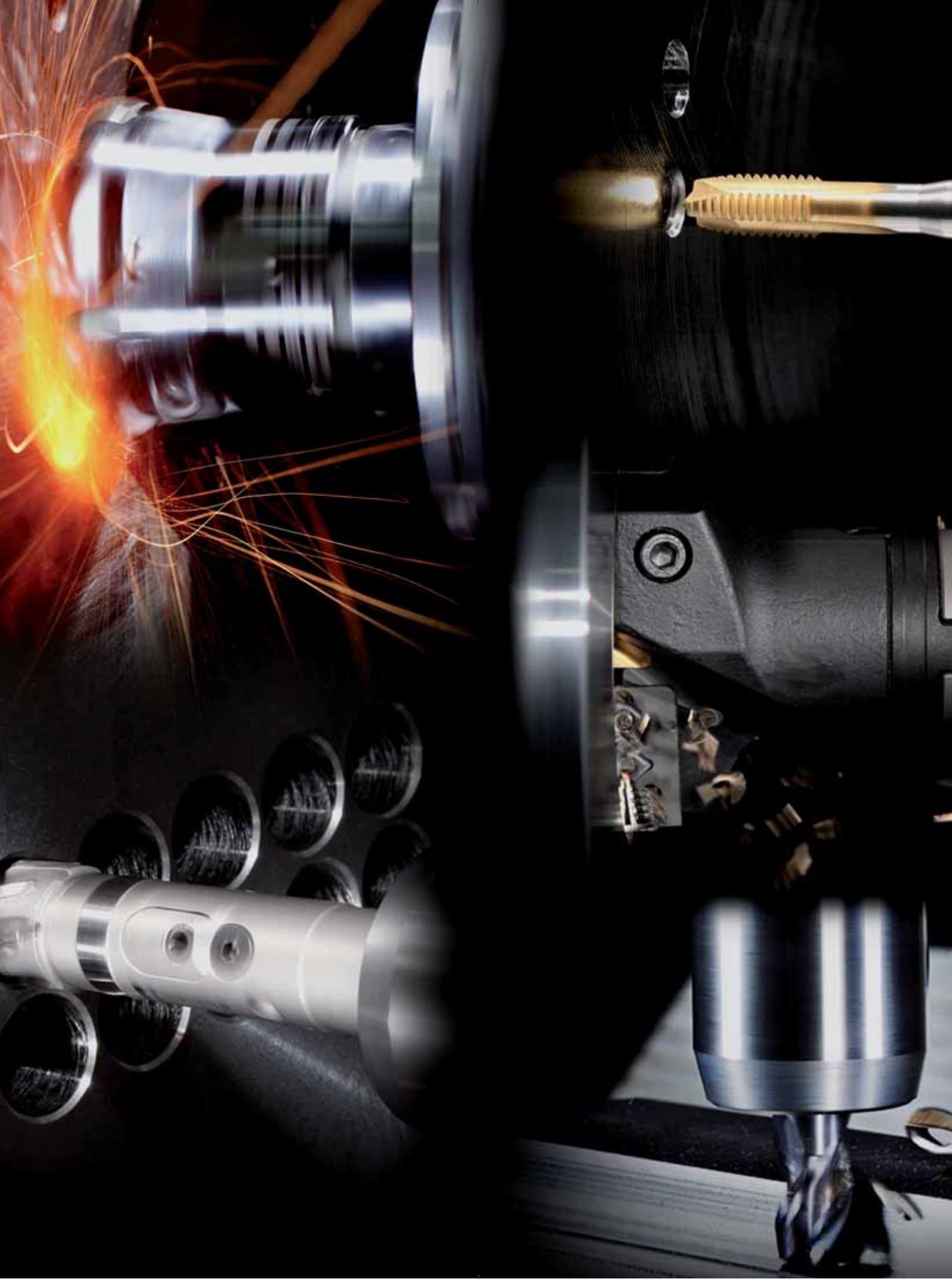


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Holemaking Products

Our latest Metalcutting Innovations are designed to deliver higher productivity, longer tool life, and increased application versatility.



SOLID CARBIDE DRILLS

See Section G for more details.

GOdrill™

TF Drills

Beyond™ Drills

Y-TECH™ Drills

TX Drills

SPF Drills

Flat-Bottom Drills

Kenna Universal™ Drills

NC Spot Drills

MODULAR DRILLS

See Section H for more details.

KenTIP™

KSEM™

KSEM PLUS™

COMBINATION TOOLS

See Section I for more details.

BF Combination Drilling System

SEFAS™ Combination Drilling System



For more information about the latest products and services from Kennametal, please contact your Kennametal Representative or Authorized Kennametal Distributor, or visit www.kennametal.com.



INDEXABLE DRILLS

See Section J for more details.

Drill Fix™

HTS Series Indexable Deep-Hole Drilling System

Indexable Drill Inserts

CTR Counterboring Tools

Counterboring Inserts

HOLE FINISHING

See Section K for more details.

Reaming Tools

SIF Steerable Toolholders

PCD Customized Tooling

Romicron™ Fine-Boring System

ModBORE™ Boring System

TAPS

See Section L for more details.

Beyond™ High-Performance Solid Carbide Taps

High-Performance HSS-E-PM Taps

High-Performance K Series Taps

General-Purpose Taps
High-Performance Solid Carbide

Thread Mills

Quick Ship Taps



Select the Correct Holemaking Solution for Your Application

Added Value for Your Performance

Increase of Productivity and Efficiency

- Material and application-specific solutions.
- Maximum metal removal rates and repeatability.
- Standardized design platforms for special tools based on “proven solutions” for individual optimizations and combination tools.

Control of Total Tooling Costs

- High tool utilization through material and application specific solutions.
- Process-safe regrinding service.
- Reduction of stocks through efficient modular concepts.
- Multiple platforms per application to achieve the most cost-efficient solution.

Solid Drilling

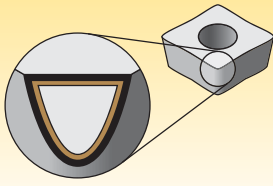
diameter		hourly rate			
		high to normal	normal (M/C)	normal to low	low (rough)
mm	inch	precision			
		IT8	IT9	IT10	IT11
1,0	.0393				
3,0	.1181				
6,0	.2362				
9,0	.3543				
12,0	.4724				
15,0	.5906				
18,0	.7087				
21,0	.8268				
24,0	.9449				
27,0	1.0630				
30,0	1.1811				
33,0	1.2992				
36,0	1.4173				
39,0	1.5354				
42,0	1.6535				
45,0	1.7717				
48,0	1.8898				
51,0	2.0079				
54,0	2.1260				
57,0	2.2441				
60,0	2.3622				
70,0	2.7559				
80,0	3.1496				
90,0	3.5433				
100,0	3.9370				
150,0	5.9055				
200,0	7.8740				
250,0	9.8425				
270,0	10"				

Optimized Purchase

- Broad selection of holemaking tools.
- Integrated into a full range of cutting tools and service offers.
- Onsite service for an efficient development and implementation of machining solutions.

Hole Finishing

diameter		hourly rate				
			very high	high (fine)	high to normal	normal (M/C)
mm	inch	precision				
		IT5	IT6	IT7	IT8	IT9
1,0	.0393					
3,0	.1181					
6,0	.2362					
9,0	.3543					
12,0	.4724					
15,0	.5906					
18,0	.7087					
21,0	.8268					
24,0	.9449					
27,0	1.0630					
30,0	1.1811					
33,0	1.2992					
36,0	1.4173					
39,0	1.5354					
42,0	1.6535					
45,0	1.7717					
48,0	1.8898					
50,0	1.9685					
100,0	3.937					
150,0	5.9055					
200,0	7.878					
250,0	9.8425					
300,0	11.811					
400,0	15.748					
500,0	19.685					
1000,0	39.3701					
1500,0	59.0551					
2000,0	78.7402					
2500,0	98.4252					

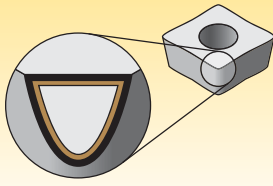


Coatings provide high-speed capability and are engineered for finishing to heavy roughing.

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous Materials
S	High-Temp Alloys
H	Hardened Materials

wear resistance ← → toughness

Grade	Coating	Grade Description	Performance Matrix																			
			05	10	15	20	25	30	35	40	45											
KCPK15		<ul style="list-style-type: none"> Multilayer TiAlN-PVD-coated universal fine-grain grade. Highest level of wear resistance for higher cutting speeds. Excellent surface quality for superior chip evacuation even when MQL is applied. More efficient than TiN-PVD grades. First choice for alloyed and high-alloy steel as well as cast iron. 	P																			
			K																			
KCM15		<ul style="list-style-type: none"> Nanolayer TiAlN-TiN-PVD coated fine-grain carbide. High wear resistance and low adhesion to stainless steel materials. Excellent surface quality for superior chip evacuation even when low-pressure coolant is applied. 	M																			
			S																			
KCK10		<ul style="list-style-type: none"> Multilayer AlCr-PVD-coated fine-grain carbide. Newly developed unique coating. Excellent surface quality for superior chip evacuation even when MQL is applied. Extraordinary wear resistance in drilling of cast iron materials. High-temperature hardness allows for elevated speeds. 	K																			
KCP15		<ul style="list-style-type: none"> Nanolayer AlTiN-PVD-coated over fine-grain carbide. Nanostructured coating with improved bonding process for longer tool life. Increased Al content for better thermal and chemical stability (oxidation resistance) and higher toughness and hardness. 	P																			
			K																			
KCPK10		<p>Composition: Advanced TiCN-Al₂O₃-CVD coating combined with cobalt-enriched carbide substrate, this grade offers a balanced combination of deformation resistance and edge toughness.</p> <p>Application: KCPK10 offers outstanding abrasion and crater wear resistance for high-speed machining of steels and cast irons. Use for very high cutting speeds with low to medium feed rates.</p>	P																			
			K																			
KCU25		<p>Composition: Advanced TiCN-Al₂O₃-CVD coating, together with a newly engineered tough carbide substrate, provides adequate deformation resistance along with excellent edge strength and offers very good wear resistance over a wide range of machining conditions.</p> <p>Application: KCU25 is a high productivity grade with high speeds and feeds, and the first choice for productive process with very good reliability in steels, stainless steels, and cast irons.</p>	P																			
			M																			
			K																			


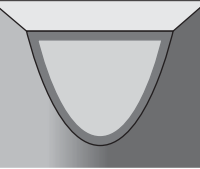
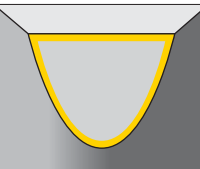
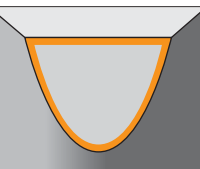
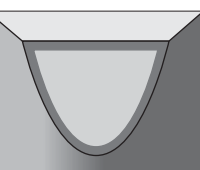
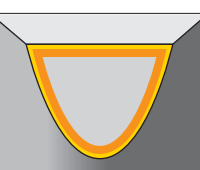


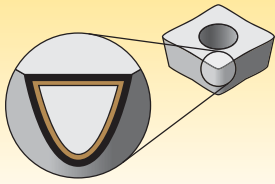
Coatings provide high-speed capability and are engineered for finishing to heavy roughing.

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous Materials
S	High-Temp Alloys
H	Hardened Materials

wear resistance ← → toughness

Grade

Coating	Grade Description	05	10	15	20	25	30	35	40	45
 KCU40	<p>Composition: Multilayered TiN-TiAlN-PVD coating and a tough substrate, that withstands interruptions and provides high wear resistance for long tool life.</p> <p>Application: KCU40 is the first choice for high reliability in most materials. This grade should be used at medium speeds and high feeds due to sharper edges. KCU40 covers steel, stainless steel, cast iron, and high-temperature alloys for high toughness applications under certain conditions.</p>	P								
		M								
 KC5410	<ul style="list-style-type: none"> TiB₂-PVD coating over a very deformation-resistant unalloyed substrate. Designed for roughing, semifinishing, and finishing of free machining (hypoeutectic <12,2% Si) aluminum, aluminum alloys, and magnesium alloys. High hardness and extremely smooth surface, resulting in reduced surface friction, speedy chip flow, and outstanding wear resistance. Prevents built-up edge because of a very low affinity for aluminum. 									
		N								
 KC6005	<ul style="list-style-type: none"> TiN-PVD-coated carbide. Highly wear-resistant substrate. Reaming grade with universal applications in high-precision carbide cutting. 	P								
		M								
 KC6105	<ul style="list-style-type: none"> TiCN-PVD-coated carbide. Reaming grade with highly wear-resistant substrate for steel and stainless steel. Particularly high level of wear resistance for stainless steel with high-precision carbide cutting values. 	P								
		M								
 KC6305	<ul style="list-style-type: none"> TiAlN-PVD-coated carbide. Reaming grade with highly wear-resistant substrate. Particularly suitable for cast iron and steel. For exceptionally high-precision finishing. High-precision carbide cutting values. 	P								
		K								
 KC7135	<ul style="list-style-type: none"> TiCN-TiN-PVD-coated carbide. Highly wear-resistant grade. For universal application in steel, stainless steel, and irons. Specifically used for KSEM PCM precentering inserts. 	P								
		M								
		K								



Coatings provide high-speed capability and are engineered for finishing to heavy roughing.

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous Materials
S	High-Temp Alloys
H	Hardened Materials

wear resistance ← → toughness

Grade

Coating	Grade Description	05	10	15	20	25	30	35	40	45
 KC7315	<ul style="list-style-type: none"> Multilayer TiAlN-PVD-coated universal fine-grain grade. Highest level of wear resistance for higher cutting speeds. More efficient than TiN-PVD grades. First choice for alloyed and high-alloy steel and cast iron. 	P								
		K								
 KC7320	<ul style="list-style-type: none"> AlTiN-PVD-coated universal fine-grain grade. Increased aluminum content for better thermal and chemical stability (oxidation resistance), and higher toughness and hardness. High level of wear resistance. Used for modular drilling of austenitic stainless steel. 	M								
		S								
 KC7325	<ul style="list-style-type: none"> Multilayer TiAlN-PVD-coated universal fine-grain grade. Highest level of wear resistance for higher cutting speeds. TiN top layer serves as wear indicator. First choice for alloyed and high-alloy steel and cast iron. 	P								
		M								
 KC7325	<ul style="list-style-type: none"> Multilayer TiAlN-PVD-coated universal fine-grain grade. Highest level of wear resistance for higher cutting speeds. TiN top layer serves as wear indicator. First choice for alloyed and high-alloy steel and cast iron. 	K								
		N								
 KC7325	<ul style="list-style-type: none"> Multilayer TiAlN-PVD-coated universal fine-grain grade. Highest level of wear resistance for higher cutting speeds. TiN top layer serves as wear indicator. First choice for alloyed and high-alloy steel and cast iron. 	S								
		H								
 KC7410	<ul style="list-style-type: none"> Multilayer AlCr-PVD-coated fine-grain carbide. Newly developed unique coating. Extraordinary wear resistance in drilling of cast iron materials. High hot hardness allows for elevated speeds. 	K								
 KC7425	<ul style="list-style-type: none"> Multilayer AlCrN-PVD-coated ultra-fine-grain carbide. Very hard coating for excellent wear resistance. Excellent surface quality for superior chip flow. Used in deep-hole drilling applications in low carbon, carbon, alloyed steels, and gray cast irons. 	P								
		K								
 KC7935	<ul style="list-style-type: none"> TiCN-Al₂O₃-CVD-coated carbide with a very tough substrate. For normal to stable conditions. High cutting values. For cutting steel and cast iron materials. Can also be used in dry machining. 	P								
		K								

Solid Carbide Drills • Recommendation Chart

standard first choice = bold alternate choice = regular simple special = gray	through coolant	flood coolant	MQL	dry	deep hole	flat bottom	drill and chamfer	universal
P – Steel	B224_HP B225_HP B226_HP B256	B221_HP B222_HP	B221_HP, B222_HP B224_HP, B225_HP B226_HP B256	B221_HP B222_HP	B269_HP B271_HPG B272_HPG B273_HPG B274_HPG	B706_FBG B707_FBG B708_FBG B709_FBG	B731_HP B732_HP	B966 B976, B977, B978 B041_CPG, B042_CPG B051_CPG, B052_CPG, B053_CPG
M – Stainless Steel	B210_HP/K210_HP B211_HP/K211_HP B212_HP/K212_HP					B706_FBL B707_FBL B708_FBL B709_FBL		B966 B976, B977, B978 B041_CPG, B042_CPG B051_CPG, B052_CPG, B053_CPG
K – Cast Iron	B254_YPC/K254_YPC B255_YPC/K255_YPC B256_YPC/K256_YPC	B104/K104 B105/K105 B106/K106	B254_YPC/K254_YPC B255_YPC/K255_YPC B256_YPC/K256_YPC	B104/K104 B105/K105 B106/K106	B269_HP B271_HPG B272_HPG B273_HPG B274_HPG	B706_FBG B707_FBG B708_FBG B709_FBG	B731_HP B732_HP	B966 B976, B977, B978 B041_CPG, B042_CPG B051_CPG, B052_CPG, B053_CPG
N – Non-Ferrous	B410/K410 B411/K411 B412/K412	B104/K104 B105/K105 B106/K106			B271_HPS B272_HPS B273_HPS B274_HPS	B706_FBS B707_FBS B708_FBS B709_FBS		B966 B976, B977, B978 B041_CPG, B042_CPG B051_CPG, B052_CPG, B053_CPG
N – CFRP		B531A/K531A B532A/K532A B533A/K533A		B531A/K531A B532A/K532A B533A/K533A				
S – Heat-Resistant Alloys, Titanium Alloys	B291_YPL, B292_YPL B284/K284, B285/K285 B125/K125					B706_FBL B707_FBL B708_FBL B709_FBL		B966 B976, B977, B978 B041_CPG, B042_CPG B051_CPG, B052_CPG, B053_CPG

Solid Carbide Drills • Dimension Tables

■ Dimensions for Kennametal Solid Carbide Drills (B_Series) • Metric

mm Ø		DIN 6535		SHORT* ~3 x D			LONG* ~5 x D			EXTRA LONG** ~8 x D		
D1 min	D1 max	D	LS	L	L3	L4 max	L	L3	L4 max	L	L3	L4 max
1,000	1,400	4	28	58	7	5	58	9	6	58	12	10
1,401	1,900	4	28	58	9	6	58	12	9	58	18	15
1,901	2,300	4	28	58	13	9	58	18	14	66	26	22
2,301	2,999	4	28	58	17	12	58	22	17	66	30	25
3,000	3,750	6	36	62	20	14	66	28	23	78	40	33
3,751	4,750	6	36	66	24	17	74	36	29	87	49	41
4,751	6,000	6	36	66	28	20	82	44	35	94	56	48
6,001	7,000	8	36	79	34	24	91	53	43	105	67	57
7,001	8,000	8	36	79	41	29	91	53	43	110	72	61
8,001	10,000	10	40	89	47	35	103	61	49	122	80	68
10,001	12,000	12	45	102	55	40	118	71	56	141	94	79
12,001	14,000	14	45	107	60	43	124	77	60	155	108	91
14,001	16,000	16	48	115	65	45	133	83	63	171	121	101
16,001	18,000	18	48	123	73	51	143	93	71	185	135	113
18,001	20,000	20	50	131	79	55	153	101	77	200	148	124
20,001	22,000	20	50	141	86	60	167	112	85	217	162	136
22,001	25,000	25	56	153	95	65	184	126	98	238	180	150

* D1<20mm to DIN 6537K
D1>20mm to factory standard
** To factory standard

NOTE: Solid Carbide Drills from Kennametal in short and regular lengths conform to DIN 6537.
Drills with long lengths conform to Kennametal factory standard.
Solid Carbide Drills with diameter D1>20mm (not DIN 6537) are also standardized to factory standard.

■ Dimensions for Kennametal Solid Carbide Drills (B_Series) • Inch

in Ø		DIN 6535		SHORT* ~3 x D			LONG* ~5 x D			EXTRA LONG** ~8 x D		
D1 min	D1 max	D	LS	L	L3	L4 max	L	L3	L4 max	L	L3	L4 max
.0394	.0551	.1575	1.10	2.28	.28	.20	2.28	.35	.24	2.28	.47	.39
.0552	.0748	.1575	1.10	2.28	.35	.24	2.28	.47	.35	2.28	.71	.59
.0748	.0906	.1575	1.10	2.28	.51	.35	2.28	.71	.55	2.60	1.02	.87
.0906	.1177	.1575	1.10	2.28	.67	.47	2.28	.87	.67	2.60	1.18	.98
.1181	.1476	.2362	1.42	2.44	.79	.55	2.60	1.10	.91	3.07	1.57	1.30
.1477	.1870	.2362	1.42	2.60	.94	.67	2.91	1.42	1.14	3.43	1.93	1.61
.1870	.2362	.2362	1.42	2.60	1.10	.79	3.23	1.73	1.38	3.70	2.20	1.89
.2363	.2756	.3150	1.42	3.11	1.34	.94	3.58	2.09	1.69	4.13	2.64	2.24
.2756	.3150	.3150	1.42	3.11	1.61	1.14	3.58	2.09	1.69	4.33	2.83	2.40
.3150	.3937	.3937	1.57	3.50	1.85	1.38	4.06	2.40	1.93	4.80	3.15	2.68
.3937	.4724	.4724	1.77	4.02	2.17	1.57	4.65	2.80	2.20	5.55	3.70	3.11
.4725	.5512	.5512	1.77	4.21	2.36	1.69	4.88	3.03	2.36	6.10	4.25	3.58
.5512	.6299	.6299	1.89	4.53	2.56	1.77	5.24	3.27	2.48	6.73	4.76	3.98
.6300	.7087	.7087	1.89	4.84	2.87	2.01	5.63	3.66	2.80	7.28	5.32	4.45
.7087	.7874	.7874	1.97	5.16	3.11	2.17	6.02	3.98	3.03	7.87	5.83	4.88
.7874	.8661	.7874	1.97	5.55	3.39	2.36	6.57	4.41	3.35	8.54	6.38	5.35
.8662	.9843	.9843	2.20	6.02	3.74	2.56	7.24	4.96	3.86	9.37	7.09	5.91

* D1<20mm to DIN 6537K
D1>20mm to factory standard
** To factory standard

■ Dimensions for Kennametal Solid Carbide Drills (K_Series) • Inch

in Ø				SHORT** ~3 x D			REGULAR** ~5 x D			LONG** ~8 x D		
D1 min	D1 max	D	LS min	L	L3	L4 max	L	L3	L4 max	L	L3	L4 max
.1250	.1563	.1875	1.44	2.48	.91	.69	2.60	1.06	.84	3.07	1.54	1.28
.1563	.1875	.1875	1.44	2.68	1.14	.89	2.91	1.38	1.12	3.31	1.77	1.52
.1876	.2500	.2500	1.44	2.87	1.34	1.02	3.23	1.69	1.37	3.74	2.20	1.89
.2500	.3125	.3125	1.52	3.11	1.50	1.11	3.58	1.97	1.58	4.33	2.72	2.33
.3126	.3750	.3750	1.59	3.50	1.81	1.37	4.06	2.36	1.91	4.92	3.23	2.78
.3750	.4375	.4375	1.67	3.78	2.01	1.50	4.37	2.60	2.08	5.24	3.46	2.96
.4376	.5000	.5000	1.79	4.02	2.13	1.56	4.65	2.76	2.18	5.63	3.74	3.17
.5000	.5625	.5625	1.79	4.21	2.32	1.69	4.88	2.99	2.35	6.10	4.21	3.58
.5626	.6250	.6250	1.91	4.53	2.52	1.83	5.24	3.23	2.53	6.73	4.72	4.04
.6250	.6875	.6875	1.91	4.84	2.83	2.09	5.63	3.62	2.86	7.28	5.28	4.53
.6876	.7500	.7500	1.99	5.08	2.99	2.19	5.83	3.74	2.92	7.76	5.67	4.86
.7500	.8125	.8125	1.99	5.31	3.23	2.36	6.02	3.94	3.06	8.15	6.06	5.20
.8126	.8750	.8750	2.07	5.55	3.39	2.46	6.57	4.41	3.47	8.54	6.38	5.46
.8750	.9375	.9375	2.15	5.79	3.50	2.52	6.93	4.69	3.69	8.94	6.69	5.71
.9376	.9375	1.0000	2.22	6.02	3.70	2.66	7.24	4.92	3.87	9.37	7.05	6.01

** To factory standard

■ Tolerances of Drills and Holes

Solid carbide drills with tolerance of m7 (SE Drill, TF Drill, KU Drill) create holes with tolerances of H9. H8 can be achieved in very good conditions. The TX Drill should be used for holes in H8, in favorable conditions H7 can be achieved.

Solid carbide drills (BF Drill) with h7 create holes in JS9–JS11. Other drilling tolerances require special solid carbide drill versions.

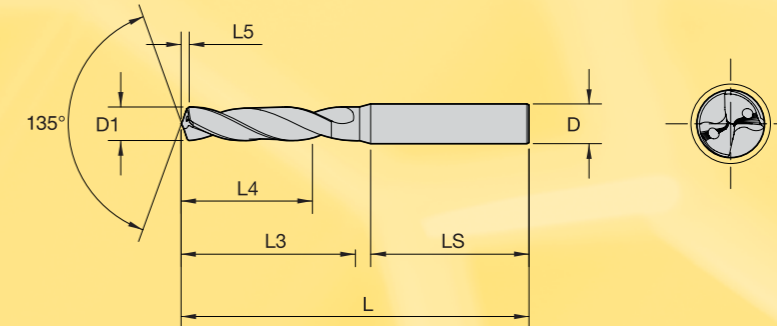
■ Shank Designs to DIN 6535



Form HE,
2° angle
Design F



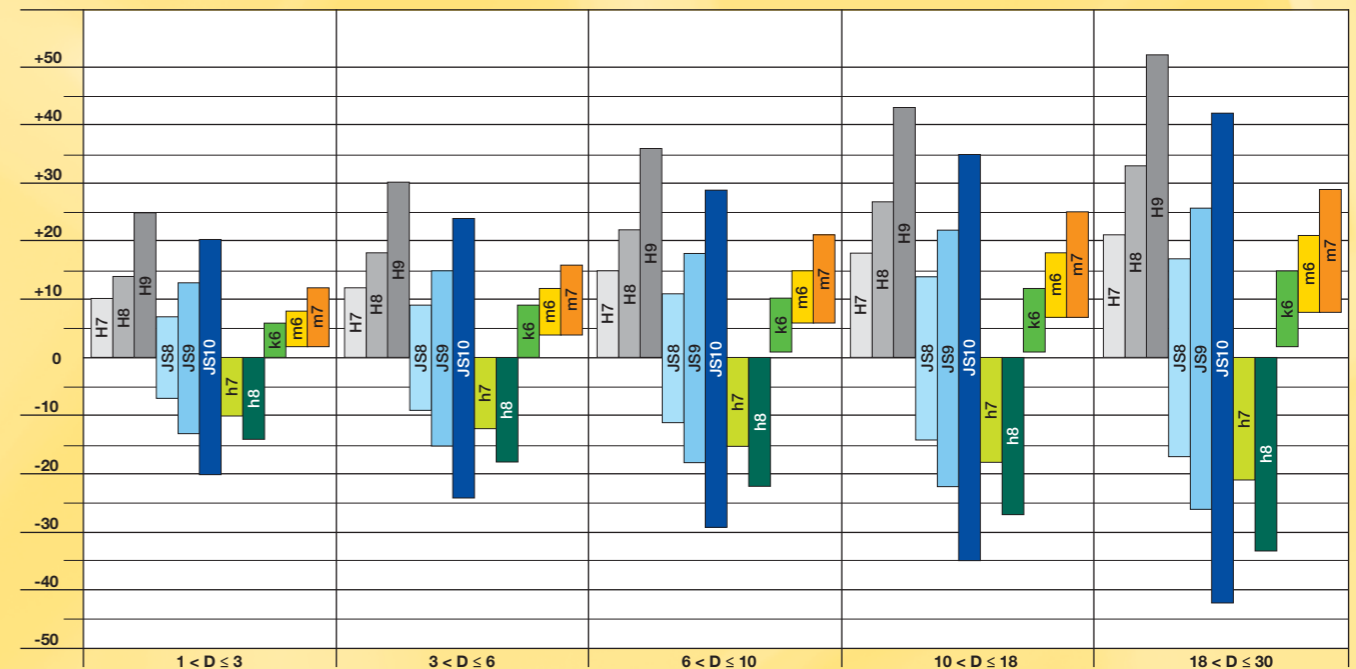
Form HA,
straight round
Design A



■ Holemaking Drilling Portfolio • Diameter Tolerances

drill type	drill tolerance	hole tolerance	hole tolerance (best*)	details
TX	k6	H8	H7	B410, B411, B412
TF	m6	H9	H8	B125
TF	m7	H9	H8	B104, B105, B106
KU	m7	H9	H8	B966, B976, B977, B978
SE	m7	H9	H8	B256
HP	m7	H9	H8	B210_HP, B211_HP, B212_HP; B221_HP, B222_HP, B224_HP, B225_HP, B226_HP; B269_HP; B284, B285
FB*	m7	H9	H8	B706_FB*, B707_FB*, B708_FB*, B709_FB*
YPC	m7	H9	H8	B254_YPC, B255_YPC, B256_YPC
YPL	m7	H9	H8	B291_YPL, B292_YPL, B293_YPL
SPF	m7	H9	H8	B531, B532, B533
BF	h7	JS9	JS8	B343
GO	h7	JS9	JS8	B041_CPG, B042_CPG, B043_CPG, B051_CPG, B052_CPG, B053_CPG
HPG	h7	JS9	JS8	B271_HPG, B272_HPG, B273_HPG, B274_HPG
HPS	h8	JS10	JS9	B271_HPS, B272_HPS, B273_HPS, B274_HPS

* Can be achieved in very good conditions.



High-Performance Solid Carbide Drills

Tool Selection Guide .....	.G2-G3
GOdrill • Microdrilling .....	.G5-G15
TF Drills • High Metal Removal Rates .....	.G16-G21
TF Drills • Titanium .....	.G22-G24
HP Beyond Drills • Stainless Steel .....	.G25-G32
HP Beyond Drills • Steel .....	.G33-G43
YPC Beyond Drills • Iron Materials .....	.G44-G51
SE 4-Margin Drills • Steel .....	.G52-G54
HP Beyond 4-Margin, Long-Length Drills .....	.G55-G58
HP Deep-Hole Drills • Steel and Non-Ferrous .....	.G59-G70
HP Drills • High-Temperature-Resistant Alloys .....	.G71-G74
Y-TECH Drills • Difficult-to-Machine Materials .....	.G75-G79
TX Drills • Close Tolerance Holes .....	.G80-G84
SPF Drills • CFRP .....	.G85-G87
Flat-Bottom Drills .....	.G88-G92
HP Beyond Step Drills .....	.G93-G96
Kenna Universal Drills .....	.G97-G108
NC Spot Drills .....	.G109



solid carbide drills for external coolant or dry machining		series	grade	standard*						hole tolerance	standard range		
				● first choice ○ alternate choice							D1 mm min-max	D1 in min-max	drilling depth L/D1
				P	M	K	N	S	H				
	GOdrill™ for microdrilling applications	B04_CPG	KC7325	●	●	●	●	●	○	IT9-IT10	1,0-12,7	.0394-.500	3-5 x
	TF Drill for high metal removal rates	B/K105	K10	○	●	●	●	○		IT9-IT10	3,0-21,0	.1130-.8101	5 x D
		B/K105	KC7210	○	●					IT9-IT10	3,5-18,5	.1250-.6563	5 x D
	HP Drill for dry applications or flood coolant	B221/B222_HP	KCPK15	●	●					IT9-IT10	3,0-21,0	.1181-.8268	3-5 x
	SPF Drill for composite (CFRP) materials	B/K53_SPF	KDF400				●			IT9-IT10	3,2-12,7	.1260-.5010	3-5 x
	KU-Drill for universal applications	B966	KC7315	●	●					IT9-IT10	3,0-20,0	.1181-.7874	3 x D
	NC Spot Drill 120°	B501	K10	●	○	●	○	○		—	6,0-12,0	.2352-.4724	1 x D
	NC Spot Drill 90°	B505	K10	●	○	●	○	○		—	6,0-20,0	.2362-.7874	1 x D

solid carbide drills with internal coolant channel		series	grade	standard*						hole tolerance	standard range		
				● first choice ○ alternate choice							D1 mm min-max	D1 inch min-max	drilling depth L/D1
				P	M	K	N	S	H				
	GOdrill for microdrilling applications	B05_CPG	KC7325	●	●	●	●	●	○	IT9-IT10	1,5-12,7	.0591-.500	3-8 x
	TF Drill for high metal removal rates	B/K125	K715						●	IT9-IT10	6,0-15,9	.2500-.6250	5 x D
	HP Drill for stainless steel	B/K21_HP	KCM15	○	●				○	IT9-IT10	3,0-21,0	.1181-.8268	3-8 x
	HP Drill for steel	B224/B225_HP	KCPK15	●	○					IT9-IT10	3,0-21,0	.1181-.8268	3-5 x
	YPC Drill for cast iron materials	B/K25_YPC	KCK10			●				IT9-IT10	3,0-25,0	.1181-.9844	3-8 x
	SE Drill for steel	B256	KC7315	●	○					IT9-IT10	5,0-16,0	.1969-.6299	8 x D
	Long-Length Drill for steel, iron, and stainless steel	B269_HP	KCPK15	●	○	○				IT9-IT10	3,0-20,0	.1181-.7874	12 x D
	Deep-Hole Drill for steel, iron, and non-ferrous materials	B27_HPG	KC7425	●	○	●				IT9-IT10	2,4-16,0	.0938-.6299	15-30 x
		B27_HPS	KN25				●			IT9-IT10	2,4-16,0	.0938-.6299	15-30 x
	HP Drill for high-temperature alloys	B/K28_	K715				○	●		IT9-IT10	3,97-25,0	.1563-.9843	5 x D
	Y-TECH™ Drill for high-temperature alloys	B29_YPL	KC7315		●			●		IT9-IT10	3,0-21,0	.1181-.8268	3-5 x
	TX Drill for close tolerance holes	B411	KF1			●	●			IT8-IT9	3,2-25,0	.1250-.9843	5 x D
	Flat-Bottom Drill for flat-bottom applications	B707_FBG	KC7315	●	●					IT9-IT10	3,0-21,0	.1181-.8268	3 x D
		B707_FBL	KC7315		●			●		IT9-IT10	3,0-21,0	.1181-.8268	3 x D
		B707_FBS	KN15				●			IT9-IT10	3,0-21,0	.1181-.8268	3 x D
	HP Step Drill for steel and iron	B73_HP	KCPK15	●	●					IT9-IT10	3,7-19,45	.1470-.7656	short, long
	KU-Drill for universal applications	B97_	KC7315	●	○	●	○	○		IT9-IT10	2,4-20,0	.0938-.7874	3-8 x

* In regard to coatings, anything is possible. If a specific drill is not suitable for your workpiece material, please contact our Engineered Solutions Department for an offer about special coatings and edge preparations.



HIGH-PERFORMANCE SOLID CARBIDE DRILLS

Solid Carbide Drills • Dimension Tables

■ Dimensions for Kennametal Solid Carbide Drills (B_Series) • Metric

mm Ø		DIN 6535		SHORT* ~3 x D			LONG* ~5 x D			EXTRA LONG** ~8 x D		
D1 min	D1 max	D	LS	L	L3	L4 max	L	L3	L4 max	L	L3	L4 max
1,000	1,400	4	28	58	7	5	58	9	6	58	12	10
1,401	1,900	4	28	58	9	6	58	12	9	58	18	15
1,901	2,300	4	28	58	13	9	58	18	14	66	26	22
2,301	2,999	4	28	58	17	12	58	22	17	66	30	25
3,000	3,750	6	36	62	20	14	66	28	23	78	40	33
3,751	4,750	6	36	66	24	17	74	36	29	87	49	41
4,751	6,000	6	36	66	28	20	82	44	35	94	56	48
6,001	7,000	8	36	79	34	24	91	53	43	105	67	57
7,001	8,000	8	36	79	41	29	91	53	43	110	72	61
8,001	10,000	10	40	89	47	35	103	61	49	122	80	68
10,001	12,000	12	45	102	55	40	118	71	56	141	94	79
12,001	14,000	14	45	107	60	43	124	77	60	155	108	91
14,001	16,000	16	48	115	65	45	133	83	63	171	121	101
16,001	18,000	18	48	123	73	51	143	93	71	185	135	113
18,001	20,000	20	50	131	79	55	153	101	77	200	148	124
20,001	22,000	20	50	141	86	60	167	112	85	217	162	136
22,001	25,000	25	56	153	95	65	184	126	98	238	180	150

* D1<20mm to DIN 6537K
D1>20mm to factory standard
** To factory standard

NOTE: Solid Carbide Drills from Kennametal in short and regular lengths conform to DIN 6537.
Drills with long lengths conform to Kennametal factory standard.
Solid Carbide Drills with diameter D1>20mm (not DIN 6537) are also standardized to factory standard.

■ Dimensions for Kennametal Solid Carbide Drills (B_Series) • Inch

in Ø		DIN 6535		SHORT* ~3 x D			LONG* ~5 x D			EXTRA LONG** ~8 x D		
D1 min	D1 max	D	LS	L	L3	L4 max	L	L3	L4 max	L	L3	L4 max
.0394	.0551	.1575	1.10	2.28	.28	.20	2.28	.35	.24	2.28	.47	.39
.0552	.0748	.1575	1.10	2.28	.35	.24	2.28	.47	.35	2.28	.71	.59
.0748	.0906	.1575	1.10	2.28	.51	.35	2.28	.71	.55	2.60	1.02	.87
.0906	.1177	.1575	1.10	2.28	.67	.47	2.28	.87	.67	2.60	1.18	.98
.1181	.1476	.2362	1.42	2.44	.79	.55	2.60	1.10	.91	3.07	1.57	1.30
.1477	.1870	.2362	1.42	2.60	.94	.67	2.91	1.42	1.14	3.43	1.93	1.61
.1870	.2362	.2362	1.42	2.60	1.10	.79	3.23	1.73	1.38	3.70	2.20	1.89
.2363	.2756	.3150	1.42	3.11	1.34	.94	3.58	2.09	1.69	4.13	2.64	2.24
.2756	.3150	.3150	1.42	3.11	1.61	1.14	3.58	2.09	1.69	4.33	2.83	2.40
.3150	.3937	.3937	1.57	3.50	1.85	1.38	4.06	2.40	1.93	4.80	3.15	2.68
.3937	.4724	.4724	1.77	4.02	2.17	1.57	4.65	2.80	2.20	5.55	3.70	3.11
.4725	.5512	.5512	1.77	4.21	2.36	1.69	4.88	3.03	2.36	6.10	4.25	3.58
.5512	.6299	.6299	1.89	4.53	2.56	1.77	5.24	3.27	2.48	6.73	4.76	3.98
.6300	.7087	.7087	1.89	4.84	2.87	2.01	5.63	3.66	2.80	7.28	5.32	4.45
.7087	.7874	.7874	1.97	5.16	3.11	2.17	6.02	3.98	3.03	7.87	5.83	4.88
.7874	.8661	.7874	1.97	5.55	3.39	2.36	6.57	4.41	3.35	8.54	6.38	5.35
.8662	.9843	.9843	2.20	6.02	3.74	2.56	7.24	4.96	3.86	9.37	7.09	5.91

* D1<20mm to DIN 6537K
D1>20mm to factory standard
** To factory standard

■ Dimensions for Kennametal Solid Carbide Drills (K_Series) • Inch

in Ø		SHORT** ~3 x D			REGULAR** ~5 x D			LONG** ~8 x D				
D1 min	D1 max	D	LS min	L	L3	L4 max	L	L3	L4 max	L	L3	L4 max
.1250	.1563	.1875	1.44	2.48	.91	.69	2.60	1.06	.84	3.07	1.54	1.28
.1563	.1875	.1875	1.44	2.68	1.14	.89	2.91	1.38	1.12	3.31	1.77	1.52
.1876	.2500	.2500	1.44	2.87	1.34	1.02	3.23	1.69	1.37	3.74	2.20	1.89
.2500	.3125	.3125	1.52	3.11	1.50	1.11	3.58	1.97	1.58	4.33	2.72	2.33
.3126	.3750	.3750	1.59	3.50	1.81	1.37	4.06	2.36	1.91	4.92	3.23	2.78
.3750	.4375	.4375	1.67	3.78	2.01	1.50	4.37	2.60	2.08	5.24	3.46	2.96
.4376	.5000	.5000	1.79	4.02	2.13	1.56	4.65	2.76	2.18	5.63	3.74	3.17
.5000	.5625	.5625	1.79	4.21	2.32	1.69	4.88	2.99	2.35	6.10	4.21	3.58
.5626	.6250	.6250	1.91	4.53	2.52	1.83	5.24	3.23	2.53	6.73	4.72	4.04
.6250	.6875	.6875	1.91	4.84	2.83	2.09	5.63	3.62	2.86	7.28	5.28	4.53
.6876	.7500	.7500	1.99	5.08	2.99	2.19	5.83	3.74	2.92	7.76	5.67	4.86
.7500	.8125	.8125	1.99	5.31	3.23	2.36	6.02	3.94	3.06	8.15	6.06	5.20
.8126	.8750	.8750	2.07	5.55	3.39	2.46	6.57	4.41	3.47	8.54	6.38	5.46
.8750	.9375	.9375	2.15	5.79	3.50	2.52	6.93	4.69	3.69	8.94	6.69	5.71
.9376	.9375	1.0000	2.22	6.02	3.70	2.66	7.24	4.92	3.87	9.37	7.05	6.01

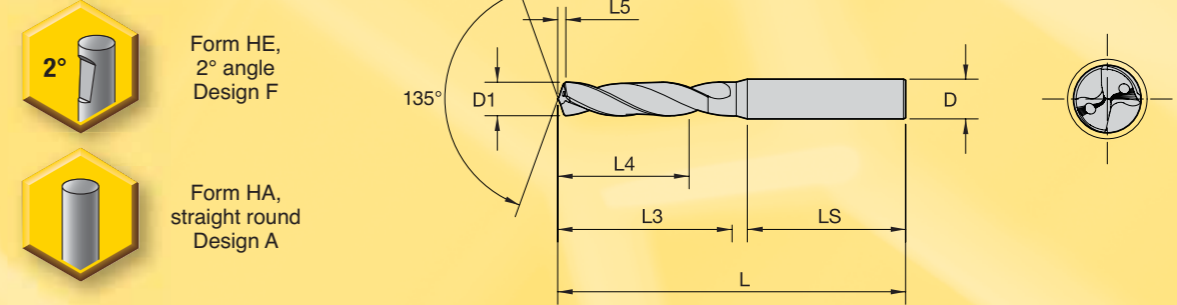
** To factory standard

■ Tolerances of Drills and Holes

Solid carbide drills with tolerance of m7 (SE Drill, TF Drill, KU Drill) create holes with tolerances of H9. H8 can be achieved in very good conditions. The TX Drill should be used for holes in H8, in favorable conditions H7 can be achieved.

Solid carbide drills (BF Drill) with h7 create holes in JS9–JS11. Other drilling tolerances require special solid carbide drill versions.

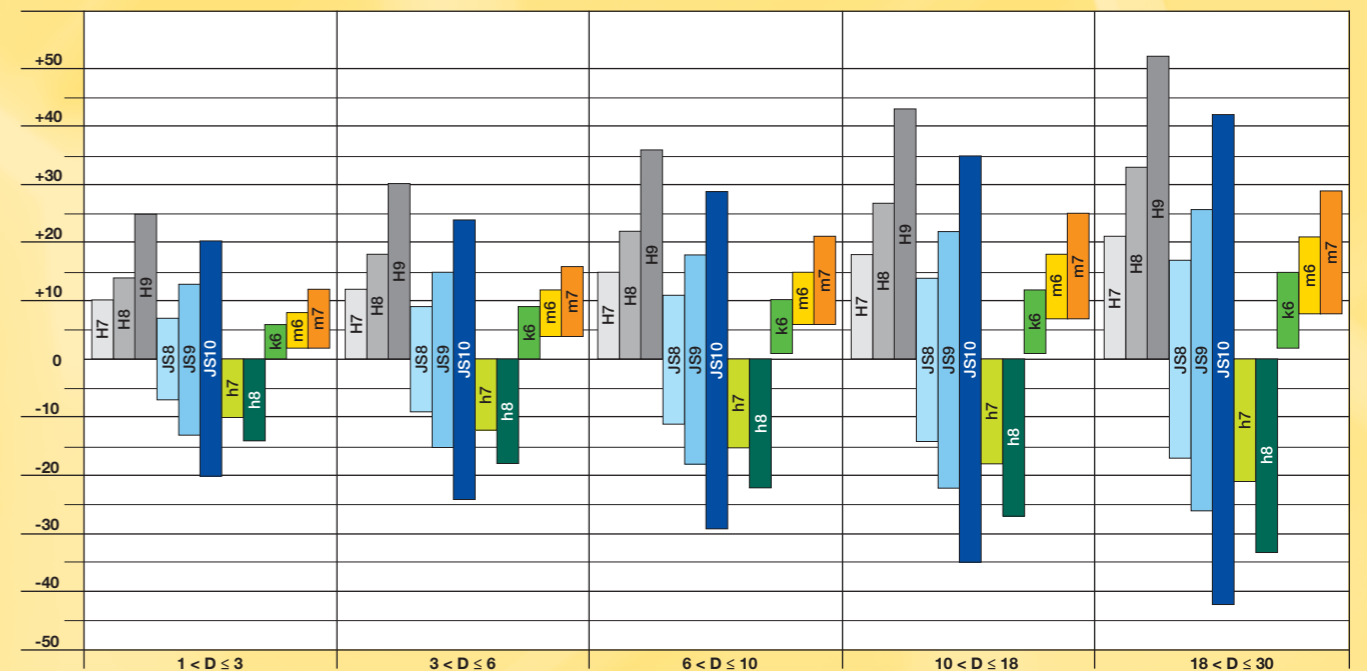
■ Shank Designs to DIN 6535



■ Holemaking Drilling Portfolio • Diameter Tolerances

drill type	drill tolerance	hole tolerance	hole tolerance (best*)	details
TX	k6	H8	H7	B410, B411, B412
TF	m6	H9	H8	B125
TF	m7	H9	H8	B104, B105, B106
KU	m7	H9	H8	B966, B976, B977, B978
SE	m7	H9	H8	B256
HP	m7	H9	H8	B210_HP, B211_HP, B212_HP; B221_HP, B222_HP, B224_HP, B225_HP, B226_HP; B269_HP; B284, B285
FB*	m7	H9	H8	B706_FB*, B707_FB*, B708_FB*, B709_FB*
YPC	m7	H9	H8	B254_YPC, B255_YPC, B256_YPC
YPL	m7	H9	H8	B291_YPL, B292_YPL, B293_YPL
SPF	m7	H9	H8	B531, B532, B533
BF	h7	JS9	JS8	B343
GO	h7	JS9	JS8	B041_CPG, B042_CPG, B043_CPG, B051_CPG, B052_CPG, B053_CPG
HPG	h7	JS9	JS8	B271_HPG, B272_HPG, B273_HPG, B274_HPG
HPS	h8	JS10	JS9	B271_HPS, B272_HPS, B273_HPS, B274_HPS

* Can be achieved in very good conditions.



Solid Carbide Drills • Recommendation Chart

standard first choice = bold alternate choice = regular simple special = gray	through coolant	flood coolant	MQL	dry	deep hole	flat bottom	drill and chamfer	universal
P – Steel	B224_HP B225_HP B226_HP B256	B221_HP B222_HP	B221_HP, B222_HP B224_HP, B225_HP B226_HP B256	B221_HP B222_HP	B269_HP B271_HPG B272_HPG B273_HPG B274_HPG	B706_FBG B707_FBG B708_FBG B709_FBG	B731_HP B732_HP	B966 B976, B977, B978 B041_CPG, B042_CPG B051_CPG, B052_CPG, B053_CPG
M – Stainless Steel	B210_HP/K210_HP B211_HP/K211_HP B212_HP/K212_HP					B706_FBL B707_FBL B708_FBL B709_FBL		B966 B976, B977, B978 B041_CPG, B042_CPG B051_CPG, B052_CPG, B053_CPG
K – Cast Iron	B254_YPC/K254_YPC B255_YPC/K255_YPC B256_YPC/K256_YPC	B104/K104 B105/K105 B106/K106	B254_YPC/K254_YPC B255_YPC/K255_YPC B256_YPC/K256_YPC	B104/K104 B105/K105 B106/K106	B269_HP B271_HPG B272_HPG B273_HPG B274_HPG	B706_FBG B707_FBG B708_FBG B709_FBG	B731_HP B732_HP	B966 B976, B977, B978 B041_CPG, B042_CPG B051_CPG, B052_CPG, B053_CPG
N – Non-Ferrous	B410/K410 B411/K411 B412/K412	B104/K104 B105/K105 B106/K106			B271_HPS B272_HPS B273_HPS B274_HPS	B706_FBS B707_FBS B708_FBS B709_FBS		B966 B976, B977, B978 B041_CPG, B042_CPG B051_CPG, B052_CPG, B053_CPG
N – CFRP		B531A/K531A B532A/K532A B533A/K533A		B531A/K531A B532A/K532A B533A/K533A				
S – Heat-Resistant Alloys, Titanium Alloys	B291_YPL, B292_YPL B284/K284, B285/K285 B125/K125					B706_FBL B707_FBL B708_FBL B709_FBL		B966 B976, B977, B978 B041_CPG, B042_CPG B051_CPG, B052_CPG, B053_CPG



GODrill™ • Kennametal's First Microdrill

The high-performance solid carbide drill tailored for very small- to medium-diameter drilling applications.

Primary Application

The all new GODrill addresses drilling operations in a diameter range of 1–12,7mm (.0394–.5") in a broad variety of materials and applications such as fuel systems or medical components. Due to its very unique design, the GODrill expands the advantages of modular drills into the small diameter range: high-end grades, wear-indicator coating, and new, proprietary geometries enable full utilization of the drill's tool life capacity. The GODrill qualifies as a very cost-effective, throwaway-type tool in the given diameter range.

Features and Benefits

GODrill Design

- Marginless design for reduced friction and heat — thus longer tool life.
- Very versatile tool works in a wide range of materials.
- Cost effective, no regrind logistics.
- No setup.
- Throw away or recycle.
- Through-coolant option down to diameter 1,5mm (.0591").

CPG Point

- Optimized gashing design for microdrilling ensures free flow of chips in the center of the drill.
- Excellent centering capabilities.
- Reduced axial forces.
- Good hole quality, roundness, and cylindricity for all materials.

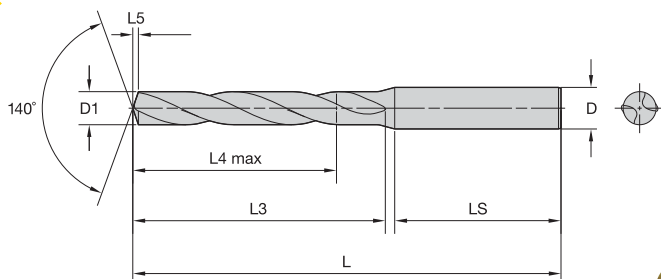
KC7325™ Grade

The grade contains a double coating:

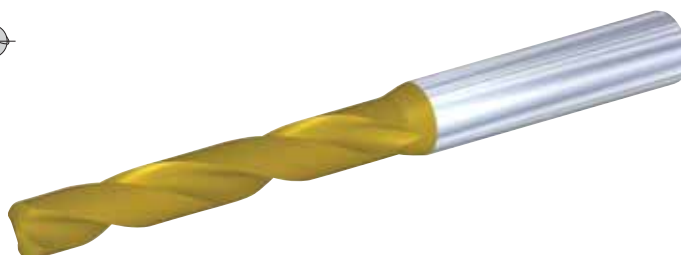
- The multilayer, TiAlN-based coating with high hot hardness enables the drill to run at high cutting speeds as well as in MQL applications.
- A TiN top layer serves as wear indicator for easier monitoring on small drills, which can be difficult to see.
- Improved visibility of wear helps to utilize the tool's full tool life capacity.



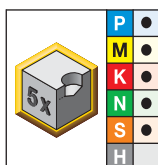
Solid Carbide Drills



For information on L, L3, and L4 max, see the Solid Carbide foldout table.



■ B041A/B042A • ~3 x D/~5 x D

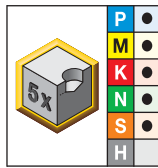
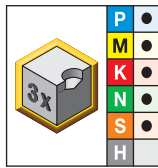


● first choice
○ alternate choice

		D1 diameter				L5	LS	D
		mm	in	fraction	wire size			
short • KC7325	long • KC7325							
B041A01000CPG	B042A01000CPG	1,000	.0394	—	—	0,1	28	4
B041A01016CPG	B042A01016CPG	1,016	.0400	—	—	0,1	28	4
B041A01041CPG	B042A01041CPG	1,041	.0410	—	—	0,2	28	4
B041A01067CPG	B042A01067CPG	1,067	.0420	—	—	0,2	28	4
B041A01092CPG	B042A01092CPG	1,092	.0430	—	—	0,2	28	4
B041A01100CPG	B042A01100CPG	1,100	.0433	—	—	0,2	28	4
B041A01181CPG	B042A01181CPG	1,181	.0465	—	—	0,2	28	4
B041A01191CPG	B042A01191CPG	1,191	.0469	—	—	0,2	28	4
B041A01200CPG	B042A01200CPG	1,200	.0472	—	—	0,2	28	4
B041A01300CPG	B042A01300CPG	1,300	.0512	—	—	0,2	28	4
B041A01321CPG	B042A01321CPG	1,321	.0520	—	—	0,2	28	4
B041A01397CPG	B042A01397CPG	1,397	.0550	—	—	0,2	28	4
B041A01400CPG	B042A01400CPG	1,400	.0551	—	—	0,2	28	4
B041A01500CPG	B042A01500CPG	1,500	.0591	—	—	0,2	28	4
B041A01600CPG	B042A01600CPG	1,600	.0630	—	—	0,2	28	4
B041A01700CPG	B042A01700CPG	1,700	.0669	—	—	0,3	28	4
B041A01800CPG	B042A01800CPG	1,800	.0709	—	—	0,3	28	4
B041A01900CPG	B042A01900CPG	1,900	.0748	—	—	0,3	28	4
B041A01984CPG	B042A01984CPG	1,984	.0781	—	—	0,3	28	4
B041A02000CPG	B042A02000CPG	2,000	.0787	—	—	0,3	28	4
B041A02100CPG	B042A02100CPG	2,100	.0827	—	—	0,3	28	4
B041A02200CPG	B042A02200CPG	2,200	.0866	—	—	0,3	28	4
B041A02300CPG	B042A02300CPG	2,300	.0906	—	—	0,4	28	4
B041A02383CPG	B042A02383CPG	2,383	.0938	3/32	—	0,4	28	4
B041A02400CPG	B042A02400CPG	2,400	.0945	—	—	0,4	28	4
B041A02439CPG	B042A02439CPG	2,439	.0960	—	41	0,4	28	4
B041A02489CPG	B042A02489CPG	2,489	.0980	—	40	0,4	28	4
B041A02500CPG	B042A02500CPG	2,500	.0984	—	—	0,4	28	4
B041A02578CPG	B042A02578CPG	2,578	.1015	—	38	0,4	28	4
B041A02600CPG	B042A02600CPG	2,600	.1024	—	—	0,4	28	4
B041A02642CPG	B042A02642CPG	2,642	.1040	—	37	0,4	28	4
B041A02700CPG	B042A02700CPG	2,700	.1063	—	—	0,4	28	4
B041A02705CPG	B042A02705CPG	2,705	.1065	—	36	0,4	28	4
B041A02779CPG	B042A02779CPG	2,779	.1094	7/64	—	0,4	28	4
B041A02800CPG	B042A02800CPG	2,800	.1102	—	—	0,5	28	4
B041A02820CPG	B042A02820CPG	2,820	.1110	—	34	0,5	28	4
B041A02870CPG	B042A02870CPG	2,870	.1130	—	33	0,5	28	4
B041A02900CPG	B042A02900CPG	2,900	.1142	—	—	0,5	28	4
B041A02947CPG	B042A02947CPG	2,947	.1160	—	32	0,5	28	4
B041A03000CPG	B042A03000CPG	3,000	.1181	—	—	0,5	36	6

(continued)

(B041A/B042A • ~3 x D/~5 x D continued)

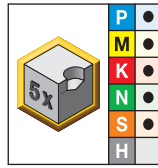
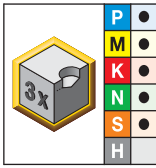


		D1 diameter				L5	LS	D
short • KC7325	long • KC7325	mm	in	fraction	wire size			
B041A03048CPG	B042A03048CPG	3,048	.1200	—	31	0,5	36	6
B041A03100CPG	B042A03100CPG	3,100	.1220	—	—	0,5	36	6
B041A03175CPG	B042A03175CPG	3,175	.1250	1/8	—	0,5	36	6
B041A03200CPG	B042A03200CPG	3,200	.1260	—	—	0,5	36	6
B041A03264CPG	B042A03264CPG	3,264	.1285	—	30	0,5	36	6
B041A03300CPG	B042A03300CPG	3,300	.1299	—	—	0,5	36	6
B041A03400CPG	B042A03400CPG	3,400	.1339	—	—	0,6	36	6
B041A03455CPG	B042A03455CPG	3,455	.1360	—	29	0,6	36	6
B041A03500CPG	B042A03500CPG	3,500	.1378	—	—	0,6	36	6
B041A03571CPG	B042A03571CPG	3,571	.1406	9/64	—	0,6	36	6
B041A03600CPG	B042A03600CPG	3,600	.1417	—	—	0,6	36	6
B041A03658CPG	B042A03658CPG	3,658	.1440	—	27	0,6	36	6
B041A03700CPG	B042A03700CPG	3,700	.1457	—	—	0,6	36	6
B041A03734CPG	B042A03734CPG	3,734	.1470	—	26	0,6	36	6
B041A03800CPG	B042A03800CPG	3,800	.1496	—	—	0,6	36	6
B041A03900CPG	B042A03900CPG	3,900	.1535	—	—	0,6	36	6
B041A03970CPG	B042A03970CPG	3,970	.1563	5/32	—	0,7	36	6
B041A04000CPG	B042A04000CPG	4,000	.1575	—	—	0,7	36	6
B041A04039CPG	B042A04039CPG	4,039	.1590	—	21	0,7	36	6
B041A04090CPG	B042A04090CPG	4,090	.1610	—	20	0,7	36	6
B041A04100CPG	B042A04100CPG	4,100	.1614	—	—	0,7	36	6
B041A04200CPG	B042A04200CPG	4,200	.1654	—	—	0,7	36	6
B041A04217CPG	B042A04217CPG	4,217	.1660	—	19	0,7	36	6
B041A04300CPG	B042A04300CPG	4,300	.1693	—	—	0,7	36	6
B041A04366CPG	B042A04366CPG	4,366	.1719	11/64	—	0,7	36	6
B041A04400CPG	B042A04400CPG	4,400	.1732	—	—	0,7	36	6
B041A04500CPG	B042A04500CPG	4,500	.1772	—	—	0,7	36	6
B041A04600CPG	B042A04600CPG	4,600	.1811	—	—	0,8	36	6
B041A04623CPG	B042A04623CPG	4,623	.1820	—	14	0,8	36	6
B041A04700CPG	B042A04700CPG	4,700	.1850	—	13	0,8	36	6
B041A04763CPG	B042A04763CPG	4,763	.1875	3/16	—	0,8	36	6
B041A04800CPG	B042A04800CPG	4,800	.1890	—	12	0,8	36	6
B041A04852CPG	B042A04852CPG	4,852	.1910	—	11	0,8	36	6
B041A04900CPG	B042A04900CPG	4,900	.1929	—	—	0,8	36	6
B041A05000CPG	B042A05000CPG	5,000	.1969	—	—	0,8	36	6
B041A05100CPG	B042A05100CPG	5,100	.2008	—	—	0,8	36	6
B041A05106CPG	B042A05106CPG	5,106	.2010	—	7	0,8	36	6
B041A05159CPG	B042A05159CPG	5,159	.2031	13/64	—	0,9	36	6
B041A05200CPG	B042A05200CPG	5,200	.2047	—	—	0,9	36	6
B041A05300CPG	B042A05300CPG	5,300	.2087	—	—	0,9	36	6
B041A05400CPG	B042A05400CPG	5,400	.2126	—	—	0,9	36	6
B041A05410CPG	B042A05410CPG	5,410	.2130	—	3	0,9	36	6
B041A05500CPG	B042A05500CPG	5,500	.2165	—	—	0,9	36	6
B041A05558CPG	B042A05558CPG	5,558	.2188	7/32	—	0,9	36	6
B041A05600CPG	B042A05600CPG	5,600	.2205	—	—	0,9	36	6
B041A05616CPG	B042A05616CPG	5,616	.2211	—	2	0,9	36	6
B041A05700CPG	B042A05700CPG	5,700	.2244	—	—	1,0	36	6
B041A05800CPG	B042A05800CPG	5,800	.2283	—	—	1,0	36	6
B041A05900CPG	B042A05900CPG	5,900	.2323	—	—	1,0	36	6
B041A05954CPG	B042A05954CPG	5,954	.2344	15/64	—	1,0	36	6
B041A06000CPG	B042A06000CPG	6,000	.2362	—	—	1,0	36	6
B041A06100CPG	B042A06100CPG	6,100	.2402	—	—	1,0	36	8

(continued)

(B041A/B042A • ~3 x D/-5 x D continued)

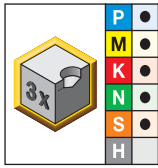
Solid Carbide Drills



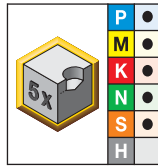
		D1 diameter				L5	LS	D
short • KC7325	long • KC7325	mm	in	fraction	wire size			
B041A06200CPG	B042A06200CPG	6,200	.2441	—	—	1,0	36	8
B041A06300CPG	B042A06300CPG	6,300	.2480	—	—	1,1	36	8
B041A06350CPG	B042A06350CPG	6,350	.2500	1/4	E	1,1	36	8
B041A06400CPG	B042A06400CPG	6,400	.2520	—	—	1,1	36	8
B041A06500CPG	B042A06500CPG	6,500	.2559	—	—	1,1	36	8
B041A06528CPG	B042A06528CPG	6,528	.2570	—	F	1,1	36	8
B041A06600CPG	B042A06600CPG	6,600	.2598	—	—	1,1	36	8
B041A06630CPG	B042A06630CPG	6,630	.2610	—	G	1,1	36	8
B041A06700CPG	B042A06700CPG	6,700	.2638	—	—	1,1	36	8
B041A06746CPG	B042A06746CPG	6,746	.2656	17/64	—	1,1	36	8
B041A06800CPG	B042A06800CPG	6,800	.2677	—	—	1,1	36	8
B041A06900CPG	B042A06900CPG	6,900	.2717	—	—	1,2	36	8
B041A07000CPG	B042A07000CPG	7,000	.2756	—	—	1,2	36	8
B041A07100CPG	B042A07100CPG	7,100	.2795	—	—	1,2	36	8
B041A07145CPG	B042A07145CPG	7,145	.2813	9/32	—	1,2	36	8
B041A07200CPG	B042A07200CPG	7,200	.2835	—	—	1,2	36	8
B041A07300CPG	B042A07300CPG	7,300	.2874	—	—	1,2	36	8
B041A07400CPG	B042A07400CPG	7,400	.2913	—	—	1,3	36	8
B041A07500CPG	B042A07500CPG	7,500	.2953	—	—	1,3	36	8
B041A07541CPG	B042A07541CPG	7,541	.2969	19/64	—	1,3	36	8
B041A07600CPG	B042A07600CPG	7,600	.2992	—	—	1,3	36	8
B041A07700CPG	B042A07700CPG	7,700	.3031	—	—	1,3	36	8
B041A07800CPG	B042A07800CPG	7,800	.3071	—	—	1,3	36	8
B041A07900CPG	B042A07900CPG	7,900	.3110	—	—	1,3	36	8
B041A07938CPG	B042A07938CPG	7,938	.3125	5/16	—	1,3	36	8
B041A08000CPG	B042A08000CPG	8,000	.3150	—	—	1,4	36	8
B041A08100CPG	B042A08100CPG	8,100	.3189	—	—	1,4	40	10
B041A08200CPG	B042A08200CPG	8,200	.3228	—	—	1,4	40	10
B041A08300CPG	B042A08300CPG	8,300	.3268	—	—	1,4	40	10
B041A08334CPG	B042A08334CPG	8,334	.3281	21/64	—	1,4	40	10
B041A08400CPG	B042A08400CPG	8,400	.3307	—	—	1,4	40	10
B041A08433CPG	B042A08433CPG	8,433	.3320	—	Q	1,4	40	10
B041A08500CPG	B042A08500CPG	8,500	.3346	—	—	1,4	40	10
B041A08600CPG	B042A08600CPG	8,600	.3386	—	—	1,5	40	10
B041A08700CPG	B042A08700CPG	8,700	.3425	—	—	1,5	40	10
B041A08733CPG	B042A08733CPG	8,733	.3438	11/32	—	1,5	40	10
B041A08800CPG	B042A08800CPG	8,800	.3465	—	—	1,5	40	10
B041A08900CPG	B042A08900CPG	8,900	.3504	—	—	1,5	40	10
B041A09000CPG	B042A09000CPG	9,000	.3543	—	—	1,5	40	10
B041A09100CPG	B042A09100CPG	9,100	.3583	—	—	1,5	40	10
B041A09129CPG	B042A09129CPG	9,129	.3594	23/64	—	1,6	40	10
B041A09200CPG	B042A09200CPG	9,200	.3622	—	—	1,6	40	10
B041A09300CPG	B042A09300CPG	9,300	.3661	—	—	1,6	40	10
B041A09347CPG	B042A09347CPG	9,347	.3680	—	U	1,6	40	10
B041A09400CPG	B042A09400CPG	9,400	.3701	—	—	1,6	40	10
B041A09500CPG	B042A09500CPG	9,500	.3740	—	—	1,6	40	10
B041A09525CPG	B042A09525CPG	9,525	.3750	3/8	—	1,6	40	10
B041A09600CPG	B042A09600CPG	9,600	.3780	—	—	1,6	40	10
B041A09700CPG	B042A09700CPG	9,700	.3819	—	—	1,7	40	10
B041A09800CPG	B042A09800CPG	9,800	.3858	—	—	1,7	40	10
B041A09900CPG	B042A09900CPG	9,900	.3898	—	—	1,7	40	10
B041A09921CPG	B042A09921CPG	9,921	.3906	25/64	—	1,7	40	10

(continued)

(B041A/B042A • ~3 x D/~5 x D continued)



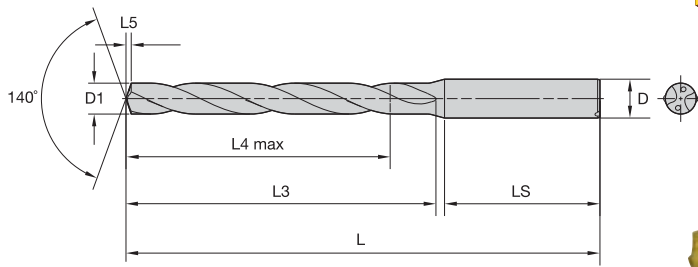
short • KC7325



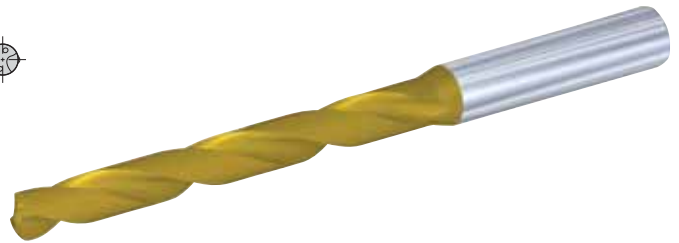
long • KC7325

		D1 diameter				L5	LS	D
		mm	in	fraction	wire size			
B041A1000CPG	B042A1000CPG	10,000	.3937	—	—	1,7	40	10
B041A10100CPG	B042A10100CPG	10,100	.3976	—	—	1,7	45	12
B041A10200CPG	B042A10200CPG	10,200	.4016	—	—	1,7	45	12
B041A10300CPG	B042A10300CPG	10,300	.4055	—	—	1,8	45	12
B041A10320CPG	B042A10320CPG	10,320	.4063	13/32	—	1,8	45	12
B041A10400CPG	B042A10400CPG	10,400	.4094	—	—	1,8	45	12
B041A10500CPG	B042A10500CPG	10,500	.4134	—	—	1,8	45	12
B041A10600CPG	B042A10600CPG	10,600	.4173	—	—	1,8	45	12
B041A10700CPG	B042A10700CPG	10,700	.4213	—	—	1,8	45	12
B041A10716CPG	B042A10716CPG	10,716	.4219	27/64	—	1,8	45	12
B041A10800CPG	B042A10800CPG	10,800	.4252	—	—	1,8	45	12
B041A10900CPG	B042A10900CPG	10,900	.4291	—	—	1,9	45	12
B041A11000CPG	B042A11000CPG	11,000	.4331	—	—	1,9	45	12
B041A11100CPG	B042A11100CPG	11,100	.4370	—	—	1,9	45	12
B041A11113CPG	B042A11113CPG	11,113	.4375	7/16	—	1,9	45	12
B041A11200CPG	B042A11200CPG	11,200	.4409	—	—	1,9	45	12
B041A11300CPG	B042A11300CPG	11,300	.4449	—	—	1,9	45	12
B041A11400CPG	B042A11400CPG	11,400	.4488	—	—	2,0	45	12
B041A11500CPG	B042A11500CPG	11,500	.4528	—	—	2,0	45	12
B041A11509CPG	B042A11509CPG	11,509	.4531	29/64	—	2,0	45	12
B041A11600CPG	B042A11600CPG	11,600	.4567	—	—	2,0	45	12
B041A11700CPG	B042A11700CPG	11,700	.4606	—	—	2,0	45	12
B041A11800CPG	B042A11800CPG	11,800	.4646	—	—	2,0	45	12
B041A11900CPG	B042A11900CPG	11,900	.4685	—	—	2,0	45	12
B041A11908CPG	B042A11908CPG	11,908	.4688	15/32	—	2,0	45	12
B041A12000CPG	B042A12000CPG	12,000	.4724	—	—	2,1	45	12
B041A12100CPG	B042A12100CPG	12,100	.4764	—	—	2,1	45	14
B041A12200CPG	B042A12200CPG	12,200	.4803	—	—	2,1	45	14
B041A12300CPG	B042A12300CPG	12,300	.4843	—	—	2,1	45	14
B041A12304CPG	B042A12304CPG	12,304	.4844	31/64	—	2,1	45	14
B041A12400CPG	B042A12400CPG	12,400	.4882	—	—	2,1	45	14
B041A12500CPG	B042A12500CPG	12,500	.4921	—	—	2,1	45	14
B041A12600CPG	B042A12600CPG	12,600	.4961	—	—	2,2	45	14
B041A12700CPG	B042A12700CPG	12,700	.5000	1/2	—	2,2	45	14

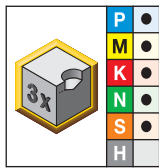
Solid Carbide Drills



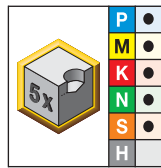
For information on L, L3, and L4 max, see the Solid Carbide foldout table.



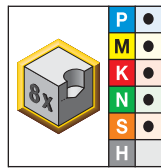
■ B051A/B052A/B053A • ~3 x D/~5 x D/~8 x D



short • KC7325



long • KC7325



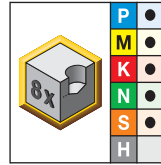
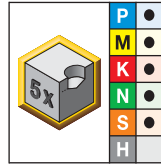
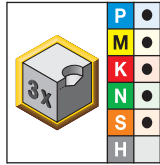
extra long • KC7325

● first choice
○ alternate choice

			D1 diameter				L5	LS	D
			mm	in	fraction	wire size			
B051A01500CPG	B052A01500CPG	B053A01500CPG	1,500	.0591	—	—	0,2	28	4
B051A01600CPG	B052A01600CPG	B053A01600CPG	1,600	.0630	—	—	0,2	28	4
B051A01700CPG	B052A01700CPG	B053A01700CPG	1,700	.0669	—	—	0,3	28	4
B051A01800CPG	B052A01800CPG	B053A01800CPG	1,800	.0709	—	—	0,3	28	4
B051A01900CPG	B052A01900CPG	B053A01900CPG	1,900	.0748	—	—	0,3	28	4
B051A01984CPG	B052A01984CPG	B053A01984CPG	1,984	.0781	—	—	0,3	28	4
B051A02000CPG	B052A02000CPG	B053A02000CPG	2,000	.0787	—	—	0,3	28	4
B051A02100CPG	B052A02100CPG	B053A02100CPG	2,100	.0827	—	—	0,3	28	4
B051A02200CPG	B052A02200CPG	B053A02200CPG	2,200	.0866	—	—	0,3	28	4
B051A02300CPG	B052A02300CPG	B053A02300CPG	2,300	.0906	—	—	0,4	28	4
B051A02383CPG	B052A02383CPG	B053A02383CPG	2,383	.0938	3/32	—	0,4	28	4
B051A02400CPG	B052A02400CPG	B053A02400CPG	2,400	.0945	—	—	0,4	28	4
B051A02439CPG	B052A02439CPG	B053A02439CPG	2,439	.0960	—	41	0,4	28	4
B051A02489CPG	B052A02489CPG	B053A02489CPG	2,489	.0980	—	40	0,4	28	4
B051A02500CPG	B052A02500CPG	B053A02500CPG	2,500	.0984	—	—	0,4	28	4
B051A02578CPG	B052A02578CPG	B053A02578CPG	2,578	.1015	—	38	0,4	28	4
B051A02600CPG	B052A02600CPG	B053A02600CPG	2,600	.1024	—	—	0,4	28	4
B051A02642CPG	B052A02642CPG	B053A02642CPG	2,642	.1040	—	37	0,4	28	4
B051A02700CPG	B052A02700CPG	B053A02700CPG	2,700	.1063	—	—	0,4	28	4
B051A02705CPG	B052A02705CPG	B053A02705CPG	2,705	.1065	—	36	0,4	28	4
B051A02779CPG	B052A02779CPG	B053A02779CPG	2,779	.1094	7/64	—	0,4	28	4
B051A02800CPG	B052A02800CPG	B053A02800CPG	2,800	.1102	—	—	0,5	28	4
B051A02820CPG	B052A02820CPG	B053A02820CPG	2,820	.1110	—	34	0,5	28	4
B051A02870CPG	B052A02870CPG	B053A02870CPG	2,870	.1130	—	33	0,5	28	4
B051A02900CPG	B052A02900CPG	B053A02900CPG	2,900	.1142	—	—	0,5	28	4
B051A02947CPG	B052A02947CPG	B053A02947CPG	2,947	.1160	—	32	0,5	28	4
B051A03000CPG	B052A03000CPG	B053A03000CPG	3,000	.1181	—	—	0,5	36	6
B051A03048CPG	B052A03048CPG	B053A03048CPG	3,048	.1200	—	31	0,5	36	6
B051A03100CPG	B052A03100CPG	B053A03100CPG	3,100	.1220	—	—	0,5	36	6
B051A03175CPG	B052A03175CPG	B053A03175CPG	3,175	.1250	1/8	—	0,5	36	6
B051A03200CPG	B052A03200CPG	B053A03200CPG	3,200	.1260	—	—	0,5	36	6
B051A03264CPG	B052A03264CPG	B053A03264CPG	3,264	.1285	—	30	0,5	36	6
B051A03300CPG	B052A03300CPG	B053A03300CPG	3,300	.1299	—	—	0,5	36	6
B051A03400CPG	B052A03400CPG	B053A03400CPG	3,400	.1339	—	—	0,6	36	6
B051A03455CPG	B052A03455CPG	B053A03455CPG	3,455	.1360	—	29	0,6	36	6
B051A03500CPG	B052A03500CPG	B053A03500CPG	3,500	.1378	—	—	0,6	36	6
B051A03571CPG	B052A03571CPG	B053A03571CPG	3,571	.1406	9/64	—	0,6	36	6
B051A03600CPG	B052A03600CPG	B053A03600CPG	3,600	.1417	—	—	0,6	36	6
B051A03658CPG	B052A03658CPG	B053A03658CPG	3,658	.1440	—	27	0,6	36	6
B051A03700CPG	B052A03700CPG	B053A03700CPG	3,700	.1457	—	—	0,6	36	6

(continued)

(B051A/B052A/B053A • ~3 x D/~5 x D/~8 x D continued)

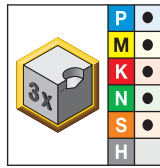


			D1 diameter				L5	LS	D
short • KC7325	long • KC7325	extra long • KC7325	mm	in	fraction	wire size			
B051A03734CPG	B052A03734CPG	B053A03734CPG	3,734	.1470	—	26	0,6	36 6	
B051A03800CPG	B052A03800CPG	B053A03800CPG	3,800	.1496	—	—	0,6	36 6	
B051A03900CPG	B052A03900CPG	B053A03900CPG	3,900	.1535	—	—	0,6	36 6	
B051A03970CPG	B052A03970CPG	B053A03970CPG	3,970	.1563	5/32	—	0,7	36 6	
B051A04000CPG	B052A04000CPG	B053A04000CPG	4,000	.1575	—	—	0,7	36 6	
B051A04039CPG	B052A04039CPG	B053A04039CPG	4,039	.1590	—	21	0,7	36 6	
B051A04090CPG	B052A04090CPG	B053A04090CPG	4,090	.1610	—	20	0,7	36 6	
B051A04100CPG	B052A04100CPG	B053A04100CPG	4,100	.1614	—	—	0,7	36 6	
B051A04200CPG	B052A04200CPG	B053A04200CPG	4,200	.1654	—	—	0,7	36 6	
B051A04217CPG	B052A04217CPG	B053A04217CPG	4,217	.1660	—	19	0,7	36 6	
B051A04300CPG	B052A04300CPG	B053A04300CPG	4,300	.1693	—	—	0,7	36 6	
B051A04366CPG	B052A04366CPG	B053A04366CPG	4,366	.1719	11/64	—	0,7	36 6	
B051A04400CPG	B052A04400CPG	B053A04400CPG	4,400	.1732	—	—	0,7	36 6	
B051A04500CPG	B052A04500CPG	B053A04500CPG	4,500	.1772	—	—	0,7	36 6	
B051A04600CPG	B052A04600CPG	B053A04600CPG	4,600	.1811	—	—	0,8	36 6	
B051A04623CPG	B052A04623CPG	B053A04623CPG	4,623	.1820	—	14	0,8	36 6	
B051A04700CPG	B052A04700CPG	B053A04700CPG	4,700	.1850	—	13	0,8	36 6	
B051A04763CPG	B052A04763CPG	B053A04763CPG	4,763	.1875	3/16	—	0,8	36 6	
B051A04800CPG	B052A04800CPG	B053A04800CPG	4,800	.1890	—	12	0,8	36 6	
B051A04852CPG	B052A04852CPG	B053A04852CPG	4,852	.1910	—	11	0,8	36 6	
B051A04900CPG	B052A04900CPG	B053A04900CPG	4,900	.1929	—	—	0,8	36 6	
B051A05000CPG	B052A05000CPG	B053A05000CPG	5,000	.1969	—	—	0,8	36 6	
B051A05100CPG	B052A05100CPG	B053A05100CPG	5,100	.2008	—	—	0,8	36 6	
B051A05106CPG	B052A05106CPG	B053A05106CPG	5,106	.2010	—	7	0,8	36 6	
B051A05159CPG	B052A05159CPG	B053A05159CPG	5,159	.2031	13/64	—	0,9	36 6	
B051A05200CPG	B052A05200CPG	B053A05200CPG	5,200	.2047	—	—	0,9	36 6	
B051A05300CPG	B052A05300CPG	B053A05300CPG	5,300	.2087	—	—	0,9	36 6	
B051A05400CPG	B052A05400CPG	B053A05400CPG	5,400	.2126	—	—	0,9	36 6	
B051A05410CPG	B052A05410CPG	B053A05410CPG	5,410	.2130	—	3	0,9	36 6	
B051A05500CPG	B052A05500CPG	B053A05500CPG	5,500	.2165	—	—	0,9	36 6	
B051A05558CPG	B052A05558CPG	B053A05558CPG	5,558	.2188	7/32	—	0,9	36 6	
B051A05600CPG	B052A05600CPG	B053A05600CPG	5,600	.2205	—	—	0,9	36 6	
B051A05616CPG	B052A05616CPG	B053A05616CPG	5,616	.2211	—	2	0,9	36 6	
B051A05700CPG	B052A05700CPG	B053A05700CPG	5,700	.2244	—	—	1,0	36 6	
B051A05800CPG	B052A05800CPG	B053A05800CPG	5,800	.2283	—	—	1,0	36 6	
B051A05900CPG	B052A05900CPG	B053A05900CPG	5,900	.2323	—	—	1,0	36 6	
B051A05954CPG	B052A05954CPG	B053A05954CPG	5,954	.2344	15/64	—	1,0	36 6	
B051A06000CPG	B052A06000CPG	B053A06000CPG	6,000	.2362	—	—	1,0	36 6	
B051A06100CPG	B052A06100CPG	B053A06100CPG	6,100	.2402	—	—	1,0	36 8	
B051A06200CPG	B052A06200CPG	B053A06200CPG	6,200	.2441	—	—	1,0	36 8	
B051A06300CPG	B052A06300CPG	B053A06300CPG	6,300	.2480	—	—	1,1	36 8	
B051A06350CPG	B052A06350CPG	B053A06350CPG	6,350	.2500	1/4	E	1,1	36 8	
B051A06400CPG	B052A06400CPG	B053A06400CPG	6,400	.2520	—	—	1,1	36 8	
B051A06500CPG	B052A06500CPG	B053A06500CPG	6,500	.2559	—	—	1,1	36 8	
B051A06528CPG	B052A06528CPG	B053A06528CPG	6,528	.2570	—	F	1,1	36 8	
B051A06600CPG	B052A06600CPG	B053A06600CPG	6,600	.2598	—	—	1,1	36 8	
B051A06630CPG	B052A06630CPG	B053A06630CPG	6,630	.2610	—	G	1,1	36 8	
B051A06700CPG	B052A06700CPG	B053A06700CPG	6,700	.2638	—	—	1,1	36 8	
B051A06746CPG	B052A06746CPG	B053A06746CPG	6,746	.2656	17/64	—	1,1	36 8	
B051A06800CPG	B052A06800CPG	B053A06800CPG	6,800	.2677	—	—	1,1	36 8	
B051A06900CPG	B052A06900CPG	B053A06900CPG	6,900	.2717	—	—	1,2	36 8	

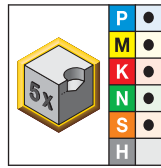
(continued)

(B051A/B052A/B053A • ~3 x D/~5 x D/~8 x D continued)

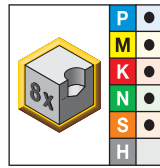
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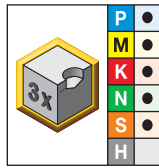
extra long • KC7325

D1 diameter

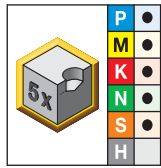
			D1 diameter				L5	LS	D
			mm	in	fraction	wire size			
B051A0700CPG	B052A0700CPG	B053A0700CPG	7,000	.2756	—	—	1,2	36	8
B051A07100CPG	B052A07100CPG	B053A07100CPG	7,100	.2795	—	—	1,2	36	8
B051A07145CPG	B052A07145CPG	B053A07145CPG	7,145	.2813	9/32	—	1,2	36	8
B051A07200CPG	B052A07200CPG	B053A07200CPG	7,200	.2835	—	—	1,2	36	8
B051A07300CPG	B052A07300CPG	B053A07300CPG	7,300	.2874	—	—	1,2	36	8
B051A07400CPG	B052A07400CPG	B053A07400CPG	7,400	.2913	—	—	1,3	36	8
B051A07500CPG	B052A07500CPG	B053A07500CPG	7,500	.2953	—	—	1,3	36	8
B051A07541CPG	B052A07541CPG	B053A07541CPG	7,541	.2969	19/64	—	1,3	36	8
B051A07600CPG	B052A07600CPG	B053A07600CPG	7,600	.2992	—	—	1,3	36	8
B051A07700CPG	B052A07700CPG	B053A07700CPG	7,700	.3031	—	—	1,3	36	8
B051A07800CPG	B052A07800CPG	B053A07800CPG	7,800	.3071	—	—	1,3	36	8
B051A07900CPG	B052A07900CPG	B053A07900CPG	7,900	.3110	—	—	1,3	36	8
B051A07938CPG	B052A07938CPG	B053A07938CPG	7,938	.3125	5/16	—	1,3	36	8
B051A08000CPG	B052A08000CPG	B053A08000CPG	8,000	.3150	—	—	1,4	36	8
B051A08100CPG	B052A08100CPG	B053A08100CPG	8,100	.3189	—	—	1,4	40	10
B051A08200CPG	B052A08200CPG	B053A08200CPG	8,200	.3228	—	—	1,4	40	10
B051A08300CPG	B052A08300CPG	B053A08300CPG	8,300	.3268	—	—	1,4	40	10
B051A08334CPG	B052A08334CPG	B053A08334CPG	8,334	.3281	21/64	—	1,4	40	10
B051A08400CPG	B052A08400CPG	B053A08400CPG	8,400	.3307	—	—	1,4	40	10
B051A08433CPG	B052A08433CPG	B053A08433CPG	8,433	.3320	—	Q	1,4	40	10
B051A08500CPG	B052A08500CPG	B053A08500CPG	8,500	.3346	—	—	1,4	40	10
B051A08600CPG	B052A08600CPG	B053A08600CPG	8,600	.3386	—	—	1,5	40	10
B051A08700CPG	B052A08700CPG	B053A08700CPG	8,700	.3425	—	—	1,5	40	10
B051A08733CPG	B052A08733CPG	B053A08733CPG	8,733	.3438	11/32	—	1,5	40	10
B051A08800CPG	B052A08800CPG	B053A08800CPG	8,800	.3465	—	—	1,5	40	10
B051A08900CPG	B052A08900CPG	B053A08900CPG	8,900	.3504	—	—	1,5	40	10
B051A09000CPG	B052A09000CPG	B053A09000CPG	9,000	.3543	—	—	1,5	40	10
B051A09100CPG	B052A09100CPG	B053A09100CPG	9,100	.3583	—	—	1,5	40	10
B051A09129CPG	B052A09129CPG	B053A09129CPG	9,129	.3594	23/64	—	1,6	40	10
B051A09200CPG	B052A09200CPG	B053A09200CPG	9,200	.3622	—	—	1,6	40	10
B051A09300CPG	B052A09300CPG	B053A09300CPG	9,300	.3661	—	—	1,6	40	10
B051A09347CPG	B052A09347CPG	B053A09347CPG	9,347	.3680	—	U	1,6	40	10
B051A09400CPG	B052A09400CPG	B053A09400CPG	9,400	.3701	—	—	1,6	40	10
B051A09500CPG	B052A09500CPG	B053A09500CPG	9,500	.3740	—	—	1,6	40	10
B051A09525CPG	B052A09525CPG	B053A09525CPG	9,525	.3750	3/8	—	1,6	40	10
B051A09600CPG	B052A09600CPG	B053A09600CPG	9,600	.3780	—	—	1,6	40	10
B051A09700CPG	B052A09700CPG	B053A09700CPG	9,700	.3819	—	—	1,7	40	10
B051A09800CPG	B052A09800CPG	B053A09800CPG	9,800	.3858	—	—	1,7	40	10
B051A09900CPG	B052A09900CPG	B053A09900CPG	9,900	.3898	—	—	1,7	40	10
B051A09921CPG	B052A09921CPG	B053A09921CPG	9,921	.3906	25/64	—	1,7	40	10

(continued)

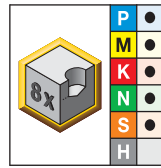
(B051A/B052A/B053A • ~3 x D/~5 x D/~8 x D continued)



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extra long • KC7325

			D1 diameter				L5	LS	D
			mm	in	fraction	wire size			
B051A1000CPG	B052A1000CPG	B053A1000CPG	10,000	.3937	—	—	1,7	40	10
B051A10100CPG	B052A10100CPG	B053A10100CPG	10,100	.3976	—	—	1,7	45	12
B051A10200CPG	B052A10200CPG	B053A10200CPG	10,200	.4016	—	—	1,7	45	12
B051A10300CPG	B052A10300CPG	B053A10300CPG	10,300	.4055	—	—	1,8	45	12
B051A10320CPG	B052A10320CPG	B053A10320CPG	10,320	.4063	13/32	—	1,8	45	12
B051A10400CPG	B052A10400CPG	B053A10400CPG	10,400	.4094	—	—	1,8	45	12
B051A10500CPG	B052A10500CPG	B053A10500CPG	10,500	.4134	—	—	1,8	45	12
B051A10600CPG	B052A10600CPG	B053A10600CPG	10,600	.4173	—	—	1,8	45	12
B051A10700CPG	B052A10700CPG	B053A10700CPG	10,700	.4213	—	—	1,8	45	12
B051A10716CPG	B052A10716CPG	B053A10716CPG	10,716	.4219	27/64	—	1,8	45	12
B051A10800CPG	B052A10800CPG	B053A10800CPG	10,800	.4252	—	—	1,8	45	12
B051A10900CPG	B052A10900CPG	B053A10900CPG	10,900	.4291	—	—	1,9	45	12
B051A11000CPG	B052A11000CPG	B053A11000CPG	11,000	.4331	—	—	1,9	45	12
B051A11100CPG	B052A11100CPG	B053A11100CPG	11,100	.4370	—	—	1,9	45	12
B051A11113CPG	B052A11113CPG	B053A11113CPG	11,113	.4375	7/16	—	1,9	45	12
B051A11200CPG	B052A11200CPG	B053A11200CPG	11,200	.4409	—	—	1,9	45	12
B051A11300CPG	B052A11300CPG	B053A11300CPG	11,300	.4449	—	—	1,9	45	12
B051A11400CPG	B052A11400CPG	B053A11400CPG	11,400	.4488	—	—	2,0	45	12
B051A11500CPG	B052A11500CPG	B053A11500CPG	11,500	.4528	—	—	2,0	45	12
B051A11509CPG	B052A11509CPG	B053A11509CPG	11,509	.4531	29/64	—	2,0	45	12
B051A11600CPG	B052A11600CPG	B053A11600CPG	11,600	.4567	—	—	2,0	45	12
B051A11700CPG	B052A11700CPG	B053A11700CPG	11,700	.4606	—	—	2,0	45	12
B051A11800CPG	B052A11800CPG	B053A11800CPG	11,800	.4646	—	—	2,0	45	12
B051A11900CPG	B052A11900CPG	B053A11900CPG	11,900	.4685	—	—	2,0	45	12
B051A11908CPG	B052A11908CPG	B053A11908CPG	11,908	.4688	15/32	—	2,0	45	12
B051A12000CPG	B052A12000CPG	B053A12000CPG	12,000	.4724	—	—	2,1	45	12
B051A12100CPG	B052A12100CPG	B053A12100CPG	12,100	.4764	—	—	2,1	45	14
B051A12200CPG	B052A12200CPG	B053A12200CPG	12,200	.4803	—	—	2,1	45	14
B051A12300CPG	B052A12300CPG	B053A12300CPG	12,300	.4843	—	—	2,1	45	14
B051A12304CPG	B052A12304CPG	B053A12304CPG	12,304	.4844	31/64	—	2,1	45	14
B051A12400CPG	B052A12400CPG	B053A12400CPG	12,400	.4882	—	—	2,1	45	14
B051A12500CPG	B052A12500CPG	B053A12500CPG	12,500	.4921	—	—	2,1	45	14
B051A12600CPG	B052A12600CPG	B053A12600CPG	12,600	.4961	—	—	2,2	45	14
B051A12700CPG	B052A12700CPG	B053A12700CPG	12,700	.5000	1/2	—	2,2	45	14

Tolerance • Metric			Tolerance • Inch		
nominal size range	D1 tolerance	D tolerance h6	nominal size range	D1 tolerance	D tolerance h6
1-3	0,000/-0,014 (h8)	0,000/-0,006	.0394-.1181	.0000/-0.0006 (h8)	.0000/-0.0002
>3-6	0,000/-0,012 (h7)	0,000/-0,008	>.1181-.2362	.0000/-0.0005 (h7)	.0000/-0.0003
>6-10	0,000/-0,015 (h7)	0,000/-0,009	>.2362-.3937	.0000/-0.0006 (h7)	.0000/-0.0004
>10-18	0,000/-0,018 (h7)	0,000/-0,011	>.3937-.7087	.0000/-0.0007 (h7)	.0000/-0.0004
>18-20	0,000/-0,021 (h7)	0,000/-0,013	>.7087-.7874	.0000/-0.0008 (h7)	.0000/-0.0005



GOdrill™ • B04_CPG Series • Grade KC7325™ • Flood Coolant for Drill Diameters 1–20mm

Solid Carbide Drills

		Cutting Speed – vc Range – m/min			Metric											
					Recommended Feed Rate (f) by Diameter											
Material Group		min	Starting Value	max		1,0	2,0	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0	
P	1	60	70	100	mm/r	0,04 - 0,09	0,05 - 0,11	0,06 - 0,13	0,09 - 0,16	0,11 - 0,22	0,13 - 0,26	0,15 - 0,31	0,18 - 0,35	0,22 - 0,42	0,28 - 0,54	
	2	80	90	100	mm/r	0,04 - 0,09	0,05 - 0,11	0,06 - 0,13	0,08 - 0,16	0,12 - 0,22	0,14 - 0,26	0,17 - 0,31	0,20 - 0,35	0,24 - 0,42	0,31 - 0,53	
	3	50	70	90	mm/r	0,05 - 0,11	0,06 - 0,13	0,07 - 0,15	0,09 - 0,17	0,13 - 0,23	0,15 - 0,28	0,19 - 0,33	0,22 - 0,38	0,26 - 0,47	0,34 - 0,59	
	4	50	70	100	mm/r	0,04 - 0,12	0,05 - 0,13	0,06 - 0,15	0,08 - 0,17	0,12 - 0,23	0,14 - 0,28	0,17 - 0,33	0,19 - 0,38	0,23 - 0,47	0,29 - 0,59	
M	6	30	40	60	mm/r	0,03 - 0,05	0,04 - 0,06	0,05 - 0,07	0,06 - 0,10	0,08 - 0,14	0,10 - 0,18	0,12 - 0,22	0,14 - 0,24	0,18 - 0,32	0,23 - 0,41	
	1	20	30	40	mm/r	0,02 - 0,05	0,03 - 0,06	0,04 - 0,07	0,05 - 0,09	0,08 - 0,11	0,09 - 0,12	0,10 - 0,14	0,12 - 0,16	0,14 - 0,18	0,16 - 0,20	
	2	30	40	50	mm/r	0,02 - 0,06	0,03 - 0,07	0,04 - 0,08	0,06 - 0,10	0,08 - 0,12	0,09 - 0,14	0,10 - 0,16	0,12 - 0,18	0,14 - 0,20	0,16 - 0,22	
K	3	20	30	40	mm/r	0,02 - 0,05	0,03 - 0,06	0,04 - 0,07	0,06 - 0,09	0,08 - 0,11	0,09 - 0,12	0,10 - 0,14	0,12 - 0,16	0,14 - 0,18	0,16 - 0,20	
	1	80	130	170	mm/r	0,09 - 0,18	0,10 - 0,20	0,11 - 0,22	0,12 - 0,24	0,16 - 0,31	0,20 - 0,38	0,23 - 0,44	0,25 - 0,49	0,31 - 0,06	0,38 - 0,47	
	2	90	110	120	mm/r	0,06 - 0,13	0,08 - 0,15	0,10 - 0,17	0,12 - 0,19	0,16 - 0,25	0,20 - 0,31	0,23 - 0,36	0,25 - 0,40	0,31 - 0,48	0,38 - 0,60	
N	3	80	110	130	mm/r	0,05 - 0,11	0,06 - 0,13	0,07 - 0,15	0,09 - 0,19	0,12 - 0,25	0,14 - 0,30	0,17 - 0,35	0,19 - 0,40	0,25 - 0,48	0,30 - 0,60	
	1	90	230	270	mm/r	0,05 - 0,12	0,06 - 0,13	0,08 - 0,14	0,10 - 0,16	0,12 - 0,20	0,16 - 0,24	0,20 - 0,28	0,24 - 0,32	0,28 - 0,40	0,32 - 0,48	
	2	90	220	270	mm/r	0,04 - 0,08	0,06 - 0,12	0,08 - 0,16	0,10 - 0,20	0,12 - 0,24	0,16 - 0,28	0,20 - 0,32	0,24 - 0,36	0,28 - 0,44	0,32 - 0,52	
	3	90	180	225	mm/r	0,10 - 0,13	0,11 - 0,14	0,12 - 0,14	0,13 - 0,16	0,14 - 0,20	0,16 - 0,24	0,20 - 0,28	0,24 - 0,32	0,28 - 0,40	0,32 - 0,44	
	5	90	130	270	mm/r	0,04 - 0,08	0,06 - 0,12	0,08 - 0,16	0,10 - 0,20	0,12 - 0,24	0,16 - 0,28	0,20 - 0,32	0,24 - 0,36	0,28 - 0,40	0,32 - 0,48	
S	1	20	25	30	mm/r	0,01 - 0,04	0,02 - 0,05	0,03 - 0,06	0,04 - 0,08	0,06 - 0,10	0,08 - 0,12	0,09 - 0,13	0,10 - 0,14	0,12 - 0,16	0,14 - 0,18	
	2	10	20	30	mm/r	0,01 - 0,03	0,02 - 0,03	0,02 - 0,04	0,03 - 0,06	0,05 - 0,08	0,07 - 0,10	0,08 - 0,11	0,09 - 0,12	0,10 - 0,14	0,11 - 0,16	
	3	20	25	40	mm/r	0,01 - 0,03	0,02 - 0,03	0,02 - 0,04	0,02 - 0,05	0,04 - 0,07	0,06 - 0,09	0,07 - 0,10	0,08 - 0,11	0,09 - 0,13	0,10 - 0,15	
	4	20	25	50	mm/r	0,01 - 0,03	0,02 - 0,03	0,02 - 0,04	0,03 - 0,06	0,05 - 0,08	0,07 - 0,10	0,08 - 0,11	0,09 - 0,12	0,10 - 0,14	0,11 - 0,16	
		Cutting Speed – vc Range – SFM			Inch											
					Recommended Feed Rate (f) by Diameter											
Material Group		min	Starting Value	max		3/64 .047	5/64 .078	1/8 .125	3/16 .188	1/4 .250	5/16 .313	3/8 .375	1/2 .500	5/8 .625	3/4 .750	
P	1	200	230	330	I PR	.001 - .003	.002 - .004	.002 - .005	.004 - .006	.005 - .008	.005 - .010	.006 - .012	.007 - .014	.008 - .017	.011 - .022	
	2	260	300	330	I PR	.001 - .003	.002 - .004	.003 - .005	.004 - .006	.005 - .008	.005 - .010	.006 - .012	.008 - .014	.010 - .017	.012 - .021	
	3	160	230	300	I PR	.002 - .004	.003 - .005	.003 - .005	.004 - .006	.005 - .009	.006 - .011	.007 - .013	.008 - .015	.010 - .018	.014 - .023	
	4	160	230	330	I PR	.001 - .004	.002 - .005	.003 - .005	.004 - .006	.005 - .009	.005 - .011	.006 - .013	.007 - .015	.009 - .018	.012 - .023	
	6	100	130	200	I PR	.001 - .003	.001 - .003	.002 - .003	.002 - .004	.004 - .005	.004 - .007	.005 - .008	.005 - .010	.007 - .013	.009 - .016	
M	1	70	100	130	I PR	.001 - .002	.001 - .002	.002 - .003	.002 - .004	.003 - .004	.004 - .005	.004 - .006	.005 - .006	.006 - .007	.006 - .008	
	2	100	130	160	I PR	.001 - .002	.001 - .002	.002 - .003	.002 - .004	.003 - .005	.004 - .006	.004 - .006	.005 - .007	.006 - .008	.006 - .009	
	3	70	100	130	I PR	.001 - .002	.001 - .002	.002 - .003	.002 - .004	.003 - .004	.004 - .005	.004 - .006	.005 - .006	.006 - .007	.006 - .008	
K	1	260	430	560	I PR	.002 - .005	.003 - .007	.003 - .006	.005 - .009	.006 - .012	.006 - .015	.009 - .017	.010 - .019	.012 - .024	.015 - .029	
	2	300	360	390	I PR	.002 - .005	.003 - .006	.003 - .005	.005 - .007	.006 - .010	.008 - .012	.009 - .014	.010 - .016	.012 - .019	.015 - .024	
	3	260	360	430	I PR	.001 - .005	.002 - .006	.002 - .005	.004 - .007	.005 - .010	.006 - .012	.006 - .014	.007 - .016	.010 - .019	.012 - .024	
N	1	300	750	890	I PR	.002 - .005	.002 - .005	.003 - .006	.004 - .006	.005 - .008	.006 - .009	.008 - .011	.009 - .013	.011 - .016	.013 - .019	
	2	300	720	890	I PR	.002 - .006	.002 - .006	.003 - .006	.004 - .008	.005 - .009	.006 - .011	.008 - .013	.009 - .014	.011 - .017	.013 - .020	
	3	300	590	740	I PR	.004 - .005	.004 - .005	.005 - .006	.005 - .006	.006 - .008	.006 - .009	.008 - .011	.009 - .013	.011 - .016	.013 - .017	
	5	300	430	890	I PR	.002 - .004	.002 - .005	.003 - .006	.004 - .008	.005 - .009	.006 - .011	.008 - .013	.009 - .014	.011 - .016	.013 - .019	
S	1	70	80	100	I PR	.001 - .002	.001 - .002	.001 - .002	.002 - .003	.002 - .004	.003 - .005	.004 - .005	.004 - .006	.005 - .006	.006 - .007	
	2	30	70	100	I PR	.001 - .002	.001 - .002	.001 - .002	.001 - .002	.002 - .003	.003 - .004	.003 - .004	.004 - .005	.004 - .006	.004 - .006	
	3	70	80	130	I PR	.001 - .002	.001 - .002	.001 - .002	.001 - .002	.002 - .003	.002 - .004	.003 - .004	.003 - .004	.004 - .005	.004 - .006	
	4	70	80	160	I PR	.001 - .002	.001 - .002	.001 - .002	.001 - .002	.002 - .003	.003 - .004	.003 - .004	.004 - .005	.004 - .006	.004 - .006	

GOdrill™ • B05_CPG Series • Grade KC7325™ • Internal Coolant for Drill Diameters 1–20mm



Solid Carbide Drills

Material Group	Cutting Speed – vc Range – m/min			Metric											
	min	Starting Value	max	Recommended Feed Rate (f) by Diameter											
				1,0	2,0	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0		
P	1	70	100	140	mm/r	0,04 - 0,09	0,05 - 0,12	0,07 - 0,14	0,08 - 0,16	0,11 - 0,22	0,13 - 0,26	0,15 - 0,31	0,18 - 0,35	0,22 - 0,42	0,28 - 0,54
	2	90	120	140	mm/r	0,04 - 0,09	0,05 - 0,12	0,07 - 0,14	0,08 - 0,16	0,12 - 0,22	0,14 - 0,26	0,17 - 0,31	0,20 - 0,35	0,24 - 0,42	0,31 - 0,53
	3	60	80	100	mm/r	0,05 - 0,10	0,06 - 0,13	0,08 - 0,15	0,09 - 0,17	0,13 - 0,23	0,15 - 0,28	0,19 - 0,33	0,22 - 0,38	0,26 - 0,47	0,34 - 0,59
	4	50	80	100	mm/r	0,05 - 0,10	0,06 - 0,13	0,07 - 0,15	0,08 - 0,17	0,12 - 0,23	0,14 - 0,28	0,17 - 0,33	0,19 - 0,38	0,23 - 0,47	0,29 - 0,59
M	6	40	50	70	mm/r	0,03 - 0,05	0,04 - 0,06	0,05 - 0,08	0,06 - 0,10	0,08 - 0,14	0,10 - 0,18	0,13 - 0,22	0,14 - 0,24	0,18 - 0,32	0,23 - 0,41
	1	20	30	40	mm/r	0,02 - 0,05	0,03 - 0,06	0,04 - 0,07	0,05 - 0,09	0,08 - 0,11	0,09 - 0,12	0,10 - 0,14	0,12 - 0,16	0,14 - 0,18	0,16 - 0,20
	2	30	40	50	mm/r	0,02 - 0,06	0,03 - 0,07	0,04 - 0,08	0,06 - 0,10	0,08 - 0,12	0,09 - 0,14	0,10 - 0,16	0,12 - 0,18	0,14 - 0,20	0,16 - 0,22
K	3	20	30	40	mm/r	0,02 - 0,05	0,03 - 0,06	0,04 - 0,07	0,05 - 0,09	0,08 - 0,11	0,09 - 0,12	0,10 - 0,14	0,12 - 0,16	0,14 - 0,18	0,16 - 0,20
	1	80	120	170	mm/r	0,08 - 0,16	0,09 - 0,17	0,11 - 0,22	0,12 - 0,24	0,16 - 0,31	0,20 - 0,38	0,23 - 0,44	0,25 - 0,49	0,31 - 0,60	0,38 - 0,74
	2	80	110	140	mm/r	0,10 - 0,14	0,11 - 0,15	0,12 - 0,16	0,13 - 0,19	0,16 - 0,25	0,20 - 0,31	0,23 - 0,36	0,25 - 0,40	0,31 - 0,48	0,38 - 0,60
N	3	80	100	130	mm/r	0,05 - 0,13	0,07 - 0,15	0,08 - 0,17	0,09 - 0,19	0,12 - 0,25	0,14 - 0,30	0,17 - 0,35	0,19 - 0,40	0,24 - 0,48	0,30 - 0,60
	1	90	230	315	mm/r	0,05 - 0,12	0,06 - 0,13	0,08 - 0,14	0,10 - 0,16	0,12 - 0,20	0,16 - 0,24	0,20 - 0,28	0,24 - 0,32	0,28 - 0,40	0,32 - 0,48
	2	90	225	270	mm/r	0,04 - 0,08	0,06 - 0,12	0,08 - 0,16	0,10 - 0,20	0,12 - 0,24	0,16 - 0,28	0,20 - 0,32	0,24 - 0,36	0,28 - 0,44	0,32 - 0,52
	3	90	180	270	mm/r	0,10 - 0,13	0,11 - 0,14	0,12 - 0,14	0,13 - 0,16	0,14 - 0,20	0,16 - 0,24	0,20 - 0,28	0,24 - 0,32	0,28 - 0,40	0,32 - 0,44
	5	90	135	180	mm/r	0,04 - 0,08	0,06 - 0,12	0,08 - 0,16	0,10 - 0,20	0,12 - 0,24	0,16 - 0,28	0,20 - 0,32	0,24 - 0,36	0,28 - 0,40	0,32 - 0,48
S	1	10	25	30	mm/r	0,01 - 0,04	0,02 - 0,05	0,03 - 0,06	0,04 - 0,08	0,06 - 0,10	0,08 - 0,12	0,09 - 0,13	0,10 - 0,14	0,12 - 0,16	0,14 - 0,18
	2	10	20	25	mm/r	0,01 - 0,03	0,02 - 0,03	0,02 - 0,04	0,03 - 0,06	0,05 - 0,08	0,07 - 0,10	0,08 - 0,11	0,09 - 0,12	0,10 - 0,14	0,11 - 0,16
	3	10	25	30	mm/r	0,01 - 0,03	0,02 - 0,03	0,02 - 0,04	0,02 - 0,05	0,04 - 0,07	0,06 - 0,09	0,07 - 0,10	0,08 - 0,11	0,09 - 0,13	0,10 - 0,15
	4	10	25	40	mm/r	0,01 - 0,03	0,02 - 0,03	0,02 - 0,04	0,03 - 0,06	0,05 - 0,08	0,07 - 0,10	0,08 - 0,11	0,09 - 0,12	0,10 - 0,14	0,11 - 0,16
Material Group	Cutting Speed – vc Range – SFM			Inch											
	min	Starting Value	max	Recommended Feed Rate (f) by Diameter											
				3/64 .047	5/64 .078	1/8 .125	3/16 .188	1/4 .250	5/16 .313	3/8 .375	1/2 .500	5/8 .625	3/4 .750		
P	1	230	330	460	IPR	.001 - .003	.002 - .004	.003 - .005	.004 - .006	.005 - .008	.005 - .010	.006 - .012	.007 - .014	.008 - .017	.011 - .022
	2	300	390	460	IPR	.001 - .003	.002 - .004	.003 - .005	.004 - .006	.005 - .008	.005 - .010	.006 - .012	.008 - .014	.010 - .017	.012 - .021
	3	200	260	330	IPR	.002 - .004	.003 - .005	.004 - .006	.004 - .006	.005 - .009	.006 - .011	.007 - .013	.008 - .015	.010 - .018	.014 - .023
	4	160	260	330	IPR	.002 - .004	.002 - .005	.003 - .006	.004 - .006	.005 - .009	.005 - .011	.006 - .013	.007 - .015	.009 - .018	.012 - .023
M	6	130	160	230	IPR	.001 - .003	.001 - .003	.002 - .004	.002 - .004	.004 - .005	.004 - .007	.005 - .008	.005 - .010	.007 - .013	.009 - .016
	1	70	100	130	IPR	.001 - .002	.001 - .002	.002 - .003	.002 - .004	.003 - .004	.004 - .005	.004 - .006	.005 - .006	.006 - .007	.006 - .008
	2	100	130	160	IPR	.001 - .002	.001 - .002	.002 - .003	.002 - .004	.003 - .005	.004 - .006	.004 - .006	.005 - .007	.006 - .008	.006 - .009
K	3	70	100	130	IPR	.001 - .002	.001 - .002	.002 - .003	.002 - .004	.003 - .004	.004 - .005	.004 - .006	.005 - .006	.006 - .007	.006 - .008
	1	260	390	560	IPR	.002 - .005	.003 - .007	.004 - .009	.005 - .009	.006 - .012	.008 - .015	.009 - .017	.010 - .019	.012 - .024	.015 - .029
	2	260	360	460	IPR	.002 - .005	.003 - .006	.004 - .007	.005 - .007	.006 - .010	.008 - .012	.009 - .014	.010 - .016	.012 - .019	.015 - .024
N	3	260	330	430	IPR	.001 - .005	.002 - .006	.003 - .007	.004 - .007	.005 - .010	.006 - .012	.006 - .014	.007 - .016	.009 - .019	.012 - .024
	1	300	750	1030	IPR	.002 - .005	.002 - .005	.003 - .006	.004 - .006	.005 - .008	.006 - .009	.008 - .011	.009 - .013	.011 - .016	.013 - .019
	2	300	740	890	IPR	.002 - .006	.002 - .006	.003 - .006	.004 - .008	.005 - .009	.006 - .011	.008 - .013	.009 - .014	.011 - .017	.013 - .020
	3	300	590	890	IPR	.004 - .005	.004 - .005	.005 - .006	.005 - .006	.006 - .008	.006 - .009	.008 - .011	.009 - .013	.011 - .016	.013 - .017
	5	300	440	590	IPR	.002 - .004	.002 - .005	.003 - .006	.004 - .008	.005 - .009	.006 - .011	.008 - .013	.009 - .014	.011 - .016	.013 - .019
S	1	30	80	100	IPR	.001 - .002	.001 - .002	.001 - .002	.002 - .003	.002 - .004	.003 - .005	.004 - .005	.004 - .006	.005 - .006	.006 - .007
	2	30	70	80	IPR	.001 - .002	.001 - .002	.001 - .002	.001 - .002	.002 - .003	.003 - .004	.003 - .004	.004 - .005	.004 - .006	.004 - .006
	3	30	80	100	IPR	.001 - .002	.001 - .002	.001 - .002	.001 - .002	.002 - .003	.002 - .004	.003 - .004	.003 - .004	.004 - .005	.004 - .006
	4	30	80	130	IPR	.001 - .002	.001 - .002	.001 - .002	.001 - .002	.002 - .003	.003 - .004	.003 - .004	.004 - .005	.004 - .006	.004 - .006

TF Drills for High Metal Removal Rates

Primary Application

B/K105 Solid Carbide Drills are ideal for high metal removal rates and excellent hole quality in short chipping materials such as gray cast iron, ductile iron, and aluminum as well as in short-hole titanium applications.

Features and Benefits

Three Cutting Edges

- Higher feed rates than with two-edged drills.

Three Spacious Flutes

- Rapid chip evacuation.
- Three-margin lands deliver better hole quality and straightness than two-flute drills.

Wear-Resistant Carbide Grade

- High tool life in abrasive materials such as cast iron and aluminum die cast alloys.

TiAlN-Coated KC7210™ Grade

- Higher wear resistance at elevated speeds.

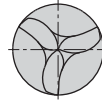
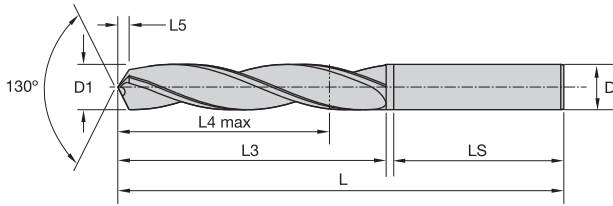
Uncoated K10™ Grade

- The uncoated grade helps to prevent built-up edge in drilling aluminum and high-temp alloys.

Customization

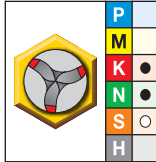
- Intermediate diameters available as engineered solutions.
- Length variations and step drills available as custom solutions.



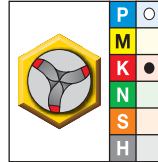


Solid Carbide Drills

■ B105 • ~5 x D



K10



KC7210

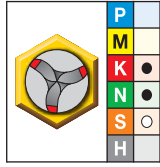
● first choice
○ alternate choice

		D1 diameter				L	L4 max	L5	LS	D
		mm	in	fraction	wire size					
B105A03000	—	3,000	.1181	—	—	66	23	0,7	36	6
B105A03100	—	3,100	.1220	—	—	66	23	0,8	36	6
B105A03200	—	3,200	.1260	—	—	66	23	0,8	36	6
B105A03300	—	3,300	.1299	—	—	66	23	0,8	36	6
B105A03500	B105A03500	3,500	.1378	—	—	66	23	0,9	36	6
B105A03700	—	3,700	.1457	—	—	66	23	0,9	36	6
B105A03800	—	3,800	.1496	—	—	74	29	0,9	36	6
B105A04000	B105A04000	4,000	.1575	—	—	74	29	1,0	36	6
B105A04100	—	4,100	.1614	—	—	74	29	1,0	36	6
B105A04200	B105A04200	4,200	.1654	—	—	74	29	1,0	36	6
B105A04300	—	4,300	.1693	—	—	74	29	1,1	36	6
B105A04500	—	4,500	.1772	—	—	74	29	1,1	36	6
B105A04650	—	4,650	.1831	—	—	74	29	1,2	36	6
B105A04700	—	4,700	.1850	—	13	74	29	1,2	36	6
B105A04800	—	4,800	.1890	—	12	82	35	1,2	36	6
B105A05000	B105A05000	5,000	.1969	—	—	82	35	1,2	36	6
B105A05100	—	5,100	.2008	—	—	82	35	1,3	36	6
B105A05200	—	5,200	.2047	—	—	82	35	1,3	36	6
B105A05500	B105A05500	5,500	.2165	—	—	82	35	1,4	36	6
B105A05550	—	5,550	.2185	—	—	82	35	1,4	36	6
B105A05700	—	5,700	.2244	—	—	82	35	1,4	36	6
B105A05800	—	5,800	.2283	—	—	82	35	1,4	36	6
B105A06000	B105A06000	6,000	.2362	—	—	82	35	1,5	36	6
B105A06100	—	6,100	.2402	—	—	91	43	1,5	36	8
B105A06300	—	6,300	.2480	—	—	91	43	1,6	36	8
B105A06400	—	6,400	.2520	—	—	91	43	1,6	36	8
B105A06500	B105A06500	6,500	.2559	—	—	91	43	1,6	36	8
B105A06600	—	6,600	.2598	—	—	91	43	1,6	36	8
B105A06700	—	6,700	.2638	—	—	91	43	1,7	36	8
B105A06800	B105A06800	6,800	.2677	—	—	91	43	1,7	36	8
B105A07000	B105A07000	7,000	.2756	—	—	91	43	1,7	36	8
B105A07100	—	7,100	.2795	—	—	91	43	1,8	36	8
B105A07400	—	7,400	.2913	—	—	91	43	1,8	36	8
B105A07500	—	7,500	.2953	—	—	91	43	1,9	36	8
B105A07600	—	7,600	.2992	—	—	91	43	1,9	36	8
B105A07800	—	7,800	.3071	—	—	91	43	1,9	36	8
B105A08000	B105A08000	8,000	.3150	—	—	91	43	2,0	36	8
B105A08100	—	8,100	.3189	—	—	103	49	2,0	40	10
B105A08300	—	8,300	.3268	—	—	103	49	2,1	40	10
B105A08400	—	8,400	.3307	—	—	103	49	2,1	40	10
B105A08500	B105A08500	8,500	.3346	—	—	103	49	2,1	40	10
B105A08600	—	8,600	.3386	—	—	103	49	2,1	40	10

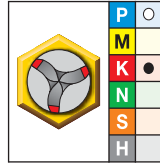
(continued)

(B105 • ~5 x D continued)

Solid Carbide Drills

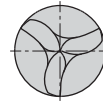
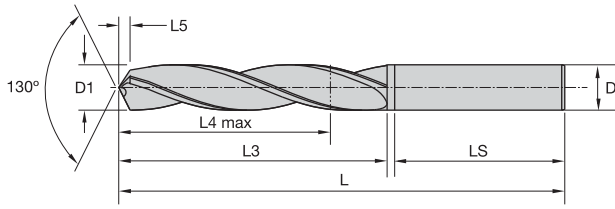


K10



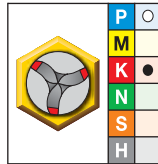
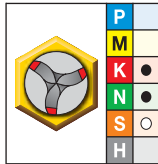
KC7210

		D1 diameter				L	L4 max	L5	LS	D
		mm	in	fraction	wire size					
B105A08700	—	8,700	.3425	—	—	103	49	2,2	40	10
B105A08800	—	8,800	.3465	—	—	103	49	2,2	40	10
B105A09000	B105A09000	9,000	.3543	—	—	103	49	2,2	40	10
B105A09100	—	9,100	.3583	—	—	103	49	2,3	40	10
B105A09300	—	9,300	.3661	—	—	103	49	2,3	40	10
B105A09500	—	9,500	.3740	—	—	103	49	2,4	40	10
B105A09700	—	9,700	.3819	—	—	103	49	2,4	40	10
B105A09800	—	9,800	.3858	—	—	103	49	2,4	40	10
B105A10000	B105A10000	10,000	.3937	—	—	103	49	2,5	40	10
B105A10100	—	10,100	.3976	—	—	118	56	2,5	45	12
B105A10200	B105A10200	10,200	.4016	—	—	118	56	2,5	45	12
B105A10300	—	10,300	.4055	—	—	118	56	2,6	45	12
B105A10500	B105A10500	10,500	.4134	—	—	118	56	2,6	45	12
B105A10700	—	10,700	.4213	—	—	118	56	2,7	45	12
B105A10800	—	10,800	.4252	—	—	118	56	2,7	45	12
B105A11000	B105A11000	11,000	.4331	—	—	118	56	2,7	45	12
B105A11100	—	11,100	.4370	—	—	118	56	2,8	45	12
B105A11200	—	11,200	.4409	—	—	118	56	2,8	45	12
B105A11500	B105A11500	11,500	.4528	—	—	118	56	2,9	45	12
B105A11700	—	11,700	.4606	—	—	118	56	2,9	45	12
B105A11800	—	11,800	.4646	—	—	118	56	2,9	45	12
B105A12000	B105A12000	12,000	.4724	—	—	118	56	3,0	45	12
B105A12100	—	12,100	.4764	—	—	124	60	3,0	45	14
B105A12500	B105A12500	12,500	.4921	—	—	124	60	3,1	45	14
B105A12700	—	12,700	.5000	1/2	—	124	60	3,2	45	14
B105A12800	—	12,800	.5039	—	—	124	60	3,2	45	14
B105A13000	B105A13000	13,000	.5118	—	—	124	60	3,2	45	14
B105A13100	—	13,100	.5157	—	—	124	60	3,3	45	14
B105A13500	B105A13500	13,500	.5315	—	—	124	60	3,4	45	14
B105A13800	—	13,800	.5433	—	—	124	60	3,4	45	14
B105A14000	B105A14000	14,000	.5512	—	—	124	60	3,5	45	14
B105A14200	—	14,200	.5591	—	—	133	63	3,5	48	16
B105A14500	—	14,500	.5709	—	—	133	63	3,6	48	16
B105A15000	B105A15000	15,000	.5906	—	—	133	63	3,7	48	16
B105A15100	—	15,100	.5945	—	—	133	63	3,8	48	16
B105A15500	B105A15500	15,500	.6102	—	—	133	63	3,9	48	16
B105A15800	—	15,800	.6220	—	—	133	63	3,9	48	16
B105A16000	—	16,000	.6299	—	—	133	63	4,0	48	16
B105A16500	—	16,500	.6496	—	—	143	71	4,1	48	18
B105A17000	—	17,000	.6693	—	—	143	71	4,2	48	18
B105A17500	B105A17500	17,500	.6890	—	—	143	71	4,4	48	18
B105A18000	B105A18000	18,000	.7087	—	—	143	71	4,5	48	18
B105A18500	B105A18500	18,500	.7283	—	—	153	77	4,6	50	20
B105A19000	—	19,000	.7480	—	—	153	77	4,7	50	20
B105A19500	—	19,500	.7677	—	—	153	77	4,9	50	20
B105A20000	—	20,000	.7874	—	—	153	77	5,0	50	20
B105A20500	—	20,500	.8071	—	—	167	85	5,1	50	20
B105A21000	—	21,000	.8268	—	—	167	85	5,2	50	20



Solid Carbide Drills

■ K105 • ~5 x D



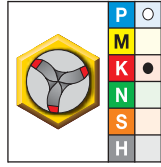
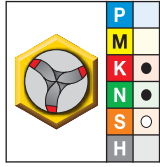
- first choice
- alternate choice

		D1 diameter				L	L4 max	L5	LS	D
		in	mm	fraction	wire size					
K105A01130	—	.1130	2,870	—	33	2.60	.84	.030	1.44	.1875
K105A01250	K105A01250	.1250	3,175	1/8	—	2.60	.84	.031	1.44	.1875
K105A01285	K105A01285	.1285	3,264	—	30	2.60	.84	.032	1.44	.1875
K105A01360	—	.1360	3,454	—	29	2.60	.84	.034	1.44	.1875
K105A01364	—	.1364	3,465	—	—	2.60	.84	.034	1.44	.1875
K105A01395	—	.1395	3,543	—	—	2.60	.84	.035	1.44	.1875
K105A01406	—	.1406	3,572	9/64	—	2.60	.84	.035	1.44	.1875
K105A01440	—	.1440	3,658	—	27	2.60	.84	.036	1.44	.1875
—	K105A01495	.1495	3,797	—	25	2.60	.84	.037	1.44	.1875
K105A01502	—	.1502	3,815	—	—	2.60	.84	.038	1.44	.1875
K105A01517	—	.1517	3,853	—	—	2.60	.84	.038	1.44	.1875
K105A01532	—	.1532	3,891	—	—	2.60	.84	.038	1.44	.1875
K105A01563	K105A01563	.1563	3,969	5/32	—	2.60	.84	.039	1.44	.1875
K105A01590	—	.1590	4,039	—	21	2.91	1.13	.040	1.44	.1875
K105A01624	—	.1624	4,125	—	—	2.91	1.13	.041	1.44	.1875
K105A01660	—	.1660	4,216	—	19	2.91	1.13	.042	1.44	.1875
K105A01695	—	.1695	4,305	—	18	2.91	1.13	.042	1.44	.1875
K105A01716	—	.1716	4,359	—	—	2.91	1.13	.043	1.44	.1875
K105A01719	K105A01719	.1719	4,366	11/64	—	2.91	1.13	.043	1.44	.1875
K105A01730	—	.1730	4,394	—	17	2.91	1.13	.043	1.44	.1875
K105A01762	—	.1762	4,476	—	—	2.91	1.13	.044	1.44	.1875
K105A01781	—	.1781	4,524	—	—	2.91	1.13	.045	1.44	.1875
—	K105A01820	.1820	4,623	—	14	2.91	1.13	.046	1.44	.1875
K105A01835	—	.1835	4,661	—	—	2.91	1.13	.046	1.44	.1875
K105A01875	K105A01875	.1875	4,762	3/16	—	2.91	1.13	.047	1.44	.1875
K105A01890	—	.1890	4,801	—	12	3.23	1.37	.047	1.44	.2500
K105A01910	—	.1910	4,851	—	11	3.23	1.37	.048	1.44	.2500
K105A01935	—	.1935	4,915	—	10	3.23	1.37	.048	1.44	.2500
K105A01976	—	.1976	5,019	—	—	3.23	1.37	.050	1.44	.2500
K105A02002	—	.2002	5,085	—	—	3.23	1.37	.050	1.44	.2500
K105A02045	—	.2045	5,194	—	—	3.23	1.37	.051	1.44	.2500
—	K105A02130	.2130	5,410	—	3	3.23	1.37	.053	1.44	.2500
K105A02175	—	.2175	5,525	—	—	3.23	1.37	.054	1.44	.2500
K105A02188	K105A02188	.2187	5,556	7/32	—	3.23	1.37	.055	1.44	.2500
K105A02279	—	.2279	5,789	—	—	3.23	1.37	.057	1.44	.2500
K105A02280	—	.2280	5,791	—	1	3.23	1.37	.057	1.44	.2500
K105A02342	—	.2342	5,949	—	—	3.23	1.37	.059	1.44	.2500
K105A02500	K105A02500	.2500	6,350	1/4	E	3.23	1.37	.063	1.44	.2500
K105A02530	—	.2530	6,426	—	—	3.58	1.59	.063	1.52	.3125
K105A02570	K105A02570	.2570	6,528	—	F	3.58	1.59	.064	1.52	.3125
K105A02620	—	.2620	6,655	—	—	3.58	1.59	.066	1.52	.3125
K105A02656	K105A02656	.2656	6,747	17/64	—	3.58	1.59	.066	1.52	.3125
—	K105A02720	.2720	6,909	—	I	3.58	1.59	.068	1.52	.3125

(continued)

(K105 • ~5 x D continued)

Solid Carbide Drills



		D1 diameter				L	L4 max	L5	LS	D
		in	mm	fraction	wire size					
K10	KC7210									
K105A02746	—	.2746	6,975	—	—	3.58	1.59	.069	1.52	.3125
K105A02813	K105A02813	.2813	7,144	9/32	—	3.58	1.59	.070	1.52	.3125
K105A02870	—	.2870	7,290	—	—	3.58	1.59	.072	1.52	.3125
K105A02879	—	.2879	7,313	—	—	3.58	1.59	.072	1.52	.3125
K105A02941	—	.2941	7,470	—	—	3.58	1.59	.074	1.52	.3125
K105A02969	K105A02969	.2969	7,541	19/64	—	3.58	1.59	.074	1.52	.3125
K105A03125	K105A03125	.3125	7,938	5/16	—	3.58	1.59	.078	1.52	.3125
K105A03281	K105A03281	.3281	8,334	21/64	—	4.06	1.92	.082	1.59	.3750
—	K105A03320	.3320	8,433	—	Q	4.06	1.92	.083	1.59	.3750
K105A03371	—	.3371	8,562	—	—	4.06	1.92	.084	1.59	.3750
K105A03438	K105A03438	.3437	8,731	11/32	—	4.06	1.92	.086	1.59	.3750
K105A03474	—	.3474	8,824	—	—	4.06	1.92	.087	1.59	.3750
K105A03566	—	.3566	9,058	—	—	4.06	1.92	.089	1.59	.3750
K105A03594	—	.3594	9,128	23/64	—	4.06	1.92	.090	1.59	.3750
—	K105A03680	.3680	9,347	—	U	4.06	1.92	.092	1.59	.3750
K105A03750	K105A03750	.3750	9,525	3/8	—	4.06	1.92	.094	1.59	.3750
K105A03906	K105A03906	.3906	9,922	25/64	—	4.37	2.09	.098	1.67	.4375
K105A04059	—	.4059	10,310	—	—	4.37	2.09	.102	1.67	.4375
K105A04063	K105A04063	.4063	10,319	13/32	—	4.37	2.09	.102	1.67	.4375
K105A04219	K105A04219	.4219	10,716	27/64	—	4.37	2.09	.105	1.67	.4375
K105A04375	K105A04375	.4375	11,112	7/16	—	4.37	2.09	.109	1.67	.4375
K105A04531	—	.4531	11,509	29/64	—	4.65	2.19	.113	1.79	.5000
K105A04545	—	.4545	11,544	—	—	4.65	2.19	.114	1.79	.5000
K105A04688	—	.4687	11,906	15/32	—	4.65	2.19	.117	1.79	.5000
K105A04844	K105A04844	.4844	12,303	31/64	—	4.65	2.19	.121	1.79	.5000
K105A05000	K105A05000	.5000	12,700	1/2	—	4.65	2.19	.125	1.79	.5000
K105A05120	—	.5120	13,005	—	—	4.88	2.36	.128	1.79	.5625
K105A05379	—	.5379	13,663	—	—	4.88	2.36	.135	1.79	.5625
K105A05625	K105A05625	.5625	14,288	9/16	—	4.88	2.36	.141	1.79	.5625
K105A05745	—	.5745	14,592	—	—	5.24	2.54	.144	1.91	.6250
K105A05848	—	.5848	14,854	—	—	5.24	2.54	.146	1.91	.6250
K105A06250	—	.6250	15,875	5/8	—	5.24	2.54	.156	1.91	.6250
—	K105A06562	.6563	16,669	21/32	—	5.63	2.87	.164	1.91	.6875
K105A06875	—	.6875	17,462	11/16	—	5.63	2.87	.172	1.91	.6875
K105A07224	—	.7224	18,349	—	—	5.83	2.93	.181	1.99	.7500
K105A07500	—	.7500	19,050	3/4	—	5.83	2.93	.187	1.99	.7500
K105A08101	—	.8101	20,576	—	—	6.02	3.07	.202	1.99	.8125

Tolerance • Metric			Tolerance • Inch		
nominal size range	D1 tolerance m7	D tolerance h6	nominal size range	D1 tolerance m7	D tolerance h6
>3-6	0,004/0,016	0,000/-0,008	>.1181-.2362	.0002/.0006	.0000/- .0003
>6-10	0,006/0,021	0,000/-0,009	>.2362-.3937	.0002/.0008	.0000/- .0004
>10-18	0,007/0,025	0,000/-0,011	>.3937-.7087	.0003/.0010	.0000/- .0004
>18-25,4	0,008/0,029	0,000/-0,013	>.7087-1.0000	.0003/.0011	.0000/- .0005

■ TF Drills • B/K105 Series • Grade K10™ • Flood Coolant for Drill Diameters 3–20mm

		Cutting Speed – vc Range – m/min			Metric								
					Recommended Feed Rate (f) by Diameter								
Material Group		min	Starting Value	max		3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
K	1	60	85	110	mm/r	0,11 - 0,20	0,12 - 0,20	0,16 - 0,28	0,20 - 0,35	0,22 - 0,42	0,24 - 0,50	0,28 - 0,61	0,30 - 0,68
	2	70	72	90	mm/r	0,11 - 0,20	0,12 - 0,20	0,16 - 0,28	0,20 - 0,35	0,22 - 0,42	0,24 - 0,50	0,28 - 0,61	0,30 - 0,68
	3	50	51	70	mm/r	0,09 - 0,18	0,10 - 0,18	0,14 - 0,26	0,18 - 0,33	0,20 - 0,40	0,22 - 0,48	0,26 - 0,59	0,28 - 0,66
N	1	100	210	410	mm/r	0,09 - 0,15	0,10 - 0,20	0,18 - 0,33	0,20 - 0,38	0,25 - 0,43	0,33 - 0,51	0,43 - 0,58	0,64 - 0,79
	2	100	248	250	mm/r	0,10 - 0,19	0,12 - 0,21	0,18 - 0,33	0,25 - 0,42	0,30 - 0,50	0,35 - 0,58	0,44 - 0,74	0,52 - 0,88
S	5	60	173	250	mm/r	0,08 - 0,15	0,13 - 0,18	0,18 - 0,33	0,20 - 0,36	0,23 - 0,38	0,33 - 0,46	0,38 - 0,48	0,58 - 0,76
S	4	30	20	51	mm/r	0,03 - 0,05	0,04 - 0,07	0,07 - 0,09	0,09 - 0,12	0,11 - 0,15	0,13 - 0,18	0,17 - 0,24	0,22 - 0,30
		Cutting Speed – vc Range – SFM			Inch								
					Recommended Feed Rate (f) by Diameter								
Material Group		min	Starting Value	max		1/8 .125	3/16 .188	1/4 .250	5/16 .313	3/8 .375	1/2 .500	5/8 .625	3/4 .750
K	1	200	280	360	IPR	.004 - .008	.005 - .008	.006 - .011	.008 - .014	.009 - .017	.009 - .020	.011 - .024	.012 - .027
	2	230	240	300	IPR	.004 - .008	.005 - .008	.006 - .011	.008 - .014	.009 - .017	.009 - .020	.011 - .024	.012 - .027
	3	160	170	230	IPR	.003 - .007	.004 - .007	.005 - .010	.007 - .013	.008 - .016	.008 - .019	.010 - .023	.011 - .026
N	1	330	690	1340	IPR	.003 - .007	.004 - .008	.007 - .013	.008 - .015	.010 - .017	.013 - .020	.017 - .023	.025 - .031
	2	330	810	820	IPR	.003 - .007	.004 - .008	.007 - .013	.008 - .015	.010 - .017	.013 - .020	.017 - .023	.025 - .031
S	5	200	570	820	IPR	.003 - .006	.005 - .007	.007 - .013	.008 - .014	.009 - .015	.013 - .018	.015 - .019	.023 - .030
S	4	100	70	170	IPR	.001 - .002	.002 - .003	.003 - .004	.004 - .005	.004 - .006	.005 - .007	.007 - .009	.009 - .012

■ TF Drills • B/K105 Series • Grade KC7210™ • Flood Coolant for Drill Diameters 3–20mm

		Cutting Speed – vc Range – m/min			Metric								
					Recommended Feed Rate (f) by Diameter								
Material Group		min	Starting Value	max		3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
K	1	80	140	161	mm/r	0,13 - 0,20	0,14 - 0,24	0,17 - 0,31	0,20 - 0,39	0,25 - 0,45	0,29 - 0,51	0,33 - 0,62	0,36 - 0,70
	2	80	120	120	mm/r	0,13 - 0,20	0,15 - 0,23	0,19 - 0,28	0,23 - 0,34	0,26 - 0,38	0,29 - 0,43	0,34 - 0,50	0,36 - 0,54
	3	60	84	130	mm/r	0,09 - 0,18	0,10 - 0,18	0,14 - 0,26	0,18 - 0,33	0,20 - 0,40	0,22 - 0,48	0,26 - 0,59	0,28 - 0,66
N	1	100	298	300	mm/r	0,10 - 0,19	0,12 - 0,21	0,18 - 0,33	0,25 - 0,42	0,30 - 0,50	0,35 - 0,58	0,44 - 0,74	0,52 - 0,88
	5	60	225	300	mm/r	0,08 - 0,15	0,13 - 0,18	0,18 - 0,33	0,20 - 0,36	0,23 - 0,38	0,33 - 0,46	0,38 - 0,48	0,58 - 0,76
		Cutting Speed – vc Range – SFM			Inch								
					Recommended Feed Rate (f) by Diameter								
Material Group		min	Starting Value	max		1/8 .125	3/16 .188	1/4 .250	5/16 .313	3/8 .375	1/2 .500	5/8 .625	3/4 .750
K	1	260	460	520	IPR	.005 - .008	.006 - .009	.007 - .012	.008 - .015	.010 - .018	.011 - .020	.013 - .024	.014 - .028
	2	260	390	390	IPR	.005 - .008	.006 - .009	.007 - .011	.009 - .013	.010 - .015	.011 - .017	.013 - .020	.014 - .021
	3	200	280	430	IPR	.003 - .007	.004 - .007	.005 - .010	.007 - .013	.008 - .016	.008 - .019	.010 - .023	.011 - .026
N	2	330	980	980	IPR	.003 - .007	.004 - .008	.007 - .013	.008 - .015	.010 - .017	.013 - .020	.017 - .023	.025 - .031
	5	200	740	980	IPR	.003 - .006	.005 - .007	.007 - .013	.008 - .014	.009 - .015	.013 - .018	.015 - .019	.023 - .030

■ TF Drills • B/K105 Series • Grade KC7210 • MQL (Minimum Quantity Lubricant) for Dry Applications for Drill Diameters 3–20mm

		Cutting Speed – vc Range – m/min			Metric								
					Recommended Feed Rate (f) by Diameter								
Material Group		min	Starting Value	max		3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
K	1	60	110	150	mm/r	0,10 - 0,20	0,13 - 0,24	0,16 - 0,31	0,20 - 0,39	0,24 - 0,44	0,27 - 0,51	0,33 - 0,62	0,36 - 0,70
	2	60	94	100	mm/r	0,13 - 0,20	0,16 - 0,23	0,20 - 0,28	0,23 - 0,34	0,26 - 0,38	0,29 - 0,43	0,34 - 0,50	0,36 - 0,54
	3	50	84	110	mm/r	0,10 - 0,19	0,13 - 0,20	0,16 - 0,31	0,20 - 0,37	0,23 - 0,44	0,26 - 0,48	0,31 - 0,58	0,33 - 0,64
		Cutting Speed – vc Range – SFM			Inch								
					Recommended Feed Rate (f) by Diameter								
Material Group		min	Starting Value	max		1/8 .125	3/16 .188	1/4 .250	5/16 .313	3/8 .375	1/2 .500	5/8 .625	3/4 .750
K	1	200	360	490	IPR	.003 - .006	.003 - .007	.004 - .009	.006 - .012	.008 - .016	.012 - .019	.015 - .023	.020 - .028
	2	200	310	330	IPR	.003 - .006	.003 - .007	.004 - .009	.006 - .012	.008 - .016	.012 - .019	.015 - .023	.020 - .028
	3	160	280	360	IPR	.003 - .006	.003 - .007	.004 - .009	.006 - .012	.008 - .016	.012 - .019	.015 - .023	.020 - .028

TF Drills with Through Coolant for Titanium Materials

Primary Application

B/K125 Solid Carbide Drills are specifically designed for titanium and titanium alloy workpiece materials.

Features and Benefits

Three Cutting Edges

- Higher feed rates than two-edged drills.

Three-Flute Design

- Three-margin lands deliver better hole quality and straightness than two-flute drills.

Through-Coolant Design

- Improved chip evacuation enables deeper holes.
- More effective cooling of the cutting edges and longer tool life.
- Lubrication of the margin lands and better hole surface quality.

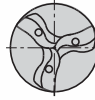
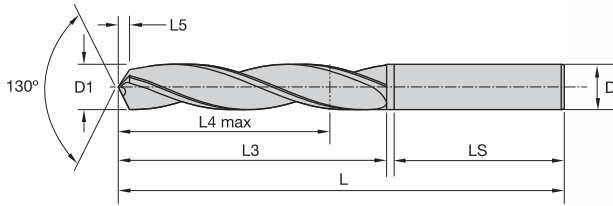
Fine-Grained Carbide Grade

- Optimum combination of toughness and wear resistance for titanium drilling applications.

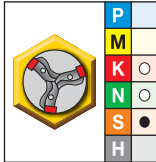
Customization

- Intermediate diameters available as semi-standards.
- Length variations and step drills available as engineered solutions.





Solid Carbide Drills

B125 • ~5 x D


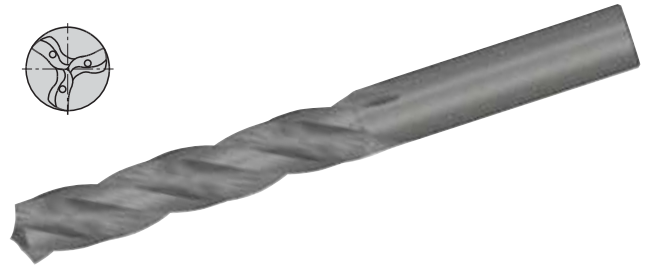
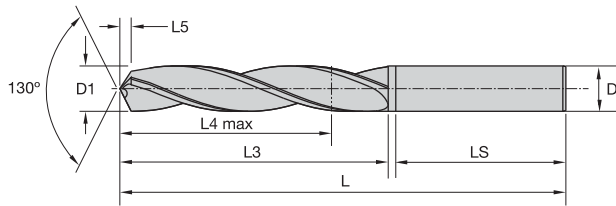
- first choice
- alternate choice

	D1 diameter				L	L4 max	L5	LS	D
	mm	in	fraction	wire size					
K715									
B125A06000	6,000	.2362	—	—	94	35	1,6	48	6
B125A06500	6,500	.2559	—	—	105	43	1,7	50	8
B125A06800	6,800	.2677	—	—	105	43	1,8	50	8
B125A07000	7,000	.2756	—	—	105	43	1,9	50	8
B125A07400	7,400	.2913	—	—	110	43	2,0	55	8
B125A07500	7,500	.2953	—	—	110	43	2,0	55	8
B125A08000	8,000	.3150	—	—	110	43	2,1	55	8
B125A08500	8,500	.3346	—	—	122	49	2,3	59	10
B125A09000	9,000	.3543	—	—	122	49	2,4	59	10
B125A09500	9,500	.3740	—	—	122	49	2,5	59	10
B125A10000	10,000	.3937	—	—	122	49	2,7	59	10
B125A10500	10,500	.4134	—	—	141	56	2,8	68	12
B125A11000	11,000	.4331	—	—	141	56	3,0	68	12
B125A12000	12,000	.4724	—	—	141	56	3,2	68	12
B125A14000	14,000	.5512	—	—	155	60	3,8	76	14

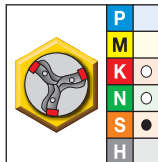
Tolerance

nominal size range	D1 tolerance m7	D tolerance h6
>3-6	0,004/0,016	0,000/-0,008
>6-10	0,006/0,021	0,000/-0,009
>10-18	0,007/0,025	0,000/-0,011
>18-25,4	0,008/0,029	0,000/-0,013

Solid Carbide Drills



■ K125 • ~5 x D



- first choice
- alternate choice

K715	D1 diameter				L	L3	L4 max	L5	LS	D
	in	mm	fraction	wire size						
K125A02500	.2500	6,350	1/4	E	3.74	1.69	1.37	.067	1.95	.2500
K125A02813	.2813	7,144	9/32	—	4.33	1.97	1.59	.076	2.26	.3125
K125A02950	.2950	7,493	—	M	4.33	1.97	1.59	.079	2.26	.3125
K125A03125	.3125	7,938	5/16	—	4.33	1.97	1.59	.084	2.26	.3125
K125A03438	.3437	8,731	11/32	—	4.92	2.36	1.92	.092	2.46	.3750
K125A03750	.3750	9,525	3/8	—	4.92	2.36	1.92	.101	2.46	.3750
K125A04063	.4063	10,319	13/32	—	5.24	2.60	2.09	.109	2.54	.4375
K125A04219	.4219	10,716	27/64	—	5.24	2.60	2.09	.113	2.54	.4375
K125A04375	.4375	11,112	7/16	—	5.24	2.60	2.09	.117	2.54	.4375
K125A04844	.4844	12,303	31/64	—	5.63	2.76	2.19	.130	2.78	.5000
K125A05000	.5000	12,700	1/2	—	5.63	2.76	2.19	.134	2.78	.5000
K125A05625	.5625	14,288	9/16	—	6.10	2.99	2.36	.151	3.01	.5625
K125A06250	.6250	15,875	5/8	—	6.73	3.23	2.54	.168	3.41	.6250

Tolerance • Metric			Tolerance • Inch		
nominal size range	D1 tolerance m7	D tolerance h6	nominal size range	D1 tolerance m7	D tolerance h6
>3-6	0,004/0,016	0,000/-0,008	>.1181-.2362	.0002/.0006	.0000/-0.0003
>6-10	0,006/0,021	0,000/-0,009	>.2362-.3937	.0002/.0008	.0000/-0.0004
>10-18	0,007/0,025	0,000/-0,011	>.3937-.7087	.0003/.0010	.0000/-0.0004
>18-25,4	0,008/0,029	0,000/-0,013	>.7087-1.0000	.0003/.0011	.0000/-0.0005

■ TF Drills • B/K125 Series • Grade K715™ • Through Coolant for Drill Diameters 3–20mm

Material Group	Cutting Speed – vc Range – m/min			Metric Recommended Feed Rate (f) by Diameter								
	min	Starting Value	max	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0	
	S 4	80	70	90	mm/r	—	—	0,03 - 0,08	0,03 - 0,08	0,03 - 0,08	0,08 - 0,15	0,08 - 0,15
Material Group	Cutting Speed – vc Range – SFM			Inch Recommended Feed Rate (f) by Diameter								
	min	Starting Value	max	1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	
	S 4	260	230	300	IPR	—	—	.001 - .003	.001 - .003	.001 - .003	.003 - .006	.003 - .006

HP Beyond™ Drills with Through Coolant for Stainless Steel



Primary Application

B/K210_HP Series Solid Carbide Drills are designed specifically for stainless steel applications, offering high performance and long tool life in regular steel and titanium materials. By combining unique Kennametal technologies, such as the HP-point, flute geometry, and a new post-coat treatment technology into one tool, the B2_HP Beyond is the ultimate high-volume production tool.

Features and Benefits

HP Drill-Point Design

- Low thrust prevents workpiece flexing.
- Excellent centering capabilities.

Unique Flute Design

- Improved chip evacuation.
- Capability to drill deeper holes in difficult-to-machine materials.

KCM15™ Beyond Grade

- A nanolayer, TiAlN-based coating with high wear resistance and low adhesion to stainless steel materials.
- The highly polished surface ensures superior chip evacuation even when low-pressure coolant is applied.
- The average metal removal rate and tool life dramatically improve (minimum 10–30%).

Customization

- Intermediate diameters available as engineered solutions.
- Length variations and step drills available as engineered solutions.
- High step diameter ratios and very complex step drill geometries are not recommended for austenitic stainless steel.
- Using Kennametal Slim Line Hydraulic Chucks together with standard B21_HP is recommended if workpiece contours need to be bypassed.

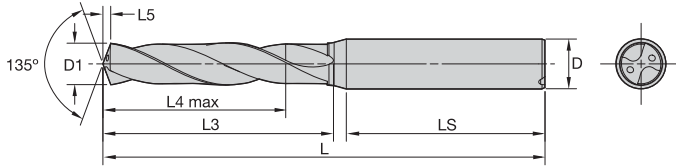
F-Shank

- For standard line items with F-shank, please refer to the e-catalog on www.kennametal.com.





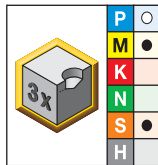
Solid Carbide Drills



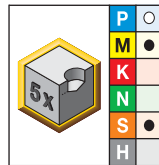
For information on L, L3, and L4 max, see the Solid Carbide foldout table.



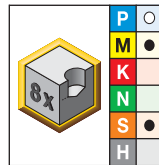
■ B210/B211/B212_HP • ~3 x D/~5 x D/~8 x D



short • KCM15



long • KCM15



extra long • KCM15

- first choice
- alternate choice

D1 diameter

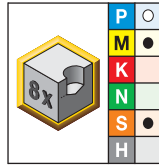
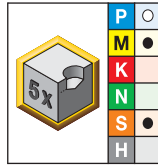
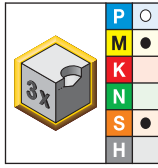
			D1 diameter						
			mm	in	fraction	wire size	L5	LS	D
B210A03000HP	B211A03000HP	B212A03000HP	3,000	.1181	—	—	0,6	36	6
B210A03048HP	B211A03048HP	B212A03048HP	3,048	.1200	—	31	0,6	36	6
—	B211A03100HP	—	3,100	.1220	—	—	0,6	36	6
B210A03175HP	B211A03175HP	B212A03175HP	3,175	.1250	1/8	—	0,6	36	6
—	B211A03200HP	—	3,200	.1260	—	—	0,6	36	6
B210A03264HP	B211A03264HP	B212A03264HP	3,264	.1285	—	30	0,6	36	6
B210A03300HP	B211A03300HP	B212A03300HP	3,300	.1299	—	—	0,6	36	6
—	B211A03400HP	—	3,400	.1339	—	—	0,6	36	6
B210A03455HP	B211A03455HP	B212A03455HP	3,455	.1360	—	29	0,7	36	6
B210A03500HP	B211A03500HP	B212A03500HP	3,500	.1378	—	—	0,7	36	6
B210A03571HP	B211A03571HP	B212A03571HP	3,571	.1406	9/64	—	0,7	36	6
—	B211A03600HP	—	3,600	.1417	—	—	0,7	36	6
B210A03658HP	B211A03658HP	B212A03658HP	3,658	.1440	—	27	0,7	36	6
B210A03700HP	B211A03700HP	B212A03700HP	3,700	.1457	—	—	0,7	36	6
B210A03734HP	B211A03734HP	B212A03734HP	3,734	.1470	—	26	0,7	36	6
—	B211A03800HP	B212A03800HP	3,800	.1496	—	—	0,7	36	6
—	B211A03861HP	—	3,861	.1520	—	24	0,7	36	6
—	B211A03900HP	—	3,900	.1535	—	—	0,7	36	6
B210A04000HP	B211A04000HP	B212A04000HP	4,000	.1575	—	—	0,8	36	6
B210A04039HP	B211A04039HP	B212A04039HP	4,039	.1590	—	21	0,8	36	6
B210A04090HP	B211A04090HP	B212A04090HP	4,090	.1610	—	20	0,8	36	6
—	B211A04100HP	B212A04100HP	4,100	.1614	—	—	0,8	36	6
B210A04200HP	B211A04200HP	B212A04200HP	4,200	.1654	—	—	0,8	36	6
B210A04217HP	B211A04217HP	B212A04217HP	4,217	.1660	—	19	0,8	36	6
—	B211A04300HP	—	4,300	.1693	—	—	0,8	36	6
B210A04366HP	B211A04366HP	B212A04366HP	4,366	.1719	11/64	—	0,8	36	6
—	B211A04400HP	—	4,400	.1732	—	—	0,8	36	6
B210A04500HP	B211A04500HP	B212A04500HP	4,500	.1772	—	—	0,8	36	6
B210A04700HP	B211A04700HP	B212A04700HP	4,700	.1850	—	13	0,9	36	6
—	B211A04800HP	B212A04800HP	4,800	.1890	—	12	0,9	36	6
B210A04852HP	B211A04852HP	B212A04852HP	4,852	.1910	—	11	0,9	36	6
—	B211A04900HP	—	4,900	.1929	—	—	0,9	36	6
B210A05000HP	B211A05000HP	B212A05000HP	5,000	.1969	—	—	0,9	36	6
B210A05100HP	B211A05100HP	B212A05100HP	5,100	.2008	—	—	1,0	36	6
B210A05106HP	B211A05106HP	B212A05106HP	5,106	.2010	—	7	1,0	36	6
B210A05159HP	B211A05159HP	B212A05159HP	5,159	.2031	13/64	—	1,0	36	6
B210A05200HP	B211A05200HP	—	5,200	.2047	—	—	1,0	36	6
—	B211A05300HP	—	5,300	.2087	—	—	1,0	36	6
B210A05400HP	B211A05400HP	—	5,400	.2126	—	—	1,0	36	6
B210A05410HP	—	—	5,410	.2130	—	3	1,0	36	6

(continued)

(B210/B211/B212_HP • ~3 x D/~5 x D/~8 x D continued)



Solid Carbide Drills

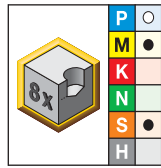
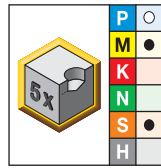
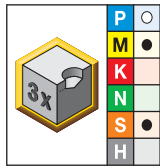


			D1 diameter						
short • KCM15	long • KCM15	extra long • KCM15	mm	in	fraction	wire size	L5	LS	D
B210A05500HP	B211A05500HP	B212A05500HP	5,500	.2165	—	—	1,0	36	6
—	B211A05600HP	—	5,600	.2205	—	—	1,1	36	6
B210A05616HP	B211A05616HP	B212A05616HP	5,616	.2211	—	2	1,1	36	6
—	B211A05700HP	—	5,700	.2244	—	—	1,1	36	6
B210A05800HP	B211A05800HP	B212A05800HP	5,800	.2283	—	—	1,1	36	6
—	B211A05900HP	—	5,900	.2323	—	—	1,1	36	6
B210A05954HP	B211A05954HP	—	5,954	.2344	15/64	—	1,1	36	6
B210A06000HP	B211A06000HP	B212A06000HP	6,000	.2362	—	—	1,1	36	6
B210A06100HP	B211A06100HP	—	6,100	.2402	—	—	1,1	36	8
B210A06200HP	B211A06200HP	—	6,200	.2441	—	—	1,2	36	8
B210A06300HP	B211A06300HP	—	6,300	.2480	—	—	1,2	36	8
B210A06350HP	B211A06350HP	B212A06350HP	6,350	.2500	1/4	E	1,2	36	8
—	B211A06400HP	—	6,400	.2520	—	—	1,2	36	8
B210A06500HP	B211A06500HP	B212A06500HP	6,500	.2559	—	—	1,2	36	8
B210A06528HP	—	—	6,528	.2570	—	F	1,2	36	8
—	B211A06600HP	—	6,600	.2598	—	—	1,2	36	8
B210A06630HP	B211A06630HP	B212A06630HP	6,630	.2610	—	G	1,2	36	8
B210A06700HP	B211A06700HP	—	6,700	.2638	—	—	1,3	36	8
B210A06800HP	B211A06800HP	B212A06800HP	6,800	.2677	—	—	1,3	36	8
B210A06900HP	B211A06900HP	—	6,900	.2717	—	—	1,3	36	8
B210A07000HP	B211A07000HP	B212A07000HP	7,000	.2756	—	—	1,3	36	8
B210A07100HP	B211A07100HP	—	7,100	.2795	—	—	1,3	36	8
—	B211A07200HP	—	7,200	.2835	—	—	1,3	36	8
—	B211A07300HP	—	7,300	.2874	—	—	1,4	36	8
—	B211A07400HP	—	7,400	.2913	—	—	1,4	36	8
B210A07500HP	B211A07500HP	B212A07500HP	7,500	.2953	—	—	1,4	36	8
—	B211A07600HP	—	7,600	.2992	—	—	1,4	36	8
—	B211A07700HP	—	7,700	.3031	—	—	1,4	36	8
B210A07800HP	B211A07800HP	B212A07800HP	7,800	.3071	—	—	1,5	36	8
—	B211A07900HP	—	7,900	.3110	—	—	1,5	36	8
B210A07938HP	—	—	7,938	.3125	5/16	—	1,5	36	8
B210A08000HP	B211A08000HP	B212A08000HP	8,000	.3150	—	—	1,5	36	8
B210A08100HP	B211A08100HP	—	8,100	.3189	—	—	1,5	40	10
B210A08200HP	B211A08200HP	—	8,200	.3228	—	—	1,5	40	10
—	B211A08300HP	—	8,300	.3268	—	—	1,6	40	10
B210A08400HP	B211A08400HP	B212A08400HP	8,400	.3307	—	—	1,6	40	10
B210A08433HP	—	—	8,433	.3320	—	Q	1,6	40	10
B210A08500HP	B211A08500HP	B212A08500HP	8,500	.3346	—	—	1,6	40	10
B210A08600HP	B211A08600HP	—	8,600	.3386	—	—	1,6	40	10
B210A08700HP	B211A08700HP	—	8,700	.3425	—	—	1,6	40	10
—	B211A08800HP	B212A08800HP	8,800	.3465	—	—	1,6	40	10
—	B211A08900HP	—	8,900	.3504	—	—	1,7	40	10
B210A09000HP	B211A09000HP	B212A09000HP	9,000	.3543	—	—	1,7	40	10
B210A09093HP	—	—	9,093	.3580	—	T	1,7	40	10
—	B211A09100HP	—	9,100	.3583	—	—	1,7	40	10
—	B211A09200HP	—	9,200	.3622	—	—	1,7	40	10
—	B211A09300HP	—	9,300	.3661	—	—	1,7	40	10
—	B211A09400HP	—	9,400	.3701	—	—	1,8	40	10
B210A09500HP	B211A09500HP	B212A09500HP	9,500	.3740	—	—	1,8	40	10
—	B211A09600HP	—	9,600	.3780	—	—	1,8	40	10
B210A09700HP	B211A09700HP	—	9,700	.3819	—	—	1,8	40	10
B210A09800HP	B211A09800HP	—	9,800	.3858	—	—	1,8	40	10

(continued)

(B210/B211/B212_HP • ~3 x D/~5 x D/~8 x D continued)

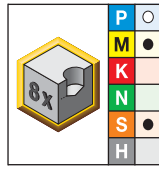
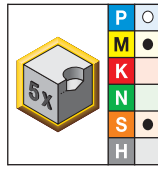
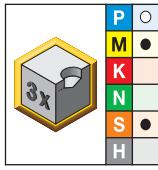
Solid Carbide Drills



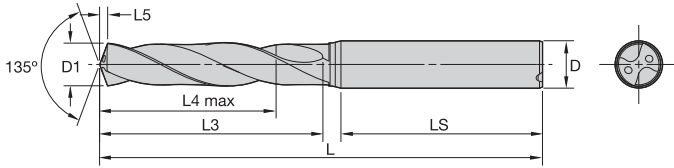
			D1 diameter						
short • KCM15	long • KCM15	extra long • KCM15	mm	in	fraction	wire size	L5	LS	D
–	B211A09900HP	–	9,900	.3898	–	–	1,8	40	10
B210A09921HP	–	–	9,921	.3906	25/64	–	1,9	40	10
B210A10000HP	B211A10000HP	B212A10000HP	10,000	.3937	–	–	1,9	40	10
–	B211A10100HP	–	10,100	.3976	–	–	1,9	45	12
B210A10200HP	B211A10200HP	B212A10200HP	10,200	.4016	–	–	1,9	45	12
–	B211A10300HP	–	10,300	.4055	–	–	1,9	45	12
B210A10400HP	B211A10400HP	–	10,400	.4094	–	–	1,9	45	12
B210A10500HP	B211A10500HP	B212A10500HP	10,500	.4134	–	–	2,0	45	12
–	B211A10600HP	–	10,600	.4173	–	–	2,0	45	12
–	B211A10700HP	–	10,700	.4213	–	–	2,0	45	12
B210A10716HP	–	–	10,716	.4219	27/64	–	2,0	45	12
B210A10800HP	B211A10800HP	–	10,800	.4252	–	–	2,0	45	12
–	B211A10900HP	–	10,900	.4291	–	–	2,0	45	12
B210A11000HP	B211A11000HP	B212A11000HP	11,000	.4331	–	–	2,1	45	12
–	B211A11100HP	–	11,100	.4370	–	–	2,1	45	12
B210A11200HP	B211A11200HP	–	11,200	.4409	–	–	2,1	45	12
–	B211A11400HP	–	11,400	.4488	–	–	2,1	45	12
B210A11500HP	B211A11500HP	–	11,500	.4528	–	–	2,1	45	12
B210A11509HP	–	–	11,509	.4531	29/64	–	2,1	45	12
–	B211A11600HP	–	11,600	.4567	–	–	2,2	45	12
–	B211A11700HP	–	11,700	.4606	–	–	2,2	45	12
–	B211A11800HP	B212A11800HP	11,800	.4646	–	–	2,2	45	12
–	B211A11900HP	–	11,900	.4685	–	–	2,2	45	12
B210A12000HP	B211A12000HP	B212A12000HP	12,000	.4724	–	–	2,2	45	12
–	B211A12100HP	–	12,100	.4764	–	–	2,3	45	14
B210A12200HP	B211A12200HP	–	12,200	.4803	–	–	2,3	45	14
–	B211A12300HP	–	12,300	.4843	–	–	2,3	45	14
B210A12304HP	–	–	12,304	.4844	31/64	–	2,3	45	14
B210A12500HP	B211A12500HP	B212A12500HP	12,500	.4921	–	–	2,3	45	14
–	B211A12600HP	–	12,600	.4961	–	–	2,3	45	14
B210A12700HP	B211A12700HP	B212A12700HP	12,700	.5000	1/2	–	2,4	45	14
B210A12800HP	B211A12800HP	–	12,800	.5039	–	–	2,4	45	14
–	B211A12900HP	–	12,900	.5079	–	–	2,4	45	14
B210A13000HP	B211A13000HP	B212A13000HP	13,000	.5118	–	–	2,4	45	14
–	B211A13100HP	–	13,100	.5157	–	–	2,4	45	14
–	B211A13200HP	–	13,200	.5197	–	–	2,5	45	14
–	B211A13300HP	–	13,300	.5236	–	–	2,5	45	14
B210A13495HP	–	–	13,495	.5313	17/32	–	2,5	45	14
B210A13500HP	B211A13500HP	B212A13500HP	13,500	.5315	–	–	2,5	45	14
–	B211A13800HP	–	13,800	.5433	–	–	2,6	45	14

(continued)

(B210/B211/B212_HP • ~3 x D/~5 x D/~8 x D continued)



			D1 diameter				L5	LS	D
			mm	in	fraction	wire size			
short • KCM15	long • KCM15	extra long • KCM15							
—	B211A13900HP	—	13,900	.5472	—	—	2,6	45	14
B210A14000HP	B211A14000HP	B212A14000HP	14,000	.5512	—	—	2,6	45	14
B210A14100HP	B211A14100HP	—	14,100	.5551	—	—	2,6	48	16
B210A14200HP	B211A14200HP	—	14,200	.5591	—	—	2,6	48	16
—	B211A14300HP	—	14,300	.5630	—	—	2,7	48	16
—	B211A14400HP	—	14,400	.5669	—	—	2,7	48	16
B210A14500HP	B211A14500HP	—	14,500	.5709	—	—	2,7	48	16
—	B211A14600HP	—	14,600	.5748	—	—	2,7	48	16
—	B211A14800HP	—	14,800	.5827	—	—	2,8	48	16
B210A15000HP	B211A15000HP	—	15,000	.5906	—	—	2,8	48	16
—	B211A15100HP	—	15,100	.5945	—	—	2,8	48	16
—	B211A15200HP	—	15,200	.5984	—	—	2,8	48	16
—	B211A15300HP	—	15,300	.6024	—	—	2,8	48	16
—	B211A15400HP	—	15,400	.6063	—	—	2,9	48	16
B210A15500HP	B211A15500HP	—	15,500	.6102	—	—	2,9	48	16
—	B211A15600HP	—	15,600	.6142	—	—	2,9	48	16
—	B211A15700HP	—	15,700	.6181	—	—	2,9	48	16
—	B211A15800HP	—	15,800	.6220	—	—	2,9	48	16
B210A15875HP	B211A15875HP	B212A15875HP	15,875	.6250	5/8	—	3,0	48	16
—	B211A15900HP	—	15,900	.6260	—	—	3,0	48	16
B210A16000HP	B211A16000HP	B212A16000HP	16,000	.6299	—	—	3,0	48	16
—	B211A16100HP	—	16,100	.6339	—	—	3,0	48	18
B210A16500HP	B211A16500HP	—	16,500	.6496	—	—	3,1	48	18
B210A16670HP	—	—	16,670	.6563	21/32	—	3,1	48	18
B210A17000HP	B211A17000HP	—	17,000	.6693	—	—	3,2	48	18
B210A17500HP	B211A17500HP	—	17,500	.6890	—	—	3,3	48	18
—	B211A17700HP	—	17,700	.6969	—	—	3,3	48	18
B210A18000HP	B211A18000HP	—	18,000	.7087	—	—	3,3	48	18
—	B211A18400HP	—	18,400	.7244	—	—	3,4	50	20
B210A18500HP	B211A18500HP	—	18,500	.7283	—	—	3,4	50	20
B210A19000HP	B211A19000HP	—	19,000	.7480	—	—	3,5	50	20
B210A19050HP	B211A19050HP	B212A19050HP	19,050	.7500	3/4	—	3,5	50	20
—	B211A19100HP	—	19,100	.7520	—	—	3,5	50	20
—	B211A19200HP	—	19,200	.7559	—	—	3,6	50	20
—	B211A19300HP	—	19,300	.7598	—	—	3,6	50	20
B210A19500HP	B211A19500HP	—	19,500	.7677	—	—	3,6	50	20
B210A20000HP	B211A20000HP	—	20,000	.7874	—	—	3,7	50	20
—	B211A20500HP	—	20,500	.8071	—	—	3,8	50	20
—	B211A21000HP	—	21,000	.8268	—	—	3,9	50	20

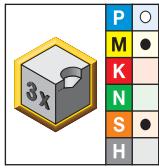


For information on L, L3, and L4 max, see the Solid Carbide foldout table.

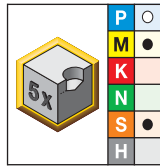


beyond

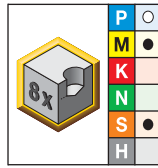
■ K210/K211/K212_HP • ~3 x D/~5 x D/~8 x D



short • KCM15



regular • KCM15



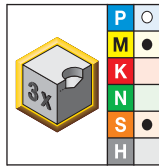
long • KCM15

- first choice
- alternate choice

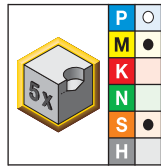
			D1 diameter				L5	LS	D
			in	mm	fraction	wire size			
K210A01563HP	K211A01563HP	K212A01563HP	.1563	3,969	5/32	—	.030	1.44	.1875
—	K211A01636HP	—	.1636	4,155	—	—	.031	1.44	.1875
—	K211A01803HP	—	.1803	4,580	—	—	.034	1.44	.1875
—	K211A01820HP	—	.1820	4,623	—	14	.034	1.44	.1875
—	K211A01850HP	—	.1850	4,699	—	13	.035	1.44	.1875
K210A01875HP	K211A01875HP	K212A01875HP	.1875	4,762	3/16	—	.035	1.44	.1875
—	K211A02071HP	—	.2071	5,260	—	—	.039	1.44	.2500
—	K211A02130HP	—	.2130	5,410	—	3	.040	1.44	.2500
K210A02188HP	K211A02188HP	K212A02188HP	.2187	5,556	—	—	.041	1.44	.2500
—	K211A02211HP	—	.2211	5,616	—	2	.042	1.44	.2500
K210A02500HP	K211A02500HP	K212A02500HP	.2500	6,350	1/4	E	.047	1.44	.2500
—	K211A02570HP	—	.2570	6,528	—	F	.048	1.52	.3125
—	K211A02610HP	—	.2610	6,629	—	G	.049	1.52	.3125
—	K211A02649HP	—	.2649	6,728	—	—	.050	1.52	.3125
K210A02656HP	K211A02656HP	K212A02656HP	.2656	6,747	17/64	—	.050	1.52	.3125
—	K211A02720HP	—	.2720	6,909	—	I	.051	1.52	.3125
—	K211A02770HP	—	.2770	7,036	—	J	.052	1.52	.3125
K210A02813HP	K211A02813HP	K212A02813HP	.2813	7,144	9/32	—	.053	1.52	.3125
K210A02969HP	K211A02969HP	K212A02969HP	.2969	7,541	19/64	—	.056	1.52	.3125
K210A03125HP	K211A03125HP	K212A03125HP	.3125	7,938	5/16	—	.058	1.52	.3125
—	K211A03230HP	—	.3230	8,204	—	P	.060	1.59	.3750
K210A03281HP	K211A03281HP	K212A03281HP	.3281	8,334	21/64	—	.061	1.59	.3750
—	K211A03320HP	—	.3320	8,433	—	Q	.062	1.59	.3750
—	K211A03390HP	—	.3390	8,611	—	R	.063	1.59	.3750
K210A03438HP	K211A03438HP	K212A03438HP	.3437	8,731	—	—	.064	1.59	.3750
K210A03594HP	K211A03594HP	K212A03594HP	.3594	9,128	23/64	—	.067	1.59	.3750
—	K211A03680HP	—	.3680	9,347	—	U	.069	1.59	.3750
K210A03750HP	K211A03750HP	K212A03750HP	.3750	9,525	3/8	—	.070	1.59	.3750
—	K211A03770HP	—	.3770	9,576	—	V	.070	1.67	.4375
—	K211A03820HP	—	.3820	9,703	—	—	.071	1.67	.4375
K210A03906HP	K211A03906HP	K212A03906HP	.3906	9,922	25/64	—	.073	1.67	.4375
—	K211A03970HP	—	.3970	10,084	—	X	.074	1.67	.4375
K210A04063HP	K211A04063HP	K212A04063HP	.4063	10,319	13/32	—	.076	1.67	.4375
K210A04219HP	K211A04219HP	K212A04219HP	.4219	10,716	27/64	—	.079	1.67	.4375

(continued)

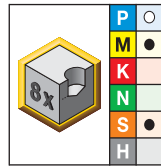
(K210/K211/K212_HP • ~3 x D/-5 x D/-8 x D continued)



short • KCM15



regular • KCM15





long • KCM15

			D1 diameter				L5	LS	D
			in	mm	fraction	wire size			
—	K211A04341HP	—	.4341	11,026	—	—	.081	1.67	.4375
K210A04375HP	K211A04375HP	K212A04375HP	.4375	11,112	7/16	—	.082	1.67	.4375
K210A04531HP	K211A04531HP	K212A04531HP	.4531	11,509	29/64	—	.084	1.79	.5000
—	K211A04571HP	—	.4571	11,610	—	—	.085	1.79	.5000
K210A04688HP	K211A04688HP	K212A04688HP	.4687	11,906	—	—	.087	1.79	.5000
K210A04844HP	K211A04844HP	K212A04844HP	.4844	12,303	31/64	—	.090	1.79	.5000
—	K211A04911HP	—	.4911	12,474	—	—	.092	1.79	.5000
K210A05000HP	K211A05000HP	K212A05000HP	.5000	12,700	1/2	—	.093	1.79	.5000
—	K211A05080HP	—	.5080	12,903	—	—	.095	1.79	.5625
—	K211A05149HP	—	.5149	13,078	—	—	.096	1.79	.5625
—	K211A05156HP	—	.5156	13,097	33/64	—	.096	1.79	.5625
—	K211A05471HP	—	.5471	13,896	—	—	.102	1.79	.5625
K210A05625HP	K211A05625HP	K212A05625HP	.5625	14,288	9/16	—	.105	1.79	.5625
—	K211A05774HP	—	.5774	14,666	—	—	.107	1.91	.6250
K210A06250HP	K211A06250HP	K212A06250HP	.6250	15,875	5/8	—	.116	1.91	.6250
—	K211A06330HP	K212A06330HP	.6330	16,078	—	—	.118	1.91	.6875
—	K211A06563HP	—	.6563	16,669	21/32	—	.122	1.91	.6875
—	K211A06562HP	—	.6563	16,669	21/32	—	.122	1.91	.6875
—	K211A06643HP	—	.6643	16,873	—	—	.124	1.91	.6875
K210A06875HP	K211A06875HP	K212A06875HP	.6875	17,462	11/16	—	.128	1.91	.6875
—	K211A06964HP	—	.6964	17,689	—	—	.129	1.99	.7500
K210A07500HP	K211A07500HP	K212A07500HP	.7500	19,050	3/4	—	.139	1.99	.7500
—	K211A07580HP	K212A07580HP	.7580	19,253	—	—	.141	1.99	.8125
—	K211A07656HP	—	.7656	19,447	49/64	—	.142	1.99	.8125
—	K211A07797HP	—	.7797	19,804	—	—	.145	1.99	.8125
—	K211A08138HP	—	.8138	20,670	—	—	.151	2.07	.8750
—	K211A08830HP	—	.8830	22,428	—	—	.164	2.15	.9375

Tolerance • Metric			Tolerance • Inch		
nominal size range	D1 tolerance m7	D tolerance h6	nominal size range	D1 tolerance m7	D tolerance h6
>3-6	0,004/0,016	0,000/-0,008	>.1181-.2362	.0002/.0006	.0000/-.0003
>6-10	0,006/0,021	0,000/-0,009	>.2362-.3937	.0002/.0008	.0000/-.0004
>10-18	0,007/0,025	0,000/-0,011	>.3937-.7087	.0003/.0010	.0000/-.0004
>18-25,4	0,008/0,029	0,000/-0,013	>.7087-1.0000	.0003/.0011	.0000/-.0005

■ HP Drills • B/K21_HP Series • Grade KCM15™ • Through Coolant for Drill Diameters 3–20mm

													
		Cutting Speed – vc			Metric								
		Range – m/min			Recommended Feed Rate (f) by Diameter								
Material Group		min	Starting Value	max		3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
P	1	110	160	210	mm/r	0,05 - 0,13	0,08 - 0,19	0,11 - 0,24	0,14 - 0,30	0,16 - 0,35	0,18 - 0,39	0,20 - 0,46	0,23 - 0,51
	2	130	170	210	mm/r	0,05 - 0,13	0,08 - 0,17	0,11 - 0,20	0,14 - 0,24	0,16 - 0,28	0,18 - 0,32	0,20 - 0,37	0,23 - 0,41
	3	110	150	190	mm/r	0,08 - 0,13	0,12 - 0,19	0,14 - 0,24	0,17 - 0,30	0,20 - 0,35	0,22 - 0,39	0,26 - 0,46	0,29 - 0,51
	4	80	120	150	mm/r	0,08 - 0,12	0,11 - 0,18	0,12 - 0,23	0,15 - 0,28	0,17 - 0,33	0,19 - 0,37	0,22 - 0,43	0,25 - 0,48
	5	60	80	90	mm/r	0,03 - 0,11	0,04 - 0,11	0,05 - 0,11	0,05 - 0,14	0,08 - 0,18	0,11 - 0,21	0,14 - 0,24	0,16 - 0,26
	6	70	120	170	mm/r	0,05 - 0,11	0,08 - 0,14	0,11 - 0,17	0,13 - 0,21	0,15 - 0,24	0,17 - 0,27	0,19 - 0,33	0,22 - 0,36
M	1	60	80	90	mm/r	0,03 - 0,08	0,06 - 0,14	0,08 - 0,19	0,11 - 0,21	0,13 - 0,23	0,14 - 0,24	0,16 - 0,26	0,19 - 0,29
	2	50	80	80	mm/r	0,03 - 0,08	0,06 - 0,14	0,08 - 0,19	0,11 - 0,21	0,13 - 0,23	0,14 - 0,24	0,16 - 0,26	0,19 - 0,29
	3	40	60	70	mm/r	0,03 - 0,08	0,06 - 0,14	0,08 - 0,19	0,11 - 0,21	0,13 - 0,23	0,14 - 0,24	0,16 - 0,26	0,19 - 0,29
S	1	20	20	20	mm/r	0,03 - 0,08	0,04 - 0,09	0,05 - 0,11	0,05 - 0,11	0,08 - 0,14	0,11 - 0,16	0,14 - 0,19	0,16 - 0,21
	2	10	20	30	mm/r	0,03 - 0,11	0,04 - 0,11	0,05 - 0,11	0,05 - 0,11	0,08 - 0,14	0,11 - 0,16	0,14 - 0,19	0,16 - 0,21
	4	30	50	60	mm/r	0,02 - 0,04	0,04 - 0,06	0,05 - 0,07	0,05 - 0,07	0,07 - 0,11	0,07 - 0,11	0,11 - 0,13	0,11 - 0,13
		Cutting Speed – vc			Inch								
		Range – SFM			Recommended Feed Rate (f) by Diameter								
Material Group		min	Starting Value	max		1/8 .125	3/16 .188	1/4 .250	5/16 .313	3/8 .375	1/2 .500	5/8 .625	3/4 .750
P	1	360	520	690	IPR	.002 - .005	.003 - .007	.004 - .009	.006 - .012	.006 - .014	.007 - .015	.008 - .018	.009 - .020
	2	430	560	690	IPR	.002 - .005	.003 - .007	.004 - .008	.006 - .009	.006 - .011	.007 - .013	.008 - .015	.009 - .016
	3	360	490	620	IPR	.003 - .005	.005 - .007	.006 - .009	.007 - .012	.008 - .014	.009 - .015	.010 - .018	.011 - .020
	4	260	390	490	IPR	.003 - .005	.004 - .007	.005 - .009	.006 - .011	.007 - .013	.007 - .015	.009 - .017	.010 - .019
	5	200	260	300	IPR	.001 - .004	.002 - .004	.002 - .004	.002 - .006	.003 - .007	.004 - .008	.006 - .009	.006 - .010
	6	230	390	560	IPR	.002 - .004	.003 - .006	.004 - .007	.005 - .008	.006 - .009	.007 - .011	.007 - .013	.009 - .014
M	1	200	260	300	IPR	.001 - .003	.002 - .006	.003 - .007	.004 - .008	.005 - .009	.006 - .009	.006 - .010	.007 - .011
	2	160	260	260	IPR	.001 - .003	.002 - .006	.003 - .007	.004 - .008	.005 - .009	.006 - .009	.006 - .010	.007 - .011
	3	130	200	230	IPR	.001 - .003	.002 - .006	.003 - .007	.004 - .008	.005 - .009	.006 - .009	.006 - .010	.007 - .011
S	1	70	70	70	IPR	.001 - .003	.002 - .004	.002 - .004	.002 - .004	.003 - .006	.004 - .006	.006 - .007	.006 - .008
	2	30	70	100	IPR	.001 - .004	.002 - .004	.002 - .004	.002 - .004	.003 - .006	.004 - .006	.006 - .007	.006 - .008
	4	100	160	200	IPR	.001 - .002	.002 - .002	.002 - .003	.002 - .003	.003 - .004	.003 - .004	.004 - .005	.004 - .005



HP Beyond™ Drills for Steel



Primary Application

B221_HP Series Solid Carbide Drills offer the highest metal removal rates and longest tool life in steel and iron materials when dry cutting or using external flood coolant. Dry drilling up to 5 x D possible.

B224_HP Series Solid Carbide Drills are ideal for super high-speed drilling of unalloyed and alloyed steel. Achieve 100% higher cutting speed without compromising tool life. Operate these drills with standard through coolant or MQL.

By combining unique Kennametal technologies, such as the HP-point, flute geometry, and a new Beyond grade technology into one tool, the B2_HP Beyond is the ultimate high-volume production tool.

Features and Benefits

HP Drill-Point Design

- Low thrust prevents workpiece flexing.
- Excellent centering capabilities.

Unique Flute Design

- Improved chip evacuation in dry and mid L/D drilling operations.
- Better hole surface quality.

KCPK15™ Beyond Grade

- The grade is a multilayer, TiAlN-based coating with high hot hardness. High cutting speeds enable use in MQL applications.
- The highly polished surface ensures superior chip evacuation even when low-pressure coolant is applied.
- The average metal removal rate and tool life performance improved dramatically (10–30%).

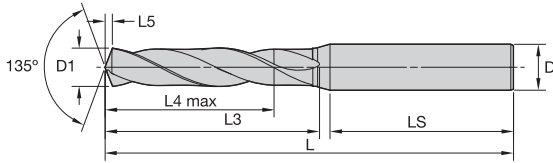
Customization

- Intermediate diameters available as semi-standards.
- Length variations and step drills available as engineered solutions.
- For holes deeper than 5 x D, internal coolant is recommended.
- Using Kennametal Slim Line Hydraulic Chucks together with standard B22_HP is recommended if workpiece contours need to be bypassed.

F-Shank

- For standard line items with F-shank please refer to the e-catalog on www.kennametal.com.

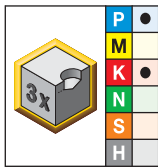




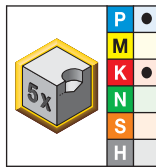
For information on L, L3, and L4 max, see the Solid Carbide foldout table.



■ B221/B222_HP • ~3 x D/~5 x D



short • KCPK15



long • KCPK15

- first choice
- alternate choice

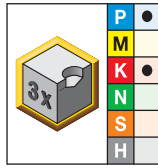
D1 diameter

		mm	in	fraction	wire size	L5	LS	D
B221A03000HP	B222A03000HP	3,000	.1181	—	—	0,6	36	6
B221A03048HP	B222A03048HP	3,048	.1200	—	31	0,6	36	6
B221A03100HP	—	3,100	.1220	—	—	0,6	36	6
B221A03175HP	B222A03175HP	3,175	.1250	1/8	—	0,6	36	6
B221A03200HP	—	3,200	.1260	—	—	0,6	36	6
B221A03264HP	B222A03264HP	3,264	.1285	—	30	0,6	36	6
B221A03300HP	B222A03300HP	3,300	.1299	—	—	0,6	36	6
B221A03400HP	—	3,400	.1339	—	—	0,6	36	6
B221A03455HP	B222A03455HP	3,455	.1360	—	29	0,7	36	6
B221A03500HP	B222A03500HP	3,500	.1378	—	—	0,7	36	6
B221A03571HP	B222A03571HP	3,571	.1406	9/64	—	0,7	36	6
B221A03600HP	—	3,600	.1417	—	—	0,7	36	6
B221A03658HP	—	3,658	.1440	—	27	0,7	36	6
B221A03700HP	B222A03700HP	3,700	.1457	—	—	0,7	36	6
B221A03734HP	—	3,734	.1470	—	26	0,7	36	6
B221A03800HP	B222A03800HP	3,800	.1496	—	—	0,7	36	6
B221A03900HP	—	3,900	.1535	—	—	0,7	36	6
B221A03970HP	B222A03970HP	3,970	.1563	5/32	—	0,7	36	6
B221A04000HP	B222A04000HP	4,000	.1575	—	—	0,8	36	6
B221A04039HP	—	4,039	.1590	—	21	0,8	36	6
B221A04090HP	—	4,090	.1610	—	20	0,8	36	6
B221A04100HP	—	4,100	.1614	—	—	0,8	36	6
B221A04200HP	B222A04200HP	4,200	.1654	—	—	0,8	36	6
B221A04217HP	—	4,217	.1660	—	19	0,8	36	6
B221A04300HP	—	4,300	.1693	—	—	0,8	36	6
B221A04366HP	B222A04366HP	4,366	.1719	11/64	—	0,8	36	6
B221A04400HP	—	4,400	.1732	—	—	0,8	36	6
B221A04500HP	B222A04500HP	4,500	.1772	—	—	0,8	36	6
B221A04600HP	B222A04600HP	4,600	.1811	—	—	0,9	36	6
B221A04623HP	—	4,623	.1820	—	14	0,9	36	6
B221A04700HP	—	4,700	.1850	—	13	0,9	36	6
B221A04763HP	B222A04763HP	4,763	.1875	3/16	—	0,9	36	6
B221A04800HP	B222A04800HP	4,800	.1890	—	12	0,9	36	6
B221A04852HP	—	4,852	.1910	—	11	0,9	36	6
B221A04900HP	—	4,900	.1929	—	—	0,9	36	6
B221A05000HP	B222A05000HP	5,000	.1969	—	—	0,9	36	6
B221A05100HP	B222A05100HP	5,100	.2008	—	—	1,0	36	6
B221A05106HP	B222A05106HP	5,106	.2010	—	7	1,0	36	6
B221A05159HP	B222A05159HP	5,159	.2031	13/64	—	1,0	36	6
B221A05200HP	—	5,200	.2047	—	—	1,0	36	6

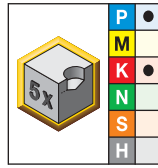
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(B221/B222_HP • ~3 x D/-5 x D continued)

Solid Carbide Drills



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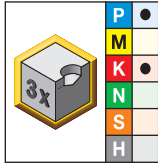
long • KCPK15

		D1 diameter				L5	LS	D
		mm	in	fraction	wire size			
B221A05300HP	—	5,300	.2087	—	—	1,0	36	6
B221A05400HP	—	5,400	.2126	—	—	1,0	36	6
B221A05410HP	B222A05410HP	5,410	.2130	—	3	1,0	36	6
B221A05500HP	B222A05500HP	5,500	.2165	—	—	1,0	36	6
B221A05558HP	B222A05558HP	5,558	.2188	7/32	—	1,0	36	6
B221A05600HP	—	5,600	.2205	—	—	1,1	36	6
B221A05616HP	—	5,616	.2211	—	2	1,1	36	6
B221A05700HP	—	5,700	.2244	—	—	1,1	36	6
B221A05800HP	B222A05800HP	5,800	.2283	—	—	1,1	36	6
B221A05900HP	—	5,900	.2323	—	—	1,1	36	6
B221A05954HP	B222A05954HP	5,954	.2344	15/64	—	1,1	36	6
B221A06000HP	B222A06000HP	6,000	.2362	—	—	1,1	36	6
B221A06100HP	—	6,100	.2402	—	—	1,1	36	8
B221A06200HP	—	6,200	.2441	—	—	1,2	36	8
B221A06300HP	—	6,300	.2480	—	—	1,2	36	8
B221A06350HP	B222A06350HP	6,350	.2500	1/4	E	1,2	36	8
B221A06400HP	—	6,400	.2520	—	—	1,2	36	8
B221A06500HP	B222A06500HP	6,500	.2559	—	—	1,2	36	8
B221A06528HP	B222A06528HP	6,528	.2570	—	F	1,2	36	8
B221A06600HP	—	6,600	.2598	—	—	1,2	36	8
B221A06630HP	—	6,630	.2610	—	G	1,2	36	8
B221A06700HP	B222A06700HP	6,700	.2638	—	—	1,3	36	8
B221A06746HP	B222A06746HP	6,746	.2656	17/64	—	1,3	36	8
B221A06800HP	B222A06800HP	6,800	.2677	—	—	1,3	36	8
B221A06900HP	—	6,900	.2717	—	—	1,3	36	8
B221A07000HP	B222A07000HP	7,000	.2756	—	—	1,3	36	8
B221A07100HP	—	7,100	.2795	—	—	1,3	36	8
B221A07145HP	B222A07145HP	7,145	.2813	9/32	—	1,3	36	8
B221A07200HP	—	7,200	.2835	—	—	1,3	36	8
B221A07300HP	—	7,300	.2874	—	—	1,4	36	8
B221A07400HP	—	7,400	.2913	—	—	1,4	36	8
B221A07500HP	B222A07500HP	7,500	.2953	—	—	1,4	36	8
B221A07541HP	B222A07541HP	7,541	.2969	19/64	—	1,4	36	8
B221A07600HP	—	7,600	.2992	—	—	1,4	36	8
B221A07700HP	—	7,700	.3031	—	—	1,4	36	8
B221A07800HP	B222A07800HP	7,800	.3071	—	—	1,5	36	8
B221A07900HP	—	7,900	.3110	—	—	1,5	36	8
B221A07938HP	B222A07938HP	7,938	.3125	5/16	—	1,5	36	8
B221A08000HP	B222A08000HP	8,000	.3150	—	—	1,5	36	8
B221A08100HP	—	8,100	.3189	—	—	1,5	40	10
B221A08200HP	B222A08200HP	8,200	.3228	—	—	1,5	40	10
B221A08300HP	—	8,300	.3268	—	—	1,6	40	10
B221A08334HP	B222A08334HP	8,334	.3281	21/64	—	1,6	40	10
B221A08400HP	—	8,400	.3307	—	—	1,6	40	10
B221A08433HP	B222A08433HP	8,433	.3320	—	Q	1,6	40	10
B221A08500HP	B222A08500HP	8,500	.3346	—	—	1,6	40	10
B221A08600HP	—	8,600	.3386	—	—	1,6	40	10
B221A08700HP	—	8,700	.3425	—	—	1,6	40	10
B221A08733HP	B222A08733HP	8,733	.3438	11/32	—	1,6	40	10
B221A08800HP	B222A08800HP	8,800	.3465	—	—	1,6	40	10
B221A08900HP	—	8,900	.3504	—	—	1,7	40	10
B221A09000HP	B222A09000HP	9,000	.3543	—	—	1,7	40	10

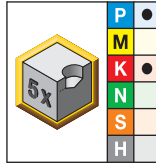
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(B221/B222_HP • ~3 x D/~5 x D continued)

Solid Carbide Drills



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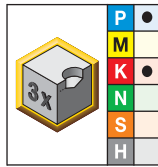


long • KCPK15

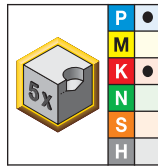
		D1 diameter				L5	LS	D
		mm	in	fraction	wire size			
B221A09100HP	—	9,100	.3583	—	—	1,7	40	10
B221A09129HP	B222A09129HP	9,129	.3594	23/64	—	1,7	40	10
B221A09200HP	—	9,200	.3622	—	—	1,7	40	10
B221A09300HP	B222A09300HP	9,300	.3661	—	—	1,7	40	10
B221A09347HP	B222A09347HP	9,347	.3680	—	U	1,7	40	10
B221A09400HP	—	9,400	.3701	—	—	1,8	40	10
B221A09500HP	B222A09500HP	9,500	.3740	—	—	1,8	40	10
B221A09525HP	B222A09525HP	9,525	.3750	3/8	—	1,8	40	10
B221A09600HP	—	9,600	.3780	—	—	1,8	40	10
B221A09700HP	—	9,700	.3819	—	—	1,8	40	10
B221A09800HP	B222A09800HP	9,800	.3858	—	—	1,8	40	10
B221A09900HP	—	9,900	.3898	—	—	1,8	40	10
B221A09921HP	B222A09921HP	9,921	.3906	25/64	—	1,9	40	10
B221A10000HP	B222A10000HP	10,000	.3937	—	—	1,9	40	10
B221A10100HP	—	10,100	.3976	—	—	1,9	45	12
B221A10200HP	B222A10200HP	10,200	.4016	—	—	1,9	45	12
B221A10300HP	—	10,300	.4055	—	—	1,9	45	12
B221A10320HP	B222A10320HP	10,320	.4063	13/32	—	1,9	45	12
B221A10400HP	—	10,400	.4094	—	—	1,9	45	12
B221A10500HP	B222A10500HP	10,500	.4134	—	—	2,0	45	12
B221A10600HP	—	10,600	.4173	—	—	2,0	45	12
B221A10700HP	—	10,700	.4213	—	—	2,0	45	12
B221A10716HP	B222A10716HP	10,716	.4219	27/64	—	2,0	45	12
B221A10800HP	B222A10800HP	10,800	.4252	—	—	2,0	45	12
B221A10900HP	—	10,900	.4291	—	—	2,0	45	12
B221A11000HP	B222A11000HP	11,000	.4331	—	—	2,1	45	12
B221A11100HP	—	11,100	.4370	—	—	2,1	45	12
B221A11113HP	B222A11113HP	11,113	.4375	7/16	—	2,1	45	12
B221A11200HP	—	11,200	.4409	—	—	2,1	45	12
B221A11300HP	—	11,300	.4449	—	—	2,1	45	12
B221A11400HP	—	11,400	.4488	—	—	2,1	45	12
B221A11500HP	B222A11500HP	11,500	.4528	—	—	2,1	45	12
B221A11509HP	B222A11509HP	11,509	.4531	29/64	—	2,1	45	12
B221A11600HP	—	11,600	.4567	—	—	2,2	45	12
B221A11700HP	—	11,700	.4606	—	—	2,2	45	12
B221A11800HP	—	11,800	.4646	—	—	2,2	45	12
B221A11900HP	—	11,900	.4685	—	—	2,2	45	12
B221A11908HP	B222A11908HP	11,908	.4688	15/32	—	2,2	45	12
B221A12000HP	B222A12000HP	12,000	.4724	—	—	2,2	45	12
B221A12100HP	—	12,100	.4764	—	—	2,3	45	14
B221A12200HP	—	12,200	.4803	—	—	2,3	45	14
B221A12300HP	—	12,300	.4843	—	—	2,3	45	14
—	B222A12304HP	12,304	.4844	31/64	—	2,3	45	14
B221A12400HP	—	12,400	.4882	—	—	2,3	45	14
B221A12500HP	B222A12500HP	12,500	.4921	—	—	2,3	45	14
B221A12600HP	—	12,600	.4961	—	—	2,3	45	14
B221A12700HP	B222A12700HP	12,700	.5000	1/2	—	2,4	45	14
B221A12800HP	—	12,800	.5039	—	—	2,4	45	14
B221A12900HP	—	12,900	.5079	—	—	2,4	45	14
B221A13000HP	B222A13000HP	13,000	.5118	—	—	2,4	45	14
B221A13100HP	—	13,100	.5157	—	—	2,4	45	14
B221A13200HP	—	13,200	.5197	—	—	2,5	45	14

(continued)

(B221/B222_HP • ~3 x D/-5 x D continued)



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		D1 diameter				L5	LS	D
		mm	in	fraction	wire size			
B221A13300HP	—	13,300	.5236	—	—	2,5	45	14
B221A13500HP	B222A13500HP	13,500	.5315	—	—	2,5	45	14
B221A13600HP	—	13,600	.5354	—	—	2,5	45	14
B221A13700HP	—	13,700	.5394	—	—	2,6	45	14
B221A13800HP	—	13,800	.5433	—	—	2,6	45	14
B221A13891HP	—	13,891	.5469	35/64	—	2,6	45	14
B221A13900HP	—	13,900	.5472	—	—	2,6	45	14
B221A14000HP	B222A14000HP	14,000	.5512	—	—	2,6	45	14
B221A14100HP	—	14,100	.5551	—	—	2,6	48	16
B221A14200HP	—	14,200	.5591	—	—	2,6	48	16
B221A14288HP	B222A14288HP	14,288	.5625	9/16	—	2,7	48	16
B221A14300HP	—	14,300	.5630	—	—	2,7	48	16
B221A14400HP	—	14,400	.5669	—	—	2,7	48	16
B221A14500HP	B222A14500HP	14,500	.5709	—	—	2,7	48	16
B221A14600HP	—	14,600	.5748	—	—	2,7	48	16
B221A14684HP	—	14,684	.5781	37/64	—	2,7	48	16
B221A14700HP	—	14,700	.5787	—	—	2,7	48	16
B221A14800HP	—	14,800	.5827	—	—	2,8	48	16
B221A14900HP	—	14,900	.5866	—	—	2,8	48	16
B221A15000HP	B222A15000HP	15,000	.5906	—	—	2,8	48	16
B221A15083HP	—	15,083	.5938	19/32	—	2,8	48	16
B221A15100HP	—	15,100	.5945	—	—	2,8	48	16
B221A15200HP	—	15,200	.5984	—	—	2,8	48	16
B221A15300HP	—	15,300	.6024	—	—	2,8	48	16
B221A15400HP	—	15,400	.6063	—	—	2,9	48	16
B221A15479HP	—	15,479	.6094	39/64	—	2,9	48	16
B221A15500HP	B222A15500HP	15,500	.6102	—	—	2,9	48	16
B221A15600HP	—	15,600	.6142	—	—	2,9	48	16
B221A15700HP	—	15,700	.6181	—	—	2,9	48	16
B221A15800HP	—	15,800	.6220	—	—	2,9	48	16
B221A15875HP	B222A15875HP	15,875	.6250	5/8	—	3,0	48	16
B221A15900HP	—	15,900	.6260	—	—	3,0	48	16
B221A16000HP	B222A16000HP	16,000	.6299	—	—	3,0	48	16
B221A16500HP	B222A16500HP	16,500	.6496	—	—	3,1	48	18
B221A17000HP	B222A17000HP	17,000	.6693	—	—	3,2	48	18
B221A17463HP	B222A17463HP	17,463	.6875	11/16	—	3,2	48	18
B221A17500HP	B222A17500HP	17,500	.6890	—	—	3,3	48	18
B221A17700HP	—	17,700	.6969	—	—	3,3	48	18
B221A18000HP	B222A18000HP	18,000	.7087	—	—	3,3	48	18
B221A18500HP	B222A18500HP	18,500	.7283	—	—	3,4	50	20
B221A19000HP	B222A19000HP	19,000	.7480	—	—	3,5	50	20
B221A19050HP	B222A19050HP	19,050	.7500	3/4	—	3,5	50	20
B221A19500HP	—	19,500	.7677	—	—	3,6	50	20
B221A20000HP	B222A20000HP	20,000	.7874	—	—	3,7	50	20
B221A20500HP	—	20,500	.8071	—	—	3,8	50	20
B221A21000HP	—	21,000	.8268	—	—	3,9	50	20

Tolerance • Metric			Tolerance • Inch		
nominal size range	D1 tolerance m7	D tolerance h6	nominal size range	D1 tolerance m7	D tolerance h6
>3-6	0,004/0,016	0,000/-0,008	>.1181-.2362	.0002/.0006	.0000/-0.0003
>6-10	0,006/0,021	0,000/-0,009	>.2362-.3937	.0002/.0008	.0000/-0.0004
>10-18	0,007/0,025	0,000/-0,011	>.3937-.7087	.0003/.0010	.0000/-0.0004
>18-25,4	0,008/0,029	0,000/-0,013	>.7087-1.0000	.0003/.0011	.0000/-0.0005

HP Drills • B221_HP, B222_HP Series • Grade KCPK15™ • Flood Coolant for Drill Diameters 3–20mm

Solid Carbide Drills

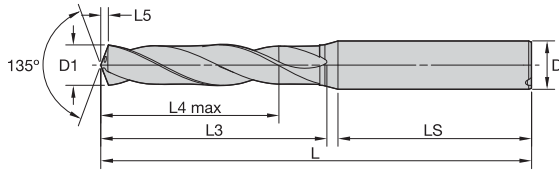
		Cutting Speed – vc			Metric								
		Range – m/min			Recommended Feed Rate (f) by Diameter								
Material Group	min	Starting Value	max		3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0	
P	1	70	110	150	mm/r	0,08 - 0,16	0,07 - 0,17	0,08 - 0,24	0,08 - 0,29	0,09 - 0,35	0,12 - 0,42	0,25 - 0,55	0,33 - 0,67
	2	90	120	160	mm/r	0,08 - 0,15	0,07 - 0,14	0,12 - 0,23	0,14 - 0,29	0,16 - 0,28	0,19 - 0,40	0,25 - 0,50	0,33 - 0,60
	3	60	90	120	mm/r	0,09 - 0,16	0,09 - 0,17	0,15 - 0,27	0,18 - 0,33	0,20 - 0,35	0,25 - 0,44	0,33 - 0,55	0,37 - 0,67
	4	50	80	120	mm/r	0,08 - 0,16	0,08 - 0,17	0,13 - 0,27	0,16 - 0,33	0,17 - 0,33	0,21 - 0,44	0,26 - 0,54	0,32 - 0,62
	6	50	80	120	mm/r	0,06 - 0,11	0,07 - 0,13	0,09 - 0,17	0,13 - 0,24	0,15 - 0,24	0,18 - 0,30	0,23 - 0,40	0,28 - 0,49
	1	70	100	120	mm/r	0,11 - 0,21	0,09 - 0,18	0,14 - 0,28	0,16 - 0,37	0,20 - 0,40	0,22 - 0,45	0,28 - 0,58	0,36 - 0,71
K	2	70	120	120	mm/r	0,11 - 0,19	0,09 - 0,16	0,14 - 0,23	0,16 - 0,32	0,19 - 0,32	0,22 - 0,37	0,28 - 0,47	0,36 - 0,60
	3	50	90	130	mm/r	0,08 - 0,17	0,07 - 0,14	0,12 - 0,25	0,13 - 0,27	0,16 - 0,29	0,18 - 0,39	0,25 - 0,48	0,29 - 0,58
			Cutting Speed – vc			Inch							
		Range – SFM			Recommended Feed Rate (f) by Diameter								
Material Group	min	Starting Value	max		1/8 .125	3/16 .188	1/4 .250	5/16 .313	3/8 .375	1/2 .500	5/8 .625	3/4 .750	
P	1	230	360	490	IPR	.003 - .006	.003 - .007	.003 - .009	.003 - .011	.004 - .014	.005 - .017	.010 - .022	.013 - .026
	2	300	390	520	IPR	.003 - .006	.003 - .006	.005 - .009	.006 - .011	.006 - .011	.007 - .016	.010 - .020	.013 - .024
	3	200	300	390	IPR	.004 - .006	.004 - .007	.006 - .011	.007 - .013	.008 - .014	.010 - .017	.013 - .022	.015 - .026
	4	160	260	390	IPR	.003 - .006	.003 - .007	.005 - .011	.006 - .013	.007 - .013	.008 - .017	.010 - .021	.013 - .024
	6	160	260	390	IPR	.002 - .004	.003 - .005	.004 - .007	.005 - .009	.006 - .009	.007 - .012	.009 - .016	.011 - .019
	1	230	330	390	IPR	.004 - .008	.004 - .007	.006 - .011	.006 - .015	.008 - .016	.009 - .018	.011 - .023	.014 - .028
K	2	230	390	390	IPR	.004 - .007	.004 - .006	.006 - .009	.006 - .013	.007 - .013	.009 - .015	.011 - .019	.014 - .024
	3	160	300	430	IPR	.003 - .007	.003 - .006	.005 - .010	.005 - .011	.006 - .011	.007 - .015	.010 - .019	.011 - .023

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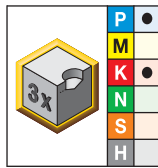
For information on L, L3, and L4 max, see the Solid Carbide foldout table.



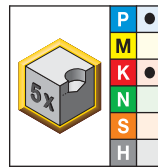
Solid Carbide Drills



■ B224/B225_HP • ~3 x D/~5 x D



short • KCPK15



long • KCPK15

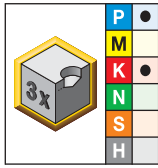
- first choice
- alternate choice

		D1 diameter				L5	LS	D
		mm	in	fraction	wire size			
B224A03000HP	B225A03000HP	3,000	.1181	—	—	0,6	36	6
B224A03048HP	B225A03048HP	3,048	.1200	—	31	0,6	36	6
B224A03100HP	B225A03100HP	3,100	.1220	—	—	0,6	36	6
B224A03175HP	B225A03175HP	3,175	.1250	1/8	—	0,6	36	6
B224A03200HP	B225A03200HP	3,200	.1260	—	—	0,6	36	6
B224A03264HP	B225A03264HP	3,264	.1285	—	30	0,6	36	6
B224A03300HP	B225A03300HP	3,300	.1299	—	—	0,6	36	6
B224A03400HP	B225A03400HP	3,400	.1339	—	—	0,6	36	6
B224A03455HP	B225A03455HP	3,455	.1360	—	29	0,7	36	6
B224A03500HP	B225A03500HP	3,500	.1378	—	—	0,7	36	6
B224A03571HP	B225A03571HP	3,571	.1406	9/64	—	0,7	36	6
B224A03600HP	B225A03600HP	3,600	.1417	—	—	0,7	36	6
B224A03658HP	—	3,658	.1440	—	27	0,7	36	6
B224A03700HP	B225A03700HP	3,700	.1457	—	—	0,7	36	6
B224A03734HP	—	3,734	.1470	—	26	0,7	36	6
B224A03797HP	B225A03797HP	3,797	.1495	—	25	0,7	36	6
B224A03800HP	B225A03800HP	3,800	.1496	—	—	0,7	36	6
B224A03900HP	B225A03900HP	3,900	.1535	—	—	0,7	36	6
B224A03970HP	B225A03970HP	3,970	.1563	5/32	—	0,7	36	6
B224A04000HP	B225A04000HP	4,000	.1575	—	—	0,8	36	6
B224A04039HP	—	4,039	.1590	—	21	0,8	36	6
B224A04090HP	—	4,090	.1610	—	20	0,8	36	6
—	B225A04100HP	4,100	.1614	—	—	0,8	36	6
B224A04200HP	B225A04200HP	4,200	.1654	—	—	0,8	36	6
B224A04217HP	—	4,217	.1660	—	19	0,8	36	6
—	B225A04300HP	4,300	.1693	—	—	0,8	36	6
B224A04366HP	B225A04366HP	4,366	.1719	11/64	—	0,8	36	6
—	B225A04400HP	4,400	.1732	—	—	0,8	36	6
B224A04496HP	B225A04496HP	4,496	.1770	—	16	0,8	36	6
—	B225A04500HP	4,500	.1772	—	—	0,8	36	6
—	B225A04600HP	4,600	.1811	—	—	0,9	36	6
B224A04623HP	—	4,623	.1820	—	14	0,9	36	6
B224A04700HP	B225A04700HP	4,700	.1850	—	13	0,9	36	6
—	B225A04760HP	4,760	.1874	—	—	0,9	36	6
B224A04763HP	—	4,763	.1875	3/16	—	0,9	36	6
—	B225A04800HP	4,800	.1890	—	12	0,9	36	6
B224A04852HP	—	4,852	.1910	—	11	0,9	36	6
—	B225A04900HP	4,900	.1929	—	—	0,9	36	6
B224A05000HP	B225A05000HP	5,000	.1969	—	—	0,9	36	6
B224A05100HP	B225A05100HP	5,100	.2008	—	—	1,0	36	6

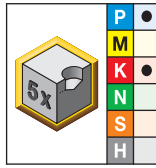
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(B224/B225_HP • ~3 x D/~5 x D continued)

Solid Carbide Drills



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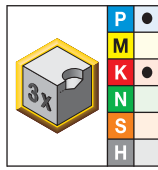
long • KCPK15

		D1 diameter				L5	LS	D
		mm	in	fraction	wire size			
B224A05106HP	B225A05106HP	5,106	.2010	—	7	1,0	36	6
B224A05159HP	B225A05159HP	5,159	.2031	13/64	—	1,0	36	6
—	B225A05200HP	5,200	.2047	—	—	1,0	36	6
—	B225A05300HP	5,300	.2087	—	—	1,0	36	6
—	B225A05400HP	5,400	.2126	—	—	1,0	36	6
B224A05410HP	B225A05410HP	5,410	.2130	—	3	1,0	36	6
B224A05500HP	B225A05500HP	5,500	.2165	—	—	1,0	36	6
B224A05558HP	B225A05558HP	5,558	.2188	7/32	—	1,0	36	6
B224A05600HP	B225A05600HP	5,600	.2205	—	—	1,1	36	6
B224A05616HP	—	5,616	.2211	—	2	1,1	36	6
—	B225A05700HP	5,700	.2244	—	—	1,1	36	6
B224A05791HP	B225A05791HP	5,791	.2280	—	1	1,1	36	6
—	B225A05800HP	5,800	.2283	—	—	1,1	36	6
—	B225A05900HP	5,900	.2323	—	—	1,1	36	6
B224A05944HP	B225A05944HP	5,944	.2340	—	A	1,1	36	6
B224A05954HP	B225A05954HP	5,954	.2344	15/64	—	1,1	36	6
B224A06000HP	B225A06000HP	6,000	.2362	—	—	1,1	36	6
—	B225A06100HP	6,100	.2402	—	—	1,1	36	8
—	B225A06200HP	6,200	.2441	—	—	1,2	36	8
—	B225A06300HP	6,300	.2480	—	—	1,2	36	8
B224A06350HP	B225A06350HP	6,350	.2500	1/4	E	1,2	36	8
—	B225A06400HP	6,400	.2520	—	—	1,2	36	8
B224A06500HP	B225A06500HP	6,500	.2559	—	—	1,2	36	8
B224A06528HP	B225A06528HP	6,528	.2570	—	F	1,2	36	8
—	B225A06600HP	6,600	.2598	—	—	1,2	36	8
B224A06630HP	—	6,630	.2610	—	G	1,2	36	8
B224A06700HP	B225A06700HP	6,700	.2638	—	—	1,3	36	8
B224A06746HP	B225A06746HP	6,746	.2656	17/64	—	1,3	36	8
B224A06800HP	B225A06800HP	6,800	.2677	—	—	1,3	36	8
—	B225A06900HP	6,900	.2717	—	—	1,3	36	8
B224A06909HP	B225A06909HP	6,909	.2720	—	I	1,3	36	8
B224A07000HP	B225A07000HP	7,000	.2756	—	—	1,3	36	8
—	B225A07100HP	7,100	.2795	—	—	1,3	36	8
B224A07145HP	B225A07145HP	7,145	.2813	9/32	—	1,3	36	8
—	B225A07200HP	7,200	.2835	—	—	1,3	36	8
—	B225A07300HP	7,300	.2874	—	—	1,4	36	8
B224A07366HP	B225A07366HP	7,366	.2900	—	L	1,4	36	8
B224A07400HP	B225A07400HP	7,400	.2913	—	—	1,4	36	8
B224A07500HP	B225A07500HP	7,500	.2953	—	—	1,4	36	8
B224A07541HP	B225A07541HP	7,541	.2969	19/64	—	1,4	36	8
—	B225A07600HP	7,600	.2992	—	—	1,4	36	8
—	B225A07700HP	7,700	.3031	—	—	1,4	36	8
—	B225A07800HP	7,800	.3071	—	—	1,5	36	8
—	B225A07900HP	7,900	.3110	—	—	1,5	36	8
B224A07938HP	B225A07938HP	7,938	.3125	5/16	—	1,5	36	8
B224A08000HP	B225A08000HP	8,000	.3150	—	—	1,5	36	8
—	B225A08100HP	8,100	.3189	—	—	1,5	40	10
B224A08200HP	B225A08200HP	8,200	.3228	—	—	1,5	40	10
—	B225A08300HP	8,300	.3268	—	—	1,6	40	10
B224A08334HP	B225A08334HP	8,334	.3281	21/64	—	1,6	40	10
—	B225A08400HP	8,400	.3307	—	—	1,6	40	10
B224A08433HP	B225A08433HP	8,433	.3320	—	Q	1,6	40	10

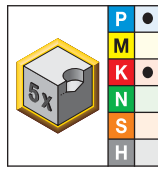
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(B224/B225_HP • ~3 x D/-5 x D continued)

Solid Carbide Drills



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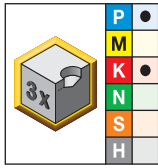
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		D1 diameter				L5	LS	D
		mm	in	fraction	wire size			
B224A08500HP	B225A08500HP	8,500	.3346	—	—	1,6	40	10
—	B225A08600HP	8,600	.3386	—	—	1,6	40	10
B224A08700HP	B225A08700HP	8,700	.3425	—	—	1,6	40	10
B224A08733HP	B225A08733HP	8,733	.3438	11/32	—	1,6	40	10
B224A08800HP	B225A08800HP	8,800	.3465	—	—	1,6	40	10
B224A08839HP	B225A08839HP	8,839	.3480	—	S	1,7	40	10
—	B225A08900HP	8,900	.3504	—	—	1,7	40	10
B224A09000HP	B225A09000HP	9,000	.3543	—	—	1,7	40	10
B224A09093HP	B225A09093HP	9,093	.3580	—	T	1,7	40	10
—	B225A09100HP	9,100	.3583	—	—	1,7	40	10
B224A09129HP	B225A09129HP	9,129	.3594	23/64	—	1,7	40	10
—	B225A09200HP	9,200	.3622	—	—	1,7	40	10
—	B225A09300HP	9,300	.3661	—	—	1,7	40	10
—	B225A09347HP	9,347	.3680	—	U	1,7	40	10
B224A09400HP	B225A09400HP	9,400	.3701	—	—	1,8	40	10
B224A09500HP	B225A09500HP	9,500	.3740	—	—	1,8	40	10
B224A09525HP	B225A09525HP	9,525	.3750	3/8	—	1,8	40	10
—	B225A09600HP	9,600	.3780	—	—	1,8	40	10
—	B225A09700HP	9,700	.3819	—	—	1,8	40	10
—	B225A09800HP	9,800	.3858	—	—	1,8	40	10
—	B225A09900HP	9,900	.3898	—	—	1,8	40	10
B224A09921HP	B225A09921HP	9,921	.3906	25/64	—	1,9	40	10
B224A10000HP	B225A10000HP	10,000	.3937	—	—	1,9	40	10
—	B225A10100HP	10,100	.3976	—	—	1,9	45	12
B224A10200HP	B225A10200HP	10,200	.4016	—	—	1,9	45	12
B224A10300HP	B225A10300HP	10,300	.4055	—	—	1,9	45	12
B224A10320HP	B225A10320HP	10,320	.4063	13/32	—	1,9	45	12
B224A10400HP	B225A10400HP	10,400	.4094	—	—	1,9	45	12
B224A10500HP	B225A10500HP	10,500	.4134	—	—	2,0	45	12
—	B225A10600HP	10,600	.4173	—	—	2,0	45	12
—	B225A10700HP	10,700	.4213	—	—	2,0	45	12
B224A10716HP	B225A10716HP	10,716	.4219	27/64	—	2,0	45	12
B224A10800HP	B225A10800HP	10,800	.4252	—	—	2,0	45	12
—	B225A10900HP	10,900	.4291	—	—	2,0	45	12
B224A11000HP	B225A11000HP	11,000	.4331	—	—	2,1	45	12
—	B225A11100HP	11,100	.4370	—	—	2,1	45	12
B224A11113HP	B225A11113HP	11,113	.4375	7/16	—	2,1	45	12
—	B225A11200HP	11,200	.4409	—	—	2,1	45	12
—	B225A11300HP	11,300	.4449	—	—	2,1	45	12
—	B225A11400HP	11,400	.4488	—	—	2,1	45	12
B224A11500HP	B225A11500HP	11,500	.4528	—	—	2,1	45	12
B224A11509HP	B225A11509HP	11,509	.4531	29/64	—	2,1	45	12
—	B225A11600HP	11,600	.4567	—	—	2,2	45	12
—	B225A11700HP	11,700	.4606	—	—	2,2	45	12
—	B225A11800HP	11,800	.4646	—	—	2,2	45	12
—	B225A11900HP	11,900	.4685	—	—	2,2	45	12
B224A11908HP	B225A11908HP	11,908	.4688	15/32	—	2,2	45	12
B224A12000HP	B225A12000HP	12,000	.4724	—	—	2,2	45	12
—	B225A12100HP	12,100	.4764	—	—	2,3	45	14
—	B225A12200HP	12,200	.4803	—	—	2,3	45	14
B224A12300HP	B225A12300HP	12,300	.4843	—	—	2,3	45	14
B224A12304HP	B225A12304HP	12,304	.4844	31/64	—	2,3	45	14

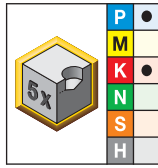
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(B224/B225_HP • ~3 x D/~5 x D continued)

Solid Carbide Drills



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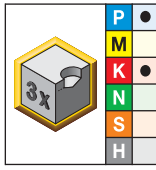
		D1 diameter				L5	LS	D
		mm	in	fraction	wire size			
	B225A12400HP	12,400	.4882	—	—	2,3	45	14
B224A12500HP	B225A12500HP	12,500	.4921	—	—	2,3	45	14
	B225A12600HP	12,600	.4961	—	—	2,3	45	14
B224A12700HP	B225A12700HP	12,700	.5000	1/2	—	2,4	45	14
B224A12800HP	B225A12800HP	12,800	.5039	—	—	2,4	45	14
	B225A12900HP	12,900	.5079	—	—	2,4	45	14
B224A13000HP	B225A13000HP	13,000	.5118	—	—	2,4	45	14
B224A13096HP	—	13,096	.5156	33/64	—	2,4	45	14
B224A13100HP	B225A13100HP	13,100	.5157	—	—	2,4	45	14
	B225A13200HP	13,200	.5197	—	—	2,5	45	14
	B225A13300HP	13,300	.5236	—	—	2,5	45	14
	B225A13400HP	13,400	.5276	—	—	2,5	45	14
B224A13495HP	B225A13495HP	13,495	.5313	17/32	—	2,5	45	14
B224A13500HP	B225A13500HP	13,500	.5315	—	—	2,5	45	14
	B225A13600HP	13,600	.5354	—	—	2,5	45	14
	B225A13700HP	13,700	.5394	—	—	2,6	45	14
	B225A13800HP	13,800	.5433	—	—	2,6	45	14
B224A13891HP	B225A13891HP	13,891	.5469	35/64	—	2,6	45	14
	B225A13900HP	13,900	.5472	—	—	2,6	45	14
B224A14000HP	B225A14000HP	14,000	.5512	—	—	2,6	45	14
	B225A14100HP	14,100	.5551	—	—	2,6	48	16
	B225A14200HP	14,200	.5591	—	—	2,6	48	16
B224A14288HP	B225A14288HP	14,288	.5625	9/16	—	2,7	48	16
	B225A14300HP	14,300	.5630	—	—	2,7	48	16
	B225A14400HP	14,400	.5669	—	—	2,7	48	16
B224A14500HP	B225A14500HP	14,500	.5709	—	—	2,7	48	16
	B225A14600HP	14,600	.5748	—	—	2,7	48	16
B224A14684HP	B225A14684HP	14,684	.5781	37/64	—	2,7	48	16
	B225A14700HP	14,700	.5787	—	—	2,7	48	16
	B225A14800HP	14,800	.5827	—	—	2,8	48	16
	B225A14900HP	14,900	.5866	—	—	2,8	48	16
	B225A15000HP	15,000	.5906	—	—	2,8	48	16
B224A15083HP	B225A15083HP	15,083	.5938	19/32	—	2,8	48	16
	B225A15100HP	15,100	.5945	—	—	2,8	48	16
	B225A15200HP	15,200	.5984	—	—	2,8	48	16
	B225A15300HP	15,300	.6024	—	—	2,8	48	16
	B225A15400HP	15,400	.6063	—	—	2,9	48	16
B224A15479HP	B225A15479HP	15,479	.6094	39/64	—	2,9	48	16
B224A15500HP	B225A15500HP	15,500	.6102	—	—	2,9	48	16
B224A15600HP	B225A15600HP	15,600	.6142	—	—	2,9	48	16
	B225A15700HP	15,700	.6181	—	—	2,9	48	16
	B225A15800HP	15,800	.6220	—	—	2,9	48	16
B224A15875HP	B225A15875HP	15,875	.6250	5/8	—	3,0	48	16
	B225A15900HP	15,900	.6260	—	—	3,0	48	16
B224A16000HP	B225A16000HP	16,000	.6299	—	—	3,0	48	16
	B225A16100HP	16,100	.6339	—	—	3,0	48	18
B224A16500HP	B225A16500HP	16,500	.6496	—	—	3,1	48	18
	B225A16670HP	16,670	.6563	21/32	—	3,1	48	18

(continued)

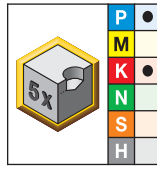
(B224/B225_HP • ~3 x D/~5 x D continued)



Solid Carbide Drills



short • KCPK15



long • KCPK15

		D1 diameter				L5	LS	D
		mm	in	fraction	wire size			
B224A17000HP	B225A17000HP	17,000	.6693	—	—	3,2	48	18
B224A17463HP	B225A17463HP	17,463	.6875	11/16	—	3,2	48	18
B224A17500HP	B225A17500HP	17,500	.6890	—	—	3,3	48	18
—	B225A17700HP	17,700	.6969	—	—	3,3	48	18
B224A18000HP	B225A18000HP	18,000	.7087	—	—	3,3	48	18
—	B225A18500HP	18,500	.7283	—	—	3,4	50	20
B224A19000HP	B225A19000HP	19,000	.7480	—	—	3,5	50	20
B224A19050HP	B225A19050HP	19,050	.7500	3/4	—	3,5	50	20
—	B225A19200HP	19,200	.7559	—	—	3,6	50	20
—	B225A19250HP	19,250	.7579	—	—	3,6	50	20
—	B225A19300HP	19,300	.7598	—	—	3,6	50	20
—	B225A19500HP	19,500	.7677	—	—	3,6	50	20
B224A20000HP	B225A20000HP	20,000	.7874	—	—	3,7	50	20
—	B225A20500HP	20,500	.8071	—	—	3,8	50	20
—	B225A21000HP	21,000	.8268	—	—	3,9	50	20

Tolerance • Metric			Tolerance • Inch		
nominal size range	D1 tolerance m7	D tolerance h6	nominal size range	D1 tolerance m7	D tolerance h6
>3-6	0,004/0,016	0,000/-0,008	>.1181-.2362	.0002/.0006	.0000/-0.0003
>6-10	0,006/0,021	0,000/-0,009	>.2362-.3937	.0002/.0008	.0000/-0.0004
>10-18	0,007/0,025	0,000/-0,011	>.3937-.7087	.0003/.0010	.0000/-0.0004
>18-25,4	0,008/0,029	0,000/-0,013	>.7087-1.0000	.0003/.0011	.0000/-0.0005

■ HP Drills • B224HP, B225HP Series • Grade KCPK15™ • Through Coolant or MQL (Minimum Quantity Lubricant) for Drill Diameters 3–20mm

		Cutting Speed – vc			Metric									
		Range – m/min			Recommended Feed Rate (f) by Diameter									
Material Group	min	Starting Value	max		3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0		
P	1	130	240	290	mm/r	0,09 - 0,18	0,11 - 0,21	0,14 - 0,25	0,16 - 0,34	0,18 - 0,39	0,20 - 0,43	0,22 - 0,51	0,26 - 0,58	
	2	190	230	270	mm/r	0,09 - 0,18	0,11 - 0,21	0,14 - 0,25	0,16 - 0,34	0,18 - 0,39	0,20 - 0,43	0,22 - 0,51	0,26 - 0,58	
	3	130	160	190	mm/r	0,01 - 0,11	0,12 - 0,21	0,14 - 0,24	0,16 - 0,34	0,18 - 0,39	0,20 - 0,43	0,22 - 0,51	0,26 - 0,58	
	4	110	150	170	mm/r	0,07 - 0,15	0,09 - 0,18	0,12 - 0,20	0,15 - 0,28	0,17 - 0,33	0,19 - 0,37	0,22 - 0,43	0,25 - 0,48	
	6	110	150	190	mm/r	0,07 - 0,13	0,11 - 0,11	0,12 - 0,20	0,15 - 0,28	0,17 - 0,33	0,19 - 0,37	0,22 - 0,43	0,25 - 0,48	
			Cutting Speed – vc			Inch								
		Range – SFM			Recommended Feed Rate (f) by Diameter									
Material Group	min	Starting Value	max		1/8 .125	3/16 .188	1/4 .250	5/16 .313	3/8 .375	1/2 .500	5/8 .625	3/4 .750		
P	1	430	790	950	IPR	.004 - .007	.004 - .008	.006 - .010	.006 - .013	.007 - .015	.008 - .017	.009 - .020	.010 - .023	
	2	620	750	890	IPR	.004 - .007	.004 - .008	.006 - .010	.006 - .013	.007 - .015	.008 - .017	.009 - .020	.010 - .023	
	3	430	520	620	IPR	.000 - .004	.005 - .008	.006 - .009	.006 - .013	.007 - .015	.008 - .017	.009 - .020	.010 - .023	
	4	360	490	560	IPR	.003 - .006	.004 - .007	.005 - .008	.006 - .011	.007 - .013	.007 - .015	.009 - .017	.010 - .019	
	6	360	490	620	IPR	.003 - .005	.004 - .004	.005 - .008	.006 - .011	.007 - .013	.007 - .015	.009 - .017	.010 - .019	

YPC Beyond™ with Through Coolant for Iron Materials



Primary Application

The all new B25_YPC Series Solid Carbide Drills are specifically engineered to deliver best-in-class hole quality and longest tool life in cast iron, ductile iron, CGI, and ADI. Operate these drills with standard through coolant or MQL.

The B25_YPC Beyond Solid Carbide Drill combines unique Kennametal technologies, such as the Y-TECH™ flute spacing, the HP-point geometry, the KCK10™ Beyond grade, and the latest, proprietary post-coat treatment technology into one tool.

Features and Benefits

Y-TECH Technology with Uneven Flute-to-Flute Angle

- Unbalanced forces by design avoid chipping on margin lands.

Three-Margin Lands

- Reduce pendulum motion by directing forces towards third margin for superior hole accuracy (cylindricity, constant diameter, hole straightness).

New HP Drill-Point Design

- Low thrust prevents workpiece flexing.
- Excellent centering capabilities.
- Highest possible feed rates.

Corner Chamfer

- Avoids breakout when drilling through holes in gray iron.
- Significantly increases tool life at elevated speeds and feeds.

KCK10 Beyond Grade

- The grade contains multiple layers of PVD coating offering outstanding wear resistance for the drilling of cast irons.
- The highly polished surface ensures superior chip evacuation even when low-pressure coolant or MQL is applied.

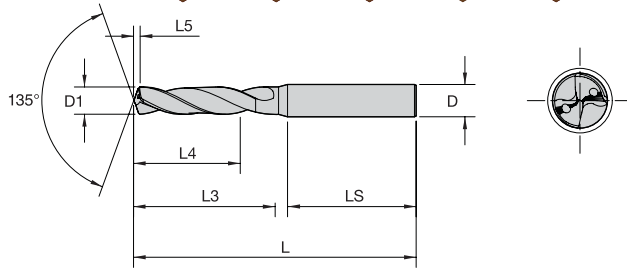
Customization

- Intermediate diameters available as semi-standards.
- Length variations and step drills available as engineered solutions.
- Using Kennametal Slim Line hydraulic chucks together with standard B25_YPC is recommended if workpiece contours need to be bypassed.

F-Shank

- For standard line items with F-shank, please refer to the e-catalog on www.kennametal.com.





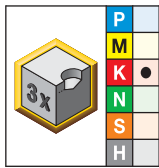
Solid Carbide Drills

NEW!

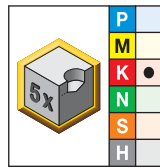
beyond

For information on L, L3, and L4 max, see the Solid Carbide foldout table.

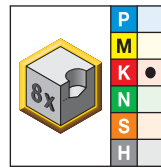
B254/B255/B256_YPC • ~3 x D/~5 x D/~8 x D



short • KCK10



long • KCK10



extra long • KCK10

- first choice
- alternate choice

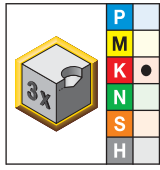
D1 diameter

			D1 diameter				L5	LS	D
			mm	in	fraction	wire size			
B254A03000YPC	B255A03000YPC	B256A03000YPC	3,000	.1181	—	—	0,9	36	6
B254A03048YPC	B255A03048YPC	B256A03048YPC	3,048	.1200	—	31	0,9	36	6
B254A03175YPC	B255A03175YPC	B256A03175YPC	3,175	.1250	1/8	—	0,9	36	6
B254A03200YPC	B255A03200YPC	B256A03200YPC	3,200	.1260	—	—	0,9	36	6
B254A03250YPC	B255A03250YPC	—	3,250	.1280	—	—	0,9	36	6
—	—	B256A03264YPC	3,264	.1285	—	30	0,9	36	6
B254A03300YPC	B255A03300YPC	B256A03300YPC	3,300	.1299	—	—	0,9	36	6
—	B255A03400YPC	—	3,400	.1339	—	—	1,0	36	6
B254A03454YPC	B255A03454YPC	—	3,454	.1360	—	29	1,0	36	6
B254A03500YPC	B255A03500YPC	B256A03500YPC	3,500	.1378	—	—	1,0	36	6
B254A03571YPC	B255A03571YPC	B256A03571YPC	3,571	.1406	9/64	—	1,0	36	6
B254A03600YPC	B255A03600YPC	—	3,600	.1417	—	—	1,0	36	6
—	—	B256A03658YPC	3,658	.1440	—	27	1,0	36	6
B254A03700YPC	B255A03700YPC	B256A03700YPC	3,700	.1457	—	—	1,0	36	6
B254A03734YPC	B255A03734YPC	—	3,734	.1470	—	26	1,1	36	6
B254A03797YPC	B255A03797YPC	—	3,797	.1495	—	25	1,1	36	6
B254A03800YPC	B255A03800YPC	B256A03800YPC	3,800	.1496	—	—	1,1	36	6
B254A03861YPC	B255A03861YPC	—	3,861	.1520	—	24	1,1	36	6
B254A03970YPC	B255A03970YPC	B256A03970YPC	3,970	.1563	5/32	—	1,1	36	6
B254A04000YPC	B255A04000YPC	B256A04000YPC	4,000	.1575	—	—	1,1	36	6
B254A04039YPC	B255A04039YPC	—	4,039	.1590	—	21	1,1	36	6
—	—	B256A04090YPC	4,090	.1610	—	20	1,1	36	6
B254A04100YPC	B255A04100YPC	B256A04100YPC	4,100	.1614	—	—	1,1	36	6
B254A04200YPC	B255A04200YPC	B256A04200YPC	4,200	.1654	—	—	1,2	36	6
—	B255A04217YPC	—	4,217	.1660	—	19	1,2	36	6
—	B255A04300YPC	B256A04300YPC	4,300	.1693	—	—	1,2	36	6
B254A04366YPC	B255A04366YPC	B256A04366YPC	4,366	.1719	11/64	—	1,2	36	6
B254A04496YPC	B255A04496YPC	—	4,496	.1770	—	16	1,2	36	6
B254A04500YPC	B255A04500YPC	B256A04500YPC	4,500	.1772	—	—	1,2	36	6
B254A04572YPC	B255A04572YPC	—	4,572	.1800	—	15	1,3	36	6
—	B255A04600YPC	—	4,600	.1811	—	—	1,3	36	6
—	—	B256A04623YPC	4,623	.1820	—	14	1,3	36	6
B254A04700YPC	B255A04700YPC	B256A04700YPC	4,700	.1850	—	13	1,3	36	6
B254A04763YPC	B255A04763YPC	—	4,763	.1875	3/16	—	1,3	36	6
B254A04800YPC	B255A04800YPC	B256A04800YPC	4,800	.1890	—	12	1,3	36	6
—	—	B256A04852YPC	4,852	.1910	—	11	1,3	36	6
—	B255A04900YPC	—	4,900	.1929	—	—	1,3	36	6
B254A05000YPC	B255A05000YPC	B256A05000YPC	5,000	.1969	—	—	1,4	36	6
B254A05055YPC	B255A05055YPC	—	5,055	.1990	—	8	1,4	36	6
B254A05100YPC	B255A05100YPC	B256A05100YPC	5,100	.2008	—	—	1,4	36	6

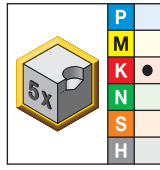
(continued)

(B254/B255/B256_YPC • ~3 x D/-5 x D/-8 x D continued)

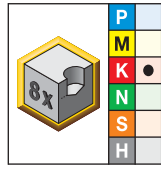
Solid Carbide Drills



short • KCK10



long • KCK10



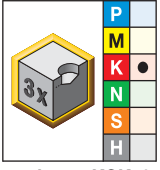
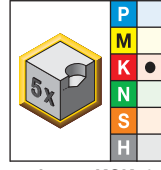
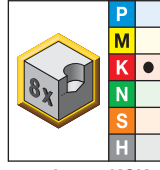
extra long • KCK10

			D1 diameter				L5	LS	D
			mm	in	fraction	wire size			
B254A05106YPC	B255A05106YPC	—	5,106	.2010	—	7	1,4	36 6	
B254A05159YPC	B255A05159YPC	B256A05159YPC	5,159	.2031	13/64	—	1,4	36 6	
—	B255A05200YPC	B256A05200YPC	5,200	.2047	—	—	1,4	36 6	
—	B255A05250YPC	—	5,250	.2067	—	—	1,4	36 6	
B254A05300YPC	B255A05300YPC	B256A05300YPC	5,300	.2087	—	—	1,4	36 6	
—	B255A05400YPC	—	5,400	.2126	—	—	1,5	36 6	
B254A05410YPC	B255A05410YPC	—	5,410	.2130	—	3	1,5	36 6	
B254A05500YPC	B255A05500YPC	B256A05500YPC	5,500	.2165	—	—	1,5	36 6	
B254A05558YPC	B255A05558YPC	—	5,558	.2188	7/32	—	1,5	36 6	
B254A05600YPC	B255A05600YPC	B256A05600YPC	5,600	.2205	—	—	1,5	36 6	
—	—	B256A05616YPC	5,616	.2211	—	2	1,5	36 6	
B254A05700YPC	B255A05700YPC	B256A05700YPC	5,700	.2244	—	—	1,5	36 6	
B254A05791YPC	B255A05791YPC	—	5,791	.2280	—	1	1,6	36 6	
B254A05800YPC	B255A05800YPC	B256A05800YPC	5,800	.2283	—	—	1,6	36 6	
—	—	B256A05900YPC	5,900	.2323	—	—	1,6	36 6	
B254A05944YPC	B255A05944YPC	—	5,944	.2340	—	A	1,6	36 6	
B254A05954YPC	B255A05954YPC	B256A05954YPC	5,954	.2344	15/64	—	1,6	36 6	
B254A06000YPC	B255A06000YPC	B256A06000YPC	6,000	.2362	—	—	1,6	36 6	
B254A06100YPC	B255A06100YPC	—	6,100	.2402	—	—	1,6	36 8	
B254A06200YPC	B255A06200YPC	B256A06200YPC	6,200	.2441	—	—	1,7	36 8	
—	B255A06300YPC	—	6,300	.2480	—	—	1,7	36 8	
B254A06350YPC	B255A06350YPC	B256A06350YPC	6,350	.2500	1/4	E	1,7	36 8	
—	B255A06400YPC	B256A06400YPC	6,400	.2520	—	—	1,7	36 8	
B254A06500YPC	B255A06500YPC	B256A06500YPC	6,500	.2559	—	—	1,7	36 8	
B254A06528YPC	B255A06528YPC	—	6,528	.2570	—	F	1,7	36 8	
B254A06600YPC	B255A06600YPC	B256A06600YPC	6,600	.2598	—	—	1,8	36 8	
—	B255A06630YPC	—	6,630	.2610	—	G	1,8	36 8	
B254A06700YPC	B255A06700YPC	B256A06700YPC	6,700	.2638	—	—	1,8	36 8	
B254A06746YPC	B255A06746YPC	—	6,746	.2656	17/64	—	1,8	36 8	
B254A06800YPC	B255A06800YPC	B256A06800YPC	6,800	.2677	—	—	1,8	36 8	
B254A06900YPC	B255A06900YPC	—	6,900	.2717	—	—	1,8	36 8	
B254A06909YPC	B255A06909YPC	—	6,909	.2720	—	I	1,8	36 8	
B254A07000YPC	B255A07000YPC	B256A07000YPC	7,000	.2756	—	—	1,9	36 8	
B254A07100YPC	—	—	7,100	.2795	—	—	1,9	36 8	
—	B255A07145YPC	—	7,145	.2813	9/32	—	1,9	36 8	
—	B255A07200YPC	—	7,200	.2835	—	—	1,9	36 8	
—	B255A07300YPC	B256A07300YPC	7,300	.2874	—	—	1,9	36 8	
B254A07366YPC	B255A07366YPC	—	7,366	.2900	—	L	1,9	36 8	
B254A07400YPC	B255A07400YPC	—	7,400	.2913	—	—	2,0	36 8	
B254A07493YPC	B255A07493YPC	—	7,493	.2950	—	M	2,0	36 8	
B254A07500YPC	B255A07500YPC	B256A07500YPC	7,500	.2953	—	—	2,0	36 8	
B254A07541YPC	B255A07541YPC	—	7,541	.2969	19/64	—	2,0	36 8	
B254A07600YPC	B255A07600YPC	B256A07600YPC	7,600	.2992	—	—	2,0	36 8	
—	B255A07700YPC	—	7,700	.3031	—	—	2,0	36 8	
B254A07800YPC	B255A07800YPC	B256A07800YPC	7,800	.3071	—	—	2,1	36 8	
B254A07900YPC	B255A07900YPC	—	7,900	.3110	—	—	2,1	36 8	
B254A07938YPC	B255A07938YPC	—	7,938	.3125	5/16	—	2,1	36 8	
B254A08000YPC	B255A08000YPC	B256A08000YPC	8,000	.3150	—	—	2,1	36 8	
B254A08100YPC	B255A08100YPC	—	8,100	.3189	—	—	2,1	40 10	
B254A08200YPC	B255A08200YPC	B256A08200YPC	8,200	.3228	—	—	2,1	40 10	
—	B255A08300YPC	B256A08300YPC	8,300	.3268	—	—	2,2	40 10	
B254A08334YPC	B255A08334YPC	—	8,334	.3281	21/64	—	2,2	40 10	

(continued)

(B254/B255/B256_YPC • ~3 x D/-5 x D/-8 x D continued)

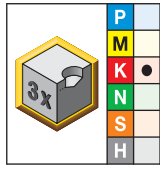
Solid Carbide Drills

	 short • KCK10	 long • KCK10	 extra long • KCK10	D1 diameter				L5	LS	D
				mm	in	fraction	wire size			
B254A08400YPC		—	—	8,400	.3307	—	—	2,2	40	10
B254A08433YPC		B255A08433YPC	—	8,433	.3320	—	Q	2,2	40	10
B254A08500YPC		B255A08500YPC	B256A08500YPC	8,500	.3346	—	—	2,2	40	10
B254A08600YPC		B255A08600YPC	B256A08600YPC	8,600	.3386	—	—	2,2	40	10
B254A08700YPC		B255A08700YPC	B256A08700YPC	8,700	.3425	—	—	2,3	40	10
B254A08733YPC		B255A08733YPC	—	8,733	.3438	11/32	—	2,3	40	10
B254A08800YPC		B255A08800YPC	B256A08800YPC	8,800	.3465	—	—	2,3	40	10
B254A08839YPC		B255A08839YPC	—	8,839	.3480	—	S	2,3	40	10
B254A08900YPC		B255A08900YPC	—	8,900	.3504	—	—	2,3	40	10
B254A09000YPC		B255A09000YPC	B256A09000YPC	9,000	.3543	—	—	2,3	40	10
B254A09093YPC		B255A09093YPC	—	9,093	.3580	—	T	2,4	40	10
B254A09100YPC		B255A09100YPC	B256A09100YPC	9,100	.3583	—	—	2,4	40	10
B254A09129YPC		B255A09129YPC	—	9,129	.3594	23/64	—	2,4	40	10
B254A09200YPC		B255A09200YPC	B256A09200YPC	9,200	.3622	—	—	2,4	40	10
—		B255A09300YPC	B256A09300YPC	9,300	.3661	—	—	2,4	40	10
—		—	B256A09347YPC	9,347	.3680	—	U	2,4	40	10
B254A09400YPC		B255A09400YPC	B256A09400YPC	9,400	.3701	—	—	2,4	40	10
B254A09500YPC		B255A09500YPC	B256A09500YPC	9,500	.3740	—	—	2,5	40	10
B254A09525YPC		B255A09525YPC	—	9,525	.3750	3/8	—	2,5	40	10
—		B255A09600YPC	B256A09600YPC	9,600	.3780	—	—	2,5	40	10
—		B255A09700YPC	B256A09700YPC	9,700	.3819	—	—	2,5	40	10
B254A09800YPC		B255A09800YPC	B256A09800YPC	9,800	.3858	—	—	2,5	40	10
B254A09921YPC		B255A09921YPC	—	9,921	.3906	25/64	—	2,6	40	10
B254A10000YPC		B255A10000YPC	B256A10000YPC	10,000	.3937	—	—	2,6	40	10
B254A10200YPC		B255A10200YPC	B256A10200YPC	10,200	.4016	—	—	2,6	45	12
B254A10262YPC		B255A10262YPC	—	10,262	.4040	—	Y	2,6	45	12
B254A10300YPC		B255A10300YPC	B256A10300YPC	10,300	.4055	—	—	2,6	45	12
B254A10320YPC		B255A10320YPC	—	10,320	.4063	13/32	—	2,7	45	12
B254A10400YPC		B255A10400YPC	B256A10400YPC	10,400	.4094	—	—	2,7	45	12
B254A10490YPC		B255A10490YPC	—	10,490	.4130	—	Z	2,7	45	12
B254A10500YPC		B255A10500YPC	B256A10500YPC	10,500	.4134	—	—	2,7	45	12
—		B255A10600YPC	—	10,600	.4173	—	—	2,7	45	12
B254A10700YPC		—	B256A10700YPC	10,700	.4213	—	—	2,7	45	12
B254A10716YPC		B255A10716YPC	—	10,716	.4219	27/64	—	2,7	45	12
B254A10800YPC		B255A10800YPC	B256A10800YPC	10,800	.4252	—	—	2,8	45	12
B254A10900YPC		B255A10900YPC	—	10,900	.4291	—	—	2,8	45	12
B254A11000YPC		B255A11000YPC	B256A11000YPC	11,000	.4331	—	—	2,8	45	12
B254A11100YPC		B255A11100YPC	—	11,100	.4370	—	—	2,8	45	12
B254A11113YPC		B255A11113YPC	—	11,113	.4375	7/16	—	2,8	45	12
B254A11200YPC		B255A11200YPC	B256A11200YPC	11,200	.4409	—	—	2,9	45	12
—		B255A11300YPC	B256A11300YPC	11,300	.4449	—	—	2,9	45	12
B254A11500YPC		B255A11500YPC	B256A11500YPC	11,500	.4528	—	—	2,9	45	12
B254A11509YPC		B255A11509YPC	—	11,509	.4531	29/64	—	2,9	45	12
—		—	B256A11600YPC	11,600	.4567	—	—	3,0	45	12
—		B255A11700YPC	—	11,700	.4606	—	—	3,0	45	12
B254A11800YPC		B255A11800YPC	B256A11800YPC	11,800	.4646	—	—	3,0	45	12
B254A11900YPC		B255A11900YPC	—	11,900	.4685	—	—	3,0	45	12
B254A11908YPC		B255A11908YPC	—	11,908	.4688	15/32	—	3,0	45	12
B254A12000YPC		B255A12000YPC	B256A12000YPC	12,000	.4724	—	—	3,1	45	12
—		B255A12100YPC	—	12,100	.4764	—	—	3,1	45	14
B254A12200YPC		B255A12200YPC	B256A12200YPC	12,200	.4803	—	—	3,1	45	14
B254A12251YPC		B255A12251YPC	—	12,251	.4823	—	—	3,1	45	14

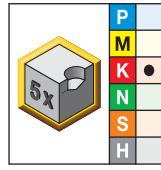
(continued)

(B254/B255/B256_YPC • ~3 x D/-5 x D/-8 x D continued)

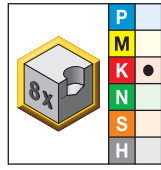
Solid Carbide Drills



short • KCK10



long • KCK10



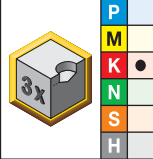
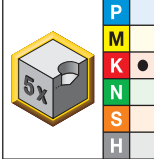
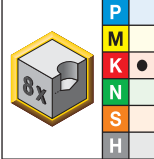
extra long • KCK10

			D1 diameter				L5	LS	D
			mm	in	fraction	wire size			
—	B255A12300YPC	B256A12300YPC	12,300	.4843	—	—	3,1	45	14
B254A12304YPC	B255A12304YPC	—	12,304	.4844	31/64	—	3,1	45	14
—	—	B256A12400YPC	12,400	.4882	—	—	3,1	45	14
B254A12500YPC	B255A12500YPC	B256A12500YPC	12,500	.4921	—	—	3,2	45	14
B254A12700YPC	B255A12700YPC	B256A12700YPC	12,700	.5000	1/2	—	3,2	45	14
B254A12800YPC	B255A12800YPC	B256A12800YPC	12,800	.5039	—	—	3,2	45	14
B254A13000YPC	B255A13000YPC	B256A13000YPC	13,000	.5118	—	—	3,3	45	14
B254A13096YPC	B255A13096YPC	B256A13096YPC	13,096	.5156	33/64	—	3,3	45	14
B254A13100YPC	—	—	13,100	.5157	—	—	3,3	45	14
B254A13200YPC	B255A13200YPC	B256A13200YPC	13,200	.5197	—	—	3,3	45	14
B254A13300YPC	—	—	13,300	.5236	—	—	3,4	45	14
B254A13400YPC	—	—	13,400	.5276	—	—	3,4	45	14
B254A13495YPC	B255A13495YPC	B256A13495YPC	13,495	.5313	17/32	—	3,4	45	14
B254A13500YPC	B255A13500YPC	B256A13500YPC	13,500	.5315	—	—	3,4	45	14
—	—	B256A13700YPC	13,700	.5394	—	—	3,5	45	14
B254A13800YPC	—	B256A13800YPC	13,800	.5433	—	—	3,5	45	14
B254A13891YPC	B255A13891YPC	B256A13891YPC	13,891	.5469	35/64	—	3,5	45	14
B254A14000YPC	B255A14000YPC	B256A14000YPC	14,000	.5512	—	—	3,5	45	14
B254A14100YPC	B255A14100YPC	—	14,100	.5551	—	—	3,6	48	16
B254A14288YPC	B255A14288YPC	—	14,288	.5625	9/16	—	3,6	48	16
B254A14500YPC	B255A14500YPC	B256A14500YPC	14,500	.5709	—	—	3,6	48	16
—	B255A14600YPC	—	14,600	.5748	—	—	3,7	48	16
B254A14684YPC	B255A14684YPC	B256A14684YPC	14,684	.5781	37/64	—	3,7	48	16
—	B255A14700YPC	—	14,700	.5787	—	—	3,7	48	16
B254A14750YPC	B255A14750YPC	—	14,750	.5807	—	—	3,7	48	16
B254A14800YPC	B255A14800YPC	B256A14800YPC	14,800	.5827	—	—	3,7	48	16
B254A15000YPC	B255A15000YPC	B256A15000YPC	15,000	.5906	—	—	3,8	48	16
B254A15083YPC	B255A15083YPC	B256A15083YPC	15,083	.5938	19/32	—	3,8	48	16
B254A15200YPC	B255A15200YPC	B256A15200YPC	15,200	.5984	—	—	3,8	48	16
B254A15250YPC	B255A15250YPC	—	15,250	.6004	—	—	3,8	48	16
—	—	B256A15300YPC	15,300	.6024	—	—	3,8	48	16
B254A15400YPC	B255A15400YPC	B256A15400YPC	15,400	.6063	—	—	3,9	48	16
B254A15479YPC	B255A15479YPC	B256A15479YPC	15,479	.6094	39/64	—	3,9	48	16
B254A15500YPC	B255A15500YPC	B256A15500YPC	15,500	.6102	—	—	3,9	48	16
B254A15600YPC	—	—	15,600	.6142	—	—	3,9	48	16
B254A15800YPC	B255A15800YPC	B256A15800YPC	15,800	.6220	—	—	4,0	48	16
B254A15875YPC	B255A15875YPC	—	15,875	.6250	5/8	—	4,0	48	16
B254A16000YPC	B255A16000YPC	B256A16000YPC	16,000	.6299	—	—	4,0	48	16
—	B255A16271YPC	B256A16271YPC	16,271	.6406	41/64	—	4,1	48	18
—	B255A16300YPC	B256A16300YPC	16,300	.6417	—	—	4,1	48	18
B254A16500YPC	B255A16500YPC	B256A16500YPC	16,500	.6496	—	—	4,1	48	18
B254A16670YPC	B255A16670YPC	B256A16670YPC	16,670	.6563	21/32	—	4,2	48	18
B254A16800YPC	B255A16800YPC	B256A16800YPC	16,800	.6614	—	—	4,2	48	18
—	B255A16900YPC	—	16,900	.6654	—	—	4,2	48	18
B254A17000YPC	B255A17000YPC	B256A17000YPC	17,000	.6693	—	—	4,2	48	18
—	B255A17200YPC	—	17,200	.6772	—	—	4,3	48	18
B254A17300YPC	B255A17300YPC	—	17,300	.6811	—	—	4,3	48	18
—	B255A17400YPC	B256A17400YPC	17,400	.6850	—	—	4,3	48	18
B254A17463YPC	B255A17463YPC	—	17,463	.6875	11/16	—	4,3	48	18
B254A17500YPC	B255A17500YPC	B256A17500YPC	17,500	.6890	—	—	4,3	48	18
B254A17800YPC	B255A17800YPC	B256A17800YPC	17,800	.7008	—	—	4,4	48	18
B254A17859YPC	B255A17859YPC	B256A17859YPC	17,859	.7031	45/64	—	4,4	48	18

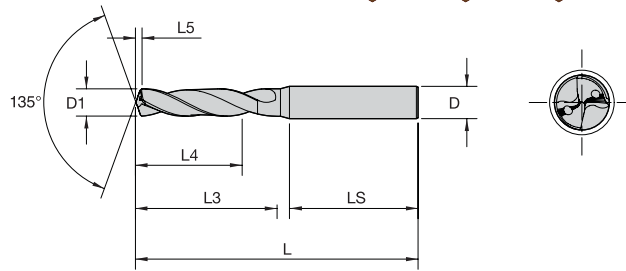
(continued)

(B254/B255/B256_YPC • ~3 x D/~5 x D/~8 x D continued)

Solid Carbide Drills

			D1 diameter				L5	LS	D
			mm	in	fraction	wire size			
									
short • KCK10	long • KCK10	extra long • KCK10							
B254A18000YPC	B255A18000YPC	B256A18000YPC	18,000	.7087	—	—	4,5	48	18
B254A18200YPC	—	—	18,200	.7165	—	—	4,5	50	20
B254A18258YPC	B255A18258YPC	B256A18258YPC	18,258	.7188	23/32	—	4,5	50	20
B254A18500YPC	B255A18500YPC	B256A18500YPC	18,500	.7283	—	—	4,6	50	20
B254A18800YPC	B255A18800YPC	B256A18800YPC	18,800	.7402	—	—	4,7	50	20
B254A19000YPC	B255A19000YPC	B256A19000YPC	19,000	.7480	—	—	4,7	50	20
B254A19050YPC	B255A19050YPC	—	19,050	.7500	3/4	—	4,7	50	20
—	B255A19446YPC	B256A19446YPC	19,446	.7656	49/64	—	4,8	50	20
B254A19446YPC	—	—	19,446	.7656	49/64	—	4,8	50	20
B254A19500YPC	B255A19500YPC	B256A19500YPC	19,500	.7677	—	—	4,8	50	20
B254A19700YPC	B255A19700YPC	—	19,700	.7756	—	—	4,9	50	20
B254A19800YPC	B255A19800YPC	B256A19800YPC	19,800	.7795	—	—	4,9	50	20
B254A20000YPC	B255A20000YPC	B256A20000YPC	20,000	.7874	—	—	4,9	50	20
—	B255A20500YPC	—	20,500	.8071	—	—	5,1	50	20
B254A20638YPC	B255A20638YPC	B256A20638YPC	20,638	.8125	13/16	—	5,1	50	20
B254A21000YPC	B255A21000YPC	—	21,000	.8268	—	—	5,2	50	20
B254A22000YPC	B255A22000YPC	B256A22000YPC	22,000	.8661	—	—	5,4	50	20
B254A22225YPC	B255A22225YPC	B256A22225YPC	22,225	.8750	7/8	—	5,5	56	25
B254A23416YPC	B255A23416YPC	—	23,416	.9219	59/64	—	5,7	56	25
B254A24000YPC	B255A24000YPC	—	24,000	.9449	—	—	5,9	56	25
B254A25000YPC	B255A25000YPC	—	25,000	.9843	—	—	6,1	56	25
—	—	B256A25004YPC	25,004	.9844	63/64	—	6,1	56	25

Solid Carbide Drills

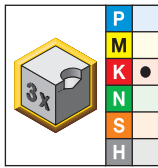


NEW!

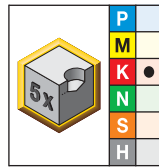
beyond

For information on L, L3, and L4 max, see the Solid Carbide foldout table.

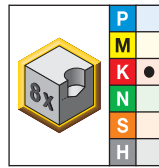
■ K254/K255/K256_YPC • ~3 x D/~5 x D/~8 x D



short • KCK10



regular • KCK10



long • KCK10

- first choice
- alternate choice

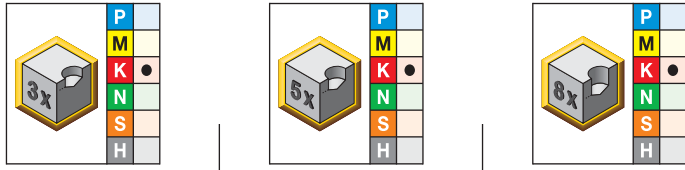
D1 diameter

			in	mm	fraction	wire size	L5	LS	D
K254A01250YPC	K255A01250YPC	—	.1250	3,175	1/8	—	.036	1.44	.1875
—	K255A01360YPC	—	.1360	3,455	—	29	.039	1.44	.1875
—	K255A01406YPC	—	.1406	3,571	9/64	—	.040	1.44	.1875
—	K255A01495YPC	—	.1495	3,797	—	25	.042	1.44	.1875
K254A01563YPC	—	K256A01563YPC	.1563	3,969	5/32	—	.044	1.44	.1875
—	K255A01563YPC	—	.1563	3,970	5/32	—	.044	1.44	.1875
—	K255A01770YPC	—	.1770	4,496	—	16	.049	1.44	.1875
K254A01875YPC	—	K256A01875YPC	.1875	4,762	3/16	—	.052	1.44	.1875
—	K255A01875YPC	—	.1875	4,763	3/16	—	.052	1.44	.1875
—	K255A02010YPC	—	.2010	5,106	—	7	.055	1.44	.2500
—	K255A02130YPC	—	.2130	5,410	—	3	.058	1.44	.2500
K254A02188YPC	K255A02188YPC	K256A02188YPC	.2188	5,558	7/32	—	.059	1.44	.2500
K254A02500YPC	K255A02500YPC	K256A02500YPC	.2500	6,350	1/4	E	.067	1.44	.2500
—	K255A02570YPC	—	.2570	6,528	—	F	.069	1.52	.3125
—	K255A02610YPC	—	.2610	6,630	—	G	.070	1.52	.3125
K254A02656YPC	K255A02656YPC	K256A02656YPC	.2656	6,746	17/64	—	.071	1.52	.3125
—	K255A02720YPC	—	.2720	6,909	—	I	.072	1.52	.3125
K254A02813YPC	K255A02813YPC	K256A02813YPC	.2813	7,145	9/32	—	.075	1.52	.3125
K254A02969YPC	K255A02969YPC	K256A02969YPC	.2969	7,541	19/64	—	.078	1.52	.3125
K254A03125YPC	K255A03125YPC	K256A03125YPC	.3125	7,938	5/16	—	.082	1.52	.3125
K254A03281YPC	K255A03281YPC	K256A03281YPC	.3281	8,334	21/64	—	.086	1.59	.3750
—	K255A03320YPC	—	.3320	8,433	—	Q	.087	1.59	.3750
K254A03438YPC	K255A03438YPC	K256A03438YPC	.3438	8,733	11/32	—	.090	1.59	.3750
K254A03594YPC	K255A03594YPC	K256A03594YPC	.3594	9,129	23/64	—	.093	1.59	.3750
—	K255A03680YPC	—	.3680	9,347	—	U	.095	1.59	.3750
K254A03750YPC	K255A03750YPC	K256A03750YPC	.3750	9,525	3/8	—	.097	1.59	.3750
K254A03906YPC	K255A03906YPC	K256A03906YPC	.3906	9,921	25/64	—	.101	1.67	.4375
K254A04063YPC	K255A04063YPC	K256A04063YPC	.4063	10,320	13/32	—	.105	1.67	.4375
K254A04219YPC	K255A04219YPC	K256A04219YPC	.4219	10,716	27/64	—	.108	1.67	.4375
K254A04375YPC	K255A04375YPC	K256A04375YPC	.4375	11,113	7/16	—	.112	1.67	.4375
K254A04531YPC	K255A04531YPC	K256A04531YPC	.4531	11,509	29/64	—	.116	1.79	.5000
K254A04688YPC	K255A04688YPC	K256A04688YPC	.4688	11,908	15/32	—	.119	1.79	.5000
K254A04844YPC	K255A04844YPC	K256A04844YPC	.4844	12,304	31/64	—	.123	1.79	.5000
K254A05000YPC	K255A05000YPC	K256A05000YPC	.5000	12,700	1/2	—	.127	1.79	.5000
—	K255A05156YPC	—	.5156	13,096	33/64	—	.130	1.79	.5625
K254A05625YPC	K255A05625YPC	K256A05625YPC	.5625	14,288	9/16	—	.142	1.79	.5625
K254A06250YPC	K255A06250YPC	K256A06250YPC	.6250	15,875	5/8	—	.156	1.91	.6250
—	K255A06563YPC	—	.6563	16,670	21/32	—	.164	1.91	.6875
K254A06875YPC	K255A06875YPC	K256A06875YPC	.6875	17,463	11/16	—	.171	1.91	.6875
K254A07500YPC	K255A07500YPC	K256A07500YPC	.7500	19,050	3/4	—	.186	1.99	.7500

(continued)

(K254/K255/K256_YPC • ~3 x D/~5 x D/~8 x D continued)

Solid Carbide Drills



	short • KCK10	regular • KCK10	long • KCK10	D1 diameter				L5	LS	D
				in	mm	fraction	wire size			
	—	K255A07656YPC	—	.7656	19,446	49/64	—	.189	1.99	.8125
K254A08125YPC		K255A08125YPC	—	.8125	20,638	13/16	—	.200	1.99	.8125
K254A08750YPC		K255A08750YPC	—	.8750	22,225	7/8	—	.215	2.07	.8750

Tolerance • Metric			Tolerance • Inch		
nominal size range	D1 tolerance m7	D tolerance h6	nominal size range	D1 tolerance m7	D tolerance h6
>3-6	0,004/0,016	0,000/-0,008	>.1181-.2362	.0002/.0006	.0000/-0.0003
>6-10	0,006/0,021	0,000/-0,009	>.2362-.3937	.0002/.0008	.0000/-0.0004
>10-18	0,007/0,025	0,000/-0,011	>.3937-.7087	.0003/.0010	.0000/-0.0004
>18-25,4	0,008/0,029	0,000/-0,013	>.7087-1.0000	.0003/.0011	.0000/-0.0005

■ YPC Drills • B/K25_YPC Series • Grade KCK10™ • Through Coolant for Drill Diameters 3–20mm

Material Group	Cutting Speed – vc			Recommended Feed Rate (f) by Diameter									
	Range – m/min			Metric									
	min	Starting Value	max	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0		
K	1	130	160	210	mm/r	0,08 - 0,12	0,15 - 0,21	0,21 - 0,29	0,26 - 0,37	0,30 - 0,42	0,34 - 0,45	0,38 - 0,53	0,42 - 0,58
	2	90	130	180	mm/r	0,08 - 0,12	0,14 - 0,18	0,20 - 0,27	0,24 - 0,32	0,26 - 0,38	0,32 - 0,42	0,36 - 0,48	0,39 - 0,53
	3	70	90	130	mm/r	0,07 - 0,11	0,11 - 0,15	0,16 - 0,22	0,20 - 0,27	0,23 - 0,32	0,25 - 0,35	0,29 - 0,40	0,32 - 0,43
Material Group	Cutting Speed – vc			Recommended Feed Rate (f) by Diameter									
	Range – SFM			Inch									
	min	Starting Value	max	1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4		
K	1	430	520	690	IPR	.003 - .005	.006 - .008	.008 - .011	.010 - .015	.012 - .017	.013 - .018	.015 - .021	.017 - .023
	2	300	430	590	IPR	.003 - .005	.006 - .007	.008 - .011	.009 - .013	.010 - .015	.013 - .017	.014 - .019	.015 - .021
	3	230	300	430	IPR	.003 - .004	.004 - .006	.006 - .009	.008 - .011	.009 - .013	.010 - .014	.011 - .016	.013 - .017

SE 4-Margin Drills with Through Coolant for Steel

Primary Application

B256 Series Solid Carbide Drills are the high-performance platform for mid-L/D applications in steel that require high accuracy and consistent hole straightness combined with excellent metal removal rates and long tool life.

Features and Benefits

SE Drill-Point Design

- Sculptured edge enables high feed rates.

Four-Margin Lands

- Improves hole straightness.
- Improves hole alignment when drilling through cross holes.

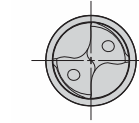
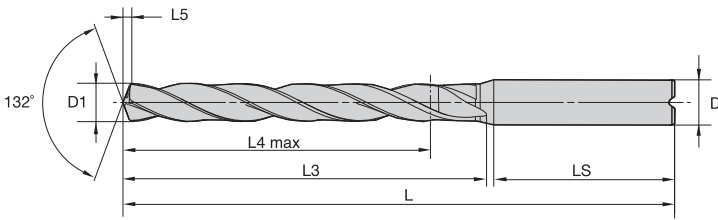
KC7315™ Grade

- Multilayer, TiAlN-based coating with high hot hardness allows 30% higher cutting speeds and constant tool life.
- Optimized tool surface finish ensures chip evacuation when drilling deeper holes.

Customization

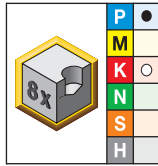
- Intermediate diameters available as semi-standards.
- Length variations and step drills available as engineered solutions.
- For follow-up operations, such as machining screw holes in connecting rods, the point angle of the step drill for the screw head should be adjusted.





Solid Carbide Drills

■ B256 • ~8 x D



- first choice
- alternate choice

	D1 diameter				L5	LS	D
	mm	in	fraction	wire size			
extra long • KC7315							
B256A05000	5,000	.1969	—	—	1,0	36	6
B256A05100	5,100	.2008	—	—	1,0	36	6
B256A05500	5,500	.2165	—	—	1,1	36	6
B256A05800	5,800	.2283	—	—	1,2	36	6
B256A06000	6,000	.2362	—	—	1,2	36	6
B256A06500	6,500	.2559	—	—	1,3	36	8
B256A06800	6,800	.2677	—	—	1,4	36	8
B256A07000	7,000	.2756	—	—	1,4	36	8
B256A07800	7,800	.3071	—	—	1,6	36	8
B256A08000	8,000	.3150	—	—	1,6	36	8
B256A08400	8,400	.3307	—	—	1,7	40	10
B256A08500	8,500	.3346	—	—	1,7	40	10
B256A08800	8,800	.3465	—	—	1,8	40	10
B256A09000	9,000	.3543	—	—	1,8	40	10
B256A09500	9,500	.3740	—	—	1,9	40	10
B256A10000	10,000	.3937	—	—	2,0	40	10
B256A10200	10,200	.4016	—	—	2,0	45	12
B256A10500	10,500	.4134	—	—	2,1	45	12
B256A11000	11,000	.4331	—	—	2,2	45	12
B256A11800	11,800	.4646	—	—	2,3	45	12
B256A12000	12,000	.4724	—	—	2,4	45	12
B256A12500	12,500	.4921	—	—	2,5	45	14
B256A13000	13,000	.5118	—	—	2,6	45	14
B256A13500	13,500	.5315	—	—	2,7	45	14
B256A14000	14,000	.5512	—	—	2,8	45	14
B256A15000	15,000	.5906	—	—	3,0	48	16
B256A16000	16,000	.6299	—	—	3,2	48	16

Tolerance • Metric			Tolerance • Inch		
nominal size range	D1 tolerance m7	D tolerance h6	nominal size range	D1 tolerance m7	D tolerance h6
>3-6	0,004/0,016	0,000/-0,008	>.1181-.2362	.0002/.0006	.0000/- .0003
>6-10	0,006/0,021	0,000/-0,009	>.2362-.3937	.0002/.0008	.0000/- .0004
>10-18	0,007/0,025	0,000/-0,011	>.3937-.7087	.0003/.0010	.0000/- .0004
>18-25,4	0,008/0,029	0,000/-0,013	>.7087-1.0000	.0003/.0011	.0000/- .0005

SE Drills • B256 Series • Grade KC7315™ • Through Coolant for Drill Diameters 3–20mm

		Cutting Speed – vc			Metric								
		Range – m/min			Recommended Feed Rate (f) by Diameter								
Material Group		min	Starting Value	max		3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
	P	1	120	145	175	mm/r	0,08 - 0,11	0,09 - 0,15	0,11 - 0,15	0,13 - 0,19	0,13 - 0,22	0,15 - 0,27	0,18 - 0,33	0,22 - 0,37
2		80	100	120	mm/r	0,08 - 0,11	0,08 - 0,13	0,09 - 0,17	0,15 - 0,21	0,16 - 0,25	0,18 - 0,33	0,22 - 0,42	0,26 - 0,50
3		80	90	120	mm/r	0,08 - 0,11	0,09 - 0,15	0,11 - 0,15	0,13 - 0,19	0,13 - 0,22	0,15 - 0,27	0,18 - 0,33	0,22 - 0,37
4		60	70	80	mm/r	0,06 - 0,09	0,07 - 0,13	0,09 - 0,13	0,11 - 0,15	0,11 - 0,17	0,13 - 0,22	0,15 - 0,27	0,17 - 0,30
		Cutting Speed – vc			Inch								
		Range – SFM			Recommended Feed Rate (f) by Diameter								
Material Group		min	Starting Value	max		1/8 .125	3/16 .188	1/4 .250	5/16 .313	3/8 .375	1/2 .500	5/8 .625	3/4 .750
	P	1	390	480	570	IPR	.003 - .004	.004 - .006	.004 - .006	.005 - .007	.005 - .009	.006 - .011	.007 - .013	.009 - .015
2		260	330	390	IPR	.003 - .004	.003 - .005	.004 - .007	.006 - .008	.006 - .010	.007 - .013	.009 - .017	.010 - .020
3		260	300	390	IPR	.003 - .004	.004 - .006	.004 - .006	.005 - .007	.005 - .009	.006 - .011	.007 - .013	.009 - .015
4		200	230	260	IPR	.002 - .004	.003 - .005	.004 - .005	.004 - .006	.004 - .007	.005 - .009	.006 - .011	.007 - .012

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HP Beyond™ 4-Margin Long-Length Drills with Through Coolant



Primary Application

B269_HP Series Solid Carbide Drills are 12 x D, long-length drills, closing the gap between 8 x D drill (B256_SE) and 15 x D (B271_HP). They are designed for deep-hole applications without pilot drill in steel, cast iron, and stainless steel materials. Operate these drills with standard through coolant or MQL. The drills have a standard A-shank according to DIN 6535 HA (round cylindrical with 2mm steps).

Features and Benefits

Four-Margin Lands

- Improves hole straightness.
- Improves hole alignment when drilling through cross holes or inclined exits.

HP Drill-Point Design

- Low thrust prevents workpiece flexing.
- Excellent centering capabilities.
- Eliminates the need for pilot drilling.

Unique Flute Design

- Drastically improved chip evacuation.
- Better hole surface quality.

KCPK15™ Beyond Grade

- The grade is a multilayer, TiAlN-based coating with high hot hardness. It enables highest cutting speeds and enables the use in MQL applications.
- The highly polished surface ensures superior chip evacuation even when low-pressure coolant is applied.

Customization

- Intermediate diameters available as engineered solutions.
- Length variations and step drills available as engineered solutions.

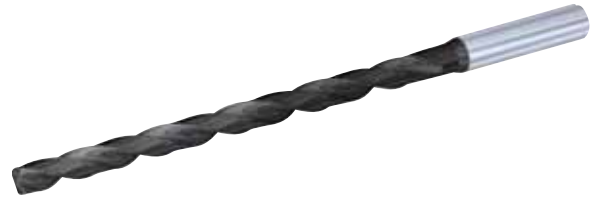
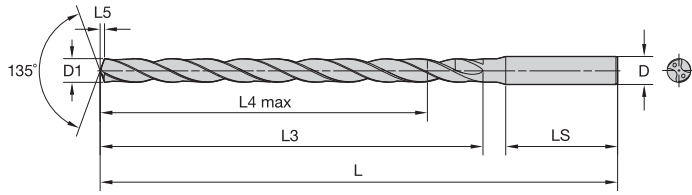


Solid Carbide Drills

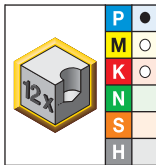
HP Beyond™ 4-Margin, Long-Length Drills • Through Coolant • 12 x D



Solid Carbide Drills



■ B269_HP • ~12 x D

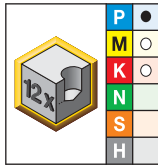


- first choice
- alternate choice

KCPK15	D1 diameter				L	L3	L4 max	L5	LS	D
	mm	in	fraction	wire size						
B269A03000HP	3,000	.1181	—	—	93	52	44	0,6	36	6
B269A03175HP	3,175	.1250	1/8	—	93	52	44	0,6	36	6
B269A03264HP	3,264	.1285	—	30	93	53	44	0,6	36	6
B269A03500HP	3,500	.1378	—	—	93	53	44	0,7	36	6
B269A03970HP	3,970	.1563	5/32	—	107	66	56	0,7	36	6
B269A04000HP	4,000	.1575	—	—	107	66	56	0,8	36	6
B269A04500HP	4,500	.1772	—	—	107	67	56	0,8	36	6
B269A04600HP	4,600	.1811	—	—	107	68	57	0,9	36	6
B269A04763HP	4,763	.1875	3/16	—	125	82	69	0,9	36	6
B269A04800HP	4,800	.1890	—	12	125	82	69	0,9	36	6
B269A05000HP	5,000	.1969	—	—	125	83	70	0,9	36	6
B269A05100HP	5,100	.2008	—	—	125	83	70	1,0	36	6
B269A05200HP	5,200	.2047	—	—	125	83	70	1,0	36	6
B269A05300HP	5,300	.2087	—	—	125	84	71	1,0	36	6
B269A05410HP	5,410	.2130	—	3	125	84	71	1,0	36	6
B269A05500HP	5,500	.2165	—	—	125	84	71	1,0	36	6
B269A05558HP	5,558	.2188	7/32	—	125	84	71	1,0	36	6
B269A05600HP	5,600	.2205	—	—	125	85	72	1,1	36	6
B269A05700HP	5,700	.2244	—	—	125	85	72	1,1	36	6
B269A05800HP	5,800	.2283	—	—	125	85	71	1,1	36	6
B269A06000HP	6,000	.2362	—	—	125	86	72	1,1	36	6
B269A06200HP	6,200	.2441	—	—	139	97	82	1,2	36	8
B269A06350HP	6,350	.2500	1/4	E	139	98	83	1,2	36	8
B269A06500HP	6,500	.2559	—	—	139	98	83	1,2	36	8
B269A06528HP	6,528	.2570	—	F	139	98	83	1,2	36	8
B269A06600HP	6,600	.2598	—	—	139	99	84	1,2	36	8
B269A06746HP	6,746	.2656	17/64	—	139	99	83	1,3	36	8
B269A06800HP	6,800	.2677	—	—	139	99	83	1,3	36	8
B269A06909HP	6,909	.2720	—	I	139	100	84	1,3	36	8
B269A07000HP	7,000	.2756	—	—	139	100	84	1,3	36	8
B269A07145HP	7,145	.2813	9/32	—	153	111	94	1,3	36	8
B269A07500HP	7,500	.2953	—	—	153	112	95	1,4	36	8
B269A07541HP	7,541	.2969	19/64	—	153	112	95	1,4	36	8
B269A07700HP	7,700	.3031	—	—	153	113	96	1,4	36	8
B269A07800HP	7,800	.3071	—	—	153	113	95	1,5	36	8
B269A07938HP	7,938	.3125	5/16	—	153	114	96	1,5	36	8
B269A08000HP	8,000	.3150	—	—	153	114	96	1,5	36	8
B269A08100HP	8,100	.3189	—	—	185	136	116	1,5	40	10
B269A08334HP	8,334	.3281	21/64	—	185	137	117	1,6	40	10
B269A08433HP	8,433	.3320	—	Q	185	137	117	1,6	40	10

(continued)

(B269_HP • ~12 x D continued)



KCPK15	D1 diameter				L	L3	L4 max	L5	LS	D
	mm	in	fraction	wire size						
B269A08500HP	8,500	.3346	—	—	185	137	117	1,6	40	10
B269A08700HP	8,700	.3425	—	—	185	138	118	1,6	40	10
B269A08733HP	8,733	.3438	11/32	—	185	138	117	1,6	40	10
B269A09000HP	9,000	.3543	—	—	185	139	118	1,7	40	10
B269A09100HP	9,100	.3583	—	—	185	139	118	1,7	40	10
B269A09129HP	9,129	.3594	23/64	—	185	139	118	1,7	40	10
B269A09500HP	9,500	.3740	—	—	185	140	119	1,8	40	10
B269A09525HP	9,525	.3750	3/8	—	185	140	119	1,8	40	10
B269A09921HP	9,921	.3906	25/64	—	185	142	120	1,9	40	10
B269A10000HP	10,000	.3937	—	—	185	142	120	1,9	40	10
B269A10200HP	10,200	.4016	—	—	218	164	140	1,9	45	12
B269A10300HP	10,300	.4055	—	—	218	165	141	1,9	45	12
B269A10320HP	10,320	.4063	13/32	—	218	165	141	1,9	45	12
B269A10500HP	10,500	.4134	—	—	218	165	141	2,0	45	12
B269A10716HP	10,716	.4219	27/64	—	218	166	142	2,0	45	12
B269A10800HP	10,800	.4252	—	—	218	166	141	2,0	45	12
B269A11000HP	11,000	.4331	—	—	218	167	142	2,1	45	12
B269A11113HP	11,113	.4375	7/16	—	218	167	142	2,1	45	12
B269A11500HP	11,500	.4528	—	—	218	168	143	2,1	45	12
B269A11800HP	11,800	.4646	—	—	218	169	143	2,2	45	12
B269A12000HP	12,000	.4724	—	—	218	170	144	2,2	45	12
B269A12100HP	12,100	.4764	—	—	246	192	164	2,3	45	14
B269A12304HP	12,304	.4844	31/64	—	246	193	165	2,3	45	14
B269A12500HP	12,500	.4921	—	—	246	193	165	2,3	45	14
B269A12700HP	12,700	.5000	1/2	—	246	194	166	2,4	45	14
B269A13000HP	13,000	.5118	—	—	246	195	166	2,4	45	14
B269A13100HP	13,100	.5157	—	—	246	195	166	2,4	45	14
B269A13500HP	13,500	.5315	—	—	246	196	167	2,5	45	14
B269A14000HP	14,000	.5512	—	—	246	198	168	2,6	45	14
B269A14100HP	14,100	.5551	—	—	277	220	188	2,6	48	16
B269A14288HP	14,288	.5625	9/16	—	277	220	188	2,7	48	16
B269A14500HP	14,500	.5709	—	—	277	221	189	2,7	48	16
B269A14684HP	14,684	.5781	37/64	—	277	222	190	2,7	48	16
B269A15000HP	15,000	.5906	—	—	277	223	190	2,8	48	16
B269A15500HP	15,500	.6102	—	—	277	224	191	2,9	48	16
B269A15875HP	15,875	.6250	5/8	—	277	225	192	3,0	48	16
B269A16000HP	16,000	.6299	—	—	277	226	192	3,0	48	16
B269A16500HP	16,500	.6496	—	—	305	249	213	3,1	48	18
B269A17000HP	17,000	.6693	—	—	305	250	214	3,2	48	18
B269A17463HP	17,463	.6875	11/16	—	305	252	215	3,2	48	18
B269A17500HP	17,500	.6890	—	—	305	252	215	3,3	48	18
B269A18000HP	18,000	.7087	—	—	305	253	216	3,3	48	18
B269A18500HP	18,500	.7283	—	—	334	277	237	3,4	50	20
B269A19000HP	19,000	.7480	—	—	334	278	238	3,5	50	20
B269A19050HP	19,050	.7500	3/4	—	334	279	239	3,5	50	20
B269A19500HP	19,500	.7677	—	—	334	280	239	3,6	50	20
B269A20000HP	20,000	.7874	—	—	334	281	240	3,7	50	20

Tolerance • Metric			Tolerance • Inch		
nominal size range	D1 tolerance m7	D tolerance h6	nominal size range	D1 tolerance m7	D tolerance h6
>3-6	0,004/0,016	0,000/-0,008	>.1181-.2362	.0002/.0006	.0000/- .0003
>6-10	0,006/0,021	0,000/-0,009	>.2362-.3937	.0002/.0008	.0000/- .0004
>10-18	0,007/0,025	0,000/-0,011	>.3937-.7087	.0003/.0010	.0000/- .0004
>18-25,4	0,008/0,029	0,000/-0,013	>.7087-1.0000	.0003/.0011	.0000/- .0005

■ HP Drills • B269_HP Series • Grade KCPK15™ • Through Coolant for Drill Diameters 3–20mm



Cutting Speed – vc				Metric									
Range – m/min				Recommended Feed Rate (f) by Diameter									
Material Group	min	Starting Value	max										
				3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0		
P	1	100	140	150	mm/r	0,12 - 0,17	0,14 - 0,23	0,17 - 0,23	0,20 - 0,29	0,29 - 0,33	0,23 - 0,41	0,27 - 0,50	0,33 - 0,56
	2	70	100	110	mm/r	0,12 - 0,17	0,12 - 0,20	0,14 - 0,26	0,23 - 0,32	0,24 - 0,38	0,27 - 0,50	0,33 - 0,63	0,39 - 0,75
	3	70	90	110	mm/r	0,12 - 0,17	0,14 - 0,23	0,17 - 0,23	0,20 - 0,29	0,29 - 0,33	0,23 - 0,41	0,27 - 0,50	0,33 - 0,56
	4	60	70	90	mm/r	0,09 - 0,14	0,11 - 0,20	0,14 - 0,20	0,17 - 0,23	0,17 - 0,26	0,20 - 0,33	0,23 - 0,41	0,26 - 0,45
M	1	50	60	80	mm/r	0,03 - 0,08	0,06 - 0,13	0,08 - 0,10	0,10 - 0,20	0,12 - 0,22	0,13 - 0,23	0,15 - 0,25	0,18 - 0,28
	2	40	50	80	mm/r	0,03 - 0,08	0,06 - 0,13	0,08 - 0,10	0,10 - 0,20	0,12 - 0,22	0,13 - 0,23	0,15 - 0,25	0,18 - 0,28
	3	40	50	70	mm/r	0,03 - 0,08	0,06 - 0,13	0,08 - 0,10	0,10 - 0,20	0,12 - 0,22	0,13 - 0,23	0,15 - 0,25	0,18 - 0,28
K	1	90	150	150	mm/r	0,12 - 0,17	0,21 - 0,30	0,30 - 0,42	0,38 - 0,42	0,38 - 0,53	0,44 - 0,60	0,54 - 0,75	0,60 - 0,83
	2	80	120	120	mm/r	0,12 - 0,17	0,20 - 0,26	0,29 - 0,39	0,35 - 0,45	0,38 - 0,54	0,45 - 0,60	0,51 - 0,69	0,56 - 0,75
	3	80	80	140	mm/r	0,11 - 0,15	0,15 - 0,21	0,23 - 0,32	0,29 - 0,39	0,33 - 0,45	0,36 - 0,50	0,42 - 0,57	0,45 - 0,62
Cutting Speed – vc				Inch									
Range – SFM				Recommended Feed Rate (f) by Diameter									
Material Group	min	Starting Value	max										
				1/8 .125	3/16 .188	1/4 .250	5/16 .313	3/8 .375	1/2 .500	5/8 .625	3/4 .750		
P	1	330	470	490	IPR	.005 - .006	.006 - .009	.006 - .009	.008 - .011	.008 - .014	.009 - .017	.011 - .020	.014 - .023
	2	230	330	360	IPR	.005 - .006	.005 - .008	.006 - .011	.009 - .012	.009 - .015	.011 - .020	.014 - .026	.015 - .030
	3	230	300	360	IPR	.005 - .006	.006 - .009	.006 - .009	.008 - .011	.008 - .014	.009 - .017	.011 - .020	.014 - .023
	4	200	230	300	IPR	.003 - .006	.005 - .008	.006 - .008	.006 - .009	.006 - .011	.008 - .014	.009 - .017	.011 - .018
M	1	160	200	260	IPR	.001 - .003	.002 - .005	.003 - .004	.004 - .008	.005 - .008	.005 - .009	.006 - .010	.007 - .011
	2	130	160	260	IPR	.001 - .003	.002 - .005	.003 - .004	.004 - .008	.005 - .008	.005 - .009	.006 - .010	.007 - .011
	3	130	160	230	IPR	.001 - .003	.002 - .005	.003 - .004	.004 - .008	.005 - .008	.005 - .009	.006 - .010	.007 - .011
K	1	300	490	490	IPR	.005 - .006	.009 - .012	.012 - .017	.015 - .021	.017 - .024	.020 - .026	.021 - .030	.024 - .032
	2	260	400	400	IPR	.005 - .006	.008 - .011	.011 - .015	.014 - .018	.015 - .021	.018 - .024	.020 - .027	.023 - .030
	3	260	260	460	IPR	.005 - .006	.006 - .009	.009 - .012	.011 - .015	.014 - .018	.014 - .020	.017 - .023	.018 - .024

HP Solid Carbide Deep-Hole Drills for Steel, Cast Iron, and Non-Ferrous Materials

Primary Application

B27_HPG Series Solid Carbide Drills are the optimum platform for drilling holes up to 30 x D in steel, cast iron, and stainless steel materials. Drill deep holes up to 4x faster than conventional HSS and gun drills. Application of MQL is possible.

The B27_HPS in the new uncoated KN25™ grade now offers the same advantages for drilling in non-ferrous materials such as aluminum, copper, and brass. These series are now available from 2,3–16mm (.09–.63") diameter and in lengths from 15–30 x D.

Features and Benefits

HP Drill-Point Design

- Low thrust.
- Excellent centering capabilities.
- Highest possible feed rates.

Four-Margin Lands

- Improves hole straightness.
- Improves hole alignment when drilling through cross holes.

Unique Flute Design

- Drastically improved chip evacuation.
- Better hole surface quality.

KC7425™ Grade (B27_HPG)

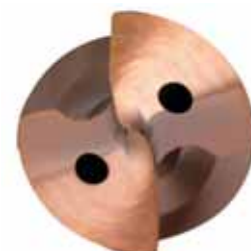
- A multilayer, AlCrN-TiSiN PVD coating provides outstanding wear resistance.
- New ultra-fine-grain carbide ensures process reliability at high feed rates.

KN25 Grade (B27_HPS)

- The uncoated grade helps to prevent built-up edge when drilling aluminum and high-temp alloys.
- The highly polished surfaces of both grades ensure superior chip evacuation, even when low-pressure coolant or MQL is applied.

Customization

- Intermediate diameters available as semi-standards.
- Length variations — including even longer versions — available as engineered solutions.

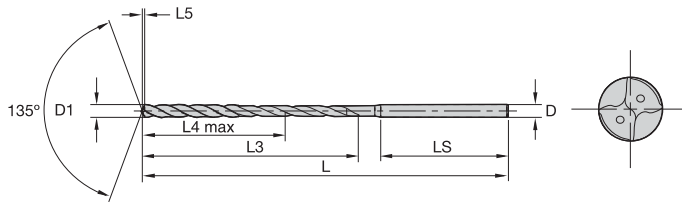


Solid Carbide Drills

Deep-Hole Drills • Steel and Non-Ferrous Materials • Through Coolant

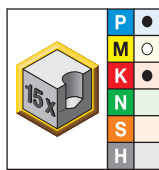


Solid Carbide Drills

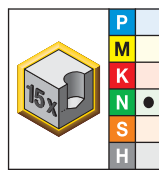


NEW!

■ B271Z_HPG/HPS • 15 x D



KC7425



KN25

- first choice
- alternate choice

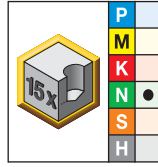
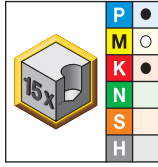
		D1 diameter				L	L3	L4 max	L5	LS	D
		mm	in	fraction	wire size						
B271Z02383KMG	B271Z02383KMS	2,383	.0938	3/32	—	86	51	44	0,4	30	3
B271Z02400KMG	B271Z02400KMS	2,400	.0945	—	—	86	51	44	0,4	30	3
B271Z02439KMG	B271Z02439KMS	2,439	.0960	—	41	86	51	44	0,5	30	3
B271Z02489KMG	B271Z02489KMS	2,489	.0980	—	40	86	51	44	0,5	30	3
B271Z02500KMG	B271Z02500KMS	2,500	.0984	—	—	86	51	44	0,5	30	3
B271Z02578KMG	B271Z02578KMS	2,578	.1015	—	38	86	51	44	0,5	30	3
B271Z02600KMG	B271Z02600KMS	2,600	.1024	—	—	86	51	44	0,5	30	3
B271Z02642KMG	B271Z02642KMS	2,642	.1040	—	37	86	51	44	0,5	30	3
B271Z02705KMG	B271Z02705KMS	2,705	.1065	—	36	86	52	45	0,5	30	3
B271Z02779KMG	B271Z02779KMS	2,779	.1094	7/64	—	86	52	45	0,5	30	3
B271Z02800KMG	B271Z02800KMS	2,800	.1102	—	—	86	52	45	0,5	30	3
B271Z02820KMG	B271Z02820KMS	2,820	.1110	—	34	86	52	45	0,5	30	3
B271Z02870KMG	B271Z02870KMS	2,870	.1130	—	33	86	52	45	0,5	30	3
B271Z02900KMG	B271Z02900KMS	2,900	.1142	—	—	86	52	45	0,5	30	3
B271Z02947KMG	B271Z02947KMS	2,947	.1160	—	32	86	52	45	0,5	30	3
B271Z03000HPG	B271Z03000HPS	3,000	.1181	—	—	86	52	45	0,6	30	3
B271Z03175HPG	B271Z03175HPS	3,175	.1250	1/8	—	105	67	58	0,6	32	4
—	B271Z03200HPS	3,200	.1260	—	—	105	67	58	0,6	32	4
B271Z03500HPG	B271Z03500HPS	3,500	.1378	—	—	105	68	59	0,6	32	4
B271Z03970HPG	B271Z03970HPS	3,970	.1563	5/32	—	105	70	60	0,7	32	4
B271Z04000HPG	B271Z04000HPS	4,000	.1575	—	—	105	70	60	0,7	32	4
B271Z04500HPG	B271Z04500HPS	4,500	.1772	—	—	124	85	74	0,8	34	5
B271Z04623HPG	—	4,623	.1820	—	14	124	86	75	0,9	34	5
B271Z04763HPG	B271Z04763HPS	4,763	.1875	3/16	—	124	86	75	0,9	34	5
B271Z05000HPG	B271Z05000HPS	5,000	.1969	—	—	124	87	75	0,9	34	5
B271Z05260HPG	—	5,260	.2071	—	—	143	102	89	1,0	36	6
B271Z05410HPG	—	5,410	.2130	—	3	143	102	89	1,0	36	6
B271Z05500HPG	B271Z05500HPS	5,500	.2165	—	—	143	102	89	1,0	36	6
B271Z05558HPG	—	5,558	.2188	7/32	—	143	102	89	1,0	36	6
B271Z05800HPG	—	5,800	.2283	—	—	143	103	89	1,1	36	6
B271Z06000HPG	B271Z06000HPS	6,000	.2362	—	—	143	104	90	1,1	36	6
B271Z06200HPG	B271Z06200HPS	6,200	.2441	—	—	162	118	103	1,1	38	7
B271Z06350HPG	B271Z06350HPS	6,350	.2500	1/4	E	162	119	104	1,2	38	7
B271Z06500HPG	B271Z06500HPS	6,500	.2559	—	—	162	119	104	1,2	38	7

(continued)

(B271Z_HPG/HPS • 15 x D continued)



Solid Carbide Drills



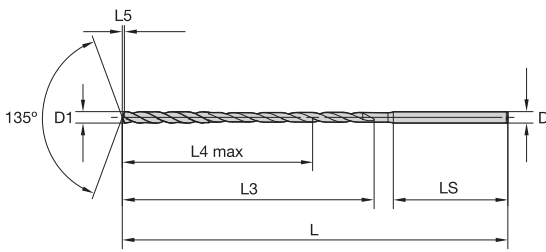
		D1 diameter				L	L3	L4 max	L5	LS	D
		mm	in	fraction	wire size						
KC7425	KN25										
B271Z06528HPG	—	6,528	.2570	—	F	162	119	104	1,2	38	7
B271Z06746HPG	B271Z06746HPS	6,746	.2656	17/64	—	162	120	104	1,2	38	7
B271Z06909HPG	—	6,909	.2720	—	I	162	121	105	1,3	38	7
B271Z07000HPG	B271Z07000HPS	7,000	.2756	—	—	162	121	105	1,3	38	7
B271Z07145HPG	B271Z07145HPS	7,145	.2813	9/32	—	181	135	118	1,3	40	8
B271Z07500HPG	B271Z07500HPS	7,500	.2953	—	—	181	136	119	1,4	40	8
B271Z07541HPG	—	7,541	.2969	19/64	—	181	136	119	1,4	40	8
B271Z07938HPG	—	7,938	.3125	5/16	—	181	138	120	1,5	40	8
B271Z08000HPG	B271Z08000HPS	8,000	.3150	—	—	181	138	120	1,5	40	8
B271Z08334HPG	—	8,334	.3281	21/64	—	200	153	134	1,5	42	9
B271Z08433HPG	—	8,433	.3320	—	Q	200	153	134	1,6	42	9
B271Z08500HPG	B271Z08500HPS	8,500	.3346	—	—	200	153	134	1,6	42	9
B271Z08733HPG	B271Z08733HPS	8,733	.3438	11/32	—	200	154	134	1,6	42	9
B271Z09000HPG	B271Z09000HPS	9,000	.3543	—	—	200	155	135	1,7	42	9
B271Z09100HPG	—	9,100	.3583	—	—	219	169	148	1,7	44	10
B271Z09500HPG	B271Z09500HPS	9,500	.3740	—	—	219	170	149	1,8	44	10
B271Z09525HPG	B271Z09525HPS	9,525	.3750	3/8	—	219	170	149	1,8	44	10
B271Z09750HPG	—	9,750	.3839	—	—	219	171	149	1,8	44	10
B271Z10000HPG	B271Z10000HPS	10,000	.3937	—	—	219	172	150	1,8	44	10
B271Z10200HPG	B271Z10200HPS	10,200	.4016	—	—	238	186	163	1,9	46	11
B271Z10500HPG	B271Z10500HPS	10,500	.4134	—	—	238	187	164	1,9	46	11
B271Z10720HPG	B271Z10720HPS	10,720	.4220	—	—	238	188	165	2,0	46	11
B271Z11000HPG	B271Z11000HPS	11,000	.4331	—	—	238	189	165	2,0	46	11
B271Z11500HPG	B271Z11500HPS	11,500	.4528	—	—	257	204	179	2,1	48	12
B271Z12000HPG	B271Z12000HPS	12,000	.4724	—	—	257	206	180	2,2	48	12
B271Z12500HPG	B271Z12500HPS	12,500	.4921	—	—	276	221	194	2,3	50	13
B271Z12700HPG	B271Z12700HPS	12,700	.5000	1/2	—	276	222	195	2,3	50	13
B271Z13000HPG	B271Z13000HPS	13,000	.5118	—	—	276	223	195	2,4	50	13
B271Z13100HPG	B271Z13100HPS	13,100	.5157	—	—	295	237	208	2,4	52	14
B271Z13500HPG	B271Z13500HPS	13,500	.5315	—	—	295	238	209	2,5	52	14
B271Z14000HPG	B271Z14000HPS	14,000	.5512	—	—	295	240	210	2,6	52	14
B271Z14290HPG	B271Z14290HPS	14,290	.5626	—	—	314	255	224	2,6	54	15
B271Z14500HPG	B271Z14500HPS	14,500	.5709	—	—	314	255	224	2,7	54	15
B271Z15000HPG	B271Z15000HPS	15,000	.5906	—	—	314	257	225	2,8	54	15
B271Z15500HPG	B271Z15500HPS	15,500	.6102	—	—	333	272	239	2,9	56	16
B271Z15870HPG	B271Z15870HPS	15,870	.6248	—	—	333	273	240	2,9	56	16
B271Z16000HPG	B271Z16000HPS	16,000	.6299	—	—	333	274	240	3,0	56	16

Solid Carbide Drills

Deep-Hole Drills • Steel and Non-Ferrous Materials • Through Coolant

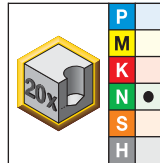
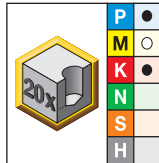


Solid Carbide Drills



NEW!

■ B272Z_HPG/HPS • 20 x D



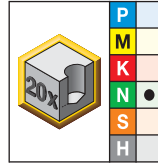
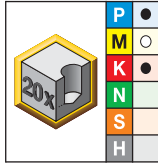
● first choice
○ alternate choice

		D1 diameter				L	L3	L4 max	L5	LS	D
		mm	in	fraction	wire size						
KC7425	KN25										
B272Z02383KMG	B272Z02383KMS	2,383	.0938	3/32	—	101	63	56	0,4	30	3
B272Z02400KMG	B272Z02400KMS	2,400	.0945	—	—	101	63	56	0,4	30	3
B272Z02439KMG	B272Z02439KMS	2,439	.0960	—	41	101	63	56	0,5	30	3
B272Z02489KMG	B272Z02489KMS	2,489	.0980	—	40	101	63	56	0,5	30	3
B272Z02500KMG	B272Z02500KMS	2,500	.0984	—	—	101	63	56	0,5	30	3
B272Z02578KMG	B272Z02578KMS	2,578	.1015	—	38	101	64	57	0,5	30	3
B272Z02600KMG	B272Z02600KMS	2,600	.1024	—	—	101	64	57	0,5	30	3
B272Z02642KMG	B272Z02642KMS	2,642	.1040	—	37	101	65	58	0,5	30	3
B272Z02705KMG	B272Z02705KMS	2,705	.1065	—	36	101	65	58	0,5	30	3
B272Z02779KMG	B272Z02779KMS	2,779	.1094	7/64	—	101	66	59	0,5	30	3
B272Z02800KMG	B272Z02800KMS	2,800	.1102	—	—	101	66	59	0,5	30	3
B272Z02820KMG	B272Z02820KMS	2,820	.1110	—	34	101	66	59	0,5	30	3
B272Z02870KMG	B272Z02870KMS	2,870	.1130	—	33	101	66	59	0,5	30	3
B272Z02900KMG	B272Z02900KMS	2,900	.1142	—	—	101	67	60	0,5	30	3
B272Z02947KMG	B272Z02947KMS	2,947	.1160	—	32	101	67	60	0,5	30	3
B272Z03000HPG	B272Z03000HPS	3,000	.1181	—	—	101	67	60	0,6	30	3
B272Z03175HPG	B272Z03175HPS	3,175	.1250	1/8	—	125	83	74	0,6	32	4
—	B272Z03300HPS	3,300	.1299	—	—	125	84	75	0,6	32	4
B272Z03500HPG	B272Z03500HPS	3,500	.1378	—	—	125	86	77	0,6	32	4
B272Z03970HPG	B272Z03970HPS	3,970	.1563	5/32	—	125	89	79	0,7	32	4
B272Z04000HPG	B272Z04000HPS	4,000	.1575	—	—	125	90	80	0,7	32	4
B272Z04500HPG	B272Z04500HPS	4,500	.1772	—	—	149	108	97	0,8	34	5
B272Z04623HPG	—	4,623	.1820	—	14	149	109	98	0,9	34	5
B272Z04763HPG	B272Z04763HPS	4,763	.1875	3/16	—	149	110	99	0,9	34	5
B272Z05000HPG	B272Z05000HPS	5,000	.1969	—	—	149	112	100	0,9	34	5
B272Z05260HPG	—	5,260	.2071	—	—	173	128	115	1,0	36	6
B272Z05410HPG	—	5,410	.2130	—	3	173	129	116	1,0	36	6
B272Z05500HPG	B272Z05500HPS	5,500	.2165	—	—	173	130	117	1,0	36	6
B272Z05558HPG	—	5,558	.2188	7/32	—	173	130	117	1,0	36	6
B272Z05800HPG	—	5,800	.2283	—	—	173	132	118	1,1	36	6
B272Z06000HPG	B272Z06000HPS	6,000	.2362	—	—	173	134	120	1,1	36	6
B272Z06200HPG	B272Z06200HPS	6,200	.2441	—	—	197	149	134	1,1	38	7
B272Z06350HPG	B272Z06350HPS	6,350	.2500	1/4	E	197	151	136	1,2	38	7
B272Z06500HPG	B272Z06500HPS	6,500	.2559	—	—	197	152	137	1,2	38	7
B272Z06528HPG	—	6,528	.2570	—	F	197	152	137	1,2	38	7
B272Z06746HPG	B272Z06746HPS	6,746	.2656	17/64	—	197	154	138	1,2	38	7
B272Z06909HPG	—	6,909	.2720	—	I	197	155	139	1,3	38	7
B272Z07000HPG	B272Z07000HPS	7,000	.2756	—	—	197	156	140	1,3	38	7
B272Z07145HPG	B272Z07145HPS	7,145	.2813	9/32	—	221	171	154	1,3	40	8
B272Z07500HPG	B272Z07500HPS	7,500	.2953	—	—	221	174	157	1,4	40	8
B272Z07541HPG	—	7,541	.2969	19/64	—	221	174	157	1,4	40	8
B272Z07938HPG	—	7,938	.3125	5/16	—	221	177	159	1,5	40	8

(continued)

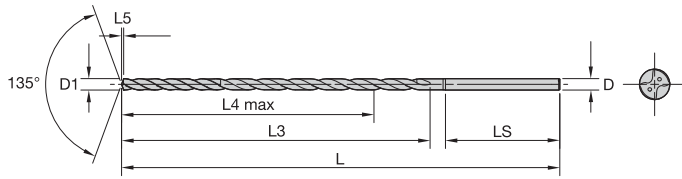


(B272Z_HPG/HPS • 20 x D continued)

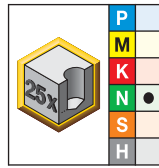
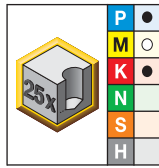


		D1 diameter				L	L3	L4 max	L5	LS	D
		mm	in	fraction	wire size						
KC7425	KN25										
B272Z08000HPG	B272Z08000HPS	8,000	.3150	—	—	221	178	160	1,5	40	8
B272Z08334HPG	—	8,334	.3281	21/64	—	245	194	175	1,5	42	9
B272Z08433HPG	—	8,433	.3320	—	Q	245	195	176	1,6	42	9
B272Z08500HPG	B272Z08500HPS	8,500	.3346	—	—	245	196	177	1,6	42	9
B272Z08733HPG	B272Z08733HPS	8,733	.3438	11/32	—	245	198	178	1,6	42	9
B272Z09000HPG	B272Z09000HPS	9,000	.3543	—	—	245	200	180	1,7	42	9
B272Z09100HPG	—	9,100	.3583	—	—	269	215	194	1,7	44	10
B272Z09500HPG	—	9,500	.3740	—	—	269	218	197	1,8	44	10
B272Z09525HPG	B272Z09525HPS	9,525	.3750	3/8	—	269	218	197	1,8	44	10
B272Z09750HPG	B272Z09750HPS	9,750	.3839	—	—	269	220	198	1,8	44	10
B272Z10000HPG	B272Z10000HPS	10,000	.3937	—	—	269	222	200	1,8	44	10
B272Z10200HPG	B272Z10200HPS	10,200	.4016	—	—	293	237	214	1,9	46	11
B272Z10500HPG	B272Z10500HPS	10,500	.4134	—	—	293	240	217	1,9	46	11
B272Z10720HPG	B272Z10720HPS	10,720	.4220	—	—	293	242	219	2,0	46	11
B272Z11000HPG	B272Z11000HPS	11,000	.4331	—	—	293	244	220	2,0	46	11
B272Z11500HPG	B272Z11500HPS	11,500	.4528	—	—	317	262	237	2,1	48	12
B272Z12000HPG	B272Z12000HPS	12,000	.4724	—	—	317	266	240	2,2	48	12
B272Z12500HPG	B272Z12500HPS	12,500	.4921	—	—	341	284	257	2,3	50	13
B272Z12700HPG	B272Z12700HPS	12,700	.5000	1/2	—	341	285	258	2,3	50	13
B272Z13000HPG	B272Z13000HPS	13,000	.5118	—	—	341	288	260	2,4	50	13
B272Z13100HPG	B272Z13100HPS	13,100	.5157	—	—	365	302	273	2,4	52	14
B272Z13500HPG	B272Z13500HPS	13,500	.5315	—	—	365	306	277	2,5	52	14
B272Z14000HPG	B272Z14000HPS	14,000	.5512	—	—	365	310	280	2,6	52	14
B272Z14290HPG	B272Z14290HPS	14,290	.5626	—	—	389	326	295	2,6	54	15
B272Z14500HPG	B272Z14500HPS	14,500	.5709	—	—	389	328	297	2,7	54	15
B272Z15000HPG	B272Z15000HPS	15,000	.5906	—	—	389	332	300	2,8	54	15
B272Z15500HPG	B272Z15500HPS	15,500	.6102	—	—	413	350	317	2,9	56	16
B272Z15870HPG	B272Z15870HPS	15,870	.6248	—	—	413	353	320	2,9	56	16
B272Z16000HPG	B272Z16000HPS	16,000	.6299	—	—	413	354	320	3,0	56	16

Solid Carbide Drills



■ B273Z_HPG/HPS • 25 x D

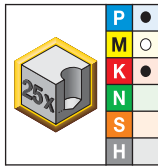
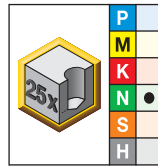


- first choice
- alternate choice

		D1 diameter				L	L3	L4 max	L5	LS	D
		mm	in	fraction	wire size						
KC7425	B273Z02383KMG	2,383	.0938	3/32	—	116	74	67	0,4	30	3
	B273Z02400KMG	2,400	.0945	—	—	116	75	68	0,4	30	3
KN25	B273Z02439KMG	2,439	.0960	—	41	116	75	68	0,5	30	3
	B273Z02489KMG	2,489	.0980	—	40	116	76	69	0,5	30	3
KC7425	B273Z02500KMG	2,500	.0984	—	—	116	76	69	0,5	30	3
	B273Z02578KMG	2,578	.1015	—	38	116	77	70	0,5	30	3
KN25	B273Z02600KMG	2,600	.1024	—	—	116	77	70	0,5	30	3
	B273Z02642KMG	2,642	.1040	—	37	116	78	71	0,5	30	3
KC7425	B273Z02705KMG	2,705	.1065	—	36	116	79	72	0,5	30	3
	B273Z02779KMG	2,779	.1094	7/64	—	116	80	73	0,5	30	3
KN25	B273Z02800KMG	2,800	.1102	—	—	116	80	73	0,5	30	3
	B273Z02820KMG	2,820	.1110	—	34	116	80	73	0,5	30	3
KC7425	B273Z02870KMG	2,870	.1130	—	33	116	81	74	0,5	30	3
	B273Z02900KMG	2,900	.1142	—	—	116	81	74	0,5	30	3
KN25	B273Z02947KMG	2,947	.1160	—	32	116	82	75	0,5	30	3
	B273Z03000HPG	3,000	.1181	—	—	116	82	75	0,6	30	3
KC7425	B273Z03175HPG	3,175	.1250	1/8	—	145	99	90	0,6	32	4
	B273Z03500HPG	3,500	.1378	—	—	145	103	94	0,6	32	4
KN25	B273Z04000HPG	4,000	.1575	—	—	145	110	100	0,7	32	4
	B273Z04500HPG	4,500	.1772	—	—	174	130	119	0,8	34	5
KC7425	B273Z05000HPG	5,000	.1969	—	—	174	137	125	0,9	34	5
	B273Z05500HPG	5,500	.2165	—	—	203	157	144	1,0	36	6
KN25	B273Z06000HPG	6,000	.2362	—	—	203	164	150	1,1	36	6
	B273Z06350HPG	6,350	.2500	1/4	E	232	182	167	1,2	38	7
KC7425	B273Z06500HPG	6,500	.2559	—	—	232	184	169	1,2	38	7
	B273Z06746HPG	6,746	.2656	17/64	—	232	187	171	1,2	38	7
KN25	B273Z07000HPG	7,000	.2756	—	—	232	191	175	1,3	38	7
	B273Z08000HPG	8,000	.3150	—	—	261	218	200	1,5	40	8
KC7425	B273Z08500HPG	8,500	.3346	—	—	290	238	219	1,6	42	9
	B273Z08733HPG	8,733	.3438	11/32	—	290	241	221	1,6	42	9
KN25	B273Z09000HPG	9,000	.3543	—	—	290	245	225	1,7	42	9
	B273Z09100HPG	9,100	.3583	—	—	319	260	239	1,7	44	10
KC7425	B273Z09525HPG	9,525	.3750	3/8	—	319	266	245	1,8	44	10
	B273Z10000HPG	10,000	.3937	—	—	319	272	250	1,8	44	10

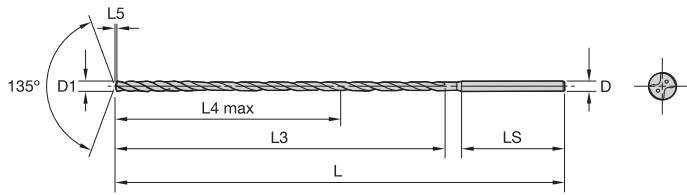
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(B273Z_HPG/HPS • 25 x D continued)


KC7425

KN25

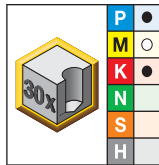
		D1 diameter				L	L3	L4 max	L5	LS	D
		mm	in	fraction	wire size						
B273Z10200HPG	B273Z10200HPS	10,200	.4016	—	—	348	288	265	1,9	46	11
B273Z10500HPG	B273Z10500HPS	10,500	.4134	—	—	348	292	269	1,9	46	11
B273Z10720HPG	B273Z10720HPS	10,720	.4220	—	—	348	295	272	2,0	46	11
B273Z11000HPG	B273Z11000HPS	11,000	.4331	—	—	348	299	275	2,0	46	11
B273Z11500HPG	B273Z11500HPS	11,500	.4528	—	—	377	319	294	2,1	48	12
B273Z12000HPG	B273Z12000HPS	12,000	.4724	—	—	377	326	300	2,2	48	12
B273Z12500HPG	B273Z12500HPS	12,500	.4921	—	—	406	346	319	2,3	50	13
B273Z12700HPG	B273Z12700HPS	12,700	.5000	1/2	—	406	349	322	2,3	50	13
B273Z13000HPG	B273Z13000HPS	13,000	.5118	—	—	406	353	325	2,4	50	13
B273Z13100HPG	B273Z13100HPS	13,100	.5157	—	—	435	368	339	2,4	52	14
B273Z13500HPG	B273Z13500HPS	13,500	.5315	—	—	435	373	344	2,5	52	14
B273Z14000HPG	B273Z14000HPS	14,000	.5512	—	—	435	380	350	2,6	52	14
B273Z14290HPG	B273Z14290HPS	14,290	.5626	—	—	464	397	366	2,6	54	15
B273Z14500HPG	B273Z14500HPS	14,500	.5709	—	—	464	400	369	2,7	54	15
B273Z15000HPG	B273Z15000HPS	15,000	.5906	—	—	464	407	375	2,8	54	15

Solid Carbide Drills

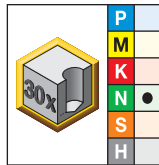


NEW!

■ B274Z_HPG/HPS • 30 x D



KC7425



KN25

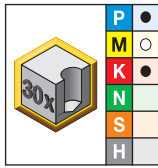
- first choice
- alternate choice

		D1 diameter									
		mm	in	fraction	wire size	L	L3	L4 max	L5	LS	D
B274Z02383KMG	B274Z02383KMS	2,383	.0938	3/32	—	131	86	79	0,4	30	3
B274Z02400KMG	B274Z02400KMS	2,400	.0945	—	—	131	87	80	0,4	30	3
B274Z02439KMG	B274Z02439KMS	2,439	.0960	—	41	131	87	80	0,5	30	3
B274Z02489KMG	B274Z02489KMS	2,489	.0980	—	40	131	88	81	0,5	30	3
B274Z02500KMG	B274Z02500KMS	2,500	.0984	—	—	131	88	81	0,5	30	3
B274Z02578KMG	B274Z02578KMS	2,578	.1015	—	38	131	90	83	0,5	30	3
B274Z02600KMG	B274Z02600KMS	2,600	.1024	—	—	131	90	83	0,5	30	3
B274Z02642KMG	B274Z02642KMS	2,642	.1040	—	37	131	91	84	0,5	30	3
B274Z02705KMG	B274Z02705KMS	2,705	.1065	—	36	131	92	85	0,5	30	3
B274Z02779KMG	B274Z02779KMS	2,779	.1094	7/64	—	131	94	87	0,5	30	3
B274Z02800KMG	B274Z02800KMS	2,800	.1102	—	—	131	94	87	0,5	30	3
B274Z02820KMG	B274Z02820KMS	2,820	.1110	—	34	131	94	87	0,5	30	3
B274Z02870KMG	B274Z02870KMS	2,870	.1130	—	33	131	95	88	0,5	30	3
B274Z02900KMG	B274Z02900KMS	2,900	.1142	—	—	131	96	89	0,5	30	3
B274Z02947KMG	B274Z02947KMS	2,947	.1160	—	32	131	97	90	0,5	30	3
B274Z03000HPG	B274Z03000HPS	3,000	.1181	—	—	131	97	90	0,6	30	3
B274Z03175HPG	B274Z03175HPS	3,175	.1250	1/8	—	165	115	106	0,6	32	4
B274Z03500HPG	B274Z03500HPS	3,500	.1378	—	—	165	121	112	0,6	32	4
B274Z03970HPG	—	3,970	.1563	5/32	—	165	129	119	0,7	32	4
B274Z04000HPG	B274Z04000HPS	4,000	.1575	—	—	165	130	120	0,7	32	4
B274Z04300HPG	—	4,300	.1693	—	—	199	149	138	0,8	34	5
B274Z04500HPG	B274Z04500HPS	4,500	.1772	—	—	199	153	142	0,8	34	5
B274Z04763HPG	—	4,763	.1875	3/16	—	199	157	146	0,9	34	5
B274Z05000HPG	B274Z05000HPS	5,000	.1969	—	—	199	162	150	0,9	34	5
B274Z05500HPG	B274Z05500HPS	5,500	.2165	—	—	233	185	172	1,0	36	6
B274Z06000HPG	B274Z06000HPS	6,000	.2362	—	—	233	194	180	1,1	36	6
B274Z06350HPG	B274Z06350HPS	6,350	.2500	1/4	E	267	214	199	1,2	38	7
B274Z06500HPG	B274Z06500HPS	6,500	.2559	—	—	267	217	202	1,2	38	7
—	B274Z06746HPS	6,746	.2656	17/64	—	267	221	205	1,2	38	7
B274Z06800HPG	—	6,800	.2677	—	—	267	222	206	1,3	38	7
B274Z07000HPG	B274Z07000HPS	7,000	.2756	—	—	267	226	210	1,3	38	7
B274Z07938HPG	—	7,938	.3125	5/16	—	301	257	239	1,5	40	8

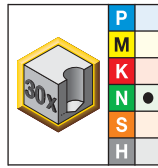
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(B274Z_HPG/HPS • 30 x D continued)

Solid Carbide Drills



KC7425



KN25

		D1 diameter				L	L3	L4 max	L5	LS	D
		mm	in	fraction	wire size						
B274Z08000HPG	B274Z08000HPS	8,000	.3150	—	—	301	258	240	1,5	40	8
B274Z08334HPG	—	8,334	.3281	21/64	—	335	278	259	1,5	42	9
B274Z08500HPG	B274Z08500HPS	8,500	.3346	—	—	335	281	262	1,6	42	9
—	B274Z08733HPS	8,733	.3438	11/32	—	335	285	265	1,6	42	9
B274Z09000HPG	B274Z09000HPS	9,000	.3543	—	—	335	290	270	1,7	42	9
B274Z09100HPG	—	9,100	.3583	—	—	369	306	285	1,7	44	10
B274Z09525HPG	B274Z09525HPS	9,525	.3750	3/8	—	369	313	292	1,8	44	10
B274Z10000HPG	B274Z10000HPS	10,000	.3937	—	—	369	322	300	1,8	44	10
B274Z10200HPG	B274Z10200HPS	10,200	.4016	—	—	403	339	316	1,9	46	11
B274Z10500HPG	B274Z10500HPS	10,500	.4134	—	—	403	345	322	1,9	46	11
B274Z10720HPG	B274Z10720HPS	10,720	.4220	—	—	403	349	326	2,0	46	11
B274Z11000HPG	B274Z11000HPS	11,000	.4331	—	—	403	354	330	2,0	46	11
B274Z11500HPG	—	11,500	.4528	—	—	437	377	363	2,1	48	12
—	B274Z11500HPS	11,500	.4528	—	—	437	377	352	2,1	48	12
B274Z12000HPG	B274Z12000HPS	12,000	.4724	—	—	437	386	360	2,2	48	12
B274Z12500HPG	B274Z12500HPS	12,500	.4921	—	—	471	409	382	2,3	50	13
B274Z12700HPG	B274Z12700HPS	12,700	.5000	1/2	—	471	412	385	2,3	50	13
B274Z13000HPG	B274Z13000HPS	13,000	.5118	—	—	471	418	390	2,4	50	13

Tolerance • Metric				Tolerance • Inch			
nominal size range	D1 HPG tolerance h7	D1HPS tolerance h8	D tolerance h6	nominal size range	D1 HPG tolerance h7	D1HPS tolerance h8	D tolerance h6
1-3	0,000/-0,010	0,000/-0,014	0,000/-0,006	.0394-.1181	.0000/-0,0004	.0000/-0,0006	.0000/-0,0002
>3-6	0,000/-0,012	0,000/-0,018	0,000/-0,008	>.1181-.2362	.0000/-0,0005	.0000/-0,0007	.0000/-0,0003
>6-10	0,000/-0,015	0,000/-0,022	0,000/-0,009	>.2362-.3937	.0000/-0,0006	.0000/-0,0009	.0000/-0,0004
>10-18	0,000/-0,018	0,000/-0,027	0,000/-0,011	>.3937-.7087	.0000/-0,0007	.0000/-0,0011	.0000/-0,0004

The B27_ deep-hole drill series offers an increase of up to 100% in metal removal rates (MRR) compared to competitive gun and HSS drills. It also enables up to 20-30% increased MRR compared to competitive solid carbide products. This MRR increase means bottom-line savings to customers in throughput, machine time, and personnel hours.

Increased Drill Head
Reduces contact with hole wall.



135° HP Point Geometry
Excellent centering ability.

Four-Margin Design
Stability increases tool life.

To achieve the best tool performance, we recommend using the deep-hole drill with a hydraulic chuck.

Reduction sleeves are available to hold the drill shank with the hydraulic chuck.

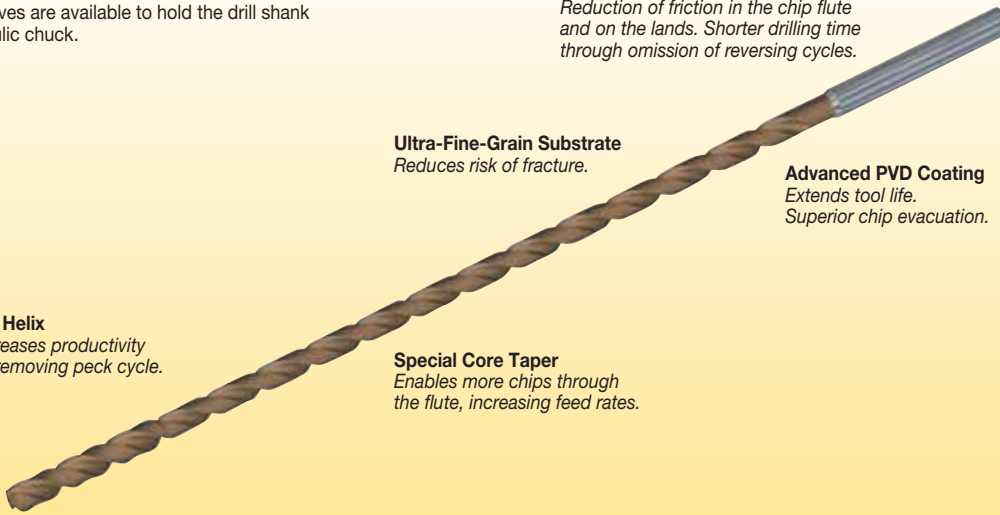
Unique New Polished Surface
Reduction of friction in the chip flute and on the lands. Shorter drilling time through omission of reversing cycles.

Ultra-Fine-Grain Substrate
Reduces risk of fracture.

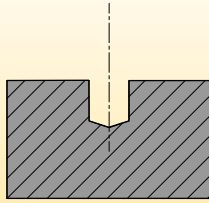
Advanced PVD Coating
Extends tool life. Superior chip evacuation.

30° Helix
Increases productivity by removing peck cycle.

Special Core Taper
Enables more chips through the flute, increasing feed rates.



D1	12mm hydraulic reducer sleeve		20mm hydraulic reducer sleeve		25mm hydraulic reducer sleeve		32mm hydraulic reducer sleeve		.500" hydraulic reducer sleeve		.750" hydraulic reducer sleeve	
	order number	catalog number	order number	catalog number	order number	catalog number	order number	catalog number	order number	catalog number	order number	catalog number
3	3026450	12MHC030M	3026648	20MHC030M	3026662	25MHC030M	—	—	2248993	50HC030M	2248995	75HC030M
4	3026451	12MHC040M	3026649	20MHC040M	3026663	25MHC040M	—	—	1606050	50HC040M	2248996	75HC040M
5	3026452	12MHC050M	3026650	20MHC050M	3026664	25MHC050M	—	—	2248994	50HC050M	2248997	75HC050M
6	3026643	12MHC060M	3026651	20MHC060M	3026665	25MHC060M	3026675	32MHC060M	1606061	50HC060M	1093271	75HC060M
7	3026644	12MHC070M	3026652	20MHC070M	3026666	25MHC070M	3026676	32MHC070M	—	—	—	—
8	3026645	12MHC080M	3026653	20MHC080M	3026667	25MHC080M	3026677	32MHC080M	1606062	50HC080M	1093272	75HC080M
9	3026646	12MHC090M	3026654	20MHC090M	3026668	25MHC090M	3026678	32MHC090M	—	—	—	—
10	3026647	12MHC100M	3026655	20MHC100M	3026669	25MHC100M	3026679	32MHC100M	1606064	50HC100M	1093273	75HC100M
11	—	—	3026656	20MHC110M	—	—	3026680	32MHC110M	—	—	—	—
12	—	—	3026657	20MHC120M	3026670	25MHC120M	3026681	32MHC120M	—	—	1093524	75HC120M
13	—	—	3026658	20MHC130M	—	—	3026682	32MHC130M	—	—	—	—
14	—	—	3026659	20MHC140M	3026671	25MHC140M	3026683	32MHC140M	—	—	1093525	75HC140M
15	—	—	3026660	20MHC150M	—	—	3026684	32MHC150M	—	—	—	—
16	—	—	3026661	20MHC160M	3026672	25MHC160M	3026685	32MHC160M	—	—	1093526	75HC160M

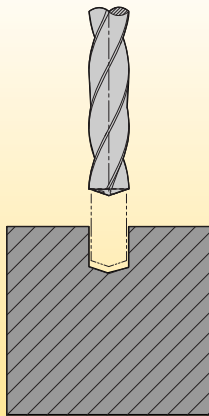


1) Pilot/Pre-Drill Hole

- Drill: B976A... KC7315™ or another drill with a 140° point angle.
- Depth of pilot: minimum 2 x D.
- Drill \varnothing = nominal \varnothing up to nominal +0,010mm (+.0004").
- Apply catalog recommended speeds and feeds.

Recommendations:

- Use only a conical (B976A) or split-point drill to pilot (do not use an SE-HP drill).
- Use a hydraulic chuck to achieve minimum tool runout.
- Be sure the machine tool and setup are rigid.
- Check the pilot drill for wear. Excessive wear can lead to premature wear on the B27_ cutting edge and possibly catastrophic failure.



2) Feed B27_ into Pilot Hole:

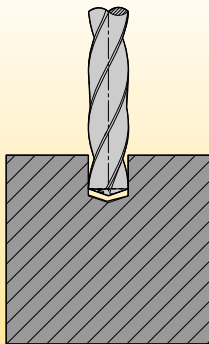
- Drill: B27_
- 1,000 RPM and recommended feed rate, no rapid traverse.
- Depth: 0,25–0,30mm (.010–.012") above the bottom of pilot hole.

Recommendations:

The coolant channels of the B27_ are smaller than typical Kennametal drills. Be sure that a steady supply of coolant is delivered through the coolant channels to the cutting edges. If coolant supply is not steady or is unequal through both channels, check:

1. Coolant filtering system.
2. Sealing of adapter/spindle.
3. Chips blocking the coolant hole on the drill shank.

NOTE: Reduce cutting speed to minimize imbalances in machine spindle/adapter. On MQL applications, make sure that the coolant is directly supplied from the chuck into the back end of the drill shank.



3) Drill Hole:

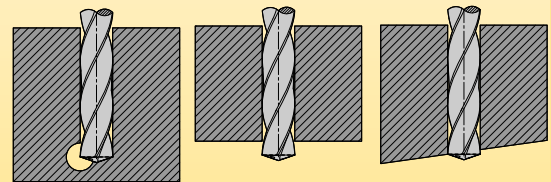
Cutting Parameters: start recommended speed and feed rate at 0,25–0,30mm (.010–.012") from the bottom of the pilot hole.

Recommendations:

DO NOT PECK OR DWELL up to 30 x D!

With long-chipping steel materials, it may be necessary to increase feed rate by 10–20% to provide optimal chip control. For long-chipping aluminum materials, it may be necessary to decrease feed rate and increase speed.

Reduce feed rate on angled exits and crossholes by 50–60%.



NOTE: Feed recommendations are usually higher than with conventional solid carbide drills.

4) Drill Retraction:

Cutting Parameters: 50 RPM and feed rate 2 m/min (40mm/rev or 1.6 IPR).

NOTE: Reduce cutting speed to minimize imbalances in machine spindle/adapter.

■ Deep-Hole Drills • B27_HPG Series • Grade KC7425™ • Through Coolant for Drill Diameters 3–16mm

		Cutting Speed – vc			Metric								
		Range – m/min			Recommended Feed Rate (f) by Diameter								
Material Group		min	Starting Value	max		3,0	4,0	6,0	8,0	10,0	12,0	14,0	16,0
P	1	70	80	90	mm/r	0,15 - 0,18	0,16 - 0,19	0,18 - 0,25	0,22 - 0,30	0,25 - 0,37	0,30 - 0,42	0,35 - 0,48	0,40 - 0,54
	2	70	80	90	mm/r	0,15 - 0,18	0,16 - 0,19	0,18 - 0,25	0,22 - 0,30	0,25 - 0,37	0,30 - 0,42	0,35 - 0,48	0,40 - 0,54
	3	60	75	90	mm/r	0,15 - 0,18	0,16 - 0,19	0,18 - 0,25	0,22 - 0,30	0,25 - 0,37	0,30 - 0,42	0,35 - 0,48	0,40 - 0,54
	4	60	70	80	mm/r	0,15 - 0,18	0,16 - 0,19	0,18 - 0,25	0,22 - 0,30	0,25 - 0,37	0,30 - 0,42	0,35 - 0,48	0,40 - 0,54
M	1	40	50	60	mm/r	0,05 - 0,09	0,07 - 0,12	0,09 - 0,14	0,10 - 0,15	0,11 - 0,16	0,12 - 0,17	0,13 - 0,18	0,14 - 0,19
	2	30	40	50	mm/r	0,04 - 0,08	0,06 - 0,10	0,08 - 0,13	0,09 - 0,14	0,10 - 0,15	0,11 - 0,16	0,12 - 0,17	0,13 - 0,18
	3	30	40	50	mm/r	0,04 - 0,08	0,06 - 0,10	0,08 - 0,13	0,09 - 0,14	0,10 - 0,15	0,11 - 0,16	0,12 - 0,17	0,13 - 0,18
K	1	60	80	100	mm/r	0,15 - 0,19	0,17 - 0,20	0,19 - 0,26	0,24 - 0,32	0,27 - 0,40	0,32 - 0,45	0,38 - 0,52	0,45 - 0,59
	2	60	70	80	mm/r	0,15 - 0,18	0,16 - 0,19	0,18 - 0,25	0,22 - 0,30	0,25 - 0,37	0,30 - 0,42	0,35 - 0,48	0,40 - 0,54
	3	40	70	100	mm/r	0,15 - 0,18	0,16 - 0,19	0,18 - 0,25	0,22 - 0,30	0,25 - 0,37	0,30 - 0,42	0,35 - 0,48	0,40 - 0,54
		Cutting Speed – vc			Inch								
		Range – SFM			Recommended Feed Rate (f) by Diameter								
Material Group		min	Starting Value	max		1/8 .125	3/16 .188	1/4 .250	5/16 .313	3/8 .375	1/2 .500	0.551	5/8 .625
P	1	230	262	295	IPR	.006 - .007	.006 - .007	.007 - .010	.009 - .012	.010 - .015	.012 - .017	.014 - .019	.016 - .021
	2	230	262	295	IPR	.006 - .007	.006 - .007	.007 - .010	.009 - .012	.010 - .015	.012 - .017	.014 - .019	.016 - .021
	3	197	246	295	IPR	.006 - .007	.006 - .007	.007 - .010	.009 - .012	.010 - .015	.012 - .017	.014 - .019	.016 - .021
	4	197	230	262	IPR	.006 - .007	.006 - .007	.007 - .010	.009 - .012	.010 - .015	.012 - .017	.014 - .019	.016 - .021
M	1	130	160	200	IPR	.002 - .004	.003 - .005	.004 - .006	.004 - .006	.004 - .006	.005 - .007	.005 - .007	.006 - .007
	2	100	130	160	IPR	.002 - .003	.002 - .004	.003 - .005	.004 - .006	.004 - .007	.004 - .006	.005 - .007	.005 - .007
	3	100	130	160	IPR	.002 - .003	.002 - .004	.003 - .006	.004 - .007	.004 - .008	.004 - .007	.005 - .007	.005 - .007
K	1	197	262	328	IPR	.006 - .007	.007 - .008	.007 - .010	.009 - .013	.011 - .016	.013 - .018	.015 - .020	.018 - .023
	2	197	230	262	IPR	.006 - .007	.006 - .007	.007 - .010	.009 - .012	.010 - .015	.012 - .017	.014 - .019	.016 - .021
	3	131	230	328	IPR	.006 - .007	.006 - .007	.007 - .010	.009 - .012	.010 - .015	.012 - .017	.014 - .019	.016 - .021

■ Deep-Hole Drills • B27_HPS Series • Grade KN25™ • Through Coolant for Drill Diameters 3–16mm

		Cutting Speed – vc			Metric								
		Range – m/min			Recommended Feed Rate (f) by Diameter								
Material Group		min	Starting Value	max		3,0	4,0	6,0	8,0	10,0	12,0	14,0	16,0
N	1	120	200	300	mm/r	0,12 - 0,17	0,13 - 0,18	0,15 - 0,24	0,19 - 0,29	0,26 - 0,35	0,31 - 0,40	0,35 - 0,45	0,41 - 0,51
	2	120	170	300	mm/r	0,13 - 0,18	0,14 - 0,19	0,16 - 0,25	0,20 - 0,30	0,28 - 0,37	0,33 - 0,42	0,38 - 0,48	0,44 - 0,54
	3	100	150	300	mm/r	0,13 - 0,18	0,14 - 0,19	0,16 - 0,25	0,20 - 0,30	0,28 - 0,37	0,33 - 0,42	0,38 - 0,48	0,44 - 0,54
	5	80	200	300	mm/r	0,03 - 0,05	0,03 - 0,06	0,03 - 0,06	0,04 - 0,06	0,05 - 0,07	0,05 - 0,08	0,05 - 0,08	0,06 - 0,09
		Cutting Speed – vc			Inch								
		Range – SFM			Recommended Feed Rate (f) by Diameter								
Material Group		min	Starting Value	max		1/8 .125	3/16 .188	1/4 .250	5/16 .313	3/8 .375	1/2 .500	0.551	5/8 .625
N	1	390	660	980	IPR	.005 - .007	.005 - .007	.006 - .009	.007 - .011	.010 - .014	.012 - .016	.014 - .018	.016 - .020
	2	390	560	980	IPR	.005 - .007	.006 - .007	.006 - .010	.008 - .012	.011 - .015	.013 - .017	.015 - .019	.017 - .021
	3	330	490	980	IPR	.005 - .007	.006 - .007	.006 - .010	.008 - .012	.011 - .015	.013 - .017	.015 - .019	.017 - .021
	5	260	660	980	IPR	.001 - .002	.001 - .002	.001 - .002	.002 - .003	.002 - .003	.002 - .003	.002 - .003	.002 - .003

HP Drills with Through Coolant for High-Temperature Alloys

Primary Application

B/K28_ Series Solid Carbide Drills offer a material-specific design and grade for machining high-temperature-resistant alloys such as titanium alloys and nickel-based alloys in aerospace applications. This drill minimizes subsurface deformation.

Features and Benefits

HP Drill-Point Design

- Low thrust prevents workpiece flexing.
- Excellent centering capabilities.

Straight Cutting Edge

- Optimized chip formation with less stress and heat generation.
- Rigid wedge at the cutting corner to withstand high thermal and mechanical stress.

Unique Flute Design

- Drastically improved chip evacuation.

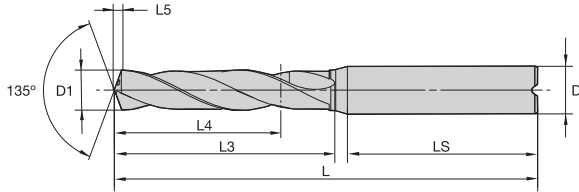
K715™ Grade

- Specified, uncoated 9% cobalt fine-grain carbide.
- The uncoated grade helps to prevent built-up edge in drilling aluminum and high-temp alloys.

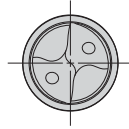
Customization

- Intermediate diameters available as semi-standards.
- Length variations and step drills available as engineered solutions.

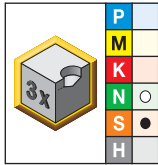




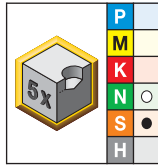
For information on L, L3, and L4 max, see the Solid Carbide foldout table.



■ B284/B285 • ~3 x D/~5 x D



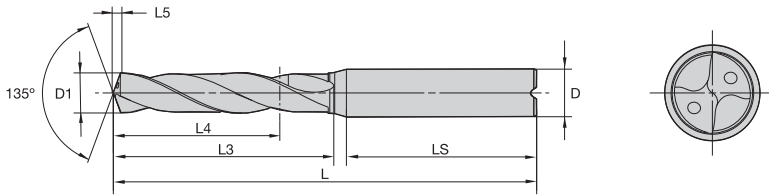
short • K715



long • K715

- first choice
- alternate choice

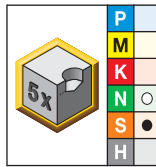
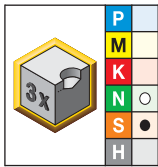
		D1 diameter				L5	LS	D
		mm	in	fraction	wire size			
B284A04000	—	4,000	.1575	—	—	0,7	36	6
B284A04200	—	4,200	.1654	—	—	0,8	36	6
B284A04500	—	4,500	.1772	—	—	0,8	36	6
B284A05000	B285A05000	5,000	.1969	—	—	0,9	36	6
B284A05100	—	5,100	.2008	—	—	0,9	36	6
B284A05500	B285A05500	5,500	.2165	—	—	1,0	36	6
—	B285A05900	5,900	.2323	—	—	1,1	36	6
B284A06000	B285A06000	6,000	.2362	—	—	1,1	36	6
—	B285A06350	6,350	.2500	1/4	E	1,2	36	8
B284A06800	—	6,800	.2677	—	—	1,3	36	8
B284A07000	—	7,000	.2756	—	—	1,3	36	8
B284A07500	—	7,500	.2953	—	—	1,4	36	8
—	B285A08000	8,000	.3150	—	—	1,5	36	8
B284A08500	—	8,500	.3346	—	—	1,6	40	10
B284A08800	—	8,800	.3465	—	—	1,6	40	10
—	B285A09540	9,540	.3756	—	—	1,8	40	10
—	B285A10000	10,000	.3937	—	—	1,8	40	10
—	B285A10500	10,500	.4134	—	—	1,9	45	12
B284A11700	—	11,700	.4606	—	—	2,2	45	12
—	B285A12000	12,000	.4724	—	—	2,2	45	12
B284A15500	—	15,500	.6102	—	—	2,9	48	16
B284A25000	—	25,000	.9843	—	—	4,6	56	25



For information on L, L3, and L4 max, see the Solid Carbide foldout table.



■ K284/K285 • ~3 x D/~5 x D



- first choice
- alternate choice

		D1 diameter				L5	LS	D
		in	mm	fraction	wire size			
short • K715	regular • K715							
K284A01563	K285A01563	.1563	3,969	5/32	—	.029	1.44	.1875
—	K285A01590	.1590	4,039	—	21	.029	1.44	.1875
K284A01875	K285A01875	.1875	4,762	3/16	—	.035	1.44	.1875
—	K285A02090	.2090	5,309	—	4	.039	1.44	.2500
K284A02188	—	.2188	5,558	7/32	—	.040	1.44	.2500
—	K285A02194	.2194	5,573	—	—	.041	1.44	.2500
—	K285A02210	.2210	5,614	—	2	.041	1.44	.2500
—	K285A02420	.2420	6,147	—	C	.045	1.44	.2500
K284A02500	K285A02500	.2500	6,350	1/4	E	.046	1.44	.2500
K284A02649	—	.2649	6,729	—	—	.049	1.52	.3125
K284A02656	—	.2656	6,746	17/64	—	.049	1.52	.3125
—	K285A02720	.2720	6,909	—	I	.050	1.52	.3125
K284A02813	—	.2813	7,145	9/32	—	.052	1.52	.3125
K284A02913	—	.2913	7,399	—	—	.054	1.52	.3125
—	K285A03125	.3125	7,938	5/16	—	.058	1.52	.3125
K284A03594	—	.3594	9,129	23/64	—	.066	1.59	.3750
—	K285A03750	.3750	9,525	3/8	—	.069	1.59	.3750
K284A03906	—	.3906	9,921	25/64	—	.072	1.67	.4375
—	K285A04375	.4375	11,113	7/16	—	.081	1.67	.4375
K284A04531	—	.4531	11,509	29/64	—	.084	1.79	.5000
K284A04688	K285A04688	.4688	11,908	15/32	—	.087	1.79	.5000
—	K285A05000	.5000	12,700	1/2	—	.092	1.79	.5000
—	K285A06562	.6563	16,669	21/32	—	.121	1.91	.6875

Tolerance • Metric			Tolerance • Inch		
nominal size range	D1 tolerance m7	D tolerance h6	nominal size range	D1 tolerance m7	D tolerance h6
>3–6	0,004/0,016	0,000/-0,008	>.1181–.2362	.0002/.0006	.0000/-.0003
>6–10	0,006/0,021	0,000/-0,009	>.2362–.3937	.0002/.0008	.0000/-.0004
>10–18	0,007/0,025	0,000/-0,011	>.3937–.7087	.0003/.0010	.0000/-.0004
>18–25,4	0,008/0,029	0,000/-0,013	>.7087–1.0000	.0003/.0011	.0000/-.0005

■ HP Drills • B/K28_Series • Grade K715™ • Through Coolant for Drill Diameters 3–20mm

Solid Carbide Drills



Material Group	Cutting Speed – vc			Metric									
	Range – m/min			Recommended Feed Rate (f) by Diameter									
	min	Starting Value	max		3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0	
N	1	120	200	400	mm/r	0,13 - 0,19	0,14 - 0,20	0,17 - 0,26	0,21 - 0,32	0,27 - 0,37	0,33 - 0,42	0,37 - 0,47	0,43 - 0,54
	2	120	170	400	mm/r	0,14 - 0,20	0,15 - 0,22	0,17 - 0,29	0,22 - 0,35	0,29 - 0,42	0,34 - 0,48	0,39 - 0,54	0,45 - 0,61
	3	100	150	400	mm/r	0,13 - 0,18	0,14 - 0,19	0,16 - 0,25	0,20 - 0,30	0,28 - 0,37	0,33 - 0,42	0,38 - 0,48	0,44 - 0,54
	5	80	200	300	mm/r	0,03 - 0,05	0,03 - 0,06	0,03 - 0,06	0,04 - 0,06	0,05 - 0,07	0,05 - 0,08	0,05 - 0,08	0,06 - 0,09
	S	1	20	25	30	mm/r	0,03 - 0,05	0,04 - 0,06	0,06 - 0,09	0,08 - 0,12	0,10 - 0,14	0,11 - 0,16	0,14 - 0,19	0,16 - 0,23
2		10	15	20	mm/r	0,03 - 0,04	0,04 - 0,05	0,06 - 0,08	0,08 - 0,10	0,10 - 0,12	0,11 - 0,13	0,12 - 0,16	0,14 - 0,18
4		20	35	50	mm/r	0,03 - 0,04	0,04 - 0,05	0,06 - 0,08	0,08 - 0,10	0,11 - 0,13	0,13 - 0,15	0,14 - 0,18	0,16 - 0,21
Material Group	Cutting Speed – vc			Inch									
	Range – SFM			Recommended Feed Rate (f) by Diameter									
	min	Starting Value	max		1/8 .125	3/16 .188	1/4 .250	5/16 .313	3/8 .375	1/2 .500	5/8 .625	3/4 .750	
N	1	390	660	1310	IPR	.005 - .007	.006 - .008	.006 - .010	.008 - .013	.011 - .014	.013 - .017	.014 - .019	.017 - .021
	2	390	560	1310	IPR	.005 - .008	.006 - .009	.007 - .011	.009 - .014	.011 - .017	.013 - .019	.015 - .021	.018 - .024
	3	330	490	1310	IPR	.005 - .007	.006 - .008	.006 - .010	.008 - .012	.011 - .015	.013 - .017	.015 - .019	.017 - .021
	5	260	660	980	IPR	.001 - .002	.001 - .002	.001 - .002	.002 - .003	.002 - .003	.002 - .003	.002 - .003	.002 - .003
	S	1	70	80	100	IPR	.001 - .002	.002 - .002	.002 - .004	.003 - .005	.004 - .006	.004 - .006	.006 - .007	.006 - .009
2		30	50	70	IPR	.001 - .001	.002 - .002	.002 - .003	.003 - .004	.004 - .005	.004 - .005	.005 - .006	.006 - .007
4		70	110	160	IPR	.001 - .001	.002 - .002	.002 - .003	.003 - .004	.004 - .005	.005 - .006	.005 - .007	.006 - .008

Y-TECH™ Drills with Through Coolant for Difficult-to-Machine Materials

Primary Application

The B29_YPL Series Solid Carbide Drills are specifically engineered to drill stainless steel, high-temp alloys, and difficult-to-machine materials.

Y-TECH drills deliver best-in-class hole quality and longest tool life in these difficult-to-machine workpiece materials. Operate these drills with standard through coolant or MQL.

Features and Benefits

YPL Drill-Point Design

- Ensures good centering and chip formation.
- No jamming of chips and enables easy reconditioning.

Uneven Flute-to-Flute Angle

- Unbalanced forces by design eliminate chipping on margin lands.

Three-Margin Lands

- Reduce pendulum motion by directing forces towards third margin, which results in superior hole accuracy (cylindricity, constant diameter, hole straightness).

KC7315™ Grade

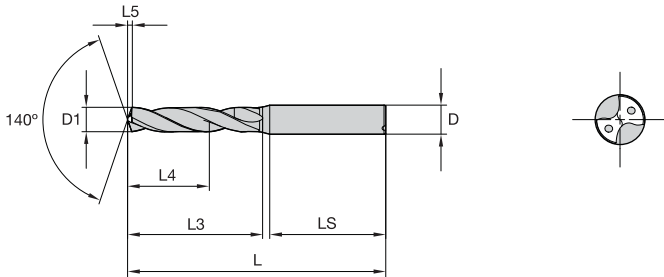
- A multilayer, TiAlN-based coating with high hot hardness enables higher cutting speeds and outstanding wear resistance.
- Optimized surface finish of the tool ensures chip evacuation in high-speed drilling and MQL applications.

Customization

- Intermediate diameters available as semi-standards.
- Length variations and step drills available as engineered solutions.
- Using Kennametal Slim Line Hydraulic Chucks together with standard B29_YPL is recommended if workpiece contours need to be bypassed.



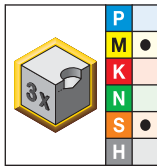
Solid Carbide Drills



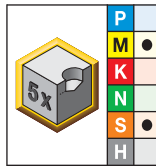
For information on L, L3, and L4 max, see the Solid Carbide foldout table.



■ B291/B292_YPL • ~3 x D/~5 x D



short • KC7315



long • KC7315

- first choice
- alternate choice

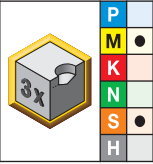
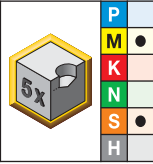
		D1 diameter				L5	LS	D
		mm	in	fraction	wire size			
B291A03000YPL	B292A03000YPL	3,000	.1181	—	—	0,6	36	6
B291A03100YPL	B292A03100YPL	3,100	.1220	—	—	0,6	36	6
B291A03175YPL	B292A03175YPL	3,175	.1250	1/8	—	0,6	36	6
B291A03200YPL	B292A03200YPL	3,200	.1260	—	—	0,6	36	6
B291A03300YPL	B292A03300YPL	3,300	.1299	—	—	0,7	36	6
B291A03400YPL	B292A03400YPL	3,400	.1339	—	—	0,7	36	6
B291A03454YPL	B292A03454YPL	3,454	.1360	—	29	0,7	36	6
B291A03500YPL	B292A03500YPL	3,500	.1378	—	—	0,7	36	6
B291A03600YPL	B292A03600YPL	3,600	.1417	—	—	0,7	36	6
B291A03700YPL	B292A03700YPL	3,700	.1457	—	—	0,7	36	6
B291A03800YPL	B292A03800YPL	3,800	.1496	—	—	0,8	36	6
B291A03900YPL	B292A03900YPL	3,900	.1535	—	—	0,8	36	6
B291A03970YPL	B292A03970YPL	3,970	.1563	5/32	—	0,8	36	6
B291A04000YPL	B292A04000YPL	4,000	.1575	—	—	0,8	36	6
B291A04100YPL	B292A04100YPL	4,100	.1614	—	—	0,8	36	6
—	B292A04200YPL	4,200	.1654	—	—	0,8	36	6
B291A04300YPL	B292A04300YPL	4,300	.1693	—	—	0,8	36	6
B291A04400YPL	—	4,400	.1732	—	—	0,9	36	6
B291A04500YPL	B292A04500YPL	4,500	.1772	—	—	0,9	36	6
—	B292A04700YPL	4,700	.1850	—	13	0,9	36	6
B291A04763YPL	B292A04763YPL	4,763	.1875	3/16	—	0,9	36	6
B291A04800YPL	B292A04800YPL	4,800	.1890	—	12	0,9	36	6
B291A04851YPL	B292A04851YPL	4,851	.1910	—	11	0,9	36	6
B291A04900YPL	—	4,900	.1929	—	—	0,9	36	6
B291A04915YPL	B292A04915YPL	4,915	.1935	—	10	1,0	36	6
B291A05000YPL	B292A05000YPL	5,000	.1969	—	—	1,0	36	6
B291A05100YPL	B292A05100YPL	5,100	.2008	—	—	1,0	36	6
B291A05200YPL	B292A05200YPL	5,200	.2047	—	—	1,0	36	6
B291A05410YPL	B292A05410YPL	5,410	.2130	—	3	1,1	36	6
B291A05500YPL	B292A05500YPL	5,500	.2165	—	—	1,1	36	6
—	B292A05558YPL	5,558	.2188	7/32	—	1,1	36	6
B291A05600YPL	B292A05600YPL	5,600	.2205	—	—	1,1	36	6
—	B292A05800YPL	5,800	.2283	—	—	1,1	36	6
B291A05900YPL	—	5,900	.2323	—	—	1,1	36	6
B291A06000YPL	B292A06000YPL	6,000	.2362	—	—	1,2	36	6
B291A06200YPL	B292A06200YPL	6,200	.2441	—	—	1,2	36	8
B291A06350YPL	B292A06350YPL	6,350	.2500	1/4	E	1,2	36	8
B291A06500YPL	B292A06500YPL	6,500	.2559	—	—	1,3	36	8
—	B292A06528YPL	6,528	.2570	—	F	1,3	36	8
—	B292A06600YPL	6,600	.2598	—	—	1,3	36	8

(continued)

(B291/B292_YPL • ~3 x D/~5 x D continued)



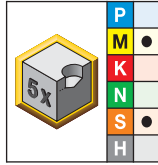
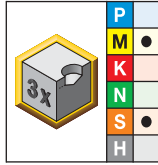
Solid Carbide Drills

		D1 diameter				L5	LS	D
		mm	in	fraction	wire size			
 short • KC7315	 long • KC7315							
—	B292A06746YPL	6,746	.2656	17/64	—	1,3	36	8
B291A06747YPL	—	6,747	.2656	17/64	—	1,3	36	8
B291A06800YPL	B292A06800YPL	6,800	.2677	—	—	1,3	36	8
—	B292A06900YPL	6,900	.2717	—	—	1,3	36	8
B291A07000YPL	B292A07000YPL	7,000	.2756	—	—	1,4	36	8
—	B292A07100YPL	7,100	.2795	—	—	1,4	36	8
B291A07144YPL	—	7,144	.2813	9/32	—	1,4	36	8
—	B292A07145YPL	7,145	.2813	9/32	—	1,4	36	8
B291A07200YPL	B292A07200YPL	7,200	.2835	—	—	1,4	36	8
—	B292A07400YPL	7,400	.2913	—	—	1,4	36	8
B291A07500YPL	B292A07500YPL	7,500	.2953	—	—	1,4	36	8
—	B292A07600YPL	7,600	.2992	—	—	1,5	36	8
—	B292A07900YPL	7,900	.3110	—	—	1,5	36	8
B291A07938YPL	B292A07938YPL	7,938	.3125	5/16	—	1,5	36	8
B291A08000YPL	B292A08000YPL	8,000	.3150	—	—	1,5	36	8
—	B292A08100YPL	8,100	.3189	—	—	1,6	40	10
—	B292A08200YPL	8,200	.3228	—	—	1,6	40	10
B291A08334YPL	B292A08334YPL	8,334	.3281	21/64	—	1,6	40	10
—	B292A08433YPL	8,433	.3320	—	Q	1,6	40	10
B291A08500YPL	B292A08500YPL	8,500	.3346	—	—	1,6	40	10
B291A08600YPL	B292A08600YPL	8,600	.3386	—	—	1,7	40	10
B291A08733YPL	B292A08733YPL	8,733	.3438	11/32	—	1,7	40	10
B291A08800YPL	B292A08800YPL	8,800	.3465	—	—	1,7	40	10
B291A08900YPL	B292A08900YPL	8,900	.3504	—	—	1,7	40	10
B291A09000YPL	B292A09000YPL	9,000	.3543	—	—	1,7	40	10
B291A09129YPL	—	9,129	.3594	23/64	—	1,8	40	10
—	B292A09130YPL	9,130	.3594	23/64	—	1,8	40	10
B291A09200YPL	B292A09200YPL	9,200	.3622	—	—	1,8	40	10
B291A09300YPL	—	9,300	.3661	—	—	1,8	40	10
—	B292A09347YPL	9,347	.3680	—	U	1,8	40	10
B291A09500YPL	B292A09500YPL	9,500	.3740	—	—	1,8	40	10
B291A09525YPL	B292A09525YPL	9,525	.3750	3/8	—	1,8	40	10
—	B292A09600YPL	9,600	.3780	—	—	1,8	40	10
B291A09700YPL	B292A09700YPL	9,700	.3819	—	—	1,9	40	10
B291A09800YPL	B292A09800YPL	9,800	.3858	—	—	1,9	40	10
B291A10000YPL	B292A10000YPL	10,000	.3937	—	—	1,9	40	10
—	B292A10100YPL	10,100	.3976	—	—	1,9	45	12
B291A10200YPL	B292A10200YPL	10,200	.4016	—	—	2,0	45	12
B291A10320YPL	B292A10320YPL	10,320	.4063	13/32	—	2,0	45	12
B291A10500YPL	B292A10500YPL	10,500	.4134	—	—	2,0	45	12
B291A10600YPL	—	10,600	.4173	—	—	2,0	45	12
B291A10716YPL	B292A10716YPL	10,716	.4219	27/64	—	2,0	45	12
B291A11000YPL	B292A11000YPL	11,000	.4331	—	—	2,1	45	12
—	B292A11112YPL	11,112	.4375	7/16	—	2,1	45	12
B291A11113YPL	—	11,113	.4375	7/16	—	2,1	45	12
B291A11500YPL	B292A11500YPL	11,500	.4528	—	—	2,2	45	12
B291A11509YPL	B292A11509YPL	11,509	.4531	29/64	—	2,2	45	12
B291A11800YPL	—	11,800	.4646	—	—	2,2	45	12
B291A11908YPL	B292A11908YPL	11,908	.4688	15/32	—	2,3	45	12
B291A12000YPL	B292A12000YPL	12,000	.4724	—	—	2,3	45	12

(continued)

(B291/B292_YPL • ~3 x D/~5 x D continued)

Solid Carbide Drills



		D1 diameter				L5	LS	D
		mm	in	fraction	wire size			
short • KC7315	long • KC7315							
B291A12300YPL	—	12,300	.4843	—	—	2,3	45	14
—	B292A12304YPL	12,304	.4844	31/64	—	2,3	45	14
B291A12500YPL	B292A12500YPL	12,500	.4921	—	—	2,4	45	14
B291A12700YPL	B292A12700YPL	12,700	.5000	1/2	—	2,4	45	14
B291A12900YPL	—	12,900	.5079	—	—	2,5	45	14
B291A13000YPL	B292A13000YPL	13,000	.5118	—	—	2,5	45	14
—	B292A13500YPL	13,500	.5315	—	—	2,6	45	14
—	B292A13650YPL	13,650	.5374	—	—	2,6	45	14
B291A13800YPL	—	13,800	.5433	—	—	2,6	45	14
—	B292A13900YPL	13,900	.5472	—	—	2,6	45	14
B291A14000YPL	B292A14000YPL	14,000	.5512	—	—	2,7	45	14
—	B292A14200YPL	14,200	.5591	—	—	2,7	48	16
B291A14288YPL	B292A14288YPL	14,288	.5625	9/16	—	2,7	48	16
B291A14500YPL	B292A14500YPL	14,500	.5709	—	—	2,8	48	16
B291A14900YPL	—	14,900	.5866	—	—	2,8	48	16
B291A15000YPL	B292A15000YPL	15,000	.5906	—	—	2,8	48	16
—	B292A15500YPL	15,500	.6102	—	—	2,9	48	16
—	B292A15600YPL	15,600	.6142	—	—	3,0	48	16
B291A15800YPL	—	15,800	.6220	—	—	3,0	48	16
B291A15875YPL	B292A15875YPL	15,875	.6250	5/8	—	3,0	48	16
B291A16000YPL	B292A16000YPL	16,000	.6299	—	—	3,0	48	16
B291A16100YPL	B292A16100YPL	16,100	.6339	—	—	3,1	48	18
—	B292A16500YPL	16,500	.6496	—	—	3,1	48	18
B291A17000YPL	B292A17000YPL	17,000	.6693	—	—	3,2	48	18
B291A17463YPL	B292A17463YPL	17,463	.6875	11/16	—	3,3	48	18
B291A17500YPL	B292A17500YPL	17,500	.6890	—	—	3,3	48	18
B291A17900YPL	—	17,900	.7047	—	—	3,4	48	18
B291A18000YPL	B292A18000YPL	18,000	.7087	—	—	3,4	48	18
—	B292A18500YPL	18,500	.7283	—	—	3,5	50	20
—	B292A19000YPL	19,000	.7480	—	—	3,6	50	20
B291A19050YPL	B292A19050YPL	19,050	.7500	3/4	—	3,6	50	20
—	B292A19100YPL	19,100	.7520	—	—	3,6	50	20
—	B292A19446YPL	19,446	.7656	49/64	—	3,7	50	20
—	B292A19500YPL	19,500	.7677	—	—	3,7	50	20
B291A19800YPL	—	19,800	.7795	—	—	3,7	50	20
—	B292A20000YPL	20,000	.7874	—	—	3,8	50	20
—	B292A20500YPL	20,500	.8071	—	—	3,9	50	20
—	B292A21000YPL	21,000	.8268	—	—	4,0	50	20

NOTE: YPL drills are designed specifically for high-temp alloys, duplex stainless steels, and other difficult-to-machine materials.

Tolerance • Metric			Tolerance • Inch		
nominal size range	D1 tolerance m7	D tolerance h6	nominal size range	D1 tolerance m7	D tolerance h6
>3-6	0,004/0,016	0,000/-0,008	>.1181-.2362	.0002/.0006	.0000/-.0003
>6-10	0,006/0,021	0,000/-0,009	>.2362-.3937	.0002/.0008	.0000/-.0004
>10-18	0,007/0,025	0,000/-0,011	>.3937-.7087	.0003/.0010	.0000/-.0004
>18-25,4	0,008/0,029	0,000/-0,013	>.7087-1.0000	.0003/.0011	.0000/-.0005

■ Y-TECH™ Drill • B29_YPL Series • Grade KC7315™ • Through Coolant for Drill Diameters 3–20mm



Solid Carbide Drills

		Cutting Speed – vc			Metric								
		Range – m/min			Recommended Feed Rate (f) by Diameter								
Material Group		min	Starting Value	max		3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
P	5	45	65	80	mm/r	0,04 - 0,08	0,06 - 0,09	0,07 - 0,12	0,09 - 0,16	0,11 - 0,19	0,13 - 0,21	0,15 - 0,26	0,18 - 0,30
	1	40	50	60	mm/r	0,07 - 0,11	0,08 - 0,12	0,13 - 0,17	0,14 - 0,21	0,14 - 0,21	0,17 - 0,23	0,19 - 0,25	0,22 - 0,27
M	2	40	50	80	mm/r	0,07 - 0,11	0,07 - 0,12	0,08 - 0,17	0,13 - 0,21	0,14 - 0,22	0,17 - 0,28	0,19 - 0,32	0,22 - 0,34
	3	40	50	70	mm/r	0,04 - 0,06	0,04 - 0,07	0,04 - 0,07	0,05 - 0,08	0,06 - 0,09	0,06 - 0,10	0,06 - 0,10	0,07 - 0,11
S	1	15	20	30	mm/r	0,06 - 0,08	0,06 - 0,08	0,07 - 0,10	0,10 - 0,13	0,11 - 0,14	0,12 - 0,16	0,14 - 0,19	0,17 - 0,22
	2	20	10	30	mm/r	0,05 - 0,07	0,05 - 0,07	0,06 - 0,08	0,08 - 0,11	0,09 - 0,12	0,10 - 0,13	0,12 - 0,16	0,14 - 0,18
	3	25	30	50	mm/r	0,03 - 0,05	0,03 - 0,05	0,04 - 0,08	0,05 - 0,10	0,05 - 0,10	0,05 - 0,10	0,07 - 0,11	0,08 - 0,12
	4	30	25	50	mm/r	0,03 - 0,05	0,03 - 0,05	0,04 - 0,08	0,05 - 0,10	0,05 - 0,10	0,05 - 0,10	0,07 - 0,11	0,08 - 0,12
		Cutting Speed – vc			Inch								
		Range – SFM			Recommended Feed Rate (f) by Diameter								
Material Group		min	Starting Value	max		1/8 .125	3/16 .188	1/4 .250	5/16 .313	3/8 .375	1/2 .500	5/8 .625	3/4 .750
P	5	150	210	260	IPR	.002 - .003	.002 - .004	.003 - .005	.004 - .006	.004 - .007	.005 - .008	.006 - .010	.007 - .012
	1	130	160	200	IPR	.003 - .004	.003 - .005	.005 - .007	.006 - .008	.006 - .008	.007 - .009	.007 - .010	.009 - .011
M	2	130	160	260	IPR	.003 - .004	.003 - .005	.003 - .007	.005 - .008	.006 - .009	.007 - .011	.007 - .013	.009 - .013
	3	130	160	230	IPR	.002 - .002	.002 - .003	.002 - .003	.002 - .003	.002 - .004	.002 - .004	.002 - .004	.003 - .004
S	1	50	70	100	IPR	.002 - .003	.002 - .003	.003 - .004	.004 - .005	.004 - .006	.005 - .006	.006 - .008	.007 - .009
	2	70	30	100	IPR	.002 - .003	.002 - .003	.002 - .003	.003 - .004	.004 - .005	.004 - .005	.005 - .006	.006 - .007
	3	80	100	160	IPR	.001 - .002	.001 - .002	.002 - .003	.002 - .004	.002 - .004	.002 - .004	.003 - .004	.003 - .005
	4	100	80	160	IPR	.001 - .002	.001 - .002	.002 - .003	.002 - .004	.002 - .004	.002 - .004	.003 - .004	.003 - .005



Carbide Recycling

Help preserve and protect our planet!

It's easy for your company to be environmentally conscious with the Kennametal Carbide Recycling Program.

By sending us your used carbide tools, you help preserve and protect the environment and ensure that these products are recycled responsibly. Kennametal accepts any coated or non-coated carbide items, including inserts, drills, reamers, and taps.



By using the Kennametal Carbide Recycling Program, you will receive:

- A partner who cares about a sustainable environment.
- Easy-to-use web portal to value your used carbide.
- Access to our popular Green Box™ options for carbide collection.
- Systematic and efficient disposal of carbide materials.
- Improved profitability.

Program is not currently available in all geographical areas.

For more information, please visit www.kennametal.com/carbiderecycling.

TX Drills with Through Coolant for Close Tolerance Holes

Primary Application

B/K411 Solid Carbide Drills have an X-shaped, free-cutting 130° point design and are designed for gray cast iron, nodular iron, and non-ferrous and aluminum alloy materials. Best suited for high-quality, close tolerance holes that require a very good surface finish.

Features and Benefits

Two Cutting Edges with Straight Flutes

- Precise shape of the hole even if used as platform for complex step drills.
- Can run into cored holes.

X-Shaped Drill Point

- Excellent centering capabilities.

Four-Margin Land Design

- Second set of cutting margin lands improves the surface quality.
- Achieve tight diameter tolerances.
- Can run through cross holes and exit on inclined surfaces.

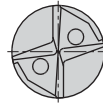
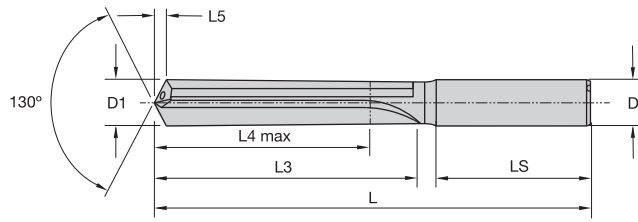
Wear-Resistant Carbide KF1™ Grade

- Long tool life in abrasive materials, such as cast iron and aluminum die cast alloys.
- The uncoated grade KF1 helps to prevent built-up edge in drilling aluminum.

Customization

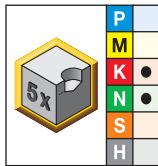
- Intermediate diameters available as semi-standards.
- Length variations and step drills available as engineered solutions.
- Coated KC7205™ grade delivers high wear resistance with very high diameter accuracy.





Solid Carbide Drills

■ B411 • ~5 x D



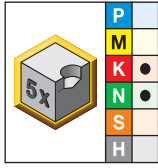
- first choice
- alternate choice

KF1	D1 diameter				L	L4 max	L5	LS	D
	mm	in	fraction	wire size					
B411A03200	3,200	.1260	—	—	66	23	0,7	36	6
B411A03300	3,300	.1299	—	—	66	23	0,8	36	6
B411A03800	3,800	.1496	—	—	74	29	0,9	36	6
B411A04000	4,000	.1575	—	—	74	29	0,9	36	6
B411A04200	4,200	.1654	—	—	74	29	1,0	36	6
B411A04500	4,500	.1772	—	—	74	29	1,0	36	6
B411A04600	4,600	.1811	—	—	74	29	1,1	36	6
B411A04650	4,650	.1831	—	—	74	29	1,1	36	6
B411A04800	4,800	.1890	—	12	82	35	1,1	36	6
B411A04900	4,900	.1929	—	—	82	35	1,1	36	6
B411A05000	5,000	.1969	—	—	82	35	1,2	36	6
B411A05100	5,100	.2008	—	—	82	35	1,2	36	6
B411A05200	5,200	.2047	—	—	82	35	1,2	36	6
B411A05500	5,500	.2165	—	—	82	35	1,3	36	6
B411A05550	5,550	.2185	—	—	82	35	1,3	36	6
B411A05800	5,800	.2283	—	—	82	35	1,4	36	6
B411A06000	6,000	.2362	—	—	82	35	1,4	36	6
B411A06300	6,300	.2480	—	—	91	43	1,5	36	8
B411A06400	6,400	.2520	—	—	91	43	1,5	36	8
B411A06500	6,500	.2559	—	—	91	43	1,5	36	8
B411A06600	6,600	.2598	—	—	91	43	1,5	36	8
B411A06800	6,800	.2677	—	—	91	43	1,6	36	8
B411A07000	7,000	.2756	—	—	91	43	1,6	36	8
B411A07400	7,400	.2913	—	—	91	43	1,7	36	8
B411A07500	7,500	.2953	—	—	91	43	1,7	36	8
B411A07800	7,800	.3071	—	—	91	43	1,8	36	8
B411A08000	8,000	.3150	—	—	91	43	1,9	36	8
B411A08400	8,400	.3307	—	—	103	49	2,0	40	10
B411A08500	8,500	.3346	—	—	103	49	2,0	40	10
B411A09000	9,000	.3543	—	—	103	49	2,1	40	10
B411A09300	9,300	.3661	—	—	103	49	2,2	40	10
B411A09500	9,500	.3740	—	—	103	49	2,2	40	10
B411A09800	9,800	.3858	—	—	103	49	2,3	40	10
B411A10000	10,000	.3937	—	—	103	49	2,3	40	10
B411A10200	10,200	.4016	—	—	118	56	2,4	45	12
B411A10500	10,500	.4134	—	—	118	56	2,4	45	12
B411A11000	11,000	.4331	—	—	118	56	2,6	45	12
B411A11200	11,200	.4409	—	—	118	56	2,6	45	12

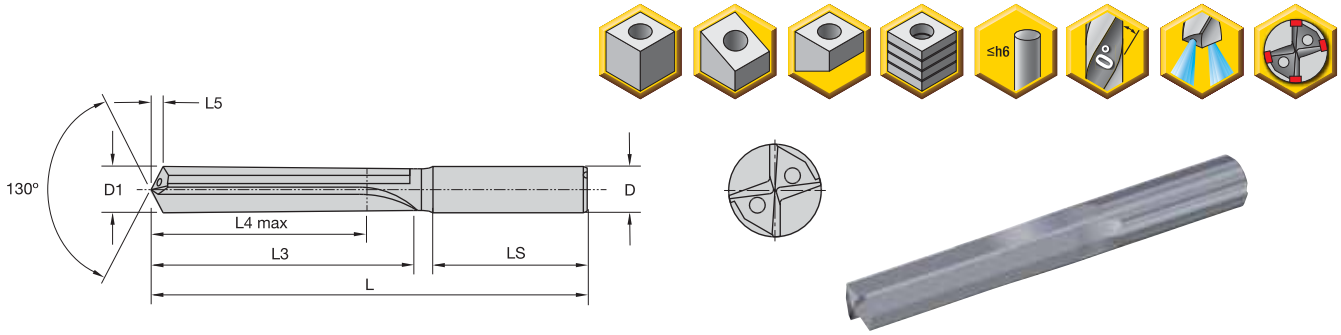
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(B411 • ~5 x D continued)

Solid Carbide Drills

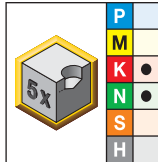


KF1	D1 diameter				L	L4 max	L5	LS	D
	mm	in	fraction	wire size					
B411A11500	11,500	.4528	—	—	118	56	2,7	45	12
B411A11800	11,800	.4646	—	—	118	56	2,8	45	12
B411A12000	12,000	.4724	—	—	118	56	2,8	45	12
B411A12500	12,500	.4921	—	—	124	60	2,9	45	14
B411A13000	13,000	.5118	—	—	124	60	3,0	45	14
B411A13500	13,500	.5315	—	—	124	60	3,1	45	14
B411A13800	13,800	.5433	—	—	124	60	3,2	45	14
B411A14000	14,000	.5512	—	—	124	60	3,3	45	14
B411A14500	14,500	.5709	—	—	133	63	3,4	48	16
B411A15000	15,000	.5906	—	—	133	63	3,5	48	16
B411A15500	15,500	.6102	—	—	133	63	3,6	48	16
B411A16000	16,000	.6299	—	—	133	63	3,7	48	16
B411A16500	16,500	.6496	—	—	143	71	3,8	48	18
B411A17000	17,000	.6693	—	—	143	71	4,0	48	18
B411A17500	17,500	.6890	—	—	143	71	4,1	48	18
B411A18000	18,000	.7087	—	—	143	71	4,2	48	18
B411A19000	19,000	.7480	—	—	153	77	4,4	50	20
B411A19500	19,500	.7677	—	—	153	77	4,5	50	20
B411A20000	20,000	.7874	—	—	153	77	4,7	50	20
B411A21000	21,000	.8268	—	—	167	85	4,9	50	20
B411A22000	22,000	.8661	—	—	167	85	5,1	50	20
B411A23000	23,000	.9055	—	—	184	98	5,4	56	25
B411A24000	24,000	.9449	—	—	184	98	5,6	56	25
B411A25000	25,000	.9843	—	—	184	98	5,8	56	25



Solid Carbide Drills

■ K411 • ~5 x D



- first choice
- alternate choice

KF1	D1 diameter				L	L4 max	L5	LS	D
	in	mm	fraction	wire size					
K411A01250	.1250	3,175	1/8	—	2.60	.84	.029	1.44	.1875
K411A01406	.1406	3,572	9/64	—	2.60	.84	.033	1.44	.1875
K411A01563	.1563	3,969	5/32	—	2.60	.84	.036	1.44	.1875
K411A01719	.1719	4,366	11/64	—	2.91	1.13	.040	1.44	.1875
K411A01875	.1875	4,762	3/16	—	2.91	1.13	.044	1.44	.1875
K411A02031	.2031	5,159	13/64	—	3.23	1.37	.047	1.44	.2500
K411A02188	.2187	5,556	7/32	—	3.23	1.37	.051	1.44	.2500
K411A02344	.2344	5,953	15/64	—	3.23	1.37	.055	1.44	.2500
K411A02500	.2500	6,350	1/4	E	3.23	1.37	.058	1.44	.2500
K411A02656	.2656	6,747	17/64	—	3.58	1.59	.062	1.52	.3125
K411A02812	.2813	7,144	9/32	—	3.58	1.59	.066	1.52	.3125
K411A02969	.2969	7,541	19/64	—	3.58	1.59	.069	1.52	.3125
K411A03125	.3125	7,938	5/16	—	3.58	1.59	.073	1.52	.3125
K411A03281	.3281	8,334	21/64	—	4.06	1.92	.077	1.59	.3750
K411A03438	.3437	8,731	11/32	—	4.06	1.92	.080	1.59	.3750
K411A03594	.3594	9,128	23/64	—	4.06	1.92	.084	1.59	.3750
K411A03750	.3750	9,525	3/8	—	4.06	1.92	.087	1.59	.3750
K411A03906	.3906	9,922	25/64	—	4.37	2.09	.091	1.67	.4375
K411A04063	.4063	10,319	13/32	—	4.37	2.09	.095	1.67	.4375
K411A04219	.4219	10,716	27/64	—	4.37	2.09	.098	1.67	.4375
K411A04375	.4375	11,112	7/16	—	4.37	2.09	.102	1.67	.4375
K411A04531	.4531	11,509	29/64	—	4.65	2.19	.106	1.79	.5000
K411A04688	.4687	11,906	15/32	—	4.65	2.19	.109	1.79	.5000
K411A04844	.4844	12,303	31/64	—	4.65	2.19	.113	1.79	.5000
K411A05000	.5000	12,700	1/2	—	4.65	2.19	.117	1.79	.5000
K411A05156	.5156	13,097	33/64	—	4.88	2.36	.120	1.79	.5625
K411A05313	.5313	13,494	17/32	—	4.88	2.36	.124	1.79	.5625
K411A05469	.5469	13,891	35/64	—	4.88	2.36	.128	1.79	.5625
K411A05625	.5625	14,288	9/16	—	4.88	2.36	.131	1.79	.5625
K411A05781	.5781	14,684	37/64	—	5.24	2.54	.135	1.91	.6250
K411A05938	.5937	15,081	19/32	—	5.24	2.54	.138	1.91	.6250
K411A06250	.6250	15,875	5/8	—	5.24	2.54	.146	1.91	.6250
K411A06875	.6875	17,463	11/16	—	5.63	2.87	.160	1.91	.6875
K411A07500	.7500	19,050	3/4	—	5.83	2.93	.175	1.99	.7500

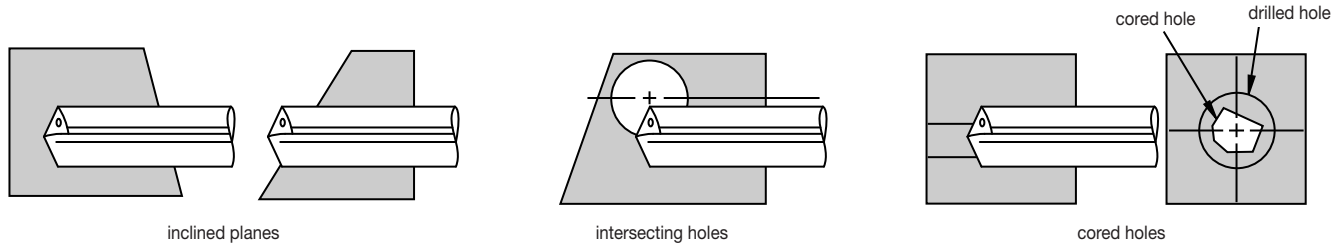
Tolerance • Metric			Tolerance • Inch		
nominal size range	D1 tolerance k6	D tolerance h6	nominal size range	D1 tolerance k6	D tolerance h6
>3-6	0,001/0,009	0,000/-0,008	>.1181-.2362	.0000/.0004	.0000/- .0003
>6-10	0,001/0,010	0,000/-0,009	>.2362-.3937	.0000/.0004	.0000/- .0004
>10-18	0,001/0,012	0,000/-0,011	>.3937-.7087	.0000/.0005	.0000/- .0004
>18-25,4	0,002/0,015	0,000/-0,013	>.7087-1.0000	.0000/.0006	.0000/- .0005

TX Drills • B/K411 Series • Grade KF1™ • Through Coolant for Drill Diameters 3–20mm

		Cutting Speed – vc			Metric									
		Range – m/min			Recommended Feed Rate (f) by Diameter									
Material Group		min	Starting Value	max		3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0	25,4
K	1	115	60	140	mm/r	0,11 - 0,20	0,12 - 0,24	0,15 - 0,28	0,18 - 0,33	0,20 - 0,38	0,23 - 0,44	0,30 - 0,53	0,34 - 0,65	0,40 - 0,76
N	1	100	250	450	mm/r	0,16 - 0,25	0,19 - 0,29	0,23 - 0,35	0,27 - 0,42	0,31 - 0,50	0,36 - 0,57	0,44 - 0,69	0,52 - 0,82	0,62 - 0,96
N	2	200	100	300	mm/r	0,15 - 0,23	0,17 - 0,28	0,21 - 0,34	0,25 - 0,39	0,30 - 0,46	0,34 - 0,54	0,42 - 0,67	0,52 - 0,82	0,61 - 0,96
N	5	100	170	250	mm/r	0,16 - 0,28	0,15 - 0,32	0,19 - 0,36	0,23 - 0,40	0,25 - 0,44	0,28 - 0,48	0,32 - 0,56	0,35 - 0,63	0,42 - 0,72
S	4	20	40	50	mm/r	0,04 - 0,07	0,04 - 0,07	0,06 - 0,09	0,08 - 0,10	0,10 - 0,14	0,13 - 0,18	0,18 - 0,26	0,22 - 0,32	0,27 - 0,38
		Cutting Speed – vc			Inch									
		Range – SFM			Recommended Feed Rate (f) by Diameter									
Material Group		min	Starting Value	max		1/8 .125	3/16 .188	1/4 .250	5/16 .313	3/8 .375	1/2 .500	5/8 .625	3/4 .750	1/1 1.000
K	1	380	200	460	IPR	.004 - .008	.005 - .009	.006 - .011	.007 - .013	.008 - .015	.009 - .017	.012 - .021	.013 - .026	.016 - .030
N	1	330	820	1480	IPR	.006 - .010	.007 - .011	.009 - .014	.011 - .017	.012 - .020	.014 - .022	.017 - .027	.020 - .032	.024 - .038
N	2	660	330	980	IPR	.006 - .009	.007 - .011	.008 - .013	.010 - .015	.012 - .018	.013 - .021	.017 - .026	.020 - .032	.024 - .038
N	5	330	560	820	IPR	.006 - .011	.006 - .013	.007 - .014	.009 - .016	.010 - .017	.011 - .019	.013 - .022	.014 - .025	.017 - .028
S	4	70	130	160	IPR	.002 - .003	.002 - .003	.002 - .004	.003 - .004	.004 - .006	.005 - .007	.007 - .010	.009 - .013	.011 - .015

TX Drill Applications

The excellent stability of the TX drill enables it to be used for drilling through inclined planes, intersecting holes, and cored holes:



SPF Drills for Composite (CFRP) Materials

Primary Application

B/K53_ Series Solid Carbide Drills offer a material-specific design and grade to machine carbon fiber-reinforced polymer (CFRP) composite materials by minimizing delamination and increasing tool life.

Features and Benefits

SPF Drill-Point Design

- Special 90° point angle increases centering capability.
- Low thrust and improved hole quality.

Unique Geometry

- Combination of point design, substrate, and coating provides longer tool life and requires substantially less cutting force.

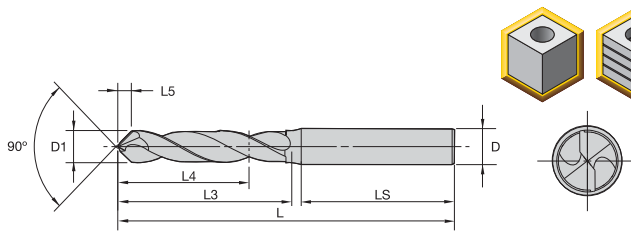
KDF400™ Grade

- CVD multilayer diamond coating provides more wear resistance and reduced friction, increasing tool life and improving chip flow.

Customization

- Intermediate diameters available as semi-standards.
- Length variations and step drills available as engineered solutions.

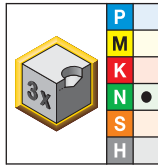




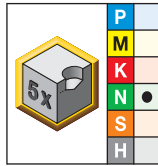
For information on L, L3, and L4 max, see the Solid Carbide foldout table.



■ B531/B532_SPF • ~3 x D/~5 x D • Metric



short • KDF400

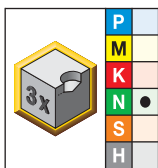


long • KDF400

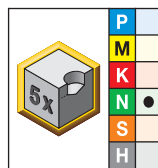
- first choice
- alternate choice

		D1 diameter				L5	LS	D
		mm	in	fraction	wire size			
B531A03200SPF	B532A03200SPF	3,200	.1260	—	—	1,5	36	6
B531A03300SPF	B532A03300SPF	3,300	.1299	—	—	1,5	36	6
B531A03600SPF	B532A03600SPF	3,600	.1417	—	—	1,6	36	6
B531A04000SPF	B532A04000SPF	4,000	.1575	—	—	1,8	36	6
B531A04366SPF	B532A04366SPF	4,366	.1719	11/64	—	2,0	36	6
B531A04851SPF	B532A04851SPF	4,851	.1910	—	11	2,2	36	6
B531A04864SPF	B532A04864SPF	4,864	.1915	—	—	2,2	36	6
B531A05100SPF	B532A05100SPF	5,100	.2008	—	—	2,3	36	6
B531A05200SPF	B532A05200SPF	5,200	.2047	—	—	2,4	36	6
B531A06000SPF	B532A06000SPF	6,000	.2362	—	—	2,7	36	6
B531A06375SPF	B532A06375SPF	6,375	.2510	—	—	2,9	36	8
B531A06400SPF	B532A06400SPF	6,400	.2520	—	—	2,9	36	8
B531A06500SPF	B532A06500SPF	6,500	.2559	—	—	3,0	36	8
—	B532A06700SPF	6,700	.2638	—	—	3,0	36	8
—	B532A07200SPF	7,200	.2835	—	—	3,3	36	8
B531A07938SPF	B532A07938SPF	7,938	.3125	5/16	—	3,6	36	8
B531A08153SPF	B532A08153SPF	8,153	.3210	—	—	3,7	40	10
B531A09550SPF	B532A09550SPF	9,550	.3760	—	—	4,3	40	10
B531A09563SPF	B532A09563SPF	9,563	.3765	—	—	4,3	40	10
B531A11125SPF	B532A11125SPF	11,125	.4380	—	—	5,1	45	12
B531A12725SPF	B532A12725SPF	12,725	.5010	—	—	5,8	45	14

■ K531/K532_SPF • ~3 x D/~5 x D • Inch



short • KDF400



regular • KDF400



- first choice
- alternate choice

		D1 diameter				L5	LS	D
		in	mm	fraction	wire size			
K531A01719SPF	K532A01719SPF	.1719	4,366	11/64	—	.078	1.44	.2500
K531A01915SPF	K532A01915SPF	.1915	4,864	—	—	.087	1.44	.2500
—	K532A02210SPF	.2210	5,613	—	—	.100	1.44	.2500
K531A02510SPF	K532A02510SPF	.2510	6,375	—	—	.114	1.44	.2500
K531A03125SPF	K532A03125SPF	.3125	7,938	5/16	—	.142	1.52	.3125
—	K532A03320SPF	.3320	8,433	—	—	.151	1.59	.3750
K531A03760SPF	K532A03760SPF	.3760	9,550	—	—	.171	1.59	.3750
K531A03765SPF	K532A03765SPF	.3765	9,563	—	—	.171	1.67	.4375
—	K532A04219SPF	.4219	10,716	27/64	—	.192	1.67	.4375
K531A04380SPF	K532A04380SPF	.4380	11,125	—	—	.199	1.67	.4375
K531A05010SPF	K532A05010SPF	.5010	12,725	—	—	.228	1.79	.5000

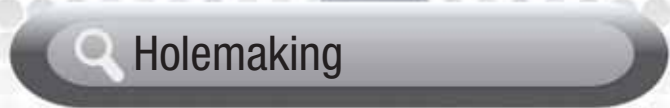
Tolerance • Metric			Tolerance • Inch		
nominal size range	D1 tolerance m7	D tolerance h6	nominal size range	D1 tolerance m7	D tolerance h6
>3-6	0,004/0,016	0,000/-0,008	>.1181-.2362	.0002/.0006	.0000/-0.0003
>6-10	0,006/0,021	0,000/-0,009	>.2362-.3937	.0002/.0008	.0000/-0.0004
>10-18	0,007/0,025	0,000/-0,011	>.3937-.7087	.0003/.0010	.0000/-0.0004
>18-25,4	0,008/0,029	0,000/-0,013	>.7087-1.0000	.0003/.0011	.0000/-0.0005

■ SPF Drills • B/K531, B/K532 Series • Grade KDF400™ • Dry Applications for Drill Diameters 3–12mm

Solid Carbide Drills

		Cutting Speed – vc			Metric						
		Range – m/min			Recommended Feed Rate (f) by Diameter						
Material Group		min	Starting Value	max		3,0	4,0	6,0	8,0	10,0	12,0
N 6	6	90	120	150	mm/r	0,03 - 0,20	0,03 - 0,20	0,03 - 0,20	0,03 - 0,20	0,03 - 0,20	0,03 - 0,20
		Cutting Speed – vc			Inch						
		Range – SFM			Recommended Feed Rate (f) by Diameter						
Material Group		min	Starting Value	max		1/8	3/16	1/4	5/16	3/8	1/2
N 6	6	300	390	490	IPR	.001 - .008	.001 - .008	.001 - .008	.001 - .008	.001 - .008	.001 - .008

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FB Drills with Through Coolant for Flat-Bottom Applications

Primary Application

B707_FB Series Solid Carbide Drills are productivity tools that combine two operations in one:

- 1) Eliminate the 180° end mill in flat-bottom drilling or when preparing an inclined or curved surface for drilling.
- 2) After full cylindrical engagement, the drill runs at normal solid carbide drilling parameters.

The B707_FBS Series with the new uncoated KN15™ grade now offers the same advantages for drilling in non-ferrous materials, such as aluminum, copper, and brass. The B707_FBL Series is designed for applications in stainless steel and high-temperature alloys.

Features and Benefits

Unique FB Drill-Point Design

- Two effective cutting edges over center enable high feed rates.
- Creates a true flat-bottom hole from O.D. to center.
- Four-margin land design improves hole straightness and roundness and provides good alignment, even when drilling cross holes.

Straight Cutting Edge

- Guarantees a true 180° hole ground.
- Rake angle correction improves chip control.

KC7315™ Grade on B707_FBG and _FBL

- Enables high drill-like penetration rates and superior tool life.

KN15 Grade on B707_FBS

- The uncoated grade prevents built-up edge reducing the risk of fracture.
- The highly polished surfaces ensure superior chip evacuation even when low-pressure coolant or MQL is applied.

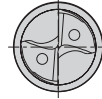
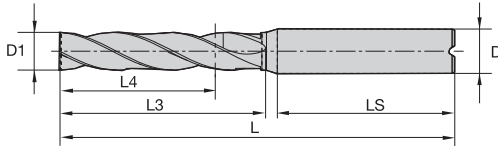
Customization

- Intermediate diameters available as semi-standards.
- Length variations available as semi-standard:
 - B706_ 1.5 x D
 - B708_ 5 x D
 - B709_ 8 x D
- Other length variations and step drills are available as engineered solutions.

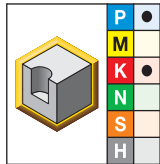




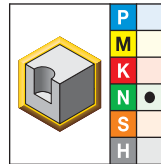
Solid Carbide Drills



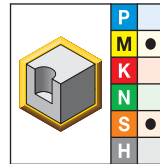
■ B707_FBG/FBS/FBL • ~3 x D



B707A-FBG • KC7315



B707A-FBS • KN15



B707A-FBL • KC7315

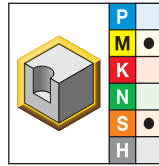
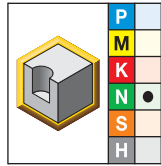
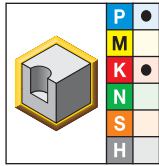
- first choice
- alternate choice

			D1 diameter				L4 max	L3	L	LS	D
			mm	in	fraction	wire size					
B707A03000FBG	B707A03000FBS	B707A03000FBL	3,000	.1181	—	—	14	20	62	36	6
B707A03175FBG	B707A03175FBS	B707A03175FBL	3,175	.1250	1/8	—	14	20	62	36	6
B707A03500FBG	B707A03500FBS	B707A03500FBL	3,500	.1378	—	—	14	20	62	36	6
B707A03970FBG	—	—	3,970	.1563	5/32	—	17	24	66	36	6
B707A04000FBG	B707A04000FBS	B707A04000FBL	4,000	.1575	—	—	17	24	66	36	6
B707A04200FBG	—	—	4,200	.1654	—	—	17	24	66	36	6
B707A04400FBG	B707A04400FBS	B707A04400FBL	4,400	.1732	—	—	17	24	66	36	6
B707A04500FBG	B707A04500FBS	B707A04500FBL	4,500	.1772	—	—	17	24	66	36	6
B707A04763FBG	—	—	4,763	.1875	3/16	—	20	28	66	36	6
B707A04800FBG	B707A04800FBS	B707A04800FBL	4,800	.1890	—	12	20	28	66	36	6
B707A04900FBG	—	—	4,900	.1929	—	—	20	28	66	36	6
B707A05000FBG	B707A05000FBS	B707A05000FBL	5,000	.1969	—	—	20	28	66	36	6
B707A05560FBG	B707A05560FBS	B707A05560FBL	5,560	.2189	—	—	20	28	66	36	6
B707A05900FBG	B707A05900FBS	B707A05900FBL	5,900	.2323	—	—	20	28	66	36	6
B707A06000FBG	B707A06000FBS	B707A06000FBL	6,000	.2362	—	—	20	28	66	36	6
B707A06350FBG	B707A06350FBS	B707A06350FBL	6,350	.2500	1/4	E	24	34	79	36	8
B707A06500FBG	B707A06500FBS	B707A06500FBL	6,500	.2559	—	—	24	34	79	36	8
B707A06800FBG	B707A06800FBS	B707A06800FBL	6,800	.2677	—	—	24	34	79	36	8
B707A07000FBG	B707A07000FBS	B707A07000FBL	7,000	.2756	—	—	24	34	79	36	8
B707A07145FBG	—	—	7,145	.2813	9/32	—	29	41	79	36	8
B707A07500FBG	B707A07500FBS	B707A07500FBL	7,500	.2953	—	—	29	41	79	36	8
B707A07800FBG	—	—	7,800	.3071	—	—	29	41	79	36	8
B707A07938FBG	B707A07938FBS	B707A07938FBL	7,938	.3125	5/16	—	29	41	79	36	8
B707A08000FBG	B707A08000FBS	B707A08000FBL	8,000	.3150	—	—	29	41	79	36	8
B707A08334FBG	—	—	8,334	.3281	21/64	—	35	47	89	40	10
B707A08500FBG	B707A08500FBS	B707A08500FBL	8,500	.3346	—	—	35	47	89	40	10
B707A08800FBG	B707A08800FBS	B707A08800FBL	8,800	.3465	—	—	35	47	89	40	10
B707A09000FBG	B707A09000FBS	B707A09000FBL	9,000	.3543	—	—	35	47	89	40	10
B707A09129FBG	—	—	9,129	.3594	23/64	—	35	47	89	40	10
B707A09500FBG	B707A09500FBS	B707A09500FBL	9,500	.3740	—	—	35	47	89	40	10
B707A09525FBG	B707A09525FBS	B707A09525FBL	9,525	.3750	3/8	—	35	47	89	40	10
B707A10000FBG	B707A10000FBS	B707A10000FBL	10,000	.3937	—	—	35	47	89	40	10
B707A10320FBG	B707A10320FBS	B707A10320FBL	10,320	.4063	13/32	—	40	55	102	45	12
B707A10500FBG	B707A10500FBS	B707A10500FBL	10,500	.4134	—	—	40	55	102	45	12

(continued)

(B707_FBG/FBS/FBL • ~3 x D continued)

Solid Carbide Drills



	B707A-FBG • KC7315	B707A-FBS • KN15	B707A-FBL • KC7315	D1 diameter				L4 max	L3	L	LS	D
				mm	in	fraction	wire size					
B707A10600FBG	—	—	—	10,600	.4173	—	—	40	55	102	45	12
B707A11000FBG	—	B707A11000FBS	B707A11000FBL	11,000	.4331	—	—	40	55	102	45	12
B707A11111FBG	—	B707A11111FBS	B707A11111FBL	11,111	.4374	—	—	40	55	102	45	12
B707A11509FBG	—	B707A11509FBS	B707A11509FBL	11,509	.4531	29/64	—	40	55	102	45	12
B707A11570FBG	—	B707A11570FBS	B707A11570FBL	11,570	.4555	—	—	40	55	102	45	12
B707A11700FBG	—	B707A11700FBS	B707A11700FBL	11,700	.4606	—	—	40	55	102	45	12
B707A11800FBG	—	B707A11800FBS	B707A11800FBL	11,800	.4646	—	—	40	55	102	45	12
B707A11908FBG	—	—	—	11,908	.4688	15/32	—	40	55	102	45	12
B707A12000FBG	—	B707A12000FBS	B707A12000FBL	12,000	.4724	—	—	40	55	102	45	12
B707A12100FBG	—	B707A12100FBS	B707A12100FBL	12,100	.4764	—	—	43	60	107	45	14
B707A12500FBG	—	B707A12500FBS	B707A12500FBL	12,500	.4921	—	—	43	60	107	45	14
B707A12700FBG	—	B707A12700FBS	B707A12700FBL	12,700	.5000	1/2	—	43	60	107	45	14
B707A12800FBG	—	B707A12800FBS	B707A12800FBL	12,800	.5039	—	—	43	60	107	45	14
B707A13000FBG	—	B707A13000FBS	B707A13000FBL	13,000	.5118	—	—	43	60	107	45	14
B707A13500FBG	—	B707A13500FBS	B707A13500FBL	13,500	.5315	—	—	43	60	107	45	14
B707A14000FBG	—	B707A14000FBS	B707A14000FBL	14,000	.5512	—	—	43	60	107	45	14
B707A14288FBG	—	B707A14288FBS	B707A14288FBL	14,288	.5625	9/16	—	45	65	115	48	16
B707A14500FBG	—	B707A14500FBS	B707A14500FBL	14,500	.5709	—	—	45	65	115	48	16
B707A15000FBG	—	B707A15000FBS	B707A15000FBL	15,000	.5906	—	—	45	65	115	48	16
B707A15250FBG	—	B707A15250FBS	B707A15250FBL	15,250	.6004	—	—	45	65	115	48	16
B707A15500FBG	—	B707A15500FBS	B707A15500FBL	15,500	.6102	—	—	45	65	115	48	16
B707A15875FBG	—	B707A15875FBS	B707A15875FBL	15,875	.6250	5/8	—	45	65	115	48	16
B707A16000FBG	—	B707A16000FBS	B707A16000FBL	16,000	.6299	—	—	45	65	115	48	16
B707A16500FBG	—	B707A16500FBS	B707A16500FBL	16,500	.6496	—	—	51	73	123	48	18
B707A17000FBG	—	B707A17000FBS	B707A17000FBL	17,000	.6693	—	—	51	73	123	48	18
B707A17463FBG	—	—	—	17,463	.6875	11/16	—	51	73	123	48	18
B707A17500FBG	—	B707A17500FBS	B707A17500FBL	17,500	.6890	—	—	51	73	123	48	18
B707A18000FBG	—	B707A18000FBS	B707A18000FBL	18,000	.7087	—	—	51	73	123	48	18
B707A18500FBG	—	—	—	18,500	.7283	—	—	55	79	131	50	20
B707A19000FBG	—	B707A19000FBS	B707A19000FBL	19,000	.7480	—	—	55	79	131	50	20
B707A19050FBG	—	B707A19050FBS	B707A19050FBL	19,050	.7500	3/4	—	55	79	131	50	20
B707A20000FBG	—	B707A20000FBS	B707A20000FBL	20,000	.7874	—	—	55	79	131	50	20
B707A21000FBG	—	B707A21000FBS	B707A21000FBL	21,000	.8268	—	—	60	86	141	50	20

Tolerance • Metric			Tolerance • Inch		
nominal size range	D1 tolerance m7	D tolerance h6	nominal size range	D1 tolerance m7	D tolerance h6
>3-6	0,004/0,016	0,000/-0,008	>.1181-.2362	.0002/.0006	.0000/-.0003
>6-10	0,006/0,021	0,000/-0,009	>.2362-.3937	.0002/.0008	.0000/-.0004
>10-18	0,007/0,025	0,000/-0,011	>.3937-.7087	.0003/.0010	.0000/-.0004
>18-25,4	0,008/0,029	0,000/-0,013	>.7087-1.0000	.0003/.0011	.0000/-.0005

■ Flat-Bottom Drills • B707_FBG Series • Grade KC7315™ • Through Coolant for Drill Diameters 3–20mm



Solid Carbide Drills

		Cutting Speed – vc			Metric								
		Range – m/min			Recommended Feed Rate (f) by Diameter								
Material Group		min	Starting Value	max									
					3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0	
P	1	100	133	170	mm/r	0,07 - 0,16	0,12 - 0,20	0,10 - 0,23	0,13 - 0,29	0,21 - 0,33	0,17 - 0,37	0,19 - 0,44	0,22 - 0,49
	2	130	150	180	mm/r	0,07 - 0,13	0,10 - 0,16	0,16 - 0,19	0,13 - 0,23	0,18 - 0,27	0,17 - 0,30	0,19 - 0,35	0,22 - 0,39
	3	80	106	130	mm/r	0,09 - 0,16	0,13 - 0,20	0,13 - 0,23	0,16 - 0,24	0,20 - 0,31	0,21 - 0,37	0,25 - 0,44	0,28 - 0,46
	4	70	98	130	mm/r	0,08 - 0,16	0,12 - 0,19	0,11 - 0,22	0,14 - 0,27	0,21 - 0,31	0,18 - 0,35	0,21 - 0,41	0,24 - 0,46
	6	70	98	130	mm/r	0,07 - 0,12	0,10 - 0,14	0,10 - 0,16	0,12 - 0,20	0,16 - 0,23	0,16 - 0,26	0,18 - 0,31	0,21 - 0,34
	K	1	70	85	100	mm/r	0,09 - 0,17	0,13 - 0,21	0,12 - 0,25	0,15 - 0,31	0,23 - 0,35	0,20 - 0,39	0,23 - 0,46	0,26 - 0,52
2		100	113	130	mm/r	0,09 - 0,15	0,12 - 0,18	0,12 - 0,21	0,15 - 0,26	0,21 - 0,30	0,20 - 0,33	0,23 - 0,39	0,26 - 0,44
3		70	105	140	mm/r	0,07 - 0,13	0,10 - 0,16	0,11 - 0,19	0,13 - 0,23	0,18 - 0,27	0,17 - 0,30	0,20 - 0,35	0,22 - 0,37

		Cutting Speed – vc			Inch								
		Range – SFM			Recommended Feed Rate (f) by Diameter								
Material Group		min	Starting Value	max									
					1/8 .125	3/16 .188	1/4 .250	5/16 .313	3/8 .375	1/2 .500	5/8 .625	3/4 .750	
P	1	330	440	560	IPR	.003 - .006	.005 - .008	.004 - .009	.005 - .001	.008 - .013	.007 - .015	.007 - .017	.009 - .019
	2	430	490	590	IPR	.003 - .005	.004 - .006	.006 - .007	.005 - .009	.007 - .010	.007 - .012	.007 - .0174	.009 - .015
	3	260	350	430	IPR	.004 - .006	.005 - .008	.005 - .009	.006 - .009	.008 - .012	.008 - .015	.010 - .017	.011 - .018
	4	230	320	430	IPR	.003 - .006	.005 - .007	.004 - .009	.006 - .011	.008 - .012	.007 - .014	.008 - .016	.009 - .018
	6	230	320	430	IPR	.003 - .005	.004 - .006	.004 - .006	.005 - .008	.006 - .009	.006 - .010	.007 - .012	.008 - .013
	K	1	230	280	330	IPR	.004 - .007	.005 - .008	.005 - .010	.006 - .012	.009 - .014	.008 - .015	.009 - .018	.010 - .020
2		330	370	430	IPR	.004 - .006	.005 - .007	.005 - .008	.006 - .010	.008 - .012	.008 - .013	.009 - .015	.010 - .017
3		230	340	460	IPR	.003 - .005	.004 - .006	.004 - .007	.005 - .009	.007 - .010	.007 - .012	.008 - .014	.009 - .015

■ Flat-Bottom Drills • B707_FBL Series • Grade KC7315 • Through Coolant for Drill Diameters 3–20mm

		Cutting Speed – vc			Metric								
		Range – m/min			Recommended Feed Rate (f) by Diameter								
Material Group		min	Starting Value	max									
					3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0	
P	1	45	65	60	mm/r	0,04 - 0,08	0,05 - 0,09	0,06 - 0,12	0,09 - 0,15	0,10 - 0,16	0,12 - 0,20	0,14 - 0,23	0,16 - 0,24
	1	40	50	60	mm/r	0,04 - 0,08	0,05 - 0,09	0,06 - 0,12	0,09 - 0,15	0,10 - 0,16	0,12 - 0,20	0,14 - 0,23	0,16 - 0,24
M	2	40	50	80	mm/r	0,06 - 0,11	0,07 - 0,11	0,08 - 0,16	0,12 - 0,20	0,13 - 0,21	0,16 - 0,27	0,18 - 0,31	0,21 - 0,33
	3	40	55	70	mm/r	0,03 - 0,04	0,03 - 0,05	0,04 - 0,06	0,04 - 0,07	0,05 - 0,08	0,06 - 0,10	0,07 - 0,11	0,08 - 0,12
S	1	20	25	30	mm/r	0,06 - 0,08	0,06 - 0,08	0,07 - 0,10	0,10 - 0,13	0,11 - 0,14	0,12 - 0,16	0,14 - 0,19	0,17 - 0,22
	2	10	20	30	mm/r	0,05 - 0,07	0,05 - 0,07	0,06 - 0,08	0,08 - 0,11	0,09 - 0,12	0,10 - 0,13	0,12 - 0,16	0,14 - 0,18
	3	30	25	50	mm/r	0,03 - 0,05	0,03 - 0,05	0,04 - 0,08	0,05 - 0,10	0,05 - 0,10	0,05 - 0,10	0,07 - 0,11	0,08 - 0,12
	4	30	25	50	mm/r	0,03 - 0,05	0,03 - 0,05	0,04 - 0,08	0,05 - 0,10	0,05 - 0,10	0,05 - 0,10	0,07 - 0,11	0,08 - 0,12

		Cutting Speed – vc			Inch								
		Range – SFM			Recommended Feed Rate (f) by Diameter								
Material Group		min	Starting Value	max									
					1/8 .125	3/16 .188	1/4 .250	5/16 .313	3/8 .375	1/2 .500	5/8 .625	3/4 .750	
P	1	150	210	200	IPR	.002 - .003	.002 - .003	.002 - .005	.004 - .006	.004 - .006	.005 - .008	.005 - .009	.006 - .010
	1	130	160	200	IPR	.002 - .003	.002 - .003	.002 - .005	.004 - .006	.004 - .006	.005 - .008	.005 - .009	.006 - .010
M	2	130	160	260	IPR	.002 - .004	.003 - .005	.003 - .006	.005 - .008	.005 - .008	.006 - .011	.007 - .012	.008 - .013
	3	130	180	230	IPR	.001 - .002	.001 - .002	.002 - .002	.002 - .003	.002 - .003	.002 - .004	.003 - .005	.003 - .005
S	1	70	80	100	IPR	.002 - .003	.002 - .003	.003 - .004	.004 - .005	.004 - .006	.005 - .006	.006 - .007	.007 - .009
	2	30	70	100	IPR	.002 - .003	.002 - .003	.002 - .003	.003 - .004	.004 - .005	.004 - .005	.005 - .006	.006 - .007
	3	100	80	160	IPR	.001 - .002	.001 - .002	.002 - .003	.002 - .004	.002 - .004	.002 - .004	.003 - .004	.003 - .005
	4	100	80	160	IPR	.001 - .002	.001 - .002	.002 - .003	.002 - .004	.002 - .004	.002 - .004	.003 - .004	.003 - .005

■ Flat-Bottom Drills • B707_FBS Series • Grade KN15™ • Through Coolant for Drill Diameters 3–20mm

Material Group	Cutting Speed – vc			Metric									
	Range – m/min			Recommended Feed Rate (f) by Diameter									
	min	Starting Value	max	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0		
N	1	120	260	400	mm/r	0,07 – 0,11	0,08 – 0,12	0,13 – 0,17	0,14 – 0,21	0,15 – 0,22	0,17 – 0,23	0,19 – 0,25	0,22 – 0,27
	2	120	250	280	mm/r	0,08 – 0,12	0,08 – 0,13	0,09 – 0,19	0,14 – 0,23	0,15 – 0,24	0,19 – 0,31	0,21 – 0,35	0,24 – 0,37
	3	100	200	260	mm/r	0,08 – 0,13	0,08 – 0,14	0,09 – 0,20	0,15 – 0,24	0,16 – 0,26	0,20 – 0,33	0,22 – 0,37	0,26 – 0,40
	5	60	150	200	mm/r	0,03 – 0,05	0,03 – 0,06	0,03 – 0,06	0,04 – 0,06	0,05 – 0,07	0,05 – 0,08	0,05 – 0,08	0,06 – 0,09
Material Group	Cutting Speed – vc			Inch									
	Range – SFM			Recommended Feed Rate (f) by Diameter									
	min	Starting Value	max	1/8 .125	3/16 .188	1/4 .250	5/16 .313	3/8 .375	1/2 .500	5/8 .625	3/4 .750		
N	1	390	850	1310	IPR	.003 – .004	.003 – .005	.005 – .007	.006 – .008	.006 – .009	.007 – .009	.007 – .010	.009 – .011
	2	390	820	920	IPR	.003 – .005	.003 – .005	.003 – .007	.006 – .009	.006 – .010	.007 – .012	.008 – .014	.010 – .015
	3	330	660	850	IPR	.003 – .005	.003 – .006	.004 – .008	.006 – .010	.006 – .010	.008 – .013	.009 – .015	.010 – .016
	5	200	490	660	IPR	.001 – .002	.001 – .002	.001 – .002	.002 – .003	.002 – .003	.002 – .003	.002 – .003	.002 – .003

The B707_FBG drill eliminates the traditional two-step process to create a flat-bottom hole using a drill and an end mill and can perform the operation 25–40% faster. It also eliminates the two-step process of using an end mill to pre-machine a flat on the workpiece material for inclined surfaces.

Workpiece Application

B707A..FBG Standard Length

B708/B709A...FBG Custom Long Length

<ul style="list-style-type: none"> Tapped hole with lead chamfer larger than FBG diameter. 	<p>No feed reduction.</p>	<p>50% feed reduction.</p>
<ul style="list-style-type: none"> Nominal diameter pilot required. 	<p>Rough or hardened surfaces. No feed reduction.</p>	<p>Pilot on all surfaces. No feed reduction.</p>
<ul style="list-style-type: none"> >6° angled entrances. 	<p>Reduce feed by 30% until full diameter, or use pilot.</p>	<p>Pilot with short FBG on all surfaces. No feed reduction.</p>
<ul style="list-style-type: none"> Angled exits. 	<p>30% feed reduction.</p>	<p>30% feed reduction.</p>
<ul style="list-style-type: none"> Round surfaces. 	<p>Reduce feed by 30% until full diameter, or use pilot.</p>	<p>Pilot with short FBG on all surfaces. No feed reduction.</p>

HP Beyond™ Step Drills with Through Coolant for Steel and Iron



Primary Application

Most tapped holes require a chamfer. The B731_HP and B732_HP Step Drills offer a one-pass solution in steels and irons in traditional tap sizes to reduce cycle time and increase productivity. An extensive range of step drills are available to cover Kennametal's taps products.

Features and Benefits

HP Drill-Point Design

- Low thrust prevents workpiece flexing.
- Excellent centering capabilities.

Unique Flute Design

- Drastically improved chip evacuation.
- Better hole surface quality.

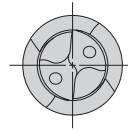
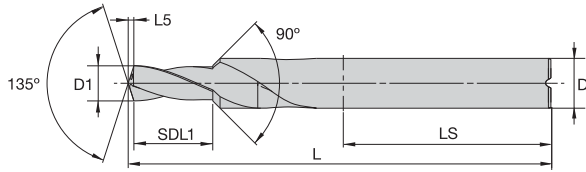
KCPK15™ Beyond Grade

- The grade is a multilayer, TiAlN-based coating with high hot hardness. High cutting speeds enable usage in MQL applications.
- The highly polished surface ensures superior chip evacuation even when low-pressure coolant is applied.
- Improves average metal removal rate and tool life by 10–20%.

Customization

- Intermediate diameters available as semi-standards.
- Using Kennametal Slim Line Hydraulic Chucks together is recommended if workpiece contours need bypassed.



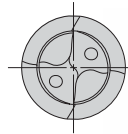
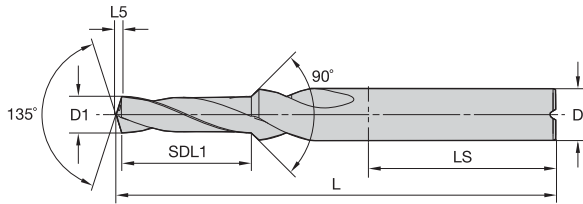


■ B731_HP • Short



- first choice
- alternate choice

short • KCPK15	D1 diameter		L	SDL1	L5	LS	D
	mm	in					
B731A03734HP	3,734	.1470	66	10	0,7	36	6
B731A04200HP	4,200	.1654	66	12	0,8	36	6
B731A04496HP	4,496	.1770	79	13	0,9	36	8
B731A05000HP	5,000	.1969	79	13	0,9	36	8
B731A05106HP	5,106	.2010	79	15	1,0	36	8
B731A05410HP	5,410	.2130	79	16	1,0	36	8
B731A06528HP	6,528	.2570	89	17	1,2	40	10
B731A06800HP	6,800	.2677	89	16	1,3	40	10
B731A06909HP	6,909	.2720	89	18	1,3	40	10
B731A07938HP	7,938	.3125	89	19	1,5	45	12
B731A08433HP	8,433	.3320	102	21	1,6	45	12
B731A08500HP	8,500	.3346	102	19	1,6	45	12
B731A09921HP	9,921	.3906	107	23	1,9	45	14
B731A10200HP	10,200	.4016	107	22	1,9	45	14
B731A10500HP	10,500	.4134	107	22	2,0	45	14
B731A10716HP	10,716	.4219	107	27	2,0	45	14
B731A12000HP	12,000	.4724	115	27	2,2	48	16
B731A12304HP	12,304	.4844	115	28	2,3	48	16
B731A12500HP	12,500	.4921	115	27	2,3	48	16
B731A13096HP	13,096	.5156	115	31	2,4	48	16
B731A13495HP	13,495	.5313	123	32	2,5	48	18
B731A14000HP	14,000	.5512	123	29	2,6	48	18
B731A16670HP	16,670	.6563	131	38	3,1	50	20
B731A17463HP	17,463	.6875	131	40	3,2	50	20
B731A19446HP	19,446	.7656	153	43	3,6	56	25



Solid Carbide Drills

B732_HP • Long

P	●
M	○
K	●
N	○
S	○
H	○

- first choice
- alternate choice

long • KCPK15	D1 diameter		L	SDL1	L5	LS	D
	mm	in					
B732A03734HP	3,734	.1470	66	16	0,7	36	6
B732A04200HP	4,200	.1654	66	17	0,8	36	6
B732A04496HP	4,496	.1770	79	17	0,9	36	8
B732A05000HP	5,000	.1969	79	20	0,9	36	8
B732A05106HP	5,106	.2010	79	20	1,0	36	8
B732A05410HP	5,410	.2130	79	21	1,0	36	8
B732A06528HP	6,528	.2570	89	24	1,2	40	10
B732A06800HP	6,800	.2677	89	25	1,3	40	10
B732A06909HP	6,909	.2720	89	25	1,3	40	10
B732A07938HP	7,938	.3125	102	27	1,5	45	12
B732A08433HP	8,433	.3320	102	29	1,6	45	12
B732A08500HP	8,500	.3346	102	30	1,6	45	12
B732A09921HP	9,921	.3906	107	33	1,9	45	14
B732A10200HP	10,200	.4016	107	35	1,9	45	14
B732A10500HP	10,500	.4134	107	35	2,0	45	14
B732A10716HP	10,716	.4219	107	37	2,0	45	14
B732A12000HP	12,000	.4724	115	40	2,2	48	16
B732A12304HP	12,304	.4844	115	41	2,3	48	16
B732A12500HP	12,500	.4921	115	40	2,3	48	16
B732A13096HP	13,096	.5156	123	44	2,4	48	16
B732A13495HP	13,495	.5313	123	45	2,5	48	18
B732A14000HP	14,000	.5512	123	43	2,6	48	18
B732A16670HP	16,670	.6563	141	55	3,1	50	20
B732A17463HP	17,463	.6875	141	58	3,2	50	20
B732A19446HP	19,446	.7656	184	76	3,6	56	25

Tolerance • Metric			Tolerance • Inch		
nominal size range	D1 tolerance m7	D tolerance h6	nominal size range	D1 tolerance m7	D tolerance h6
>3-6	0,004/0,016	0,000/-0,008	>.1181-.2362	.0002/.0006	.0000/- .0003
>6-10	0,006/0,021	0,000/-0,009	>.2362-.3937	.0002/.0008	.0000/- .0004
>10-18	0,007/0,025	0,000/-0,011	>.3937-.7087	.0003/.0010	.0000/- .0004
>18-25,4	0,008/0,029	0,000/-0,013	>.7087-1.0000	.0003/.0011	.0000/- .0005

■ HP Step Drills • B73_HP Series • Grade KCPK15™ • Through Coolant for Drill Diameters 3–16mm

		Cutting Speed – vc			Metric								
		Range – m/min			Recommended Feed Rate (f) by Diameter								
Material Group		min	Starting Value	max									
					3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0	
P	1	140	220	240	mm/r	0,07 - 0,17	0,09 - 0,21	0,11 - 0,24	0,14 - 0,30	0,16 - 0,35	0,18 - 0,39	0,20 - 0,46	0,24 - 0,50
	2	180	210	240	mm/r	0,07 - 0,14	0,09 - 0,17	0,11 - 0,20	0,14 - 0,24	0,16 - 0,28	0,18 - 0,32	0,20 - 0,37	0,24 - 0,43
	3	120	150	180	mm/r	0,09 - 0,17	0,12 - 0,21	0,14 - 0,24	0,17 - 0,30	0,20 - 0,35	0,22 - 0,39	0,26 - 0,46	0,29 - 0,50
	4	100	140	180	mm/r	0,08 - 0,17	0,11 - 0,20	0,12 - 0,23	0,15 - 0,28	0,17 - 0,33	0,19 - 0,37	0,22 - 0,43	0,25 - 0,45
	6	140	100	180	mm/r	0,07 - 0,13	0,09 - 0,15	0,11 - 0,17	0,13 - 0,21	0,15 - 0,24	0,17 - 0,27	0,19 - 0,33	0,21 - 0,36
	K	1	140	160	180	mm/r	0,09 - 0,18	0,12 - 0,22	0,13 - 0,26	0,16 - 0,33	0,19 - 0,37	0,21 - 0,41	0,24 - 0,48	0,27 - 0,51
2		100	150	200	mm/r	0,09 - 0,16	0,12 - 0,19	0,13 - 0,22	0,16 - 0,27	0,19 - 0,32	0,21 - 0,35	0,24 - 0,41	0,27 - 0,45
3		100	140	180	mm/r	0,07 - 0,14	0,09 - 0,17	0,12 - 0,20	0,14 - 0,24	0,16 - 0,28	0,18 - 0,32	0,21 - 0,37	0,24 - 0,39
		Cutting Speed – vc			Inch								
		Range – SFM			Recommended Feed Rate (f) by Diameter								
Material Group		min	Starting Value	max									
					1/8 .125	3/16 .188	1/4 .250	5/16 .313	3/8 .375	1/2 .500	5/8 .625	3/4 .750	
P	1	460	720	790	IPR	.003 - .007	.004 - .008	.004 - .009	.006 - .012	.006 - .014	.007 - .015	.008 - .018	.009 - .020
	2	590	690	790	IPR	.003 - .006	.004 - .007	.004 - .008	.006 - .009	.006 - .011	.007 - .013	.008 - .015	.009 - .017
	3	390	490	590	IPR	.004 - .007	.005 - .008	.006 - .009	.007 - .012	.008 - .014	.009 - .015	.010 - .018	.011 - .020
	4	330	460	590	IPR	.003 - .007	.004 - .008	.005 - .009	.006 - .011	.007 - .013	.007 - .015	.009 - .017	.010 - .018
	6	460	330	590	IPR	.003 - .005	.004 - .006	.004 - .007	.005 - .008	.006 - .009	.007 - .011	.007 - .013	.008 - .014
	K	1	460	520	590	IPR	.004 - .007	.005 - .009	.005 - .010	.006 - .013	.007 - .015	.008 - .016	.009 - .019	.011 - .020
2		330	490	660	IPR	.004 - .006	.005 - .007	.005 - .009	.006 - .011	.007 - .013	.008 - .014	.009 - .016	.011 - .018
3		330	460	590	IPR	.003 - .006	.004 - .007	.005 - .008	.006 - .009	.006 - .011	.007 - .013	.008 - .015	.009 - .015



Kenna Universal™ Drills

Primary Application

Kenna Universal Drills (B96_B97_Series) are engineered to deliver superior performance in steel, cast iron, and stainless steel applications making it ideal for small- and medium-sized shops. The universal application profile reduces tool change times and the number of drills in inventory. Covering a large spectrum of off-the-shelf diameters and a broad range of applications makes Kenna Universal Drills an excellent alternative to other high-performance products.

The new B976Z series is available from 2,383–3mm (.0938-.1181") making it the first standard offering in less than 3mm. This extended diameter offering covers all common tap drill sizes, including an expanded selection of wire, fractional, and letter sizes.

Use as Pilot Drill

- Ideal point angle and tolerance make the Kenna Universal Drill the preferred pilot drill for B27_Series Solid Carbide Deep-Hole Drills.

Features and Benefits

Kenna Universal Drill-Point Design

- Low thrust. Works well on a variety of machines.
- Excellent centering capabilities.
- Easy to regrind.

Four-Margin Land Design

- Improves hole straightness and roundness.
- Provides good alignment and stability in tough drilling applications — even when drilling through cross holes.

KC7315™ Grade

- A multilayer, TiAlN-based coating with high hot hardness enables 30% higher cutting speeds and constant tool life.
- Surface finish ensures chip evacuation when drilling deep holes.

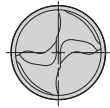
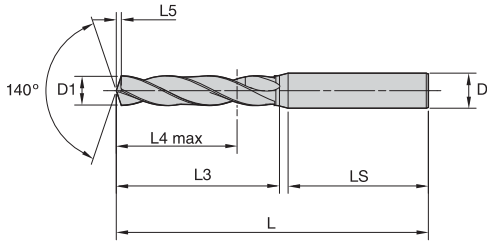
Customization

- Intermediate diameters available as semi-standards.
- Length variations and step drills available as engineered solutions.

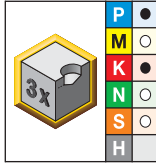
F-Shank

- For standard line items with F-shank, please refer to the e-catalog on www.kennametal.com.





■ B966 • ~3 x D

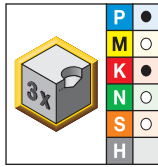


● first choice
○ alternate choice

	D1 diameter				L	L4 max	L5	LS	D
	mm	in	fraction	wire size					
short • KC7315									
B966A03000	3,000	.1181	—	—	62	14	0,5	36	6
B966A03100	3,100	.1220	—	—	62	14	0,5	36	6
B966A03200	3,200	.1260	—	—	62	14	0,5	36	6
B966A03300	3,300	.1299	—	—	62	14	0,5	36	6
B966A03400	3,400	.1339	—	—	62	14	0,6	36	6
B966A03500	3,500	.1378	—	—	62	14	0,6	36	6
B966A03600	3,600	.1417	—	—	62	14	0,6	36	6
B966A03700	3,700	.1457	—	—	62	14	0,6	36	6
B966A03800	3,800	.1496	—	—	66	17	0,6	36	6
B966A03900	3,900	.1535	—	—	66	17	0,6	36	6
B966A04000	4,000	.1575	—	—	66	17	0,7	36	6
B966A04100	4,100	.1614	—	—	66	17	0,7	36	6
B966A04200	4,200	.1654	—	—	66	17	0,7	36	6
B966A04300	4,300	.1693	—	—	66	17	0,7	36	6
B966A04400	4,400	.1732	—	—	66	17	0,7	36	6
B966A04500	4,500	.1772	—	—	66	17	0,7	36	6
B966A04600	4,600	.1811	—	—	66	17	0,8	36	6
B966A04700	4,700	.1850	—	13	66	17	0,8	36	6
B966A04800	4,800	.1890	—	12	66	20	0,8	36	6
B966A04900	4,900	.1929	—	—	66	20	0,8	36	6
B966A05000	5,000	.1969	—	—	66	20	0,8	36	6
B966A05100	5,100	.2008	—	—	66	20	0,8	36	6
B966A05200	5,200	.2047	—	—	66	20	0,9	36	6
B966A05300	5,300	.2087	—	—	66	20	0,9	36	6
B966A05400	5,400	.2126	—	—	66	20	0,9	36	6
B966A05500	5,500	.2165	—	—	66	20	0,9	36	6
B966A05600	5,600	.2205	—	—	66	20	0,9	36	6
B966A05700	5,700	.2244	—	—	66	20	1,0	36	6
B966A05800	5,800	.2283	—	—	66	20	1,0	36	6
B966A05900	5,900	.2323	—	—	66	20	1,0	36	6
B966A06000	6,000	.2362	—	—	66	20	1,0	36	6
B966A06100	6,100	.2402	—	—	79	24	1,0	36	8
B966A06200	6,200	.2441	—	—	79	24	1,0	36	8
B966A06300	6,300	.2480	—	—	79	24	1,1	36	8
B966A06400	6,400	.2520	—	—	79	24	1,1	36	8
B966A06500	6,500	.2559	—	—	79	24	1,1	36	8

(continued)

(B966 • ~3 x D continued)



short • KC7315	D1 diameter				L	L4 max	L5	LS	D
	mm	in	fraction	wire size					
B966A06600	6,600	.2598	—	—	79	24	1,1	36	8
B966A06700	6,700	.2638	—	—	79	24	1,1	36	8
B966A06800	6,800	.2677	—	—	79	24	1,1	36	8
B966A06900	6,900	.2717	—	—	79	24	1,2	36	8
B966A07000	7,000	.2756	—	—	79	24	1,2	36	8
B966A07100	7,100	.2795	—	—	79	29	1,2	36	8
B966A07200	7,200	.2835	—	—	79	29	1,2	36	8
B966A07300	7,300	.2874	—	—	79	29	1,2	36	8
B966A07400	7,400	.2913	—	—	79	29	1,3	36	8
B966A07500	7,500	.2953	—	—	79	29	1,3	36	8
B966A07600	7,600	.2992	—	—	79	29	1,3	36	8
B966A07700	7,700	.3031	—	—	79	29	1,3	36	8
B966A07800	7,800	.3071	—	—	79	29	1,3	36	8
B966A07900	7,900	.3110	—	—	79	29	1,3	36	8
B966A08000	8,000	.3150	—	—	79	29	1,4	36	8
B966A08100	8,100	.3189	—	—	89	35	1,4	40	10
B966A08200	8,200	.3228	—	—	89	35	1,4	40	10
B966A08300	8,300	.3268	—	—	89	35	1,4	40	10
B966A08400	8,400	.3307	—	—	89	35	1,4	40	10
B966A08500	8,500	.3346	—	—	89	35	1,4	40	10
B966A08600	8,600	.3386	—	—	89	35	1,5	40	10
B966A08700	8,700	.3425	—	—	89	35	1,5	40	10
B966A08800	8,800	.3465	—	—	89	35	1,5	40	10
B966A08900	8,900	.3504	—	—	89	35	1,5	40	10
B966A09000	9,000	.3543	—	—	89	35	1,5	40	10
B966A09100	9,100	.3583	—	—	89	35	1,5	40	10
B966A09200	9,200	.3622	—	—	89	35	1,6	40	10
B966A09300	9,300	.3661	—	—	89	35	1,6	40	10
B966A09400	9,400	.3701	—	—	89	35	1,6	40	10
B966A09500	9,500	.3740	—	—	89	35	1,6	40	10
B966A09600	9,600	.3780	—	—	89	35	1,6	40	10
B966A09700	9,700	.3819	—	—	89	35	1,7	40	10
B966A09800	9,800	.3858	—	—	89	35	1,7	40	10
B966A09900	9,900	.3898	—	—	89	35	1,7	40	10
B966A10000	10,000	.3937	—	—	89	35	1,7	40	10
B966A10100	10,100	.3976	—	—	102	40	1,7	45	12
B966A10200	10,200	.4016	—	—	102	40	1,7	45	12
B966A10300	10,300	.4055	—	—	102	40	1,8	45	12
B966A10400	10,400	.4094	—	—	102	40	1,8	45	12
B966A10500	10,500	.4134	—	—	102	40	1,8	45	12
B966A10600	10,600	.4173	—	—	102	40	1,8	45	12
B966A10700	10,700	.4213	—	—	102	40	1,8	45	12
B966A10800	10,800	.4252	—	—	102	40	1,8	45	12
B966A10900	10,900	.4291	—	—	102	40	1,9	45	12
B966A11000	11,000	.4331	—	—	102	40	1,9	45	12
B966A11100	11,100	.4370	—	—	102	40	1,9	45	12
B966A11200	11,200	.4409	—	—	102	40	1,9	45	12
B966A11300	11,300	.4449	—	—	102	40	1,9	45	12

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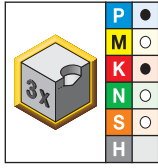
Solid Carbide Drills

Kenna Universal™ Drills • Without Coolant

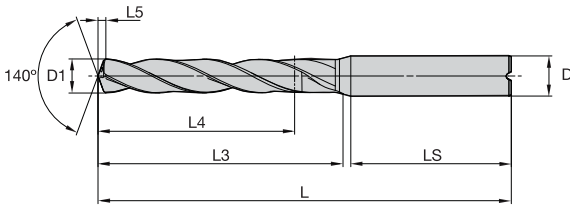


(B966 • ~3 x D continued)

Solid Carbide Drills

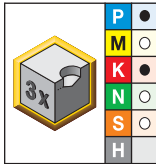


short • KC7315	D1 diameter				L	L4 max	L5	LS	D
	mm	in	fraction	wire size					
B966A11400	11,400	.4488	—	—	102	40	2,0	45	12
B966A11500	11,500	.4528	—	—	102	40	2,0	45	12
B966A11600	11,600	.4567	—	—	102	40	2,0	45	12
B966A11700	11,700	.4606	—	—	102	40	2,0	45	12
B966A11800	11,800	.4646	—	—	102	40	2,0	45	12
B966A11900	11,900	.4685	—	—	102	40	2,0	45	12
B966A12000	12,000	.4724	—	—	102	40	2,1	45	12
B966A12100	12,100	.4764	—	—	107	43	2,1	45	14
B966A12200	12,200	.4803	—	—	107	43	2,1	45	14
B966A12300	12,300	.4843	—	—	107	43	2,1	45	14
B966A12400	12,400	.4882	—	—	107	43	2,1	45	14
B966A12500	12,500	.4921	—	—	107	43	2,1	45	14
B966A12600	12,600	.4961	—	—	107	43	2,2	45	14
B966A12700	12,700	.5000	1/2	—	107	43	2,2	45	14
B966A12800	12,800	.5039	—	—	107	43	2,2	45	14
B966A12900	12,900	.5079	—	—	107	43	2,2	45	14
B966A13000	13,000	.5118	—	—	107	43	2,2	45	14
B966A13100	13,100	.5157	—	—	107	43	2,3	45	14
B966A13200	13,200	.5197	—	—	107	43	2,3	45	14
B966A13300	13,300	.5236	—	—	107	43	2,3	45	14
B966A13500	13,500	.5315	—	—	107	43	2,3	45	14
B966A13700	13,700	.5394	—	—	107	43	2,4	45	14
B966A14000	14,000	.5512	—	—	107	43	2,4	45	14
B966A14200	14,200	.5591	—	—	115	45	2,5	48	16
B966A14300	14,300	.5630	—	—	115	45	2,5	48	16
B966A14500	14,500	.5709	—	—	115	45	2,5	48	16
B966A14700	14,700	.5787	—	—	115	45	2,5	48	16
B966A14800	14,800	.5827	—	—	115	45	2,6	48	16
B966A15000	15,000	.5906	—	—	115	45	2,6	48	16
B966A15500	15,500	.6102	—	—	115	45	2,7	48	16
B966A15700	15,700	.6181	—	—	115	45	2,7	48	16
B966A16000	16,000	.6299	—	—	115	45	2,8	48	16
B966A16500	16,500	.6496	—	—	123	51	2,9	48	18
B966A17000	17,000	.6693	—	—	123	51	2,9	48	18
B966A17500	17,500	.6890	—	—	123	51	3,0	48	18
B966A18000	18,000	.7087	—	—	123	51	3,1	48	18
B966A20000	20,000	.7874	—	—	131	55	3,5	50	20

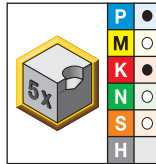


Solid Carbide Drills

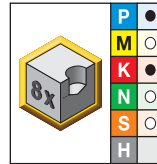
■ B976/B977/B978 • ~3 x D/~5 x D/~8 x D



short • KC7315



long • KC7315



extra long • KC7315

- first choice
- alternate choice

			D1 diameter						
			mm	in	fraction	wire size	L5	LS	D
B976Z02383	—	—	2,383	.0938	3/32	—	0,4	28	3
B976Z02400	—	—	2,400	.0945	—	—	0,4	28	3
B976Z02439	—	—	2,439	.0960	—	41	0,4	28	3
B976Z02489	—	—	2,489	.0980	—	40	0,4	28	3
B976Z02500	—	—	2,500	.0984	—	—	0,4	28	3
B976Z02578	—	—	2,578	.1015	—	38	0,4	28	3
B976Z02600	—	—	2,600	.1024	—	—	0,4	28	3
B976Z02642	—	—	2,642	.1040	—	37	0,4	28	3
B976Z02705	—	—	2,705	.1065	—	36	0,4	28	3
B976Z02779	—	—	2,779	.1094	7/64	—	0,4	28	3
B976Z02800	—	—	2,800	.1102	—	—	0,5	28	3
B976Z02820	—	—	2,820	.1110	—	34	0,5	28	3
B976Z02870	—	—	2,870	.1130	—	33	0,5	28	3
B976Z02900	—	—	2,900	.1142	—	—	0,5	28	3
B976Z02947	—	—	2,947	.1160	—	32	0,5	28	3
B976A03000	B977A03000	—	3,000	.1181	—	—	0,5	36	6
—	—	B978A03000	3,000	.1181	—	—	0,6	36	6
B976A03100	B977A03100	—	3,100	.1220	—	—	0,5	36	6
B976A03175	B977A03175	—	3,175	.1250	1/8	—	0,5	36	6
B976A03180	—	—	3,180	.1252	—	—	0,5	36	6
B976A03200	B977A03200	—	3,200	.1260	—	—	0,5	36	6
—	B977A03250	—	3,250	.1280	—	—	0,5	36	6
B976A03300	B977A03300	—	3,300	.1299	—	—	0,5	36	6
—	B977A03400	—	3,400	.1339	—	—	0,6	36	6
B976A03454	B977A03454	—	3,454	.1360	—	29	0,6	36	6
B976A03500	B977A03500	—	3,500	.1378	—	—	0,6	36	6
B976A03600	B977A03600	—	3,600	.1417	—	—	0,6	36	6
B976A03700	B977A03700	—	3,700	.1457	—	—	0,6	36	6
B976A03734	B977A03734	—	3,734	.1470	—	26	0,6	36	6
B976A03797	B977A03797	—	3,797	.1495	—	25	0,6	36	6
B976A03800	B977A03800	—	3,800	.1496	—	—	0,6	36	6
—	B977A03900	—	3,900	.1535	—	—	0,6	36	6
B976A03970	B977A03970	—	3,970	.1563	5/32	—	0,7	36	6
—	—	B978A03970	3,970	.1563	5/32	—	0,8	36	6
B976A04000	B977A04000	—	4,000	.1575	—	—	0,7	36	6
—	—	B978A04000	4,000	.1575	—	—	0,8	36	6
B976A04039	B977A04039	—	4,039	.1590	—	21	0,7	36	6
—	B977A04100	—	4,100	.1614	—	—	0,7	36	6
B976A04200	B977A04200	—	4,200	.1654	—	—	0,7	36	6
—	—	B978A04200	4,200	.1654	—	—	0,9	36	6
B976A04300	B977A04300	—	4,300	.1693	—	—	0,7	36	6
B976A04366	B977A04366	—	4,366	.1719	11/64	—	0,7	36	6

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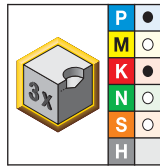
Solid Carbide Drills

Kenna Universal™ Drills • Through Coolant

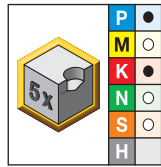


(B976/B977/B978 • ~3 x D/~5 x D/~8 x D continued)

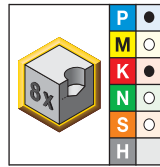
Solid Carbide Drills



short • KC7315



long • KC7315



extra long • KC7315

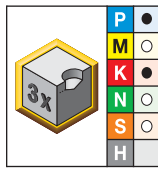
D1 diameter

			mm	in	fraction	wire size	L5	LS	D
—	B977A04400	—	4,400	.1732	—	—	0,7	36	6
B976A04496	B977A04496	—	4,496	.1770	—	16	0,7	36	6
B976A04500	B977A04500	—	4,500	.1772	—	—	0,7	36	6
—	—	B978A04500	4,500	.1772	—	—	0,9	36	6
—	B977A04580	—	4,580	.1803	—	15	0,8	36	6
B976A04600	B977A04600	—	4,600	.1811	—	—	0,8	36	6
B976A04620	—	—	4,620	.1819	—	—	0,8	36	6
—	B977A04623	—	4,623	.1820	—	14	0,8	36	6
—	B977A04650	—	4,650	.1831	—	—	0,8	36	6
B976A04700	B977A04700	—	4,700	.1850	—	13	0,8	36	6
B976A04763	B977A04763	—	4,763	.1875	3/16	—	0,8	36	6
—	—	B978A04763	4,763	.1875	3/16	—	1,0	36	6
B976A04800	B977A04800	—	4,800	.1890	—	12	0,8	36	6
B976A04900	B977A04900	—	4,900	.1929	—	—	0,8	36	6
B976A05000	B977A05000	—	5,000	.1969	—	—	0,8	36	6
—	—	B978A05000	5,000	.1969	—	—	1,0	36	6
B976A05100	B977A05100	—	5,100	.2008	—	—	0,8	36	6
—	—	B978A05100	5,100	.2008	—	—	1,1	36	6
B976A05106	B977A05106	—	5,106	.2010	—	7	0,8	36	6
B976A05200	B977A05200	—	5,200	.2047	—	—	0,9	36	6
—	—	B978A05200	5,200	.2047	—	—	1,1	36	6
B976A05250	—	—	5,250	.2067	—	—	0,9	36	6
B976A05300	B977A05300	—	5,300	.2087	—	—	0,9	36	6
—	—	B978A05300	5,300	.2087	—	—	1,1	36	6
B976A05400	B977A05400	—	5,400	.2126	—	—	0,9	36	6
B976A05410	B977A05410	—	5,410	.2130	—	3	0,9	36	6
B976A05500	B977A05500	—	5,500	.2165	—	—	0,9	36	6
—	—	B978A05500	5,500	.2165	—	—	1,1	36	6
B976A05558	B977A05558	—	5,558	.2188	7/32	—	0,9	36	6
—	—	B978A05558	5,558	.2188	7/32	—	1,2	36	6
B976A05575	—	—	5,575	.2195	—	—	0,9	36	6
B976A05600	B977A05600	—	5,600	.2205	—	—	0,9	36	6
B976A05700	B977A05700	—	5,700	.2244	—	—	1,0	36	6
—	—	B978A05700	5,700	.2244	—	—	1,2	36	6
B976A05791	B977A05791	—	5,791	.2280	—	1	1,0	36	6
B976A05800	B977A05800	—	5,800	.2283	—	—	1,0	36	6
—	B977A05900	—	5,900	.2323	—	—	1,0	36	6
B976A05944	B977A05944	—	5,944	.2340	—	A	1,0	36	6
B976A06000	B977A06000	—	6,000	.2362	—	—	1,0	36	6
—	—	B978A06000	6,000	.2362	—	—	1,2	36	6
—	B977A06100	—	6,100	.2402	—	—	1,0	36	8
—	—	B978A06100	6,100	.2402	—	—	1,3	36	8
B976A06200	B977A06200	—	6,200	.2441	—	—	1,0	36	8
—	—	B978A06200	6,200	.2441	—	—	1,3	36	8
—	B977A06300	—	6,300	.2480	—	—	1,1	36	8
—	—	B978A06300	6,300	.2480	—	—	1,3	36	8
B976A06350	B977A06350	—	6,350	.2500	1/4	E	1,1	36	8
—	—	B978A06350	6,350	.2500	1/4	E	1,3	36	8
—	B977A06400	—	6,400	.2520	—	—	1,1	36	8
—	—	B978A06400	6,400	.2520	—	—	1,3	36	8
B976A06500	B977A06500	—	6,500	.2559	—	—	1,1	36	8
—	—	B978A06500	6,500	.2559	—	—	1,4	36	8

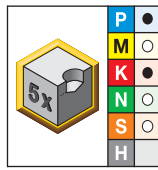
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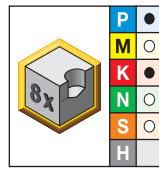
(B976/B977/B978 • ~3 x D/-5 x D/-8 x D continued)



short • KC7315



long • KC7315



extra long • KC7315

			D1 diameter						
			mm	in	fraction	wire size	L5	LS	D
B976A06528	B977A06528	—	6,528	.2570	—	F	1,1	36	8
B976A06530	—	—	6,530	.2571	—	—	1,1	36	8
B976A06600	B977A06600	—	6,600	.2598	—	—	1,1	36	8
—	—	B978A06600	6,600	.2598	—	—	1,4	36	8
B976A06700	B977A06700	—	6,700	.2638	—	—	1,1	36	8
—	—	B978A06700	6,700	.2638	—	—	1,4	36	8
B976A06746	—	—	6,746	.2656	17/64	—	1,1	36	8
—	—	B978A06746	6,746	.2656	17/64	—	1,4	36	8
B976A06750	—	—	6,750	.2657	—	—	1,1	36	8
B976A06800	B977A06800	—	6,800	.2677	—	—	1,1	36	8
—	—	B978A06800	6,800	.2677	—	—	1,4	36	8
—	B977A06900	—	6,900	.2717	—	—	1,2	36	8
B976A06909	B977A06909	—	6,909	.2720	—	I	1,2	36	8
B976A07000	B977A07000	—	7,000	.2756	—	—	1,2	36	8
—	—	B978A07000	7,000	.2756	—	—	1,5	36	8
—	B977A07100	—	7,100	.2795	—	—	1,2	36	8
B976A07145	B977A07145	—	7,145	.2813	9/32	—	1,2	36	8
—	—	B978A07145	7,145	.2813	9/32	—	1,5	36	8
B976A07200	B977A07200	—	7,200	.2835	—	—	1,2	36	8
—	B977A07300	—	7,300	.2874	—	—	1,2	36	8
B976A07366	B977A07366	—	7,366	.2900	—	L	1,2	36	8
B976A07400	B977A07400	—	7,400	.2913	—	—	1,3	36	8
B976A07500	B977A07500	—	7,500	.2953	—	—	1,3	36	8
—	—	B978A07500	7,500	.2953	—	—	1,6	36	8
B976A07541	B977A07541	—	7,541	.2969	19/64	—	1,3	36	8
—	—	B978A07541	7,541	.2969	19/64	—	1,6	36	8
—	B977A07600	—	7,600	.2992	—	—	1,3	36	8
—	B977A07700	—	7,700	.3031	—	—	1,3	36	8
—	—	B978A07700	7,700	.3031	—	—	1,6	36	8
B976A07800	B977A07800	—	7,800	.3071	—	—	1,3	36	8
—	—	B978A07800	7,800	.3071	—	—	1,6	36	8
B976A07900	B977A07900	—	7,900	.3110	—	—	1,3	36	8
B976A07938	B977A07938	—	7,938	.3125	5/16	—	1,3	36	8
—	—	B978A07938	7,938	.3125	5/16	—	1,7	36	8
B976A08000	B977A08000	—	8,000	.3150	—	—	1,4	36	8
—	—	B978A08000	8,000	.3150	—	—	1,7	36	8
B976A08100	B977A08100	—	8,100	.3189	—	—	1,4	40	10
—	—	B978A08100	8,100	.3189	—	—	1,7	40	10
B976A08200	B977A08200	—	8,200	.3228	—	—	1,4	40	10
B976A08300	B977A08300	—	8,300	.3268	—	—	1,4	40	10
B976A08334	B977A08334	—	8,334	.3281	21/64	—	1,4	40	10
—	—	B978A08334	8,334	.3281	21/64	—	1,8	40	10
—	B977A08400	—	8,400	.3307	—	—	1,4	40	10
B976A08430	—	—	8,430	.3319	—	—	1,4	40	10
B976A08433	B977A08433	—	8,433	.3320	—	Q	1,4	40	10
B976A08500	B977A08500	—	8,500	.3346	—	—	1,4	40	10
—	—	B978A08500	8,500	.3346	—	—	1,8	40	10
B976A08600	B977A08600	—	8,600	.3386	—	—	1,5	40	10
—	—	B978A08600	8,600	.3386	—	—	1,8	40	10
B976A08700	B977A08700	—	8,700	.3425	—	—	1,5	40	10
—	—	B978A08700	8,700	.3425	—	—	1,8	40	10
B976A08733	B977A08733	—	8,733	.3438	11/32	—	1,5	40	10

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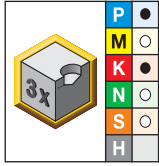
Solid Carbide Drills

Kenna Universal™ Drills • Through Coolant

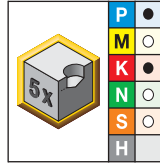


Solid Carbide Drills

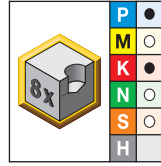
(B976/B977/B978 • ~3 x D/-5 x D/-8 x D continued)



short • KC7315



long • KC7315



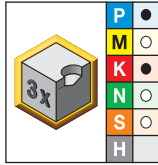
extra long • KC7315

			D1 diameter						
			mm	in	fraction	wire size	L5	LS	D
—	—	B978A08733	8,733	.3438	11/32	—	1,8	40	10
B976A08800	B977A08800	—	8,800	.3465	—	—	1,5	40	10
—	—	B978A08800	8,800	.3465	—	—	1,9	40	10
B976A08839	B977A08839	—	8,839	.3480	—	S	1,5	40	10
—	B977A08900	—	8,900	.3504	—	—	1,5	40	10
B976A09000	B977A09000	—	9,000	.3543	—	—	1,5	40	10
—	—	B978A09000	9,000	.3543	—	—	1,9	40	10
B976A09093	B977A09093	—	9,093	.3580	—	T	1,5	40	10
B976A09100	B977A09100	—	9,100	.3583	—	—	1,5	40	10
—	—	B978A09100	9,100	.3583	—	—	1,9	40	10
B976A09129	B977A09129	—	9,129	.3594	23/64	—	1,6	40	10
—	—	B978A09129	9,129	.3594	23/64	—	1,9	40	10
B976A09200	B977A09200	—	9,200	.3622	—	—	1,6	40	10
B976A09300	B977A09300	—	9,300	.3661	—	—	1,6	40	10
—	B977A09347	—	9,347	.3680	—	U	1,6	40	10
B976A09400	B977A09400	—	9,400	.3701	—	—	1,6	40	10
B976A09500	B977A09500	—	9,500	.3740	—	—	1,6	40	10
—	—	B978A09500	9,500	.3740	—	—	2,0	40	10
B976A09525	B977A09525	—	9,525	.3750	3/8	—	1,6	40	10
—	—	B978A09525	9,525	.3750	3/8	—	2,0	40	10
B976A09600	B977A09600	—	9,600	.3780	—	—	1,6	40	10
B976A09700	B977A09700	—	9,700	.3819	—	—	1,7	40	10
—	—	B978A09700	9,700	.3819	—	—	2,0	40	10
—	B977A09703	—	9,703	.3820	—	—	1,7	40	10
—	B977A09746	—	9,746	.3837	—	—	1,7	40	10
B976A09750	—	—	9,750	.3839	—	—	1,7	40	10
B976A09800	B977A09800	—	9,800	.3858	—	—	1,7	40	10
—	—	B978A09800	9,800	.3858	—	—	2,1	40	10
—	B977A09900	—	9,900	.3898	—	—	1,7	40	10
—	—	B978A09900	9,900	.3898	—	—	2,1	40	10
B976A09921	B977A09921	—	9,921	.3906	25/64	—	1,7	40	10
—	—	B978A09921	9,921	.3906	25/64	—	2,1	40	10
B976A10000	B977A10000	—	10,000	.3937	—	—	1,7	40	10
—	—	B978A10000	10,000	.3937	—	—	2,1	40	10
—	B977A10100	—	10,100	.3976	—	—	1,7	45	12
—	—	B978A10100	10,100	.3976	—	—	2,1	45	12
B976A10200	B977A10200	—	10,200	.4016	—	—	1,7	45	12
—	—	B978A10200	10,200	.4016	—	—	2,2	45	12
B976A10262	B977A10262	—	10,262	.4040	—	Y	1,8	45	12
—	B977A10300	—	10,300	.4055	—	—	1,8	45	12
—	—	B978A10300	10,300	.4055	—	—	2,2	45	12
B976A10320	B977A10320	—	10,320	.4063	13/32	—	1,8	45	12
—	—	B978A10320	10,320	.4063	13/32	—	2,2	45	12
—	B977A10400	—	10,400	.4094	—	—	1,8	45	12
B976A10500	B977A10500	—	10,500	.4134	—	—	1,8	45	12
—	—	B978A10500	10,500	.4134	—	—	2,2	45	12
—	B977A10600	—	10,600	.4173	—	—	1,8	45	12
B976A10700	B977A10700	—	10,700	.4213	—	—	1,8	45	12
B976A10716	B977A10716	—	10,716	.4219	27/64	—	1,8	45	12
—	—	B978A10716	10,716	.4219	27/64	—	2,3	45	12
B976A10800	B977A10800	—	10,800	.4252	—	—	1,8	45	12
—	—	B978A10800	10,800	.4252	—	—	2,3	45	12
—	B977A10900	—	10,900	.4291	—	—	1,9	45	12
B976A11000	B977A11000	—	11,000	.4331	—	—	1,9	45	12

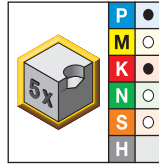
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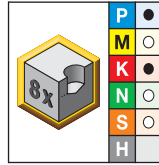
(B976/B977/B978 • ~3 x D/~5 x D/~8 x D continued)



short • KC7315



long • KC7315



extra long • KC7315

			D1 diameter						
			mm	in	fraction	wire size	L5	LS	D
—	—	B978A11000	11,000	.4331	—	—	2,3	45	12
—	B977A11100	—	11,100	.4370	—	—	1,9	45	12
B976A11113	B977A11113	—	11,113	.4375	7/16	—	1,9	45	12
—	—	B978A11113	11,113	.4375	7/16	—	2,4	45	12
B976A11200	B977A11200	—	11,200	.4409	—	—	1,9	45	12
—	—	B978A11200	11,200	.4409	—	—	2,4	45	12
B976A11300	B977A11300	—	11,300	.4449	—	—	1,9	45	12
—	—	B978A11300	11,300	.4449	—	—	2,4	45	12
—	B977A11400	—	11,400	.4488	—	—	2,0	45	12
—	—	B978A11400	11,400	.4488	—	—	2,4	45	12
B976A11500	B977A11500	—	11,500	.4528	—	—	2,0	45	12
—	—	B978A11500	11,500	.4528	—	—	2,4	45	12
B976A11509	B977A11509	—	11,509	.4531	29/64	—	2,0	45	12
—	—	B978A11509	11,509	.4531	29/64	—	2,4	45	12
—	B977A11600	—	11,600	.4567	—	—	2,0	45	12
B976A11700	B977A11700	—	11,700	.4606	—	—	2,0	45	12
—	—	B978A11700	11,700	.4606	—	—	2,5	45	12
—	B977A11800	—	11,800	.4646	—	—	2,0	45	12
—	—	B978A11800	11,800	.4646	—	—	2,5	45	12
—	B977A11900	—	11,900	.4685	—	—	2,0	45	12
B976A11908	B977A11908	—	11,908	.4688	15/32	—	2,0	45	12
—	—	B978A11908	11,908	.4688	15/32	—	2,5	45	12
B976A12000	B977A12000	—	12,000	.4724	—	—	2,1	45	12
—	—	B978A12000	12,000	.4724	—	—	2,5	45	12
—	B977A12100	—	12,100	.4764	—	—	2,1	45	14
—	B977A12200	—	12,200	.4803	—	—	2,1	45	14
B976A12300	B977A12300	—	12,300	.4843	—	—	2,1	45	14
B976A12304	B977A12304	—	12,304	.4844	31/64	—	2,1	45	14
—	—	B978A12304	12,304	.4844	31/64	—	2,6	45	14
—	B977A12400	—	12,400	.4882	—	—	2,1	45	14
B976A12500	B977A12500	—	12,500	.4921	—	—	2,1	45	14
—	—	B978A12500	12,500	.4921	—	—	2,7	45	14
—	B977A12600	—	12,600	.4961	—	—	2,2	45	14
B976A12700	B977A12700	—	12,700	.5000	1/2	—	2,2	45	14
—	—	B978A12700	12,700	.5000	1/2	—	2,7	45	14
B976A12800	B977A12800	—	12,800	.5039	—	—	2,2	45	14
—	—	B978A12800	12,800	.5039	—	—	2,7	45	14
—	B977A12900	—	12,900	.5079	—	—	2,2	45	14
—	B977A12903	—	12,903	.5080	—	—	2,2	45	14
B976A13000	B977A13000	—	13,000	.5118	—	—	2,2	45	14
—	—	B978A13000	13,000	.5118	—	—	2,8	45	14
—	B977A13096	—	13,096	.5156	33/64	—	2,3	45	14
—	B977A13100	—	13,100	.5157	—	—	2,3	45	14
B976A13300	B977A13300	—	13,300	.5236	—	—	2,3	45	14
B976A13495	B977A13495	—	13,495	.5313	17/32	—	2,3	45	14
B976A13500	B977A13500	—	13,500	.5315	—	—	2,3	45	14
—	—	B978A13500	13,500	.5315	—	—	2,9	45	14
B976A13700	B977A13700	—	13,700	.5394	—	—	2,4	45	14
—	B977A13800	—	13,800	.5433	—	—	2,4	45	14
B976A14000	B977A14000	—	14,000	.5512	—	—	2,4	45	14
—	—	B978A14000	14,000	.5512	—	—	3,0	45	14
B976A14100	—	—	14,100	.5551	—	—	2,4	48	16
B976A14200	B977A14200	—	14,200	.5591	—	—	2,5	48	16
B976A14288	B977A14288	—	14,288	.5625	9/16	—	2,5	48	16

(continued)

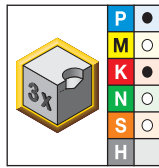
Solid Carbide Drills

Kenna Universal™ Drills • Through Coolant

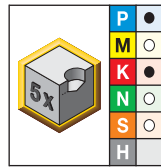


(B976/B977/B978 • ~3 x D/~5 x D/~8 x D continued)

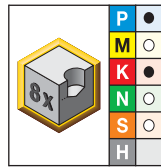
Solid Carbide Drills



short • KC7315



long • KC7315



extra long • KC7315

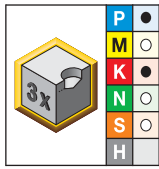
D1 diameter

			mm	in	fraction	wire size	L5	LS	D
—	—	B978A14288	14,288	.5625	9/16	—	3,0	48	16
B976A14500	B977A14500	—	14,500	.5709	—	—	2,5	48	16
—	—	B978A14500	14,500	.5709	—	—	3,1	48	16
—	B977A14600	—	14,600	.5748	—	—	2,5	48	16
B976A14700	B977A14700	—	14,700	.5787	—	—	2,5	48	16
—	B977A14900	—	14,900	.5866	—	—	2,6	48	16
B976A15000	B977A15000	—	15,000	.5906	—	—	2,6	48	16
—	—	B978A15000	15,000	.5906	—	—	3,2	48	16
—	B977A15100	—	15,100	.5945	—	—	2,6	48	16
—	—	B978A15100	15,100	.5945	—	—	3,2	48	16
—	—	B978A15200	15,200	.5984	—	—	3,2	48	16
—	—	B978A15300	15,300	.6024	—	—	3,3	48	16
B976A15500	B977A15500	—	15,500	.6102	—	—	2,7	48	16
—	—	B978A15500	15,500	.6102	—	—	3,3	48	16
—	B977A15700	—	15,700	.6181	—	—	2,7	48	16
—	B977A15800	—	15,800	.6220	—	—	2,7	48	16
—	—	B978A15800	15,800	.6220	—	—	3,4	48	16
B976A15875	B977A15875	—	15,875	.6250	5/8	—	2,7	48	16
—	—	B978A15875	15,875	.6250	5/8	—	3,4	48	16
—	B977A15900	—	15,900	.6260	—	—	2,8	48	16
B976A16000	B977A16000	—	16,000	.6299	—	—	2,8	48	16
—	—	B978A16000	16,000	.6299	—	—	3,4	48	16
—	B977A16078	—	16,078	.6330	—	—	2,8	48	18
—	—	B978A16078	16,078	.6330	—	—	3,4	48	18
—	B977A16200	—	16,200	.6378	—	—	2,8	48	18
—	—	B978A16200	16,200	.6378	—	—	3,5	48	18
—	B977A16400	—	16,400	.6457	—	—	2,8	48	18
B976A16500	B977A16500	—	16,500	.6496	—	—	2,9	48	18
—	—	B978A16500	16,500	.6496	—	—	3,5	48	18
—	B977A16600	—	16,600	.6535	—	—	2,9	48	18
—	B977A16667	—	16,667	.6562	—	—	2,9	48	18
B976A16670	B977A16670	—	16,670	.6563	21/32	—	2,9	48	18
—	B977A16700	—	16,700	.6575	—	—	2,9	48	18
B976A16800	—	—	16,800	.6614	—	—	2,9	48	18
B976A17000	B977A17000	—	17,000	.6693	—	—	2,9	48	18
—	—	B978A17000	17,000	.6693	—	—	3,6	48	18
B976A17100	—	—	17,100	.6732	—	—	3,0	48	18
B976A17463	B977A17463	—	17,463	.6875	11/16	—	3,0	48	18
—	—	B978A17463	17,463	.6875	11/16	—	3,7	48	18
B976A17500	B977A17500	—	17,500	.6890	—	—	3,0	48	18
—	—	B978A17500	17,500	.6890	—	—	3,7	48	18
—	B977A17700	—	17,700	.6969	—	—	3,1	48	18
B976A18000	B977A18000	—	18,000	.7087	—	—	3,1	48	18
—	—	B978A18000	18,000	.7087	—	—	3,9	48	18
—	B977A18400	—	18,400	.7244	—	—	3,2	50	20
—	B977A18500	—	18,500	.7283	—	—	3,2	50	20

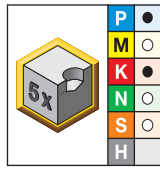
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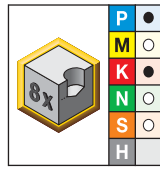
(B976/B977/B978 • ~3 x D/~5 x D/~8 x D continued)



short • KC7315



long • KC7315



extra long • KC7315

			D1 diameter				L5	LS	D
			mm	in	fraction	wire size			
—	—	B978A18500	18,500	.7283	—	—	4,0	50	20
—	B977A18600	—	18,600	.7323	—	—	3,2	50	20
—	B977A18800	—	18,800	.7402	—	—	3,3	50	20
B976A19000	B977A19000	—	19,000	.7480	—	—	3,3	50	20
—	—	B978A19000	19,000	.7480	—	—	4,1	50	20
B976A19050	B977A19050	—	19,050	.7500	3/4	—	3,3	50	20
—	—	B978A19050	19,050	.7500	3/4	—	4,1	50	20
—	B977A19200	—	19,200	.7559	—	—	3,3	50	20
—	B977A19253	—	19,253	.7580	—	—	3,3	50	20
—	—	B978A19253	19,253	.7580	—	—	4,1	50	20
—	B977A19446	—	19,446	.7656	49/64	—	3,4	50	20
B976A19500	B977A19500	—	19,500	.7677	—	—	3,4	50	20
B976A19700	B977A19700	—	19,700	.7756	—	—	3,4	50	20
—	—	B978A19800	19,800	.7795	—	—	4,2	50	20
B976A19840	B977A19840	—	19,840	.7811	—	—	3,5	50	20
—	—	B978A19840	19,840	.7811	—	—	4,3	50	20
B976A20000	B977A20000	—	20,000	.7874	—	—	3,5	50	20
—	—	B978A20000	20,000	.7874	—	—	4,3	50	20

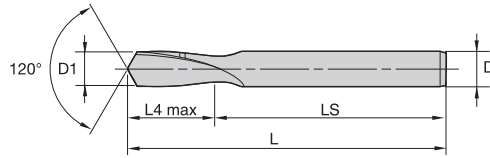
NOTE: The point angle on B978 Series is 132°.

Tolerance • Metric			Tolerance • Inch		
nominal size range	D1 tolerance m7	D tolerance h6	nominal size range	D1 tolerance m7	D tolerance h6
>3-6	0,004/0,016	0,000/-0,008	>3-6	0,004/0,016	0,000/-0,008
>6-10	0,006/0,021	0,000/-0,009	>6-10	0,006/0,021	0,000/-0,009
>10-18	0,007/0,025	0,000/-0,011	>10-18	0,007/0,025	0,000/-0,011
>18-25,4	0,008/0,029	0,000/-0,013	>18-25,4	0,008/0,029	0,000/-0,013

Kenna Universal™ Drills • B97_Series • Grade KC7315™ • Through Coolant for Drill Diameters 2–20mm

Solid Carbide Drills

		Cutting Speed – vc			Metric									
		Range – m/min			Recommended Feed Rate (f) by Diameter									
Material Group		min	Starting Value	max		2,0	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
P	1	70	100	140	mm/r	0,05 - 0,12	0,07 - 0,14	0,08 - 0,16	0,11 - 0,22	0,13 - 0,26	0,15 - 0,31	0,18 - 0,35	0,22 - 0,42	0,28 - 0,54
	2	90	120	140	mm/r	0,05 - 0,12	0,07 - 0,14	0,08 - 0,16	0,12 - 0,22	0,14 - 0,26	0,17 - 0,31	0,20 - 0,35	0,24 - 0,42	0,31 - 0,53
	3	60	80	100	mm/r	0,06 - 0,13	0,08 - 0,15	0,09 - 0,17	0,13 - 0,23	0,15 - 0,28	0,19 - 0,33	0,22 - 0,38	0,26 - 0,47	0,34 - 0,59
	4	50	80	100	mm/r	0,06 - 0,13	0,07 - 0,15	0,08 - 0,17	0,12 - 0,23	0,14 - 0,28	0,17 - 0,33	0,19 - 0,38	0,23 - 0,47	0,29 - 0,59
	6	40	50	70	mm/r	0,04 - 0,06	0,05 - 0,08	0,06 - 0,10	0,08 - 0,14	0,10 - 0,18	0,13 - 0,22	0,14 - 0,24	0,18 - 0,32	0,23 - 0,41
	1	50	20	40	mm/r	0,03 - 0,06	0,04 - 0,07	0,05 - 0,09	0,08 - 0,11	0,09 - 0,12	0,10 - 0,14	0,12 - 0,16	0,14 - 0,18	0,16 - 0,20
M	2	30	50	50	mm/r	0,03 - 0,07	0,04 - 0,08	0,06 - 0,10	0,08 - 0,12	0,09 - 0,14	0,10 - 0,16	0,12 - 0,18	0,14 - 0,20	0,16 - 0,22
	3	20	55	40	mm/r	0,03 - 0,06	0,04 - 0,07	0,05 - 0,09	0,08 - 0,11	0,09 - 0,12	0,10 - 0,14	0,12 - 0,16	0,14 - 0,18	0,16 - 0,20
K	1	80	120	170	mm/r	0,09 - 0,17	0,11 - 0,22	0,12 - 0,24	0,16 - 0,31	0,20 - 0,38	0,23 - 0,44	0,25 - 0,49	0,31 - 0,60	0,38 - 0,74
	2	80	110	140	mm/r	0,11 - 0,15	0,12 - 0,16	0,13 - 0,19	0,16 - 0,25	0,20 - 0,31	0,23 - 0,36	0,25 - 0,40	0,31 - 0,48	0,38 - 0,60
	3	80	100	130	mm/r	0,07 - 0,15	0,08 - 0,17	0,09 - 0,19	0,12 - 0,25	0,14 - 0,30	0,17 - 0,35	0,19 - 0,40	0,24 - 0,48	0,30 - 0,60
N	1	90	230	315	mm/r	0,06 - 0,13	0,08 - 0,14	0,10 - 0,16	0,12 - 0,20	0,16 - 0,24	0,20 - 0,28	0,24 - 0,32	0,28 - 0,40	0,32 - 0,48
	2	90	225	270	mm/r	0,06 - 0,12	0,08 - 0,16	0,10 - 0,20	0,12 - 0,24	0,16 - 0,28	0,20 - 0,32	0,24 - 0,36	0,28 - 0,44	0,32 - 0,52
	3	90	180	270	mm/r	0,11 - 0,14	0,12 - 0,14	0,13 - 0,16	0,14 - 0,20	0,16 - 0,24	0,20 - 0,28	0,24 - 0,32	0,28 - 0,40	0,32 - 0,44
	5	90	135	180	mm/r	0,06 - 0,12	0,08 - 0,16	0,01 - 0,20	0,12 - 0,24	0,16 - 0,28	0,20 - 0,32	0,24 - 0,36	0,28 - 0,40	0,32 - 0,48
S	1	10	25	30	mm/r	0,02 - 0,05	0,03 - 0,06	0,04 - 0,08	0,06 - 0,10	0,08 - 0,12	0,09 - 0,13	0,10 - 0,14	0,12 - 0,16	0,14 - 0,18
	2	10	20	25	mm/r	0,02 - 0,03	0,02 - 0,04	0,03 - 0,06	0,05 - 0,08	0,07 - 0,10	0,08 - 0,11	0,09 - 0,12	0,10 - 0,14	0,11 - 0,16
	3	10	25	30	mm/r	0,02 - 0,03	0,02 - 0,04	0,02 - 0,05	0,04 - 0,07	0,06 - 0,09	0,07 - 0,10	0,08 - 0,11	0,09 - 0,13	0,10 - 0,15
	4	10	25	40	mm/r	0,02 - 0,03	0,02 - 0,04	0,03 - 0,06	0,05 - 0,08	0,07 - 0,10	0,08 - 0,11	0,09 - 0,12	0,10 - 0,14	0,11 - 0,16
		Cutting Speed – vc			Inch									
		Range – SFM			Recommended Feed Rate (f) by Diameter									
Material Group		min	Starting Value	max		5/64 .078	1/8 .125	3/16 .188	1/4 .250	5/16 .313	3/8 .375	1/2 .500	5/8 .625	3/4 .750
P	1	230	330	460	IPR	.002 - .004	.003 - .005	.004 - .006	.005 - .008	.005 - .010	.006 - .012	.007 - .014	.008 - .017	.011 - .022
	2	300	390	460	IPR	.002 - .004	.003 - .005	.004 - .006	.005 - .008	.005 - .010	.006 - .012	.008 - .014	.010 - .017	.012 - .021
	3	200	260	330	IPR	.003 - .005	.004 - .006	.004 - .006	.005 - .009	.006 - .011	.007 - .013	.008 - .015	.010 - .018	.014 - .023
	4	160	260	330	IPR	.002 - .005	.003 - .006	.004 - .006	.005 - .009	.005 - .011	.006 - .013	.007 - .015	.009 - .018	.012 - .023
	6	130	160	230	IPR	.001 - .003	.002 - .004	.002 - .004	.004 - .005	.004 - .007	.005 - .008	.005 - .010	.007 - .013	.009 - .016
	1	160	70	130	IPR	.001 - .002	.002 - .003	.002 - .004	.003 - .004	.004 - .005	.004 - .006	.005 - .006	.006 - .007	.006 - .008
M	2	100	160	160	IPR	.001 - .002	.002 - .003	.002 - .004	.003 - .005	.004 - .006	.004 - .006	.005 - .007	.006 - .008	.006 - .009
	3	70	180	130	IPR	.001 - .002	.002 - .003	.002 - .004	.003 - .004	.004 - .005	.004 - .006	.005 - .006	.006 - .007	.006 - .008
	1	260	390	560	IPR	.003 - .007	.004 - .009	.005 - .009	.006 - .012	.008 - .015	.009 - .017	.010 - .019	.012 - .024	.015 - .029
K	2	260	360	460	IPR	.003 - .006	.004 - .007	.005 - .007	.006 - .010	.008 - .012	.009 - .014	.010 - .016	.012 - .019	.015 - .024
	3	260	330	430	IPR	.002 - .006	.003 - .007	.004 - .007	.005 - .010	.006 - .012	.006 - .014	.007 - .016	.009 - .019	.012 - .024
	1	300	750	1030	IPR	.002 - .005	.003 - .006	.004 - .006	.005 - .008	.006 - .009	.008 - .011	.009 - .013	.011 - .016	.013 - .019
N	2	300	740	890	IPR	.002 - .006	.003 - .006	.004 - .008	.005 - .009	.006 - .011	.008 - .013	.009 - .014	.011 - .017	.013 - .020
	3	300	590	890	IPR	.004 - .005	.005 - .006	.005 - .006	.006 - .008	.006 - .009	.008 - .011	.009 - .013	.011 - .016	.013 - .017
	5	300	440	590	IPR	.002 - .005	.003 - .006	.004 - .008	.005 - .009	.006 - .011	.008 - .013	.009 - .014	.011 - .016	.013 - .019
	1	30	80	100	IPR	.001 - .002	.001 - .002	.002 - .003	.002 - .004	.003 - .005	.004 - .005	.004 - .006	.005 - .006	.006 - .007
S	2	30	70	80	IPR	.001 - .002	.001 - .002	.001 - .002	.002 - .003	.003 - .004	.003 - .004	.004 - .005	.004 - .006	.004 - .006
	3	30	80	100	IPR	.001 - .002	.001 - .002	.001 - .002	.002 - .003	.002 - .004	.003 - .004	.003 - .004	.004 - .005	.004 - .006
	4	30	80	130	IPR	.001 - .002	.001 - .002	.001 - .002	.002 - .003	.003 - .004	.003 - .004	.004 - .005	.004 - .006	.004 - .006

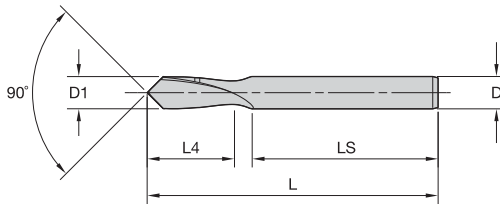


■ B501 • Z-Shank

P	●
M	
K	●
N	
S	
H	

- first choice
- alternate choice

B501 • K10	D1 diameter			wire size	L	L4 max	LS	D
	mm	in	fraction					
B501Z06000	6,000	.2362	—	—	54	9	33	6
B501Z10000	10,000	.3937	—	—	66	12	45	10
B501Z12000	12,000	.4724	—	—	73	14	52	12



■ B505

P	●
M	
K	●
N	
S	
H	

- first choice
- alternate choice

B505 • K10	D1 diameter			wire size	L	L4 max	LS	D
	mm	in	fraction					
B505Z06000	6,000	.2362	—	—	54	9	33	6
B505Z08000	8,000	.3150	—	—	58	11	37	8
B505Z10000	10,000	.3937	—	—	66	12	45	10
B505Z12000	12,000	.4724	—	—	73	14	52	12
B505Z16000	16,000	.6299	—	—	82	16	61	16
B505Z20000	20,000	.7874	—	—	92	18	71	20

Tolerance • Metric				Tolerance • Inch			
D1	tolerance h8	D	tolerance h6	D1	tolerance h8	D	tolerance h6
>3-6	0,000/-0,018	6	0,000/-0,008	>3-6	0,000/-0,018	6	0,000/-0,008
>6-10	0,000/-0,022	8-10	0,000/-0,009	>6-10	0,000/-0,022	8-10	0,000/-0,009
>10-18	0,000/-0,027	12-18	0,000/-0,011	>10-18	0,000/-0,027	12-18	0,000/-0,011
>18-21	0,000/-0,033	20	0,000/-0,013	>18-21	0,000/-0,033	20	0,000/-0,013









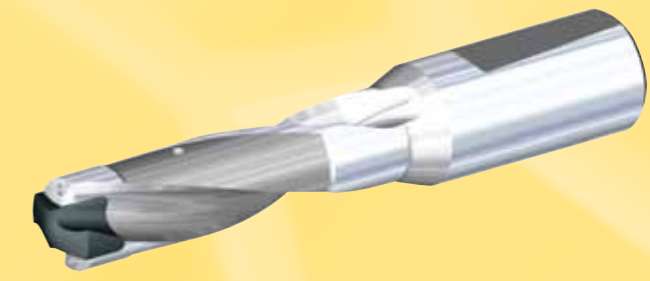
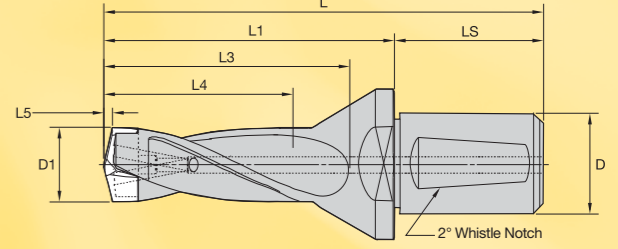
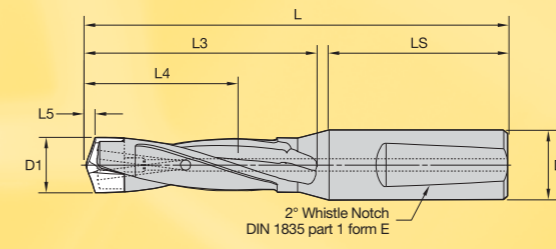
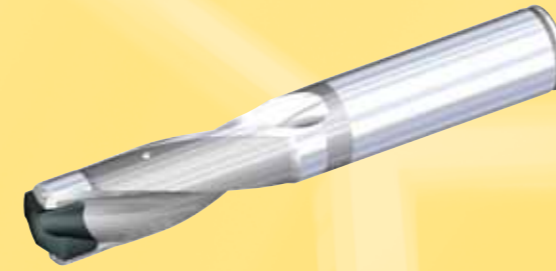
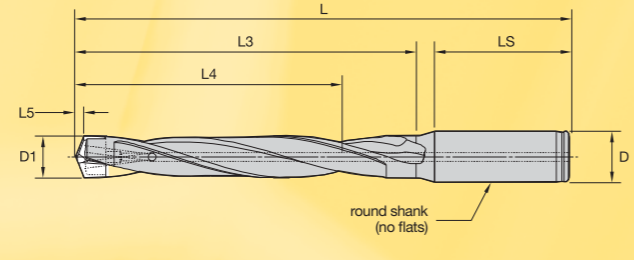
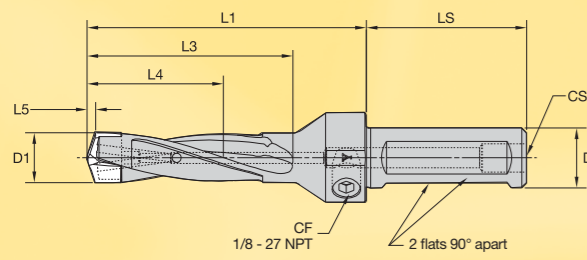


A large grid of graph paper with a light gray background and a fine grid of thin gray lines, intended for taking notes or drawing technical diagrams.



181835
K
0001

Modular Drills • Dimension Tables



■ Dimensions for KSEM™ Modular Drills • Inch



Flanged Shank • Inch

mm	D1 in	5 x D L1	L4 max	wrench	8 x D L1	L4 max	wrench
12,700	.5000	3.94	2.50	170.294	—	—	—
12,929	.5090	4.00	2.55	170.294	—	—	—
13,106	.5160	4.00	2.58	170.294	—	—	—
13,487	.5310	4.13	2.66	170.294	—	—	—
13,894	.5470	4.13	2.73	170.289	—	—	—
14,300	.5630	4.25	2.81	170.289	—	—	—
14,681	.5780	4.31	2.89	170.289	—	—	—
15,088	.5940	4.38	2.97	170.289	—	—	—
15,469	.6090	4.5	3.05	170.289	—	—	—
15,875	.6250	4.75	3.15	170.270	6.25	5.00	170.271
17,463	.6875	5.25	3.54	170.270	7.00	5.50	170.271
19,050	.7500	5.88	3.94	170.271	7.50	6.00	170.281
19,050	.7500	6.00	3.94	170.271	7.50	6.00	170.281
20,637	.8125	6.25	4.33	170.273	8.00	6.50	170.282
20,638	.8125	6.25	4.33	170.273	—	—	—
22,225	.8750	6.63	4.72	170.273	8.50	7.00	170.282
22,225	.8750	6.75	4.72	170.273	8.50	7.00	170.282
23,813	.9375	6.63	4.72	170.273	9.13	7.50	170.282
24,606	.9688	7.13	5.12	170.275	—	—	—
25,003	.9844	7.13	5.12	170.275	9.50	7.88	170.283
25,400	1.0000	7.25	5.12	170.275	9.63	8.00	170.283
25,400	1.0000	7.25	5.12	170.275	9.63	8.00	170.283
26,988	1.0625	7.63	5.51	170.275	10.25	8.50	170.283
28,575	1.1250	8.13	5.91	170.277	10.75	9.00	170.284
30,163	1.1875	8.50	6.30	170.277	11.38	9.50	170.284
31,750	1.2500	8.50	6.30	170.277	11.88	10.00	170.284
31,750	1.2500	8.75	6.30	170.277	11.88	10.00	170.284



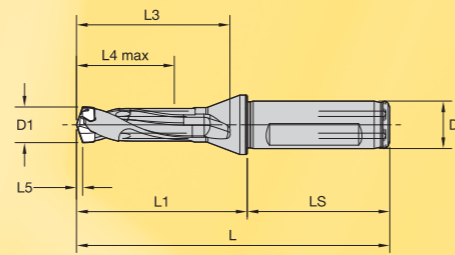
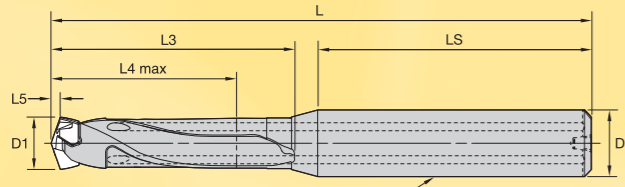
Round Shank • Inch

mm	D1 in	7 x D L	L4 max	wrench	10 x D L	L4 max	wrench
12.70	.5000	5.63	3.50	170.295	7.75	5.00	170.296
12.70	.5000	6.13	3.50	170.295	—	—	—
12.93	.5090	6.25	3.56	170.295	7.88	5.09	170.296
13.10	.5160	6.25	3.61	170.295	8.00	5.16	170.296
13.49	.5310	6.38	3.72	170.295	8.13	5.31	170.296
13.89	.5470	6.50	3.83	170.290	8.25	5.47	170.291
14.29	.5630	6.63	3.94	170.290	8.38	5.63	170.291
14.68	.5780	6.75	4.05	170.290	8.50	5.78	170.291
15.08	.5940	6.88	4.16	170.290	8.75	5.94	170.291
15.48	.6090	7.00	4.27	170.290	8.88	6.09	170.291
15.88	.6250	7.38	4.41	170.270	9.00	6.25	170.281
16.10	.6335	8.00	4.59	170.271	9.13	6.34	170.281
16.67	.6563	8.00	4.96	170.271	9.38	6.56	170.281
17.46	.6875	8.00	4.96	170.271	9.75	6.88	170.281
18.25	.7188	8.88	5.51	170.271	10.25	7.19	170.281
19.05	.7500	8.88	5.51	170.271	10.50	7.50	170.281
19.05	.7500	9.88	5.51	170.281	11.50	7.50	170.281
19.28	.7585	8.88	5.51	170.271	—	—	—
19.28	.7585	—	—	—	11.50	7.59	170.281
19.85	.7813	9.88	5.51	170.281	11.75	7.81	170.281
20.64	.8125	10.25	6.06	170.273	12.13	8.13	170.282
21.43	.8438	10.25	6.06	170.273	12.50	8.44	170.282
22.23	.8750	10.88	6.61	170.282	12.75	8.75	170.282
22.23	.8750	11.13	6.61	170.282	—	—	—
22.45	.8835	10.88	6.61	170.282	12.88	8.84	170.282
23.02	.9063	10.88	6.61	170.282	13.13	9.06	170.282
23.81	.9375	10.88	6.61	170.282	13.44	9.38	170.282
24.61	.9688	11.63	7.17	170.275	13.88	9.69	170.283
25.00	.9844	11.63	7.17	170.283	14.00	9.84	170.283
25.40	1.0000	11.63	7.17	170.283	14.13	10.00	170.283
25.40	1.0000	11.88	7.17	170.283	14.38	10.00	170.283
25.68	1.0105	12.25	7.08	170.283	14.50	10.11	170.283
26.20	1.0313	12.50	7.72	170.283	14.75	10.31	170.283
26.99	1.0625	12.50	7.72	170.283	15.13	10.63	170.283
27.78	1.0938	12.50	7.72	170.283	15.50	10.94	170.283
28.58	1.1250	13.13	8.27	170.284	15.75	11.25	170.284
29.37	1.1563	13.13	8.27	170.284	16.13	11.56	170.284
30.16	1.1875	13.75	8.82	170.284	16.50	11.88	170.284
30.96	1.2188	13.75	8.82	170.284	16.88	12.19	170.284
31.75	1.2500	13.75	8.82	170.284	17.13	12.50	170.284
31.75	1.2500	14.25	8.82	170.284	17.63	12.50	170.284

Round Shank • Inch

mm	D1 in	3 x D L	L4 max	wrench	5 x D L	L4 max	wrench
12,700	.5000	—	—	170.294	4.63	2.50	170.294
12,700	.5000	4.13	1.50	170.294	5.13	2.50	170.294
12,929	.5090	4.25	1.53	170.294	5.25	2.55	170.294
13,106	.5160	—	—	170.294	5.25	2.58	170.294
13,487	.5310	4.25	1.59	170.294	5.38	2.66	170.294
13,894	.5470	4.38	1.64	170.289	5.44	2.73	170.289
14,300	.5630	4.38	1.69	170.289	5.50	2.81	170.289
14,681	.5780	4.50	1.73	170.289	5.63	2.89	170.289
15,088	.5940	4.50	1.78	170.289	5.75	2.97	170.289
15,469	.6090	4.63	1.83	170.289	5.88	3.05	170.289
15,875	.6250	4.63	1.88	170.270	6.00	3.15	170.270
16,091	.6335	—	—	170.270	6.50	3.54	170.270
16,104	.6340	4.75	1.90	170.270	—	—	170.270
16,281	.6410	4.75	1.92	170.270	6.50	3.54	170.270
16,662	.6560	4.88	1.97	170.270	—	—	170.270
16,669	.6563	—	—	170.270	6.50	3.54	170.270
17,069	.6720	4.88	2.02	170.270	6.50	3.54	170.270
17,463	.6875	4.88	2.06	170.270	6.50	3.54	170.270
17,856	.7030	5.00	2.11	170.270	6.50	3.54	170.270
18,256	.7188	—	—	170.270	7.25	3.94	170.270
18,263	.7190	5.00	2.16	170.270	—	—	170.270
18,644	.7340	5.13	2.20	170.270	7.25	3.94	170.270
19,050	.7500	6.13	2.25	170.270	8.25	3.94	170.271
19,050	.7500	5.13	2.25	170.270	7.25	3.94	170.270
19,279	.7585	5.25	2.28	170.270	7.25	3.94	170.270
19,456	.7660	6.25	2.30	170.270	8.25	3.94	170.271
19,845	.7813	6.25	2.34	170.270	8.13	3.94	170.271
19,837	.7810	—	—	—	—	—	170.271
20,244	.7970	6.38	2.39	170.272	8.50	4.33	170.272
20,638	.8125	6.38	2.44	170.272	8.50	4.33	170.272
21,431	.8438	—	—	170.272	8.50	4.33	170.272
21,438	.8440	6.50	2.53	170.272	—	—	170.272
21,829	.8590	6.63	2.58	170.272	8.50	4.33	170.272
21,819	.8590	—	—	170.272	—	—	170.272
22,225	.8750	6.88	2.63	170.272	9.00	4.72	170.273
22,225	.8750	6.63	2.63	170.272	9.25	4.72	170.273
22,454	.8835	6.75	2.65	170.272	9.00	4.72	170.273
22,454	.8840	—	—	170.272	—	—	170.273
23,012	.9060	6.75	2.72	170.272	—	—	170.273
23,019	.9063	—	—	170.272	9.00	4.72	170.273
23,419	.9220	6.88	2.77	170.272	9.00	4.72	170.273
23,813	.9375	6.88	2.81	170.272	9.00	4.72	170.273
24,606	.9688	—	—	170.272	9.50	5.12	170.274
24,613	.9690	7.00	2.91	170.274	—	—	170.274
25,003	.9844	7.13	2.95	170.274	9.50	5.12	170.274
25,400	1.0000	7.13	3.00	170.274	9.75	5.12	170.274
25,400	1.0000	—	—	170.274	9.50	5.12	170.274
25,679	1.0105	—	—	170.274	10.00	5.06	170.274
25,679	1.0110	7.50	3.03	170.274	—	—	—
26,187	1.0310	7.50	3.09	170.274	—	—	—
26,195	1.0313	—	—	170.274	10.25	5.51	170.275
26,594	1.0470	—	—	170.274	10.25	5.51	170.275
26,988	1.0625	7.63	3.19	170.274	10.25	5.51	170.275
27,781	1.0938	—	—	170.274	10.25	5.51	170.275
28,169	1.1090	7.88	3.33	170.274	10.75	5.91	170.276
28,575	1.1250	7.88	3.38	170.276	10.75	5.91	170.276
29,362	1.1560	8.00	3.47	170.276	—	—	—
29,370	1.1563	—	—	170.276	10.75	5.91	170.276
29,769	1.1720	8.13	3.52	170.276	10.75	5.91	170.276
30,163	1.1875	8.13	3.56	170.276	11.25	6.30	170.277
30,556	1.2030	—	—	170.276	11.25	6.30	170.277
30,958	1.2188	—	—	170.276	11.25	6.30	170.277
30,963	1.2190	8.25	3.66	170.276	—	—	—
31,750	1.2500	8.38	3.75	170.276	11.75	6.30	170.277
31,750	1.2500	13.13	9.06	170.276	11.25	6.30	170.277
32,537	1.2810	9.00	3.84	170.276	12.50	6.41	170.277
32,941	1.2970	—	—	170.276	12.50	6.48	170.277
32,944</							

Modular Drills • Dimension Tables



■ Dimensions for KenTIP™ Modular Drills • Round Shank • Metric



D1 mm	D1 max	seat	L5	LS	round D	1,5 x D L	L4 max	3 x D L	L4 max	5 x D L	L4 max	8 x D L	L4 max	wrench
8,000	8,490	F	1,4	41	10	67	13	79	26	97	43	123	68	170,306
8,500	8,990	G	1,5	41	10	68	14	81	27	100	45	127	72	170,306
9,000	9,490	H	1,6	41	10	69	14	83	29	103	48	132	76	170,306
9,500	9,990	I	1,6	41	10	70	15	85	30	107	50	137	80	170,306
10,000	10,490	J	1,7	46	12	77	16	92	32	115	53	147	84	170,307
10,500	10,990	K	1,8	46	12	78	17	94	33	118	55	151	88	170,307
11,000	11,490	L	1,9	46	12	79	17	96	35	121	58	156	92	170,307
11,500	11,990	M	2,0	46	12	80	18	98	36	124	60	160	96	170,307
12,000	12,490	N	2,1	46	14	83	19	101	38	127	63	165	100	170,308
12,500	12,990	O	2,2	46	14	84	20	103	39	130	65	169	104	170,308
13,000	13,490	P	2,2	46	14	85	20	105	41	133	68	174	108	170,308
13,500	13,990	Q	2,3	46	14	86	21	107	42	137	70	179	112	170,308
14,000	14,490	R	2,4	49	16	91	22	112	44	143	73	187	116	170,309
14,500	14,990	S	2,5	49	16	92	23	114	45	146	75	191	120	170,309
15,000	15,990	T	2,6	49	16	94	24	118	48	152	80	200	128	170,309
16,000	16,990	U	2,8	49	18	97	26	122	51	158	85	209	136	170,309
17,000	17,990	V	2,9	49	18	100	27	127	54	165	90	219	144	170,314
18,000	18,990	W	3,1	51	20	105	29	133	57	173	95	230	152	170,314
19,000	19,990	X	3,3	51	20	107	30	137	60	179	100	239	160	170,314
20,000	20,990	Y	3,4	57	25	116	32	147	63	191	105	254	168	170,314
21,000	21,990	Z	3,6	56	25	118	33	151	66	198	110	264	176	170,314
22,000	22,990	ZA	3,8	56	25	122	35	156	69	204	115	273	184	170,314
23,000	23,990	ZB	4,0	56	25	124	36	160	72	210	120	282	192	170,314
24,000	24,990	ZC	4,1	56	25	127	38	164	75	216	125	291	200	170,314
25,000	25,990	ZD	4,3	60	32	133	39	172	78	227	130	305	208	170,314
26,000	26,990	ZE	4,5	60	32	138	41	178	81	232	135	315	216	170,314
27,000	27,990	ZE	4,7	61	32	139	42	181	84	239	140	323	224	170,314

■ Dimensions for KenTIP Modular Drills • Flanged Shank • Metric



D1 mm	D1 max	seat	L5	LS	flanged D	1,5 x D L	L4 max	3 x D L	L4 max	5 x D L	L4 max	8 x D L	L4 max	wrench
8,000	8,490	F	1,4	41	12	73	13	79	26	104	43	129	68	170,306
8,500	8,990	G	1,5	41	12	74	14	81	27	107	45	134	72	170,306
9,000	9,490	H	1,6	41	12	76	14	83	29	110	48	138	76	170,306
9,500	9,990	I	1,6	41	12	77	15	85	30	114	50	144	80	170,306
10,000	10,490	J	1,7	46	16	81	16	92	32	120	53	151	84	170,307
10,500	10,990	K	1,8	46	16	82	17	94	33	123	55	156	88	170,307
11,000	11,490	L	1,9	46	16	84	17	96	35	126	58	160	92	170,307
11,500	11,990	M	2,0	46	16	85	18	98	36	129	60	165	96	170,307
12,000	12,490	N	2,1	46	16	87	19	101	38	132	63	169	100	170,308
12,500	12,990	O	2,2	46	16	88	20	103	39	135	65	174	104	170,308
13,000	13,490	P	2,2	46	16	90	20	105	41	138	68	178	108	170,308
13,500	13,990	Q	2,3	46	16	91	21	107	42	142	70	184	112	170,308
14,000	14,490	R	2,4	49	16	92	22	112	44	145	73	188	116	170,309
14,500	14,990	S	2,5	49	16	93	23	114	45	148	75	193	120	170,309
15,000	15,990	T	2,6	49	20	98	24	118	48	156	80	204	128	170,309
16,000	16,990	U	2,8	49	20	100	26	122	51	162	85	213	136	170,309
17,000	17,990	V	2,9	49	20	104	27	127	54	169	90	223	144	170,314
18,000	18,990	W	3,1	51	25	112	29	133	57	181	95	238	152	170,314
19,000	19,990	X	3,3	51	25	115	30	137	60	187	100	247	160	170,314
20,000	20,990	Y	3,4	57	25	117	32	147	63	193	105	256	168	170,314
21,000	21,990	Z	3,6	56	25	120	33	151	66	200	110	266	176	170,314
22,000	22,990	ZA	3,8	56	25	123	35	156	69	206	115	275	184	170,314
23,000	23,990	ZB	4,0	56	25	126	36	160	72	212	120	284	192	170,314
24,000	24,990	ZC	4,1	56	25	128	38	164	75	218	125	293	200	170,314
25,000	25,990	ZD	4,3	60	25	131	39	172	78	225	130	303	208	170,314
26,000	26,990	ZE	4,5	60	25	135	41	178	81	230	135	313	216	170,314
27,000	27,990	ZE	4,7	61	25	137	42	181	84	237	140	321	224	170,314

■ Dimensions for KenTIP Modular Drills • Round Shank • Inch



D1 in	D1 max	seat	L5	LS	round D	3 x D L	L4 max	5 x D L	L4 max	8 x D L	L4 max	wrench
.3125	.3343	F	.054	1.59	.3750	3.13	1.00	3.88	1.67	4.88	2.68	170,306
.3346	.3539	G	.058	1.59	.3750	3.25	1.06	4.00	1.77	5.13	2.83	170,306
.3543	.3736	H	.062	1.59	.3750	3.38	1.12	4.13	1.87	5.25	2.99	170,306
.3740	.3933	I	.065	1.59	.3750	3.38	1.18	4.38	1.97	5.38	3.15	170,306
.3740	.3933	I	.065	1.67	.4375	3.38	1.18	4.25	1.97	5.38	3.15	170,306
.3937	.4130	J	.068	1.67	.4375	3.63	1.24	4.63	2.07	5.75	3.31	170,307
.4134	.4327	K	.073	1.67	.4375	3.75	1.30	4.75	2.16	6.00	3.46	170,307
.4331	.4524	L	.075	1.67	.4375	3.88	1.36	4.88	2.26	6.25	3.62	170,307
.4528	.4720	M	.078	1.79	.5000	3.88	1.42	5.00	2.36	6.50	3.78	170,307
.4724	.4917	N	.084	1.79	.5000	4.00	1.48	5.00	2.46	6.75	3.94	170,308
.4921	.5114	O	.086	1.79	.5000	4.13	1.54	5.13	2.56	7.00	4.09	170,308
.4921	.5114	O	.086	1.79	.5625	4.13	1.54	5.13	2.56	7.00	4.09	170,308
.5118	.5311	P	.089	1.79	.5625	4.25	1.60	5.25	2.66	7.13	4.25	170,308
.5315	.5508	Q	.094	1.79	.5625	4.25	1.65	5.50	2.75	7.25	4.41	170,308
.5512	.5705	R	.097	1.79	.5625	4.50	1.71	5.75	2.85	7.38	4.57	170,309
.5709	.5902	S	.100	1.91	.6250	4.50	1.77	5.75	2.95	7.50	4.72	170,309
.5906	.6295	T	.102	1.91	.6250	4.75	1.89	6.00	3.15	7.75	5.04	170,309
.6299	.6689	U	.109	1.91	.6875	4.88	2.01	6.25	3.34	8.00	5.36	170,309
.6693	.7083	V	.120	1.91	.6875	5.00	2.12	6.50	3.54	8.75	5.67	170,314
.7087	.7476	W	.120	2.00	.7500	5.25	2.24	6.88	3.74	9.25	5.98	170,314
.7480	.7870	X	.130	2.00	.7500	5.50	2.36	7.13	3.94	9.63	6.30	170,314
.7874	.8264	Y	.140	2.00	.8125	5.75	2.48	7.50	4.13	10.00	6.61	170,314
.8270	.8660	Z	.143	2.07	.8750	5.88	2.60	7.63	4.33	10.25	6.93	170,314
.8660	.9055	ZA	.149	2.07	.8750	6.00	2.72	7.88	4.53	10.63	7.24	170,314
.9060	.9450	ZB	.156	2.15	.9375	6.25	2.83	8.25	4.72	11.13	7.56	170,314
.9450	.9840	ZC	.163	3.00	1.0000	7.25	2.95	9.38	4.92	12.25	7.87	170,314
.9840	1.0236	ZD	.170	3.00	1.0000	7.38	3.07	9.63	5.12	12.63	8.19	170,314
1.0236	1.1020	ZE	.177	3.25	1.2500	7.86	3.19	9.99	5.32	13.25	8.50	170,314
1.0630	1.1020	ZE	.185	3.25	1.2500	7.98	3.31	10.18	5.51	13.57	8.82	170,314

Modular Drills

Tool Selection Guide .....	.H2-H3
KenTip .....	.H4-H15
KSEM .....	.H16-H44
KSEM PLUS .....	.H46-H59



modular drills with internal coolant channel		standard*						standard range					
		grade/series	● first choice ○ alternate choice						diameter range				
			P	M	K	N	S	H	hole tolerance	D1 mm min-max	D1 inch min-max	drilling depth L/D1	
KenTIP™ with front clamping mechanism													
	KenTIP inserts	KCP15 HP	●		○			IT9-IT11	7,94-27,99	.3125-1.1020			
		KC7410 HPC			●				7,94-27,99	.3125-1.1020			
		KC7410 HPCCL			●				7,94-26,19	.3125-1.0310			
		KC7320 HPL		●					7,94-27,99	.3125-1.1020			
	chamfering inserts	KC7014 FAS-GD	○	○	○	●	○		12,50-36,01	.4921-1.4177			
		KC7215 FAS GD	●	○	●	○	●						
	KenTIP bodies								7,94≤Ø<9,50	.3125≤Ø<.3740	max 1.5-8 x D		
									9,50≤Ø<11,00	.3740≤Ø<.4331			
										11,00≤Ø<12,50		.4331≤Ø<.4921	
										12,50≤Ø<14,00		.4921≤Ø<.5512	
										14,00≤Ø<15,50		.5512≤Ø<.6102	
										15,50≤Ø<16,50		.6102≤Ø<.6496	
										16,50≤Ø<20,50		.6496≤Ø<.8071	
										20,50≤Ø<21,00		.8071≤Ø<.8268	
								21,00≤Ø<27,99	.8268≤Ø<1.1020				
KSEM™ for extended length and drilling diameters													
	KSEM inserts	KC7235 HP	●		○			IT9-IT11	12,50-40,00	.4921-1.5748			
		KC7315 HP/HPG	●		○				12,50-40,00	.4921-1.5748			
		KC7410 HPL			●				12,50-40,00	.4921-1.5748			
		KC7410 HPCCL			●				12,50-32,00	.4921-1.2598			
		KC7320 HPL		●					12,50-40,00	.4921-1.5748			
		KC7135 PC	●	●					12,50-40,00	.4921-1.5748			
	chamfering inserts	KC7015 TPGX-GD		●		○			12,50-40,00	.4921-1.5748			
		KC7140 TPGX-GD	●	○	○	●	○						
		KC7315 TPGX-GD	○	○	●	○	●						
	KSEM bodies	WN							12,50≤Ø<16,50	.4921≤Ø<.6496	1-10 x D		
									16,50≤Ø<20,00	.6496≤Ø<.7874			
									20,00≤Ø≤32,00	.7874≤Ø≤1.2598			
		WD								32,00<Ø≤40,00	1.2598<Ø≤1.5748	1-5 x D	
		WN chamfer								12,50≤Ø<16,50	.4921≤Ø<.6496	1 x D	
										16,50≤Ø<20,00	.6496≤Ø<.7874		
										20,00≤Ø≤32,00	.7874<Ø≤1.2598		
WD chamfer								32,00<Ø≤40,00	1.2598<Ø<1.5748	1 x D			
KSEM PLUS™ for largest drilling depths and diameters													
	heads	A1 (regular)						IT9-IT11	28,00-70,00	1.1020-2.7559			
		B1 (guided)						IT9-IT11	B1 head available in 2012				
	KSEM PLUS inserts	KC7315 HPG	●	●	○	○	○		14,00 - 34,00				
		KC7410 HPC			●				<i>PDD reference only</i>				
	DFR™ inserts	KC7315 DFR-GD	●	○	○	○	●		(28,00-31,00)	(1.1020-1.2210)			
		KC7140 DFR-LD	●	●	○	○	○						
		KC7225 DFR-MD	○	○	●	●	○						
	DFT™ inserts	KC7315 DFT-HP	●	●	○	○	○		(31,75-70,00)	(1.2500-2.7560)			
		KC7140 DFT-MD	●	●	○	○	○						
	DFC inserts for B1 heads only	KCU40 DFC- HP	●	○	○	●	●		(28,00-70,00)	(1.1020-2.7560)			
		KCU25 DFC- HP	○	○	●	○	○						
		KC7140 DFC-MD	●	●	○	○	○						
	guiding pads for B1 heads only	KCU 40 DPT	●	●	●	●	●		B1 head available in 2012				
	KSEM PLUS bodies	WD						IT9-IT11	31,75≤Ø<40,00	1.2500≤Ø<2.7560	3-10 x D		
									40,00≤Ø≤70,00	1.5748≤Ø≤2.5590			
		SSF							IT9-IT11	31,75≤Ø<40,00	1.2500-1.5748	3-10 x D	
										40,00≤Ø≤70,00	1.5748-2.5590		

* Apart from our standard drills, we can offer you a wide variety of special coating solutions and edge preparations to fulfill all your needs. If a specific drill is not suitable for your workpiece material, please contact our **Engineered Solutions Department**.

■ Standard Product
□ Engineered Solutions

engineered solution range			coolant	drilling	inclined exit	stacked plates	flat bottom	counter-sinking	counter-boring	cross hole	2 flute 2 margin cooled	2 flute 4 margin cooled	corner chamfer	plain shank $\leq H_6$	Whistle Notch 2°	WD shank	flat shank	SSF shank	KM [®] shank	HSX shank	page(s)
diameter range		max drilling depth																			
D1 metric min-max	D1 inch min-max																				
7,94-27,99	.3125-1.1020	-	■	■	□	■	□				■	□	□								H6
12,50-36,01	.4921-1.4177	-						■													H14
7,94 ≤ Ø < 9,50	.3125 ≤ Ø < .3740	12 x D	■	■	■	■	□	**	□					■	□	□	■	□	□	□	H12
9,50 ≤ Ø < 11,00	.3740 ≤ Ø < .4331	13 x D	■	■	■	■	□	**	□					■	□	□	■	□	□	□	
11,00 ≤ Ø < 12,50	.5424 ≤ Ø < .4921	14 x D	■	■	■	■	□	**	□					■	□	□	■	□	□	□	
12,50 ≤ Ø < 14,00	.4921 ≤ Ø < .5512	15 x D	■	■	■	■	□	**	□					■	□	□	■	□	□	□	
14,00 ≤ Ø < 15,00	.5512 ≤ Ø < .6102	16 x D	■	■	■	■	□	**	□					■	□	□	■	□	□	□	
15,50 ≤ Ø < 16,50	.6102 ≤ Ø < .6496	17 x D	■	■	■	■	□	**	□					■	□	□	■	□	□	□	
16,50 ≤ Ø < 20,50	.6496 ≤ Ø < .8070	18 x D	■	■	■	■	□	**	□					■	□	□	■	□	□	□	
20,50 ≤ Ø < 21,00	.8070 ≤ Ø < .8267	20 x D	■	■	■	■	□	**	□					■	□	□	■	□	□	□	
21,00 ≤ Ø < 27,99	.8267 ≤ Ø < 1.1010	500,0mm	■	■	■	■	□	**	□					■	□	□	■	□	□	□	
12,50-40,00	.4921-1.5748	-		■	■	■	□				■/□	■/□	□								H17
		-		■	■	■	□				■/□	■/□	□								
		-		■	■	■	□				■/□	■/□	■								
		-		■	■	■	□				■	□	□								
		-		■	■	■	□				■/□	■/□	□								
12,50-40,00	.4921-1.5748	-						■													H36
		-						■													
		-						■													
12,50 ≤ Ø < 16,50	.4921 ≤ Ø < .6496	15 x D	■	■	■	■	□	□	□					□	■	□	□	□	□	□	H25
16,50 ≤ Ø < 20,00	.6496 ≤ Ø < .7874	18 x D	■	■	■	■	□	□	□					□	■	□	□	□	□	□	
20,00 ≤ Ø ≤ 32,00	.7874 ≤ Ø ≤ 1.2598	20 x D	■	■	■	■	□	□	□					□	■	□	□	□	□	□	
32,00 ≤ Ø ≤ 40,00	1.2598 ≤ Ø ≤ 1.5748	20 x D (max 750mm)	■	■	■	■	□	□	□					□	□	■	□	□	□	□	
12,50 ≤ Ø < 16,50	.4921 ≤ Ø < .6496	1 x D	■	■	■	■	□	■	□					□	■	□	□	□	□	□	H25
16,50 ≤ Ø < 20,00	.6496 ≤ Ø < .7874		■	■	■	■	□	■	□					□	■	□	□	□	□	□	
20,00 ≤ Ø ≤ 32,00	.7874 ≤ Ø ≤ 1.2598		■	■	■	■	□	■	□					□	■	□	□	□	□	□	
32,00 ≤ Ø ≤ 40,00	1.2598 ≤ Ø ≤ 1.5748		■	■	■	■	□	■	□					□	□	■	□	□	□	□	
28,00-70,00	1.1020-2.7560	-	■	■	■	■	□			■											H50
B1 head available in 2012		-	■	■	■	■	□			■											
14,00-34,00	PDD reference only	-		■	■	■	□				■/□	■/□	□								H52
		-		■	■	■	□				■/□	■/□	□								
28,00 ≤ Ø ≤ 31,75	1.1020 ≤ Ø ≤ 1.2500	-		■	■	■	□				■/□	■/□	□								H53
		-		■	■	■	□				■/□	■/□	□								
31,75 ≤ Ø ≤ 70,00	1.2500 ≤ Ø ≤ 2.7560	-		■	■	■	□				■/□	■/□	□								-
		-		■	■	■	□				■/□	■/□	□								
28,00 ≤ Ø ≤ 70,00	1.1020 ≤ Ø ≤ 2.7560	-		■	■	■	□			■	■/□	■/□	□								H48
70,00 ≤ Ø ≤ 127,00	2.7560 ≤ Ø ≤ 5.0000	-		■	■	■	□			■	■/□	■/□	□								
diameters >70mm available in 2012		-		■	■	■	□			■	■/□	■/□	□								
31,75 ≤ Ø < 40,00	1.2500 ≤ Ø < 2.7560	3-20x (max 750mm)	■	■	■	■	□	□	□								■	□	□	□	H48
40,00 ≤ Ø ≤ 70,00	1.5748 ≤ Ø ≤ 2.5590	3-8 x D	■	■	■	■	□	□	□								■	□	□	□	
70,00 ≤ Ø ≤ 127,00	2.7559 ≤ Ø ≤ 5.0000	3-8 x D	■	■	■	■	□	□	□											□	
diameters >70mm available in 2012		3-20x (max 750mm)	■	■	■	■	□	□	□								□	■	□	□	
31,75 ≤ Ø < 40,00	1.2500 ≤ Ø < 2.7560	3-8 x D	■	■	■	■	□	□	□											□	H48
40,00 ≤ Ø ≤ 70,00	1.5748 ≤ Ø ≤ 2.5590	3-8 x D	■	■	■	■	□	□	□											□	
70,00 ≤ Ø ≤ 127,00	2.7559 ≤ Ø ≤ 5.0000	3-8 x D	■	■	■	■	□	□	□											□	
diameters >70mm available in 2012		3-8 x D	■	■	■	■	□	□	□												□

** Alternative chamfering solutions are available in combination with SEFAS™ or BF; see page I1.
Please use this table for orientation purposes only. Detailed information on available products (inserts, toolholders, etc.) can be found on the indicated pages of this catalog.



KenTIP™ Modular Drill System

Primary Application

The KenTIP Modular Drill System offers performance levels commonly achieved with solid carbide drills. The patented locking system enables inserts to be changed inside the machine tool. Use KenTIP in steel, cast iron, ductile iron, and stainless steel applications.

KenTIP Modular Drills are available up to diameter 1.1020" (27,99mm). With the new diameter extensions of KSEM PLUS™ down to 28mm, we offer modular drilling solutions with a front clamping mechanism from diameter 8–70mm. The user can change the drilling inserts in the machine without taking the body off, saving setup time and manufacturing costs.

Introducing the all new KenTIP inserts made of KCP15™ grade especially developed to provide longer tool life for steel applications.

Features and Benefits

Improved Interface

- Stronger pocket seats on all inserts and bodies.
- Longer tip and body life in unstable conditions, especially side loads.
- All new tips and bodies are interchangeable with previous versions.

HP Drill-Point Design

- Low thrust prevents workpiece flexing.
- Excellent centering capabilities.
- **NEW** HPC(M) for cast iron applications.
- **NEW** HPL(M) for stainless steel applications.

Easy Insert Change

- Locking method requires no screws or clamps.
- Insert blades can be changed with a simple provided tool and does not require drill body removal from the machine or holder.

Disposable

- No reconditioning costs.
- Consistent performance.
- Eliminates number of tools waiting for reconditioning, providing significant cost savings.

Tailored Grades and Geometries

- KCP15 grade has a new PVD coating enabling longer tool life in all steel applications.
- KC7320™ grade AlTiN-based PVD coating for the demands of drilling stainless steels.
- KC7410™ grade contains multiple layers of PVD coating offering outstanding wear resistance for the drilling of cast irons. The geometry prevents breakout when drilling through holes.
 - KTIP_HPC inserts are designed for gray cast and low-strength ductile irons (K1).
 - KTIP_HPCL_ inserts are ideal for low- and medium-strength CGI and ductile irons and high-strength ductile and austempered ductile Iron (K2, K3).



Drill Body Portfolio

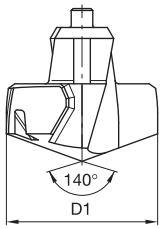
- Standard 3, 5, and 8 x D tool bodies with round and flanged shank available, inch and metric.
- **NEW!** Standard 1.5 x D bodies available, especially for piloting operations.
- For the latest product list, please refer to the e-catalog at www.kennametal.com.

Customization

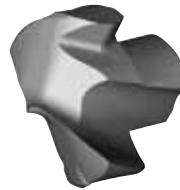
- Intermediate diameters available as semi-standards.
- Close tolerance tips available for precision holes.
- Chamfering insert pockets available.
- Multiple steps possible.



Modular Drills



HP

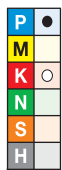


HPC/HPCCL



HPL

KTIP Inserts

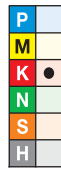


- first choice
- alternate choice

				D1		seat size
				mm	in	
KCP15		KC7410		KC7410		KC7320
KTIP0794HPM	KTIP0794HPCM	KTIP0794HPCCLM	KTIP0794HPLM	7,938	.3125	F
KTIP0800HPM	KTIP0800HPCM	KTIP0800HPCCLM	KTIP0800HPLM	8,000	.3150	F
KTIP0810HPM	KTIP0810HPCM	KTIP0810HPCCLM	KTIP0810HPLM	8,100	.3189	F
KTIP0816HPM	—	—	KTIP0816HPLM	8,164	.3214	F
KTIP0820HPM	KTIP0820HPCM	KTIP0820HPCCLM	KTIP0820HPLM	8,204	.3230	F
KTIP0830HPM	KTIP0830HPCM	KTIP0830HPCCLM	KTIP0830HPLM	8,300	.3268	F
KTIP0833HPM	KTIP0833HPCM	KTIP0833HPCCLM	KTIP0833HPLM	8,334	.3281	F
KTIP0840HPM	KTIP0840HPCM	KTIP0840HPCCLM	KTIP0840HPLM	8,400	.3307	F
KTIP0843HPM	—	—	—	8,433	.3320	F
KTIP0850HPM	KTIP0850HPCM	KTIP0850HPCCLM	KTIP0850HPLM	8,500	.3346	G
KTIP0860HPM	KTIP0860HPCM	KTIP0860HPCCLM	KTIP0860HPLM	8,600	.3386	G
KTIP0861HPM	—	—	—	8,611	.3390	G
KTIP0870HPM	KTIP0870HPCM	KTIP0870HPCCLM	KTIP0870HPLM	8,700	.3425	G
KTIP0873HPM	KTIP0873HPCM	KTIP0873HPCCLM	—	8,733	.3438	G
KTIP0880HPM	KTIP0880HPCM	KTIP0880HPCCLM	KTIP0880HPLM	8,800	.3465	G
KTIP0884HPM	—	—	—	8,839	.3480	G
KTIP0890HPM	KTIP0890HPCM	KTIP0890HPCCLM	KTIP0890HPLM	8,900	.3504	G
KTIP0900HPM	KTIP0900HPCM	KTIP0900HPCCLM	KTIP0900HPLM	9,000	.3543	H
KTIP0909HPM	—	—	—	9,093	.3580	H
KTIP0910HPM	KTIP0910HPCM	—	KTIP0910HPLM	9,100	.3583	H
KTIP0913HPM	KTIP0913HPCM	KTIP0913HPCCLM	—	9,129	.3594	H
KTIP0920HPM	KTIP0920HPCM	KTIP0920HPCCLM	KTIP0920HPLM	9,200	.3622	H
KTIP0930HPM	KTIP0930HPCM	KTIP0930HPCCLM	KTIP0930HPLM	9,300	.3661	H
KTIP0935HPM	—	—	—	9,347	.3680	H
KTIP0940HPM	KTIP0940HPCM	KTIP0940HPCCLM	KTIP0940HPLM	9,400	.3701	H
KTIP0950HPM	KTIP0950HPCM	KTIP0950HPCCLM	KTIP0950HPLM	9,500	.3740	I
KTIP0953HPM	KTIP0953HPCM	KTIP0953HPCCLM	—	9,525	.3750	I
KTIP0956HPM	KTIP0956HPCM	KTIP0956HPCCLM	KTIP0956HPLM	9,558	.3763	I
KTIP0958HPM	—	—	KTIP0958HPLM	9,576	.3770	I
KTIP0960HPM	KTIP0960HPCM	KTIP0960HPCCLM	KTIP0960HPLM	9,600	.3780	I
KTIP0970HPM	KTIP0970HPCM	KTIP0970HPCCLM	KTIP0970HPLM	9,703	.3820	I
KTIP0980HPM	KTIP0980HPCM	KTIP0980HPCCLM	KTIP0980HPLM	9,804	.3860	I
KTIP0990HPM	KTIP0990HPCM	KTIP0990HPCCLM	KTIP0990HPLM	9,900	.3898	I
KTIP0992HPM	KTIP0992HPCM	KTIP0992HPCCLM	—	9,921	.3906	I
KTIP1000HPM	KTIP1000HPCM	KTIP1000HPCCLM	KTIP1000HPLM	10,000	.3937	J
KTIP1002HPM	KTIP1002HPCM	—	KTIP1002HPLM	10,023	.3946	J
KTIP1008HPM	—	—	—	10,084	.3970	J
KTIP1010HPM	KTIP1010HPCM	KTIP1010HPCCLM	KTIP1010HPLM	10,100	.3976	J
KTIP1020HPM	KTIP1020HPCM	KTIP1020HPCCLM	KTIP1020HPLM	10,200	.4016	J
KTIP1026HPM	KTIP1026HPCM	KTIP1026HPCCLM	—	10,262	.4040	J

(continued)

(KTIP Inserts continued)

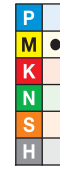


KCP15	KC7410	KC7410	KC7320	D1		seat size
				mm	in	
KTIP1030HPM KTIP1032HPM	KTIP1030HPCM KTIP1032HPCM	KTIP1030HPCCLM KTIP1032HPCCLM	KTIP1030HPLM KTIP1032HPLM	10,300 10,320	.4055 .4063	J J
KTIP1040HPM KTIP1049HPM	KTIP1040HPCM KTIP1049HPCM	— KTIP1049HPCCLM	KTIP1040HPLM —	10,400 10,490	.4094 .4130	J J
KTIP1050HPM KTIP1060HPM	KTIP1050HPCM KTIP1060HPCM	KTIP1050HPCCLM —	KTIP1050HPLM KTIP1060HPLM	10,500 10,600	.4134 .4173	K K
KTIP1070HPM KTIP1072HPM	KTIP1070HPCM KTIP1072HPCM	KTIP1070HPCCLM KTIP1072HPCCLM	KTIP1070HPLM —	10,700 10,716	.4213 .4219	K K
KTIP1080HPM KTIP1090HPM	KTIP1080HPCM KTIP1090HPCM	KTIP1080HPCCLM KTIP1090HPCCLM	KTIP1080HPLM KTIP1090HPLM	10,800 10,900	.4252 .4291	K K
KTIP1100HPM KTIP1110HPM	KTIP1100HPCM KTIP1110HPCM	KTIP1100HPCCLM —	KTIP1100HPLM KTIP1110HPLM	11,000 11,100	.4331 .4370	L L
KTIP1111HPM KTIP1120HPM	KTIP1111HPCM KTIP1120HPCM	— KTIP1120HPCCLM	KTIP1111HPLM KTIP1120HPLM	11,113 11,200	.4375 .4409	L L
KTIP1130HPM KTIP1140HPM	KTIP1130HPCM KTIP1140HPCM	KTIP1130HPCCLM KTIP1140HPCCLM	— KTIP1140HPLM	11,300 11,400	.4449 .4488	L L
KTIP1150HPM KTIP1151HPM	KTIP1150HPCM KTIP1151HPCM	KTIP1150HPCCLM KTIP1151HPCCLM	KTIP1150HPLM —	11,500 11,509	.4528 .4531	M M
KTIP1160HPM KTIP1161HPM	KTIP1160HPCM —	KTIP1160HPCCLM —	KTIP1160HPLM KTIP1161HPLM	11,600 11,610	.4567 .4571	M M
KTIP1170HPM KTIP1180HPM	KTIP1170HPCM KTIP1180HPCM	KTIP1170HPCCLM KTIP1180HPCCLM	— KTIP1180HPLM	11,700 11,800	.4606 .4646	M M
KTIP1190HPM KTIP1191HPM	KTIP1190HPCM KTIP1191HPCM	KTIP1190HPCCLM KTIP1191HPCCLM	KTIP1190HPLM KTIP1191HPLM	11,900 11,908	.4685 .4688	M M
KTIP1200HPM KTIP1210HPM	KTIP1200HPCM KTIP1210HPCM	KTIP1200HPCCLM KTIP1210HPCCLM	KTIP1200HPLM KTIP1210HPLM	12,000 12,100	.4724 .4764	N N
KTIP1220HPM KTIP1230HPM	KTIP1220HPCM KTIP1230HPCM	KTIP1220HPCCLM —	KTIP1220HPLM KTIP1230HPLM	12,200 12,304	.4803 .4844	N N
KTIP1240HPM KTIP1247HPM	KTIP1240HPCM —	KTIP1240HPCCLM —	— —	12,400 12,474	.4882 .4911	N N
KTIP1250HPM KTIP1260HPM	KTIP1250HPCM KTIP1260HPCM	KTIP1250HPCCLM KTIP1260HPCCLM	KTIP1250HPLM —	12,500 12,600	.4921 .4961	O O
KTIP1270HPM KTIP1280HPM	KTIP1270HPCM KTIP1280HPCM	KTIP1270HPCCLM KTIP1280HPCCLM	KTIP1270HPLM KTIP1280HPLM	12,700 12,800	.5000 .5039	O O
KTIP1290HPM KTIP1300HPM	KTIP1290HPCM KTIP1300HPCM	KTIP1290HPCCLM KTIP1300HPCCLM	KTIP1290HPLM KTIP1300HPLM	12,903 13,000	.5080 .5118	O P
KTIP1310HPM KTIP1320HPM	KTIP1310HPCM KTIP1320HPCM	KTIP1310HPCCLM KTIP1320HPCCLM	KTIP1310HPLM KTIP1320HPLM	13,096 13,200	.5156 .5197	P P
KTIP1330HPM KTIP1340HPM	KTIP1330HPCM KTIP1340HPCM	KTIP1330HPCCLM KTIP1340HPCCLM	— —	13,300 13,400	.5236 .5276	P P
KTIP1349HPM KTIP1350HPM	KTIP1349HPCM KTIP1350HPCM	KTIP1349HPCCLM KTIP1350HPCCLM	KTIP1349HPLM KTIP1350HPLM	13,494 13,500	.5313 .5315	P Q
KTIP1360HPM KTIP1370HPM	KTIP1360HPCM KTIP1370HPCM	KTIP1360HPCCLM KTIP1370HPCCLM	— —	13,600 13,700	.5354 .5394	Q Q
KTIP1380HPM KTIP1389HPM	KTIP1380HPCM KTIP1389HPCM	KTIP1380HPCCLM KTIP1389HPCCLM	KTIP1380HPLM KTIP1389HPLM	13,800 13,891	.5433 .5469	Q Q
KTIP1390HPM KTIP1400HPM	— KTIP1400HPCM	— KTIP1400HPCCLM	KTIP1390HPLM KTIP1400HPLM	13,896 14,000	.5471 .5512	Q R
KTIP1410HPM KTIP1420HPM	KTIP1410HPCM KTIP1420HPCM	KTIP1410HPCCLM KTIP1420HPCCLM	KTIP1410HPLM KTIP1420HPLM	14,100 14,200	.5551 .5591	R R
KTIP1429HPM KTIP1430HPM	KTIP1429HPCM KTIP1430HPCM	KTIP1429HPCCLM KTIP1430HPCCLM	KTIP1429HPLM KTIP1430HPLM	14,288 14,300	.5625 .5630	R R

(continued)

(KTIP Inserts continued)

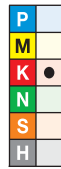
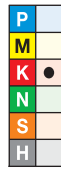
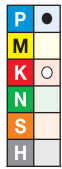
Modular Drills



				D1		seat size
KCP15		KC7410	KC7410	mm	in	
KTIP1440HPM	KTIP1440HPCM	KTIP1440HPCCLM	KTIP1440HPLM	14,400	.5669	R
KTIP1450HPM	KTIP1450HPCM	KTIP1450HPCCLM	KTIP1450HPLM	14,500	.5709	S
KTIP1460HPM	KTIP1460HPCM	KTIP1460HPCCLM	—	14,600	.5748	S
KTIP1467HPM	—	—	KTIP1467HPLM	14,666	.5774	S
KTIP1468HPM	KTIP1468HPCM	KTIP1468HPCCLM	KTIP1468HPLM	14,684	.5781	S
KTIP1470HPM	KTIP1470HPCM	KTIP1470HPCCLM	—	14,700	.5787	S
KTIP1480HPM	KTIP1480HPCM	KTIP1480HPCCLM	KTIP1480HPLM	14,800	.5827	S
KTIP1490HPM	—	—	—	14,900	.5866	S
KTIP1500HPM	KTIP1500HPCM	KTIP1500HPCCLM	KTIP1500HPLM	15,000	.5906	T
KTIP1508HPM	KTIP1508HPCM	KTIP1508HPCCLM	—	15,083	.5938	T
KTIP1510HPM	KTIP1510HPCM	KTIP1510HPCCLM	KTIP1510HPLM	15,100	.5945	T
KTIP1520HPM	KTIP1520HPCM	—	KTIP1520HPLM	15,200	.5984	T
KTIP1530HPM	KTIP1530HPCM	KTIP1530HPCCLM	—	15,300	.6024	T
KTIP1540HPM	KTIP1540HPCM	KTIP1540HPCCLM	—	15,400	.6063	T
KTIP1548HPM	—	—	—	15,479	.6094	T
KTIP1550HPM	KTIP1550HPCM	KTIP1550HPCCLM	KTIP1550HPLM	15,500	.6102	T
KTIP1560HPM	KTIP1560HPCM	KTIP1560HPCCLM	—	15,600	.6142	T
KTIP1570HPM	KTIP1570HPCM	KTIP1570HPCCLM	—	15,700	.6181	T
KTIP1580HPM	KTIP1580HPCM	KTIP1580HPCCLM	—	15,800	.6220	T
KTIP1588HPM	KTIP1588HPCM	KTIP1588HPCCLM	KTIP1588HPLM	15,875	.6250	T
KTIP1600HPM	KTIP1600HPCM	KTIP1600HPCCLM	KTIP1600HPLM	16,000	.6299	U
KTIP1603HPM	—	—	—	16,027	.6310	U
KTIP1608HPM	KTIP1608HPCM	KTIP1608HPCCLM	KTIP1608HPLM	16,078	.6330	U
KTIP1610HPM	KTIP1610HPCM	KTIP1610HPCCLM	KTIP1610HPLM	16,100	.6339	U
KTIP1620HPM	KTIP1620HPCM	KTIP1620HPCCLM	—	16,200	.6378	U
KTIP1627HPM	—	—	—	16,271	.6406	U
KTIP1630HPM	KTIP1630HPCM	KTIP1630HPCCLM	—	16,300	.6417	U
KTIP1640HPM	KTIP1640HPCM	KTIP1640HPCCLM	—	16,400	.6457	U
KTIP1650HPM	KTIP1650HPCM	KTIP1650HPCCLM	KTIP1650HPLM	16,500	.6496	U
KTIP1660HPM	KTIP1660HPCM	KTIP1660HPCCLM	—	16,600	.6535	U
KTIP1667HPM	KTIP1667HPCM	KTIP1667HPCCLM	KTIP1667HPLM	16,670	.6563	U
KTIP1670HPM	KTIP1670HPCM	KTIP1670HPCCLM	—	16,700	.6575	U
KTIP1680HPM	KTIP1680HPCM	KTIP1680HPCCLM	—	16,800	.6614	U
KTIP1687HPM	—	—	—	16,873	.6643	U
KTIP1690HPM	KTIP1690HPCM	KTIP1690HPCCLM	—	16,900	.6654	U
KTIP1700HPM	KTIP1700HPCM	KTIP1700HPCCLM	KTIP1700HPLM	17,000	.6693	V
KTIP1707HPM	—	—	—	17,066	.6719	V
KTIP1710HPM	KTIP1710HPCM	KTIP1710HPCCLM	—	17,100	.6732	V
KTIP1720HPM	KTIP1720HPCM	—	—	17,200	.6772	V
KTIP1730HPM	KTIP1730HPCM	KTIP1730HPCCLM	—	17,300	.6811	V
KTIP1740HPM	—	—	—	17,400	.6850	V
KTIP1748HPM	—	—	KTIP1748HPLM	17,463	.6875	V
KTIP1750HPM	KTIP1750HPCM	KTIP1750HPCCLM	KTIP1750HPLM	17,500	.6890	V
KTIP1760HPM	KTIP1760HPCM	KTIP1760HPCCLM	—	17,600	.6929	V
KTIP1770HPM	KTIP1770HPCM	—	KTIP1770HPLM	17,700	.6969	V
KTIP1780HPM	KTIP1780HPCM	KTIP1780HPCCLM	—	17,800	.7008	V
KTIP1786HPM	—	—	—	17,859	.7031	V
KTIP1790HPM	—	—	—	17,900	.7047	V
KTIP1800HPM	KTIP1800HPCM	KTIP1800HPCCLM	KTIP1800HPLM	18,000	.7087	W
KTIP1810HPM	KTIP1810HPCM	KTIP1810HPCCLM	—	18,100	.7126	W
KTIP1820HPM	—	—	—	18,200	.7165	W
KTIP1826HPM	—	—	—	18,258	.7188	W

(continued)

(KTIP Inserts continued)



	KCP15	KC7410	KC7410	KC7320	D1		seat size
					mm	in	
	KTIP1830HPM	—	—	—	18,300	.7205	W
	KTIP1840HPM	—	—	KTIP1840HPLM	18,400	.7244	W
	KTIP1850HPM	KTIP1850HPCM	KTIP1850HPCCLM	KTIP1850HPLM	18,500	.7283	W
	KTIP1860HPM	—	—	—	18,600	.7323	W
	KTIP1865HPM	—	—	KTIP1865HPLM	18,654	.7344	W
	KTIP1870HPM	—	—	—	18,700	.7362	W
	KTIP1880HPM	KTIP1880HPCM	KTIP1880HPCCLM	—	18,800	.7402	W
	KTIP1890HPM	KTIP1890HPCM	KTIP1890HPCCLM	—	18,900	.7441	W
	KTIP1900HPM	KTIP1900HPCM	KTIP1900HPCCLM	KTIP1900HPLM	19,000	.7480	X
	KTIP1905HPM	KTIP1905HPCM	KTIP1905HPCCLM	KTIP1905HPLM	19,050	.7500	X
	KTIP1910HPM	—	—	KTIP1910HPLM	19,100	.7520	X
	KTIP1920HPM	KTIP1920HPCM	KTIP1920HPCCLM	KTIP1920HPLM	19,200	.7559	X
	KTIP1923HPM	—	—	KTIP1923HPLM	19,228	.7570	X
	KTIP1925HPM	—	—	KTIP1925HPLM	19,253	.7580	X
	KTIP1928HPM	—	—	KTIP1928HPLM	19,279	.7590	X
	KTIP1930HPM	—	—	—	19,300	.7598	X
	KTIP1935HPM	—	—	KTIP1935HPLM	19,350	.7620	X
	KTIP1940HPM	—	—	—	19,400	.7638	X
	KTIP1946HPM	—	—	KTIP1946HPLM	19,446	.7656	X
	KTIP1950HPM	KTIP1950HPCM	KTIP1950HPCCLM	KTIP1950HPLM	19,500	.7677	X
	KTIP1960HPM	KTIP1960HPCM	KTIP1960HPCCLM	—	19,600	.7717	X
	KTIP1970HPM	KTIP1970HPCM	KTIP1970HPCCLM	—	19,700	.7756	X
	KTIP1980HPM	KTIP1980HPCM	KTIP1980HPCCLM	—	19,800	.7795	X
	KTIP1984HPM	—	—	KTIP1985HPLM	19,844	.7813	X
	KTIP1990HPM	—	—	—	19,900	.7835	X
	KTIP2000HPM	KTIP2000HPCM	KTIP2000HPCCLM	KTIP2000HPLM	20,000	.7874	Y
	KTIP2010HPM	KTIP2010HPCM	KTIP2010HPCCLM	—	20,100	.7913	Y
	KTIP2020HPM	—	—	—	20,200	.7953	Y
	KTIP2024HPM	—	—	KTIP2024HPLM	20,241	.7969	Y
	KTIP2030HPM	KTIP2030HPCM	KTIP2030HPCCLM	—	20,300	.7992	Y
	KTIP2040HPM	—	—	—	20,400	.8031	Y
	KTIP2050HPM	KTIP2050HPCM	KTIP2050HPCCLM	KTIP2050HPLM	20,500	.8071	Y
	KTIP2060HPM	KTIP2060HPCM	KTIP2060HPCCLM	—	20,600	.8110	Y
	KTIP2064HPM	—	—	KTIP2064HPLM	20,638	.8125	Y
	KTIP2070HPM	—	—	—	20,700	.8150	Y
	KTIP2080HPM	—	—	—	20,800	.8189	Y
	KTIP2090HPM	—	—	—	20,900	.8228	Y
	KTIP2099HPM	KTIP2099HPCM	KTIP2099HPCCLM	KTIP2099HPLM	20,990	.8264	Y
	KTIP2100HPM	KTIP2100HPCM	—	KTIP2100HPLM	21,000	.8268	Z
	KTIP2143HPM	KTIP2143HPCM	—	—	21,432	.8438	Z
	—	—	—	KTIP2143HPLM	21,438	.8440	Z
	KTIP2150HPM	KTIP2150HPCM	—	KTIP2150HPLM	21,500	.8465	Z
	KTIP2200HPM	KTIP2200HPCM	—	KTIP2200HPLM	22,000	.8661	ZA
	KTIP2223HPM	KTIP2223HPCM	—	KTIP2223HPLM	22,225	.8750	ZA
	KTIP2244HPM	KTIP2244HPCM	—	KTIP2244HPLM	22,454	.8840	ZA
	KTIP2250HPM	KTIP2250HPCM	—	KTIP2250HPLM	22,500	.8858	ZA
	KTIP2300HPM	KTIP2300HPCM	—	KTIP2300HPLM	23,000	.9055	ZB
	KTIP2350HPM	KTIP2350HPCM	—	KTIP2350HPLM	23,500	.9252	ZB
	KTIP2381HPM	KTIP2381HPCM	—	KTIP2381HPLM	23,813	.9375	ZB
	KTIP2400HPM	KTIP2400HPCM	—	KTIP2400HPLM	24,000	.9449	ZC
	KTIP2450HPM	KTIP2450HPCM	—	KTIP2450HPLM	24,500	.9646	ZC
	KTIP2461HPM	KTIP2461HPCM	—	KTIP2461HPLM	24,608	.9688	ZC

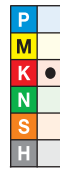


Modular Drills

(continued)

(KTIP Inserts continued)

Modular Drills



	KCP15	KC7410	KC7410	KC7320	D1		seat size
					mm	in	
	KTIP2500HPM	KTIP2500HPCM	—	KTIP2500HPLM	25,000	.9843	ZD
	KTIP2540HPM	KTIP2540HPCM	—	KTIP2540HPLM	25,400	1.0000	ZD
	KTIP2550HPM	KTIP2550HPCM	—	KTIP2550HPLM	25,500	1.0039	ZD
	KTIP2567HPM	KTIP2567HPCM	—	KTIP2567HPLM	25,679	1.0110	ZD
	KTIP2581HPM	KTIP2581HPCM	—	KTIP2581HPLM	25,806	1.0160	ZD
	KTIP2599HPM	KTIP2599HPCM	—	KTIP2599HPLM	25,990	1.0232	ZD
	KTIP2600HPM	KTIP2600HPCM	—	—	26,000	1.0236	ZE
	KTIP2619HPM	KTIP2619HPCM	—	—	26,187	1.0310	ZE
	KTIP2650HPM	KTIP2650HPCM	—	—	26,500	1.0433	ZE
	KTIP2659HPM	KTIP2659HPCM	—	—	26,590	1.0469	ZE
	KTIP2700HPM	KTIP2700HPCM	—	—	27,000	1.0630	ZE
	KTIP2750HPM	KTIP2750HPCM	—	—	27,500	1.0827	ZE
	KTIP2778HPM	KTIP2778HPCM	—	—	27,780	1.0938	ZE
	KTIP2799HPM	KTIP2799HPCM	—	—	27,990	1.1020	ZE

KTIP-HP (M), HPC (M), HPL (M) Geometry
Tolerance

D1 metric	tolerance k8	D1 inch	tolerance k8
8-10	0,000/+0,022	.3125-.3906	.000/+0.0009
>10-17	0,000/+0,027	>.3906-.6250	.000/+0.0011
>17-18	0,000/+0,027	>.6692-.7090	.000/+0.0010
>18-28	0,000/+0,033	>.7090-.8228	.000/+0.0013

■ Modular Drill Carbide Insert Blades • KenTIP • HP(M) Geometry • Grade KCP15™ • Through Coolant

Material Group	Cutting Speed – vc			Metric									
	Range – m/min			Recommended Feed Rate (f) by Diameter									
	min	Starting Value	max	8,0	10,0	12,0	14,0	16,0	20,0	24,0	28,0		
P	1	90	130	180	mm/r 0,12 - 0,21	0,14 - 0,26	0,15 - 0,33	0,18 - 0,41	0,20 - 0,47	0,26 - 0,50	0,27 - 0,51	0,30 - 0,54	
	2	110	150	190	mm/r 0,12 - 0,25	0,14 - 0,30	0,15 - 0,35	0,18 - 0,38	0,20 - 0,47	0,26 - 0,50	0,27 - 0,51	0,30 - 0,54	
	3	50	80	110	mm/r 0,12 - 0,29	0,13 - 0,37	0,17 - 0,39	0,22 - 0,48	0,24 - 0,48	0,32 - 0,54	0,32 - 0,54	0,35 - 0,56	
	4	50	80	110	mm/r 0,12 - 0,29	0,13 - 0,37	0,17 - 0,39	0,18 - 0,48	0,19 - 0,48	0,24 - 0,48	0,35 - 0,46	0,27 - 0,46	
K	1	60	100	180	mm/r 0,16 - 0,30	0,17 - 0,34	0,18 - 0,37	0,22 - 0,44	0,26 - 0,50	0,33 - 0,62	0,35 - 0,65	0,40 - 0,70	
	2	60	80	90	mm/r 0,16 - 0,30	0,17 - 0,32	0,18 - 0,35	0,22 - 0,43	0,26 - 0,50	0,33 - 0,62	0,35 - 0,65	0,40 - 0,70	
	3	40	70	90	mm/r 0,17 - 0,32	0,18 - 0,35	0,19 - 0,38	0,21 - 0,43	0,22 - 0,46	0,24 - 0,50	0,25 - 0,51	0,40 - 0,70	
Material Group	Cutting Speed – vc			Inch									
	Range – SFM			Recommended Feed Rate (f) by Diameter									
	min	Starting Value	max	.315	.394	.472	.551	.630	.787	.945	1.102		
P	1	295	425	590	IPR .005 - .008	.006 - .010	.006 - .013	.007 - .016	.008 - .019	.010 - .020	.011 - .020	.012 - .021	
	2	360	490	625	IPR .005 - .010	.006 - .012	.006 - .014	.007 - .015	.008 - .019	.010 - .020	.011 - .020	.012 - .021	
	3	165	260	360	IPR .005 - .011	.005 - .015	.007 - .015	.009 - .019	.009 - .019	.013 - .021	.013 - .021	.014 - .022	
	4	165	260	360	IPR .005 - .011	.005 - .015	.007 - .015	.007 - .019	.007 - .019	.009 - .019	.014 - .018	.011 - .018	
K	1	195	330	590	IPR .006 - .012	.007 - .013	.007 - .015	.009 - .017	.010 - .020	.013 - .024	.014 - .026	.016 - .028	
	2	195	260	295	IPR .006 - .012	.007 - .013	.007 - .014	.009 - .017	.010 - .020	.013 - .024	.014 - .026	.016 - .028	
	3	130	230	295	IPR .007 - .013	.007 - .014	.007 - .015	.008 - .017	.009 - .018	.009 - .020	.010 - .020	.016 - .028	

■ Modular Drill Carbide Insert Blades • KenTIP™ • HPC(M) Geometry • Grade KC7410™ • Through Coolant

Material Group	Cutting Speed – vc Range – m/min			Metric									
	min	Starting Value	max	Recommended Feed Rate (f) by Diameter									
				8,0	10,0	12,0	14,0	16,0	20,0	24,0	28,0		
K	1	100	175	200	mm/r	0,14 - 0,32	0,16 - 0,37	0,19 - 0,43	0,23 - 0,48	0,26 - 0,55	0,30 - 0,61	0,33 - 0,65	0,35 - 0,69
	2	100	160	180	mm/r	0,06 - 0,11	0,08 - 0,13	0,09 - 0,14	0,10 - 0,15	0,11 - 0,17	0,13 - 0,20	0,15 - 0,22	0,17 - 0,25
	3	70	85	100	mm/r	0,06 - 0,11	0,08 - 0,13	0,09 - 0,14	0,10 - 0,15	0,11 - 0,17	0,13 - 0,20	0,15 - 0,22	0,17 - 0,25
Material Group	Cutting Speed – vc Range – SFM			Inch									
	min	Starting Value	max	Recommended Feed Rate (f) by Diameter									
				.315	.394	.472	.551	.630	.787	.945	1.102		
K	1	328	574	656	IPR	.006 - .013	.006 - .015	.007 - .017	.009 - .019	.010 - .022	.012 - .024	.013 - .026	.014 - .027
	2	328	525	591	IPR	.002 - .004	.003 - .005	.004 - .006	.004 - .006	.004 - .007	.005 - .008	.006 - .009	.007 - .010
	3	230	279	328	IPR	.002 - .004	.003 - .005	.004 - .006	.004 - .006	.004 - .007	.005 - .008	.006 - .009	.007 - .010



■ Modular Drill Carbide Insert Blades • KenTIP • HPCCL(M) Classic Line Geometry • Grade KC7410 • Through Coolant

Material Group	Cutting Speed – vc Range – m/min			Metric									
	min	Starting Value	max	Recommended Feed Rate (f) by Diameter									
				8,0	10,0	12,0	14,0	16,0	20,0	24,0	28,0		
K	1	100	175	200	mm/r	0,14 - 0,32	0,16 - 0,37	0,19 - 0,43	0,23 - 0,48	0,26 - 0,55	0,30 - 0,61	0,33 - 0,65	0,35 - 0,69
	2	100	160	180	mm/r	0,14 - 0,32	0,16 - 0,37	0,19 - 0,43	0,23 - 0,48	0,26 - 0,55	0,30 - 0,61	0,33 - 0,65	0,35 - 0,69
	3	70	85	100	mm/r	0,13 - 0,26	0,15 - 0,31	0,17 - 0,35	0,19 - 0,40	0,21 - 0,44	0,28 - 0,51	0,31 - 0,57	0,34 - 0,62
Material Group	Cutting Speed – vc Range – SFM			Inch									
	min	Starting Value	max	Recommended Feed Rate (f) by Diameter									
				.315	.394	.472	.551	.630	.787	.945	1.102		
K	1	328	574	656	IPR	.006 - .013	.006 - .015	.007 - .017	.009 - .019	.010 - .022	.012 - .024	.013 - .026	.014 - .027
	2	328	525	591	IPR	.006 - .013	.006 - .015	.007 - .017	.009 - .019	.010 - .022	.012 - .024	.013 - .026	.014 - .027
	3	230	279	328	IPR	.005 - .010	.006 - .012	.007 - .014	.007 - .016	.008 - .017	.011 - .020	.012 - .022	.013 - .024

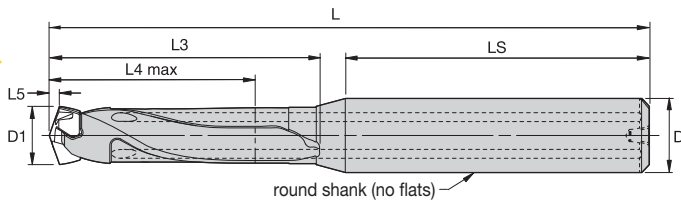
■ Modular Drill Carbide Insert Blades • KenTIP • HPL(M) Geometry • Grade KC7320™ • Through Coolant

Material Group	Cutting Speed – vc Range – m/min			Metric									
	min	Starting Value	max	Recommended Feed Rate (f) by Diameter									
				8,0	10,0	12,0	14,0	16,0	20,0	24,0	28,0		
M	1	50	60	90	mm/r	0,06 - 0,11	0,08 - 0,13	0,09 - 0,14	0,10 - 0,15	0,11 - 0,17	0,13 - 0,20	0,15 - 0,22	0,17 - 0,25
	2	30	50	90	mm/r	0,06 - 0,11	0,08 - 0,13	0,09 - 0,14	0,10 - 0,15	0,11 - 0,17	0,13 - 0,20	0,15 - 0,22	0,17 - 0,25
	3	20	40	60	mm/r	0,06 - 0,11	0,08 - 0,13	0,09 - 0,14	0,10 - 0,15	0,11 - 0,17	0,13 - 0,20	0,15 - 0,22	0,17 - 0,25
Material Group	Cutting Speed – vc Range – SFM			Inch									
	min	Starting Value	max	Recommended Feed Rate (f) by Diameter									
				.315	.394	.472	.551	.630	.787	.945	1.102		
M	1	165	180	295	IPR	.002 - .004	.003 - .005	.004 - .006	.004 - .006	.004 - .007	.005 - .008	.006 - .009	.007 - .010
	2	100	150	295	IPR	.002 - .004	.003 - .005	.004 - .006	.004 - .006	.004 - .007	.005 - .008	.006 - .009	.007 - .010
	3	65	120	200	IPR	.002 - .004	.003 - .005	.004 - .006	.004 - .006	.004 - .007	.005 - .008	.006 - .009	.007 - .010

- Tool body shipped with insert wrench.



Modular Drills



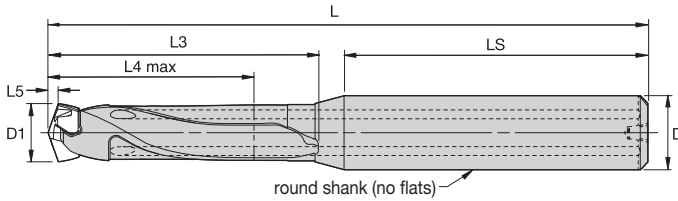
For information on L, L3, and L4 max, see the Modular Drill foldout table.



■ KenTIP Round Shank • 3 x D/5 x D/8 x D • Inch

			D1		D1 max		L5	LS	D	seat size	KenTIP wrench
			mm	in	mm	in					
	KTIP0313R3SS038	KTIP0313R5SS038	7,940	.3125	8,490	.3343	.055	1.59	.3750	F	170.306
	KTIP0335R3SS038	KTIP0335R5SS038	8,500	.3346	8,990	.3539	.059	1.59	.3750	G	170.306
	KTIP0354R3SS038	KTIP0354R5SS038	9,000	.3543	9,490	.3736	.063	1.59	.3750	H	170.306
	KTIP0374R3SS038	KTIP0374R5SS038	9,500	.3740	9,990	.3933	.063	1.59	.3750	I	170.306
	KTIP0374R3SS044	KTIP0374R5SS044	9,500	.3740	9,990	.3933	.063	1.67	.4375	I	170.306
	KTIP0394R3SS044	KTIP0394R5SS044	10,000	.3937	10,490	.4130	.067	1.67	.4375	J	170.307
	KTIP0413R3SS044	KTIP0413R5SS044	10,500	.4134	10,990	.4327	.071	1.67	.4375	K	170.307
	KTIP0433R3SS044	KTIP0433R5SS044	11,000	.4331	11,490	.4524	.075	1.67	.4375	L	170.307
	KTIP0453R3SS050	KTIP0453R5SS050	11,500	.4528	11,990	.4720	.079	1.79	.5000	M	170.307
	KTIP0472R3SS050	KTIP0472R5SS050	12,000	.4724	12,490	.4917	.083	1.79	.5000	N	170.308
	KTIP0492R3SS050	KTIP0492R5SS050	12,500	.4921	12,990	.5114	.087	1.79	.5000	O	170.308
	KTIP0492R3SS056	KTIP0492R5SS056	12,500	.4921	12,990	.5114	.087	1.79	.5625	O	170.308
	KTIP0512R3SS056	KTIP0512R5SS056	13,000	.5118	13,490	.5311	.087	1.79	.5625	P	170.308
	KTIP0532R3SS056	KTIP0532R5SS056	13,500	.5315	13,990	.5508	.091	1.79	.5625	Q	170.308
	KTIP0551R3SS056	KTIP0551R5SS056	14,000	.5512	14,490	.5705	.095	1.79	.5625	R	170.309
	KTIP0571R3SS063	KTIP0571R5SS063	14,500	.5709	14,990	.5902	.098	1.91	.6250	S	170.309
	KTIP0591R3SS063	KTIP0591R5SS063	15,000	.5906	15,990	.6295	.102	1.91	.6250	T	170.309
	KTIP0630R3SS069	KTIP0630R5SS069	16,000	.6299	16,990	.6689	.110	1.91	.6875	U	170.309
	KTIP0669R3SS069	KTIP0669R5SS069	17,000	.6693	17,990	.7083	.115	1.91	.6875	V	170.314
	KTIP0709R3SS075	KTIP0709R5SS075	18,000	.7087	18,990	.7476	.122	2.00	.7500	W	170.314
	KTIP0748R3SS075	KTIP0748R5SS075	19,000	.7480	19,990	.7870	.129	2.00	.7500	X	170.314
	KTIP0787R3SS081	KTIP0787R5SS081	20,000	.7874	20,990	.8264	.136	2.00	.8125	Y	170.314
	KTIP0827R3SS088	KTIP0827R5SS088	21,000	.8268	21,990	.8657	.142	2.07	.8750	Z	170.314
	KTIP0866R3SS088	KTIP0866R5SS088	22,000	.8661	22,990	.9051	.150	2.07	.8750	ZA	170.314
	KTIP0906R3SS094	KTIP0906R5SS094	23,000	.9055	23,990	.9445	.158	2.15	.9375	ZB	170.314
	KTIP0945R3SS100	KTIP0945R5SS100	24,000	.9449	24,990	.9839	.161	3.00	1.0000	ZC	170.314
	KTIP0984R3SS100	KTIP0984R5SS100	25,000	.9843	25,990	1.0232	.169	3.00	1.0000	ZD	170.314
	KTIP1024R3SS125	KTIP1024R5SS125	26,000	1.0236	26,990	1.0626	.176	3.25	1.2500	ZE	170.314
	KTIP1063R3SS125	KTIP1063R5SS125	26,000	1.0236	27,990	1.1020	.184	3.25	1.2500	ZE	170.314

- Tool body shipped with insert wrench.



For information on L, L3, and L4 max, see the Modular Drill foldout table.



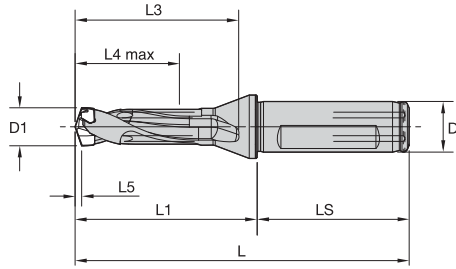
Modular Drills

■ KenTIP Round Shank • 1.5 x D/3 x D/5 x D/8 x D • Metric



				D1		D1 max		L5 LS D	seat size	KenTIP wrench
				mm	in	mm	in			
KTIP080R1SS10M	KTIP080R3SS10M	KTIP080R5SS10M	KTIP080R8SS10M	8,000	.3150	8,490	.3343	1,4 41 10	F	170.306
KTIP085R1SS10M	KTIP085R3SS10M	KTIP085R5SS10M	KTIP085R8SS10M	8,500	.3346	8,990	.3539	1,5 41 10	G	170.306
KTIP090R1SS10M	KTIP090R3SS10M	KTIP090R5SS10M	KTIP090R8SS10M	9,000	.3543	9,490	.3736	1,6 41 10	H	170.306
KTIP095R1SS10M	KTIP095R3SS10M	KTIP095R5SS10M	KTIP095R8SS10M	9,500	.3740	9,990	.3933	1,6 41 10	I	170.306
KTIP100R1SS12M	KTIP100R3SS12M	KTIP100R5SS12M	KTIP100R8SS12M	10,000	.3937	10,490	.4130	1,7 46 12	J	170.307
KTIP105R1SS12M	KTIP105R3SS12M	KTIP105R5SS12M	KTIP105R8SS12M	10,500	.4134	10,990	.4327	1,8 46 12	K	170.307
KTIP110R1SS12M	KTIP110R3SS12M	KTIP110R5SS12M	KTIP110R8SS12M	11,000	.4331	11,490	.4524	1,9 46 12	L	170.307
KTIP115R1SS12M	KTIP115R3SS12M	KTIP115R5SS12M	KTIP115R8SS12M	11,500	.4528	11,990	.4720	2,0 46 12	M	170.307
KTIP120R1SS14M	KTIP120R3SS14M	KTIP120R5SS14M	KTIP120R8SS14M	12,000	.4724	12,490	.4917	2,1 46 14	N	170.308
KTIP125R1SS14M	KTIP125R3SS14M	KTIP125R5SS14M	KTIP125R8SS14M	12,500	.4921	12,990	.5114	2,2 46 14	O	170.308
KTIP130R1SS14M	KTIP130R3SS14M	KTIP130R5SS14M	KTIP130R8SS14M	13,000	.5118	13,490	.5311	2,2 46 14	P	170.308
KTIP135R1SS14M	KTIP135R3SS14M	KTIP135R5SS14M	KTIP135R8SS14M	13,500	.5315	13,990	.5508	2,3 46 14	Q	170.308
KTIP140R1SS16M	KTIP140R3SS16M	KTIP140R5SS16M	KTIP140R8SS16M	14,000	.5512	14,490	.5705	2,4 49 16	R	170.309
KTIP145R1SS16M	KTIP145R3SS16M	KTIP145R5SS16M	KTIP145R8SS16M	14,500	.5709	14,990	.5902	2,5 49 16	S	170.309
KTIP150R1SS16M	KTIP150R3SS16M	KTIP150R5SS16M	KTIP150R8SS16M	15,000	.5906	15,990	.6295	2,6 49 16	T	170.309
KTIP160R1SS18M	KTIP160R3SS18M	KTIP160R5SS18M	KTIP160R8SS18M	16,000	.6299	16,990	.6689	2,8 49 18	U	170.309
KTIP170R1SS18M	KTIP170R3SS18M	KTIP170R5SS18M	KTIP170R8SS18M	17,000	.6693	17,990	.7083	2,9 49 18	V	170.314
KTIP180R1SS20M	KTIP180R3SS20M	KTIP180R5SS20M	KTIP180R8SS20M	18,000	.7087	18,990	.7476	3,1 51 20	W	170.314
KTIP190R1SS20M	KTIP190R3SS20M	KTIP190R5SS20M	KTIP190R8SS20M	19,000	.7480	19,990	.7870	3,3 51 20	X	170.314
KTIP200R1SS25M	KTIP200R3SS25M	KTIP200R5SS25M	KTIP200R8SS25M	20,000	.7874	20,990	.8264	3,5 57 25	Y	170.314
KTIP210R1SS25M	KTIP210R3SS25M	KTIP210R5SS25M	KTIP210R8SS25M	21,000	.8268	21,990	.8657	3,6 57 25	Z	170.314
KTIP220R1SS25M	KTIP220R3SS25M	KTIP220R5SS25M	KTIP220R8SS25M	22,000	.8661	22,990	.9051	3,8 57 25	ZA	170.314
KTIP230R1SS25M	KTIP230R3SS25M	KTIP230R5SS25M	KTIP230R8SS25M	23,000	.9055	23,990	.9445	4,0 57 25	ZB	170.314
KTIP240R1SS25M	KTIP240R3SS25M	KTIP240R5SS25M	KTIP240R8SS25M	24,000	.9449	24,990	.9839	4,1 57 25	ZC	170.314
KTIP250R1SS32M	KTIP250R3SS32M	KTIP250R5SS32M	KTIP250R8SS32M	25,000	.9843	25,990	1.0232	4,3 61 32	ZD	170.314
KTIP260R1SS32M	KTIP260R3SS32M	KTIP260R5SS32M	KTIP260R8SS32M	26,000	1.0236	26,990	1.0626	4,5 61 32	ZE	170.314
KTIP270R1SS32M	KTIP270R3SS32M	KTIP270R5SS32M	KTIP270R8SS32M	27,000	1.0630	27,990	1.1020	4,7 61 32	ZE	170.314

- Tool body shipped with insert wrench.



For information on L, L3, and L4 max, see the Modular Drill foldout table.



Modular Drills

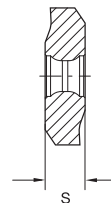
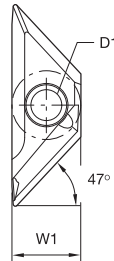
■ KenTIP Flanged Shank • 1.5 x D/3 x D/5 x D/8 x D • Metric



				D1		D1 max		L5	LS	D	seat size	KenTIP wrench
				mm	in	mm	in					
KTIP080R1SCF12M	KTIP080R3SCF12M	KTIP080R5SCF12M	KTIP080R8SCF12M	8,000	.3150	8,490	.3343	1,4	45	12	F	170.306
KTIP085R1SCF12M	KTIP085R3SCF12M	KTIP085R5SCF12M	KTIP085R8SCF12M	8,500	.3346	8,990	.3539	1,5	45	12	G	170.306
KTIP090R1SCF12M	KTIP090R3SCF12M	KTIP090R5SCF12M	KTIP090R8SCF12M	9,000	.3543	9,490	.3736	1,6	45	12	H	170.306
KTIP095R1SCF12M	KTIP095R3SCF12M	KTIP095R5SCF12M	KTIP095R8SCF12M	9,500	.3740	9,990	.3933	1,6	45	12	I	170.306
KTIP100R1SCF16M	KTIP100R3SCF16M	KTIP100R5SCF16M	KTIP100R8SCF16M	10,000	.3937	10,490	.4130	1,7	48	16	J	170.307
KTIP105R1SCF16M	KTIP105R3SCF16M	KTIP105R5SCF16M	KTIP105R8SCF16M	10,500	.4134	10,990	.4327	1,8	48	16	K	170.307
KTIP110R1SCF16M	KTIP110R3SCF16M	KTIP110R5SCF16M	KTIP110R8SCF16M	11,000	.4331	11,490	.4524	1,9	48	16	L	170.307
KTIP115R1SCF16M	KTIP115R3SCF16M	KTIP115R5SCF16M	KTIP115R8SCF16M	11,500	.4528	11,990	.4720	2,0	48	16	M	170.307
KTIP120R1SCF16M	KTIP120R3SCF16M	KTIP120R5SCF16M	KTIP120R8SCF16M	12,000	.4724	12,490	.4917	2,1	48	16	N	170.308
KTIP125R1SCF16M	KTIP125R3SCF16M	KTIP125R5SCF16M	KTIP125R8SCF16M	12,500	.4921	12,990	.5114	2,2	48	16	O	170.308
KTIP130R1SCF16M	KTIP130R3SCF16M	KTIP130R5SCF16M	KTIP130R8SCF16M	13,000	.5118	13,490	.5311	2,2	48	16	P	170.308
KTIP135R1SCF16M	KTIP135R3SCF16M	KTIP135R5SCF16M	KTIP135R8SCF16M	13,500	.5315	13,990	.5508	2,3	48	16	Q	170.308
KTIP140R1SCF16M	KTIP140R3SCF16M	KTIP140R5SCF16M	KTIP140R8SCF16M	14,000	.5512	14,490	.5705	2,4	48	16	R	170.309
KTIP145R1SCF16M	KTIP145R3SCF16M	KTIP145R5SCF16M	KTIP145R8SCF16M	14,500	.5709	14,990	.5902	2,5	48	16	S	170.309
KTIP150R1SCF20M	KTIP150R3SCF20M	KTIP150R5SCF20M	KTIP150R8SCF20M	15,000	.5906	15,990	.6295	2,6	50	20	T	170.309
KTIP160R1SCF20M	KTIP160R3SCF20M	KTIP160R5SCF20M	KTIP160R8SCF20M	16,000	.6299	16,990	.6689	2,8	50	20	U	170.309
KTIP170R1SCF20M	KTIP170R3SCF20M	KTIP170R5SCF20M	KTIP170R8SCF20M	17,000	.6693	17,990	.7083	2,9	50	20	V	170.314
KTIP180R1SCF25M	KTIP180R3SCF25M	KTIP180R5SCF25M	KTIP180R8SCF25M	18,000	.7087	18,990	.7476	3,1	56	25	W	170.314
KTIP190R1SCF25M	KTIP190R3SCF25M	KTIP190R5SCF25M	KTIP190R8SCF25M	19,000	.7480	19,990	.7870	3,3	56	25	X	170.314
KTIP200R1SCF25M	KTIP200R3SCF25M	KTIP200R5SCF25M	KTIP200R8SCF25M	20,000	.7874	20,990	.8264	3,5	56	25	Y	170.314
KTIP210R1SCF25M	KTIP210R3SCF25M	KTIP210R5SCF25M	KTIP210R8SCF25M	21,000	.8268	21,990	.8657	3,6	56	25	Z	170.314
KTIP220R1SCF25M	KTIP220R3SCF25M	KTIP220R5SCF25M	KTIP220R8SCF25M	22,000	.8661	22,990	.9051	3,8	56	25	ZA	170.314
KTIP230R1SCF25M	KTIP230R3SCF25M	KTIP230R5SCF25M	KTIP230R8SCF25M	23,000	.9055	23,990	.9445	4,0	56	25	ZB	170.314
KTIP240R1SCF25M	KTIP240R3SCF25M	KTIP240R5SCF25M	KTIP240R8SCF25M	24,000	.9449	24,990	.9839	4,1	56	25	ZC	170.314
KTIP250R1SCF25M	KTIP250R3SCF25M	KTIP250R5SCF25M	KTIP250R8SCF25M	25,000	.9843	25,990	1.0232	4,3	56	25	ZD	170.314
KTIP260R1SCF25M	KTIP260R3SCF25M	KTIP260R5SCF25M	KTIP260R8SCF25M	26,000	1.0236	26,990	1.0626	4,5	56	25	ZE	170.314
KTIP270R1SCF25M	KTIP270R3SCF25M	KTIP270R5SCF25M	KTIP270R8SCF25M	27,000	1.0630	27,990	1.1020	4,7	56	25	ZE	170.314

■ KenTIP Chamfering Insert

- Drilling and chamfering in one operation.
- No height adjustment required.
- Low setup time.
- Use standard inserts.
- Tool bodies available as custom solutions.



- first choice
- alternate choice

P	●	○
M	○	○
K	○	○
N	○	○
S	○	○
H	○	○

■ FAS-GD Geometry

catalog number	W1		D1		S		KC7015	KC7215
	mm	in	mm	in	mm	in		
FAS100302GD	6,35	.250	2,85	.112	3,48	.137	●	○

Mounting the KenTIP Inserts



1) Fix drill holder on arbor. For insert exchange, fix arbor on the machine or set on tool presetter.



2) Remove dust using air blast.



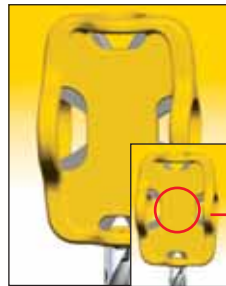
3) Put insert into drill holder (use gloves to protect your hands).



4) Turn lightly in a clockwise direction (use gloves to protect your hands).



5) Set the wrench properly.



6) Make sure the wrench fits with the insert slot (check size and alignment of wrench and insert slots to avoid injury).



Slot for wrench



7) Slowly turn the wrench in a clockwise direction.



8) Complete.

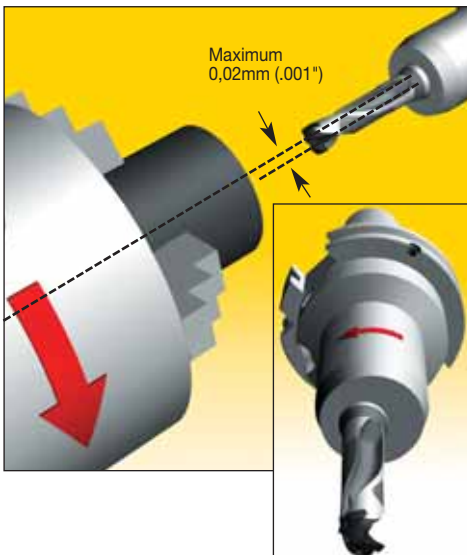
Cooling the KenTIP Drill



External cooling

Only when using the 3 x D tool bodies

Note



KSEM™ Modular Drill System

Primary Application

The KSEM Modular Drill System offers extended length and drilling diameters beyond the KenTIP™ Modular Drill System. Hole depths of 10 x D up to 1.575" (40mm) drilling diameter are standard. Various grades are available for your most demanding applications. The KSEM Modular Drill System covers a diameter range from .4921–1.5748" (12,5–40mm).

Features and Benefits

HP Drill-Point Design

- Low thrust prevents workpiece flexing.
- Excellent centering capabilities.
- HP(M) and HPG(M) for all steel applications.
- **NEW** HPC(M) for cast iron applications.
- **NEW** HPL(M) for stainless steel.

Easy Insert Change

- Robust pocket design requires only a simple wrench for blade removal.
- Selection of grades/geometries available.

Strength of Design

- Accelerated feed rates offer increased productivity.
- Four-wall pocket provides insert stability.
- All geometries except HPL(M) can be reconditioned by Kennametal for added economy.
- Through coolant standard for improved tool life, hole finish, and chip removal.

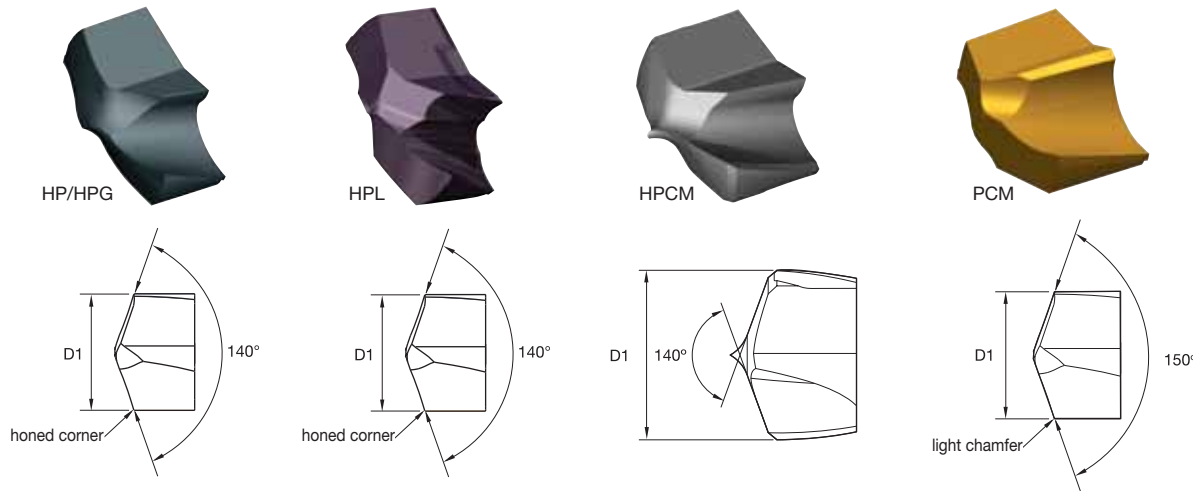
Tailored Grades and Geometries

- KC7315™ grade is a TiAlN-based PVD grade offering superior performance in all steel applications.
- KC7320™ grade has an AlTiN-based PVD coating developed for the demands of drilling stainless steels.
- KC7410™ grade contains multiple layers of PVD coating offering superior wear resistance when drilling cast irons. The geometry prevents breakout when drilling through holes.
 - KTIP_HPC inserts are designed for gray cast and low-strength ductile irons (K1).
 - KTIP_HPCCL_ inserts are ideal for low- and medium-strength CGI and ductile irons and high-strength ductile and austempered ductile iron (K2, K3).
 - For KSEM_HPCCL_ line items, please refer to the e-catalog at www.kennametal.com.

Customization

- Intermediate diameters available as semi-standards.
- Chamfering insert pockets available.
- Multiple steps possible.





Modular Drills

■ KSEM Inserts



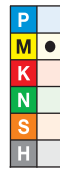
- first choice
- alternate choice

KC7235		KC7315		KC7315		KC7320		KC7410		KC7135		D1		seat size
												mm	in	
KSEM1250HPM	KSEM1250HPM	KSEM1250HPM	KSEM1250HPM	KSEM1250HPGM	KSEM1250HPLM	KSEM1250HPCM	KSEM1250PCM	12,500	.4921	C				
KSEM1260HPM	KSEM1260HPM	KSEM1260HPM	KSEM1260HPM	KSEM1260HPGM	KSEM1260HPLM	—	KSEM1260PCM	12,600	.4961	C				
KSEM1270HPM	KSEM1270HPM	KSEM1270HPM	KSEM1270HPM	KSEM1270HPGM	KSEM1270HPLM	KSEM1270HPCM	—	12,700	.5000	C				
KSEM1280HPM	KSEM1280HPM	KSEM1280HPM	KSEM1280HPM	KSEM1280HPGM	KSEM1280HPLM	—	KSEM1280PCM	12,800	.5039	C				
KSEM1293HPM	KSEM1293HPM	KSEM1293HPM	KSEM1293HPM	KSEM1293HPGM	KSEM1293HPLM	KSEM1293HPCM	—	12,930	.5090	C				
KSEM1300HPM	KSEM1300HPM	KSEM1300HPM	KSEM1300HPM	KSEM1300HPGM	KSEM1300HPLM	KSEM1300HPCM	KSEM1300PCM	13,000	.5118	C				
KSEM1310HPM	KSEM1310HPM	KSEM1310HPM	KSEM1310HPM	KSEM1310HPGM	KSEM1311HPLM	KSEM1310HPCM	—	13,100	.5160	C				
—	KSEM1320HPM	KSEM1320HPM	KSEM1320HPM	KSEM1320HPGM	—	—	—	13,200	.5197	C				
KSEM1350HPM	KSEM1350HPM	KSEM1350HPM	KSEM1350HPM	KSEM1350HPGM	KSEM1350HPLM	KSEM1350HPCM	KSEM1350PCM	13,500	.5310	C				
KSEM1360HPM	KSEM1360HPM	KSEM1360HPM	KSEM1360HPM	KSEM1360HPGM	KSEM1360HPLM	—	—	13,600	.5354	B				
KSEM1370HPM	KSEM1370HPM	KSEM1370HPM	KSEM1370HPM	KSEM1370HPGM	—	—	—	13,700	.5394	B				
KSEM1380HPM	KSEM1380HPM	KSEM1380HPM	KSEM1380HPM	KSEM1380HPGM	KSEM1380HPLM	—	KSEM1380PCM	13,800	.5433	B				
KSEM1389HPM	KSEM1389HPM	KSEM1389HPM	KSEM1389HPM	KSEM1389HPGM	KSEM1389HPLM	KSEM1389HPCM	—	13,890	.5470	B				
KSEM1400HPM	KSEM1400HPM	KSEM1400HPM	KSEM1400HPM	KSEM1400HPGM	KSEM1400HPLM	KSEM1400HPCM	KSEM1400PCM	14,000	.5512	B				
KSEM1410HPM	KSEM1410HPM	KSEM1410HPM	KSEM1410HPM	KSEM1410HPGM	KSEM1410HPLM	—	KSEM1410PCM	14,100	.5551	B				
—	—	—	—	—	KSEM1415HPLM	—	—	14,150	.5571	B				
KSEM1420HPM	KSEM1420HPM	KSEM1420HPM	KSEM1420HPM	KSEM1420HPGM	KSEM1420HPLM	—	—	14,200	.5591	B				
KSEM1429HPM	KSEM1429HPM	KSEM1429HPM	KSEM1429HPM	KSEM1429HPGM	KSEM1429HPLM	KSEM1429HPCM	—	14,290	.5630	B				
—	KSEM1440HPM	KSEM1440HPM	KSEM1440HPM	KSEM1440HPGM	—	—	—	14,400	.5669	B				
KSEM1450HPM	KSEM1450HPM	KSEM1450HPM	KSEM1450HPM	KSEM1450HPGM	KSEM1450HPLM	KSEM1450HPCM	KSEM1450PCM	14,500	.5709	B				
—	KSEM1460HPM	KSEM1460HPM	KSEM1460HPM	KSEM1460HPGM	KSEM1460HPLM	—	KSEM1460PCM	14,600	.5748	A				
KSEM1468HPM	KSEM1468HPM	KSEM1468HPM	KSEM1468HPM	KSEM1468HPGM	KSEM1468HPLM	KSEM1468HPCM	—	14,680	.5780	A				
KSEM1480HPM	KSEM1480HPM	KSEM1480HPM	KSEM1480HPM	KSEM1480HPGM	KSEM1480HPLM	—	KSEM1480PCM	14,800	.5827	A				
KSEM1500HPM	KSEM1500HPM	KSEM1500HPM	KSEM1500HPM	KSEM1500HPGM	KSEM1500HPLM	KSEM1500HPCM	KSEM1500PCM	15,000	.5906	A				
KSEM1508HPM	KSEM1508HPM	KSEM1508HPM	KSEM1508HPM	KSEM1508HPGM	KSEM1508HPLM	—	—	15,080	.5940	A				
KSEM1530HPM	KSEM1530HPM	KSEM1530HPM	KSEM1530HPM	KSEM1530HPGM	—	—	—	15,300	.6024	A				
—	KSEM1548HPM	KSEM1548HPM	KSEM1548HPM	KSEM1548HPGM	KSEM1548HPLM	KSEM1548HPCM	—	15,480	.6090	A				
KSEM1550HPM	KSEM1550HPM	KSEM1550HPM	KSEM1550HPM	KSEM1550HPGM	KSEM1550HPLM	KSEM1550HPCM	KSEM1550PCM	15,500	.6102	A				
KSEM1560HPM	KSEM1560HPM	KSEM1560HPM	KSEM1560HPM	KSEM1560HPGM	KSEM1560HPLM	—	KSEM1560PCM	15,600	.6142	A				
—	KSEM1570HPM	KSEM1570HPM	KSEM1570HPM	KSEM1570HPGM	—	—	—	15,700	.6181	A				
KSEM1580HPM	KSEM1580HPM	KSEM1580HPM	KSEM1580HPM	KSEM1580HPGM	—	—	KSEM1580PCM	15,800	.6220	A				
KSEM1588HPM	KSEM1588HPM	KSEM1588HPM	KSEM1588HPM	KSEM1588HPGM	KSEM1588HPLM	KSEM1588HPCM	—	15,880	.6250	1				
KSEM1600HPM	KSEM1600HPM	KSEM1600HPM	KSEM1600HPM	KSEM1600HPGM	KSEM1600HPLM	KSEM1600HPCM	KSEM1600PCM	16,000	.6299	1				
—	—	—	—	—	KSEM1610HPLM	—	—	16,100	.6339	1				
KSEM1609HPM	KSEM1609HPM	KSEM1609HPM	KSEM1609HPM	KSEM1609HPGM	KSEM1609HPLM	KSEM1609HPCM	—	16,090	.6340	1				
—	—	—	—	—	KSEM1615HPLM	—	—	16,150	.6358	1				

(continued)

(KSEM Inserts continued)

Modular Drills



KC7235	KC7315	KC7315	KC7320	KC7410	KC7135	D1		seat size
						mm	in	
—	KSEM1620HPM	KSEM1620HPGM	KSEM1620HPLM	—	KSEM1620PCM	16,200	.6378	1
KSEM1627HPM	KSEM1627HPM	KSEM1627HPGM	KSEM1627HPLM	KSEM1627HPCM	—	16,270	.6410	1
KSEM1650HPM	KSEM1650HPM	KSEM1650HPGM	KSEM1650HPLM	KSEM1650HPCM	KSEM1650PCM	16,500	.6496	1
KSEM1667HPM	KSEM1667HPM	KSEM1667HPGM	KSEM1667HPLM	KSEM1667HPCM	—	16,670	.6560	1
KSEM1700HPM	KSEM1700HPM	KSEM1700HPGM	KSEM1700HPLM	KSEM1700HPCM	KSEM1700PCM	17,000	.6693	1
KSEM1707HPM	KSEM1707HPM	KSEM1707HPGM	KSEM1707HPLM	KSEM1707HPCM	—	17,070	.6720	1
KSEM1746HPM	KSEM1746HPM	KSEM1746HPGM	KSEM1746HPLM	—	—	17,460	.6875	1
—	—	—	—	KSEM1746HPCM	—	17,460	.6880	1
KSEM1750HPM	KSEM1750HPM	KSEM1750HPGM	KSEM1750HPLM	KSEM1750HPCM	KSEM1750PCM	17,500	.6890	1
—	—	KSEM1770HPGM	—	—	—	17,700	.6969	1
—	—	—	KSEM1775HPLM	—	—	17,750	.6988	1
—	—	—	KSEM1780HPLM	—	—	17,800	.7008	1
KSEM1786HPM	KSEM1786HPM	KSEM1786HPGM	KSEM1786HPLM	—	—	17,860	.7030	1
—	—	—	KSEM1790HPLM	—	—	17,900	.7047	1
KSEM1800HPM	KSEM1800HPM	KSEM1800HPGM	KSEM1800HPLM	KSEM1800HPCM	KSEM1800PCM	18,000	.7087	1
KSEM1826HPM	KSEM1826HPM	KSEM1826HPGM	KSEM1826HPLM	KSEM1826HPCM	—	18,260	.7190	2
—	—	—	KSEM1839HPLM	—	—	18,390	.7240	2
KSEM1850HPM	KSEM1850HPM	KSEM1850HPGM	KSEM1850HPLM	KSEM1850HPCM	KSEM1850PCM	18,500	.7283	2
—	—	—	KSEM1860HPLM	—	—	18,600	.7323	2
KSEM1865HPM	KSEM1865HPM	KSEM1865HPGM	KSEM1865HPLM	—	—	18,650	.7340	2
—	—	—	KSEM1890HPLM	—	—	18,900	.7441	2
KSEM1900HPM	KSEM1900HPM	KSEM1900HPGM	KSEM1900HPLM	KSEM1900HPCM	KSEM1900PCM	19,000	.7480	2
KSEM1905HPM	KSEM1905HPM	KSEM1905HPGM	KSEM1905HPLM	KSEM1905HPCM	—	19,050	.7500	2
—	—	—	KSEM1920HPLM	—	—	19,200	.7559	2
KSEM1923HPM	KSEM1923HPM	—	KSEM1923HPLM	—	—	19,228	.7570	2
—	—	KSEM1925HPGM	KSEM1925HPLM	—	—	19,250	.7579	2
KSEM1927HPM	KSEM1927HPM	KSEM1927HPGM	KSEM1927HPLM	KSEM1927HPCM	—	19,270	.7590	2
—	—	—	KSEM1935HPLM	—	—	19,350	.7618	2
—	—	—	KSEM1936HPLM	—	—	19,360	.7622	2
KSEM1945HPM	KSEM1945HPM	KSEM1945HPGM	KSEM1945HPLM	KSEM1945HPCM	—	19,450	.7660	2
KSEM1950HPM	KSEM1950HPM	KSEM1950HPGM	KSEM1950HPLM	KSEM1950HPCM	KSEM1950PCM	19,500	.7677	2
—	—	KSEM1970HPGM	—	—	—	19,700	.7756	3
KSEM1984HPM	KSEM1984HPM	KSEM1984HPGM	KSEM1984HPLM	KSEM1984HPCM	—	19,840	.7810	2
KSEM2000HPM	KSEM2000HPM	KSEM2000HPGM	KSEM2000HPLM	KSEM2000HPCM	KSEM2000PCM	20,000	.7874	3
—	—	—	KSEM2010HPLM	—	—	20,100	.7913	3
KSEM2024HPM	KSEM2024HPM	KSEM2024HPGM	KSEM2024HPLM	KSEM2024HPCM	—	20,240	.7970	3
—	—	—	KSEM2035HPLM	—	—	20,350	.8012	3
KSEM2050HPM	KSEM2050HPM	KSEM2050HPGM	KSEM2050HPLM	KSEM2050HPCM	KSEM2050PCM	20,500	.8071	3
KSEM2064HPM	KSEM2064HPM	KSEM2064HPGM	KSEM2064HPLM	—	—	20,640	.8125	3
—	—	—	—	KSEM2064HPCM	—	20,640	.8130	3
KSEM2100HPM	KSEM2100HPM	KSEM2100HPGM	KSEM2100HPLM	KSEM2100HPCM	KSEM2100PCM	21,000	.8268	3
—	—	—	KSEM2115HPLM	—	—	21,150	.8327	3
—	—	—	KSEM2133HPLM	—	—	21,330	.8398	3
KSEM2143HPM	KSEM2143HPM	KSEM2143HPGM	KSEM2143HPLM	KSEM2143HPCM	—	21,430	.8440	3
KSEM2150HPM	KSEM2150HPM	KSEM2150HPGM	KSEM2150HPLM	KSEM2150HPCM	KSEM2150PCM	21,500	.8460	3
—	—	KSEM2170HPGM	—	—	—	21,700	.8543	3
KSEM2183HPM	KSEM2183HPM	KSEM2183HPGM	KSEM2183HPLM	—	—	21,830	.8590	3
KSEM2200HPM	KSEM2200HPM	KSEM2200HPGM	KSEM2200HPLM	KSEM2200HPCM	KSEM2200PCM	22,000	.8661	3
KSEM2223HPM	KSEM2223HPM	KSEM2223HPGM	KSEM2223HPLM	KSEM2223HPCM	—	22,230	.8750	4
KSEM2244HPM	KSEM2244HPM	KSEM2244HPGM	KSEM2244HPLM	KSEM2244HPCM	—	22,440	.8840	4

(continued)

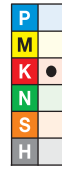
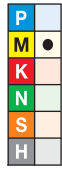
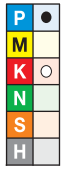
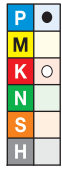
(KSEM Inserts continued)

												D1		seat size
												mm	in	
	KC7235		KC7315		KC7315		KC7320		KC7410		KC7135			
KSEM2250HPM		KSEM2250HPM		KSEM2250HPGM		KSEM2250HPLM		KSEM2250HPCM		KSEM2250PCM		22,500	.8858	4
—		—		—		KSEM2277HPLM		—		—		22,770	.8965	4
KSEM2300HPM		KSEM2300HPM		KSEM2300HPGM		KSEM2300HPLM		KSEM2300HPCM		KSEM2300PCM		23,000	.9055	4
—		—		KSEM2310HPGM		—		—		—		23,100	.9094	4
—		—		KSEM2330HPGM		—		—		—		23,300	.9173	4
KSEM2342HPM		KSEM2342HPM		KSEM2342HPGM		KSEM2342HPLM		KSEM2342HPCM		—		23,420	.9220	4
KSEM2350HPM		KSEM2350HPM		KSEM2350HPGM		KSEM2350HPLM		KSEM2350HPCM		KSEM2350PCM		23,500	.9252	4
KSEM2381HPM		KSEM2381HPM		KSEM2381HPGM		KSEM2381HPLM		—		—		23,810	.9375	4
—		—		—		—		KSEM2381HPCM		—		23,810	.9380	4
KSEM2400HPM		KSEM2400HPM		KSEM2400HPGM		KSEM2400HPLM		KSEM2400HPCM		KSEM2400PCM		24,000	.9449	4
—		—		KSEM2430HPGM		—		—		—		24,300	.9567	5
KSEM2450HPM		KSEM2450HPM		KSEM2450HPGM		KSEM2450HPLM		KSEM2450HPCM		KSEM2450PCM		24,500	.9646	5
KSEM2461HPM		KSEM2461HPM		KSEM2461HPGM		KSEM2461HPLM		KSEM2461HPCM		—		24,610	.9690	5
KSEM2500HPM		KSEM2500HPM		KSEM2500HPGM		KSEM2500HPLM		KSEM2500HPCM		KSEM2500PCM		25,000	.9843	5
—		—		—		KSEM2507HPLM		—		—		25,070	.9870	5
KSEM2540HPM		KSEM2540HPM		KSEM2540HPGM		KSEM2540HPLM		KSEM2540HPCM		—		25,400	1.0000	5
KSEM2550HPM		KSEM2550HPM		KSEM2550HPGM		KSEM2550HPLM		KSEM2550HPCM		KSEM2550PCM		25,500	1.0039	5
—		—		KSEM2560HPGM		KSEM2560HPLM		—		—		25,600	1.0080	5
KSEM2560HPM		KSEM2560HPM		—		—		—		—		25,610	1.0080	5
—		—		—		KSEM2565HPLM		—		—		25,650	1.0098	5
—		—		KSEM2565HPGM		—		—		—		25,654	1.0100	5
KSEM2567HPM		KSEM2567HPM		KSEM2567HPGM		KSEM2567HPLM		KSEM2567HPCM		—		25,670	1.0110	5
KSEM2581HPM		—		—		—		—		—		25,806	1.0160	5
KSEM2600HPM		KSEM2600HPM		KSEM2600HPGM		KSEM2600HPLM		KSEM2600HPCM		KSEM2600PCM		26,000	1.0236	5
KSEM2619HPM		KSEM2619HPM		KSEM2619HPGM		KSEM2619HPLM		KSEM2619HPCM		—		26,190	1.0310	6
KSEM2650HPM		KSEM2650HPM		KSEM2650HPGM		KSEM2650HPLM		KSEM2650HPCM		KSEM2650PCM		26,500	1.0433	6
KSEM2659HPM		KSEM2659HPM		KSEM2659HPGM		KSEM2659HPLM		KSEM2659HPCM		—		26,590	1.0470	6
—		—		—		KSEM2670HPLM		—		—		26,700	1.0512	6
—		—		—		KSEM2581HPLM		—		—		25,810	1.0610	5
KSEM2700HPM		KSEM2700HPM		KSEM2700HPGM		KSEM2700HPLM		KSEM2700HPCM		KSEM2700PCM		27,000	1.0630	6
KSEM2750HPM		KSEM2750HPM		KSEM2750HPGM		KSEM2750HPLM		KSEM2750HPCM		—		27,500	1.0827	6
KSEM2778HPM		KSEM2778HPM		KSEM2778HPGM		KSEM2779HPLM		KSEM2778HPCM		—		27,780	1.0940	6
KSEM2800HPM		KSEM2800HPM		KSEM2800HPGM		KSEM2800HPLM		KSEM2800HPCM		KSEM2800PCM		28,000	1.1024	6
—		—		—		KSEM2810HPLM		—		—		28,100	1.1063	7
KSEM2818HPM		KSEM2818HPM		KSEM2818HPGM		KSEM2817HPLM		KSEM2818HPCM		—		28,180	1.1090	7
KSEM2850HPM		KSEM2850HPM		KSEM2850HPGM		KSEM2850HPLM		KSEM2850HPCM		KSEM2850PCM		28,500	1.1220	7
KSEM2858HPM		KSEM2858HPM		KSEM2858HPGM		KSEM2858HPLM		KSEM2858HPCM		—		28,580	1.1250	7
KSEM2900HPM		KSEM2900HPM		KSEM2900HPGM		KSEM2900HPLM		KSEM2900HPCM		KSEM2900PCM		29,000	1.1417	7
KSEM2937HPM		KSEM2937HPM		KSEM2937HPGM		KSEM2937HPLM		KSEM2937HPCM		—		29,730	1.1560	7
KSEM2950HPM		KSEM2950HPM		KSEM2950HPGM		KSEM2950HPLM		KSEM2950HPCM		KSEM2950PCM		29,500	1.1614	7
KSEM2977HPM		KSEM2977HPM		KSEM2977HPGM		KSEM2977HPLM		KSEM2977HPCM		—		29,770	1.1720	7
KSEM3000HPM		KSEM3000HPM		KSEM3000HPGM		KSEM3000HPLM		KSEM3000HPCM		KSEM3000PCM		30,000	1.1811	7
KSEM3016HPM		KSEM3016HPM		KSEM3016HPGM		KSEM3016HPLM		—		—		30,160	1.1875	8
—		—		—		—		KSEM3016HPCM		—		30,160	1.1880	8
KSEM3050HPM		KSEM3050HPM		KSEM3050HPGM		KSEM3050HPLM		KSEM3050HPCM		KSEM3050PCM		30,500	1.2008	8
—		—		KSEM3056HPGM		—		—		—		30,560	1.2030	8
KSEM3096HPM		KSEM3096HPM		KSEM3096HPGM		—		—		—		30,960	1.2190	8
KSEM3100HPM		KSEM3100HPM		KSEM3100HPGM		KSEM3100HPLM		KSEM3100HPCM		KSEM3100PCM		31,000	1.2200	8
KSEM3150HPM		KSEM3150HPM		KSEM3150HPGM		KSEM3150HPLM		—		KSEM3150PCM		31,500	1.2402	8
KSEM3175HPM		KSEM3175HPM		KSEM3175HPGM		KSEM3175HPLM		KSEM3175HPCM		—		31,750	1.2500	8

(continued)

(KSEM Inserts continued)

Modular Drills

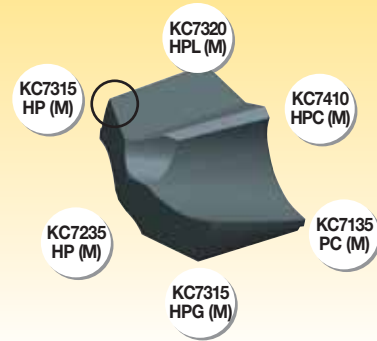


										D1		seat size
										mm	in	
KSEM3200HPM	KSEM3200HPM	KSEM3200HPGM	KSEM3200HPLM	KSEM3200HPCM	KSEM3200PCM	32,000	1.2598	8				
KSEM3250HPM	KSEM3250HPM	KSEM3250HPGM	—	—	—	32,500	1.2795	9				
KSEM3254HPM	KSEM3254HPM	KSEM3254HPGM	KSEM3254HPLM	—	—	32,540	1.2810	9				
—	KSEM3294HPM	KSEM3294HPGM	—	—	—	32,940	1.2970	9				
KSEM3300HPM	KSEM3300HPM	KSEM3300HPGM	KSEM3300HPLM	—	—	33,000	1.2992	9				
KSEM3334HPM	KSEM3334HPM	KSEM3334HPGM	—	—	—	33,340	1.3130	9				
—	—	—	KSEM3335HPLM	—	—	33,400	1.3130	9				
KSEM3350HPM	—	KSEM3350HPGM	—	—	—	33,500	1.3189	9				
—	—	KSEM3373HPGM	—	—	—	33,730	1.3280	9				
KSEM3400HPM	KSEM3400HPM	KSEM3400HPGM	KSEM3400HPLM	—	—	34,000	1.3386	9				
—	KSEM3413HPM	KSEM3413HPGM	—	—	—	34,130	1.3440	9				
KSEM3450HPM	KSEM3450HPM	KSEM3450HPGM	—	—	—	34,500	1.3583	9				
KSEM3493HPM	KSEM3493HPM	KSEM3493HPGM	KSEM3493HPLM	—	—	34,930	1.3750	9				
KSEM3500HPM	KSEM3500HPM	KSEM3500HPGM	KSEM3500HPLM	—	—	35,000	1.3780	9				
—	KSEM3550HPM	KSEM3550HPGM	—	—	—	35,500	1.3976	9				
KSEM3572HPM	KSEM3572HPM	KSEM3572HPGM	KSEM3571HPLM	—	—	35,720	1.4060	9				
KSEM3600HPM	KSEM3600HPM	KSEM3600HPGM	KSEM3600HPLM	—	—	36,000	1.4173	9				
—	—	KSEM3612HPGM	—	—	—	36,120	1.4220	10				
—	—	KSEM3650HPGM	—	—	—	36,500	1.4375	10				
KSEM3651HPM	—	KSEM3651HPGM	—	—	—	36,510	1.4375	10				
KSEM3700HPM	KSEM3700HPM	KSEM3700HPGM	KSEM3700HPLM	—	—	37,000	1.4567	10				
KSEM3731HPM	—	KSEM3731HPGM	—	—	—	37,310	1.4690	10				
KSEM3750HPM	KSEM3750HPM	KSEM3750HPGM	KSEM3750HPLM	—	—	37,500	1.4764	10				
KSEM3800HPM	KSEM3800HPM	KSEM3800HPGM	KSEM3800HPLM	—	—	38,000	1.4961	10				
KSEM3810HPM	KSEM3810HPM	KSEM3810HPGM	KSEM3810HPLM	—	—	38,100	1.5000	10				
KSEM3846HPM	—	KSEM3846HPGM	KSEM3846HPLM	—	—	38,460	1.5140	10				
—	KSEM3850HPM	KSEM3850HPGM	—	—	—	38,500	1.5157	10				
KSEM3900HPM	KSEM3900HPM	KSEM3900HPGM	KSEM3900HPLM	—	—	39,000	1.5354	10				
—	KSEM3950HPM	KSEM3950HPGM	KSEM3950HPLM	—	—	39,500	1.5551	10				
KSEM4000HPM	KSEM4000HPM	KSEM4000HPGM	KSEM4000HPLM	—	KSEM4000PCM	40,000	1.5748	10				

Tolerance HP/HPG/HPL/HPC • Metric		Tolerance PC • Metric	
D1 metric	tolerance h8	D1 metric	tolerance k7
12,5–18	+0,000/-0,027	12,5–18	+0,001/+ 0,019
>18–30	+0,000/-0,033	>18–30	+0,002/+ 0,023
>30–40	+0,000/-0,039	>30–40	+0,002/+ 0,027

Tolerance HP/HPG/HPL/HPC • Inch		Tolerance PC • Inch	
D1 inch	tolerance h8	D1 inch	tolerance k7
.500–.709	+.000/- .0010	.500–.709	+.0000/+ .0008
>.709–1.181	+.000/- .0013	>.709–1.181	+.0000/+ .0009
>1.181–1.575	+.000/- .0015	>1.181–1.575	+.0000/+ .0010

For reconditioning information pls contact our Customer Application Support or visit www.kennametal.com



grade	geometry	composition and application	ISO class
KC7320		PVD high Al content TiAlN-coated universal fine-grain grade: <ul style="list-style-type: none"> • Excellent oxidation stability and adjusted toughness. • High level of wear resistance. • Used for modular drilling of austenitic stainless steel. 	M20
	HPL (M)		
KC7410		PVD high multilayer AlCr-based coating over fine-grain carbide: <ul style="list-style-type: none"> • Newly developed unique coating. • Extraordinary wear resistance in drilling of cast iron materials. • High hot hardness enables elevated speeds. 	K15
	HPC (M)		
KC7135		PVD-TiCN-TiN-coated carbide: <ul style="list-style-type: none"> • Highly wear-resistant grade. • For universal application in steel, stainless steel, and irons. • Specifically used for KSEM PCM precentering inserts. 	P40 K35
	PC (M)		
KC7315		PVD-TiAlN-coated universal fine-grain grade: <ul style="list-style-type: none"> • Highest level of wear resistance for higher cutting speeds. • More efficient than PVD-TiN grades. • First choice for alloyed and high-alloy steel as well as cast iron. • Latest geometry for low thrust and highest speed and feed rates; up to 7 x D no precentering required. 	K20 M15 P30
	HPG (M)		
KC7235		PVD-TiAlN-coated fine-grain carbide: <ul style="list-style-type: none"> • Tough substrate. • Highly wear-resistant coating. • Suitable for machining steel even in difficult conditions. 	K35 M30 P40
	HP (M)		
KC7315		PVD-TiAlN-coated universal fine-grain grade: <ul style="list-style-type: none"> • Highest level of wear resistance for higher cutting speeds. • More efficient than PVD-TiN grades. • First choice for alloyed and high-alloy steel as well as cast iron. • Latest geometry for low thrust and highest speed and feed rates; up to 7 x D no precentering required. 	K20 M15 P30
	HP (M)		

■ Modular Drill Carbide Insert Blades • KSEM™ • HP(M) Geometry • Grade KC7235™ • Through Coolant

Material Group	Cutting Speed – vc Range – m/min			Metric							
	min	Starting Value	max	Recommended Feed Rate (f) by Diameter							
				12,5	16,0	20,0	25,4	32,0	40,0		
P	1	100	110	120	mm/r	0,15 - 0,31	0,17 - 0,36	0,19 - 0,41	0,25 - 0,53	0,29 - 0,60	0,33 - 0,69
	2	80	95	110	mm/r	0,15 - 0,31	0,17 - 0,36	0,19 - 0,41	0,25 - 0,53	0,29 - 0,60	0,33 - 0,69
	3	65	70	80	mm/r	0,15 - 0,31	0,17 - 0,36	0,19 - 0,41	0,25 - 0,53	0,29 - 0,60	0,33 - 0,69
Material Group	Cutting Speed – vc Range – SFM			Inch							
	min	Starting Value	max	Recommended Feed Rate (f) by Diameter							
				0.462	0.630	0.787	1.000	1.260	1.575		
P	1	330	360	390	IPR	.006 - .012	.007 - .014	.007 - .016	.010 - .021	.011 - .024	.013 - .027
	2	260	310	360	IPR	.006 - .012	.007 - .014	.007 - .016	.010 - .021	.011 - .024	.013 - .027
	3	210	230	260	IPR	.006 - .012	.007 - .014	.007 - .016	.010 - .021	.011 - .024	.013 - .027

■ Modular Drill Carbide Insert Blades • KSEM • HP(M) Geometry • Grade KC7315™ • Through Coolant

Material Group	Cutting Speed – vc Range – m/min			Metric							
	min	Starting Value	max	Recommended Feed Rate (f) by Diameter							
				12,5	16,0	20,0	25,4	32,0	40,0		
P	1	70	90	110	mm/r	0,15 - 0,31	0,17 - 0,36	0,19 - 0,41	0,25 - 0,53	0,29 - 0,60	0,33 - 0,69
	2	80	100	120	mm/r	0,15 - 0,31	0,17 - 0,36	0,19 - 0,41	0,25 - 0,53	0,29 - 0,60	0,33 - 0,69
	3	65	75	80	mm/r	0,15 - 0,28	0,17 - 0,31	0,19 - 0,36	0,25 - 0,46	0,23 - 0,53	0,33 - 0,60
	4	50	65	75	mm/r	0,12 - 0,28	0,14 - 0,31	0,16 - 0,36	0,20 - 0,46	0,23 - 0,53	0,30 - 0,60
	5	45	50	65	mm/r	0,09 - 0,15	0,11 - 0,18	0,12 - 0,21	0,15 - 0,25	0,17 - 0,29	0,20 - 0,33
	6	45	50	65	mm/r	0,12 - 0,23	0,14 - 0,26	0,16 - 0,29	0,20 - 0,38	0,23 - 0,43	0,26 - 0,54
Material Group	Cutting Speed – vc Range – SFM			Inch							
	min	Starting Value	max	Recommended Feed Rate (f) by Diameter							
				0.462	0.630	0.787	1.000	1.260	1.575		
P	1	230	300	360	IPR	.006 - .012	.007 - .014	.007 - .016	.010 - .021	.011 - .024	.013 - .027
	2	260	330	390	IPR	.006 - .012	.007 - .014	.007 - .016	.010 - .021	.014 - .024	.016 - .027
	3	210	250	260	IPR	.006 - .011	.007 - .012	.007 - .014	.010 - .018	.009 - .021	.013 - .024
	4	150	160	210	IPR	.005 - .011	.006 - .012	.006 - .014	.008 - .018	.009 - .021	.012 - .024
	5	150	160	210	IPR	.004 - .006	.004 - .007	.005 - .008	.006 - .010	.007 - .011	.008 - .013
	6	150	160	210	IPR	.005 - .009	.006 - .010	.006 - .011	.008 - .015	.009 - .017	.010 - .021

■ Modular Drill Carbide Insert Blades • KSEM • HPG(M) Geometry • Grade KC7315 • Through Coolant

Material Group	Cutting Speed – vc Range – m/min			Metric							
	min	Starting Value	max	Recommended Feed Rate (f) by Diameter							
				12,5	16,0	20,0	25,4	32,0	40,0		
P	1	75	110	140	mm/r	0,15 - 0,34	0,17 - 0,40	0,19 - 0,45	0,25 - 0,58	0,29 - 0,66	0,33 - 0,76
	2	90	120	150	mm/r	0,15 - 0,34	0,17 - 0,40	0,19 - 0,45	0,25 - 0,58	0,29 - 0,66	0,33 - 0,76
	3	50	75	100	mm/r	0,15 - 0,28	0,17 - 0,34	0,19 - 0,40	0,25 - 0,51	0,29 - 0,58	0,33 - 0,66
	4	55	75	95	mm/r	0,12 - 0,31	0,14 - 0,34	0,16 - 0,40	0,20 - 0,51	0,23 - 0,58	0,26 - 0,66
	5	50	65	80	mm/r	0,09 - 0,17	0,11 - 0,20	0,12 - 0,23	0,15 - 0,28	0,17 - 0,32	0,20 - 0,36
	6	50	65	80	mm/r	0,12 - 0,25	0,14 - 0,29	0,16 - 0,32	0,20 - 0,42	0,23 - 0,47	0,26 - 0,54
K	1	90	135	175	mm/r	0,17 - 0,35	0,21 - 0,42	0,25 - 0,48	0,31 - 0,59	0,37 - 0,70	0,43 - 0,81
	2	90	110	125	mm/r	0,17 - 0,33	0,21 - 0,41	0,25 - 0,48	0,31 - 0,59	0,37 - 0,70	0,43 - 0,81
	3	40	95	125	mm/r	0,18 - 0,36	0,20 - 0,41	0,21 - 0,44	0,23 - 0,48	0,25 - 0,53	0,27 - 0,57
Material Group	Cutting Speed – vc Range – SFM			Inch							
	min	Starting Value	max	Recommended Feed Rate (f) by Diameter							
				0.462	0.630	0.787	1.000	1.260	1.575		
P	1	250	360	460	IPR	.006 - .013	.007 - .016	.007 - .018	.010 - .023	.011 - .026	.013 - .030
	2	300	390	490	IPR	.006 - .013	.007 - .016	.007 - .018	.010 - .023	.011 - .026	.013 - .030
	3	160	250	330	IPR	.006 - .011	.007 - .013	.007 - .016	.010 - .020	.011 - .023	.013 - .026
	4	160	210	260	IPR	.005 - .012	.006 - .011	.006 - .016	.008 - .020	.009 - .023	.010 - .026
	5	160	210	260	IPR	.004 - .007	.004 - .008	.005 - .009	.006 - .011	.007 - .013	.008 - .014
	6	160	210	260	IPR	.005 - .010	.006 - .011	.006 - .013	.008 - .017	.009 - .019	.010 - .021
K	1	300	440	570	IPR	.007 - .014	.008 - .017	.010 - .019	.012 - .023	.015 - .028	.017 - .032
	2	300	360	410	IPR	.007 - .013	.008 - .016	.010 - .019	.012 - .023	.015 - .028	.017 - .032
	3	130	310	410	IPR	.007 - .014	.008 - .016	.008 - .017	.009 - .019	.010 - .021	.011 - .022

■ Modular Drill Carbide Insert Blades • KSEM™ • HPC(M) Geometry • Grade KC7410™ • Through Coolant

Material Group	Cutting Speed – vc Range – m/min			Metric							
	min	Starting Value	max	Recommended Feed Rate (f) by Diameter							
				12,5	16,0	20,0	25,4	32,0	40,0		
K	1	100	175	200	mm/r	0,17 - 0,35	0,21 - 0,42	0,25 - 0,48	0,31 - 0,59	0,37 - 0,70	0,43 - 0,81
	2	100	160	180	mm/r	0,09 - 0,14	0,11 - 0,17	0,13 - 0,20	0,16 - 0,25	0,18 - 0,28	0,21 - 0,31
	3	70	85	100	mm/r	0,09 - 0,14	0,11 - 0,17	0,13 - 0,20	0,16 - 0,25	0,18 - 0,28	0,21 - 0,31
Material Group	Cutting Speed – vc Range – SFM			Inch							
	min	Starting Value	max	Recommended Feed Rate (f) by Diameter							
				0.462	0.630	0.787	1.000	1.260	1.575		
K	1	330	570	660	IPR	.007 - .014	.008 - .017	.010 - .019	.012 - .023	.015 - .028	.017 - .032
	2	330	520	590	IPR	.004 - .006	.004 - .007	.005 - .008	.006 - .010	.007 - .011	.008 - .012
	3	230	280	330	IPR	.004 - .006	.004 - .007	.005 - .008	.006 - .010	.007 - .011	.008 - .012

■ Modular Drill Carbide Insert Blades • KSEM • HPC(M) Classic Line Geometry • Grade KC7410 • Through Coolant

Material Group	Cutting Speed – vc Range – m/min			Metric							
	min	Starting Value	max	Recommended Feed Rate (f) by Diameter							
				12,5	16,0	20,0	25,4	32,0	40,0		
K	1	100	175	200	mm/r	0,17 - 0,35	0,21 - 0,42	0,25 - 0,48	0,31 - 0,59	0,37 - 0,70	0,43 - 0,81
	2	100	160	180	mm/r	0,17 - 0,33	0,21 - 0,41	0,25 - 0,48	0,31 - 0,59	0,37 - 0,70	0,43 - 0,81
	3	70	85	100	mm/r	0,18 - 0,36	0,20 - 0,41	0,21 - 0,44	0,23 - 0,48	0,25 - 0,53	0,27 - 0,57
Material Group	Cutting Speed – vc Range – SFM			Inch							
	min	Starting Value	max	Recommended Feed Rate (f) by Diameter							
				0.462	0.630	0.787	1.000	1.260	1.575		
K	1	330	570	660	IPR	.007 - .014	.008 - .017	.010 - .019	.012 - .023	.015 - .028	.017 - .032
	2	330	520	590	IPR	.007 - .013	.008 - .016	.010 - .019	.012 - .023	.015 - .028	.017 - .032
	3	230	280	330	IPR	.007 - .014	.008 - .016	.008 - .017	.009 - .019	.010 - .021	.011 - .022

■ Modular Drill Carbide Insert Blades • KSEM • HPL(M) Geometry • Grade KC7320™ • Through Coolant

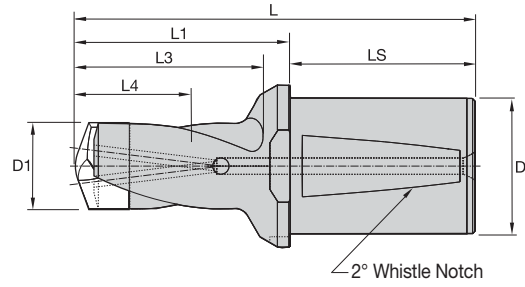
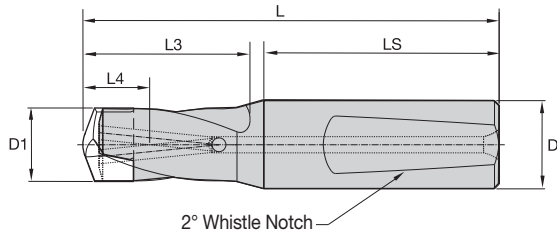
Material Group	Cutting Speed – vc Range – m/min			Metric							
	min	Starting Value	max	Recommended Feed Rate (f) by Diameter							
				12,5	16,0	20,0	25,4	32,0	40,0		
M	1	30	60	90	mm/r	0,09 - 0,14	0,11 - 0,17	0,13 - 0,20	0,16 - 0,25	0,18 - 0,28	0,21 - 0,31
	2	30	50	90	mm/r	0,09 - 0,14	0,11 - 0,17	0,13 - 0,20	0,16 - 0,25	0,18 - 0,28	0,21 - 0,31
	3	20	40	60	mm/r	0,09 - 0,14	0,11 - 0,17	0,13 - 0,20	0,16 - 0,25	0,18 - 0,28	0,21 - 0,31
Material Group	Cutting Speed – vc Range – SFM			Inch							
	min	Starting Value	max	Recommended Feed Rate (f) by Diameter							
				0.462	0.630	0.787	1.000	1.260	1.575		
M	1	100	200	300	IPR	.004 - .006	.004 - .007	.005 - .008	.006 - .010	.007 - .011	.008 - .012
	2	100	160	300	IPR	.004 - .006	.004 - .007	.005 - .008	.006 - .010	.007 - .011	.008 - .012
	3	70	130	200	IPR	.004 - .006	.004 - .007	.005 - .008	.006 - .010	.007 - .011	.008 - .012

■ Modular Drill Carbide Insert Blades • KSEM™ • PC(M) Geometry • Grade KC7135™ • Through Coolant

Modular Drills

Material Group	Cutting Speed – vc Range – m/min			Metric						
	min	Starting Value	max	Recommended Feed Rate (f) by Diameter						
				12,5	16,0	20,0	25,4	32,0		
P	1	90	100	110	mm/r	0,14 - 0,23	0,17 - 0,25	0,19 - 0,29	0,23 - 0,38	0,26 - 0,43
	2	80	90	100	mm/r	0,17 - 0,23	0,19 - 0,25	0,22 - 0,29	0,29 - 0,38	0,32 - 0,43
	3	55	65	75	mm/r	0,14 - 0,20	0,15 - 0,23	0,17 - 0,25	0,23 - 0,34	0,26 - 0,38
	4	50	60	70	mm/r	0,11 - 0,20	0,13 - 0,23	0,14 - 0,25	0,18 - 0,34	0,21 - 0,38
	5	45	50	60	mm/r	0,08 - 0,11	0,10 - 0,13	0,11 - 0,14	0,14 - 0,18	0,15 - 0,20
	6	45	55	65	mm/r	0,11 - 0,17	0,13 - 0,18	0,14 - 0,20	0,18 - 0,28	0,21 - 0,31
K	1	60	60	90	mm/r	0,08 - 0,24	0,09 - 0,28	0,11 - 0,31	0,14 - 0,43	0,15 - 0,48
	2	60	60	75	mm/r	0,18 - 0,24	0,21 - 0,28	0,23 - 0,31	0,28 - 0,37	0,32 - 0,42
	3	40	40	75	mm/r	0,15 - 0,24	0,18 - 0,26	0,21 - 0,29	0,23 - 0,37	0,25 - 0,42
Material Group	Cutting Speed – vc Range – SFM			Inch						
	min	Starting Value	max	Recommended Feed Rate (f) by Diameter						
				0.462	0.630	0.787	1.000	1.260		
P	1	300	330	360	IPR	.006 - .009	.007 - .010	.007 - .011	.009 - .015	.010 - .017
	2	260	300	330	IPR	.007 - .009	.007 - .010	.009 - .011	.011 - .015	.013 - .017
	3	180	210	250	IPR	.006 - .008	.006 - .009	.007 - .010	.009 - .013	.010 - .015
	4	150	160	200	IPR	.004 - .008	.005 - .009	.006 - .010	.007 - .013	.008 - .015
	5	150	180	210	IPR	.003 - .004	.004 - .005	.004 - .006	.006 - .007	.006 - .008
	6	150	180	210	IPR	.004 - .007	.005 - .007	.006 - .008	.007 - .011	.008 - .012
K	1	200	200	300	IPR	.003 - .009	.004 - .011	.004 - .012	.006 - .017	.006 - .019
	2	200	200	250	IPR	.007 - .009	.008 - .011	.009 - .012	.011 - .015	.013 - .017
	3	130	130	250	IPR	.006 - .009	.007 - .010	.008 - .011	.009 - .015	.010 - .017

- Use insert blade diameter within the designated seat size.
- Drill shipped with central lock screw and wrench.
- Order insert blades separately; see pages H42–H43.



Modular Drills

■ KSEM WN/WD Shank • 1 x D • Metric



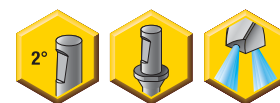
	D1		D1 max		L	L1	L4 max	L5	LS	D	seat size	central lock screw	wrench
	mm	in	mm	in									
KSEM125R1WN16M	12,500	.4921	13,500	.5314	78	—	14	2,0	48	16	C	364.017	170.294
KSEM136R1WN16M	13,510	.5319	14,500	.5708	81	—	15	2,2	48	16	B	364.016	170.289
KSEM146R1WN20M	14,510	.5713	15,874	.6249	85	—	16	2,3	50	20	A	364.016	170.289
KSEM160R1WN20M	16,000	.6299	18,000	.7086	88	—	18	2,5	50	20	1	364.010	170.270
KSEM181R1WN25M	18,010	.7091	19,999	.7873	99	—	20	2,9	56	25	2	364.010	170.270
KSEM200R1WN25M	20,000	.7874	22,000	.8661	102	—	22	3,2	56	25	3	364.011	170.272
KSEM221R1WN25M	22,010	.8665	24,000	.9448	107	—	24	3,5	56	25	4	364.011	170.272
KSEM241R1WN32M	24,010	.9453	26,000	1.0236	115	—	26	3,8	60	32	5	364.012	170.274
KSEM261R1WN32M	26,010	1.0240	28,000	1.1023	119	—	28	4,0	60	32	6	364.012	170.274
KSEM281R1WN32M	28,016	1.1028	30,000	1.1811	123	—	30	4,3	60	32	7	364.013	170.276
KSEM301R1WN32M	30,010	1.1815	32,000	1.2598	127	—	32	4,6	60	32	8	364.013	170.276
KSEM321R1WD50M	32,010	1.2602	36,000	1.4173	147	79	36	4,9	68	50	9	364.015	170.276
KSEM361R1WD50M	36,010	1.4177	40,000	1.5748	155	87	40	5,5	68	50	10	364.015	170.276

Modular Drills

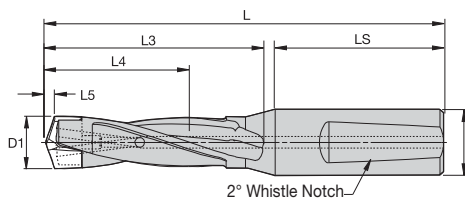
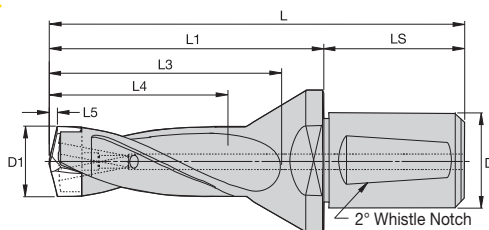
KSEM™ 2° Whistle Notch™ Shank Bodies



- Use designated insert blade with each drill body.
- Drill shipped with central lock screw and wrench.
- Order insert blade separately; see pages H42–H43.



Modular Drills



for diameters >16mm, DIN 1835 part 1 form E
for diameters <6mm, DIN 6535 – HE



For information on L, L3, and L4 max, see the Modular Drill foldout table.



■ KSEM WN/WD Shank • 3 x D/5 x D • Metric



		D1		D1 max		L5	LS	D	seat size	central lock screw
		mm	in	mm	in					
KSEM125R3WN16M	KSEM125R5WN16M	12,500	.4921	13,000	.5118	2,0	48	16	C	364.017
KSEM130R3WN16M	KSEM130R5WN16M	13,000	.5118	13,500	.5314	2,1	48	16	C	364.017
KSEM135R3WN16M	KSEM135R5WN16M	13,500	.5315	13,500	.5314	2,1	48	16	C	364.017
KSEM136R3WN16M	KSEM136R5WN16M	13,510	.5319	14,000	.5512	2,2	48	16	B	364.016
KSEM140R3WN16M	KSEM140R5WN16M	14,000	.5512	14,500	.5708	2,2	48	16	B	364.016
KSEM145R3WN20M	KSEM145R5WN20M	14,500	.5709	14,500	.5708	2,3	50	20	B	364.016
KSEM146R3WN20M	KSEM146R5WN20M	14,510	.5713	15,000	.5906	2,3	50	20	A	364.016
KSEM150R3WN20M	KSEM150R5WN20M	15,000	.5906	15,500	.6102	2,4	50	20	A	364.016
KSEM155R3WN20M	KSEM155R5WN20M	15,500	.6102	15,874	.6249	2,5	50	20	A	364.016
KSEM160R3WN20M	KSEM160R5WN20M	16,000	.6299	16,500	.6496	2,5	50	20	1	364.010
KSEM165R3WN20M	KSEM165R5WN20M	16,500	.6496	17,000	.6693	2,6	50	20	1	364.010
KSEM170R3WN20M	KSEM170R5WN20M	17,000	.6693	17,500	.6890	2,7	50	20	1	364.010
KSEM175R3WN20M	KSEM175R5WN20M	17,500	.6890	18,000	.7086	2,8	50	20	1	364.010
KSEM180R3WN20M	KSEM180R5WN20M	18,000	.7087	18,000	.7086	2,9	50	20	1	364.010
–	KSEM181R5WN25M	18,010	.7091	18,500	.7283	2,9	56	25	2	364.010
KSEM185R3WN25M	KSEM185R5WN25M	18,500	.7283	19,000	.7480	2,9	56	25	2	364.010
KSEM190R3WN25M	KSEM190R5WN25M	19,000	.7480	19,500	.7677	3,0	56	25	2	364.010
KSEM195R3WN25M	KSEM195R5WN25M	19,500	.7677	19,999	.7873	3,1	56	25	2	364.010
KSEM200R3WN25M	KSEM200R5WN25M	20,000	.7874	20,500	.8071	3,2	56	25	3	364.011
KSEM205R3WN25M	KSEM205R5WN25M	20,500	.8071	21,000	.8268	3,3	56	25	3	364.011
KSEM210R3WN25M	KSEM210R5WN25M	21,000	.8268	21,500	.8465	3,3	56	25	3	364.011
KSEM215R3WN25M	KSEM215R5WN25M	21,500	.8465	22,000	.8661	3,4	56	25	3	364.011
KSEM220R3WN25M	KSEM220R5WN25M	22,000	.8661	22,000	.8661	3,5	56	25	3	364.011
–	KSEM221R5WN25M	22,010	.8665	22,500	.8858	3,5	56	25	4	364.011
KSEM225R3WN25M	KSEM225R5WN25M	22,500	.8858	23,000	.9055	3,6	56	25	4	364.011
KSEM230R3WN25M	KSEM230R5WN25M	23,000	.9055	23,500	.9252	3,7	56	25	4	364.011
KSEM235R3WN25M	KSEM235R5WN25M	23,500	.9252	24,000	.9448	3,7	56	25	4	364.011
KSEM240R3WN25M	KSEM240R5WN25M	24,000	.9449	24,000	.9448	3,8	56	25	4	364.011
–	KSEM241R5WN32M	24,010	.9453	24,500	.9646	3,8	60	32	5	364.012
KSEM245R3WN32M	KSEM245R5WN32M	24,500	.9646	25,000	.9843	3,9	60	32	5	364.012
KSEM250R3WN32M	KSEM250R5WN32M	25,000	.9843	25,500	1.0039	3,8	60	32	5	364.012
KSEM255R3WN32M	KSEM255R5WN32M	25,500	1.0039	26,000	1.0236	3,9	60	32	5	364.012
KSEM260R3WN32M	KSEM260R5WN32M	26,000	1.0236	26,000	1.0236	4,0	60	32	5	364.012
–	KSEM261R5WN32M	26,010	1.0240	26,500	1.0433	4,0	60	32	6	364.012

(continued)

(KSEM WN/WD Shank • 3 x D/5 x D • Metric continued)

		D1		D1 max		L5	LS	D	seat size	central lock screw
		mm	in	mm	in					
KSEM265R3WN32M	KSEM265R5WN32M	26,500	1.0433	27,000	1.0630	4,1	60	32	6	364.012
KSEM270R3WN32M	KSEM270R5WN32M	27,000	1.0630	27,500	1.0827	4,2	60	32	6	364.012
KSEM275R3WN32M	KSEM275R5WN32M	27,500	1.0827	28,000	1.1023	4,2	60	32	6	364.012
KSEM280R3WN32M	KSEM280R5WN32M	28,000	1.1024	28,000	1.1023	4,3	60	32	6	364.012
—	KSEM281R5WN32M	28,016	1.1028	28,500	1.1220	4,3	60	32	7	364.013
KSEM285R3WN32M	KSEM285R5WN32M	28,500	1.1220	29,000	1.1417	4,4	60	32	7	364.013
KSEM290R3WN32M	KSEM290R5WN32M	29,000	1.1417	29,500	1.1614	4,5	60	32	7	364.013
KSEM295R3WN32M	KSEM295R5WN32M	29,500	1.1614	30,000	1.1811	4,5	60	32	7	364.013
KSEM300R3WN32M	KSEM300R5WN32M	30,000	1.1811	30,000	1.1811	4,6	60	32	7	364.013
—	KSEM301R5WN32M	30,010	1.1815	30,500	1.2008	4,6	60	32	8	364.013
KSEM305R3WN32M	KSEM305R5WN32M	30,500	1.2008	31,000	1.2205	4,7	60	32	8	364.013
KSEM310R3WN32M	KSEM310R5WN32M	31,000	1.2205	31,500	1.2402	4,8	60	32	8	364.013
KSEM315R3WN32M	KSEM315R5WN32M	31,500	1.2402	32,000	1.2598	4,8	60	32	8	364.013
KSEM320R3WN32M	KSEM320R5WN32M	32,000	1.2598	32,000	1.2598	4,9	60	32	8	364.013
KSEM321R3WD50M	KSEM321R5WD50M	32,010	1.2602	33,000	1.2992	4,9	68	50	9	364.015
KSEM330R3WD50M	KSEM330R5WD50M	33,000	1.2992	34,000	1.3386	5,1	68	50	9	364.015
KSEM340R3WD50M	KSEM340R5WD50M	34,000	1.3386	35,000	1.3780	5,2	68	50	9	364.015
KSEM350R3WD50M	KSEM350R5WD50M	35,000	1.3780	36,000	1.4173	5,4	68	50	9	364.015
KSEM360R3WD50M	KSEM360R5WD50M	36,000	1.4173	36,000	1.4173	5,5	68	50	9	364.015
KSEM361R3WD50M	KSEM361R5WD50M	36,010	1.4177	37,000	1.4567	5,5	68	50	10	364.015
KSEM370R3WD50M	KSEM370R5WD50M	37,000	1.4567	38,000	1.4961	5,7	68	50	10	364.015
KSEM380R3WD50M	KSEM380R5WD50M	38,000	1.4961	39,000	1.5354	5,8	68	50	10	364.015
KSEM390R3WD50M	KSEM390R5WD50M	39,000	1.5354	40,000	1.5748	6,0	68	50	10	364.015
KSEM400R3WD50M	KSEM400R5WD50M	40,000	1.5748	40,000	1.5748	6,2	68	50	10	364.015



Modular Drills

Modular Drills

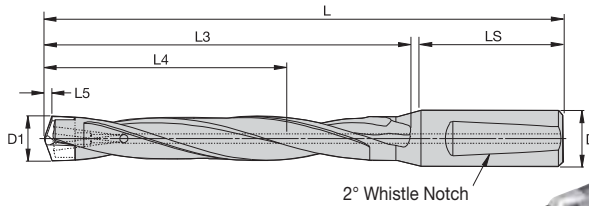
KSEM™ 2° Whistle Notch™ Shank Bodies



- Use designated insert blade with each drill body.
- Drill shipped with central lock screw and wrench.
- Order insert blade separately; see pages H42–H43.



for diameter <16mm DIN 6535 – HE
for diameter >16mm DIN 1835 part 1 form E
For information on L, L3, and L4 max,
see the Modular Drill foldout table.



■ KSEM WN Shank • 7 x D/10 x D • Metric



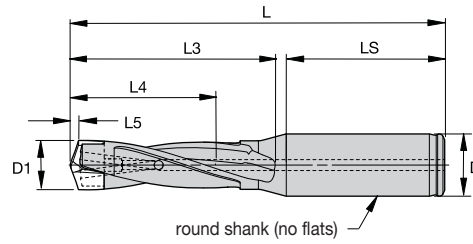
		D1		D1 max		L5	LS	D	seat size	central lock screw
		mm	in	mm	in					
KSEM125R7WN16M	KSEM125R10WN16M	12,500	.4921	13,000	.5118	2,0	48	16	C	364.017
KSEM130R7WN16M	KSEM130R10WN16M	13,000	.5118	13,500	.5314	2,1	48	16	C	364.017
KSEM135R7WN16M	KSEM135R10WN16M	13,500	.5315	13,500	.5314	2,1	48	16	C	364.017
KSEM136R7WN16M	KSEM136R10WN16M	13,510	.5319	14,000	.5512	2,2	48	16	B	364.016
KSEM140R7WN16M	KSEM140R10WN16M	14,000	.5512	14,500	.5708	2,2	48	16	B	364.016
KSEM145R7WN20M	KSEM145R10WN20M	14,500	.5709	14,500	.5708	2,3	50	20	B	364.016
KSEM146R7WN20M	KSEM146R10WN20M	14,510	.5713	15,000	.5906	2,3	50	20	A	364.016
KSEM150R7WN20M	KSEM150R10WN20M	15,000	.5906	15,500	.6102	2,4	50	20	A	364.016
KSEM155R7WN20M	KSEM155R10WN20M	15,500	.6102	15,874	.6249	2,5	50	20	A	364.016
KSEM160R7WN20M	KSEM160R10WN20M	16,000	.6299	16,500	.6496	2,5	50	20	1	364.010
KSEM165R7WN20M	KSEM165R10WN20M	16,500	.6496	17,000	.6693	2,6	50	20	1	364.010
KSEM170R7WN20M	KSEM170R10WN20M	17,000	.6693	17,500	.6890	2,7	50	20	1	364.010
KSEM175R7WN20M	KSEM175R10WN20M	17,500	.6890	18,000	.7086	2,8	50	20	1	364.010
KSEM180R7WN20M	KSEM180R10WN20M	18,000	.7087	18,000	.7086	2,9	50	20	1	364.010
–	KSEM181R10WN25M	18,010	.7091	18,500	.7283	2,9	56	25	2	364.010
KSEM185R7WN25M	KSEM185R10WN25M	18,500	.7283	19,000	.7480	2,9	56	25	2	364.010
KSEM190R7WN25M	KSEM190R10WN25M	19,000	.7480	19,500	.7677	3,0	56	25	2	364.010
KSEM195R7WN25M	KSEM195R10WN25M	19,500	.7677	19,999	.7873	3,1	56	25	2	364.010
KSEM200R7WN25M	KSEM200R10WN25M	20,000	.7874	20,500	.8071	3,2	56	25	3	364.011
KSEM205R7WN25M	KSEM205R10WN25M	20,500	.8071	21,000	.8268	3,3	56	25	3	364.011
KSEM210R7WN25M	KSEM210R10WN25M	21,000	.8268	21,500	.8465	3,3	56	25	3	364.011
KSEM215R7WN25M	KSEM215R10WN25M	21,500	.8465	22,000	.8661	3,4	56	25	3	364.011
KSEM220R7WN25M	KSEM220R10WN25M	22,000	.8661	22,000	.8661	3,5	56	25	3	364.011
–	KSEM221R10WN25M	22,010	.8665	22,500	.8858	3,5	56	25	4	364.011
KSEM225R7WN25M	KSEM225R10WN25M	22,500	.8858	23,000	.9055	3,6	56	25	4	364.011
KSEM230R7WN25M	KSEM230R10WN25M	23,000	.9055	23,500	.9252	3,7	56	25	4	364.011
KSEM235R7WN25M	KSEM235R10WN25M	23,500	.9252	24,000	.9448	3,7	56	25	4	364.011
KSEM240R7WN25M	KSEM240R10WN25M	24,000	.9449	24,000	.9448	3,8	56	25	4	364.011
–	KSEM241R10WN32M	24,010	.9453	24,500	.9646	3,8	60	32	5	364.012
KSEM245R7WN32M	KSEM245R10WN32M	24,500	.9646	25,000	.9843	3,9	60	32	5	364.012
KSEM250R7WN32M	KSEM250R10WN32M	25,000	.9843	25,500	1.0039	3,8	60	32	5	364.012
KSEM255R7WN32M	KSEM255R10WN32M	25,500	1.0039	26,000	1.0236	3,9	60	32	5	364.012
KSEM260R7WN32M	KSEM260R10WN32M	26,000	1.0236	26,000	1.0236	4,0	60	32	5	364.012
–	KSEM261R10WN32M	26,010	1.0240	26,500	1.0433	4,0	60	32	6	364.012
KSEM265R7WN32M	KSEM265R10WN32M	26,500	1.0433	27,000	1.0630	4,1	60	32	6	364.012
KSEM270R7WN32M	KSEM270R10WN32M	27,000	1.0630	27,500	1.0827	4,2	60	32	6	364.012
KSEM275R7WN32M	KSEM275R10WN32M	27,500	1.0827	28,000	1.1023	4,2	60	32	6	364.012
KSEM280R7WN32M	KSEM280R10WN32M	28,000	1.1024	28,000	1.1023	4,3	60	32	6	364.012
–	KSEM281R10WN32M	28,016	1.1028	28,500	1.1220	4,3	60	32	7	364.013
KSEM285R7WN32M	KSEM285R10WN32M	28,500	1.1220	29,000	1.1417	4,4	60	32	7	364.013
KSEM290R7WN32M	KSEM290R10WN32M	29,000	1.1417	29,500	1.1614	4,5	60	32	7	364.013
KSEM295R7WN32M	KSEM295R10WN32M	29,500	1.1614	30,000	1.1811	4,5	60	32	7	364.013
KSEM300R7WN32M	KSEM300R10WN32M	30,000	1.1811	30,000	1.1811	4,6	60	32	7	364.013
–	KSEM301R10WN32M	30,010	1.1815	30,500	1.2008	4,6	60	32	8	364.013
KSEM305R7WN32M	–	30,500	1.2008	31,000	1.2205	4,7	60	32	8	364.013
KSEM310R7WN32M	KSEM310R10WN32M	31,000	1.2205	31,500	1.2402	4,8	60	32	8	364.013
KSEM315R7WN32M	–	31,500	1.2402	32,000	1.2598	4,8	60	32	8	364.013
KSEM320R7WN32M	KSEM320R10WN32M	32,000	1.2598	32,000	1.2598	4,9	60	32	8	364.013

Modular Drills

- Use designated insert blade with each drill body.
- For alternatives, see insert blade fitment chart on page H44.
- Drill shipped with central lock screw and wrench.
- Order insert blade separately; see pages H42–H43.



For information on L, L3, and L4 max, see the Modular Drill foldout table.



Modular Drills




■ KSEM Round Shank • 3 x D/5 x D • Inch

		D1		D1 max		L5	LS	D	seat size	central lock screw
		mm	in	mm	in					
—	KSEM0500R5SS050	12,700	.5000	13,200	.5197	.079	1.50	.5000	C	364.017
KSEM0500R3SS075	KSEM0500R5SS075	12,700	.5000	13,200	.5197	.079	2.00	.7500	C	364.017
KSEM0509R3SS075	KSEM0509R5SS075	12,929	.5090	13,429	.5287	.081	2.00	.7500	C	364.017
—	KSEM0516R5SS075	13,106	.5160	13,500	.5314	.082	2.00	.7500	C	364.017
KSEM0531R3SS075	KSEM0531R5SS075	13,494	.5313	13,500	.5314	.084	2.00	.7500	C	364.017
KSEM0547R3SS075	—	13,891	.5470	14,394	.5667	.087	2.00	.7500	B	364.016
—	KSEM0547R5SS075	13,894	.5470	14,394	.5667	.087	2.00	.7500	B	364.016
KSEM0563R3SS075	KSEM0563R5SS075	14,300	.5630	14,500	.5708	.089	2.00	.7500	B	364.016
KSEM0578R3SS075	KSEM0578R5SS075	14,681	.5780	15,181	.5977	.092	2.00	.7500	A	364.016
KSEM0594R3SS075	KSEM0594R5SS075	15,088	.5940	15,588	.6137	.094	2.00	.7500	A	364.016
KSEM0609R3SS075	KSEM0609R5SS075	15,469	.6090	15,874	.6249	.097	2.00	.7500	A	364.016
KSEM0625R3SS075	KSEM0625R5SS075	15,875	.6250	16,375	.6447	.099	2.00	.7500	1	364.010
KSEM0634R3SS075	KSEM0634R5SS075	16,104	.6340	16,604	.6537	.101	2.00	.7500	1	364.010
KSEM0641R3SS075	KSEM0641R5SS075	16,281	.6410	16,781	.6607	.102	2.00	.7500	1	364.010
KSEM0656R3SS075	KSEM0656R5SS075	16,670	.6563	17,170	.6760	.104	2.00	.7500	1	364.010
KSEM0672R3SS075	KSEM0672R5SS075	17,069	.6720	17,569	.6917	.107	2.00	.7500	1	364.010
KSEM0688R3SS075	KSEM0688R5SS075	17,463	.6875	17,963	.7072	.109	2.00	.7500	1	364.010
KSEM0703R3SS075	KSEM0703R5SS075	17,856	.7030	18,000	.7086	.112	2.00	.7500	1	364.010
KSEM0719R3SS075	KSEM0719R5SS075	18,256	.7188	18,756	.7384	.114	2.00	.7500	2	364.010
KSEM0734R3SS075	KSEM0734R5SS075	18,644	.7340	19,144	.7537	.117	2.00	.7500	2	364.010
KSEM0750R3SS075	KSEM0750R5SS075	19,050	.7500	19,550	.7502	.119	2.00	.7500	2	364.010
KSEM0750R3SS100	KSEM0750R5SS100	19,050	.7500	19,550	.7502	.119	3.00	1.0000	2	364.010
KSEM0759R3SS075	KSEM0759R5SS075	19,279	.7585	19,779	.7787	.121	2.00	.7500	2	364.010
KSEM0766R3SS100	KSEM0766R5SS100	19,456	.7660	19,956	.7857	.122	3.00	1.0000	2	364.010
KSEM0781R3SS100	KSEM0781R5SS100	19,844	.7813	19,999	.7873	.124	3.00	1.0000	2	364.010
KSEM0797R3SS100	KSEM0797R5SS100	20,244	.7970	20,744	.8167	.127	3.00	1.0000	3	364.011
KSEM0813R3SS100	KSEM0813R5SS100	20,638	.8125	21,138	.8322	.129	3.00	1.0000	3	364.011
KSEM0844R3SS100	KSEM0844R5SS100	21,431	.8438	21,931	.8634	.134	3.00	1.0000	3	364.011
KSEM0859R3SS100	KSEM0859R5SS100	21,819	.8590	22,000	.8661	.136	3.00	1.0000	3	364.011
KSEM0875R3SS100	KSEM0875R5SS100	22,225	.8750	22,725	.8947	.139	3.00	1.0000	4	364.011
KSEM0875R3SS125	KSEM0875R5SS125	22,225	.8750	22,725	.8947	.139	3.25	1.2500	4	364.011
KSEM0884R3SS100	KSEM0884R5SS100	22,454	.8840	22,954	.9037	.140	3.00	1.0000	4	364.011
KSEM0906R3SS100	KSEM0906R5SS100	23,019	.9063	23,519	.9260	.144	3.00	1.0000	4	364.011
KSEM0922R3SS100	KSEM0922R5SS100	23,419	.9220	23,919	.9417	.146	3.00	1.0000	4	364.011
KSEM0938R3SS100	KSEM0938R5SS100	23,813	.9375	24,000	.9448	.149	3.00	1.0000	4	364.011
KSEM0969R3SS100	KSEM0969R5SS100	24,606	.9688	25,106	.9884	.154	3.00	1.0000	5	364.012
KSEM0984R3SS100	KSEM0984R5SS100	25,003	.9844	25,503	1.0041	.151	3.00	1.0000	5	364.012
KSEM1000R3SS100	KSEM1000R5SS100	25,400	1.0000	25,900	1.0197	.154	3.00	1.0000	5	364.012

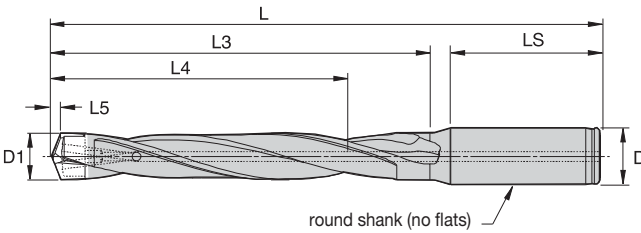
(continued)

(KSEM Round Shank • 3 x D/5 x D • Inch continued)

Modular Drills

			D1		D1 max			L5	LS	D	seat size	 central lock screw
			mm	in	mm	in	D					
—		KSEM1000R5SS125	25,400	1.0000	25,900	1.0197	.154	3.25	1.2500	5	364.012	
KSEM1011R3SS125		KSEM1011R5SS125	25,679	1.0110	26,000	1.0236	.156	3.25	1.2500	5	364.012	
KSEM1031R3SS125		KSEM1031R5SS125	26,195	1.0313	26,695	1.0510	.159	3.25	1.2500	6	364.012	
—		KSEM1047R5SS125	26,594	1.0470	27,094	1.0667	.161	3.25	1.2500	6	364.012	
KSEM1063R3SS125		KSEM1063R5SS125	26,988	1.0625	27,488	1.0822	.164	3.25	1.2500	6	364.012	
—		KSEM1094R5SS125	27,781	1.0938	28,000	1.1023	.168	3.25	1.2500	6	364.012	
KSEM1109R3SS125		KSEM1109R5SS125	28,169	1.1090	28,669	1.1287	.171	3.25	1.2500	7	364.013	
KSEM1125R3SS125		KSEM1125R5SS125	28,575	1.1250	29,075	1.1447	.173	3.25	1.2500	7	364.013	
KSEM1156R3SS125		KSEM1156R5SS125	29,370	1.1563	29,870	1.1760	.178	3.25	1.2500	7	364.013	
KSEM1172R3SS125		KSEM1172R5SS125	29,769	1.1720	30,000	1.1811	.180	3.25	1.2500	7	364.013	
KSEM1188R3SS125		KSEM1188R5SS125	30,163	1.1875	30,663	1.2072	.183	3.25	1.2500	8	364.013	
—		KSEM1203R5SS125	30,556	1.2030	31,056	1.2227	.185	3.25	1.2500	8	364.013	
KSEM1219R3SS125		KSEM1219R5SS125	30,958	1.2188	31,458	1.2385	.188	3.25	1.2500	8	364.013	
KSEM1250R3SS125		KSEM1250R5SS125	31,750	1.2500	32,000	1.2598	.192	3.25	1.2500	8	364.013	
KSEM1250R3SS150		KSEM1250R5SS150	31,750	1.2500	32,000	1.2598	.192	3.75	1.5000	8	364.013	
KSEM1281R3SS150		KSEM1281R5SS150	32,537	1.2810	33,537	1.3204	.197	3.75	1.5000	9	364.015	
KSEM1297R3SS150		KSEM1297R5SS150	32,941	1.2970	33,941	1.3363	.200	3.75	1.5000	9	364.015	
KSEM1313R3SS150		KSEM1313R5SS150	33,350	1.3130	34,350	1.3524	.202	3.75	1.5000	9	364.015	
KSEM1328R3SS150		KSEM1328R5SS150	33,731	1.3280	34,731	1.3674	.204	3.75	1.5000	9	364.015	
—		KSEM1344R5SS150	34,138	1.3440	35,138	1.3834	.207	3.75	1.5000	9	364.015	
KSEM1375R3SS150		KSEM1375R5SS150	34,925	1.3750	35,925	1.4144	.212	3.75	1.5000	9	364.015	
KSEM1406R3SS150		KSEM1406R5SS150	35,712	1.4060	36,000	1.4173	.216	3.75	1.5000	9	364.015	
—		KSEM1422R5SS150	36,119	1.4220	37,119	1.4614	.219	3.75	1.5000	10	364.015	
KSEM1438R3SS150		KSEM1438R5SS150	36,513	1.4380	37,513	1.4769	.221	3.75	1.5000	10	364.015	
—		KSEM1469R5SS150	37,313	1.4690	38,313	1.5084	.226	3.75	1.5000	10	364.015	
KSEM1500R3SS150		KSEM1500R5SS150	38,100	1.5000	39,100	1.5394	.231	3.75	1.5000	10	364.015	
KSEM1514R3SS150		KSEM1514R5SS150	38,456	1.5140	39,456	1.5534	.233	3.75	1.5000	10	364.015	

- Use designated insert blade with each drill body.
- For alternatives, see insert blade fitment chart on page H44.
- Drill shipped with central lock screw and wrench.
- Order insert blade separately; see pages H42–H43.



For information on L, L3, and L4 max, see the Modular Drill foldout table.



Modular Drills

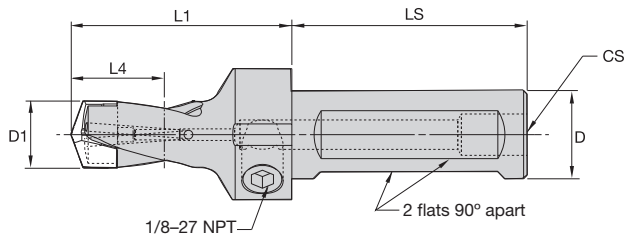
■ KSEM Round Shank • 7 x D/10 x D • Inch

		D1		D1 max		L5	LS	D	seat size	central lock screw
		mm	in	mm	in					
KSEM0500R7SS050	—	12,700	.5000	13,200	.5197	.079	1.50	.5000	C	364.017
KSEM0500R7SS075	KSEM0500R10SS075	12,700	.5000	13,200	.5197	.079	2.00	.7500	C	364.017
KSEM0509R7SS075	KSEM0509R10SS075	12,929	.5090	13,429	.5287	.081	2.00	.7500	C	364.017
KSEM0516R7SS075	KSEM0516R10SS075	13,096	.5160	13,500	.5314	.082	2.00	.7500	C	364.017
KSEM0531R7SS075	KSEM0531R10SS075	13,494	.5313	13,500	.5314	.084	2.00	.7500	C	364.017
KSEM0547R7SS075	KSEM0547R10SS075	13,891	.5470	14,394	.5667	.087	2.00	.7500	B	364.016
KSEM0563R7SS075	KSEM0563R10SS075	14,288	.5630	14,500	.5708	.089	2.00	.7500	B	364.016
KSEM0578R7SS075	KSEM0578R10SS075	14,681	.5780	15,181	.5977	.092	2.00	.7500	A	364.016
KSEM0594R7SS075	KSEM0594R10SS075	15,083	.5940	15,588	.6137	.094	2.00	.7500	A	364.016
KSEM0609R7SS075	KSEM0609R10SS075	15,479	.6090	15,874	.6249	.097	2.00	.7500	A	364.016
KSEM0625R7SS075	KSEM0625R10SS075	15,875	.6250	16,375	.6447	.099	2.00	.7500	1	364.010
KSEM0634R7SS075	KSEM0634R10SS075	16,104	.6340	16,604	.6537	.101	2.00	.7500	1	364.010
KSEM0656R7SS075	KSEM0656R10SS075	16,670	.6563	17,170	.6760	.104	2.00	.7500	1	364.010
KSEM0688R7SS075	KSEM0688R10SS075	17,463	.6875	17,963	.7072	.109	2.00	.7500	1	364.010
KSEM0719R7SS075	KSEM0719R10SS075	18,256	.7188	18,756	.7384	.114	2.00	.7500	2	364.010
KSEM0750R7SS075	KSEM0750R10SS075	19,050	.7500	19,550	.7502	.119	2.00	.7500	2	364.010
KSEM0750R7SS100	KSEM0750R10SS100	19,050	.7500	19,550	.7502	.119	3.00	1.0000	2	364.010
KSEM0759R7SS075	—	19,279	.7585	19,779	.7787	.121	2.00	.7500	2	364.010
—	KSEM0759R10SS100	19,279	.7585	19,779	.7787	.121	3.00	1.0000	2	364.010
KSEM0781R7SS100	KSEM0781R10SS100	19,844	.7813	19,999	.7873	.124	3.00	1.0000	2	364.010
KSEM0813R7SS100	KSEM0813R10SS100	20,638	.8125	21,138	.8322	.129	3.00	1.0000	3	364.011
KSEM0844R7SS100	KSEM0844R10SS100	21,431	.8438	21,931	.8634	.134	3.00	1.0000	3	364.011
KSEM0875R7SS100	KSEM0875R10SS100	22,225	.8750	22,725	.8947	.139	3.00	1.0000	4	364.011
KSEM0875R7SS125	—	22,225	.8750	22,725	.8947	.139	3.25	1.2500	4	364.011
KSEM0884R7SS100	KSEM0884R10SS100	22,454	.8840	22,954	.9037	.140	3.00	1.0000	4	364.011
KSEM0906R7SS100	KSEM0906R10SS100	23,019	.9063	23,519	.9260	.144	3.00	1.0000	4	364.011
KSEM0938R7SS100	KSEM0938R10SS100	23,813	.9375	24,000	.9448	.149	3.00	1.0000	4	364.011
KSEM0969R7SS100	KSEM0969R10SS100	24,606	.9688	25,106	.9884	.154	3.00	1.0000	5	364.012
KSEM0984R7SS100	KSEM0984R10SS100	25,003	.9844	25,503	1.0041	.151	3.00	1.0000	5	364.012
KSEM1000R7SS100	KSEM1000R10SS100	25,400	1.0000	25,900	1.0197	.154	3.00	1.0000	5	364.012
KSEM1000R7SS125	KSEM1000R10SS125	25,400	1.0000	25,900	1.0197	.154	3.25	1.2500	5	364.012
KSEM1011R7SS125	KSEM1011R10SS125	25,679	1.0110	26,000	1.0236	.156	3.25	1.2500	5	364.012
KSEM1031R7SS125	KSEM1031R10SS125	26,195	1.0313	26,695	1.0510	.159	3.25	1.2500	6	364.012
KSEM1063R7SS125	KSEM1063R10SS125	26,988	1.0625	27,488	1.0822	.164	3.25	1.2500	6	364.012
KSEM1094R7SS125	KSEM1094R10SS125	27,781	1.0938	28,000	1.1023	.168	3.25	1.2500	6	364.012
KSEM1125R7SS125	KSEM1125R10SS125	28,575	1.1250	29,075	1.1447	.173	3.25	1.2500	7	364.013
KSEM1156R7SS125	KSEM1156R10SS125	29,370	1.1563	29,870	1.1760	.178	3.25	1.2500	7	364.013
KSEM1188R7SS125	KSEM1188R10SS125	30,163	1.1875	30,663	1.2072	.183	3.25	1.2500	8	364.013
KSEM1219R7SS125	KSEM1219R10SS125	30,958	1.2188	31,458	1.2385	.188	3.25	1.2500	8	364.013
KSEM1250R7SS125	KSEM1250R10SS125	31,750	1.2500	32,000	1.2598	.192	3.25	1.2500	8	364.013
KSEM1250R7SS150	KSEM1250R10SS150	31,750	1.2500	32,000	1.2598	.192	3.75	1.5000	8	364.013

- Use any insert blade diameter within the designated seat size.
- Drill shipped with central lock screw, wrench, and side pipe plug (inch only).
- Order insert blades separately; see pages H42–H43.



Modular Drills



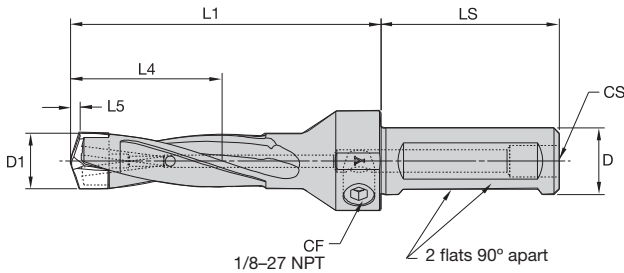
■ KSEM Flanged Shank • 1 x D • Inch



	D1		D1 max		L	L1	L4 max	L5	LS	D	seat size	CS	central lock screw	wrench
	mm	in	mm	in										
KSEM0493R1SSF075	12,522	.4930	13,500	.5314	3.94	1.94	.53	.07	2.00	.750	C	1/8-27 NPT	364.017	170.294
KSEM0532R1SSF075	13,513	.5320	14,500	.5708	4.00	2.00	.61	.08	2.00	.750	B	1/8-27 NPT	364.016	170.289
KSEM0571R1SSF075	14,503	.5710	15,874	.6249	4.00	2.00	.63	.09	2.00	.750	A	1/8-27 NPT	364.016	170.289
KSEM0625R1SSF075	15,875	.6250	18,000	.7086	4.19	2.19	.71	.10	2.00	.750	1	1/8-27 NPT	364.010	170.270
KSEM0709R1SSF075	18,009	.7090	19,999	.7873	4.25	2.25	.78	.11	2.00	.750	2	1/8-27 NPT	364.010	170.270
KSEM0788R1SSF100	20,015	.7880	22,000	.8661	5.50	2.50	.87	.13	3.00	1.000	3	1/4-18 NPT	364.011	170.272
KSEM0867R1SSF100	22,022	.8670	24,000	.9448	5.56	2.56	.95	.14	3.00	1.000	4	1/4-18 NPT	364.011	170.272
KSEM0945R1SSF100	24,003	.9450	26,000	1.0236	5.63	2.63	1.02	.15	3.00	1.000	5	1/4-18 NPT	364.012	170.274
KSEM1024R1SSF125	26,010	1.0240	28,000	1.1023	6.13	2.88	1.11	.16	3.25	1.250	6	1/4-18 NPT	364.012	170.274
KSEM1103R1SSF125	28,016	1.1030	30,000	1.1811	6.19	2.94	1.18	.17	3.25	1.250	7	1/4-18 NPT	364.013	170.276
KSEM1182R1SSF125	30,023	1.1820	32,000	1.2598	6.25	3.00	1.27	.18	3.25	1.250	8	1/4-18 NPT	364.013	170.276
KSEM1260R1SSF125	32,004	1.2600	36,000	1.4173	6.50	3.25	1.42	.19	3.25	1.250	9	1/4-18 NPT	364.015	170.276
KSEM1418R1SSF125	36,017	1.4180	40,000	1.5748	6.63	3.38	1.57	.22	3.25	1.250	10	1/4-18 NPT	364.015	170.276



- Use designated insert blade with each drill body.
- For alternatives, see insert blade fitment chart on page H44.
- Drill shipped with central lock screw, wrench, and side pipe plug.
- Order insert blade separately; see pages H42–H43.



Modular Drills

■ KSEM Flanged Shank • 3 x D • Inch



	D1		D1 max		L1	L4 max	L5	LS	D	seat size	CS	central lock screw	wrench
	mm	in	mm	in									
KSEM0500R3SSF075	12,700	.5000	13,200	.5197	2.88	1.50	.08	2.00	.750	C	1/8-27 NPT	364.017	170.294
KSEM0509R3SSF075	12,929	.5090	13,429	.5287	2.88	1.53	.08	2.00	.750	C	1/8-27 NPT	364.017	170.294
KSEM0516R3SSF075	13,106	.5160	13,500	.5314	2.88	1.55	.08	2.00	.750	C	1/8-27 NPT	364.017	170.294
KSEM0531R3SSF075	13,487	.5310	13,500	.5314	2.94	1.59	.08	2.00	.750	C	1/8-27 NPT	364.017	170.294
KSEM0547R3SSF075	13,894	.5470	14,394	.5667	3.00	1.64	.09	2.00	.750	B	1/8-27 NPT	364.016	170.289
KSEM0563R3SSF075	14,300	.5630	14,500	.5708	3.06	1.69	.09	2.00	.750	B	1/8-27 NPT	364.016	170.289
KSEM0578R3SSF075	14,681	.5780	15,181	.5977	3.13	1.73	.09	2.00	.750	A	1/8-27 NPT	364.016	170.289
KSEM0594R3SSF075	15,088	.5940	15,588	.6137	3.19	1.78	.09	2.00	.750	A	1/8-27 NPT	364.016	170.289
KSEM0609R3SSF075	15,469	.6090	15,874	.6249	3.25	1.83	.10	2.00	.750	A	1/8-27 NPT	364.016	170.289
KSEM0625R3SSF075	15,875	.6250	16,375	.6447	3.50	1.89	.10	2.00	.750	1	1/8-27 NPT	364.010	170.270
KSEM0634R3SSF075	16,104	.6340	16,604	.6537	3.50	2.05	.10	2.00	.750	1	1/8-27 NPT	364.010	170.270
KSEM0641R3SSF075	16,281	.6410	16,781	.6607	3.63	2.05	.10	2.00	.750	1	1/8-27 NPT	364.010	170.270
KSEM0672R3SSF075	17,069	.6720	17,569	.6917	3.63	2.05	.11	2.00	.750	1	1/8-27 NPT	364.010	170.270
KSEM0688R3SSF075	17,463	.6875	17,963	.7072	3.75	2.13	.11	2.00	.750	1	1/8-27 NPT	364.010	170.270
KSEM0703R3SSF075	17,856	.7030	18,000	.7086	3.75	2.13	.11	2.00	.750	1	1/8-27 NPT	364.010	170.270
KSEM0734R3SSF075	18,644	.7340	19,144	.7537	4.25	2.36	.12	2.00	.750	2	1/8-27 NPT	364.010	170.270
KSEM0750R3SSF075	19,050	.7500	19,550	.7502	4.25	2.36	.12	2.00	.750	2	1/8-27 NPT	364.010	170.270
KSEM0750R3SSF100	19,050	.7500	19,550	.7502	4.50	2.36	.12	3.00	1.000	2	1/4-18 NPT	364.010	170.270
KSEM0759R3SSF100	19,279	.7590	19,779	.7787	4.50	2.36	.12	3.00	1.000	2	1/4-18 NPT	364.010	170.270
KSEM0766R3SSF100	19,456	.7660	19,956	.7857	4.50	2.36	.12	3.00	1.000	2	1/4-18 NPT	364.010	170.270
KSEM0781R3SSF100	19,844	.7813	19,999	.7873	4.50	2.36	.12	3.00	1.000	2	1/4-18 NPT	364.010	170.270
KSEM0797R3SSF100	20,244	.7970	20,744	.8167	4.50	2.36	.13	3.00	1.000	3	1/4-18 NPT	364.011	170.272
KSEM0813R3SSF100	20,638	.8125	21,138	.8322	4.50	2.60	.13	3.00	1.000	3	1/4-18 NPT	364.011	170.272
KSEM0859R3SSF100	21,819	.8590	22,000	.8661	4.63	2.60	.14	3.00	1.000	3	1/4-18 NPT	364.011	170.272
KSEM0875R3SSF100	22,225	.8750	22,725	.8947	4.75	2.83	.14	3.00	1.000	4	1/4-18 NPT	364.011	170.272
KSEM0875R3SSF125	22,225	.8750	22,725	.8947	5.00	2.83	.14	3.25	1.250	4	1/4-18 NPT	364.011	170.272
KSEM0884R3SSF100	22,454	.8840	22,954	.9037	4.75	2.83	.14	3.00	1.000	4	1/4-18 NPT	364.011	170.272
KSEM0906R3SSF100	23,019	.9063	23,519	.9260	4.75	2.83	.14	3.00	1.000	4	1/4-18 NPT	364.011	170.272
KSEM0922R3SSF100	23,419	.9220	23,919	.9417	4.75	2.83	.15	3.00	1.000	4	1/4-18 NPT	364.011	170.272
KSEM0938R3SSF100	23,813	.9375	24,000	.9448	4.75	2.83	.15	3.00	1.000	4	1/4-18 NPT	364.011	170.272
KSEM0969R3SSF100	24,606	.9688	25,106	.9884	5.13	3.07	.15	3.00	1.000	5	1/4-18 NPT	364.012	170.274
KSEM0984R3SSF100	25,003	.9844	25,503	1.0041	5.13	3.07	.15	3.00	1.000	5	1/4-18 NPT	364.012	170.274
KSEM1000R3SSF100	25,400	1.0000	25,900	1.0197	5.13	3.07	.15	3.00	1.000	5	1/4-18 NPT	364.012	170.274
KSEM1000R3SSF125	25,400	1.0000	25,900	1.0197	5.25	3.07	.15	3.25	1.250	5	1/4-18 NPT	364.012	170.274
KSEM1011R3SSF100	25,679	1.0110	26,000	1.0236	5.13	3.07	.16	3.00	1.000	5	1/4-18 NPT	364.012	170.274
KSEM1031R3SSF125	26,195	1.0313	26,695	1.0510	5.50	3.31	.16	3.25	1.250	6	1/4-18 NPT	364.012	170.274

(continued)

(KSEM Flanged Shank • 3 x D • Inch continued)

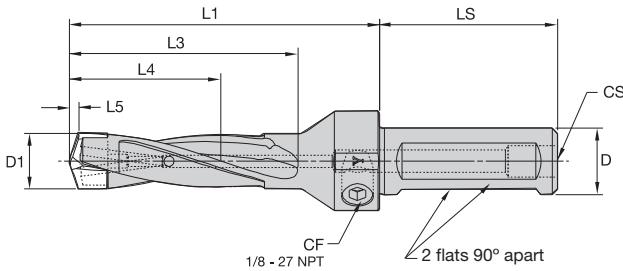
Modular Drills



	D1		D1 max		L1	L4 max	L5	LS	D	seat size	CS	central lock screw	wrench
	mm	in	mm	in									
KSEM1047R3SSF125	26,594	1.0470	27,094	1.0667	5.50	3.31	.16	3.25	1.250	6	1/4-18 NPT	364.012	170.274
KSEM1063R3SSF125	26,988	1.0625	27,488	1.0822	5.50	3.31	.16	3.25	1.250	6	1/4-18 NPT	364.012	170.274
KSEM1094R3SSF125	27,781	1.0938	28,000	1.1023	5.50	3.31	.17	3.25	1.250	6	1/4-18 NPT	364.012	170.274
KSEM1109R3SSF125	28,169	1.1090	28,669	1.1287	5.75	3.54	.17	3.25	1.250	7	1/4-18 NPT	364.013	170.276
KSEM1125R3SSF125	28,575	1.1250	29,075	1.1447	5.75	3.54	.17	3.25	1.250	7	1/4-18 NPT	364.013	170.276
KSEM1156R3SSF125	29,370	1.1563	29,870	1.1760	5.75	3.54	.18	3.25	1.250	7	1/4-18 NPT	364.013	170.276
KSEM1188R3SSF125	30,163	1.1875	30,663	1.2072	6.00	3.78	.18	3.25	1.250	8	1/4-18 NPT	364.013	170.276
KSEM1203R3SSF125	30,556	1.2030	31,056	1.2227	6.00	3.78	.19	3.25	1.250	8	1/4-18 NPT	364.013	170.276
KSEM1250R3SSF125	31,750	1.2500	32,000	1.2598	6.00	3.78	.19	3.25	1.250	8	1/4-18 NPT	364.013	170.276
KSEM1250R3SSF150	31,750	1.2500	32,000	1.2598	6.25	3.78	.19	3.75	1.500	8	1/4-18 NPT	364.013	170.276
KSEM1281R3SSF150	32,537	1.2810	33,537	1.3204	7.00	3.90	.20	3.75	1.500	9	1/4-18 NPT	364.015	170.276
KSEM1297R3SSF150	32,941	1.2970	33,941	1.3363	7.00	3.90	.20	3.75	1.500	9	1/4-18 NPT	364.015	170.276
KSEM1313R3SSF150	33,350	1.3130	34,350	1.3524	7.13	4.02	.20	3.75	1.500	9	1/4-18 NPT	364.015	170.276
KSEM1328R3SSF150	33,731	1.3280	34,731	1.3674	7.13	4.02	.20	3.75	1.500	9	1/4-18 NPT	364.015	170.276
KSEM1344R3SSF150	34,138	1.3440	35,138	1.3834	7.25	4.13	.21	3.75	1.500	9	1/4-18 NPT	364.015	170.276
KSEM1375R3SSF150	34,925	1.3750	35,925	1.4144	7.25	4.13	.21	3.75	1.500	9	1/4-18 NPT	364.015	170.276
KSEM1406R3SSF150	35,712	1.4060	36,000	1.4173	7.38	4.25	.22	3.75	1.500	9	1/4-18 NPT	364.015	170.276
KSEM1422R3SSF150	36,119	1.4220	37,119	1.4614	7.50	4.37	.22	3.75	1.500	10	1/4-18 NPT	364.015	170.276
KSEM1438R3SSF150	36,513	1.4380	37,513	1.4769	7.50	4.37	.22	3.75	1.500	10	1/4-18 NPT	364.015	170.276
KSEM1469R3SSF150	37,313	1.4690	38,313	1.5084	7.63	4.49	.23	3.75	1.500	10	1/4-18 NPT	364.015	170.276
KSEM1500R3SSF150	38,100	1.5000	39,100	1.5394	7.75	4.61	.23	3.75	1.500	10	1/4-18 NPT	364.015	170.276
KSEM1514R3SSF150	38,456	1.5140	39,456	1.5534	7.75	4.61	.23	3.75	1.500	10	1/4-18 NPT	364.015	170.276



- Use designated insert blade with each drill body.
- For alternatives, see insert blade fitment chart on page H44.
- Drill shipped with central lock screw, wrench, and side pipe plug.
- Order insert blade separately; see pages H42–H43.



Modular Drills

For information on L, L3, and L4 max, see the Modular Drill foldout table.

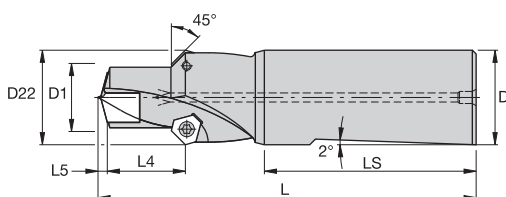
■ KSEM Flanged Shank • 5 x D/8 x D • Inch

		D1		D1 max		L5	LS	D	seat size	CS	central lock screw
		mm	in	mm	in						
KSEM0500R5SSF075	—	12,700	.5000	13,200	.5197	.079	2.00	.7500	C	1/8-27 NPT	364.017
KSEM0509R5SSF075	—	12,929	.5090	13,429	.5287	.081	2.00	.7500	C	1/8-27 NPT	364.017
KSEM0516R5SSF075	—	13,106	.5160	13,500	.5314	.082	2.00	.7500	C	1/8-27 NPT	364.017
KSEM0531R5SSF075	—	13,487	.5310	13,500	.5314	.084	2.00	.7500	C	1/8-27 NPT	364.017
KSEM0547R5SSF075	—	13,894	.5470	14,394	.5667	.087	2.00	.7500	B	1/8-27 NPT	364.016
KSEM0563R5SSF075	—	14,300	.5630	14,500	.5708	.089	2.00	.7500	B	1/8-27 NPT	364.016
KSEM0578R5SSF075	—	14,681	.5780	15,181	.5977	.092	2.00	.7500	A	1/8-27 NPT	364.016
KSEM0594R5SSF075	—	15,088	.5940	15,588	.6137	.094	2.00	.7500	A	1/8-27 NPT	364.016
KSEM0609R5SSF075	—	15,469	.6090	15,874	.6249	.097	2.00	.7500	A	1/8-27 NPT	364.016
KSEM0625R5SSF075	KSEM0625R8SSF075	15,875	.6250	16,375	.6447	.099	2.00	.7500	1	1/8-27 NPT	364.010
KSEM0688R5SSF075	KSEM0688R8SSF075	17,463	.6875	17,963	.7072	.109	2.00	.7500	1	1/8-27 NPT	364.010
KSEM0750R5SSF075	KSEM0750R8SSF075	19,050	.7500	19,550	.7502	.119	2.00	.7500	2	1/8-27 NPT	364.010
KSEM0750R5SSF100	KSEM0750R8SSF100	19,050	.7500	19,550	.7502	.119	3.00	1.0000	2	1/4-18 NPT	364.010
KSEM0813R5SSF100	KSEM0813R8SSF100	20,638	.8125	21,138	.8322	.129	3.00	1.0000	3	1/4-18 NPT	364.011
KSEM0875R5SSF100	KSEM0875R8SSF100	22,225	.8750	22,725	.8947	.139	3.00	1.0000	4	1/4-18 NPT	364.011
KSEM0875R5SSF125	KSEM0875R8SSF125	22,225	.8750	22,725	.8947	.139	3.25	1.2500	4	1/4-18 NPT	364.011
KSEM0938R5SSF100	KSEM0938R8SSF100	23,813	.9375	24,000	.9448	.149	3.00	1.0000	4	1/4-18 NPT	364.011
KSEM0969R5SSF100	—	24,606	.9688	25,106	.9884	.154	3.00	1.0000	5	1/4-18 NPT	364.012
KSEM0984R5SSF100	KSEM0984R8SSF100	25,003	.9844	25,503	1.0041	.151	3.00	1.0000	5	1/4-18 NPT	364.012
KSEM1000R5SSF100	KSEM1000R8SSF100	25,400	1.0000	25,900	1.0197	.154	3.00	1.0000	5	1/4-18 NPT	364.012
KSEM1000R5SSF125	KSEM1000R8SSF125	25,400	1.0000	25,900	1.0197	.154	3.25	1.2500	5	1/4-18 NPT	364.012
KSEM1063R5SSF125	KSEM1063R8SSF125	26,988	1.0625	27,488	1.0822	.164	3.25	1.2500	6	1/4-18 NPT	364.012
KSEM1125R5SSF125	KSEM1125R8SSF125	28,575	1.1250	29,075	1.1447	.173	3.25	1.2500	7	1/4-18 NPT	364.013
KSEM1188R5SSF125	KSEM1188R8SSF125	30,163	1.1875	30,663	1.2072	.183	3.25	1.2500	8	1/4-18 NPT	364.013
KSEM1250R5SSF125	KSEM1250R8SSF125	31,750	1.2500	32,000	1.2598	.192	3.25	1.2500	8	1/4-18 NPT	364.013
KSEM1250R5SSF150	KSEM1250R8SSF150	31,750	1.2500	32,000	1.2598	.192	3.75	1.5000	8	1/4-18 NPT	364.013

KSEM Chamfering Solutions

- Drilling and chamfering in one operation.
- No height adjustment required.
- Low setup time.
- Use standard inserts.
- Tool bodies available as standard.

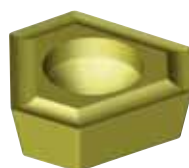
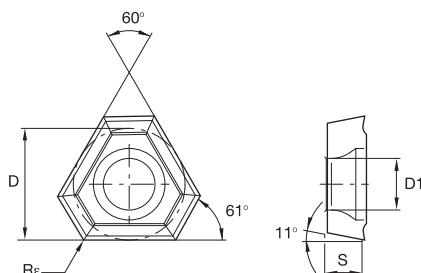
- Use any KSEM insert blade diameter within the designated seat size.
- Drill shipped with central lock screw, insert screw, and wrenches.
- Order insert blades separately; see pages H42–H43.
- Order TPGX chamfering insert separately; see page H36.



■ KSEM Bodies • WN/WD Shank with Chamfer • 1 x D • Metric



	D1		D1 max		D22	L	L4 max	L5	LS	D	seat size	chamfer insert	central lock screw	wrench
	mm	in	mm	in										
KSEM125R1WN16F45M	12,500	.4921	13,500	.5314	18	107	14	2,0	48,0	16	C	TPGX0902ZPR	364.017	170.051
KSEM136R1WN16F45M	13,510	.5319	14,500	.5708	19	107	15	2,2	48,0	16	B	TPGX0902ZPR	364.016	170.289
KSEM146R1WN20F45M	14,510	.5713	15,874	.6249	20	109	16	2,3	50,0	20	A	TPGX0902ZPR	364.016	170.289
KSEM160R1WN20F45M	16,000	.6299	18,000	.7086	22	110	18	2,5	50,0	20	1	TPGX1102ZPR	364.010	170.270
KSEM181R1WN25F45M	18,010	.7091	19,999	.7873	25	118	20	2,9	56,0	25	2	TPGX1102ZPR	364.010	170.270
KSEM200R1WN25F45M	20,000	.7874	22,000	.8661	28	120	22	3,2	56,0	25	3	TPGX1303ZPR	364.011	170.272
KSEM221R1WN25F45M	22,010	.8665	24,000	.9448	30	123	24	3,5	56,0	25	4	TPGX1303ZPR	364.011	170.272
KSEM241R1WN32F45M	24,010	.9453	26,000	1.0236	34	129	26	3,8	60,0	32	5	TPGX1603ZPR	364.012	170.055
KSEM261R1WN32F45M	26,010	1.0240	28,000	1.1023	36	131	28	4,0	60,0	32	6	TPGX1603ZPR	364.012	170.055
KSEM281R1WN32F45M	28,016	1.1028	30,000	1.1811	38	134	30	4,3	60,0	32	7	TPGX1603ZPR	364.013	170.276
KSEM301R1WN32F45M	30,010	1.1815	32,000	1.2598	40	136	32	4,6	60,0	32	8	TPGX1603ZPR	364.013	170.276
KSEM321R1WD50F45M	32,010	1.2602	36,000	1.4173	42	155	36	4,9	68,0	50	9	TPGX1603ZPR	364.015	170.276
KSEM361R1WD50F45M	36,010	1.4177	40,000	1.5748	46	165	40	5,5	68,0	50	10	TPGX1603ZPR	364.015	170.276



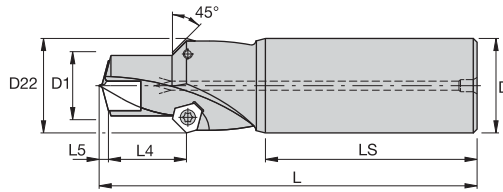
- first choice
- alternate choice

P	●	○	○
M	●	○	○
K	○	○	○
N	○	○	○
S	○	○	○
H	○	○	○

■ TPGX-GD Geometry

catalog number	D		S		Re		D1		KC7015	KC7140	KC7315
	mm	in	mm	in	mm	in	mm	in			
TPGX0902ZPRGD	5,56	.219	2,38	.094	0,20	.008	2,50	.098	●	●	●
TPGX1102ZPRGD	6,35	.250	2,38	.094	0,20	.008	2,85	.112	●	●	●
TPGX1303ZPRGD	7,94	.313	3,18	.125	0,20	.008	3,40	.134	●	●	●
TPGX1603ZPRGD	9,52	.375	3,18	.125	0,20	.008	4,40	.173	●	●	●

- Use any KSEM insert blade diameter within the designated seat size.
- Drill shipped with central lock screw, insert screw, and wrenches.
- Order insert blade separately; see pages H42–H43.
- Order TPGX chamfering insert separately; see page H36.

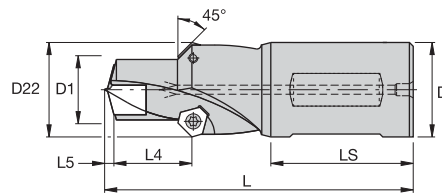


Modular Drills

■ **KSEM Bodies • Round Shank with Chamfer • 1 x D • Inch**



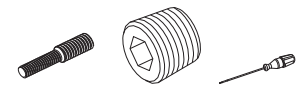
	D1		D1 max		D22	L	L4 max	L5	LS	D	seat size	chamfer insert	central lock screw	wrench
	mm	in	mm	in										
KSEM0493R1SS075F45	12,500	.4921	13,500	.5314	.70	3.75	.53	.08	2.00	.750	C	TPGX0902ZPR	364.017	170.051
KSEM0532R1SS075F45	13,600	.5350	14,500	.5708	.74	3.75	.57	.08	2.00	.750	B	TPGX0902ZPR	364.016	170.289
KSEM0571R1SS075F45	14,600	.5750	15,874	.6249	.77	3.75	.62	.09	2.00	.750	A	TPGX0902ZPR	364.016	170.289
KSEM0625R1SS075F45	15,880	.6250	18,000	.7086	.88	3.75	.71	.10	2.00	.750	1	TPGX1102ZPR	364.010	170.270
KSEM0709R1SS075F45	18,260	.7190	19,999	.7873	.96	3.75	.78	.11	2.00	.750	2	TPGX1102ZPR	364.010	170.270
KSEM0788R1SS100F45	20,000	.7870	22,000	.8661	1.11	5.00	.87	.13	3.00	1.000	3	TPGX1303ZPR	364.011	170.272
KSEM0867R1SS100F45	22,230	.8750	24,000	.9448	1.19	5.00	.94	.14	3.00	1.000	4	TPGX1303ZPR	364.011	170.272
KSEM0945R1SS100F45	24,500	.9650	26,000	1.0236	1.34	5.25	1.02	.15	3.00	1.000	5	TPGX1603ZPR	364.012	170.055
KSEM1024R1SS125F45	26,187	1.0310	28,000	1.1023	1.42	5.75	1.10	.16	3.25	1.250	6	TPGX1603ZPR	364.012	170.055
KSEM1103R1SS125F45	28,169	1.1090	30,000	1.1811	1.50	5.75	1.18	.17	3.25	1.250	7	TPGX1603ZPR	364.013	170.276
KSEM1182R1SS125F45	30,160	1.1880	32,000	1.2598	1.58	5.75	1.26	.18	3.25	1.250	8	TPGX1603ZPR	364.013	170.276
KSEM1260R1SS125F45	32,500	1.2800	36,000	1.4173	1.66	6.00	1.42	.19	3.25	1.250	9	TPGX1603ZPR	364.015	170.276
KSEM1418R1SS125F45	36,119	1.4220	40,000	1.5748	1.82	6.00	1.57	.22	3.25	1.250	10	TPGX1603ZPR	364.015	170.276



■ **KSEM Bodies • Flanged Shank with Chamfer • 1 x D • Inch**

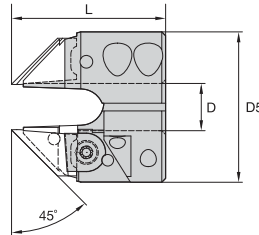


	D1		D1 max		D22	L	L4 max	L5	LS	D	seat size	chamfer insert	central lock screw	pipe plug	wrench
	mm	in	mm	in											
KSEM0493R1SSF075F45	12,500	.4921	13,500	.5314	.70	4.00	.53	.08	2.00	.750	C	TPGX0902ZPR	364.017	HSFS0125	170.051
KSEM0532R1SSF075F45	13,600	.5350	14,500	.5708	.74	4.25	.57	.08	2.00	.750	B	TPGX0902ZPR	364.016	HSFS0125	170.289
KSEM0571R1SSF075F45	14,600	.5750	15,874	.6249	.77	4.25	.62	.09	2.00	.750	A	TPGX0902ZPR	364.016	HSFS0125	170.289
KSEM0625R1SSF075F45	15,880	.6250	18,000	.7086	.88	4.25	.71	.10	2.00	.750	1	TPGX1102ZPR	364.010	HSFS0125	170.270
KSEM0709R1SSF075F45	18,260	.7190	19,999	.7873	.96	4.25	.78	.11	2.00	.750	2	TPGX1102ZPR	364.010	HSFS0125	170.270
KSEM0788R1SSF100F45	20,000	.7870	22,000	.8661	1.11	5.50	.87	.13	3.00	1.000	3	TPGX1303ZPR	364.011	HSFS0125	170.272
KSEM0867R1SSF100F45	22,230	.8750	24,000	.9448	1.19	5.50	.94	.14	3.00	1.000	4	TPGX1303ZPR	364.011	HSFS0125	170.272
KSEM0945R1SSF100F45	24,500	.9650	26,000	1.0236	1.34	5.75	1.02	.15	3.00	1.000	5	TPGX1603ZPR	364.012	HSFS0125	170.055
KSEM1024R1SSF125F45	26,187	1.0310	28,000	1.1023	1.42	5.75	1.10	.16	3.25	1.250	6	TPGX1603ZPR	364.012	HSFS0125	170.055
KSEM1103R1SSF125F45	28,169	1.1090	30,000	1.1811	1.50	6.25	1.18	.17	3.25	1.250	7	TPGX1603ZPR	364.013	HSFS0125	170.276
KSEM1182R1SSF125F45	30,160	1.1880	32,000	1.2598	1.58	6.25	1.26	.18	3.25	1.250	8	TPGX1603ZPR	364.013	HSFS0125	170.276
KSEM1260R1SSF125F45	32,500	1.2800	36,000	1.4173	1.66	6.25	1.42	.19	3.25	1.250	9	TPGX1603ZPR	364.015	HSFS0125	170.276
KSEM1418R1SSF125F45	36,119	1.4220	40,000	1.5748	1.82	6.25	1.57	.22	3.25	1.250	10	TPGX1603ZPR	364.015	HSFS0125	170.276



- The NEW chamfering rings for KSEM are available in a diameter range of 12,5–32mm.
- The KSEM SEF ring is double-edged, features a more rigid design to withstand high feed rates, and reduces time-consuming deburring and small chamfer operations.
- Reduce machining time — combine drilling and chamfering in one operation.
- Short-term availability — standard tooling off-the-shelf — KSEM body and inserts, SEF ring, and SEFAS™ inserts.
- Flexibility — adjustable drilling depth.
- For speed and feed recommendations, please refer to catalog recommendations based on geometry and tool body length of the carrying KSEM tool.

- Small chamfers up to 1mm do not need further feed reduction.
- At deeper chamfers, a feed rate reduction of 50% is highly recommended to avoid vibrations and movement of the ring during operation.
- For inserts, please refer to SEFAS System on page I26, insert 3.42807R021.

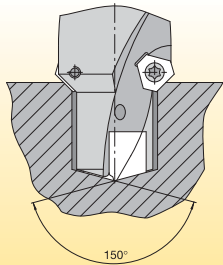


■ Chamfer Rings

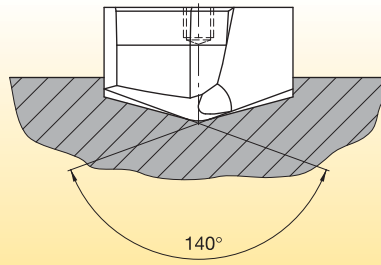


catalog number	D		L		D5		clamp assy	chip deflector	chip deflector screw	drill clamp screw	socket-head cap screw
	mm	in	mm	in	mm	in					
KSEM125SEFM	12,5	.4921	40	1.57	39	1.54	360.551	360.660	128.508	191.726	—
KSEM130SEFM	13,0	.5118	40	1.57	39	1.54	360.551	360.660	128.508	191.726	—
KSEM135SEFM	13,5	.5315	40	1.57	39	1.54	360.551	360.660	128.508	191.726	—
KSEM140SEFM	14,0	.5512	40	1.57	40	1.57	360.551	360.661	128.508	199.123	—
KSEM145SEFM	14,5	.5709	40	1.57	40	1.57	360.551	360.661	128.508	199.123	—
KSEM150SEFM	15,0	.5906	40	1.57	40	1.57	360.551	360.662	128.508	199.123	—
KSEM155SEFM	15,5	.6102	40	1.57	40	1.57	360.551	360.662	128.508	199.123	—
KSEM160SEFM	16,0	.6299	42	1.65	43	1.69	360.551	360.663	128.508	199.123	—
KSEM165SEFM	16,5	.6496	42	1.65	43	1.69	360.551	360.663	128.508	199.123	—
KSEM170SEFM	17,0	.6693	42	1.65	43	1.69	360.551	360.663	128.508	199.123	—
KSEM175SEFM	17,5	.6890	42	1.65	43	1.69	360.551	360.663	128.508	199.123	—
KSEM180SEFM	18,0	.7087	42	1.65	43	1.69	360.551	360.663	128.508	199.123	—
KSEM185SEFM	18,5	.7283	42	1.65	43	1.69	360.551	360.664	128.508	199.123	—
KSEM190SEFM	19,0	.7480	42	1.65	43	1.69	360.551	360.664	128.508	199.123	—
KSEM195SEFM	19,5	.7677	42	1.65	43	1.69	360.551	360.664	128.508	199.123	—
KSEM200SEFM	20,0	.7874	48	1.89	50	1.97	360.551	360.665	128.510	199.123	—
KSEM205SEFM	20,5	.8071	48	1.89	50	1.97	360.551	360.665	128.510	199.123	—
KSEM210SEFM	21,0	.8268	48	1.89	50	1.97	360.551	360.665	128.510	199.123	—
KSEM215SEFM	21,5	.8465	48	1.89	50	1.97	360.551	360.665	128.510	199.123	—
KSEM220SEFM	22,0	.8661	48	1.89	50	1.97	360.551	360.665	128.510	199.123	—
KSEM225SEFM	22,5	.8858	50	1.97	50	1.97	360.551	360.666	128.510	—	125.516
KSEM230SEFM	23,0	.9055	50	1.97	50	1.97	360.551	360.666	128.510	—	125.516
KSEM235SEFM	23,5	.9252	50	1.97	50	1.97	360.551	360.666	128.510	—	125.516
KSEM240SEFM	24,0	.9449	50	1.97	50	1.97	360.551	360.666	128.510	—	125.516
KSEM245SEFM	24,5	.9646	54	2.13	55	2.17	360.551	360.667	128.510	—	125.620
KSEM250SEFM	25,0	.9843	54	2.13	55	2.17	360.551	360.667	128.510	—	125.620
KSEM255SEFM	25,5	1.0039	54	2.13	55	2.17	360.551	360.667	128.510	—	125.620
KSEM260SEFM	26,0	1.0236	54	2.13	55	2.17	360.551	360.667	128.510	—	125.620
KSEM265SEFM	26,5	1.0433	56	2.20	55	2.17	360.551	360.668	128.510	—	125.620
KSEM270SEFM	27,0	1.0630	56	2.20	55	2.17	360.551	360.668	128.510	—	125.620
KSEM275SEFM	27,5	1.0827	56	2.20	55	2.17	360.551	360.668	128.510	—	125.620
KSEM280SEFM	28,0	1.1024	56	2.20	55	2.17	360.551	360.668	128.510	—	125.620
KSEM285SEFM	28,5	1.1220	61	2.40	60	2.36	360.551	360.669	128.510	—	125.620
KSEM290SEFM	29,0	1.1417	61	2.40	60	2.36	360.551	360.669	128.510	—	125.620
KSEM295SEFM	29,5	1.1614	61	2.40	60	2.36	360.551	360.669	128.510	—	125.620
KSEM300SEFM	30,0	1.1811	61	2.40	60	2.36	360.551	360.669	128.510	—	125.620
KSEM305SEFM	30,5	1.2008	61	2.40	60	2.36	360.551	360.670	128.510	—	125.620
KSEM310SEFM	31,0	1.2205	61	2.40	60	2.36	360.551	360.670	128.510	—	125.620
KSEM315SEFM	31,5	1.2402	61	2.40	60	2.36	360.551	360.670	128.510	—	125.620
KSEM320SEFM	32,0	1.2598	61	2.40	60	2.36	360.551	360.670	128.510	—	125.620

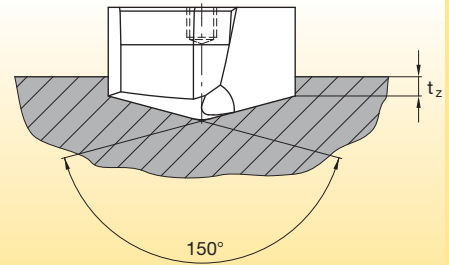
NOTE: Order inserts separately; see the SEFAS system, page I26, insert 3.42807R021.



Centering using PCM inserts



HPM inserts of the follower drill



Precentering with FAS centering tool

Why is precentering necessary?

- Generally speaking, for drilling depths 5x the nominal diameter and above (5 x D).
- In unstable conditions (workpiece and tool clamping).

Why precenter using PCM inserts?

- Soft-cut entry of follower drill due to 150° point angle of the PCM insert.
- No extension of the follower drill in the entry area.
- No breaks at the cutting edges.

What happens if...

...a center cannot be used for technical reasons?

- Spot drill with normal insert at normal and reduced cutting data (approximately 1/2 vc and approximately 1/2 vf), then continue drilling with regular cutting data without lifting off/stopping.

...there is no suitable PCM cutting insert in the standard range (ϕ)?

- Manufacture to order using PCM geometry and k7 tolerance.
or
- Center using the same cutter insert as for the follower drill but without the cutting edges penetrating the workpiece (spot drill ϕ approximately 90% of drill ϕ D1).

...only one tool body is required?

- Enter the workpiece with 50% feed until the cutting edges and the heels have penetrated the hole, then continue drilling without lifting off/stopping using regular cutting data.

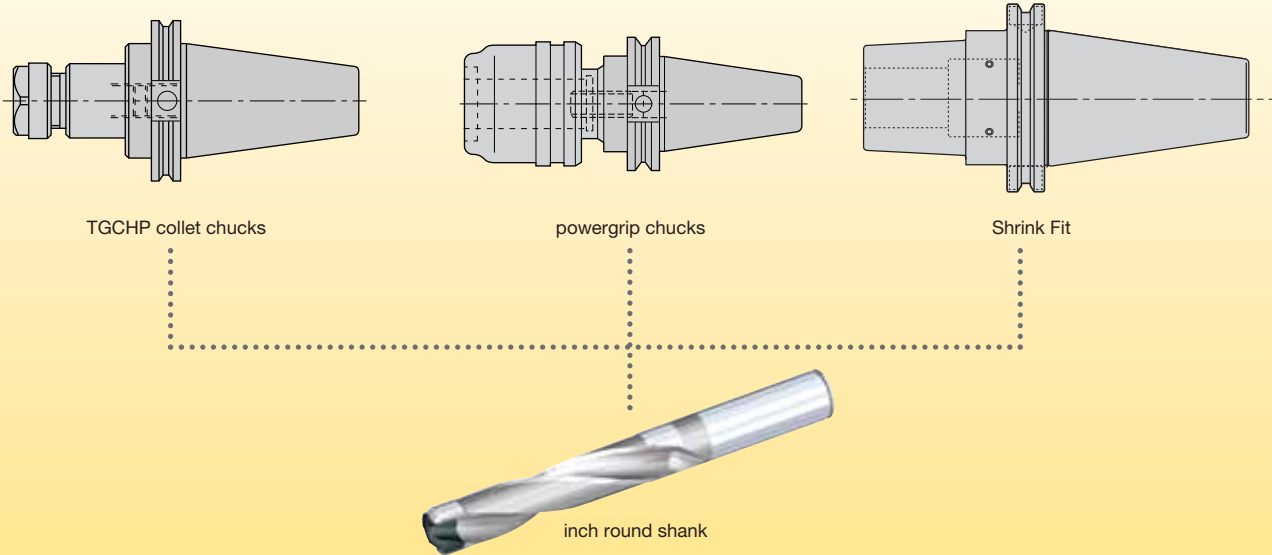
Other problems

Short hole drilling with precentering support tool?

- Up to 1x nominal diameter (1 x D) possible.

Rotating Applications

KSEM inch drills with round shanks (no flats) are specifically designed for rotating applications where the drill rotates and the workpiece remains stationary. The shank to drill-point location of these drills is held to an extremely close tolerance. To maintain accuracy, and get maximum performance from the KSEM drill, use only the approved toolholding method shown below.

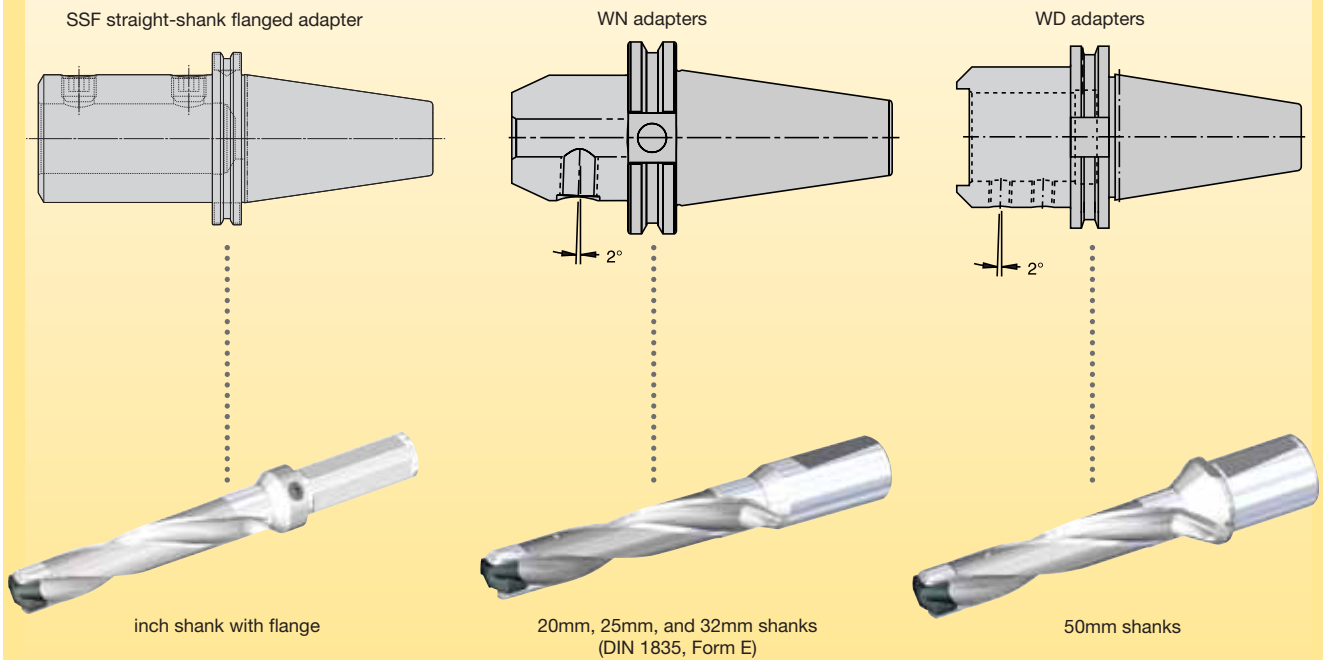


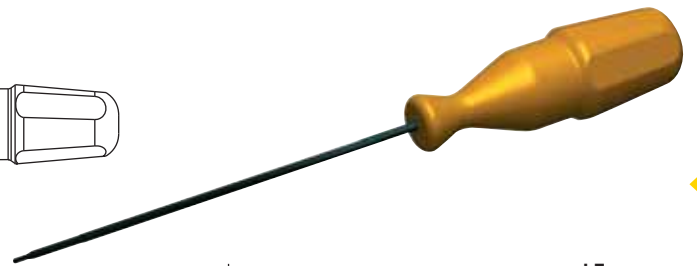
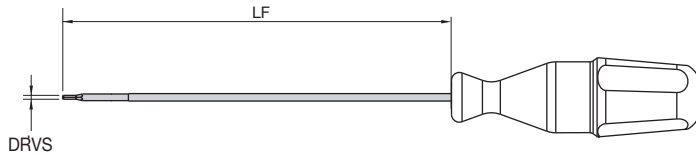
Inch Drill Bodies with Flange

KSEM inch drills with a flange can be used in rotating applications where the drill rotates and the workpiece remains stationary. To maintain accuracy and get maximum performance from the drill, use only the approved toolholding method shown here.

Metric Drill Bodies with a 2° Whistle Notch™

KSEM metric drills come equipped with 2° Whistle Notch shanks. The 20mm, 25mm, and 32mm diameter shanks use WN adapters. The 50mm shank uses a WD adapter. Choose the correct adapter to minimize runout and securely hold the drill.



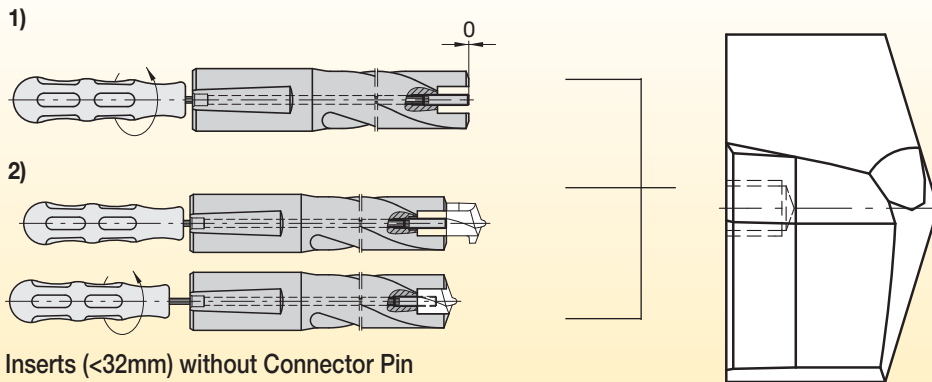


■ KSEM Spare Wrenches

order number	catalog number	DRVS	LF	
			mm	in
1126021	170.270	1.5mm	185,00	7
1126032	170.271	1.5mm	225,00	9
1510773	170.281	1.5mm	297,00	12
1255899	170.285	1.5mm	351,00	14
1126040	170.272	2mm	210,00	8
1126049	170.273	2mm	260,00	10
1510776	170.282	2mm	343,00	14
1255900	170.286	2mm	405,00	16
1126066	170.274	2.5mm	240,00	9
1126072	170.275	2.5mm	295,00	12
1510779	170.283	2.5mm	393,00	15
1255901	170.287	2.5mm	459,00	18
1126079	170.276	3mm	265,00	10
1126088	170.277	3mm	330,00	13
1510781	170.284	3mm	439,00	17
1255902	170.288	3mm	513,00	20
1834819	170.294	T5	156,00	6
1836470	170.295	T5	188,00	7
1836471	170.296	T5	290,00	11
1795811	170.289	T6	156,00	6
1795956	170.290	T6	188,00	7
1795960	170.291	T6	290,00	11

Modular Drills

Mounting the Inserts



Inserts (<32mm) without Connector Pin

- 1) Use the screwdriver to set the threaded pin:
 - for inserts up to Ø 32mm, flush with the drill face.
 - for inserts bigger Ø 32mm, set 2mm below the drill face.
- 2) Tighten the insert using the screwdriver to fit securely in the insert seat.

To change the insert, turn the clamping screw counter-clockwise until the insert is released.

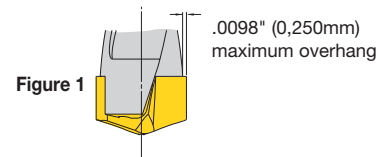
Repair of Damaged Threaded Pin

In the event that the central threaded pin becomes damaged, it can be removed after severing it in the tool body. To do this, drill beneath the insert seat in the tool body. The insert and threaded pin can then be removed. For information regarding the position and diameter of this repair hole, please refer to the manual (sheet 290.001 D/GB) supplied with the tool body.

NOTE: For inserts without a connector pin, avoid jamming during mounting through precise positioning.

Insert blades may be used, within limits, on different drill bodies. The insert blade must be of the same seat size. Overhang (see Figure 1) must be kept under .0098" (0,250mm) per side. For best drilling performance, rigidity, and efficient chip evacuation, always use the first-choice steel body. Performance may be compromised by using alternatives. In some applications, chips may bind between the drill body and the hole wall — especially when machining long-chipping materials like austenitic stainless steel and low-carbon steel.

(does not apply to stub length drills)



Modular Drills

diameter D		insert blade	seat size	first choice	alternate body 1	alternate body 2	alternate body 3	alternate body 4
inch	mm							
.492	12,50	KSEM1250	C	KSEM125..M	—	—	—	—
.500	12,70	KSEM0500	C	KSEM0500..	KSEM125..M	—	—	—
.509	12,93	KSEM0509	C	KSEM0509..	KSEM0500..	KSEM125..M	—	—
.512	13,00	KSEM1300	C	KSEM130..M	KSEM0509..	KSEM0500..	KSEM125..M	—
.516	13,10	KSEM0516	C	KSEM0516..	KSEM130..M	KSEM0509..	KSEM0500..	—
.531	13,50	KSEM1350	C	KSEM135..M	KSEM0531..	KSEM0516..	KSEM130..M	—
.547	13,89	KSEM0547	B	KSEM0547..	KSEM136..M	—	—	—
.551	14,00	KSEM1400	B	KSEM140..M	KSEM136..M	KSEM0547..	—	—
.563	14,29	KSEM0563	B	KSEM0563..	KSEM140..M	KSEM0547..	—	—
.571	14,50	KSEM1450	B	KSEM145..M	KSEM0563..	KSEM140..M	—	—
.578	14,68	KSEM0578	A	KSEM0578..	KSEM146..M	—	—	—
.591	15,00	KSEM1500	A	KSEM150..M	KSEM146..M	KSEM0578..	—	—
.594	15,08	KSEM0594	A	KSEM0594..	KSEM150..M	KSEM0578..	—	—
.609	15,48	KSEM0609	A	KSEM0609..	KSEM0594..	KSEM150..M	—	—
.610	15,50	KSEM1550	A	KSEM155..M	KSEM0609..	KSEM0594..	KSEM150..M	—
.625	15,88	KSEM0625	1	KSEM0625..	—	—	—	—
.630	16,00	KSEM1600	1	KSEM160..M	KSEM0625..	—	—	—
.634	16,09	KSEM0634	1	KSEM0634..	KSEM160..M	KSEM0625..	—	—
.641	16,27	KSEM0641	1	KSEM0641..	KSEM0634..	KSEM160..M	KSEM0625..	—
.650	16,50	KSEM1650	1	KSEM165..M	KSEM0641..	KSEM0634..	—	—
.656	16,67	KSEM0656	1	KSEM0656..	KSEM165..M	KSEM0641..	—	—
.669	17,00	KSEM1700	1	KSEM170..M	KSEM0656..	KSEM165..M	—	—
.672	17,07	KSEM0672	1	KSEM0672..	KSEM170..M	KSEM0656..	—	—
.688	17,46	KSEM0688	1	KSEM0688..	KSEM0672..	KSEM170..M	—	—
.689	17,50	KSEM1750	1	KSEM175..M	KSEM0688..	KSEM0672..	KSEM170..M	—
.700	17,78	KSEM0700	1	N/A	KSEM175..M	KSEM0688..	—	—
.703	17,86	KSEM0703	1	KSEM0703..	KSEM175..M	KSEM0688..	—	—
.709	18,00	KSEM1800	1	KSEM180..M	KSEM0703..	KSEM175..M	—	—
.719	18,26	KSEM0719	2	KSEM0719..	KSEM181..M	—	—	—
.728	18,50	KSEM1850	2	KSEM185..M	KSEM0719..	KSEM181..M	—	—
.734	18,65	KSEM0734	2	KSEM0734..	KSEM185..M	KSEM0719..	—	—
.748	19,00	KSEM1900	2	KSEM190..M	KSEM0734..	KSEM185..M	—	—
.750	19,05	KSEM0750	2	KSEM0750..	KSEM190..M	KSEM0734..	—	—
.759	19,27	KSEM0759	2	KSEM0759..	KSEM0750..	KSEM190..M	—	—
.766	19,45	KSEM0766	2	KSEM0766..	KSEM0759..	KSEM0750..	KSEM190..M	—
.768	19,50	KSEM1950	2	KSEM195..M	KSEM0766..	KSEM0759..	KSEM0750..	KSEM190..M
.781	19,84	KSEM0781	2	KSEM0781..	KSEM195..M	KSEM0766..	—	—
.787	20,00	KSEM2000	3	KSEM200..M	—	—	—	—
.797	20,24	KSEM0797	3	KSEM0797..	KSEM200..M	—	—	—
.800	20,32	KSEM0800	3	N/A	KSEM0797..	KSEM200..M	—	—
.807	20,50	KSEM2050	3	KSEM205..M	KSEM0797..	KSEM200..M	—	—
.813	20,64	KSEM0813	3	KSEM0813..	KSEM205..M	KSEM0797..	—	—
.827	21,00	KSEM2100	3	KSEM210..M	KSEM0813..	KSEM205..M	—	—
.844	21,43	KSEM0844	3	KSEM0844..	KSEM210..M	—	—	—
.847	21,50	KSEM2150	3	KSEM215..M	KSEM0844..	KSEM210..M	—	—
.859	21,83	KSEM0859	3	KSEM0859..	KSEM215..M	KSEM0844..	—	—
.866	22,00	KSEM2200	3	KSEM220..M	KSEM0859..	KSEM215..M	—	—
.875	22,23	KSEM0875	4	KSEM0875..	KSEM221..M	—	—	—
.884	22,44	KSEM0884	4	KSEM0884..	KSEM0875..	KSEM221..M	—	—
.886	22,50	KSEM2250	4	KSEM225..M	KSEM0884..	KSEM0875..	KSEM221..M	—
.906	23,00	KSEM2300	4	KSEM230..M	KSEM0906..	KSEM225..M	—	—
.922	23,42	KSEM0922	4	KSEM0922..	KSEM230..M	—	—	—
.925	23,50	KSEM2350	4	KSEM235..M	KSEM0922..	KSEM230..M	—	—
.938	23,81	KSEM0938	4	KSEM0938..	KSEM235..M	KSEM0922..	—	—
.945	24,00	KSEM2400	4	KSEM240..M	KSEM0938..	KSEM235..M	—	—

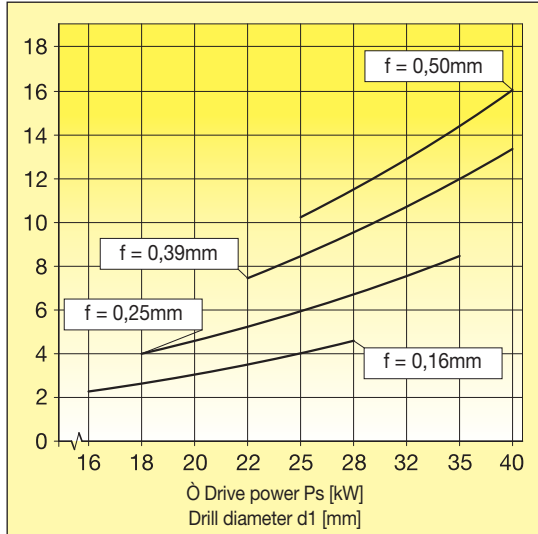
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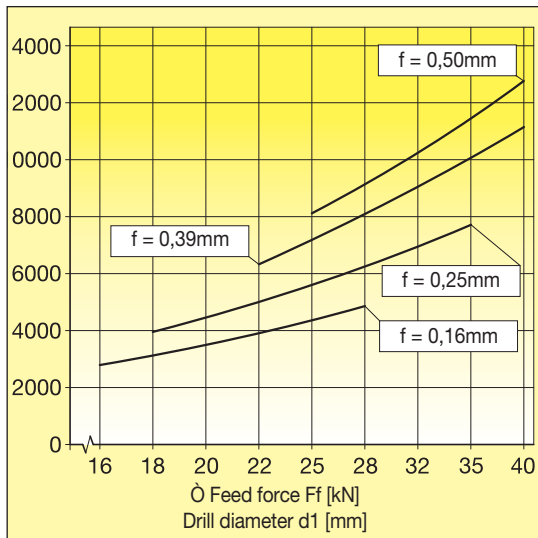
diameter D		insert blade	seat size	first choice	alternate body 1	alternate body 2	alternate body 3	alternate body 4
inch	mm							
.965	24,50	KSEM2450	5	KSEM245..M	KSEM241..M	—	—	—
.969	24,61	KSEM0969	5	KSEM0969..	KSEM245..M	—	—	—
.984	25,00	KSEM2500	5	KSEM250..M	KSEM0984..	KSEM0969..	KSEM245..M	—
1.000	25,40	KSEM1000	5	KSEM1000..	KSEM250..M	—	—	—
1.004	25,50	KSEM2550	5	KSEM255..M	KSEM1000..	KSEM250..M	—	—
1.011	25,67	KSEM1011	5	KSEM1011..	KSEM255..M	—	—	—
1.024	26,00	KSEM2600	5	KSEM260..M	KSEM1011..	KSEM255..M	—	—
1.031	26,19	KSEM1031	6	KSEM1031..	KSEM261..M	—	—	—
1.043	26,50	KSEM2650	6	KSEM265..M	KSEM1031..	KSEM261..M	—	—
1.047	26,59	KSEM1047	6	KSEM1047..	KSEM265..M	KSEM1031..	KSEM261..M	—
1.063	27,00	KSEM2700	6	KSEM270..M	KSEM1063..	KSEM1047..	KSEM265..M	—
1.083	27,50	KSEM2750	6	KSEM275..M	KSEM270..M	KSEM1063..	—	—
1.094	27,78	KSEM1094	6	KSEM1094..	KSEM275..M	—	—	—
1.102	28,00	KSEM2800	6	KSEM280..M	KSEM1094..	KSEM275..M	—	—
1.109	28,18	KSEM1109	7	KSEM1109..	KSEM281..M	—	—	—
1.122	28,50	KSEM2850	7	KSEM285..M	KSEM1109..	KSEM281..M	—	—
1.125	28,58	KSEM1125	7	KSEM1125..	KSEM285..M	KSEM1109..	KSEM281..M	—
1.142	29,00	KSEM2900	7	KSEM290..M	KSEM1125..	KSEM285..M	—	—
1.156	29,37	KSEM1156	7	KSEM1156..	KSEM290..M	—	—	—
1.161	29,50	KSEM2950	7	KSEM295..M	KSEM1156..	KSEM290..M	—	—
1.172	29,77	KSEM1172	7	KSEM1172..	KSEM295..M	KSEM1156..	—	—
1.181	30,00	KSEM3000	7	KSEM300..M	KSEM1172..	KSEM295..M	—	—
1.188	30,16	KSEM1188	8	KSEM1188..	KSEM301..M	—	—	—
1.201	30,50	KSEM3050	8	KSEM305..M	KSEM1188..	KSEM301..M	—	—
1.203	30,56	KSEM1203	8	KSEM1203..	KSEM305..M	KSEM1188..	KSEM301..M	—
1.219	30,96	KSEM1219	8	KSEM1219..	KSEM1203..	KSEM305..M	—	—
1.220	31,00	KSEM3100	8	KSEM310..M	KSEM1219..	KSEM1203..	KSEM305..M	—
1.240	31,50	KSEM3150	8	KSEM315..M	KSEM310..M	—	—	—
1.250	31,75	KSEM1250	8	KSEM1250..	KSEM315..M	—	—	—
1.260	32,00	KSEM3200	8	KSEM320..M	KSEM1250..	KSEM315..M	—	—
1.280	32,50	KSEM3250	9	—	KSEM321..M	—	—	—
1.281	32,54	KSEM1281	9	KSEM1281..	KSEM321..M	—	—	—
1.297	32,94	KSEM1297	9	KSEM1297..	KSEM1281..	—	—	—
1.299	33,00	KSEM3300	9	KSEM330..M	KSEM1297..	KSEM1281..	—	—
1.313	33,34	KSEM1313	9	KSEM1313..	KSEM330..M	KSEM1297..	—	—
1.319	33,50	KSEM3350	9	—	—	KSEM1313..	KSEM330..M	—
1.328	33,73	KSEM1328	9	KSEM1328..	KSEM1313..	—	—	—
1.339	34,00	KSEM3400	9	KSEM340..M	KSEM1328..	—	—	—
1.344	34,13	KSEM1344	9	KSEM1344..	KSEM340..M	KSEM1328..	—	—
1.358	34,50	KSEM3450	9	—	—	KSEM1344..	KSEM340..M	—
1.375	34,93	KSEM1375	9	KSEM1375..	—	—	—	—
1.378	35,00	KSEM3500	9	KSEM350..M	KSEM1375..	—	—	—
1.398	35,50	KSEM3550	9	—	—	KSEM350..M	—	—
1.406	35,72	KSEM1406	9	KSEM1406..	—	—	—	—
1.417	36,00	KSEM3600	9	KSEM360..M	KSEM1406..	—	—	—
1.422	36,12	KSEM1422	10	KSEM1422..	KSEM361..M	—	—	—
1.437	36,50	KSEM3650	10	—	—	KSEM1422..	KSEM361..M	—
1.438	36,51	KSEM1438	10	KSEM1438..	KSEM1422..	KSEM361..M	—	—
1.457	37,00	KSEM3700	10	KSEM370..M	KSEM1438..	—	—	—
1.469	37,31	KSEM1469	10	KSEM1469..	KSEM370..M	—	—	—
1.476	37,50	KSEM3750	10	—	—	KSEM1469..	KSEM370..M	—
1.496	38,00	KSEM3800	10	KSEM380..M	—	—	—	—
1.500	38,10	KSEM1500	10	KSEM1500..	KSEM380..M	—	—	—
1.514	38,46	KSEM1514	10	KSEM1514..	KSEM1500..	KSEM380..M	—	—
1.516	38,50	KSEM3850	10	—	—	KSEM1514..	KSEM1500..	KSEM380..M
1.535	39,00	KSEM3900	10	KSEM390..M	—	—	—	—
1.555	39,50	KSEM3950	10	—	—	KSEM390..M	—	—
1.575	40,00	KSEM4000	10	KSEM400..M	—	—	—	—

Modular Drills

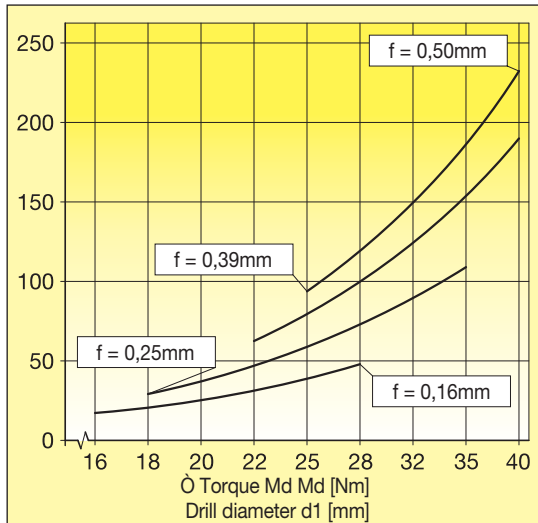
Drive Power (kW)



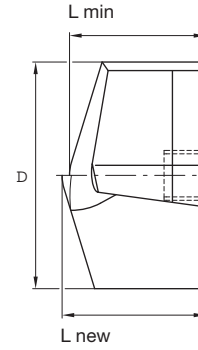
Feed Force (kN)



Torque (Nm)




NOTE: The diagrams above are used to determine the drive power, feed force, and torque. They are based on cutting force measurement in tempered steels in Cgr. 6. Tensile strength: Rm = 600 N/mm². The base cutting speed used is: vc = 80 m/min.



The following coolant pressure is recommended:

relative drilling depth	coolant pressure
1-3 x D	8 bars
5 x D	12 bars
7 x D	20 bars
10 x D	30 bars

insert seat size	diameter range D (mm)	L min (mm)	L new (mm)
C	12,50-13,50	8,5	9,6
B	13,51-14,50	8,9	10,1
A	14,51-15,88	9,4	10,6
1	15,88-18,00	10,3	11,6
2	18,01-19,99	11,2	12,6
3	20,00-22,00	12,1	13,6
4	22,01-24,00	13,0	14,6
5	24,01-26,00	13,9	15,6
6	26,01-28,00	14,8	16,6
7	28,01-30,00	15,7	17,6
8	30,01-32,00	16,6	18,6
9	32,01-36,00	18,4	20,6
10	36,01-40,00	20,2	22,6



WIND ENERGY TAPS

The new high-performance, large-sized HSS-E-PM taps called Wind Taps were developed for the manufacturers of some of the most important wind turbine components like hubs, rings, and gearbox housings to increase productivity and keep up with the rapid increase in demand for such components.

- Designed for both conventional non-rigid and CNC-synchronous tapping machines.
- Manufactured to DIN 376 dimension.
- Extra-long version developed to reach longer overhang that is very common on these big components.
- Precision h6 shanks enable use in either conventional tap holders with square drive or in precision round toolholders.

Tap into something great at your Authorized Kennametal Distributor or at www.kennametal.com.

www.kennametal.com

 **KENNAMETAL®**



KSEM PLUS™ Modular Drill System

The KSEM PLUS drill concept is simple but effective. It combines the benefits of the KSEM modular drill (high feeds and length-to-diameter [L/D] ratios) with the benefits of an indexable drill (high speeds and low consumable costs).

Primary Application

The KSEM PLUS modular drill in steel, cast iron, and stainless steel materials replaces HSS or indexable drilling tool solutions in the diameter range of 1.102–2.756" (28–70mm) from 3–10 x D. For applications within the energy market (e.g., bearing rings for windmills), this tool delivers vast improvements in productivity and capacity.

Features and Benefits

Replaceable Head with Newly Developed FDS-Interface Coupling

- Quickly and easily replace inserts or drill heads without the need to remove the complete tool body from the machine.
- Save money and reduce tool stock by changing just the drill head and not the complete tool body if the front section wears out.
- Use one tool body for different sizes of drill heads.

Two Effective Cutting Edges

- Higher metal removal rates than indexable drills.
- Up to 100% increased productivity.
- L/D ratio capabilities from 3–10 x D.

KSEM PLUS Center Insert with HP

- Feed rate capabilities of modular drills.
- Longer life of KSEM PLUS inserts and no chip flow obstruction.
- No precentering at L/D less than 8 x D.

DFT™/DFR™ Outboard Inserts

- Higher speeds than modular drills.
- More stable cutting conditions.
- Improved surface finish and hole diameter accuracy.



Tailored Grades and Geometries

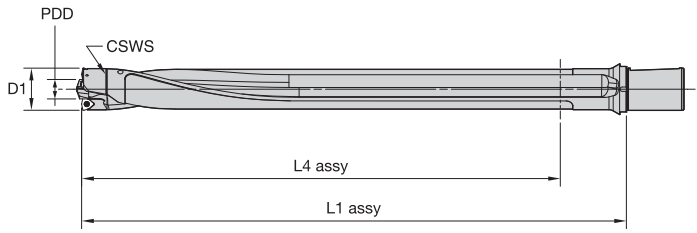
- KC7315™ grade is a TiAlN-based PVD grade, offering superior performance in all steel applications.
- KC7410™ grade contains multiple layers of PVD coating, offering outstanding wear-resistance when drilling cast irons.
- KC7140™ grade is a TiCN-based PVD grade, offering excellent toughness in unstable conditions and is the first choice in stainless steel.

Customization

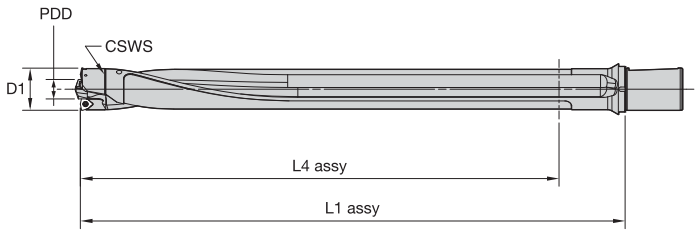
- Heads are available in intermediate diameters and up to Ø 76mm available as semi-standards.
- Tool bodies are available with different shank styles and up to 20x drill Ø as long as total length including shank <920mm.
- Heads for reground inserts are available as semi-standards.
- Tool bodies are available with different shank styles.
- B1 style heads with DFC outboard inserts are available for machining stacked plates, cross hole applications, and situations with inclined exits.

To learn more, [scan here](#).
For instructions on how to scan, please see page xxix.





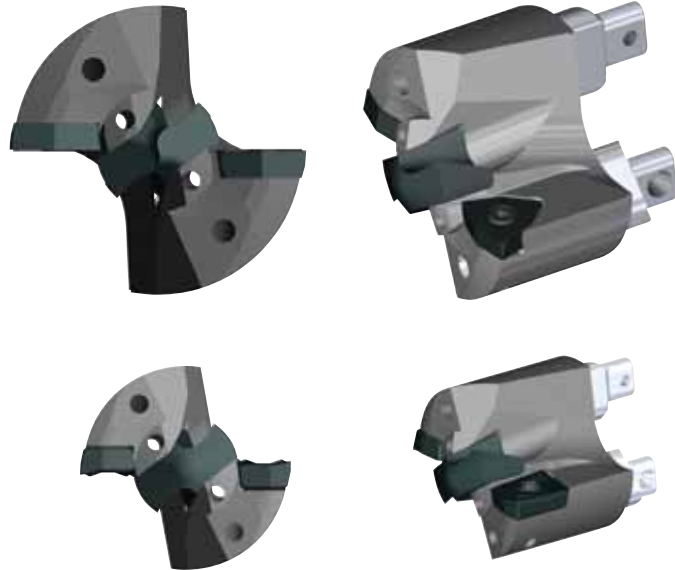
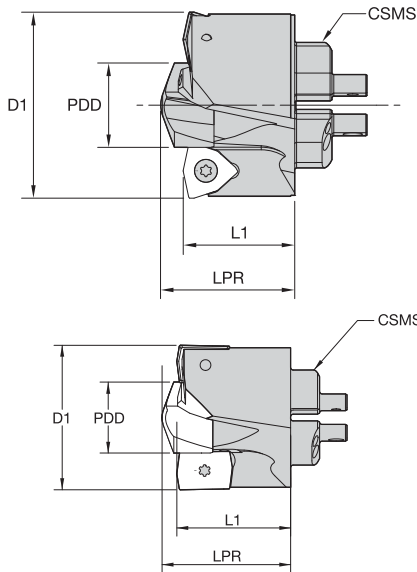
available KSEM PLUS heads				requested insert size reference per head		available tool bodies per CSWS connecting size 3 x D, 5 x D, 8 x D, 10 x D (metric and inch bodies)						
D1 mm	in	KSEM PLUS head order number	KSEM PLUS head ANSI catalog number	PDD (mm)	outboard gage insert	CSWS	KSEM PLUS body order number	KSEM PLUS ANSI catalog number	L/D ratio	L4 assembly (mm)	L1 assembly (mm)	
				center insert size reference	DFR/DFT							
28,00	1.102	4000408	KSEMP2800FDS28A1M	14,00	DFR040304D28	28	4000409	WD32FDS28128M	3 x D	93	150	
28,58	1.125	4047811	KSEMP1125FDS28A1	15,00	DFR040304D28		4051136	WD32FDS28190M	5 x D	155	212	
29,00	1.142	4047812	KSEMP2900FDS28A1M	15,00	DFR040304D28		4051137	WD32FDS28283M	8 x D	248	305	
29,36	1.156	4047823	KSEMP1156FDS28A1	16,00	DFR040304D28		4000411	WD32FDS28345M	10 x D	310	367	
30,00	1.181	4047824	KSEMP3000FDS28A1M	16,00	DFR040304D28		4051138	SSF150FDS280502	3 x D	93	150	
30,18	1.188	4047825	KSEMP1188FDS28A1	17,00	DFR040304D28		4051139	SSF150FDS280746	5 x D	155	212	
30,96	1.219	4047826	KSEMP1219FDS28A1	17,00	DFR040304D28		4051140	SSF150FDS281112	8 x D	248	305	
31,00	1.221	4047827	KSEMP3100FDS28A1M	17,00	DFR040304D28		4051141	SSF150FDS281356	10 x D	310	367	
31,75	1.250	3794916	KSEMP1250FDS32A1	15,00	DFT05T308D32		32	3950219	WD32FDS32146M	3 x D	105	166
32,00	1.260	3794291	KSEMP3200FDS32A1M	15,00	DFT05T308D32			3794428	WD32FDS32216M	5 x D	175	236
33,00	1.299	3742210	KSEMP3300FDS32A1M	16,00	DFT05T308D33	3742293		WD32FDS32321M	8 x D	280	341	
33,20	1.307	3793949	KSEMP3320FDS32A1M	16,00	DFT05T308D33	3794429		WD32FDS32391M	10 x D	350	411	
33,35	1.313	3794917	KSEMP1313FDS32A1	17,00	DFT05T308D33	3952192		SSF150FDS320573	3 x D	105	166	
34,00	1.339	3794292	KSEMP3400FDS32A1M	17,00	DFT05T308D33	3794835		SSF150FDS320850	5 x D	175	236	
34,93	1.375	3794918	KSEMP1375FDS32A1	18,00	DFT05T308D33	3794836		SSF150FDS321263	8 x D	280	341	
35,00	1.378	3794393	KSEMP3500FDS32A1M	18,00	DFT05T308D33	3794837		SSF150FDS321539	10 x D	350	411	
36,00	1.417	3794394	KSEMP3600FDS36A1M	13,00	DFT06T308D36	36		3950220	WD32FDS36166M	3 x D	117	186
36,53	1.438	3794919	KSEMP1438FDS36A1	14,00	DFT06T308D36			3794430	WD32FDS36244M	5 x D	195	264
37,00	1.457	3794395	KSEMP3700FDS36A1M	14,00	DFT06T308D36		3794431	WD32FDS36361M	8 x D	312	381	
37,50	1.476	3794427	KSEMP3750FDS36A1M	15,00	DFT06T308D36		3794432	WD32FDS36439M	10 x D	390	459	
38,00	1.496	3794396	KSEMP3800FDS36A1M	15,00	DFT06T308D36		3952343	SSF150FDS360652	3 x D	117	186	
38,10	1.500	3794920	KSEMP1500FDS36A1	15,00	DFT06T308D36		3794838	SSF150FDS360960	5 x D	195	264	
39,00	1.535	3794397	KSEMP3900FDS36A1M	16,00	DFT06T308D39		3794839	SSF150FDS361421	8 x D	312	381	
39,20	1.543	3793950	KSEMP3920FDS36A1M	16,00	DFT06T308D39		3794840	SSF150FDS361728	10 x D	390	459	
39,70	1.563	3794921	KSEMP1563FDS36A1	17,00	DFT06T308D39							
40,00	1.575	3794398	KSEMP4000FDS40A1M	17,00	DFT06T308D39		40	3872075	WD50FDS40183M	3 x D	132	208
41,00	1.614	3794399	KSEMP4100FDS40A1M	18,00	DFT06T308D39	3794443		WD50FDS40271M	5 x D	220	296	
41,28	1.625	3794922	KSEMP1625FDS40A1	18,00	DFT06T308D39	3794444		WD50FDS40403M	8 x D	352	428	
42,00	1.654	3794400	KSEMP4200FDS40A1M	19,00	DFT06T308D39	3794445		WD50FDS40491M	10 x D	440	516	
43,00	1.693	3794401	KSEMP4300FDS40A1M	20,00	DFT06T308D39	3952344		SSF200FDS400721	3 x D	132	208	
44,00	1.732	3794402	KSEMP4400FDS40A1M	21,00	DFT06T308D44	3794841		SSF200FDS401066	5 x D	220	296	
44,45	1.750	3794933	KSEMP1750FDS40A1	22,00	DFT06T308D44	3794842		SSF200FDS401586	8 x D	352	428	
						3794843		SSF200FDS401933	10 x D	440	516	



available KSEM PLUS heads			requested insert size reference per head		available tool bodies per CSWS connecting size 3 x D, 5 x D, 8 x D, 10 x D (metric and inch bodies)					
D1 mm in	KSEM PLUS head order number	KSEM PLUS head ANSI catalog number	PDD (mm)	outboard gage insert	CSWS	KSEM PLUS body order number	KSEM PLUS ANSI catalog number	L/D ratio	L4 assembly (mm)	L1 assembly (mm)
			center insert size reference	DFR/DFT						
45,00 1.772	3794403	KSEMP4500FDS45A1M	18,00	DFT070408D45	45	3872709	WD50FDS45206M	3 x D	147	231
46,00 1.811	3794404	KSEMP4600FDS45A1M	19,00	DFT070408D45		3794446	WD50FDS45304M	5 x D	245	329
47,00 1.850	3794405	KSEMP4700FDS45A1M	20,00	DFT070408D45		3794447	WD50FDS45451M	8 x D	392	476
47,63 1.875	3794934	KSEMP1875FDS45A1	21,00	DFT070408D45		3794448	WD50FDS45549M	10 x D	490	574
48,00 1.890	3794406	KSEMP4800FDS45A1M	21,00	DFT070408D45		3952345	SSF200FDS450809	3 x D	147	231
49,00 1.929	3794407	KSEMP4900FDS45A1M	22,00	DFT070408D45		3794904	SSF200FDS451196	5 x D	245	329
						3794905	SSF200FDS451775	8 x D	392	476
						3794906	SSF200FDS452161	10 x D	490	574
50,00 1.969	3742211	KSEMP5000FDS50A1M	23,00	DFT070408D50	50	3950221	WD50FDS50228M	3 x D	165	258
50,80 2.000	3794935	KSEMP2000FDS50A1	24,00	DFT070408D50		3794449	WD50FDS50338M	5 x D	275	368
51,00 2.008	3794408	KSEMP5100FDS50A1M	24,00	DFT070408D50		3742294	WD50FDS50503M	8 x D	440	533
52,00 2.047	3794409	KSEMP5200FDS50A1M	25,00	DFT070408D50		3794450	WD50FDS50613M	10 x D	550	643
53,00 2.087	3794410	KSEMP5300FDS50A1M	26,00	DFT070408D50		3952346	SSF200FDS500896	3 x D	165	258
53,98 2.125	3794936	KSEMP2125FDS50A1	27,00	DFT070408D50		3794907	SSF200FDS501330	5 x D	275	368
54,00 2.126	3794411	KSEMP5400FDS50A1M	27,00	DFT070408D50		3794908	SSF200FDS501980	8 x D	440	533
55,00 2.165	3794412	KSEMP5500FDS50A1M	28,00	DFT070408D50		3794908	SSF200FDS502413	10 x D	550	643
56,00 2.205	3794413	KSEMP5600FDS56A1M	20,00	DFT090508D56	56	3950222	WD50FDS56259M	3 x D	186	289
57,00 2.244	3794414	KSEMP5700FDS56A1M	21,00	DFT090508D56		3794451	WD50FDS56383M	5 x D	310	413
57,15 2.250	3794937	KSEMP2250FDS56A1	21,00	DFT090508D56		3794452	WD50FDS56569M	8 x D	496	599
58,00 2.284	3794415	KSEMP5800FDS56A1M	22,00	DFT090508D56		3794453	WD50FDS56693M	10 x D	620	723
59,00 2.323	3794416	KSEMP5900FDS56A1M	23,00	DFT090508D56		3952347	SSF200FDS561020	3 x D	186	289
60,00 2.362	3794417	KSEMP6000FDS56A1M	24,00	DFT090508D56		3794910	SSF200FDS561507	5 x D	310	413
60,33 2.375	3794938	KSEMP2375FDS56A1	24,00	DFT090508D56		3794911	SSF200FDS562240	8 x D	496	599
61,00 2.402	3794418	KSEMP6100FDS56A1M	25,00	DFT090508D56		3794912	SSF200FDS562783	10 x D	620	723
62,00 2.441	3794419	KSEMP6200FDS56A1M	26,00	DFT090508D56						
63,00 2.480	3794420	KSEMP6300FDS63A1M	27,00	DFT090508D63	63	3950333	WD50FDS63289M	3 x D	210	325
63,50 2.500	3794939	KSEMP2500FDS63A1	28,00	DFT090508D63		3794454	WD50FDS63429M	5 x D	350	465
64,00 2.520	3794421	KSEMP6400FDS63A1M	28,00	DFT090508D63		3794455	WD50FDS63639M	8 x D	560	675
65,00 2.559	3794422	KSEMP6500FDS63A1M	29,00	DFT090508D63		3742296	WD50FDS63779M	10 x D	700	815
66,00 2.598	3794423	KSEMP6600FDS63A1M	30,00	DFT090508D63		3952348	SSF200FDS631138	3 x D	210	325
66,68 2.625	3794940	KSEMP2625FDS63A1	31,00	DFT090508D63		3794913	SSF200FDS631688	5 x D	350	465
67,00 2.638	3794424	KSEMP6700FDS63A1M	31,00	DFT090508D63		3794914	SSF200FDS632515	8 x D	560	675
68,00 2.677	3794425	KSEMP6800FDS63A1M	32,00	DFT090508D63		3794915	SSF200FDS633066	10 x D	700	815
69,00 2.717	3794426	KSEMP6900FDS63A1M	33,00	DFT090508D63						
69,85 2.750	3794941	KSEMP2750FDS63A1	34,00	DFT090508D63						
70,00 2.756	3742212	KSEMP7000FDS63A1M	34,00	DFT090508D63						

- To ensure 100% system stability, KSEM™ inserts used for KSEM PLUS should not be reground.
- KSEM PLUS heads are shipped with all insert screws.
- KSEM PLUS heads are shipped with two wrenches: one for the KSEM insert and one to be used for the DFT™/DFR™ inserts as well as for the assembly of the body to the head.

- Order KSEM PLUS shanks using connection coupling size (CSMS) to determine which heads go with each shank.
- PDD in the callout drawing refers to the D1 of the HPGM and HPCM inserts for use with KSEM PLUS.
- Order inserts (KSEM, DFT, and DFR) for KSEM PLUS separately.



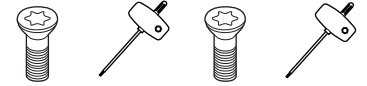
■ KSEM PLUS Heads 28–70mm



order number	ISO catalog number	ANSI catalog number	D1		PDD		LPR		L1		CSMS system size	KSEM insert screw	KSEM wrench	Drill Fix insert screw	Drill Fix wrench
			mm	in	mm	in	mm	in	mm	in					
4000408	KSEMP2800FDS28A1M	KSEMP2800FDS28A1M	28,00	1.102	14,00	.5512	24,9	.980	22,0	.866	FDS28	364.016	170.350	192.432	170.352
4047811	KSEMP2858FDS28A1M	KSEMP1125FDS28A1	28,58	1.125	15,00	.5906	25,0	.984	22,0	.866	FDS28	364.016	170.350	192.432	170.352
4047812	KSEMP2900FDS28A1M	KSEMP2900FDS28A1M	29,00	1.142	15,00	.5906	25,0	.984	22,0	.866	FDS28	364.016	170.350	192.432	170.352
4047823	KSEMP2937FDS28A1M	KSEMP1156FDS28A1	29,36	1.156	16,00	.6299	25,2	.992	22,0	.866	FDS28	364.010	170.345	192.432	170.352
4047824	KSEMP3000FDS28A1M	KSEMP3000FDS28A1M	30,00	1.181	16,00	.6299	25,2	.992	22,0	.866	FDS28	364.010	170.345	192.432	170.352
4047825	KSEMP3017FDS28A1M	KSEMP1188FDS28A1	30,18	1.188	17,00	.6693	25,41	1.000	22,0	.866	FDS28	364.010	170.345	192.432	170.352
4047826	KSEMP3096FDS28A1M	KSEMP1219FDS28A1	30,96	1.219	17,00	.6693	25,41	1.000	22,0	.866	FDS28	364.010	170.345	192.432	170.352
4047827	KSEMP3100FDS28A1M	KSEMP3100FDS28A1M	31,00	1.221	17,00	.6693	25,41	1.000	22,0	.866	FDS28	364.010	170.345	192.432	170.352
3794916	KSEMP3175FDS32A1M	KSEMP1250FDS32A1	31,75	1.250	15,00	.5906	23,0	.907	20,0	.787	FDS32	364.016	170.350	191.924	170.353
3794291	KSEMP3200FDS32A1M	KSEMP3200FDS32A1M	32,00	1.260	15,00	.5906	23,0	.907	20,0	.787	FDS32	364.016	170.350	191.924	170.353
3742210	KSEMP3300FDS32A1M	KSEMP3300FDS32A1M	33,00	1.299	16,00	.6299	23,2	.913	20,0	.787	FDS32	364.010	170.345	191.924	170.353
3793949	KSEMP3320FDS32A1M	KSEMP3320FDS32A1M	33,20	1.307	16,00	.6299	23,2	.913	20,0	.787	FDS32	364.010	170.345	191.924	170.353
3794917	KSEMP3334FDS32A1M	KSEMP1313FDS32A1	33,35	1.313	17,00	.6693	23,4	.920	20,0	.787	FDS32	364.010	170.345	191.924	170.353
3794292	KSEMP3400FDS32A1M	KSEMP3400FDS32A1M	34,00	1.339	17,00	.6693	23,4	.920	20,0	.787	FDS32	364.010	170.345	191.924	170.353
3794918	KSEMP3493FDS32A1M	KSEMP1375FDS32A1	34,93	1.375	18,00	.7087	23,6	.928	20,0	.787	FDS32	364.010	170.345	191.924	170.353
3794393	KSEMP3500FDS32A1M	KSEMP3500FDS32A1M	35,00	1.378	18,00	.7087	23,6	.928	20,0	.787	FDS32	364.010	170.345	191.924	170.353
3794394	KSEMP3600FDS36A1M	KSEMP3600FDS36A1M	36,00	1.417	13,00	.5118	22,7	.893	20,0	.787	FDS36	364.016	170.350	191.916	170.355
3794919	KSEMP3651FDS36A1M	KSEMP1438FDS36A1	36,53	1.438	14,00	.5512	22,9	.900	20,0	.787	FDS36	364.016	170.350	191.916	170.355
3794395	KSEMP3700FDS36A1M	KSEMP3700FDS36A1M	37,00	1.457	14,00	.5512	22,9	.900	20,0	.787	FDS36	364.016	170.350	191.916	170.355
3794427	KSEMP3750FDS36A1M	KSEMP3750FDS36A1M	37,50	1.476	15,00	.5906	23,0	.907	20,0	.787	FDS36	364.016	170.350	191.916	170.355
3794396	KSEMP3800FDS36A1M	KSEMP3800FDS36A1M	38,00	1.496	15,00	.5906	23,0	.907	20,0	.787	FDS36	364.016	170.350	191.916	170.355
3794920	KSEMP3810FDS36A1M	KSEMP1500FDS36A1	38,10	1.500	15,00	.5906	23,0	.907	20,0	.787	FDS36	364.016	170.350	191.916	170.355
3794397	KSEMP3900FDS36A1M	KSEMP3900FDS36A1M	39,00	1.535	16,00	.6299	23,2	.913	20,0	.787	FDS36	364.010	170.345	191.916	170.355
3793950	KSEMP3920FDS36A1M	KSEMP3920FDS36A1M	39,20	1.543	16,00	.6299	23,2	.913	20,0	.787	FDS36	364.010	170.345	191.916	170.355

(continued)

(KSEM PLUS Heads 28–70mm continued)



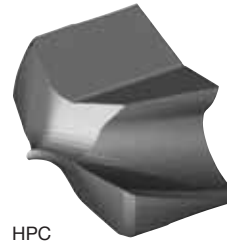
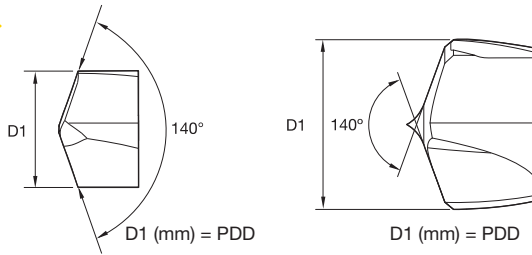
order number	ISO catalog number	ANSI catalog number	D1 mm in	PDD mm in	LPR mm in	L1 mm in	CSMS system size	KSEM insert screw	KSEM wrench	Drill Fix insert screw	Drill Fix wrench
3794921	KSEMP3970FDS36A1M	KSEMP1563FDS36A1	39,70 1.563	17,00 .6693	23,4 .920	20,0 .787	FDS36	364.010	170.345	191.916	170.355
3794398	KSEMP4000FDS40A1M	KSEMP4000FDS40A1M	40,00 1.575	17,00 .6693	28,6 1.125	25,0 .984	FDS40	364.010	170.345	191.916	170.355
3794399	KSEMP4100FDS40A1M	KSEMP4100FDS40A1M	41,00 1.614	18,00 .7087	28,8 1.132	25,0 .984	FDS40	364.010	170.345	191.916	170.355
3794922	KSEMP4128FDS40A1M	KSEMP1625FDS40A1	41,28 1.625	18,00 .7087	28,8 1.132	25,0 .984	FDS40	364.010	170.345	191.916	170.355
3794400	KSEMP4200FDS40A1M	KSEMP4200FDS40A1M	42,00 1.654	19,00 .7480	28,9 1.139	25,0 .984	FDS40	364.010	170.345	191.916	170.355
3794401	KSEMP4300FDS40A1M	KSEMP4300FDS40A1M	43,00 1.693	20,00 .7874	29,1 1.146	25,0 .984	FDS40	364.011	170.346	191.916	170.355
3794402	KSEMP4400FDS40A1M	KSEMP4400FDS40A1M	44,00 1.732	21,00 .8268	29,3 1.153	25,0 .984	FDS40	364.011	170.346	191.916	170.355
3794933	KSEMP4445FDS40A1M	KSEMP1750FDS40A1	44,45 1.750	22,00 .8661	29,5 1.160	25,0 .984	FDS40	364.011	170.346	191.916	170.355
3794403	KSEMP4500FDS45A1M	KSEMP4500FDS45A1M	45,00 1.772	18,00 .7087	28,8 1.132	25,0 .984	FDS45	364.010	170.345	191.698	170.355
3794404	KSEMP4600FDS45A1M	KSEMP4600FDS45A1M	46,00 1.811	19,00 .7480	28,9 1.139	25,0 .984	FDS45	364.010	170.345	191.698	170.355
3794405	KSEMP4700FDS45A1M	KSEMP4700FDS45A1M	47,00 1.850	20,00 .7874	29,1 1.146	25,0 .984	FDS45	364.011	170.346	191.698	170.355
3794934	KSEMP4763FDS45A1M	KSEMP1875FDS45A1	47,63 1.875	21,00 .8268	29,3 1.153	25,0 .984	FDS45	364.011	170.346	191.698	170.355
3794406	KSEMP4800FDS45A1M	KSEMP4800FDS45A1M	48,00 1.890	21,00 .8268	29,3 1.153	25,0 .984	FDS45	364.011	170.346	191.698	170.355
3794407	KSEMP4900FDS45A1M	KSEMP4900FDS45A1M	49,00 1.929	22,00 .8661	29,5 1.160	25,0 .984	FDS45	364.011	170.346	191.698	170.355
3742211	KSEMP5000FDS50A1M	KSEMP5000FDS50A1M	50,00 1.969	23,00 .9055	34,8 1.372	30,0 1.181	FDS50	364.011	170.346	191.698	170.355
3794935	KSEMP5080FDS50A1M	KSEMP2000FDS50A1	50,80 2.000	24,00 .9449	35,0 1.379	30,0 1.181	FDS50	364.011	170.346	191.698	170.355
3794408	KSEMP5100FDS50A1M	KSEMP5100FDS50A1M	51,00 2.008	24,00 .9449	35,0 1.379	30,0 1.181	FDS50	364.011	170.346	191.698	170.355
3794409	KSEMP5200FDS50A1M	KSEMP5200FDS50A1M	52,00 2.047	25,00 .9843	35,2 1.386	30,0 1.181	FDS50	364.012	170.347	191.698	170.355
3794410	KSEMP5300FDS50A1M	KSEMP5300FDS50A1M	53,00 2.087	26,00 1.0236	35,4 1.392	30,0 1.181	FDS50	364.012	170.347	191.698	170.355
3794936	KSEMP5398FDS50A1M	KSEMP2125FDS50A1	53,98 2.125	27,00 1.0630	35,6 1.399	30,0 1.181	FDS50	364.012	170.347	191.698	170.355
3794411	KSEMP5400FDS50A1M	KSEMP5400FDS50A1M	54,00 2.126	27,00 1.0630	35,6 1.399	30,0 1.181	FDS50	364.012	170.347	191.698	170.355
3794412	KSEMP5500FDS50A1M	KSEMP5500FDS50A1M	55,00 2.165	28,00 1.1024	35,7 1.406	30,0 1.181	FDS50	364.012	170.347	191.698	170.355
3794413	KSEMP5600FDS56A1M	KSEMP5600FDS56A1M	56,00 2.205	20,00 .7874	34,3 1.351	30,0 1.181	FDS56	364.011	170.346	191.726	170.356
3794414	KSEMP5700FDS56A1M	KSEMP5700FDS56A1M	57,00 2.244	21,00 .8268	34,5 1.358	30,0 1.181	FDS56	364.011	170.346	191.726	170.356
3794937	KSEMP5715FDS56A1M	KSEMP2250FDS56A1	57,15 2.250	21,00 .8268	34,5 1.358	30,0 1.181	FDS56	364.011	170.346	191.726	170.356
3794415	KSEMP5800FDS56A1M	KSEMP5800FDS56A1M	58,00 2.284	22,00 .8661	34,7 1.365	30,0 1.181	FDS56	364.011	170.346	191.726	170.356
3794416	KSEMP5900FDS56A1M	KSEMP5900FDS56A1M	59,00 2.323	23,00 .9055	34,8 1.372	30,0 1.181	FDS56	364.011	170.346	191.726	170.356
3794417	KSEMP6000FDS56A1M	KSEMP6000FDS56A1M	60,00 2.362	24,00 .9449	35,0 1.379	30,0 1.181	FDS56	364.011	170.346	191.726	170.356
3794938	KSEMP6033FDS56A1M	KSEMP2375FDS56A1	60,33 2.375	24,00 .9449	35,0 1.379	30,0 1.181	FDS56	364.011	170.346	191.726	170.356
3794418	KSEMP6100FDS56A1M	KSEMP6100FDS56A1M	61,00 2.402	25,00 .9843	35,2 1.386	30,0 1.181	FDS56	364.012	170.347	191.726	170.356
3794419	KSEMP6200FDS56A1M	KSEMP6200FDS56A1M	62,00 2.441	26,00 1.0236	35,4 1.392	30,0 1.181	FDS56	364.012	170.347	191.726	170.356
3794420	KSEMP6300FDS63A1M	KSEMP6300FDS63A1M	63,00 2.480	27,00 1.0630	41,8 1.643	36,0 1.417	FDS63	364.012	170.347	191.726	170.356
3794939	KSEMP6350FDS63A1M	KSEMP2500FDS63A1	63,50 2.500	28,00 1.1024	41,9 1.650	36,0 1.417	FDS63	364.012	170.347	191.726	170.356
3794421	KSEMP6400FDS63A1M	KSEMP6400FDS63A1M	64,00 2.520	28,00 1.1024	41,9 1.650	36,0 1.417	FDS63	364.012	170.347	191.726	170.356
3794422	KSEMP6500FDS63A1M	KSEMP6500FDS63A1M	65,00 2.559	29,00 1.1417	42,1 1.657	36,0 1.417	FDS63	364.013	170.348	191.726	170.356
3794423	KSEMP6600FDS63A1M	KSEMP6600FDS63A1M	66,00 2.598	30,00 1.1811	42,3 1.664	36,0 1.417	FDS63	364.013	170.348	191.726	170.356
3794940	KSEMP6668FDS63A1M	KSEMP2625FDS63A1	66,68 2.625	31,00 1.2205	42,5 1.671	36,0 1.417	FDS63	364.013	170.348	191.726	170.356
3794424	KSEMP6700FDS63A1M	KSEMP6700FDS63A1M	67,00 2.638	31,00 1.2205	42,5 1.671	36,0 1.417	FDS63	364.013	170.348	191.726	170.356
3794425	KSEMP6800FDS63A1M	KSEMP6800FDS63A1M	68,00 2.677	32,00 1.2598	42,6 1.678	36,0 1.417	FDS63	364.013	170.348	191.726	170.356
3794426	KSEMP6900FDS63A1M	KSEMP6900FDS63A1M	69,00 2.717	33,00 1.2992	42,8 1.685	36,0 1.417	FDS63	364.015	170.348	191.726	170.356
3794941	KSEMP6985FDS63A1M	KSEMP2750FDS63A1	69,85 2.750	34,00 1.3386	43,0 1.692	36,0 1.417	FDS63	364.015	170.348	191.726	170.356
3742212	KSEMP7000FDS63A1M	KSEMP7000FDS63A1M	70,00 2.756	34,00 1.3386	43,0 1.692	36,0 1.417	FDS63	364.015	170.348	191.726	170.356

Modular Drills

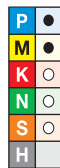
- To ensure 100% system stability, KSEM™ inserts used for KSEM PLUS should not be reground.
- The callout D1 (mm) = PDD. PDD is used in reference to the KSEM PLUS heads.



Modular Drills



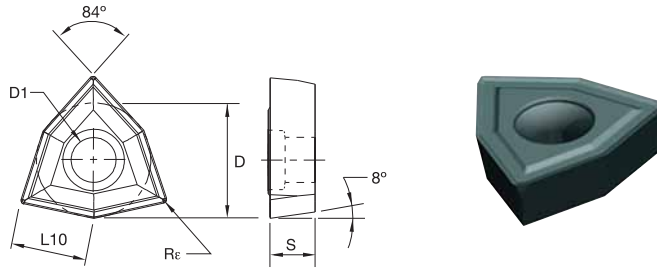
KSEMP Inserts



- first choice
- alternate choice

		D1		seat size
		mm	in	
HPGM • KC7315	HPCM • KC7410			
KSEMP1300HPGM	KSEM1300HPCM	13,000	.5118	C
KSEMP1400HPGM	KSEM1400HPCM	14,000	.5512	B
KSEMP1500HPGM	KSEM1500HPCM	15,000	.5906	A
KSEMP1600HPGM	KSEM1600HPCM	16,000	.6299	1
KSEMP1700HPGM	KSEM1700HPCM	17,000	.6693	1
KSEMP1800HPGM	KSEM1800HPCM	18,000	.7087	1
KSEMP1900HPGM	KSEM1900HPCM	19,000	.7480	2
KSEMP2000HPGM	KSEM2000HPCM	20,000	.7874	3
KSEMP2100HPGM	KSEM2100HPCM	21,000	.8268	3
KSEMP2200HPGM	KSEM2200HPCM	22,000	.8661	3
KSEMP2300HPGM	KSEM2300HPCM	23,000	.9055	4
KSEMP2400HPGM	KSEM2400HPCM	24,000	.9449	4
KSEMP2500HPGM	KSEM2500HPCM	25,000	.9843	5
KSEMP2600HPGM	KSEM2600HPCM	26,000	1.0236	5
KSEMP2700HPGM	KSEM2700HPCM	27,000	1.0630	6
KSEMP2800HPGM	KSEM2800HPCM	28,000	1.1024	6
KSEMP2900HPGM	KSEM2900HPCM	29,000	1.1417	7
KSEMP3000HPGM	KSEM3000HPCM	30,000	1.1811	7
KSEMP3100HPGM	KSEM3100HPCM	31,000	1.2205	8
KSEMP3200HPGM	KSEM3200HPCM	32,000	1.2598	8
KSEMP3300HPGM	—	33,000	1.2992	9
KSEMP3400HPGM	—	34,000	1.3386	9

Tolerance HPG • Metric		Tolerance HPC • Metric		Tolerance HPG • Inch		Tolerance HPC • Inch	
D1	tolerance h8	D1	tolerance k8	D1	tolerance h8	D1	tolerance k8
12,5–18	+0,000/-0,027	12,5–18	+0,027/0,000	.500–.709	+0,000/-0,0010	.500–.709	+0,0010/-0,0000
>18–30	+0,000/-0,033	>18–30	+0,033/0,000	>.709–1.181	+0,000/-0,0013	>.709–1.181	+0,0013/-0,0000
>30–40	+0,000/-0,039	>30–40	+0,039/0,000	>1.181–1.575	+0,000/-0,0015	>1.181–1.575	+0,0015/-0,0000



- first choice
- alternate choice

P	●
M	●
K	●
N	○
S	○
H	○

Modular Drills

■ DFT-HP

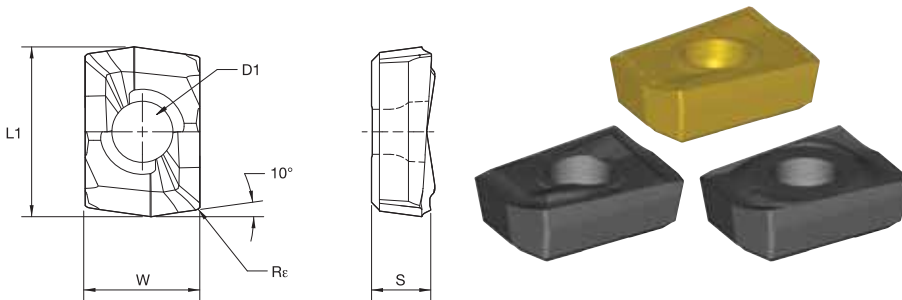
outboard insert size reference (DFT)	order number	catalog number	L10		D		D1		S		Rε		KC7315
			mm	in	mm	in	mm	in	mm	in	mm	in	
DFT05T308D32	3648429	DFT05T308D32HP	5,29	.208	8,00	.315	3,40	.134	3,75	.148	0,80	.031	●
DFT05T308D33	3668995	DFT05T308D33HP	5,29	.208	8,00	.315	3,40	.134	3,75	.148	0,80	.031	●
DFT06T308D36	3648427	DFT06T308D36HP	6,62	.260	10,00	.394	4,40	.173	3,75	.148	0,80	.031	●
DFT06T308D39	3668996	DFT06T308D39HP	6,62	.260	10,00	.394	4,40	.173	3,75	.148	0,80	.031	●
DFT06T308D44	3668997	DFT06T308D44HP	6,62	.260	10,00	.394	4,40	.173	3,75	.148	0,80	.031	●
DFT070408D45	3648432	DFT070408D45HP	7,94	.313	12,00	.472	4,40	.173	4,75	.187	0,80	.031	●
DFT070408D50	3668998	DFT070408D50HP	7,94	.313	12,00	.472	4,40	.173	4,75	.187	0,80	.031	●
DFT090508D56	3648476	DFT090508D56HP	9,92	.391	15,00	.591	5,50	.217	5,25	.207	0,80	.031	●
DFT090508D63	3668999	DFT090508D63HP	9,92	.391	15,00	.591	5,50	.217	5,25	.207	0,80	.031	●

■ DFT-MD

outboard insert size reference (DFT)	order number	catalog number	L10		D		D1		S		Rε		KC7140
			mm	in	mm	in	mm	in	mm	in	mm	in	
DFT05T308D32	3648430	DFT05T308D32MD	5,29	.208	8,00	.315	3,40	.134	3,75	.148	0,80	.031	●
DFT05T308D33	3669000	DFT05T308D33MD	5,29	.208	8,00	.315	3,40	.134	3,75	.148	0,80	.031	●
DFT06T308D36	3648428	DFT06T308D36MD	6,62	.260	10,00	.394	4,40	.173	3,75	.148	0,80	.031	●
DFT06T308D39	3669001	DFT06T308D39MD	6,62	.260	10,00	.394	4,40	.173	3,75	.148	0,80	.031	●
DFT06T308D44	3669002	DFT06T308D44MD	6,62	.260	10,00	.394	4,40	.173	3,75	.148	0,80	.031	●
DFT070408D45	3648474	DFT070408D45MD	7,94	.313	12,00	.472	4,40	.173	4,75	.187	0,80	.031	●
DFT070408D50	3669083	DFT070408D50MD	7,94	.313	12,00	.472	4,40	.173	4,75	.187	0,80	.031	●
DFT090508D56	3648478	DFT090508D56MD	9,92	.391	15,00	.591	5,50	.217	5,25	.207	0,80	.031	●
DFT090508D63	3669084	DFT090508D63MD	9,92	.391	15,00	.591	5,50	.217	5,25	.207	0,80	.031	●

- first choice
- alternate choice

P	●
M	●
K	○
N	○
S	○
H	○



- first choice
- alternate choice

P	●	○	○
M	●	○	○
K	○	○	○
N	○	○	○
S	○	○	○
H	○	○	○

■ DFR Inserts

catalog number	L1		W		D1		S		Rε		KC7140	KC7225	KC7315
	mm	in	mm	in	mm	in	mm	in	mm	in			
DFR040304D28GD	10,76	.4236	7,26	.2860	2,85	.1122	3,79	.1492	0,40	.0156	○	○	○
DFR040304D28LD	10,76	.4236	7,26	.2860	2,85	.1122	3,78	.1490	0,40	.0156	○	●	○
DFR040304D28MD	10,76	.4236	7,26	.2860	2,85	.1122	3,79	.1490	0,40	.0156	●	○	○

■ **Modular Drill • KSEM PLUS™ • Metric**

Modular Drills

Material Group	Condition	Cutting Speed – vc Range – m/min			Metric Recommended Feed Rate (f) by Diameter						
		min	Starting Value	max							
					KSEM 14....17 DFR04... 28,00-31,74	KSEM 15....18 DFT05.. 31,75-35,99	KSEM 13....22 DFT06... 36,00-44,99	KSEM 18....28 DFT07... 45,00-55,99	KSEM 20....34 DFT09... 56,00-70,00		
P	2	S	90	190	230	mm/r	0,160 - 0,280	0,160 - 0,280	0,200 - 0,360	0,200 - 0,400	0,200 - 0,450
		U	71	130	170	mm/r	0,160 - 0,280	0,160 - 0,280	0,200 - 0,360	0,200 - 0,400	0,200 - 0,450
		I	50	80	110	mm/r	0,160 - 0,280	0,160 - 0,280	0,200 - 0,320	0,200 - 0,400	0,200 - 0,450
	3	S	90	180	230	mm/r	0,160 - 0,280	0,160 - 0,280	0,200 - 0,320	0,200 - 0,400	0,200 - 0,450
		U	70	120	170	mm/r	0,160 - 0,280	0,160 - 0,280	0,200 - 0,320	0,200 - 0,400	0,200 - 0,450
		I	50	70	106	mm/r	0,160 - 0,280	0,160 - 0,280	0,200 - 0,320	0,200 - 0,400	0,200 - 0,450
	4	S	90	140	220	mm/r	0,160 - 0,280	0,160 - 0,280	0,200 - 0,320	0,200 - 0,400	0,200 - 0,450
		U	70	110	160	mm/r	0,160 - 0,280	0,160 - 0,280	0,200 - 0,320	0,200 - 0,400	0,200 - 0,450
		I	50	80	110	mm/r	0,160 - 0,280	0,160 - 0,280	0,200 - 0,320	0,200 - 0,400	0,200 - 0,450
	5	S	90	130	210	mm/r	0,160 - 0,280	0,160 - 0,280	0,200 - 0,320	0,200 - 0,400	0,200 - 0,450
		U	70	100	150	mm/r	0,160 - 0,280	0,160 - 0,280	0,200 - 0,320	0,200 - 0,400	0,200 - 0,450
		I	50	70	100	mm/r	0,160 - 0,280	0,160 - 0,280	0,200 - 0,320	0,200 - 0,400	0,200 - 0,450
6	S	70	90	180	mm/r	0,160 - 0,280	0,160 - 0,280	0,200 - 0,320	0,200 - 0,400	0,200 - 0,450	
	U	50	75	120	mm/r	0,160 - 0,280	0,160 - 0,280	0,200 - 0,320	0,200 - 0,400	0,200 - 0,450	
	I	40	60	100	mm/r	0,160 - 0,280	0,160 - 0,280	0,200 - 0,320	0,200 - 0,400	0,200 - 0,450	
M	1	S	60	110	135	mm/r	0,130 - 0,250	0,130 - 0,250	0,160 - 0,280	0,160 - 0,320	0,200 - 0,360
		U	40	70	90	mm/r	0,130 - 0,250	0,130 - 0,250	0,160 - 0,280	0,160 - 0,320	0,200 - 0,360
		I	30	50	65	mm/r	0,130 - 0,250	0,130 - 0,250	0,160 - 0,280	0,160 - 0,320	0,200 - 0,360
	2	S	60	100	135	mm/r	0,130 - 0,250	0,130 - 0,250	0,160 - 0,280	0,160 - 0,320	0,200 - 0,360
		U	40	60	90	mm/r	0,130 - 0,250	0,130 - 0,250	0,160 - 0,280	0,160 - 0,320	0,200 - 0,360
		I	30	50	65	mm/r	0,130 - 0,250	0,130 - 0,250	0,160 - 0,280	0,160 - 0,320	0,200 - 0,360
3	S	50	90	135	mm/r	0,130 - 0,250	0,130 - 0,250	0,160 - 0,280	0,160 - 0,320	0,200 - 0,360	
	U	40	60	90	mm/r	0,130 - 0,250	0,130 - 0,250	0,160 - 0,280	0,160 - 0,320	0,200 - 0,360	
	I	25	40	65	mm/r	0,130 - 0,250	0,130 - 0,250	0,160 - 0,280	0,160 - 0,320	0,200 - 0,360	
K	1	S	90	170	230	mm/r	0,180 - 0,300	0,180 - 0,300	0,216 - 0,360	0,240 - 0,420	0,300 - 0,480
		U	60	120	160	mm/r	0,180 - 0,300	0,180 - 0,300	0,216 - 0,360	0,240 - 0,420	0,300 - 0,480
		I	40	70	90	mm/r	0,180 - 0,300	0,180 - 0,300	0,216 - 0,360	0,240 - 0,420	0,300 - 0,480
	2	S	90	160	220	mm/r	0,180 - 0,300	0,180 - 0,300	0,216 - 0,360	0,240 - 0,420	0,300 - 0,480
		U	60	110	160	mm/r	0,180 - 0,300	0,180 - 0,300	0,216 - 0,360	0,240 - 0,420	0,300 - 0,480
		I	40	70	100	mm/r	0,180 - 0,300	0,180 - 0,300	0,216 - 0,360	0,240 - 0,420	0,300 - 0,480
3	S	90	150	210	mm/r	0,180 - 0,300	0,180 - 0,300	0,216 - 0,360	0,240 - 0,420	0,300 - 0,480	
	U	60	100	150	mm/r	0,180 - 0,300	0,180 - 0,300	0,216 - 0,360	0,240 - 0,420	0,300 - 0,480	
	I	35	60	90	mm/r	0,180 - 0,300	0,180 - 0,300	0,216 - 0,360	0,240 - 0,420	0,300 - 0,480	
N	1	S	150	240	360	mm/r	0,120 - 0,200	0,120 - 0,200	0,144 - 0,280	0,160 - 0,320	0,200 - 0,400
		U	100	160	240	mm/r	0,120 - 0,200	0,120 - 0,200	0,144 - 0,280	0,160 - 0,320	0,200 - 0,400
		I	60	100	160	mm/r	0,120 - 0,200	0,120 - 0,200	0,144 - 0,280	0,160 - 0,320	0,200 - 0,400
	2	S	150	220	360	mm/r	0,120 - 0,200	0,120 - 0,200	0,144 - 0,280	0,160 - 0,320	0,200 - 0,400
		U	100	150	240	mm/r	0,120 - 0,200	0,120 - 0,200	0,144 - 0,280	0,160 - 0,320	0,200 - 0,400
		I	60	100	160	mm/r	0,120 - 0,200	0,120 - 0,200	0,144 - 0,280	0,160 - 0,320	0,200 - 0,400
	3	S	150	200	360	mm/r	0,120 - 0,200	0,120 - 0,200	0,144 - 0,280	0,160 - 0,320	0,200 - 0,400
		U	100	140	240	mm/r	0,120 - 0,200	0,120 - 0,200	0,144 - 0,280	0,160 - 0,320	0,200 - 0,400
		I	60	90	160	mm/r	0,120 - 0,200	0,120 - 0,200	0,144 - 0,280	0,160 - 0,320	0,200 - 0,400
4	S	110	220	260	mm/r	0,120 - 0,200	0,120 - 0,200	0,144 - 0,280	0,160 - 0,320	0,200 - 0,400	
	U	70	140	170	mm/r	0,120 - 0,200	0,120 - 0,200	0,144 - 0,280	0,160 - 0,320	0,200 - 0,400	
	I	45	90	110	mm/r	0,120 - 0,200	0,120 - 0,200	0,144 - 0,280	0,160 - 0,320	0,200 - 0,400	

■ **Insert Recommendation**

Material Group	Outboard/ Inboard	Insert Style	Grade
P	O	DFR-GD	KC7315
		DFT-HP	
		KSEMP-HPG	
M	O	DFR-MD	KC7315
		DFT-MD	
		KSEMP-HPG	
K	O	DFR-LD	KC7215
		DFT-HP	KC7315
		KSEMP-HPC	KC7410
N	O	DFR-GD	KC7315
		DFT-HP	
		KSEMP-HPG	

Modular Drill • KSEM PLUS™ • Inch

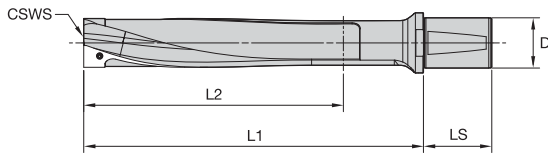
Material Group	Condition	Cutting Speed – vc Range – SFM			Inch Recommended Feed Rate (f) by Diameter							
		min	Starting Value	max	KSEM 14....17 DFR04... 1.102-1.249	KSEM 15....18 DFT05... 1.250-1.416	KSEM 13....22 DFT06... 1.417-1.771	KSEM 18....28 DFT07... 1.772-2.204	KSEM 20....34 DFT09... 2.205-2.756			
P	2	S	295	623	755	IPR	.006 - .011	.006 - .011	.008 - .014	.008 - .016	.008 - .018	
		U	233	427	558	IPR	.006 - .011	.006 - .011	.008 - .014	.008 - .016	.008 - .018	
		I	164	262	361	IPR	.006 - .011	.006 - .011	.008 - .014	.008 - .016	.008 - .018	
	3	S	295	591	755	IPR	.006 - .011	.006 - .011	.008 - .014	.008 - .016	.008 - .018	
		U	230	394	558	IPR	.006 - .011	.006 - .011	.008 - .014	.008 - .016	.008 - .018	
		I	164	230	361	IPR	.006 - .011	.006 - .011	.008 - .014	.008 - .016	.008 - .018	
	4	S	295	459	722	IPR	.006 - .011	.006 - .011	.008 - .014	.008 - .016	.008 - .018	
		U	230	361	525	IPR	.006 - .011	.006 - .011	.008 - .014	.008 - .016	.008 - .018	
		I	264	262	361	IPR	.006 - .011	.006 - .011	.008 - .014	.008 - .016	.008 - .018	
	5	S	295	427	689	IPR	.006 - .011	.006 - .011	.008 - .014	.008 - .016	.008 - .018	
		U	230	328	689	IPR	.006 - .011	.006 - .011	.008 - .014	.008 - .016	.008 - .018	
		I	164	230	492	IPR	.006 - .011	.006 - .011	.008 - .014	.008 - .016	.008 - .018	
	6	S	230	295	591	IPR	.006 - .011	.006 - .011	.008 - .014	.008 - .016	.008 - .018	
		U	164	246	394	IPR	.006 - .011	.006 - .011	.008 - .014	.008 - .016	.008 - .018	
		I	131	197	328	IPR	.006 - .011	.006 - .011	.008 - .014	.008 - .016	.008 - .018	
	M	1	S	197	361	443	IPR	.005 - .010	.005 - .010	.006 - .011	.006 - .013	.008 - .014
			U	131	230	295	IPR	.005 - .010	.005 - .010	.006 - .011	.006 - .013	.008 - .014
			I	98	164	213	IPR	.005 - .010	.005 - .010	.006 - .011	.006 - .013	.008 - .014
2		S	197	328	443	IPR	.005 - .010	.005 - .010	.006 - .011	.006 - .013	.008 - .014	
		U	131	197	295	IPR	.005 - .010	.005 - .010	.006 - .011	.006 - .013	.008 - .014	
		I	98	164	213	IPR	.005 - .010	.005 - .010	.006 - .011	.006 - .013	.008 - .014	
3		S	164	295	443	IPR	.005 - .010	.005 - .010	.006 - .011	.006 - .013	.008 - .014	
		U	131	197	295	IPR	.005 - .010	.005 - .010	.006 - .011	.006 - .013	.008 - .014	
		I	82	131	213	IPR	.005 - .010	.005 - .010	.006 - .011	.006 - .013	.008 - .014	
K	1	S	295	558	755	IPR	.007 - .012	.007 - .012	.009 - .014	.009 - .017	.012 - .019	
		U	197	394	525	IPR	.007 - .012	.007 - .012	.009 - .014	.009 - .017	.012 - .019	
		I	131	230	295	IPR	.007 - .012	.007 - .012	.009 - .014	.009 - .017	.012 - .019	
	2	S	295	525	722	IPR	.007 - .012	.007 - .012	.009 - .014	.009 - .017	.012 - .019	
		U	197	361	525	IPR	.007 - .012	.007 - .012	.009 - .014	.009 - .017	.012 - .019	
		I	131	230	328	IPR	.007 - .012	.007 - .012	.009 - .014	.009 - .017	.012 - .019	
	3	S	295	492	689	IPR	.007 - .012	.007 - .012	.009 - .014	.009 - .017	.012 - .019	
		U	197	328	492	IPR	.007 - .012	.007 - .012	.009 - .014	.009 - .017	.012 - .019	
		I	115	197	295	IPR	.007 - .012	.007 - .012	.009 - .014	.009 - .017	.012 - .019	
N	1	S	492	787	1181	IPR	.005 - .008	.005 - .008	.006 - .011	.006 - .013	.008 - .016	
		U	328	525	787	IPR	.005 - .008	.005 - .008	.006 - .011	.006 - .013	.008 - .016	
		I	197	328	525	IPR	.005 - .008	.005 - .008	.006 - .011	.006 - .013	.008 - .016	
	2	S	492	722	1181	IPR	.005 - .008	.005 - .008	.006 - .011	.006 - .013	.008 - .016	
		U	328	492	787	IPR	.005 - .008	.005 - .008	.006 - .011	.006 - .013	.008 - .016	
		I	197	328	525	IPR	.005 - .008	.005 - .008	.006 - .011	.006 - .013	.008 - .016	
	3	S	492	656	1181	IPR	.005 - .008	.005 - .008	.006 - .011	.006 - .013	.008 - .016	
		U	328	459	787	IPR	.005 - .008	.005 - .008	.006 - .011	.006 - .013	.008 - .016	
		I	197	295	525	IPR	.005 - .008	.005 - .008	.006 - .011	.006 - .013	.008 - .016	
	4	S	361	722	853	IPR	.005 - .008	.005 - .008	.006 - .011	.006 - .013	.008 - .016	
		U	230	459	558	IPR	.005 - .008	.005 - .008	.006 - .011	.006 - .013	.008 - .016	
		I	148	295	361	IPR	.005 - .008	.005 - .008	.006 - .011	.006 - .013	.008 - .016	

Modular Drills

Insert Recommendation

Material Group	Outboard/ Inboard	Insert Style	Grade
P	O	DFR-GD	KC7315
		DFT-HP	
		KSEMP-HPG	
M	O	DFR-MD	KC7315
		DFT-MD	
		KSEM-HPG	
K	O	DFR-LD	KC7215
		DFT-HP	KC7315
		KSEM-HPC	KC7410
N	O	DFR-GD	KC7315
		DFT-HP	
		KSEMP-HPG	

- Order KSEM PLUS heads according to the connection coupling size (CSWS).
- Order KSEM PLUS heads separately; see page H50–H51.
- Wrench will be shipped with KSEM PLUS head.



Modular Drills

■ KSEM PLUS WD Shanks • 3 x D • Metric



catalog number	CSWS system size	D	L1	L2	LS	clamp screw
WD32FDS28128M	FDS28	32	128	71	58	193.537
WD32FDS32146M	FDS32	32	146	85	58	193.523
WD32FDS36166M	FDS36	32	166	97	58	193.524
WD50FDS40183M	FDS40	50	183	107	68	193.524
WD50FDS45206M	FDS45	50	206	122	68	193.525
WD50FDS50228M	FDS50	50	228	135	68	193.525
WD50FDS56259M	FDS56	50	259	156	68	193.526
WD50FDS63289M	FDS63	50	289	174	68	193.526



■ KSEM PLUS WD Shanks • 5 x D • Metric



catalog number	CSWS system size	D	L1	L2	LS	clamp screw
WD32FDS28190M	FDS28	32	190	133	58	193.537
WD32FDS32216M	FDS32	32	216	155	58	193.523
WD32FDS36244M	FDS36	32	244	175	58	193.524
WD50FDS40271M	FDS40	32	271	195	68	193.524
WD50FDS45304M	FDS45	50	304	220	68	193.525
WD50FDS50338M	FDS50	50	338	245	68	193.525
WD50FDS56383M	FDS56	50	383	280	68	193.526
WD50FDS63429M	FDS63	50	429	314	68	193.526



■ KSEM PLUS WD Shanks • 8 x D • Metric



catalog number	CSWS system size	D	L1	L2	LS	clamp screw
WD32FDS28283M	FDS28	32	283	226	58	193.537
WD32FDS32321M	FDS32	32	321	260	58	193.523
WD32FDS36361M	FDS36	32	361	292	58	193.524
WD50FDS40403M	FDS40	50	403	327	68	193.524
WD50FDS45451M	FDS45	50	451	367	68	193.525
WD50FDS50503M	FDS50	50	503	410	68	193.525
WD50FDS56569M	FDS56	50	569	466	68	193.526
WD50FDS63639M	FDS63	50	639	524	68	193.526



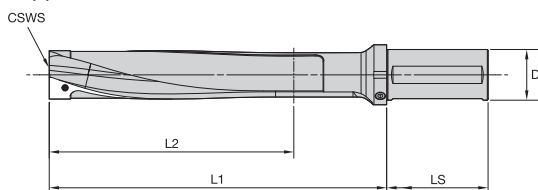
■ KSEM PLUS WD Shanks • 10 x D • Metric



catalog number	CSWS system size	D	L1	L2	LS	clamp screw
WD32FDS28345M	FDS28	32	345	288	58	193.537
WD32FDS32391M	FDS32	32	391	330	58	193.523
WD32FDS36439M	FDS36	32	439	370	58	193.524
WD50FDS40491M	FDS40	50	491	415	68	193.524
WD50FDS45549M	FDS45	50	549	465	68	193.525
WD50FDS50613M	FDS50	50	613	520	68	193.525
WD50FDS56693M	FDS56	50	693	590	68	193.526
WD50FDS63779M	FDS63	50	779	664	68	193.526



- Order KSEM PLUS heads according to the connection coupling size (CSWS).
- Order KSEM PLUS heads separately; see pages H50–H51.
- Wrench will be shipped with KSEM PLUS head.



Modular Drills

■ KSEM PLUS SSF Shanks • 3 x D • Inch


catalog number	CSWS system size	D	L1	L2	LS	clamp screw	pipe plug
SSF150FDS280502	FDS28	1.5000	5.04	2.80	3.75	193.537	HSFS0125
SSF150FDS320573	FDS32	1.5000	5.75	3.35	3.75	193.523	HSFS0125
SSF150FDS360652	FDS36	1.5000	6.54	3.82	3.75	193.524	HSFS0125
SSF200FDS400721	FDS40	2.0000	7.20	4.21	3.75	193.524	HSFS0125
SSF200FDS450809	FDS45	2.0000	8.11	4.80	4.00	193.525	HSFS0125
SSF200FDS500896	FDS50	2.0000	8.98	5.32	4.00	193.525	HSFS0125
SSF200FDS561020	FDS56	2.0000	10.20	6.14	4.00	193.526	HSFS0125
SSF200FDS631138	FDS63	2.0000	11.38	6.85	4.00	193.526	HSFS0125


■ KSEM PLUS SSF Shanks • 5 x D • Inch


catalog number	CSWS system size	D	L1	L2	LS	clamp screw	pipe plug
SSF150FDS280746	FDS28	1.5000	7.48	5.24	3.75	193.537	HSFS0125
SSF150FDS320850	FDS32	1.5000	8.50	6.10	3.75	193.523	HSFS0125
SSF150FDS360960	FDS36	1.5000	9.61	6.89	3.75	193.524	HSFS0125
SSF200FDS401066	FDS40	2.0000	10.67	7.68	4.00	193.524	HSFS0125
SSF200FDS451196	FDS45	2.0000	11.97	8.66	4.00	193.525	HSFS0125
SSF200FDS501330	FDS50	2.0000	13.31	9.65	4.00	193.525	HSFS0125
SSF200FDS561507	FDS56	2.0000	15.08	11.02	4.00	193.526	HSFS0125
SSF200FDS631688	FDS63	2.0000	16.89	12.36	4.00	193.526	HSFS0125


■ KSEM PLUS SSF Shanks • 8 x D • Inch


catalog number	CSWS system size	D	L1	L2	LS	clamp screw	pipe plug
SSF150FDS281112	FDS28	1.5000	11.14	8.90	3.75	193.537	HSFS0125
SSF150FDS321263	FDS32	1.5000	12.64	10.24	3.75	193.523	HSFS0125
SSF150FDS361421	FDS36	1.5000	14.21	11.50	3.75	193.524	HSFS0125
SSF200FDS401586	FDS40	2.0000	15.87	12.87	4.00	193.524	HSFS0125
SSF200FDS451775	FDS45	2.0000	17.76	14.45	4.00	193.525	HSFS0125
SSF200FDS501980	FDS50	2.0000	19.80	16.14	4.00	193.525	HSFS0125
SSF200FDS562240	FDS56	2.0000	22.40	18.35	4.00	193.526	HSFS0125
SSF200FDS632515	FDS63	2.0000	25.16	20.63	4.00	193.526	HSFS0125


■ KSEM PLUS SSF Shanks • 10 x D • Inch


catalog number	CSWS system size	D	L1	L2	LS	clamp screw	pipe plug
SSF150FDS281356	FDS28	1.5000	13.58	11.34	3.75	193.537	HSFS0125
SSF150FDS321539	FDS32	1.5000	15.39	12.99	3.75	193.523	HSFS0125
SSF150FDS361728	FDS36	1.5000	17.28	14.57	3.75	193.524	HSFS0125
SSF200FDS401933	FDS40	2.0000	19.33	16.34	4.00	193.524	HSFS0125
SSF200FDS452161	FDS45	2.0000	21.61	18.31	4.00	193.525	HSFS0125
SSF200FDS502413	FDS50	2.0000	24.13	20.47	4.00	193.525	HSFS0125
SSF200FDS562783	FDS56	2.0000	27.28	23.23	4.00	193.526	HSFS0125
SSF200FDS633066	FDS63	2.0000	30.67	26.14	4.00	193.526	HSFS0125



KSEM PLUS™ Application Cautions and Hints



Half cylindrical holes



Cored holes



Hole expansion on the center axis

Coolant Recommendations

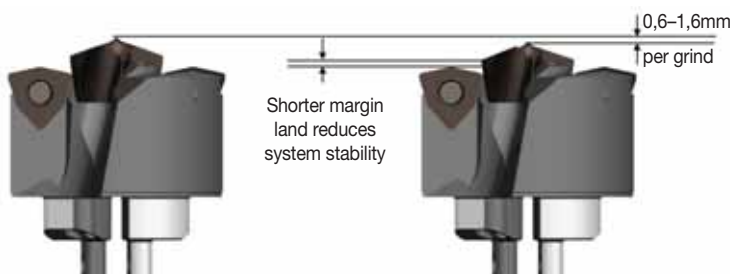


Internal coolant is recommended for optimum chip flow and tool life.

KSEM PLUS Application Cautions and Piloting

Application		L/D < 6 x D	L/D < 8 x D	L/D > 8 x D
	Regular Entrance Exit	Piloting Not Required	Reduce Feed by 50%	KSEM™ Pilot Drill
	Angled Entrance < 3°	KSEM Pilot Drill	KSEM Pilot Drill	KSEM Pilot Drill
	Angled and Concave Entrance > 3°	Face Mill and KSEM Pilot Drill	Face Mill and KSEM Pilot Drill	Face Mill and KSEM Pilot Drill
	Angled Exit	Regular Entrance Exit	Reduce Feed by 75%	Not Recommended
	Stacked Material	Stacked material requires a custom solution head using S2S inserts.		

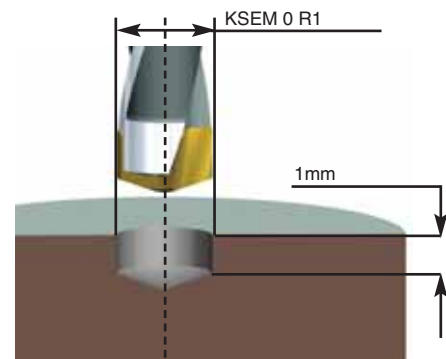
The KSEM PLUS Piloting Insert SHOULD NOT be Reground:



Only new KSEM PLUS inserts will provide consistency and process security of the KSEM PLUS modular drill system.

NOTE: Reground KSEM PLUS inserts can be used in KSEM drills.

Piloting Instructions:



1. KSEM....PCM
Pilot drill Ø equal KSEMP Ø PDD
2. Drill 1mm deep from full diameter



New KSEM PLUS B1 Head

Discover *New Dimensions* with

KSEM PLUS™ Extensions

KSEM PLUS is the industry benchmark when drilling large diameter applications. With significantly reduced cost per hole, KSEM PLUS now extends its range.

Diameter Extension:

- New generation of large heads featuring diameters above 70mm and up to 127mm in 10 x D*.

Application Extension:

- New KSEM PLUS B1 heads for difficult applications using new DFC inserts and guiding pads.
- Drilling through inclined exits up to 15°.
- Perfect guidance of head when drilling through cross holes with widths up to 50% of drill diameter.
- Works great in stacked materials.
- Standard range of KSEM PLUS B1 heads available from 28–70mm*.

“This is not drilling, this is more like punching! Surfaces and accuracy are fully compliant with our requirements. We have been waiting a long time for such a drill!”
Customer, Germany

*NOTE: Please contact our engineered solution team for available offers.

www.kennametal.com

 **KENNAMETAL®**






Combination Tools

Tool Selection Guide .....	.I2-I3
BF Combination Drilling System .....	.I5-I18
B343_HPG Drill for BF .....	.I5-I8
KenTIP for BF .....	.I9-I11
BF Bodies .....	.I12-I13
BF Inserts .....	.I14-I15
SEFAS Combination Drilling System .....	.I19-I26
SEFAS Bodies .....	.I21-I24
SEFAS Hardware .....	.I25
SEFAS Chamfering Inserts .....	.I26



Combination Tools

		standard						hole tolerance	standard range			customized solution range		
		P	M	K	N	S	H		diameter range			diameter range		
									D1 mm min - max	D1 inch min - max	drilling depth L/D1	D1 mm min - max	D1 inch min - max	drilling depth
	BF with Solid Carbide Drill Combination Tool	●		●	●			IT7-11	3,4-18 (B343 drill)	.134-.709 (B343 drill)	approx. 3 x D	3,4-22,5	.134-.885	.1-5 x D
	BF with KenTIP™ Combination Tool	●	●	●				IT7-11	8-18,99	.313-.826	3 x D 4 x D 5 x D	8-25,99	.313-1.023	3-5 x D
	SEFAS™ Combination Tool	●	●	●	●	●		IT7-11	4-20	.157-.787	approx. 3 x D 5 x D 8 x D 12 x D	3,4-25	.134-1.039	1-5 x D

* In regard to insert and drill coatings, anything is possible. If a specific insert or drill is not suitable for your workpiece material, please contact our Engineered Solutions Department for an offer about special coatings and edge preparations.

**Except for L/D 5 x D.

¹⁾ Other shank styles available as customized solution.

		■ standard capabilities ¹⁾				■ standard and □ customized solution capabilities									
coolant															page(s)
■		■	■			■			□		■	□		■	16-18
■		■	■			■			□		■	□		■	19-18
■		■	■	■		■			□		■			■	121-126

Combination Tools

Combination Tools

Combination Drilling Tools are customizable using standard components and combine centering, drilling, and countersinking into a single operation, increasing productivity by reducing cycle time and tool changes.

Both the BF and SEFAS™ combination systems provide high flexibility to adapt the tool to varying hole geometries and provide full through-coolant capabilities.

BF Combination Drilling System

- Drilling, chamfering, and countersinking in one tool.
- Uses solid carbide and modular KenTIP™ drills.
- Covered drill diameter range .125–.750" (3,4–18mm).
- A specific range of drill diameters can be applied for each drill body based upon drill shank size.
- Highly flexible system:
 - Chamfer insert with different angles.
 - Insert design enables for special geometrical shapes.
 - Inserts can be easily interchanged.

SEFAS™ Combination Drilling System

- High-performance, self-centering drill and chamfer in one tool.
- Drill diameter range .156–.750" (4–18mm).
- Uses standard solid carbide drills in HP and TX styles as well as modular KenTIP drills.
- 90° and 82° angles available for chamfer inserts.
- Various shanks can be used with metric and inch diameter drills.

NOTE: TF drills may be used with one insert in limited applications.
Consult your Kennametal Sales Representative for more information.



BF Combination Drilling System

Primary Application

Combines centering, drilling, and countersinking into a single operation, increasing productivity by reducing cycle time and number of tool changes. The modular design provides flexibility to adapt the tool to varying hole geometries in small- and medium-lot-size manufacturing.

With its slim design and full-through-coolant capabilities, the BF combination system can be used even for deeper holes, critical materials, and with restricted workspace.

Features and Benefits

Productivity

- Reduce the number of tool changes and your cycle time by combining drilling and countersinking into one operation.
- Use high-performance solid carbide drills and KenTIP™ drill bodies to achieve high speeds and feeds.
- Avoid the need for reconditioning by using KenTIP blades.

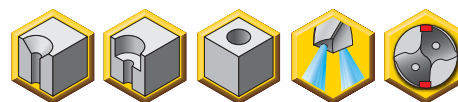
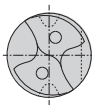
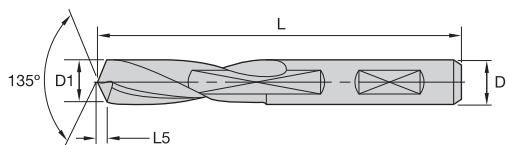
Versatility

- Choose between solid carbide drills and KenTIP drill bodies.
- Various grades and insert styles.
- Benefit from the modular system when adjusting the drill length or insert style to manufacture different geometries.

Customization

- Length variations available as engineered solutions.
- TX drills for aluminum are available as engineered solutions.
- BF inserts can be customized to almost any required geometry.





Combination Tools

■ B343_HPG



- first choice
- alternate choice

KC7315	D1 diameter				wire size	D	L	L7 min		L7 max		L5
	mm	in	in					mm	in	mm	in	
B343S03175HPG	3,18	.125	—	—	—	4,00	55,00	1,00	.039	10,00	.394	0,60
B343S03400HPG	3,40	.134	—	—	—	4,00	55,00	1,00	.039	10,00	.394	0,63
B343S03500HPG	3,50	.138	—	—	—	4,00	55,00	1,60	.063	10,60	.417	0,65
B343S03797HPG	3,80	.150	—	25	—	4,00	55,00	3,30	.130	12,30	.484	0,70
B343S03800HPG	3,80	.150	—	—	—	4,00	55,00	3,30	.130	12,30	.484	0,70
B343S03970HPG	3,97	.156	5/32	—	—	4,00	55,00	4,20	.165	13,20	.520	0,73
B343S04000HPG	4,00	.158	—	—	—	4,00	55,00	4,40	.173	13,40	.528	0,74
B343S04100HPG	4,10	.161	—	—	—	5,00	62,00	3,70	.146	13,70	.539	0,76
B343S04200HPG	4,20	.165	—	—	—	5,00	62,00	4,20	.165	14,20	.559	0,78
B343S04300HPG	4,30	.169	—	—	—	5,00	62,00	4,70	.185	14,70	.579	0,79
B343S04500HPG	4,50	.177	—	—	—	5,00	62,00	5,60	.221	15,60	.614	0,83
B343S04600HPG	4,60	.181	—	—	—	5,00	62,00	5,80	.228	15,80	.622	0,85
B343S04623HPG	4,62	.182	—	14	—	5,00	62,00	5,90	.232	15,90	.626	0,85
B343S04763HPG	4,76	.188	3/16	—	—	5,00	62,00	6,60	.260	16,60	.654	0,88
B343S04900HPG	4,90	.193	—	—	—	5,00	62,00	7,20	.284	17,20	.677	0,90
B343S05000HPG	5,00	.197	—	—	—	5,00	62,00	7,60	.299	17,60	.693	0,92
B343S05100HPG	5,10	.201	—	—	—	6,00	66,00	6,80	.268	17,80	.701	0,94
B343S05200HPG	5,20	.205	—	—	—	6,00	66,00	7,20	.284	18,20	.717	0,96
B343S05300HPG	5,30	.209	—	—	—	6,00	66,00	7,60	.299	18,60	.732	0,98
B343S05400HPG	5,40	.213	—	—	—	6,00	66,00	8,00	.315	19,00	.748	1,00
B343S05410HPG	5,41	.213	—	—	—	6,00	66,00	8,00	.315	19,00	.748	1,00
B343S05500HPG	5,50	.217	—	—	—	6,00	66,00	8,40	.331	19,40	.764	1,02
B343S05550HPG	5,55	.219	—	—	—	6,00	66,00	8,30	.327	19,30	.760	1,02
B343S05558HPG	5,56	.219	7/32	—	—	6,00	66,00	8,40	.331	19,40	.764	1,03
B343S05600HPG	5,60	.221	—	—	—	6,00	66,00	8,50	.335	19,50	.768	1,03
B343S05800HPG	5,80	.228	—	—	—	6,00	66,00	9,30	.366	20,30	.799	1,07
B343S06000HPG	6,00	.236	—	—	—	6,00	66,00	10,00	.394	21,00	.827	1,11
B343S06100HPG	6,10	.240	—	—	—	7,00	74,00	9,10	.358	21,10	.831	1,13
B343S06200HPG	6,20	.244	—	—	—	7,00	74,00	9,50	.374	21,50	.847	1,14
B343S06300HPG	6,30	.248	—	—	—	7,00	74,00	9,80	.386	21,80	.858	1,16
B343S06350HPG	6,35	.250	1/4	—	—	7,00	74,00	10,00	.394	22,00	.866	1,17
B343S06400HPG	6,40	.252	—	—	—	7,00	74,00	10,20	.402	22,20	.874	1,18
B343S06500HPG	6,50	.256	—	—	—	7,00	74,00	10,50	.413	22,50	.886	1,20
B343S06528HPG	6,53	.257	—	F	—	7,00	74,00	10,60	.417	22,60	.890	1,21
B343S06600HPG	6,60	.260	—	—	—	7,00	74,00	10,90	.429	22,90	.902	1,22
B343S06700HPG	6,70	.264	—	—	—	7,00	74,00	11,20	.441	23,20	.913	1,24
B343S06746HPG	6,75	.266	17/64	—	—	7,00	74,00	11,40	.449	23,40	.921	1,25
B343S06800HPG	6,80	.268	—	—	—	7,00	74,00	11,50	.453	23,50	.925	1,26
B343S06900HPG	6,90	.272	—	—	—	7,00	74,00	11,90	.469	23,90	.941	1,27
B343S06909HPG	6,91	.272	—	—	—	7,00	74,00	11,90	.469	23,90	.941	1,28
B343S07000HPG	7,00	.276	—	—	—	7,00	74,00	12,20	.480	24,20	.953	1,29
B343S07145HPG	7,14	.281	9/32	—	—	8,00	79,00	11,10	.437	24,10	.949	1,32

(continued)

(B343_HPG continued)



KC7315	D1 diameter				wire size	D		L7 min		L7 max		L5
	mm	in	in			mm	L	mm	in	mm	in	
B343S07300HPG	7,30	.287	—	—	—	8,00	79,00	11,60	.457	24,60	.969	1,35
B343S07400HPG	7,40	.291	—	—	—	8,00	79,00	11,90	.469	24,90	.980	1,37
B343S07500HPG	7,50	.295	—	—	—	8,00	79,00	12,30	.484	25,30	.996	1,38
B343S07541HPG	7,54	.297	19/64	—	—	8,00	79,00	12,40	.488	25,40	1.000	1,39
B343S07700HPG	7,70	.303	—	—	—	8,00	79,00	12,90	.508	25,90	1.020	1,42
B343S07800HPG	7,80	.307	—	—	—	8,00	79,00	13,20	.520	26,20	1.032	1,44
B343S07900HPG	7,90	.311	—	—	—	8,00	79,00	13,50	.532	26,50	1.043	1,46
B343S07938HPG	7,94	.313	5/16	—	—	8,00	79,00	13,60	.535	26,60	1.047	1,47
B343S08000HPG	8,00	.315	—	—	—	8,00	79,00	13,80	.543	26,80	1.055	1,48
B343S08100HPG	8,10	.319	—	—	—	9,00	84,00	12,60	.496	26,60	1.047	1,50
B343S08200HPG	8,20	.323	—	—	—	9,00	84,00	12,80	.504	26,80	1.055	1,51
B343S08300HPG	8,30	.327	—	—	—	9,00	84,00	13,10	.516	27,10	1.067	1,53
B343S08334HPG	8,33	.328	21/64	—	—	9,00	84,00	13,20	.520	27,20	1.071	1,54
B343S08400HPG	8,40	.331	—	—	—	9,00	84,00	13,40	.528	27,40	1.079	1,55
B343S08433HPG	8,43	.332	—	Q	—	9,00	84,00	13,50	.532	27,50	1.083	1,56
B343S08500HPG	8,50	.335	—	—	—	9,00	84,00	13,70	.539	27,70	1.091	1,57
B343S08600HPG	8,60	.339	—	—	—	9,00	84,00	14,00	.551	28,00	1.102	1,59
B343S08700HPG	8,70	.343	—	—	—	9,00	84,00	14,30	.563	28,30	1.114	1,61
B343S08733HPG	8,73	.344	11/32	—	—	9,00	84,00	14,40	.567	28,40	1.118	1,61
B343S08800HPG	8,80	.347	—	—	—	9,00	84,00	14,50	.571	28,50	1.122	1,62
B343S08900HPG	8,90	.350	—	—	—	9,00	84,00	14,80	.583	28,80	1.134	1,64
B343S09000HPG	9,00	.354	—	—	—	9,00	84,00	15,10	.595	29,10	1.146	1,66
B343S09100HPG	9,10	.358	—	—	—	10,00	89,00	14,30	.563	28,80	1.134	1,68
B343S09129HPG	9,13	.359	23/64	—	—	10,00	89,00	14,40	.567	28,90	1.138	1,69
B343S09347HPG	9,35	.368	—	U	—	10,00	89,00	15,00	.591	29,50	1.161	1,73
B343S09400HPG	9,40	.370	—	—	—	10,00	89,00	15,10	.595	29,60	1.165	1,74
B343S09500HPG	9,50	.374	—	—	—	10,00	89,00	15,40	.606	29,90	1.177	1,75
B343S09525HPG	9,53	.375	3/8	—	—	10,00	89,00	15,40	.606	29,90	1.177	1,76
B343S09600HPG	9,60	.378	—	—	—	10,00	89,00	15,60	.614	30,10	1.185	1,77
B343S09700HPG	9,70	.382	—	—	—	10,00	89,00	15,90	.626	30,40	1.197	1,79
B343S09800HPG	9,80	.386	—	—	—	10,00	89,00	16,20	.638	30,70	1.209	1,81
B343S09921HPG	9,92	.391	25/64	—	—	10,00	89,00	16,50	.650	31,00	1.221	1,83
B343S10000HPG	10,00	.394	—	—	—	10,00	89,00	16,70	.658	31,20	1.228	1,85
B343S10100HPG	10,10	.398	—	—	—	11,00	95,00	15,90	.626	30,90	1.217	1,86
B343S10200HPG	10,20	.402	—	—	—	11,00	95,00	16,20	.638	31,20	1.228	1,88
B343S10300HPG	10,30	.406	—	—	—	11,00	95,00	16,40	.646	31,40	1.236	1,90
B343S10320HPG	10,32	.406	13/32	—	—	11,00	95,00	16,50	.650	31,50	1.240	1,91
B343S10400HPG	10,40	.409	—	—	—	11,00	95,00	16,70	.658	31,70	1.248	1,92
B343S10500HPG	10,50	.413	—	—	—	11,00	95,00	16,90	.665	31,90	1.256	1,94
B343S10600HPG	10,60	.417	—	—	—	11,00	95,00	17,20	.677	32,20	1.268	1,96

(continued)

Combination Tools

(B343_HPG continued)



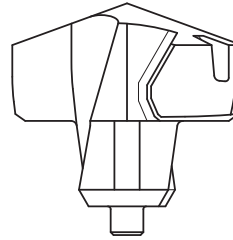
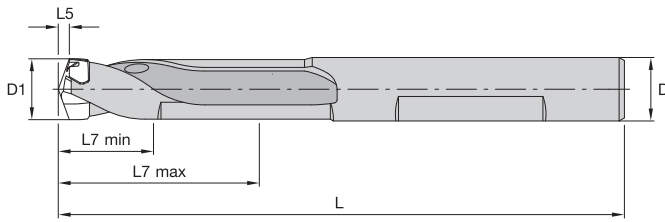
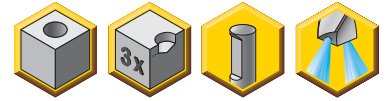
Combination Tools

KC7315	D1 diameter				wire size	D		L7 min		L7 max		L5
	mm	in	in			D	L	mm	in	mm	in	
B343S10700HPG	10,70	.421	—	—	11,00	95,00	17,40	.685	32,40	1.276	1,98	
B343S10710HPG	10,71	.422	27/64	—	11,00	95,00	17,40	.685	32,40	1.276	1,98	
B343S10800HPG	10,80	.425	—	—	11,00	95,00	17,70	.697	32,70	1.287	1,99	
B343S11000HPG	11,00	.433	—	—	11,00	95,00	18,10	.713	33,10	1.303	2,03	
B343S11100HPG	11,10	.437	—	—	12,00	102,00	17,40	.685	32,90	1.295	2,05	
B343S11110HPG	11,11	.438	7/16	—	12,00	102,00	17,40	.685	32,90	1.295	2,05	
B343S11200HPG	11,20	.441	—	—	12,00	102,00	17,60	.693	33,10	1.303	2,07	
B343S11300HPG	11,30	.445	—	—	12,00	102,00	17,90	.705	33,40	1.315	2,09	
B343S11500HPG	11,50	.453	—	—	12,00	102,00	18,30	.721	33,80	1.331	2,12	
B343S11508HPG	11,51	.453	29/64	—	12,00	102,00	18,30	.721	33,80	1.331	2,12	
B343S11700HPG	11,70	.461	—	—	12,00	102,00	18,80	.740	34,30	1.350	2,16	
B343S11800HPG	11,80	.465	—	—	12,00	102,00	19,00	.748	34,50	1.358	2,18	
B343S11900HPG	11,90	.469	15/32	—	12,00	102,00	19,30	.760	34,80	1.370	2,20	
B343S12000HPG	12,00	.472	—	—	12,00	102,00	19,50	.768	35,00	1.378	2,22	
B343S12200HPG	12,20	.480	—	—	13,00	102,00	18,90	.744	34,90	1.374	2,25	
B343S12300HPG	12,30	.484	31/64	—	13,00	102,00	19,20	.756	35,31	1.390	2,27	
B343S12500HPG	12,50	.492	—	—	13,00	102,00	19,60	.772	35,56	1.400	2,31	
B343S12700HPG	12,70	.500	1/2	—	13,00	102,00	20,10	.791	36,10	1.421	2,34	
B343S12800HPG	12,80	.504	—	—	13,00	102,00	20,30	.799	36,30	1.429	2,36	
B343S13000HPG	13,00	.512	—	—	13,00	102,00	20,70	.815	36,70	1.445	2,40	
B343S13096HPG	13,10	.516	33/64	—	14,00	107,00	20,20	.795	36,70	1.445	2,42	
B343S13100HPG	13,10	.516	—	—	14,00	107,00	20,20	.795	36,70	1.445	2,42	
B343S13200HPG	13,20	.520	—	—	14,00	107,00	20,40	.803	36,90	1.453	2,44	
B343S13500HPG	13,50	.532	—	—	14,00	107,00	21,10	.831	37,60	1.480	2,49	
B343S14000HPG	14,00	.551	—	—	14,00	107,00	22,10	.870	38,60	1.520	2,58	
B343S14100HPG	14,10	.555	—	—	15,00	111,00	21,30	.839	38,30	1.508	2,60	
B343S14200HPG	14,20	.559	—	—	15,00	111,00	21,50	.847	38,50	1.516	2,62	
B343S14280HPG	14,28	.563	9/16	—	15,00	111,00	21,70	.854	38,70	1.524	2,64	
B343S15000HPG	15,00	.591	—	—	15,00	111,00	23,20	.913	40,20	1.583	2,77	
B343S15500HPG	15,50	.610	—	—	16,00	115,00	23,20	.913	40,70	1.602	2,86	
B343S15870HPG	15,87	.625	5/8	—	16,00	115,00	23,90	.941	41,40	1.630	2,93	
B343S16000HPG	16,00	.630	—	—	16,00	115,00	24,20	.953	41,70	1.642	2,95	
B343S16500HPG	16,50	.650	—	—	17,00	115,00	24,20	.953	42,20	1.661	3,05	
B343S16670HPG	16,67	.656	21/32	—	17,00	115,00	24,50	.965	42,50	1.673	3,08	
B343S17000HPG	17,00	.669	—	—	17,00	115,00	25,10	.988	43,10	1.697	3,14	
B343S17460HPG	17,46	.688	11/16	—	18,00	117,00	25,00	.984	43,50	1.713	3,22	
B343S17500HPG	17,50	.689	—	—	18,00	117,00	25,10	.988	43,60	1.717	3,23	
B343S17700HPG	17,70	.697	—	—	18,00	117,00	25,50	1.004	44,00	1.732	3,27	
B343S18000HPG	18,00	.709	—	—	18,00	117,00	26,00	1.024	44,50	1.752	3,32	

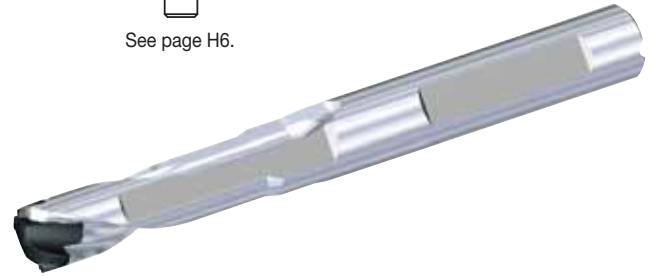
Tolerance • Metric

D1	tolerance h7	D	tolerance h6
>3-6	0,000/-0,012	6	0,000/-0,008
>6-10	0,000/-0,016	8-10	0,000/-0,009
>10-18	0,000/-0,018	12-18	0,000/-0,011

- Tool body with insert wrench included.
- Order KenTIP blades separately.



See page H6.

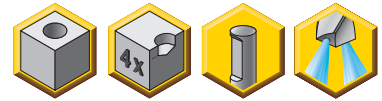


Combination Tools

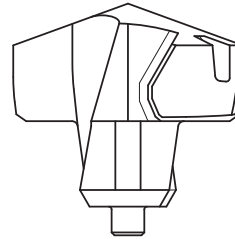
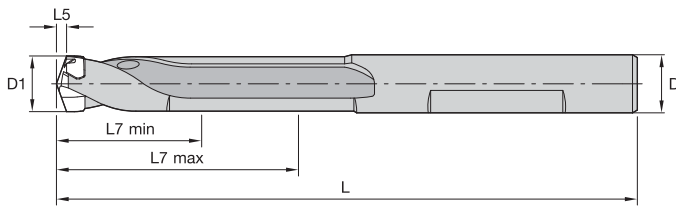
■ KenTIP • 3 x D • Metric

catalog number	D1		D1 max		D	L	L7 min	L7 max	L5	insert blade seat size
	mm	in	mm	in						
KTIP080R3BF08M	7,94	.313	8,49	.334	8,0	80,0	11,5	25,5	1,4	F
KTIP080R3BF09M	7,94	.313	8,49	.334	9,0	81,0	11,5	25,5	1,4	F
KTIP085R3BF09M	8,50	.335	8,99	.354	9,0	82,0	12,5	27,0	1,5	G
KTIP090R3BF09M	9,00	.354	9,49	.374	9,0	82,0	13,5	28,5	1,6	H
KTIP090R3BF10M	9,00	.354	9,49	.374	10,0	91,0	13,5	28,5	1,6	H
KTIP095R3BF10M	9,50	.374	9,99	.393	10,0	92,0	15,0	30,0	1,6	I
KTIP100R3BF10M	10,00	.394	10,49	.413	10,0	93,0	16,0	31,5	1,7	J
KTIP100R3BF11M	10,00	.394	10,49	.413	11,0	94,0	16,0	31,5	1,7	J
KTIP105R3BF11M	10,50	.413	10,99	.433	11,0	94,0	17,0	33,0	1,8	K
KTIP110R3BF11M	11,00	.433	11,49	.452	11,0	96,0	18,5	34,5	1,9	L
KTIP110R3BF12M	11,00	.433	11,49	.452	12,0	106,0	18,5	34,5	1,9	L
KTIP115R3BF12M	11,50	.453	11,99	.472	12,0	107,0	19,5	36,0	2,0	M
KTIP120R3BF12M	12,00	.472	12,49	.492	12,0	108,0	20,5	37,5	2,1	N
KTIP120R3BF13M	12,00	.472	12,49	.492	13,0	108,0	20,5	37,5	2,1	N
KTIP125R3BF13M	12,50	.492	12,99	.511	13,0	110,0	22,0	39,0	2,2	O
KTIP130R3BF13M	13,00	.512	13,49	.531	13,0	111,0	23,0	40,5	2,2	P
KTIP130R3BF14M	13,00	.512	13,49	.531	14,0	111,0	23,0	40,5	2,2	P
KTIP135R3BF14M	13,50	.532	13,99	.551	14,0	112,0	24,5	42,0	2,3	Q
KTIP140R3BF14M	14,00	.551	14,49	.571	14,0	113,0	25,5	43,5	2,4	R
KTIP140R3BF15M	14,00	.551	14,49	.571	15,0	118,0	25,5	43,5	2,4	R
KTIP145R3BF15M	14,50	.571	14,99	.590	15,0	118,0	26,5	45,0	2,5	S
KTIP150R3BF15M	15,00	.591	15,99	.630	15,0	121,0	29,0	48,0	2,6	T
KTIP150R3BF16M	15,00	.591	15,99	.630	16,0	121,0	29,0	48,0	2,6	T
KTIP160R3BF16M	16,00	.630	16,99	.669	16,0	123,0	31,5	51,0	2,8	U
KTIP160R3BF17M	16,00	.630	16,99	.669	17,0	124,0	31,5	51,0	2,8	U
KTIP170R3BF17M	17,00	.669	17,99	.708	17,5	127,0	34,0	54,0	2,9	V
KTIP170R3BF18M	17,00	.669	17,99	.708	18,0	127,0	34,0	54,0	2,9	V
KTIP180R3BF18M	18,00	.709	18,99	.748	18,0	130,0	36,5	57,0	3,1	W

- Tool body with insert wrench included.
- Order KenTIP blades separately.



Combination Tools



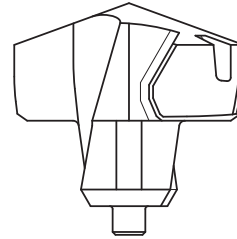
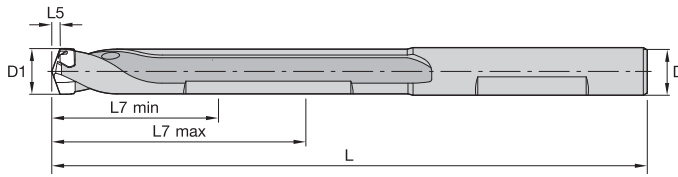
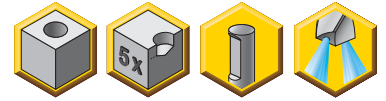
See page H6.



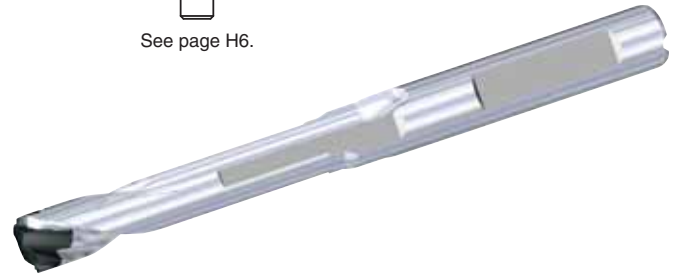
■ KenTIP • 4 x D • Metric

catalog number	D1		D1 max		D	L	L7 min	L7 max	L5	insert blade seat size
	mm	in	mm	in						
KTIP080R4BF09M	8,00	.315	8,49	.334	12,0	89,5	20,0	34,0	1,4	F
KTIP085R4BF09M	8,50	.335	8,99	.354	10,0	91,0	21,5	36,0	1,5	G
KTIP090R4BF10M	9,00	.354	9,49	.374	10,0	100,5	23,0	38,0	1,6	H
KTIP095R4BF10M	9,50	.374	9,99	.393	12,0	102,0	25,0	40,0	1,6	I
KTIP100R4BF11M	10,00	.394	10,49	.413	12,0	104,5	26,5	42,0	1,7	J
KTIP105R4BF11M	10,50	.413	10,99	.433	12,0	105,0	28,0	44,0	1,8	K
KTIP110R4BF12M	11,00	.433	11,49	.452	12,0	117,5	30,0	46,0	1,9	L
KTIP115R4BF12M	11,50	.453	11,99	.472	12,0	119,0	31,5	48,0	2,0	M
KTIP120R4BF13M	12,00	.472	12,49	.492	13,0	120,5	33,0	50,0	2,1	N
KTIP125R4BF13M	12,50	.492	12,99	.511	13,0	123,0	35,0	52,0	2,2	O
KTIP130R4BF14M	13,00	.512	13,49	.531	14,0	124,5	36,5	54,0	2,2	P
KTIP135R4BF14M	13,50	.532	13,99	.551	14,0	126,0	38,5	56,0	2,3	Q
KTIP140R4BF15M	14,00	.551	14,49	.571	15,0	132,5	40,0	58,0	2,4	R
KTIP145R4BF15M	14,50	.571	14,99	.590	15,0	133,0	41,5	60,0	2,5	S
KTIP150R4BF16M	15,00	.591	16,00	.630	16,0	137,0	45,0	64,0	2,6	T
KTIP160R4BF17M	16,00	.630	16,99	.669	17,0	141,0	48,5	68,0	2,8	U
KTIP170R4BF18M	17,00	.669	17,99	.708	18,0	145,0	52,0	72,0	2,9	V
KTIP180R4BF18M	18,00	.709	18,99	.748	18,0	149,0	55,5	76,0	3,1	W

- Tool body with insert wrench included.
- Order KenTIP blades separately.



See page H6.

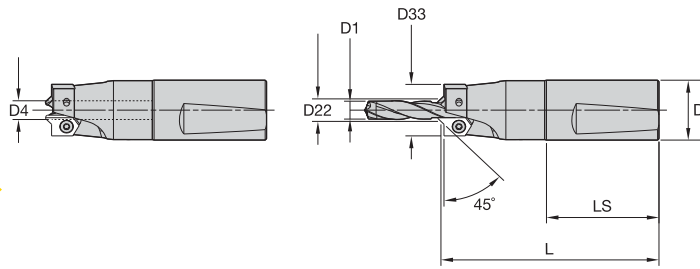


Combination Tools

■ KenTIP • 5 x D • Metric

catalog number	D1		D1 max		D	L	L7 min	L7 max	L5	insert blade seat size
	mm	in	mm	in						
KTIP080R5BF09M	8,00	.315	8,49	.334	12,0	98,0	28,5	42,5	1,4	F
KTIP085R5BF09M	8,50	.335	8,99	.354	9,0	100,0	30,5	45,0	1,5	G
KTIP090R5BF10M	9,00	.354	9,49	.374	12,0	110,0	32,5	47,5	1,6	H
KTIP095R5BF10M	9,50	.374	9,99	.393	12,0	112,0	35,0	50,0	1,6	I
KTIP100R5BF11M	10,00	.394	10,49	.413	10,0	115,0	37,0	52,5	1,7	J
KTIP105R5BF11M	10,50	.413	10,99	.433	12,0	116,0	39,0	55,0	1,8	K
KTIP110R5BF12M	11,00	.433	11,49	.452	12,0	129,0	41,5	57,5	1,9	L
KTIP115R5BF12M	11,50	.453	11,99	.472	12,0	131,0	43,5	60,0	2,0	M
KTIP120R5BF13M	12,00	.472	12,49	.492	13,0	133,0	45,5	62,5	2,1	N
KTIP125R5BF13M	12,50	.492	12,99	.511	13,0	136,0	48,0	65,0	2,2	O
KTIP130R5BF14M	13,00	.512	13,49	.531	14,0	138,0	50,0	67,5	2,2	P
KTIP135R5BF14M	13,50	.532	13,99	.551	14,0	140,0	52,5	70,0	2,3	Q
KTIP140R5BF15M	14,00	.551	14,49	.571	15,0	147,0	54,5	72,5	2,4	R
KTIP145R5BF15M	14,50	.571	14,99	.590	15,0	148,0	56,5	75,0	2,5	S
KTIP150R5BF16M	15,00	.591	16,00	.630	16,0	153,0	61,0	80,0	2,6	T
KTIP160R5BF17M	16,00	.630	16,99	.669	17,0	158,0	65,5	85,0	2,8	U
KTIP170R5BF18M	17,00	.669	17,99	.708	18,0	163,0	70,0	90,0	2,9	V
KTIP180R5BF18M	18,00	.709	18,99	.748	18,0	168,0	74,5	95,0	3,1	W

- Drill body shipped with all screws and wrenches.
- Order the inserts and drills separately.
- Drills with shanks up to and including 9,10mm use only one insert.



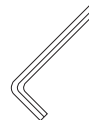
Combination Tools

■ Round Shank • 2° Whistle Notch™ Shank • Metric



DIN 1835 Form A	DIN 1835 Form E	D1	D1 max	D4	D	D22	D33	L	LS	insert
3.37042R320	3.37042R820	3,40	4,000	4,00	20,0	9,0	14,9	85,0	50,0	3.41020..
3.37051R320	3.37051R820	4,10	4,500	5,00	20,0	9,5	15,4	85,0	50,0	3.41020..
3.37052R320	3.37052R820	4,60	5,000	5,00	20,0	10,0	15,9	85,0	50,0	3.41020..
3.37061R320	3.37061R820	5,10	5,500	6,00	20,0	10,5	16,4	85,0	50,0	3.41020..
3.37062R320	3.37062R820	5,55	6,000	6,00	20,0	11,0	16,9	85,0	50,0	3.41020..
3.37071R320	3.37071R820	6,10	7,000	7,00	20,0	11,5	17,4	95,0	50,0	3.41020..
3.37081R320	3.37081R820	7,30	8,000	8,00	20,0	12,6	18,4	95,0	50,0	3.41020..
3.37091R320	3.37091R820	8,10	9,000	9,00	20,0	13,6	19,4	95,0	50,0	3.41020..
3.37092R320	3.37092R820	8,10	9,000	9,00	20,0	13,7	19,4	97,3	50,0	3.41020..
3.37101R332	3.37101R832	9,10	10,000	10,00	32,0	14,7	27,9	115,0	60,0	3.41220..
3.37111R332	3.37111R832	10,10	11,000	11,00	32,0	15,7	28,9	115,0	60,0	3.41220..
3.37121R332	3.37121R832	11,10	12,000	12,00	32,0	16,7	29,9	125,0	60,0	3.41220..
3.37131R332	3.37131R832	12,20	13,000	13,00	32,0	17,7	31,0	125,0	60,0	3.41220..
3.37141R332	3.37141R832	13,10	14,000	14,00	32,0	18,2	31,5	125,0	60,0	3.41220..
3.37151R332	3.37151R832	14,10	15,000	15,00	32,0	19,3	32,5	125,0	60,0	3.41220..
3.37161R332	3.37161R832	15,50	16,000	16,00	32,0	20,3	33,5	125,0	60,0	3.41220..
3.37171R332	3.37171R832	16,50	17,000	17,00	32,0	21,3	34,5	125,0	60,0	3.41220..
3.37181R332	3.37181R832	17,50	18,000	18,00	32,0	22,3	35,5	125,0	60,0	3.41220..

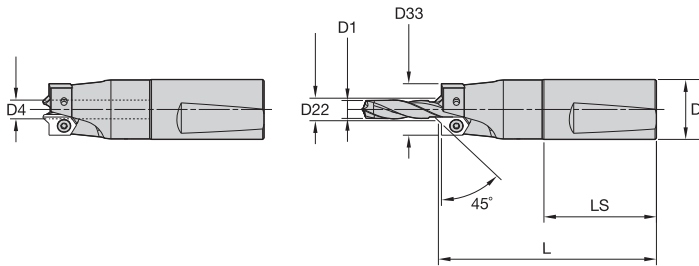
■ Spare Parts



D1	back-up screw	drill clamp screw	hex wrench	insert screw	wrench
3,40	192.888	192.718	170.003	192.432	170.028
4,10	192.888	192.718	170.003	192.432	170.028
4,60	192.888	192.718	170.003	192.432	170.028
5,10	192.888	192.718	170.003	192.432	170.028
5,55	192.888	192.718	170.003	192.432	170.028
6,10	192.888	192.718	170.003	192.432	170.028
7,30	192.888	192.718	170.003	192.432	170.028
8,10	192.888	192.718	170.003	192.432	170.028
8,10	192.888	192.718	170.003	192.432	170.028
9,10	192.889	192.720	170.005	191.725	170.025
10,10	192.889	192.720	170.005	191.725	170.025
11,10	192.889	192.720	170.005	191.725	170.025
12,20	192.889	192.720	170.005	191.725	170.025
13,10	192.889	192.720	170.005	191.725	170.025
14,10	192.887	192.720	170.005	191.725	170.025
15,50	192.887	192.720	170.005	191.725	170.025
16,50	192.887	192.720	170.005	191.725	170.025
17,50	192.887	192.720	170.005	191.725	170.025

NOTE: Dimensions are factored with a 45° insert positioned in insert pocket.

- Drill body shipped with all screws and wrenches.
- Order the inserts and drills separately.
- Drills up to and including .359" shanks use only one insert.



■ Round Shank • Inch



catalog number	D1	D1 max	D4	D	D22	D33	L	LS	insert
KBF14	.125	.156	4,0	.75	.36	.59	3.34	1.97	3.41020..
KBF15B	.182	.188	5,0	.75	.40	.62	3.34	1.97	3.41020..
KBF16B	.213	.230	6,0	.75	.44	.66	3.34	1.97	3.41020..
KBF17	.250	.266	7,0	.75	.46	.68	3.73	1.97	3.41020..
KBF18	.281	.313	8,0	.75	.50	.72	3.74	1.97	3.41020..
KBF19	.328	.344	9,0	1.00	.54	.76	4.21	2.20	3.41020..
KBF110	.359	.391	10,0	1.00	.58	1.10	4.53	2.20	3.41220..
KBF111	.406	.430	11,0	1.00	.62	1.14	4.53	2.20	3.41220..
KBF112	.438	.469	12,0	1.00	.66	1.18	4.92	2.20	3.41220..
KBF113	.484	.510	13,0	1.00	.70	1.22	4.91	2.20	3.41220..
KBF114	.516	.550	14,0	1.25	.72	1.24	4.91	2.40	3.41220..
KBF115	.563	.590	15,0	1.25	.76	1.28	4.91	2.36	3.41220..
KBF116	.625	.630	16,0	1.25	.80	1.32	5.06	2.36	3.41220..
KBF117	.656	.670	17,0	1.25	.84	1.36	4.91	2.40	3.41220..
KBF118	.688	.700	18,0	1.25	.88	1.40	4.91	2.36	3.41220..

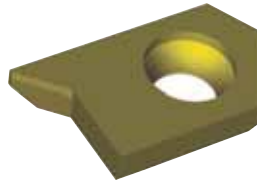
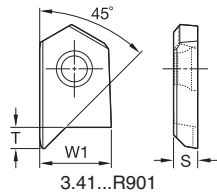
■ Spare Parts



D1	back-up screw	drill clamp screw	insert screw	wrench
.125	192.888	192.718	192.432	170.028
.182	192.888	192.718	192.432	170.028
.213	192.888	192.718	192.432	170.028
.250	192.888	192.718	192.432	170.028
.281	192.888	192.718	192.432	170.028
.328	192.889	192.718	192.432	170.028
.359	192.889	192.720	191.725	170.025
.406	192.889	192.720	191.725	170.025
.438	192.889	192.720	191.725	170.025
.484	192.889	192.720	191.725	170.025
.516	192.889	192.720	191.725	170.025
.563	192.887	192.720	191.725	170.025
.625	192.887	192.720	191.725	170.025
.656	192.887	192.720	191.725	170.025
.688	192.887	192.720	191.725	170.025

NOTE: Dimensions are factored with a 45° insert positioned in insert pocket.

- Standard steel drill bodies are designed for inserts with 41° and 45° chamfers.



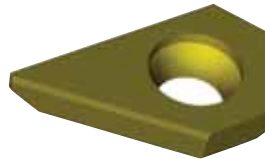
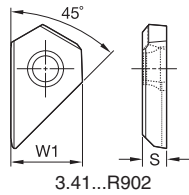
- first choice
- alternate choice

P	●	●
M	●	●
K	●	●
N	●	●
S	●	●
H	●	●

■ BF Insert R901 • 45° with Spot Face

Combination Tools

catalog number	S		W1		T		CS5	KC7315
	mm	in	mm	in	mm	in		
3.41020R901	3,00	.118	6,10	.240	2,90	.114	●	●
3.41220R901	3,50	.138	10,10	.398	3,05	.120	●	●



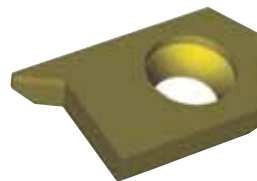
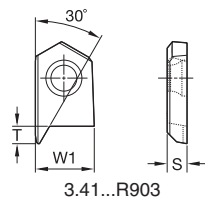
- first choice
- alternate choice

P	●	●
M	●	●
K	●	●
N	●	●
S	●	●
H	●	●

■ BF Insert R902 • 45°

catalog number	S		W1		CS5	KC7315
	mm	in	mm	in		
3.41020R902	3,00	.118	6,10	.240	●	●
3.41220R902	3,50	.138	10,10	.398	●	●

- When using the 60° insert or special insert, the assembled tool should be inspected.
- These insert combinations require that the steel body be altered to provide insert coverage.



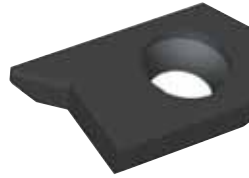
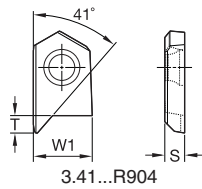
- first choice
- alternate choice

P	●	●
M	●	●
K	●	●
N	●	●
S	●	●
H	●	●

■ BF Insert R903 • 60° with Spot Face

catalog number	S		W1		T		CS5	KC7315
	mm	in	mm	in	mm	in		
3.41020R903	3,00	.118	6,10	.240	2,90	.114	●	●
3.41220R903	3,50	.138	10,10	.398	3,05	.120	●	●

• Standard steel drill bodies are designed for inserts with 41° and 45° chamfers.



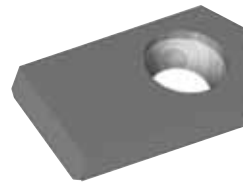
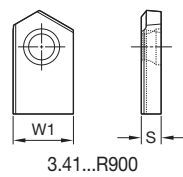
● first choice
○ alternate choice

P	●
M	●
K	●
N	●
S	●
H	●

■ BF Insert R904 • 41° with Spot Face

catalog number	S		W1		T		KC7315
	mm	in	mm	in	mm	in	
3.41020R904	3,00	.118	6,10	.240	2,90	.114	●
3.41220R904	3,50	.138	10,10	.398	3,05	.120	●

Combination Tools

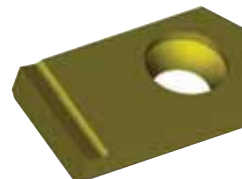
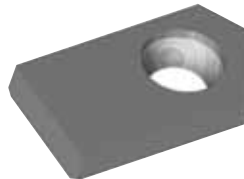
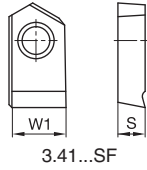
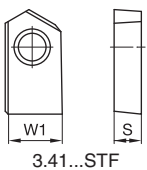


● first choice
○ alternate choice

P	●
M	●
K	○
N	●
S	●
H	●

■ BF Insert R900 • Semi-Finished

catalog number	S		W1		KMF
	mm	in	mm	in	
3.41020R900	3,00	.118	6,10	.240	●
3.41220R900	3,50	.138	10,10	.398	●



● first choice
○ alternate choice

P	●
M	●
K	○
N	●
S	●
H	●

■ BF Insert R900 S(T)F • Semi-Finished

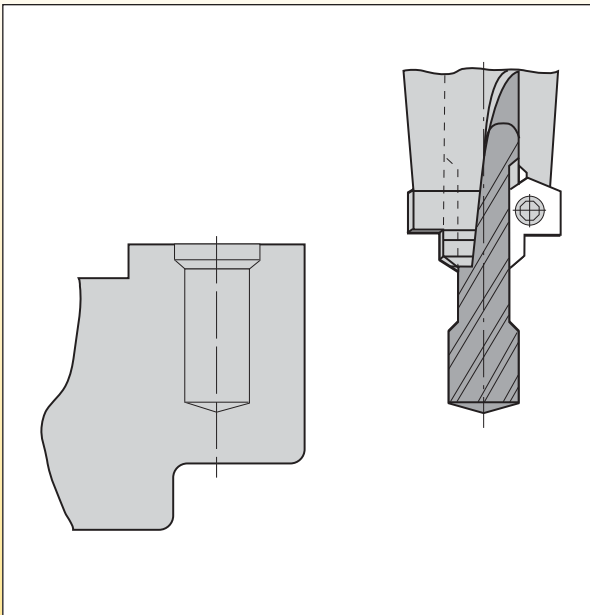
catalog number	S		W1		CS5	KMF
	mm	in	mm	in		
3.41020R900STF	3,00	.118	6,10	.240	●	●
3.41220R900SF	3,50	.138	10,10	.398	●	●
3.41220R900STF	3,50	.138	10,10	.398	●	●

Engineered Solutions Available!

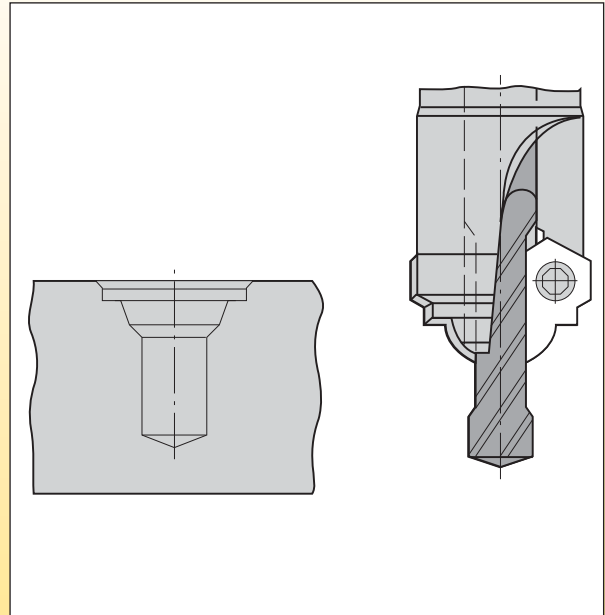


Combination Tools

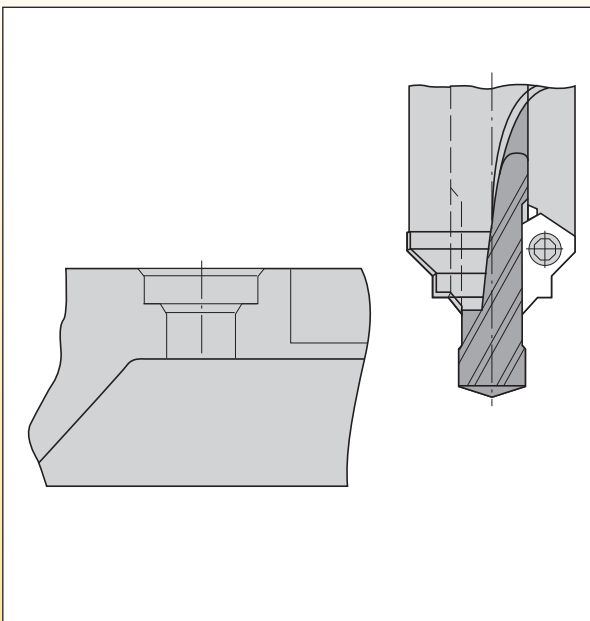
Tapped Hole with Protection Countersinking



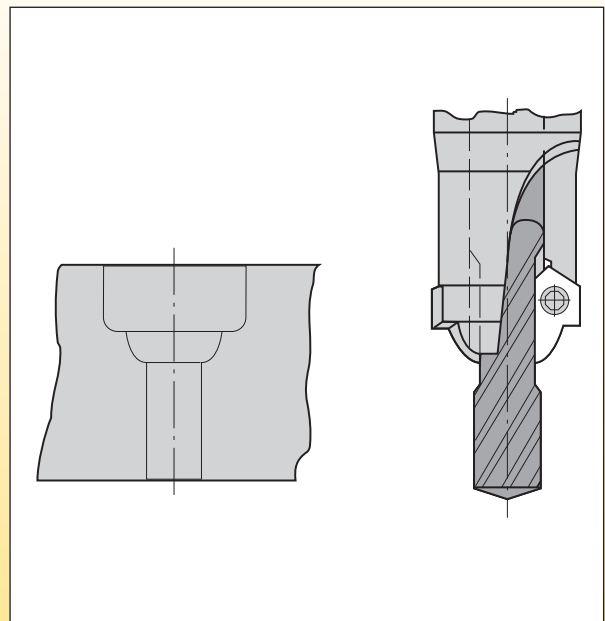
Countersinking for Round Sealing Rings



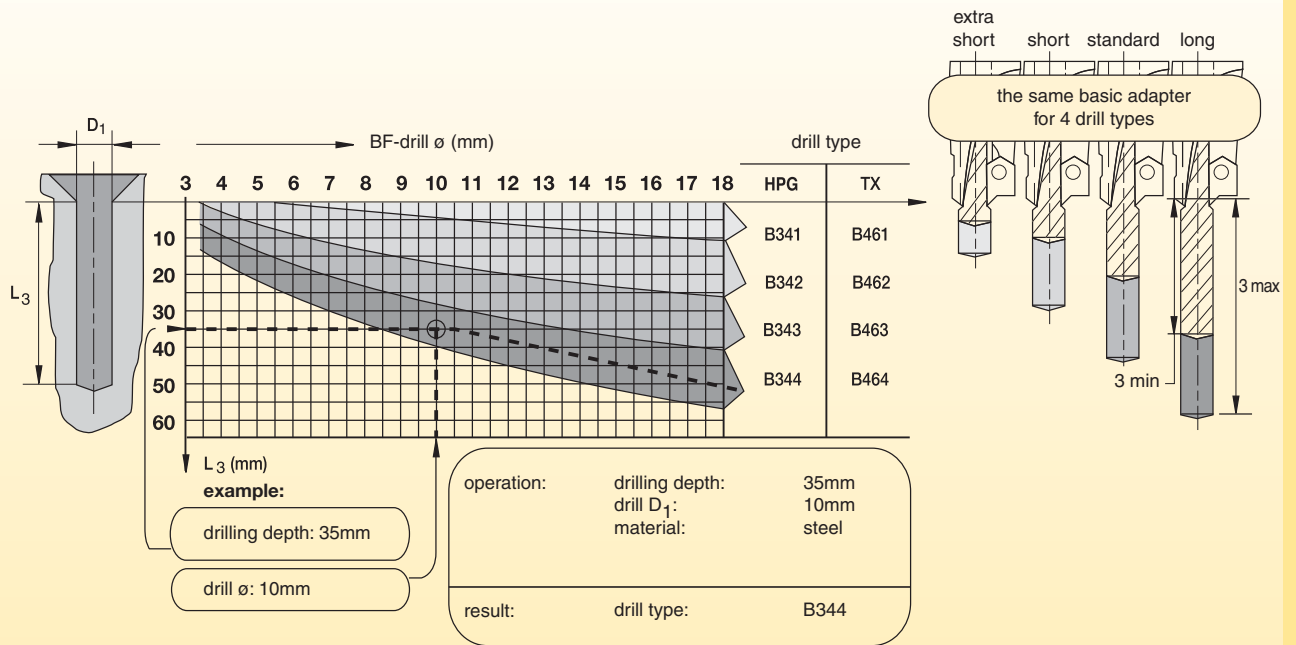
Countersinking for Countersunk Head Screws



Countersinking for Aluminum Rim



Possible Drilling Depths • Semi-Standard Series

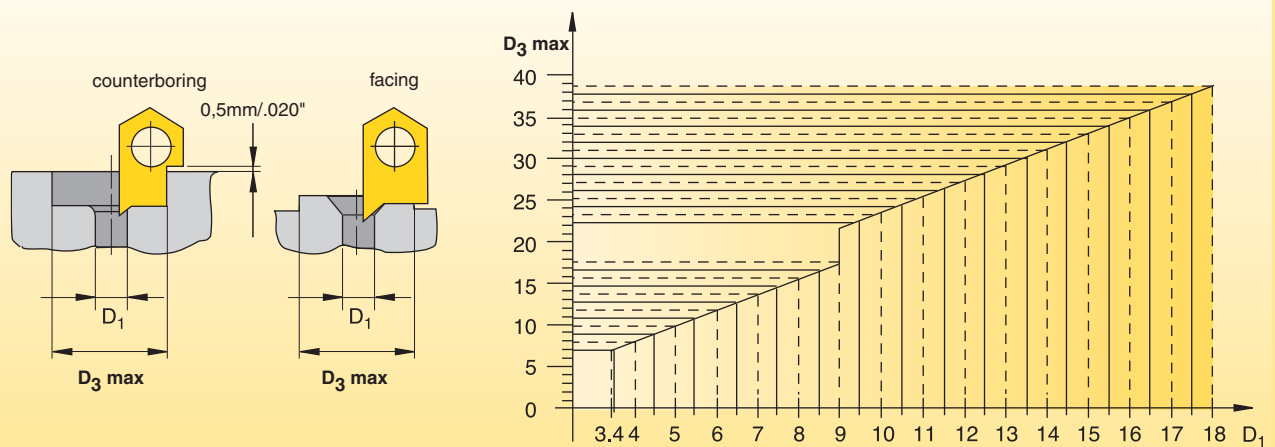


Possible Facing and Counterboring Diameters

90° insert blanks are available to grind special geometry forms for other multiprofile applications. Contact your local Kennametal Representative for special insert profile designs and quoting.

Use the table below to determine the maximum facing or counterboring diameter for a given BF drill diameter. Reference your chosen drill diameter across the bottom axis of the table and then read up and across to the left axis to find the maximum facing or counterboring diameter.

Possible Facing and Countersinking Diameter • Machining Steel



■ HP Drills • B343HPG Series • Grade KC7315™ • Through Coolant

Combination Tools

		Cutting Speed – vc			Metric								
		Range – m/min			Recommended Feed Rate (f) by Diameter								
Material Group		min	Starting Value	max		3,0	4,0	6,0	8,0	10,0	12,0	16,0	18,0
P	1	100	140	180	mm/r	0,07 - 0,16	0,08 - 0,19	0,10 - 0,23	0,13 - 0,29	0,15 - 0,33	0,17 - 0,37	0,19 - 0,44	0,22 - 0,44
	2	90	115	140	mm/r	0,07 - 0,13	0,08 - 0,17	0,10 - 0,19	0,13 - 0,23	0,15 - 0,27	0,17 - 0,30	0,19 - 0,35	0,22 - 0,39
	3	80	100	120	mm/r	0,10 - 0,16	0,11 - 0,19	0,13 - 0,23	0,16 - 0,29	0,19 - 0,33	0,21 - 0,37	0,25 - 0,44	0,28 - 0,49
	4	70	90	110	mm/r	0,08 - 0,16	0,10 - 0,19	0,11 - 0,22	0,12 - 0,25	0,14 - 0,29	0,16 - 0,32	0,21 - 0,41	0,24 - 0,46
	5	70	85	110	mm/r	0,07 - 0,12	0,08 - 0,14	0,10 - 0,16	0,12 - 0,20	0,14 - 0,23	0,16 - 0,26	0,18 - 0,31	0,21 - 0,34
K	1	100	120	140	mm/r	0,09 - 0,17	0,10 - 0,21	0,12 - 0,25	0,15 - 0,31	0,17 - 0,35	0,20 - 0,39	0,23 - 0,46	0,26 - 0,52
	2	80	105	130	mm/r	0,09 - 0,15	0,10 - 0,18	0,12 - 0,21	0,15 - 0,26	0,18 - 0,30	0,20 - 0,33	0,23 - 0,39	0,26 - 0,44
	3	70	85	100	mm/r	0,08 - 0,13	0,10 - 0,15	0,11 - 0,19	0,14 - 0,23	0,16 - 0,26	0,18 - 0,30	0,21 - 0,35	0,23 - 0,39
		Cutting Speed – vc			Inch								
		Range – SFM			Recommended Feed Rate (f) by Diameter								
Material Group		min	Starting Value	max		1/8 .125	3/16 .188	1/4 .250	5/16 .313	3/8 .375	1/2 .500	5/8 .625	3/4 .750
P	1	328	459	591	IPR	.003 - .006	.003 - .007	.004 - .009	.005 - .011	.006 - .013	.007 - .015	.007 - .017	.009 - .017
	2	295	377	459	IPR	.003 - .005	.003 - .007	.004 - .007	.005 - .009	.006 - .011	.007 - .012	.007 - .014	.009 - .017
	3	262	328	394	IPR	.004 - .006	.004 - .007	.005 - .009	.006 - .011	.007 - .013	.008 - .015	.010 - .017	.011 - .019
	4	230	295	361	IPR	.003 - .006	.004 - .007	.004 - .009	.005 - .010	.006 - .011	.006 - .013	.008 - .016	.009 - .018
	5	230	279	361	IPR	.003 - .005	.003 - .006	.004 - .006	.005 - .008	.006 - .009	.006 - .010	.007 - .012	.008 - .013
K	1	328	394	459	IPR	.004 - .007	.004 - .008	.005 - .011	.005 - .010	.007 - .014	.008 - .015	.009 - .018	.010 - .020
	2	262	345	427	IPR	.004 - .006	.004 - .007	.005 - .008	.006 - .010	.007 - .012	.008 - .013	.009 - .015	.010 - .017
	3	230	279	328	IPR	.003 - .005	.004 - .006	.004 - .007	.006 - .009	.006 - .010	.007 - .012	.008 - .014	.009 - .015

NOTE: When using BF bodies with KTIP, please refer to the recommended cutting data for KTIP tools on pages H10–H11.
 Please be aware that the values mentioned are only guidelines.
 It is highly recommended to adjust cutting data according to your specific application in order to achieve best drilling results.

SEFAS™ Combination Drilling System

Primary Application

Combines centering, drilling, and chamfering into a single operation, increasing productivity by reducing cycle time and number of tool changes.

These productivity gains can be achieved by still using standard solid carbide or KenTIP™ drills. The system provides full through coolant capabilities.

Features and Benefits

Productivity

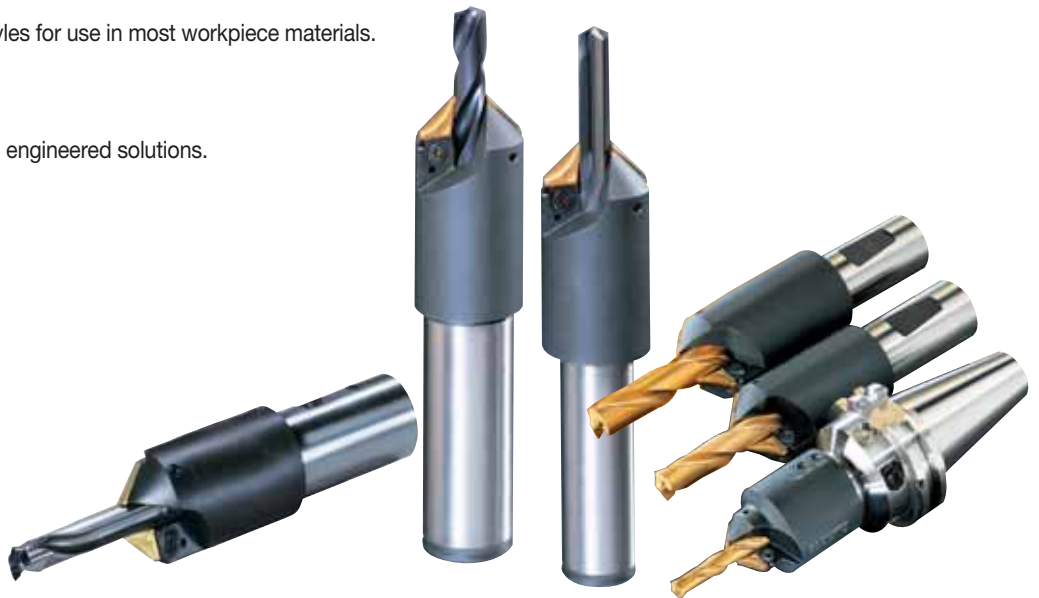
- Reduce the number of tool changes and your cycle time by combining drilling and countersinking into one operation.
- Achieve highest metal removal rates by applying a HP-style drill.
- Reduce your inventory and avoid reconditioning by using KenTIP blades.
- Easily change tool within the machine by applying KenTIP.

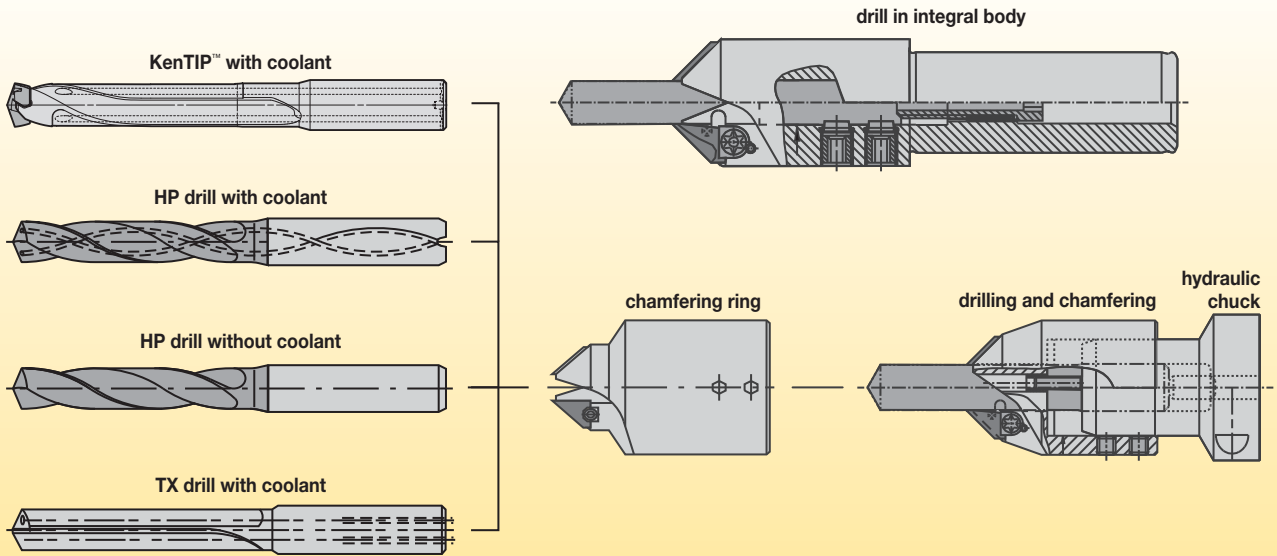
Versatility

- Any style of standard HP drill can be used, achieving highest metal removal rates.
- Use TX drills to achieve excellent hole quality and tool life in non-ferrous materials.
- For increased accuracy and tool life, use the Kennametal hydraulic chuck recommended for cylindrical tool shanks.
- Benefit from various insert styles for use in most workpiece materials.

Customization

- Length variations available as engineered solutions.



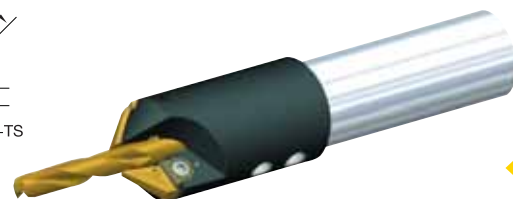
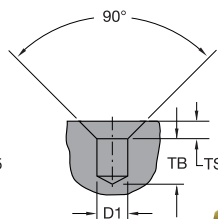
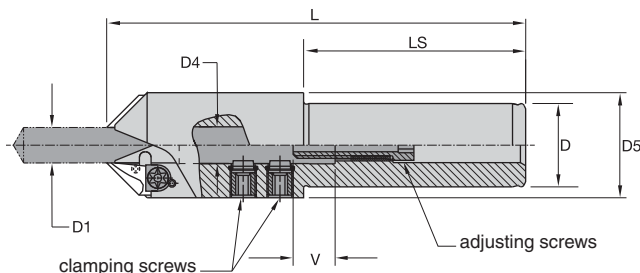


The SEFAS combination drilling system may be used in most workpiece materials. The design and flexibility of the system can be used with a wide variety of solid carbide drills.

Three types of SEFAS chamfering tools are offered: (1) integral bodies with a compact design that provides additional workpiece and work-holding clearance; (2) chamfering rings that may be mounted to Kennametal hydraulic chucks for optimal drill performance and increased productivity; and (3) high-performance HSK bodies for new machine spindles and high-output applications.



- Drill body shipped with all screws, clamps, and wrenches.
- Order the inserts and drills separately.
- Two chamfer inserts required per body.



Combination Tools

Round Shank • For Use with Inch Drills • Inch

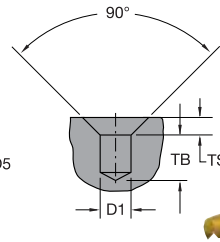
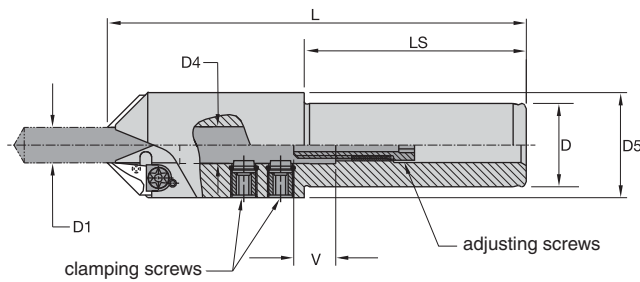
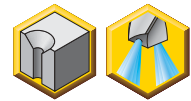

catalog number	D1	D1 max	D	D4	D5	L	LS	V	gage insert	insert clamp	Torx wrench	drill clamp screw	adjusting screw
SEF156187RSS075	.1560	.188	.75	.19	.94	4.06	2.00	.71	3.42805..	360.550	170.024	360.650	360.516
SEF218250RSS075	>.01880	.250	.75	.25	.97	4.13	2.00	.71	3.42805..	360.550	170.024	360.651	360.510
SEF265312RSS075	>.02500	.313	.75	.31	1.03	4.31	2.00	.71	3.42805..	360.550	170.024	360.652	360.510
SEF328375RSS075	>.03130	.375	.75	.38	1.16	4.63	2.00	.67	3.42805..	360.550	170.024	360.653	360.510
SEF390437RSS100	>.03750	.438	1.00	.44	1.47	5.75	3.00	.75	3.42807..	360.551	170.025	360.654	360.513
SEF453500RSS100	>.04380	.500	1.00	.50	1.53	5.88	3.00	.83	3.42807..	360.551	170.025	360.655	360.513
SEF500562RSS100	>.05000	.563	1.00	.56	1.59	6.06	3.00	.63	3.42807..	360.551	170.025	360.656	360.511
SEF562625RSS125	>.05630	.625	1.25	.63	1.66	6.44	3.25	.75	3.42807..	360.551	170.025	360.657	360.511
SEF625687RSS125	>.06250	.688	1.25	.69	1.81	6.50	3.25	.59	3.42807..	360.551	170.025	360.658	360.511
SEF687750RSS125	>.06880	.750	1.25	.75	1.88	6.56	3.25	.67	3.42807..	360.551	170.025	360.659	360.511
SEF750812RSS125	>.07500	.813	1.25	.81	1.94	6.63	3.25	.67	3.42807..	360.551	170.025	360.679	360.511
SEF812875RSS150	>.08130	.875	1.50	.88	2.09	7.25	3.75	.63	3.42807..	360.551	170.025	360.680	360.511
SEF875937RSS150	>.08750	.938	1.50	.94	2.16	7.38	3.75	.71	3.42807..	360.551	170.025	360.681	360.511
SEF9371010RSS150	>.09380	1.010	1.50	1.00	2.25	7.50	3.75	.71	3.42807..	360.551	170.025	360.682	360.511

Achievable Drilling (TB) and Sink Depths (TS)

drill diameter D1	K210, K254, K284		K211, K222, K255, K285, K411		K212, K256		unalloyed and low-alloy steel; unalloyed and alloy steel and cast iron; high-alloy steel and stainless steel		
	TB _{min}	TB _{max}	TB _{min}	TB _{max}	TB _{min}	TB _{max}	TS ₁₀₀	TS ₈₀	TS _{max}
.156-.188	.236	.866	.472	1.102	.866	1.102	.047	.071	.098
>.188-.250	.354	1.024	.709	1.378	1.220	1.890	.059	.087	.118
>.250-.266	.433	1.102	.906	1.575	1.654	2.323	.079	.118	.157
>.266-.313	.433	1.102	.906	1.575	1.654	2.323	.098	.157	.197
>.313-.375	.512	1.142	1.063	1.693	1.929	2.559	.118	.197	.236
>.375-.438	.551	1.260	1.142	1.850	2.008	2.717	.138	.197	.276
>.438-.500	.591	1.378	1.220	2.008	2.205	2.992	.157	.236	.315
>.500-.563	.827	1.417	1.496	2.087	2.717	3.307	.157	.236	.315
>.563-.625	.866	1.575	1.575	2.283	3.071	3.780	.157	.236	.315
>.625-.688	1.299	1.850	2.087	2.638	3.740	4.291	.157	.236	.315
>.688-.750	1.378	2.008	2.126	2.756	4.055	4.685	.157	.236	.315
>.750-.813	1.552	2.181	2.260	2.890	4.386	5.016	.157	.236	.315
>.813-.875	1.702	2.293	2.726	3.317	4.694	5.285	.157	.236	.315
>.875-.938	1.735	2.404	2.876	3.546	4.884	5.554	.157	.236	.315
>.938-1.010	1.846	2.515	3.067	3.736	5.193	5.862	.157	.236	.315

NOTE: TS₁₀₀: maximum sink depths at which the full feed values can be maintained during chamfering and sinking.
 TS₈₀: maximum sink depths that can be achieved without chipbreak cycles and at a 20% feed reduction.
 TS_{max}: maximum sink depths that can be achieved without chipbreak cycles and at a 50% feed reduction.

- Drill body shipped with all screws, clamps, and wrenches.
- Order the inserts and drills separately.
- Two chamfer inserts required per body.



Combination Tools

■ Round Shank • For Use with Metric Drills • Metric



catalog number	D1	D1 max	D4	D	D5	L	LS	V	gage insert	insert clamp	Torx wrench	drill clamp screw	adjusting screw
SEF040060RSS075M	4,000	6,0	6,0	.75	.94	4.06	2.00	.71	3.42805..	360.550	170.024	360.630	360.510
SEF060080RSS075M	>6,000	8,0	8,0	.75	1.02	4.31	2.00	.71	3.42805..	360.550	170.024	360.634	360.510
SEF080100RSS100M	>8,000	10,0	10,0	1.00	1.14	5.63	3.00	.67	3.42805..	360.550	170.024	360.631	360.510
SEF100120RSS125M	>10,000	12,0	12,0	1.25	1.50	6.13	3.25	.83	3.42807..	360.551	170.025	360.635	360.513
SEF120140RSS125M	>12,000	14,0	14,0	1.25	1.57	6.31	3.25	.63	3.42807..	360.551	170.025	360.636	360.511
SEF140160RSS125M	>14,000	16,0	16,0	1.25	1.63	6.44	3.25	.75	3.42807..	360.551	170.025	360.632	360.511
SEF160180RSS125M	>16,000	18,0	18,0	1.25	1.85	6.56	3.25	.59	3.42807..	360.551	170.025	360.633	360.511
SEF180200RSS125M	>18,000	20,0	20,0	1.25	1.93	6.69	3.25	.67	3.42807..	360.551	170.025	360.637	360.511

■ 2° Whistle Notch™ (WN) Shank • For Use with Metric Drills • Metric



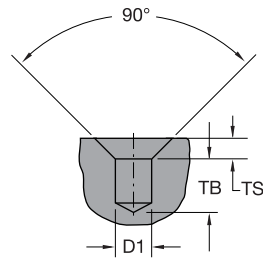
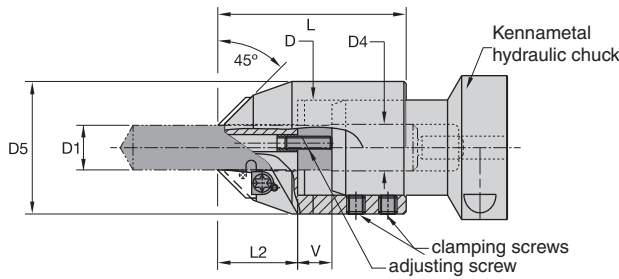
catalog number	D1	D1 max	D	D4	D5	L	LS	V	gage insert	insert clamp	Torx wrench	drill clamp screw	adjusting screw
3.37060R720	4,000	6,0	20,0	6,0	24,0	102,0	52,0	18,0	3.42805..	360.550	170.024	360.630	360.510
3.37080R720	>6,000	8,0	20,0	8,0	26,0	108,0	52,0	18,0	3.42805..	360.550	170.024	360.634	360.510
3.37100R720	>8,000	10,0	20,0	10,0	29,0	122,0	52,0	17,0	3.42805..	360.550	170.024	360.631	360.510
3.37120R732	>10,000	12,0	32,0	12,0	38,0	133,0	62,0	21,0	3.42807..	360.551	170.025	360.635	360.513
3.37140R732	>12,000	14,0	32,0	14,0	40,0	137,0	62,0	16,0	3.42807..	360.551	170.025	360.636	360.511
3.37160R732	>14,000	16,0	32,0	16,0	41,5	141,0	62,0	19,0	3.42807..	360.551	170.025	360.632	360.511
3.37180R732	>16,000	18,0	32,0	18,0	47,0	144,0	62,0	15,0	3.42807..	360.551	170.025	360.633	360.511

■ HSK Shank • For Use with Metric Drills • Metric



catalog number	D1	D1 max	D	D4	D5	L1	L4 max	V	gage insert	insert clamp	Torx wrench	drill clamp screw	adjusting screw
SEF040060RHSK63AM	4,000	6,00	63,0	6,0	24,0	95,0	51,0	18,0	3.42805..	360.550	170.024	360.630	360.510
SEF060080RHSK63AM	>6,000	8,00	63,0	8,0	26,0	102,0	57,0	18,0	3.42805..	360.550	170.024	360.634	360.510
SEF080100RHSK63AM	>8,000	10,00	63,0	10,0	29,0	111,0	68,0	17,0	3.42805..	360.550	170.024	360.631	360.510
SEF100120RHSK63AM	>10,000	12,00	63,0	12,0	38,0	122,0	89,0	21,0	3.42807..	360.551	170.025	360.635	360.517
SEF120140RHSK63AM	>12,000	14,00	63,0	14,0	40,0	126,0	94,0	16,0	3.42807..	360.551	170.025	360.636	360.517
SEF140160RHSK63AM	>14,000	16,00	63,0	16,0	42,0	130,0	99,0	19,0	3.42807..	360.551	170.025	360.632	360.517

- Drill body shipped with all screws, clamps, and wrenches.
- Order the inserts and drills separately.
- Use only with hydraulic chucks.



■ Chamfer Rings • For Use with Metric Kennametal Hydraulic Chucks • For Use with Inch or Metric Drills



catalog number	D1	D1 max	D	D4	D5	L	LS	V	gage insert	insert clamp	Torx wrench	drill clamp screw	adjusting screw
3.37526R006	4,000	6,0	25,7	6,0	38,0	49,5	21,0	5,0	3.42805..	360.550	170.024	190.195	192.057
3.37528R008	>6,000	8,0	27,7	8,0	40,0	50,0	21,0	6,0	3.42805..	360.550	170.024	190.195	190.371
3.37530R010	>8,000	10,0	29,7	10,0	41,5	56,5	22,0	8,0	3.42805..	360.550	170.024	190.195	193.113
3.37532R012	>10,000	12,0	31,6	12,0	48,0	68,0	29,0	12,0	3.42807..	360.551	170.025	190.076	193.114
3.37534R014	>12,000	14,0	33,6	14,0	50,0	70,5	29,0	12,0	3.42807..	360.551	170.025	190.076	193.114
3.37538R016	>14,000	16,0	37,6	16,0	54,0	78,0	32,0	12,0	3.42807..	360.551	170.025	190.076	193.115
3.37540R018	>16,000	18,0	39,6	18,0	56,0	80,5	34,0	15,0	3.42807..	360.551	170.025	190.076	193.116
3.37542R020	>18,000	20,0	41,6	20,0	58,0	82,5	35,0	15,0	3.42807..	360.551	170.025	190.076	193.116

■ Achievable Drilling (TB) and Sink Depths (TS)



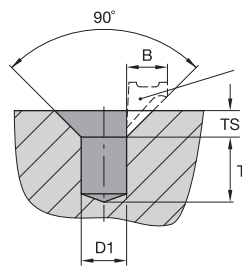
drill diameter D1	B210, B221, B224, B254, B284, B291, B707, B966, B976		B211, B222, B225, B285, B292, B411, B708, B977		B212, B256, B709, B978		B269		unalloyed and low-alloy steel; unalloyed and alloy steel and cast iron; high-alloy steel and stainless steel		
	TB _{min}	TB _{max}	TB _{min}	TB _{max}	TB _{min}	TB _{max}	TB _{min}	TB _{max}	TS ₁₀₀	TS ₈₀	TS _{max}
4,0-4,7	4	17	12	29	20	36	45	62	1,2	1,8	2,5
>4,7-6,0	4	20	20	35	27	43	63	80	1,5	2,2	3,0
>6,0-7,0	11	24	23	40	32	49	71	88	2	3,0	4,0
>7,0-8,0	11	28	23	40	42	59	85	102	2,5	4,0	5,0
>8,0-10,0	13	29	27	43	46	62	109	125	2,5	4,0	5,0
>10,0-12,0	15	35	31	51	54	74	131	151	3,5	5,0	7,0
>12,0-14,0	21	36	38	53	69	84	160	175	4,0	6,0	8,0
>14,0-16,0	22	40	40	58	78	96	184	202	4,0	6,0	8,0
>16,0-18,0	31	45	51	65	93	107	213	227	4,0	6,0	8,0
>18,0-20,0	34	50	56	72	103	119	237	253	4,0	6,0	8,0

(continued)

(continued)

drill diameter D1	K210, K254, K284		K211, K222, K255, K285, K411		K212, K256		unalloyed and low-alloy steel; unalloyed and alloy steel and cast iron; high-alloy steel and stainless steel		
	T _{Bmin}	T _{Bmax}	T _{Bmin}	T _{Bmax}	T _{Bmin}	T _{Bmax}	TS ₁₀₀	TS ₈₀	TS _{max}
.156-.250	not applicable (drill shank diameter > chamfer ring inside diameter)								
>.250-.313	not applicable (metric ring and hydraulic chuck are not interchangeable)								
>.313-.375	.748	1.339	1.229	1.890	2.165	2.756	.098	.157	.197
>.375-.500	not applicable (drill shank diameter > chamfer ring inside diameter), not applicable (metric ring and hydraulic chuck are not interchangeable)								
>.500-.563	not applicable (drill shank diameter > chamfer ring inside diameter), not applicable (metric ring and hydraulic chuck are not interchangeable)								
>.563-.625	.906	1.732	1.614	2.441	3.110	3.937	.157	.236	.315
>.625-.709	not applicable (metric ring and hydraulic chuck are not interchangeable)								
>.709-.750	1.142	2.087	1.890	2.835	3.819	4.764	.157	.236	.315

NOTE: TS₁₀₀: maximum sink depths at which the full feed values can be maintained during chamfering and sinking.
 TS₈₀: maximum sink depths that can be achieved without chipbreak cycles and at a 20% feed reduction.
 TS_{max}: maximum sink depths that can be achieved without chipbreak cycles and at a 50% feed reduction.
 When using SEFAS with GOdrill™, please contact your Kennametal representative for application support.

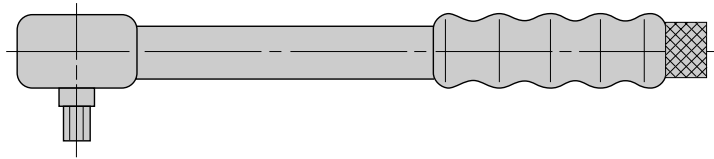


Combination Tools

■ Achievable Drilling (T) and Sink Depths (TS) with KenTIP Tool Bodies

D1		drilling depths (T) with SEFAS compact tools						drilling depths (T) with SEFAS chamfer rings						sink depths (TS)		
mm	in	3x		5x		8x		3x		5x		8x		TS ₁₀₀	TS ₈₀	TS _{max}
		T	T _{max}	T	T _{max}	T	T _{max}	T	T _{max}	T	T _{max}	T	T _{max}			
8,00-8,49	.3125-.3343	11	19	21	37	47	63	11	22	22	40	48	66	2,5	4,0	5,0
8,50-8,99	.3346-.3539	12	21	24	40	51	67	12	24	25	43	52	70	2,5	4,0	5,0
9,00-9,49	.3543-.3736	12	23	27	43	56	72	12	26	28	46	57	75	2,5	4,0	5,0
9,50-9,99	.3740-.3933	13	25	31	47	61	77	13	28	32	50	62	80	2,5	4,0	5,0
10,00-10,49	.3937-.4130	13	26	28	49	60	81	13	28	29	51	61	83	3,5	5,0	7,0
10,50-10,99	.4134-.4327	14	28	31	52	64	85	14	30	32	54	65	87	3,5	5,0	7,0
11,00-11,49	.4331-.4524	14	30	34	55	69	90	14	32	35	57	70	92	3,5	5,0	7,0
11,50-11,99	.4528-.4720	15	32	37	58	73	94	15	34	38	60	74	96	3,5	5,0	7,0
12,00-12,49	.4724-.4917	15	30	41	56	79	94	15	32	36	58	74	96	4,0	6,0	8,0
12,50-12,99	.4921-.5114	17	32	44	59	83	98	16	34	39	61	78	100	4,0	6,0	8,0
13,00-13,49	.5118-.5311	19	34	47	62	88	103	16	36	42	64	83	105	4,0	6,0	8,0
13,50-13,99	.5315-.5508	21	36	51	66	93	108	17	38	46	68	88	110	4,0	6,0	8,0
14,00-14,49	.5512-.5705	19	37	50	68	94	112	18	40	49	71	93	115	4,0	6,0	8,0
14,50-14,99	.5709-.5902	21	39	53	71	98	116	20	42	52	74	97	119	4,0	6,0	8,0
15,00-15,99	.5906-.6295	25	43	59	77	107	125	24	46	58	80	106	128	4,0	6,0	8,0
16,00-16,99	.6299-6689	29	47	65	83	117	135	28	50	64	85	115	136	4,0	6,0	8,0
17,00-17,99	.6693-.7083	35	49	73	87	127	141	30	54	68	92	122	146	4,0	6,0	8,0
18,00-18,99	.7087-.7476	36	52	76	92	133	149	33	57	73	97	130	154	4,0	6,0	8,0
19,00-19,99	.7480-.7870	40	56	82	98	142	158	37	61	79	103	139	163	4,0	6,0	8,0

NOTE: TS₁₀₀: maximum sink depths at which the full feed values can be maintained during chamfering and sinking.
 TS₈₀: maximum sink depths that can be achieved without chipbreak cycles and at a 20% feed reduction.
 TS_{max}: maximum sink depths that can be achieved without chipbreak cycles and at a 50% feed reduction.
 T: minimum drilling depth that can be achieved due to the protruded length of the drill.
 T_{max}: maximum drilling depth that can be achieved due to the protruded length of the drill.

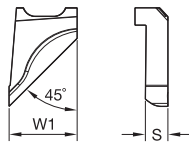

■ Torque Wrench • Metric

drill diameter D1	torque wrench	tightening torque Nm	SW	drill clamp screw	wrench adapter
4,0-6,0	170.190	7	3	360.630	170.240
>6,0-8,0	170.190	8	3	360.635	170.240
>8,0-10,0	170.190	10	4	360.631	170.232
>10,0-12,0	170.190	15	4	360.635	170.232
>12,0-14,0	170.190	20	5	360.636	170.233
>14,0-16,0	170.190	30	5	360.632	170.233
>16,0-18,0	170.190	45	6	360.633	170.234
>18,0-20,0	170.190	45	6	360.637	170.234


■ Torque Wrench • Inch

drill diameter D1	torque wrench	tightening torque ft. lbs.	SW	drill clamp screw	wrench adapter
.156-.188	170.190	5.2	3	360.650	170.240
>.188-.250	170.190	5.9	3	360.651	170.240
>.250-.313	170.190	5.9	3	360.652	170.240
>.313-.375	170.190	7.4	4	360.653	170.232
>.375-.438	170.190	11.1	4	360.654	170.232
>.438-.500	170.190	11.1	4	360.655	170.232
>.500-.563	170.190	14.8	5	360.656	170.233
>.563-.625	170.190	22.1	5	360.657	170.233
>.625-.688	170.190	33.2	6	360.658	170.234
>.688-.750	170.190	33.2	6	360.659	170.234
>.750-.813	170.190	35.4	6	360.679	170.234
>.813-.875	170.190	44.3	8	360.680	170.229
>.875-.938	170.190	47.9	8	360.681	170.229
>.938-1.010	170.190	51.6	8	360.682	170.229





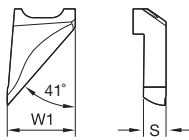
● first choice
○ alternate choice

P	■	●		
M	■			
K	■	●	●	
N	■		●	●
S	■			
H	■			

■ SEFAS Chamfering Inserts for Solid Carbide Drills • 45°

Combination Tools

catalog number	angle	S		W1		CS5	KC7215	KMF
		mm	in	mm	in			
3.42805R001	45	2,83	.111	8,00	.315	●	●	●
3.42807R001	45	3,98	.157	12,00	.472	●	●	●

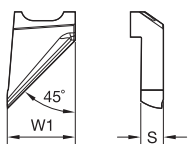


● first choice
○ alternate choice

P	■			
M	■			
K	■	●		
N	■		●	
S	■			
H	■			

■ SEFAS Chamfering Inserts for Solid Carbide Drills • 41°

catalog number	angle	S		W1		KC7215
		mm	in	mm	in	
3.42805R081	41	2,83	.111	8,00	.315	●
3.42807R081	41	3,98	.157	12,00	.472	●



● first choice
○ alternate choice

P	■		●	
M	■	●		
K	■		●	
N	■			●
S	■			
H	■			

■ SEFAS Chamfering Inserts for KenTIP™ and KSEM™ Drills • 45°

catalog number	angle	S		W1		KC7015	KC7315	KMF
		mm	in	mm	in			
3.42805R021	45	2,83	.111	8,00	.315	●	●	●
3.42807R021	45	3,98	.157	12,00	.472	●	●	●

Looking for a product that's not shown in this catalog?
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Visit <http://www.kennametal.com/holemaking/> to browse our electronic catalog any time you're looking for Kennametal's best tooling solutions. It's fast, free, and always available. The online e-catalog is updated weekly with products and solutions for milling, turning, holemaking, and tooling systems applications.



Indexable Drills

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Drill Fix DFS	J19–J35
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HTS-C Indexable Drill System	J52–J61
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Indexable Drills

		standard						hole tolerance	standard range			customized solution range		
		P	M	K	N	S	H		diameter range			diameter range		
									D1 mm min-max	D1 inch min-max	drilling depth L/D1	D1 mm min-max	D1 inch min-max	drilling depth
	DFR™ Indexable Drill Body Short-Hole Drilling	●	●	●	●	●	IT9-11	12,5-25	.500-1.039	2 x D 3 x D 4 x D	12,5-26	.500-1.023	1-5 x D	
	DFS™ Indexable Drill Body Short-Hole Drilling	●	●	●	●	●	IT9-11	24-55	.945-2.165	2 x D 3 x D 4 x D 5 x D	18-55	.708-2.165	1-5 x D	
	DFT™ Indexable Drill Body Short-Hole Drilling	●	●	●	●	●	IT9-11	16-83mm	.625-3.250	2.5 x D 4 x D	15,8-83	.622-3.250	1-5 x D	
	HTS-C Indexable Drilling Tool Deep-Hole Drilling	●	●	●	●	●	IT9-11	20-45	.750-1.750	5 x D 8 x D	19,05-45	.749-1.750	1-20 x D	
	HTS-R Indexable Drilling Tool Deep-Hole Drilling	●	●	●	●	●	IT9-11	40-55	1.574-2.165	10 x D	40-55	1.574-2.165	1-10 x D	
	HTS Indexable Drilling Tool Deep-Hole Drilling	●	●	●	●	●	IT9-11	45-270	1.772-10.630	10 x D	45-540	1.772-21.259	1-10 x D	
	S2 S Countersinking Countersinking Tool	●	●	●	●	●	IT9-11	15,1-46,2	.813-3.125	1 x D	11,5-150	.452-5.905	1-5 x D	

In regard to insert and drill coatings, anything is possible. If a specific insert or drill is not suitable for your workpiece material, please contact our Engineered Solutions Department for an offer about special coatings and edge preparations.

*Except for L/D 5 x D.

¹⁾ Other shank styles available as customized solution.

		■ standard capabilities ¹⁾								■ standard and □ customized solution capabilities								
coolant		2°	TS	XMZ	DV	BT	BT											page(s)
	■		■							■	■	■	■	■	□	□		J8-J18
	■		■	■						■	■	■	■	■*	□	□	□	J20-J35
	■		■	■						■	■	■	■	■	□	□		J37-J49
	■		■							■						□		J53-J61
	■			■		■	■	■	■	■								J73-J79
	■			■		■	■	■	■	■								J80-J94
	■	■													■	□		J105-J107

Indexable Drills



Drill Fix™ DFR™, DFS™, and DFT™

Primary Application

Drill short holes up to 5 x D with DFR, DFS, and DFT indexable drills in steel, cast iron, ductile iron, stainless steel, and non-ferrous materials. The Drill Fix portfolio covers the diameter range .500–3.250" (12,5–82mm).

Apply where speed and economy are prime considerations.

Features and Benefits

Drill Fix DFR

- Diameter range of 12,5–24mm in 2 x D, 3 x D, and 4 x D.
- Rectangular-shaped inserts offer the highest stability and feed rates at smaller sizes.
- Long body tool life due to soft starting cut, short chips, and low cutting forces.
- X-offset design to adjust diameter size on turning machines and optimize tolerances on machining centers.

Drill Fix DFS

- Combines the benefits of a trigon-style DFT inboard insert and a square-style SP..X outboard insert.
- Standard diameter range from 1.000–2.500" (24–55mm) in 2 x D, 3 x D, 4 x D, and new 5 x D.
- Drill Fix DFT insert has inner insert for best centering capabilities.
- Squared-outboard insert offering four economic cutting edges.
- Highest feed rates and cutting speeds applicable due to highly stable tool body design.
- X-offset design to adjust diameter size on turning machines and optimize tolerances on machining centers.
- Beyond™ grades to achieve highest productivity, achieving outstanding results in steel, stainless steel, and cast iron.

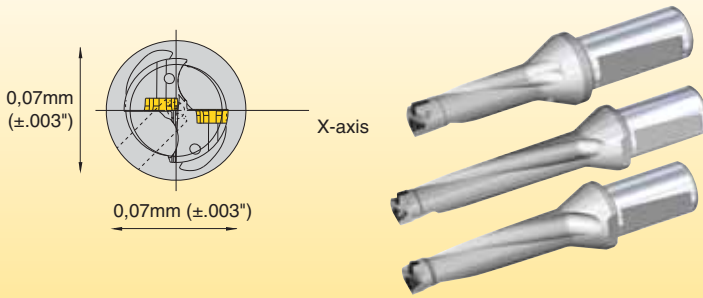


Drill Fix™ DFT™

- One drill system that covers a large diameter range, from 1.000–3.250" (24–82mm) in 2.5 x D and 4 x D.
- Best centering capabilities due to trigon-shaped inserts used as inboard and outboard insert.
- Various insert grades and geometries available.
- Balanced cutting forces in the shank center for highest tool body stability.
- X-offset design to adjust diameter size on turning machines and optimize tolerances on machining centers.

Stationary Applications

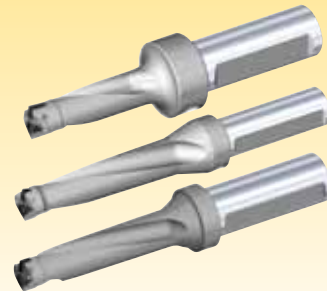
Metric Drill Bodies with 2° Whistle Notch™



Metric shank drills with a 2° Whistle Notch shank are easily mounted into inch turrets using a WD adaptor. Align the X-axis of the drill with the X-axis of the machine tool as described above. Accurate alignment is absolutely essential for good performance. The drill must be on center within the tolerance shown above. Angularity must not exceed 0,07mm (.003").

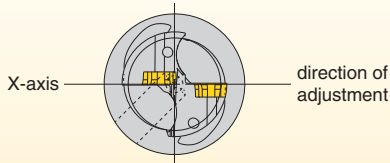
Inch Bodies • Flange

Drill Fix™ inch drills, with a flange, were designed for use on lathes or any machine where the tool remains stationary and the workpiece rotates. An "x" is marked on the flat of the X-axis of the drill to aid insert orientation on the machine tool. It is important to align the X-axis of the drill with the X-axis on the machine tool. Accurate alignment is absolutely essential for good performance. The drill must be on center, within the tolerance shown here. Angularity must not exceed 0,07mm (.003") within the designated drill depth.



Drill Fix X-Adjustment

Applications Examples

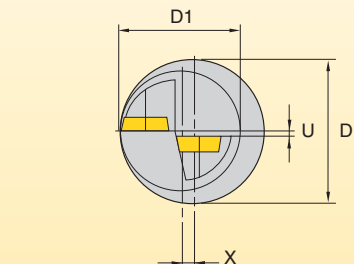
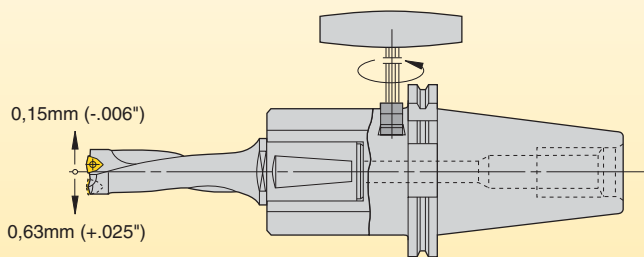


Stationary Tool

The X-adjustment must be made at the outer cutting edge, parallel to the surface of the outer insert when the turret of the turning machine is offset along the X-axis.

Rotating Tool • Straight Shank

Use an adjustable eccentric chuck with a steep taper to help offset the drill along the X-axis when machining with a rotating tool on a machining center.

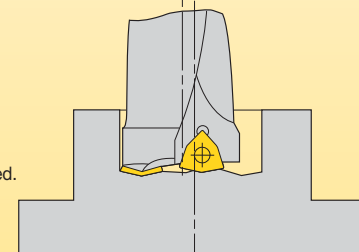


X-Adjustment Description

Different diameter holes can be drilled using the same Drill Fix drill. Holes with a diameter greater than the nominal diameter can be drilled directly into a solid. Intermediate dimensions are produced by means of the X-adjustment.

Benefits

- Eliminates the need for special tools for intermediate dimensions.
- Just a few drills cover a wide application range.
- Once precise adjustment of the desired diameter is made, tolerances of 0,05mm (± .002") are achieved.



Additional information on X-adjustment, as well as additional information to Drill Fix tools, is available on the Kennametal website, www.kennametal.com.

Drill Fix™ DFR™

Drill Fix DFR offers maximum feed rates at diameter range 12,5–24mm at 2 x D, 3 x D, and 4 x D applications. Using rectangular-shaped inboard and outboard inserts enables soft starting cuts and short chips as well as enabling higher feed rates than small-size symmetrical-trigon or square inserts. Drill Fix DFR's low cutting forces provide long tool body life and highest stability at smallest sizes.

Furthermore, these inserts enable soft starting cuts and short chips. The low cutting forces of a Drill Fix DFR provide long tool body life and highest stability at smallest sizes.

Features and Benefits

Productivity and Profitability

- Achieve highest feed rates with rectangular-shaped inserts that offer a soft starting cut and highest stability.
- Use X-offset on turning machines to adjust the drill diameter, eliminating the need for specials in many applications and on machining centers, to reach tolerance optimization.
- Same insert size is used in each pocket, reducing inventory costs.

Versatility

- Diameter range covering .500–1.000" (12,5–24mm).
- 2 x D, 3 x D, and 4 x D L/D ratios as standard.
- Various shanks as standard available: WD, SSF, and new KM-TS™.
- Multiple insert grades and geometries available.
- Use where feed rates are the limiting factor.
- Apply at straight holes, inclined entries and exits, interrupted cuts, and rough or welded entry surfaces.
- Eccentric chuck available as standard.

Reliability

- Highest stability at smaller sizes due to rectangular-shaped insert.
- Same insert can be used as inboard or outboard insert. No risk of mixing up inner and outer insert.
- Low cutting forces resulting in long body tool life.

Customization

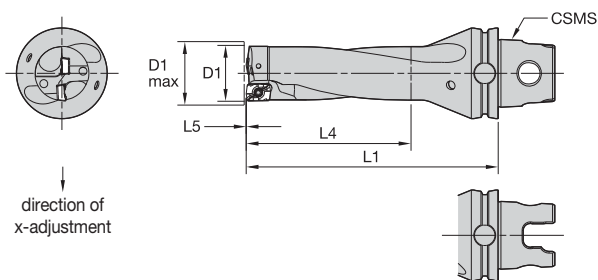
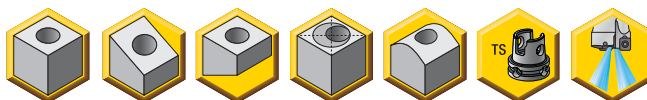
- Intermediate diameters available as semi-standards.
- Engineered solutions available.
- Multistep drills available upon request.
- Left-hand version available.



To learn more, [scan here](#).
For instructions on how to scan, please see page xxix.



- Drill shipped with insert screws and Torx wrench.
- See page J95 for inserts.



Indexable Drills

■ **KM32TS, KM40TS, and KM50TS Shanks • 3 x D • Metric**

KM32TS		KM40TS		KM50TS		D1			L1	L4 max	L5	gage insert
				mm	in	D1 max						
KM32TSDFR125R3M	KM40TSDFR125R3M	KM50TSDFR125R3M		12,50	.492	13,50	67,9	37,5	0,5	DFR0202..		
KM32TSDFR130R3M	KM40TSDFR130R3M	KM50TSDFR130R3M		13,00	.512	14,00	69,4	39,0	0,5	DFR0202..		
KM32TSDFR140R3M	KM40TSDFR140R3M	KM50TSDFR140R3M		14,00	.551	15,00	72,4	42,0	0,5	DFR0202..		
KM32TSDFR150R3M	KM40TSDFR150R3M	KM50TSDFR150R3M		15,00	.591	16,00	75,4	45,0	0,5	DFR0202..		
KM32TSDFR160R3M	KM40TSDFR160R3M	KM50TSDFR160R3M		16,00	.630	17,00	78,4	48,0	0,5	DFR0202..		
KM32TSDFR170R3M	KM40TSDFR170R3M	KM50TSDFR170R3M		17,00	.669	18,00	82,4	51,0	0,6	DFR0302..		
KM32TSDFR180R3M	KM40TSDFR180R3M	KM50TSDFR180R3M		18,00	.709	19,00	85,4	54,0	0,6	DFR0302..		
KM32TSDFR190R3M	KM40TSDFR190R3M	KM50TSDFR190R3M		19,00	.748	20,00	89,4	57,0	0,6	DFR0302..		
KM32TSDFR200R3M	KM40TSDFR200R3M	KM50TSDFR200R3M		20,00	.787	21,00	92,4	60,0	0,6	DFR0302..		
KM32TSDFR210R3M	KM40TSDFR210R3M	KM50TSDFR210R3M		21,00	.827	22,00	96,6	63,0	0,8	DFR0403..		
KM32TSDFR220R3M	KM40TSDFR220R3M	KM50TSDFR220R3M		22,00	.866	23,00	99,6	66,0	0,8	DFR0403..		
KM32TSDFR230R3M	KM40TSDFR230R3M	KM50TSDFR230R3M		23,00	.906	24,00	103,6	69,0	0,8	DFR0403..		
KM32TSDFR240R3M	KM40TSDFR240R3M	KM50TSDFR240R3M		24,00	.945	25,00	106,6	72,0	0,8	DFR0403..		

■ **KM32TS, KM40TS, and KM50TS Shanks • 3 x D • Inch**

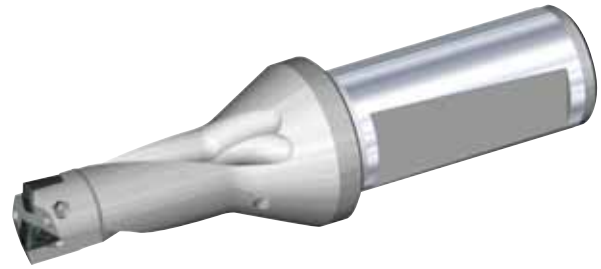
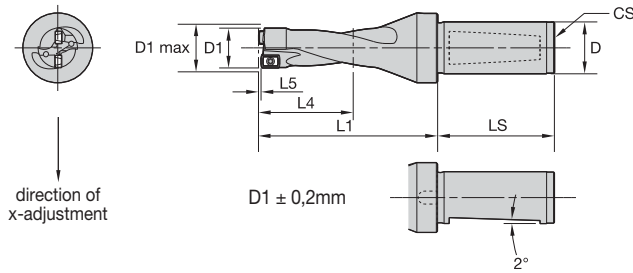
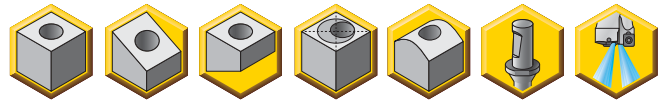
KM32TS		KM40TS		KM50TS		D1			L1	L4 max	L5	gage insert
				in	mm	D1 max						
KM32TSDFR0500R3	KM40TSDFR0500R3	KM50TSDFR0500R3		.500	12,70	.540	2,64	1,50	.02	DFR0202..		
KM32TSDFR0531R3	KM40TSDFR0531R3	KM50TSDFR0531R3		.531	13,49	.571	2,76	1,59	.02	DFR0202..		
KM32TSDFR0563R3	KM40TSDFR0563R3	KM50TSDFR0563R3		.563	14,30	.603	2,89	1,69	.02	DFR0202..		
KM32TSDFR0594R3	KM40TSDFR0594R3	KM50TSDFR0594R3		.594	15,09	.634	3,01	1,78	.02	DFR0202..		
KM32TSDFR0625R3	KM40TSDFR0625R3	KM50TSDFR0625R3		.625	15,88	.665	3,14	1,88	.02	DFR0202..		
KM32TSDFR0656R3	KM40TSDFR0656R3	KM50TSDFR0656R3		.656	16,66	.696	3,27	1,97	.02	DFR0302..		
KM32TSDFR0688R3	KM40TSDFR0688R3	KM50TSDFR0688R3		.688	17,48	.728	3,39	2,06	.02	DFR0302..		
KM32TSDFR0734R3	KM40TSDFR0734R3	KM50TSDFR0734R3		.734	18,64	.774	3,52	2,20	.02	DFR0302..		
KM32TSDFR0750R3	KM40TSDFR0750R3	KM50TSDFR0750R3		.750	19,05	.790	3,52	2,25	.02	DFR0302..		
KM32TSDFR0781R3	KM40TSDFR0781R3	KM50TSDFR0781R3		.781	19,84	.821	3,64	2,34	.02	DFR0302..		
KM32TSDFR0813R3	KM40TSDFR0813R3	KM50TSDFR0813R3		.813	20,65	.853	3,77	2,44	.03	DFR0403..		
KM32TSDFR0844R3	KM40TSDFR0844R3	KM50TSDFR0844R3		.844	21,44	.884	3,90	2,53	.03	DFR0403..		
KM32TSDFR0875R3	KM40TSDFR0875R3	KM50TSDFR0875R3		.875	22,23	.915	4,02	2,63	.03	DFR0403..		
KM32TSDFR0906R3	KM40TSDFR0906R3	KM50TSDFR0906R3		.906	23,01	.946	4,15	2,72	.03	DFR0403..		
KM32TSDFR0938R3	KM40TSDFR0938R3	KM50TSDFR0938R3		.938	23,83	.978	4,27	2,81	.03	DFR0403..		
KM32TSDFR0969R3	KM40TSDFR0969R3	KM50TSDFR0969R3		.969	24,61	1,009	4,40	2,91	.03	DFR0403..		

WARNING

During through-hole operations, a slug or disc is produced as the tool breaks through the workpiece. When the drill is stationary and the workpiece is rotating, this slug may be hurled from the chuck by centrifugal force. Provide adequate shielding to protect bystanders.

gage insert	insert screw	Torx wrench	Torx size
DFR0202..	193.281	170.027	T6
DFR0302..	192.416	170.023	T7
DFR0403..	192.432	170.025	T8

- Drill shipped with insert screws and Torx wrench.
- See page J95 for inserts.


WN/WD Shank • 2 x D • Metric

D		D1			gage insert		
20	32	mm	in	D1 max	L1	L4 max	L5
DFR125R2WD20M	—	12,50	.492	13,50	47,4	25,0	0,5
DFR127R2WD20M	—	12,70	.500	13,70	47,8	25,4	0,5
DFR130R2WD20M	—	13,00	.512	14,00	48,4	26,0	0,5
DFR135R2WD20M	—	13,50	.532	14,50	49,4	27,0	0,5
DFR140R2WD20M	—	14,00	.551	15,00	50,4	28,0	0,5
DFR145R2WD20M	—	14,50	.571	15,50	53,4	29,0	0,5
DFR150R2WD20M	—	15,00	.591	16,00	54,4	30,0	0,5
DFR155R2WD20M	—	15,50	.610	16,50	55,4	31,0	0,5
DFR160R2WD20M	—	16,00	.630	17,00	56,4	32,0	0,5
—	DFR165R2WD32M	16,50	.650	17,50	62,4	33,0	0,6
—	DFR170R2WD32M	17,00	.669	18,00	63,4	34,0	0,6
—	DFR175R2WD32M	17,50	.689	18,50	64,4	35,0	0,6
—	DFR180R2WD32M	18,00	.709	19,00	65,4	36,0	0,6
—	DFR185R2WD32M	18,50	.728	19,50	66,4	37,0	0,6
—	DFR190R2WD32M	19,00	.748	20,00	67,4	38,0	0,6
—	DFR195R2WD32M	19,50	.768	20,50	68,4	39,0	0,6
—	DFR200R2WD32M	20,00	.787	21,00	72,4	40,0	0,6
—	DFR205R2WD32M	20,50	.807	21,50	73,6	41,0	0,8
—	DFR210R2WD32M	21,00	.827	22,00	74,6	42,0	0,8
—	DFR220R2WD32M	22,00	.866	23,00	76,6	44,0	0,8
—	DFR230R2WD32M	23,00	.906	24,00	78,6	46,0	0,8
—	DFR240R2WD32M	24,00	.945	25,00	80,6	48,0	0,8

Indexable Drills

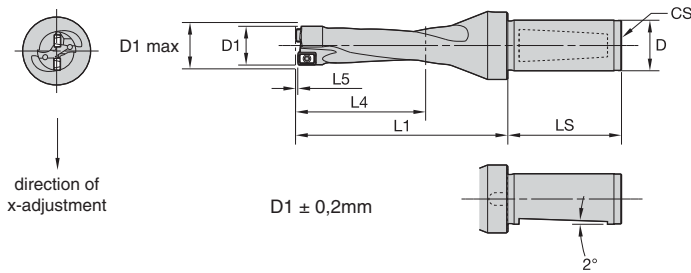
WARNING

During through-hole operations, a slug or disc is produced as the tool breaks through the workpiece. When the drill is stationary and the workpiece is rotating, this slug may be hurled from the chuck by centrifugal force. Provide adequate shielding to protect bystanders.

gage insert	insert screw	Torx wrench	Torx size
DFR0202..	193.281	170.027	6
DFR0302..	192.416	170.023	7
DFR0403..	192.432	170.028	8

D	LS	CS
20	45	R 1/8 BSP
32	58	R 1/4 BSP

- Drill shipped with insert screws and Torx wrench.
- See page J95 for inserts.



■ WN/WD Shank • 3 x D • Metric

Indexable Drills

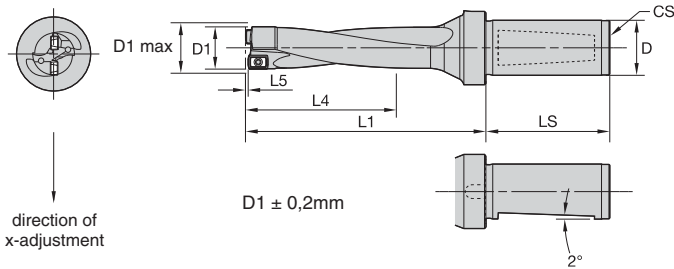
	D			D1		L1	L4 max	L5	gage insert	
	20	25	32	mm	in					
DFR125R3WD20M	—	—	—	12,50	.492	13,50	59,9	37,5	0,5	DFR0202..
DFR127R3WD20M	—	—	—	12,70	.500	13,70	60,5	38,1	0,5	DFR0202..
DFR130R3WD20M	—	—	—	13,00	.512	14,00	61,4	39,0	0,5	DFR0202..
DFR135R3WD20M	—	—	—	13,50	.532	14,50	62,9	40,5	0,5	DFR0202..
DFR140R3WD20M	—	—	—	14,00	.551	15,00	64,4	42,0	0,5	DFR0202..
DFR145R3WD20M	—	—	—	14,50	.571	15,50	67,9	43,5	0,5	DFR0202..
DFR150R3WD20M	—	—	—	15,00	.591	16,00	69,4	45,0	0,5	DFR0202..
DFR155R3WD20M	—	—	—	15,50	.610	16,50	70,9	46,5	0,5	DFR0202..
DFR160R3WD20M	—	—	—	16,00	.630	17,00	72,4	48,0	0,5	DFR0202..
—	—	—	DFR165R3WD32M	16,50	.650	17,50	78,9	49,5	0,6	DFR0302..
—	—	—	DFR170R3WD32M	17,00	.669	18,00	80,4	51,0	0,6	DFR0302..
—	DFR175R3WD25M	—	DFR175R3WD32M	17,50	.689	18,50	81,9	52,5	0,6	DFR0302..
—	DFR180R3WD25M	—	DFR180R3WD32M	18,00	.709	19,00	83,4	54,0	0,6	DFR0302..
—	DFR185R3WD25M	—	DFR185R3WD32M	18,50	.728	19,50	84,9	55,5	0,6	DFR0302..
—	DFR190R3WD25M	—	DFR190R3WD32M	19,00	.748	20,00	86,4	57,0	0,6	DFR0302..
—	DFR195R3WD25M	—	DFR195R3WD32M	19,50	.768	20,50	87,9	58,5	0,6	DFR0302..
—	DFR200R3WD25M	—	DFR200R3WD32M	20,00	.787	21,00	92,4	60,0	0,6	DFR0302..
—	DFR205R3WD25M	—	DFR205R3WD32M	20,50	.807	21,50	94,1	61,5	0,8	DFR0403..
—	DFR210R3WD25M	—	DFR210R3WD32M	21,00	.827	22,00	95,6	63,0	0,8	DFR0403..
—	DFR220R3WD25M	—	DFR220R3WD32M	22,00	.866	23,00	98,6	66,0	0,8	DFR0403..
—	DFR230R3WD25M	—	DFR230R3WD32M	23,00	.906	24,00	101,6	69,0	0,8	DFR0403..
—	DFR240R3WD25M	—	DFR240R3WD32M	24,00	.945	25,00	104,6	72,0	0,8	DFR0403..

WARNING

During through-hole operations, a slug or disc is produced as the tool breaks through the workpiece. When the drill is stationary and the workpiece is rotating, this slug may be hurled from the chuck by centrifugal force. Provide adequate shielding to protect bystanders.

gage insert	insert screw	Torx wrench	Torx size			
				D	LS	CS
DFR0202..	193.281	170.027	6	20	45	R 1/8 BSP
DFR0302..	192.416	170.023	7	25	45	R 1/4 BSP
DFR0403..	192.432	170.028	8	32	58	R 1/4 BSP

- Drill shipped with insert screws and Torx wrench.
- See page J95 for inserts.



■ WN/WD Shank • 4 x D • Metric

D		D1		D1 max	L1	L4 max	L5	gage insert
20	32	mm	in					
DFR125R4WD20M	—	12,50	.492	13,50	72,4	50,0	0,5	DFR0202..
DFR127R4WD20M	—	12,70	.500	13,70	73,2	50,8	0,5	DFR0202..
DFR130R4WD20M	—	13,00	.512	14,00	74,4	52,0	0,5	DFR0202..
DFR135R4WD20M	—	13,50	.532	14,50	76,4	54,0	0,5	DFR0202..
DFR140R4WD20M	—	14,00	.551	15,00	78,4	56,0	0,5	DFR0202..
DFR145R4WD20M	—	14,50	.571	15,50	82,4	58,0	0,5	DFR0202..
DFR150R4WD20M	—	15,00	.591	16,00	84,4	60,0	0,5	DFR0202..
DFR155R4WD20M	—	15,50	.610	16,50	86,4	62,0	0,5	DFR0202..
DFR160R4WD20M	—	16,00	.630	17,00	88,4	64,0	0,5	DFR0202..
—	DFR165R4WD32M	16,50	.650	17,50	95,4	66,0	0,6	DFR0302..
—	DFR170R4WD32M	17,00	.669	18,00	97,4	68,0	0,6	DFR0302..
—	DFR175R4WD32M	17,50	.689	18,50	99,4	70,0	0,6	DFR0302..
—	DFR180R4WD32M	18,00	.709	19,00	101,4	72,0	0,6	DFR0302..
—	DFR185R4WD32M	18,50	.728	19,50	103,4	74,0	0,6	DFR0302..
—	DFR190R4WD32M	19,00	.748	20,00	105,4	76,0	0,6	DFR0302..
—	DFR195R4WD32M	19,50	.768	20,50	107,4	78,0	0,6	DFR0302..
—	DFR200R4WD32M	20,00	.787	21,00	109,4	80,0	0,6	DFR0302..
—	DFR205R4WD32M	20,50	.807	21,50	111,6	82,0	0,8	DFR0403..
—	DFR210R4WD32M	21,00	.827	22,00	113,6	84,0	0,8	DFR0403..
—	DFR220R4WD32M	22,00	.866	23,00	117,6	88,0	0,8	DFR0403..
—	DFR230R4WD32M	23,00	.906	24,00	121,6	92,0	0,8	DFR0403..
—	DFR240R4WD32M	24,00	.945	25,00	125,6	96,0	0,8	DFR0403..

Indexable Drills

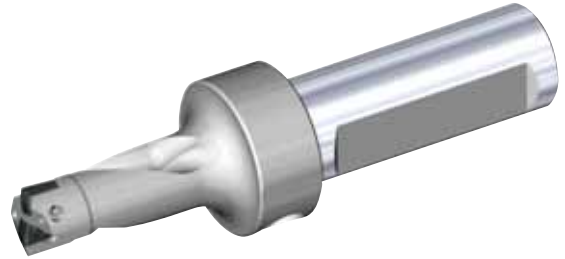
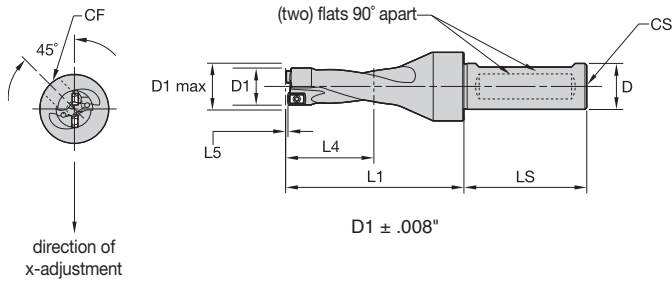
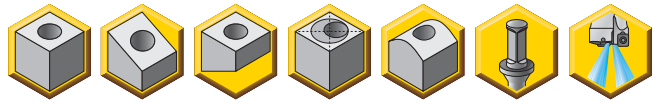
WARNING

During through-hole operations, a slug or disc is produced as the tool breaks through the workpiece. When the drill is stationary and the workpiece is rotating, this slug may be hurled from the chuck by centrifugal force. Provide adequate shielding to protect bystanders.

gage insert	insert screw	Torx wrench	Torx size
DFR0202..	193.281	170.027	6
DFR0302..	192.416	170.023	7
DFR0403..	192.432	170.028	8

D	LS	CS
20	45	R 1/8 BSP
32	58	R 1/4 BSP

- Drill shipped with insert screws, side pipe plug, and Torx wrench.
- See page J95 for inserts.



■ Flange Shank • 2 x D • Inch

Indexable Drills

	D		D1		D1 max	L1	L4 max	L5	gage insert
	0.750	1.000	in	mm					
DFR0500R2SSF075	—	—	.500	12,70	.539	1.95	1.00	.02	DFR0202..
DFR0563R2SSF075	—	—	.563	14,30	.602	2.08	1.13	.02	DFR0202..
DFR0625R2SSF075	—	—	.625	15,88	.664	2.20	1.25	.02	DFR0202..
DFR0688R2SSF075	—	—	.688	17,48	.727	2.33	1.38	.02	DFR0302..
—	—	DFR0750R2SSF100	.750	19,05	.789	2.52	1.50	.02	DFR0302..
—	—	DFR0813R2SSF100	.813	20,65	.852	2.65	1.63	.03	DFR0403..
—	—	DFR0875R2SSF100	.875	22,23	.914	2.87	1.75	.03	DFR0403..
—	—	DFR0938R2SSF100	.938	23,83	.977	2.99	1.88	.03	DFR0403..
—	—	DFR1000R2SSF100	1.000	25,40	1.039	3.12	2.00	.03	DFR0403..

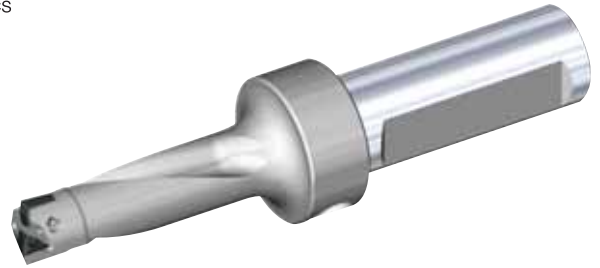
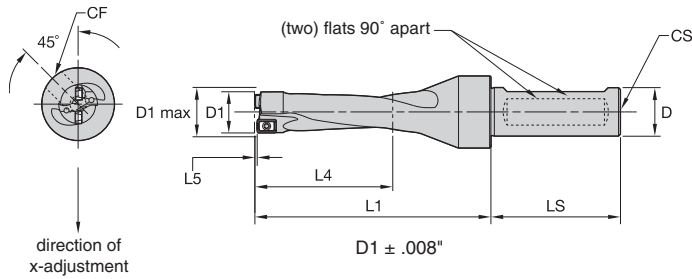
WARNING

During through-hole operations, a slug or disc is produced as the tool breaks through the workpiece. When the drill is stationary and the workpiece is rotating, this slug may be hurled from the chuck by centrifugal force. Provide adequate shielding to protect bystanders.

gage insert	insert screw	Torx wrench	Torx size
DFR0202..	193.281	170.027	6
DFR0302..	192.416	170.023	7
DFR0403..	192.432	170.028	8

D	LS	CF	CS	pipe plug
0.75	2.00	1/8-27 NPT	1/8-27 NPT	HSFS0125
1.00	3.00	1/8-27 NPT	1/4-18 NPT	HSFS0125

- Drill shipped with insert screws, side pipe plug, and Torx wrench.
- See page J95 for inserts.



■ Flange Shank • 3 x D • Inch

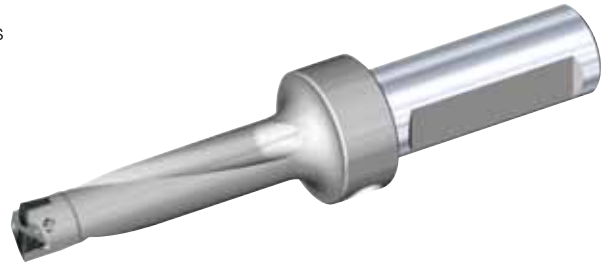
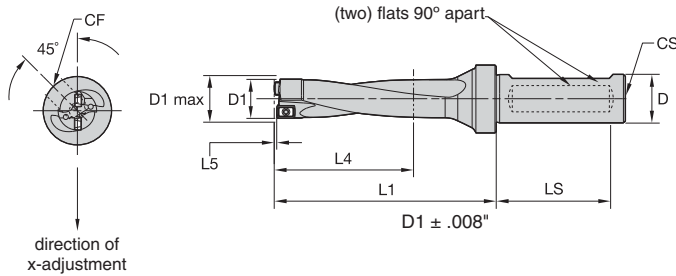
	D			D1					gage insert	
	0.750	1.000	1.250	in	mm	D1 max	L1	L4 max		L5
DFR0500R3SSF075	—	—	—	.500	12,70	.539	2.44	1.59	.02	DFR0202..
DFR0531R3SSF075	—	—	—	.531	13,49	.571	2.50	1.69	.02	DFR0202..
DFR0563R3SSF075	—	—	—	.563	14,30	.602	2.64	1.69	.02	DFR0202..
DFR0594R3SSF075	—	—	—	.594	15,09	.633	2.70	1.78	.02	DFR0202..
DFR0625R3SSF075	DFR0625R3SSF100	—	—	.625	15,88	.664	2.83	1.88	.02	DFR0202..
DFR0656R3SSF075	DFR0656R3SSF100	—	—	.656	16,66	.695	2.92	1.97	.02	DFR0302..
DFR0688R3SSF075	DFR0688R3SSF100	—	—	.688	17,48	.727	3.02	2.06	.02	DFR0302..
DFR0703R3SSF075	DFR0703R3SSF100	—	—	.703	17,86	.742	3.13	2.11	.02	DFR0302..
DFR0734R3SSF075	DFR0734R3SSF100	—	—	.734	18,64	.773	3.22	2.20	.02	DFR0302..
DFR0750R3SSF075	DFR0750R3SSF100	—	—	.750	19,05	.789	3.27	2.25	.02	DFR0302..
DFR0781R3SSF075	DFR0781R3SSF100	—	—	.781	19,84	.820	3.36	2.34	.02	DFR0302..
DFR0813R3SSF075	DFR0813R3SSF100	—	—	.813	20,65	.852	3.46	2.44	.03	DFR0403..
DFR0844R3SSF075	DFR0844R3SSF100	—	—	.844	21,44	.883	3.65	2.53	.03	DFR0403..
DFR0875R3SSF075	DFR0875R3SSF100	—	—	.875	22,23	.914	3.74	2.63	.03	DFR0403..
—	DFR0906R3SSF100	—	—	.906	23,01	.945	3.83	2.72	.03	DFR0403..
—	DFR0938R3SSF100	—	—	.938	23,83	.977	3.93	2.81	.03	DFR0403..
—	DFR0969R3SSF100	—	—	.969	24,61	1.008	4.02	2.91	.03	DFR0403..
—	DFR0984R3SSF100	—	—	.984	24,99	1.023	4.07	2.95	.03	DFR0403..
—	DFR1000R3SSF100	DFR1000R3SSF125	—	1.000	25,40	1.039	4.12	3.00	.03	DFR0403..

Indexable Drills

WARNING
During through-hole operations, a slug or disc is produced as the tool breaks through the workpiece. When the drill is stationary and the workpiece is rotating, this slug may be hurled from the chuck by centrifugal force. Provide adequate shielding to protect bystanders.

gage insert	insert screw	Torx wrench	Torx size	D	LS	CF	CS	pipe plug
DFR0202..	193.281	170.027	6	0.75	2.00	1/8-27 NPT	1/8-27 NPT	HSFS0125
DFR0302..	192.416	170.023	7	1.00	3.00	1/8-27 NPT	1/4-18 NPT	HSFS0125
DFR0403..	192.432	170.028	8	1.25	3.25	1/8-27 NPT	1/4-18 NPT	HSFS0125

- Drill shipped with insert screws, side pipe plug, and Torx wrench.
- See page J95 for inserts.



■ Flange Shank • 4 x D • Inch

Indexable Drills

	D			D1			L1	L4 max	L5	gage insert
	0.750	1.000	1.250	in	mm	D1 max				
DFR0500R4SSF075	—	—	—	.500	12,70	.540	2.95	2.00	.02	DFR0202..
DFR0531R4SSF075	—	—	—	.531	13,49	.571	3.05	2.12	.02	DFR0202..
DFR0563R4SSF075	—	—	—	.563	14,30	.603	3.21	2.25	.02	DFR0202..
DFR0594R4SSF075	—	—	—	.594	15,09	.633	3.30	2.38	.02	DFR0202..
DFR0625R4SSF075	DFR0625R4SSF100	—	—	.625	15,88	.664	3.45	2.50	.02	DFR0202..
—	DFR0656R4SSF100	—	—	.656	16,66	.695	3.58	2.62	.02	DFR0302..
—	DFR0688R4SSF100	—	—	.688	17,48	.727	3.71	2.75	.02	DFR0302..
—	DFR0703R4SSF100	—	—	.703	17,86	.742	3.83	2.81	.02	DFR0302..
—	DFR0734R4SSF100	—	—	.734	18,64	.773	3.95	2.94	.02	DFR0302..
—	DFR0750R4SSF100	—	—	.750	19,05	.789	4.02	3.00	.02	DFR0302..
—	DFR0781R4SSF100	—	—	.781	19,84	.820	4.14	3.12	.02	DFR0302..
—	DFR0813R4SSF100	—	—	.813	20,65	.852	4.27	3.25	.03	DFR0403..
—	DFR0844R4SSF100	—	—	.844	21,44	.883	4.49	3.38	.03	DFR0403..
—	DFR0875R4SSF100	—	—	.875	22,23	.914	4.62	3.50	.03	DFR0403..
—	DFR0906R4SSF100	—	—	.906	23,01	.945	4.74	3.62	.03	DFR0403..
—	DFR0938R4SSF100	—	—	.938	23,83	.977	4.87	3.75	.03	DFR0403..
—	DFR0969R4SSF100	—	—	.969	24,61	1.008	4.99	3.88	.03	DFR0403..
—	DFR0984R4SSF100	—	—	.984	24,99	1.023	5.05	3.84	.03	DFR0403..
—	DFR1000R4SSF100	DFR1000R4SSF125	—	1.000	25,40	1.039	5.12	4.00	.03	DFR0403..

WARNING
During through-hole operations, a slug or disc is produced as the tool breaks through the workpiece. When the drill is stationary and the workpiece is rotating, this slug may be hurled from the chuck by centrifugal force. Provide adequate shielding to protect bystanders.

gage insert	insert screw	Torx wrench	Torx size	D	LS	CF	CS	pipe plug
				0.75	1.00	1.25	1/8-27 NPT		1/8-27 NPT	1/4-18 NPT	1/4-18 NPT
DFR0202..	193.281	170.027	6	0.75	2.00	1/8-27 NPT	1/8-27 NPT	HSFS0125
DFR0302..	192.416	170.023	7	1.00	3.00	1/8-27 NPT	1/4-18 NPT	HSFS0125
DFR0403..	192.432	170.028	8	1.25	3.25	1/8-27 NPT	1/4-18 NPT	HSFS0125

DFR™ • Metric

Material Group	Condition	Pocket Seat	Geometry	Grade	Cutting Speed – vc Range – m/min		Metric				
							Recommended Feed Rate (f) by Diameter				
					min	Starting Value	max	Ø (mm)	DFR02... 12,50-16,00	DFR03... 16,50-20,00	DFR04 20,50-24,00
P	1	S	O MD	KCU25	310	325	360	mm/r	0,09 - 0,15	0,11 - 0,18	0,15 - 0,25
			I MD	KC7140							
		U	O MD	KCU40	200	215	230				
			I MD	KC7140							
	I	O MD	KC7140	130	135	150					
		I MD	KC7140								
	2	S	O GD	KCPK10	310	325	360				
			I LD	KC7140							
		U	O GD	KCU40	200	215	230				
			I LD	KC7140							
	I	O MD	KC7140	130	135	150					
		I LD	KC7140								
	3	S	O GD	KCPK10	260	285	320				
			I LD	KC7140							
		U	O GD	KCU40	180	195	220				
			I LD	KC7140							
	I	O GD	KC7140	110	120	140					
		I LD	KC7140								
	4	S	O GD	KCU25	220	250	300				
			I LD	KC7140							
		U	O GD	KCU40	150	180	220				
			I LD	KC7140							
	I	O GD	KC7140	90	110	140					
		I LD	KC7140								
5	S	O GD	KCU25	180	200	220					
		I LD	KC7140								
	U	O GD	KCU40	120	135	150					
		I LD	KC7140								
I	O GD	KC7140	70	85	100						
	I LD	KC7140									
6	S	O GD	KCU25	180	200	220					
		I LD	KC7140								
	U	O GD	KCU40	120	135	150					
		I LD	KC7140								
I	O GD	KC7140	70	85	100						
	I LD	KC7140									
M	1	S	O MD	KC7140	150	190	230				
			I MD	KC7140							
		U	O MD	KC7140	100	130	160				
			I MD	KC7140							
	2	S	O MD	KC7140	150	180	210				
			I MD	KC7140							
		U	O MD	KC7140	100	130	160				
			I MD	KC7140							
	3	S	O MD	KC7140	100	130	160				
			I MD	KC7140							
		U	O MD	KC7140	80	110	140				
			I MD	KC7140							
I	O MD	KC7140	50	70	90						
	I MD	KC7140									

Condition: S = Stable cutting conditions; U = Unstable cutting conditions; I = Interrupted cutting conditions
 Pocket seat: I = Inboard insert; O = Outboard insert



DFR™ • Metric

Indexable Drills

Material Group	Condition	Pocket Seat	Geometry	Grade	Cutting Speed – vc Range – m/min			Metric					
								Recommended Feed Rate (f) by Diameter					
					min	Starting Value	max	Ø (mm)	DFR02... 12,50-16,00	DFR03... 16,50-20,00	DFR04 20,50-24,00		
K	1	S	O	GD	KCPK10	200	240	300	mm/r	0,10 - 0,18	0,12 - 0,20	0,14 - 0,24	
			I	LD	KCU40								
		U	O	GD	KCU25	120	155	200	mm/r	0,10 - 0,18	0,12 - 0,20	0,14 - 0,24	
	I		LD	KC7140									
	2	S	I	O	GD	KCPK10	180	220	260	mm/r	0,10 - 0,18	0,12 - 0,20	0,14 - 0,24
				I	LD	KCU40							
		U	O	GD	KCU25	110	140	170	mm/r	0,10 - 0,18	0,12 - 0,20	0,14 - 0,24	
	I		LD	KC7140									
	3	S	I	O	GD	KCPK10	180	220	260	mm/r	0,10 - 0,18	0,12 - 0,20	0,14 - 0,24
				I	LD	KCU40							
		U	O	GD	KCU25	110	140	170	mm/r	0,10 - 0,18	0,12 - 0,20	0,14 - 0,24	
	I		LD	KC7140									
N	1	S	O	ST	KD1425	400	600	800	mm/r	0,07 - 0,09	0,10 - 0,14	0,12 - 0,16	
			I	LD	KCU40								
		U	O	LD	KCU40	300	400	500	mm/r	0,07 - 0,09	0,10 - 0,14	0,12 - 0,16	
	I		LD	KCU40									
	2	S	I	O	ST	KD1425	375	550	775	mm/r	0,07 - 0,09	0,10 - 0,14	0,12 - 0,16
				I	LD	KCU40							
		U	O	LD	KCU40	250	350	450	mm/r	0,07 - 0,09	0,10 - 0,14	0,12 - 0,16	
	I		LD	KCU40									
	3	S	I	O	ST	KD1425	350	500	650	mm/r	0,07 - 0,09	0,10 - 0,14	0,12 - 0,16
				I	LD	KCU40							
		U	O	LD	KCU40	250	350	450	mm/r	0,07 - 0,09	0,10 - 0,14	0,12 - 0,16	
	I		LD	KCU40									
	4	S	I	O	ST	KD1425	400	600	800	mm/r	0,07 - 0,09	0,10 - 0,14	0,12 - 0,16
				I	LD	KCU40							
		U	O	LD	KCU40	250	350	450	mm/r	0,07 - 0,09	0,10 - 0,14	0,12 - 0,16	
	I		LD	KCU40									
	5	S	I	O	ST	KD1425	400	600	800	mm/r	0,07 - 0,09	0,10 - 0,14	0,12 - 0,16
				I	LD	KCU40							
U		O	HP	KCU40	250	350	450	mm/r	0,07 - 0,09	0,10 - 0,14	0,12 - 0,16		
	I	HP	KMF										
S	1	S	O	GD	KCU40	60	70	75	mm/r	0,04 - 0,06	0,05 - 0,08	0,06 - 0,10	
			I	LD	KCU40								
		U	O	GD	KCU40	40	50	60	mm/r	0,04 - 0,06	0,05 - 0,08	0,06 - 0,10	
	I		LD	KC7140									
	2	S	I	O	MD	KC7140	25	30	40	mm/r	0,04 - 0,06	0,05 - 0,08	0,06 - 0,10
				I	MD	KC7140							
		U	O	GD	KCU40	50	60	70	mm/r	0,04 - 0,06	0,05 - 0,08	0,06 - 0,10	
	I		LD	KCU40									
	3	S	I	O	GD	KCU40	70	80	90	mm/r	0,05 - 0,08	0,06 - 0,10	0,06 - 0,10
				I	LD	KCU40							
		U	O	GD	KCU40	50	60	70	mm/r	0,05 - 0,08	0,06 - 0,10	0,06 - 0,10	
	I		LD	KC7140									
	4	S	I	O	MD	KC7140	30	40	50	mm/r	0,05 - 0,08	0,06 - 0,10	0,06 - 0,10
				I	MD	KC7140							
		U	O	GD	KCU40	70	80	90	mm/r	0,05 - 0,08	0,06 - 0,10	0,06 - 0,10	
	I		LD	KCU40									
	4	S	I	O	GD	KCU40	70	80	90	mm/r	0,05 - 0,08	0,06 - 0,10	0,06 - 0,10
				I	LD	KCU40							
U		O	GD	KCU40	50	60	70	mm/r	0,05 - 0,08	0,06 - 0,10	0,06 - 0,10		
	I	LD	KC7140										
4	S	I	O	MD	KC7140	30	40	50	mm/r	0,05 - 0,08	0,06 - 0,10	0,06 - 0,10	
			I	MD	KC7140								
	U	O	MD	KC7140	30	40	50	mm/r	0,05 - 0,08	0,06 - 0,10	0,06 - 0,10		
I		MD	KC7140										

Condition: S = Stable cutting conditions; U = Unstable cutting conditions; I = Interrupted cutting conditions

Pocket seat: I = Inboard insert; O = Outboard insert

DFR™ • Inch

Material Group	Condition	Pocket Seat	Geometry	Grade	Cutting Speed – vc Range – SFM			Inch										
					min	Starting Value	max	Recommended Feed Rate (f) by Diameter										
								Ø (in)	DFR02... .500-.625	DFR03... .688-.750	DFR04... .813-1.00							
P	1	S	O MD	KCU25	1017	1066	1181	IPR	.004 - .006	.004 - .007	.006 - .010							
			I MD	KC7140														
		U	O MD	KCU40								656	705	754	IPR	.004 - .006	.004 - .007	.006 - .010
			I MD	KC7140														
		I	O MD	KC7140								426	443	492	IPR	.004 - .006	.004 - .007	.006 - .010
			I MD	KC7140														
	2	S	O GD	KCPK10	1017	1066	979	IPR	.004 - .006	.004 - .007	.006 - .010							
			I LD	KC7140														
		U	O GD	KCU40								656	705	754	IPR	.004 - .006	.004 - .007	.006 - .010
			I LD	KC7140														
		I	O MD	KC7140								426	443	492	IPR	.004 - .006	.004 - .007	.006 - .010
			I LD	KC7140														
	3	S	O GD	KCPK10	853	935	1050	IPR	.004 - .006	.004 - .007	.006 - .010							
			I LD	KC7140														
		U	O GD	KCU40								590	640	722	IPR	.004 - .006	.004 - .007	.006 - .010
			I LD	KC7140														
		I	O GD	KC7140								361	394	459	IPR	.004 - .006	.004 - .007	.006 - .010
			I LD	KC7140														
	4	S	O GD	KCU25	722	820	984	IPR	.004 - .006	.004 - .007	.006 - .010							
			I LD	KC7140														
		U	O GD	KCU40								492	590	722	IPR	.004 - .006	.004 - .007	.006 - .010
			I LD	KC7140														
		I	O GD	KC7140								295	361	459	IPR	.004 - .006	.004 - .007	.006 - .010
			I LD	KC7140														
5	S	O GD	KCU25	590	656	722	IPR	.003 - .005	.004 - .006	.004 - .007								
		I LD	KC7140															
	U	O GD	KCU40								394	443	492	IPR	.003 - .005	.004 - .006	.004 - .007	
		I LD	KC7140															
	I	O GD	KC7140								230	279	328	IPR	.003 - .005	.004 - .006	.004 - .007	
		I LD	KC7140															
6	S	O GD	KCU25	590	656	722	IPR	.004 - .006	.004 - .007	.006 - .010								
		I LD	KC7140															
	U	O GD	KCU40								394	443	492	IPR	.004 - .006	.004 - .007	.006 - .010	
		I LD	KC7140															
	I	O GD	KC7140								230	279	328	IPR	.004 - .006	.004 - .007	.006 - .010	
		I LD	KC7140															
M	1	S	O MD	KC7140	492	623	754	IPR	.003 - .005	.003 - .006	.004 - .007							
			I MD	KC7140														
		U	O MD	KC7140								328	426	525	IPR	.003 - .005	.003 - .006	.004 - .007
			I MD	KC7140														
		I	O MD	KC7140								197	262	328	IPR	.003 - .005	.003 - .006	.004 - .007
			I MD	KC7140														
	2	S	O MD	KC7140	492	590	689	IPR	.003 - .005	.003 - .006	.004 - .007							
			I MD	KC7140														
		U	O MD	KC7140								328	426	525	IPR	.003 - .005	.003 - .006	.004 - .007
			I MD	KC7140														
		I	O MD	KC7140								197	262	328	IPR	.003 - .005	.003 - .006	.004 - .007
			I MD	KC7140														
3	S	O MD	KC7140	328	426	525	IPR	.003 - .005	.003 - .006	.004 - .007								
		I MD	KC7140															
	U	O MD	KC7140								262	361	459	IPR	.003 - .005	.003 - .006	.004 - .007	
		I MD	KC7140															
	I	O MD	KC7140								164	230	295	IPR	.003 - .005	.003 - .006	.004 - .007	
		I MD	KC7140															

Condition: S = Stable cutting conditions; U = Unstable cutting conditions; I = Interrupted cutting conditions
 Pocket seat: I = Inboard insert; O = Outboard insert



■ DFR™ • Inch

Indexable Drills

Material Group	Condition	Pocket Seat	Geometry	Grade	Cutting Speed – vc Range – SFM			Inch				
								Recommended Feed Rate (f) by Diameter				
					min	Starting Value	max	Ø (in)	DFR02... .500-.625	DFR03... .688-.750	DFR04... .813-1.00	
K	1	S	O GD	KCPK10	656	787	984	IPR	.004 - .007	.005 - .008	.006 - .009	
			I LD	KCU40								
		U	O GD	KCU25	394	508	656	IPR	.004 - .007	.005 - .008	.006 - .009	
	I LD		KCU40									
	2	S	I	O GD	KCPK10	590	722	853	IPR	.004 - .007	.005 - .008	.006 - .009
				I LD	KCU40							
		U	O GD	KCU25	361	459	558	IPR	.004 - .007	.005 - .008	.005 - .009	
	I LD		KCU40									
	N	1	S	O ST	KD1425	1312	1968	2624	IPR	.003 - .004	.004 - .006	.005 - .006
				I LD	KCU40							
			U	O LD	KCU40	984	1312	1640	IPR	.003 - .004	.004 - .006	.005 - .006
		I LD		KCU40								
2		S	I	O ST	KD1425	1230	1804	2542	IPR	.003 - .004	.004 - .006	.005 - .006
				I LD	KCU40							
		U	O LD	KCU40	820	1148	1476	IPR	.003 - .004	.004 - .006	.005 - .006	
I LD			KCU40									
3		S	I	O ST	KD1425	1148	1640	2132	IPR	.003 - .004	.004 - .006	.005 - .006
				I LD	KCU40							
		U	O LD	KCU40	820	1148	1476	IPR	.003 - .004	.004 - .006	.005 - .006	
I LD			KCU40									
S	1	S	O ST	KD1425	1312	1968	2624	IPR	.003 - .004	.004 - .006	.005 - .006	
			I LD	KCU40								
		U	O LD	KCU40	820	1148	1476	IPR	.003 - .004	.004 - .006	.005 - .006	
	I LD		KCU40									
	2	S	I	O GD	KCU40	197	230	246	IPR	.002 - .002	.002 - .003	.002 - .004
				I LD	KCU40							
		U	O GD	KCU40	131	164	197	230	IPR	.002 - .002	.002 - .003	.002 - .004
	I MD		KC7140									
	3	S	I	O GD	KCU40	230	262	295	IPR	.002 - .004	.002 - .003	.002 - .004
				I LD	KCU40							
		U	O GD	KCU40	164	197	230	IPR	.002 - .003	.002 - .004	.002 - .004	
	I MD		KC7140									
S	4	S	O GD	KCU40	230	262	295	IPR	.002 - .003	.002 - .004	.002 - .004	
			I LD	KCU40								
		U	O GD	KCU40	164	197	230	IPR	.002 - .003	.002 - .004	.002 - .004	
	I MD		KC7140									

Condition: S = Stable cutting conditions; U = Unstable cutting conditions; I = Interrupted cutting conditions; Pocket seat: I = Inboard insert; O = Outboard insert

Drill Fix™ DFS™

Drill Fix DFS combines the economical squared outboard insert with the superior centering capabilities of the trigon inboard insert. The DFS indexable drills offer increased metal removal rates combined with high surface quality and hole straightness.

Available in a diameter range of 24–48mm (1–2.5"), the Drill Fix DFS provides the highest cutting data capabilities, even under difficult conditions, offering long tool body life and excellent chip evacuation. DFS indexable drills are now available as standard up to 5 x D supplementing the portfolio of 2 x D, 3 x D, and 4 x D.

Boost your productivity even further and achieve outstanding results in steel, stainless steel, and cast iron with the new Beyond™ DFS outboard inserts in KCPK10™, KCU25™, and KCU40™.

Features and Benefits

Higher Productivity and Profitability

- Achieve highest metal removal rates and excellent chip evacuation due to advanced chip flutes and non-central and increased cooling channels.
- Make use of squared outboard inserts that offer four economic cutting edges where needed.
- Benefit from a complete product portfolio offering standard L/D ratios up to 5 x D.

Versatility

- Drill holes up to 5 x D in steel, cast iron, ductile iron, stainless steel, and non-ferrous materials.
- Use where speed and economy are prime considerations.
- Apply DFS drills to straight holes, inclined entries and exits, interrupted cuts, and rough or welded entry surfaces.
- Use X-offset on turning machines to adjust the drill diameter, eliminating the need for specials in many applications and on machining centers to reach tolerance optimization.
- Eccentric chuck available as standard.

Reliability

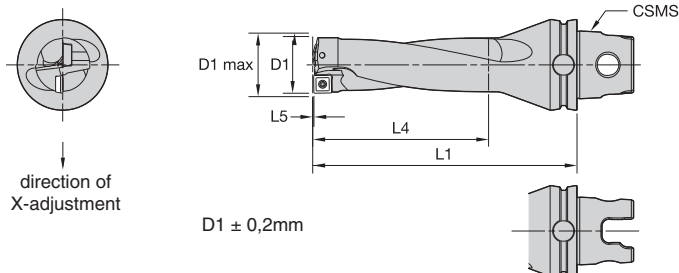
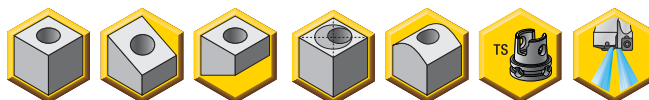
- Benefit from high accuracy holes independently from feed rates applied.
- Gain outstanding results by applying the Beyond DFS inserts.
- High wear resistance at interrupted cuts due to squared outboard insert.

Customization

- Intermediate diameters, multistep drills, and other non-standard shanks are available.
- Smaller and larger diameters available.



- Drill shipped with insert screws and Torx wrench.
- See pages J100–J103 for inserts.



Indexable Drills

■ **KM40TS, KM50TS, KM63TS, and KM63XMZ Shanks • 3 x D • Metric**

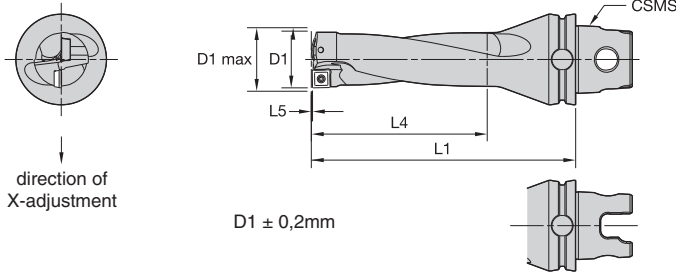
KM40TS		KM50TS		KM63TS		KM63XMZ		D1	D1	L4	gage insert	gage insert		
								mm	in	max	L1	max	outside	inside
KM40TSDFS250R3M	KM50TSDFS250R3M	KM63TSDFS250R3M	KM63XMZDFS250R3YM	25,00	.984	26,00	119,0	75,0	SPGX0703..	DFT05T3..				
KM40TSDFS270R3M	KM50TSDFS270R3M	KM63TSDFS270R3M	KM63XMZDFS270R3YM	27,00	1.063	28,00	126,0	81,0	SPPX09T3..	DFT05T3..				
KM40TSDFS290R3M	KM50TSDFS290R3M	KM63TSDFS290R3M	KM63XMZDFS290R3YM	29,00	1.142	30,00	133,0	87,0	SPPX09T3..	DFT05T3..				
KM40TSDFS310R3M	KM50TSDFS310R3M	KM63TSDFS310R3M	KM63XMZDFS310R3YM	31,00	1.221	32,00	140,0	93,0	SPPX09T3..	DFT05T3..				
—	KM50TSDFS330R3M	KM63TSDFS330R3M	KM63XMZDFS330R3YM	33,00	1.299	34,00	147,0	99,0	SPPX1204..	DFT06T3..				
—	KM50TSDFS350R3M	KM63TSDFS350R3M	KM63XMZDFS350R3YM	35,00	1.378	36,00	154,0	105,0	SPPX1204..	DFT06T3..				
—	KM50TSDFS380R3M	KM63TSDFS380R3M	KM63XMZDFS380R3YM	38,00	1.496	39,00	164,0	114,0	SPPX1204..	DFT06T3..				
—	—	KM63TSDFS410R3M	KM63XMZDFS410R3YM	41,00	1.614	42,00	175,0	123,0	SPPX1204..	DFT0704..				
—	—	KM63TSDFS440R3M	KM63XMZDFS440R3YM	44,00	1.732	45,00	185,0	132,0	SPPX15T5..	DFT0704..				
—	—	KM63TSDFS470R3M	KM63XMZDFS470R3YM	47,00	1.850	48,00	196,0	141,0	SPPX15T5..	DFT0704..				

WARNING

During through-hole operations, a slug or disc is produced as the tool breaks through the workpiece. When the drill is stationary and the workpiece is rotating, this slug may be hurled from the chuck by centrifugal force. Provide adequate shielding to protect bystanders.

D1 mm	inboard insert screw	outboard insert screw	Torx wrench	Torx size
24–25,9	193.491	192.432	170.028	8
26–32,9	191.924	191.924	170.024	9
33–43,9	191.916	191.916	170.025	15
44–49,9	191.698	192.433	170.025	15
50–56	192.433	192.433	170.025	15

- Drill shipped with insert screws, side pipe plug, and Torx wrench.
- See pages J100–J103 for inserts.


■ KM40TS, KM50TS, KM63TS, and KM63XMZ Shanks • 3 x D • Inch

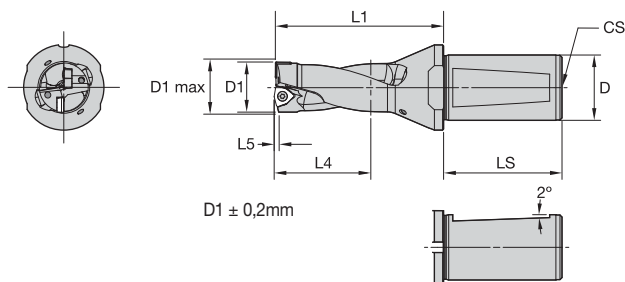
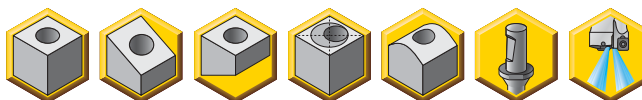
KM40TS		KM50TS		KM63TS		KM63XMZ		D1	D1	L4	gage insert	gage insert
								in	mm	max	outside	inside
										L1		
										max		
										L5		
KM40TSDFS1000R3	KM50TSDFS1000R3	KM63TSDFS1000R3	KM63XMZDFS1000R3Y	1.000	25,40	1.040	4.75	3.00	.02		SPGX0703..	DFT05T3..
KM40TSDFS1125R3	KM50TSDFS1125R3	KM63TSDFS1125R3	KM63XMZDFS1125R3Y	1.125	28,58	1.165	5.25	3.38	.03		SPPX09T3..	DFT05T3..
KM40TSDFS1250R3	KM50TSDFS1250R3	KM63TSDFS1250R3	KM63XMZDFS1250R3Y	1.250	31,75	1.290	5.63	3.75	.03		SPPX09T3..	DFT05T3..
—	KM50TSDFS1313R3	KM63TSDFS1313R3	KM63XMZDFS1313R3Y	1.313	33,35	1.353	5.94	3.94	.03		SPPX1204..	DFT06T3..
—	KM50TSDFS1375R3	KM63TSDFS1375R3	KM63XMZDFS1375R3Y	1.375	34,93	1.415	6.13	4.13	.03		SPPX1204..	DFT06T3..
—	KM50TSDFS1438R3	KM63TSDFS1438R3	KM63XMZDFS1438R3Y	1.438	36,53	1.478	6.31	4.31	.04		SPPX1204..	DFT06T3..
—	KM50TSDFS1500R3	KM63TSDFS1500R3	KM63XMZDFS1500R3Y	1.500	38,10	1.540	6.50	4.50	.04		SPPX1204..	DFT06T3..
—	KM50TSDFS1563R3	KM63TSDFS1563R3	KM63XMZDFS1563R3Y	1.563	39,70	1.603	6.81	4.69	.04		SPPX1204..	DFT06T3..
—	—	KM63TSDFS1625R3	KM63XMZDFS1625R3Y	1.625	41,28	1.665	7.00	4.88	.04		SPPX1204..	DFT0704..
—	—	KM63TSDFS1688R3	KM63XMZDFS1688R3Y	1.688	42,88	1.728	7.19	5.06	.04		SPPX1204..	DFT0704..
—	—	KM63TSDFS1750R3	KM63XMZDFS1750R3Y	1.750	44,45	1.790	7.38	5.25	.04		SPPX15T5..	DFT0704..
—	—	KM63TSDFS1875R3	KM63XMZDFS1875R3Y	1.875	47,63	1.915	7.88	5.63	.05		SPPX15T5..	DFT0704..

WARNING

During through-hole operations, a slug or disc is produced as the tool breaks through the workpiece. When the drill is stationary and the workpiece is rotating, this slug may be hurled from the chuck by centrifugal force. Provide adequate shielding to protect bystanders.

D1 in	inboard insert screw	outboard insert screw	Torx wrench	Torx size
1–1.030	193.491	192.432	170.028	8
1.031–1.312	191.924	191.924	170.024	9
1.313–1.749	191.916	191.916	170.025	15
1.750–1.937	191.698	192.433	170.025	15
1.938–2.156	192.433	192.433	170.025	15

- Drill shipped with insert screws and Torx wrench.
- See pages J100–J103 for inserts.



Indexable Drills

■ WN/WD Shank • 2 x D • Metric

	D			D1		L4 max	L1	L5	gage insert outside	gage insert inside	
	32	40	50	mm	in						
DFS240R2WD32M	—	—	—	24,00	.945	25,00	48,0	80,0	0,5	SPGX0703..	DFT05T3..
DFS250R2WD32M	—	—	—	25,00	.984	26,00	50,0	83,0	0,6	SPGX0703..	DFT05T3..
DFS310R2WD32M	—	—	—	25,00	.984	26,00	50,0	83,0	0,6	SPPX09T3..	DFT05T3..
DFS260R2WD32M	—	—	—	26,00	1.024	27,00	52,0	86,0	0,6	SPPX09T3..	DFT05T3..
DFS270R2WD32M	—	—	—	27,00	1.063	28,00	54,0	89,0	0,7	SPPX09T3..	DFT05T3..
DFS280R2WD32M	—	—	—	28,00	1.102	29,00	56,0	91,0	0,7	SPPX09T3..	DFT05T3..
DFS290R2WD32M	—	—	—	29,00	1.142	30,00	58,0	94,0	0,8	SPPX09T3..	DFT05T3..
DFS300R2WD32M	—	—	—	30,00	1.181	31,00	60,0	97,0	0,8	SPPX09T3..	DFT05T3..
DFS320R2WD32M	—	—	—	32,00	1.260	33,00	64,0	103,0	0,9	SPPX09T3..	DFT05T3..
DFS330R2WD32M	—	—	—	33,00	1.299	34,00	66,0	105,0	0,8	SPPX1204..	DFT06T3..
DFS340R2WD32M	—	—	—	34,00	1.339	35,00	68,0	108,0	0,8	SPPX1204..	DFT06T3..
DFS350R2WD32M	—	—	—	35,00	1.378	36,00	70,0	111,0	0,9	SPPX1204..	DFT06T3..
DFS360R2WD32M	—	—	—	36,00	1.417	37,00	72,0	114,0	0,9	SPPX1204..	DFT06T3..
DFS370R2WD32M	—	—	—	37,00	1.457	38,00	74,0	117,0	0,9	SPPX1204..	DFT06T3..
DFS380R2WD32M	—	—	—	38,00	1.496	39,00	76,0	119,0	1,0	SPPX1204..	DFT06T3..
DFS390R2WD32M	—	—	—	39,00	1.535	40,00	78,0	122,0	1,0	SPPX1204..	DFT06T3..
DFS400R2WD32M	—	—	—	40,00	1.575	41,00	80,0	125,0	1,0	SPPX1204..	DFT06T3..
DFS410R2WD32M	—	—	—	41,00	1.614	42,00	82,0	128,0	1,0	SPPX1204..	DFT0704..
DFS420R2WD32M	—	—	—	42,00	1.654	43,00	84,0	131,0	1,1	SPPX1204..	DFT0704..
DFS430R2WD32M	—	—	—	43,00	1.693	44,00	86,0	133,0	1,1	SPPX1204..	DFT0704..
DFS440R2WD32M	—	—	—	44,00	1.732	45,00	88,0	135,0	1,1	SPPX15T5..	DFT0704..
—	DFS450R2WD40M	—	—	45,00	1.772	46,00	90,0	137,0	1,1	SPPX15T5..	DFT0704..
—	DFS460R2WD40M	—	—	46,00	1.811	47,00	92,0	140,0	1,1	SPPX15T5..	DFT0704..
—	DFS470R2WD40M	—	—	47,00	1.850	48,00	94,0	142,0	1,2	SPPX15T5..	DFT0704..
—	DFS480R2WD40M	—	—	48,00	1.890	49,00	96,0	144,0	1,2	SPPX15T5..	DFT0704..
—	DFS490R2WD40M	—	—	49,00	1.929	50,00	98,0	146,0	1,2	SPPX15T5..	DFT0905..
—	DFS500R2WD40M	—	—	50,00	1.969	51,00	100,0	148,0	1,2	SPPX15T5..	DFT0905..
—	DFS510R2WD40M	—	—	51,00	2.008	52,00	102,0	150,0	1,3	SPPX15T5..	DFT0905..
—	DFS520R2WD40M	—	—	52,00	2.047	53,00	104,0	152,0	1,3	SPPX15T5..	DFT0905..
—	DFS530R2WD40M	—	—	53,00	2.087	54,00	106,0	154,0	1,3	SPPX15T5..	DFT0905..
—	DFS540R2WD40M	—	—	54,00	2.126	55,00	108,0	156,0	1,3	SPPX15T5..	DFT0905..
—	—	DFS550R2WD50M	—	55,00	2.165	56,00	110,0	158,0	1,4	SPPX15T5..	DFT0905..

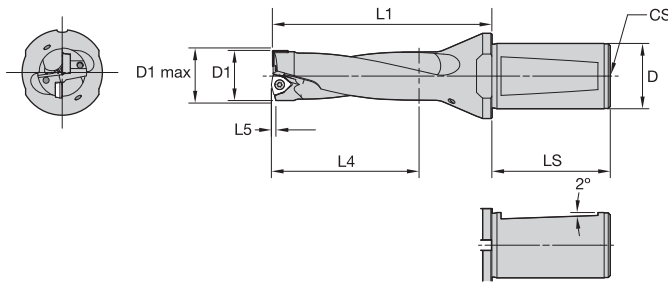
WARNING

During through-hole operations, a slug or disc is produced as the tool breaks through the workpiece. When the drill is stationary and the workpiece is rotating, this slug may be hurled from the chuck by centrifugal force. Provide adequate shielding to protect bystanders.

D1 mm	inboard insert screw	outboard insert screw	Torx wrench	Torx size
24–25,9	193.491	192.432	170.028	8
26–32,9	191.924	191.924	170.024	9
33–43,9	191.916	191.916	170.025	15
44–49,9	191.698	192.433	170.025	15
50–56	192.433	192.433	170.025	15

D	LS	CS
32	58	R 1/4 BSP
40	68	R 1/4 BSP
50	68	R 1/4 BSP

- Drill shipped with insert screws and Torx wrench.
- See pages J100–J103 for inserts.


Whistle Notch™ WD Shank • 3 x D • Metric

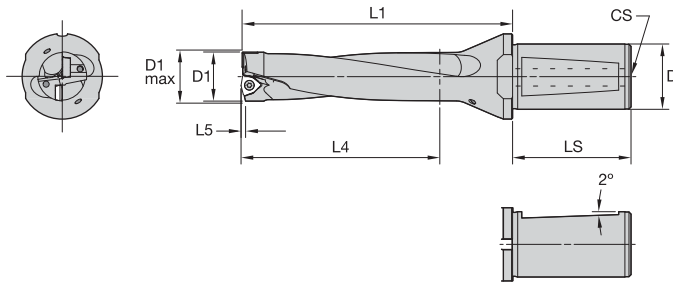
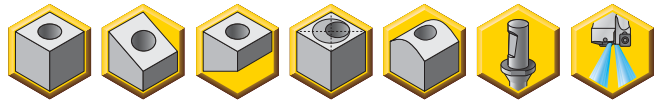
D		D1 mm	D1 in	D1 max	L1	L4 max	L5	gage insert outside	gage insert inside
32	40									50
DFS240R3WD32M	—	24,00	.945	25,00	104,0	72,0	0,5	SPGX0703..	DFT05T3..
DFS250R3WD32M	—	25,00	.984	26,00	108,0	75,0	0,6	SPGX0703..	DFT05T3..
DFS260R3WD32M	—	26,00	1.024	27,00	112,0	78,0	0,6	SPPX09T3..	DFT05T3..
DFS270R3WD32M	—	27,00	1.063	28,00	116,0	81,0	0,7	SPPX09T3..	DFT05T3..
DFS280R3WD32M	—	28,00	1.102	29,00	119,0	84,0	0,7	SPPX09T3..	DFT05T3..
DFS290R3WD32M	—	29,00	1.142	30,00	123,0	87,0	0,8	SPPX09T3..	DFT05T3..
DFS300R3WD32M	—	30,00	1.181	31,00	127,0	90,0	0,8	SPPX09T3..	DFT05T3..
DFS310R3WD32M	—	31,00	1.221	32,00	131,0	93,0	0,8	SPPX09T3..	DFT05T3..
DFS320R3WD32M	—	32,00	1.260	33,00	135,0	96,0	0,9	SPPX09T3..	DFT05T3..
DFS330R3WD32M	—	33,00	1.299	34,00	138,0	99,0	0,8	SPPX1204..	DFT06T3..
DFS340R3WD32M	—	34,00	1.339	35,00	142,0	102,0	0,8	SPPX1204..	DFT06T3..
DFS350R3WD32M	—	35,00	1.378	36,00	146,0	105,0	0,9	SPPX1204..	DFT06T3..
DFS360R3WD32M	—	36,00	1.417	37,00	150,0	108,0	0,9	SPPX1204..	DFT06T3..
DFS370R3WD32M	—	37,00	1.457	38,00	154,0	111,0	0,9	SPPX1204..	DFT06T3..
DFS380R3WD32M	—	38,00	1.496	39,00	157,0	114,0	1,0	SPPX1204..	DFT06T3..
DFS390R3WD32M	—	39,00	1.535	40,00	161,0	117,0	1,0	SPPX1204..	DFT06T3..
DFS400R3WD32M	—	40,00	1.575	41,00	165,0	120,0	1,0	SPPX1204..	DFT06T3..
DFS410R3WD32M	—	41,00	1.614	42,00	169,0	123,0	1,0	SPPX1204..	DFT0704..
DFS420R3WD32M	—	42,00	1.654	43,00	173,0	126,0	1,1	SPPX1204..	DFT0704..
DFS430R3WD32M	—	43,00	1.693	44,00	176,0	129,0	1,1	SPPX1204..	DFT0704..
DFS440R3WD32M	—	44,00	1.732	45,00	179,0	132,0	1,1	SPPX15T5..	DFT0704..
—	DFS450R3WD40M	—	45,00	1.772	46,00	182,0	1,1	SPPX15T5..	DFT0704..
—	DFS460R3WD40M	—	46,00	1.811	47,00	186,0	1,1	SPPX15T5..	DFT0704..
—	DFS470R3WD40M	—	47,00	1.850	48,00	189,0	1,2	SPPX15T5..	DFT0704..
—	DFS480R3WD40M	—	48,00	1.890	49,00	192,0	1,2	SPPX15T5..	DFT0704..
—	DFS490R3WD40M	—	49,00	1.929	50,00	195,0	1,2	SPPX15T5..	DFT0905..
—	DFS500R3WD40M	—	50,00	1.969	51,00	198,0	1,2	SPPX15T5..	DFT0905..
—	DFS510R3WD40M	—	51,00	2.008	52,00	201,0	1,3	SPPX15T5..	DFT0905..
—	DFS520R3WD40M	—	52,00	2.047	53,00	204,0	1,3	SPPX15T5..	DFT0905..
—	DFS530R3WD40M	—	53,00	2.087	54,00	207,0	1,3	SPPX15T5..	DFT0905..
—	DFS540R3WD40M	—	54,00	2.126	55,00	210,0	1,3	SPPX15T5..	DFT0905..
—	—	DFS550R3WD50M	55,00	2.165	56,00	213,0	1,4	SPPX15T5..	DFT0905..

WARNING
 During through-hole operations, a slug or disc is produced as the tool breaks through the workpiece. When the drill is stationary and the workpiece is rotating, this slug may be hurled from the chuck by centrifugal force. Provide adequate shielding to protect bystanders.

D1 mm	inboard insert screw	outboard insert screw	Torx wrench	Torx size
24–25,9	193.491	192.432	170.028	8
26–32,9	191.924	191.924	170.024	9
33–43,9	191.916	191.916	170.025	15
44–49,9	191.698	192.433	170.025	15
50–56	192.433	192.433	170.025	15

D	LS	CS
32	58	R 1/4 BSP
40	68	R 1/4 BSP
50	68	R 1/4 BSP

- Drill shipped with insert screws and Torx wrench.
- See pages J100–J103 for inserts.



■ WN/WD Shank • 4 x D • Metric

Indexable Drills

D		D1	D1	L1	L4	L5	gage insert	gage insert	
32	40	mm	in	max	max		outside	inside	
DFS240R4WD32M	—	24,00	.945	25,00	128,0	96,0	0,5	SPGX0703..	DFT05T3..
DFS250R4WD32M	—	25,00	.984	26,00	133,0	100,0	0,6	SPGX0703..	DFT05T3..
DFS260R4WD32M	—	26,00	1.024	27,00	138,0	104,0	0,6	SPPX09T3..	DFT05T3..
DFS270R4WD32M	—	27,00	1.063	28,00	143,0	108,0	0,7	SPPX09T3..	DFT05T3..
DFS280R4WD32M	—	28,00	1.102	29,00	147,0	112,0	0,7	SPPX09T3..	DFT05T3..
DFS290R4WD32M	—	29,00	1.142	30,00	152,0	116,0	0,8	SPPX09T3..	DFT05T3..
DFS300R4WD32M	—	30,00	1.181	31,00	157,0	120,0	0,8	SPPX09T3..	DFT05T3..
DFS310R4WD32M	—	31,00	1.221	32,00	162,0	124,0	0,8	SPPX09T3..	DFT05T3..
DFS320R4WD32M	—	32,00	1.260	33,00	167,0	128,0	0,9	SPPX09T3..	DFT05T3..
DFS330R4WD32M	—	33,00	1.299	34,00	171,0	132,0	0,8	SPPX1204..	DFT06T3..
DFS340R4WD32M	—	34,00	1.339	35,00	176,0	136,0	0,8	SPPX1204..	DFT06T3..
DFS350R4WD32M	—	35,00	1.378	36,00	181,0	140,0	0,9	SPPX1204..	DFT06T3..
DFS360R4WD32M	—	36,00	1.417	37,00	186,0	144,0	0,9	SPPX1204..	DFT06T3..
DFS370R4WD32M	—	37,00	1.457	38,00	191,0	148,0	0,9	SPPX1204..	DFT06T3..
DFS380R4WD32M	—	38,00	1.496	39,00	195,0	152,0	1,0	SPPX1204..	DFT06T3..
DFS390R4WD32M	—	39,00	1.535	40,00	200,0	156,0	1,0	SPPX1204..	DFT06T3..
DFS400R4WD32M	—	40,00	1.575	41,00	205,0	160,0	1,0	SPPX1204..	DFT06T3..
DFS410R4WD32M	—	41,00	1.614	42,00	210,0	164,0	1,0	SPPX1204..	DFT0704..
DFS420R4WD32M	—	42,00	1.654	43,00	215,0	168,0	1,1	SPPX1204..	DFT0704..
DFS430R4WD32M	—	43,00	1.693	44,00	219,0	172,0	1,1	SPPX1204..	DFT0704..
DFS440R4WD32M	—	44,00	1.732	45,00	223,0	176,0	1,1	SPPX15T5..	DFT0704..
—	DFS450R4WD40M	45,00	1.772	46,00	227,0	180,0	1,1	SPPX15T5..	DFT0704..
—	DFS460R4WD40M	46,00	1.811	47,00	232,0	184,0	1,1	SPPX15T5..	DFT0704..
—	DFS470R4WD40M	47,00	1.850	48,00	236,0	188,0	1,2	SPPX15T5..	DFT0704..
—	DFS480R4WD40M	48,00	1.890	49,00	240,0	192,0	1,2	SPPX15T5..	DFT0704..

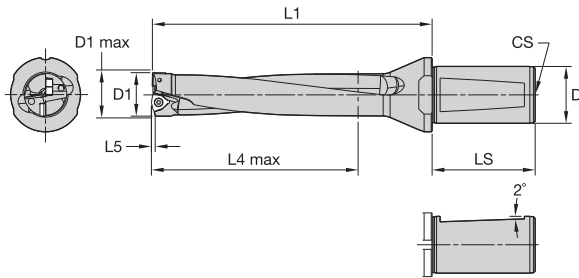
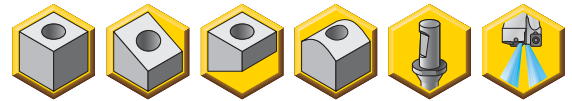
WARNING

During through-hole operations, a slug or disc is produced as the tool breaks through the workpiece. When the drill is stationary and the workpiece is rotating, this slug may be hurled from the chuck by centrifugal force. Provide adequate shielding to protect bystanders.

D1 mm	inboard insert screw	outboard insert screw	Torx wrench	Torx size
24–25,9	193.491	192.432	170.028	8
26–32,9	191.924	191.924	170.024	9
33–43,9	191.916	191.916	170.025	15
44–49,9	191.698	192.433	170.025	15
50–56	192.433	192.433	170.025	15

D	LS	CS
32	58	R 1/4 BSP
40	68	R 1/4 BSP

- Drill shipped with insert screws and Torx wrench.
- See pages J100–J103 for inserts.


■ WN/WD Shank • 5 x D • Metric

D		D1		D1 max	L1	L4 max	L5	gage insert outside	gage insert inside
32	40	mm	in						
DFS240R5WD32M	—	24,00	.945	24,00	152,0	120,0	0,5	SPGX0703..	DFT05T3..
DFS250R5WD32M	—	25,00	.984	25,00	158,0	125,0	0,6	SPGX0703..	DFT05T3..
DFS260R5WD32M	—	26,00	1.024	26,00	164,0	130,0	0,6	SPPX09T3..	DFT05T3..
DFS270R5WD32M	—	27,00	1.063	27,00	170,0	135,0	0,7	SPPX09T3..	DFT05T3..
DFS280R5WD32M	—	28,00	1.102	28,00	175,0	140,0	0,7	SPPX09T3..	DFT05T3..
DFS290R5WD32M	—	29,00	1.142	29,00	181,0	145,0	0,8	SPPX09T3..	DFT05T3..
DFS300R5WD32M	—	30,00	1.181	30,00	187,0	150,0	0,8	SPPX09T3..	DFT05T3..
DFS310R5WD32M	—	31,00	1.221	31,00	193,0	155,0	0,8	SPPX09T3..	DFT05T3..
DFS320R5WD32M	—	32,00	1.260	32,00	199,0	160,0	0,9	SPPX09T3..	DFT05T3..
DFS330R5WD32M	—	33,00	1.299	33,00	204,0	165,0	0,8	SPPX1204..	DFT06T3..
DFS340R5WD32M	—	34,00	1.339	34,00	210,0	170,0	0,8	SPPX1204..	DFT06T3..
DFS350R5WD32M	—	35,00	1.378	35,00	216,0	175,0	0,9	SPPX1204..	DFT06T3..
DFS360R5WD32M	—	36,00	1.417	36,00	222,0	180,0	0,9	SPPX1204..	DFT06T3..
DFS370R5WD32M	—	37,00	1.457	37,00	228,0	185,0	0,9	SPPX1204..	DFT06T3..
DFS380R5WD32M	—	38,00	1.496	38,00	233,0	190,0	1,0	SPPX1204..	DFT06T3..
DFS390R5WD32M	—	39,00	1.535	39,00	239,0	195,0	1,0	SPPX1204..	DFT06T3..
DFS400R5WD32M	—	40,00	1.575	40,00	245,0	200,0	1,0	SPPX1204..	DFT06T3..
DFS410R5WD32M	—	41,00	1.614	41,00	251,0	205,0	1,0	SPPX1204..	DFT0704..
DFS420R5WD32M	—	42,00	1.654	42,00	257,0	210,0	1,1	SPPX1204..	DFT0704..
DFS430R5WD32M	—	43,00	1.693	43,00	262,0	215,0	1,1	SPPX1204..	DFT0704..
DFS440R5WD32M	—	44,00	1.732	44,00	267,0	220,0	1,1	SPPX15T5..	DFT0704..
—	DFS450R5WD40M	45,00	1.772	45,00	272,0	225,0	1,1	SPPX15T5..	DFT0704..
—	DFS460R5WD40M	46,00	1.811	46,00	278,0	230,0	1,1	SPPX15T5..	DFT0704..
—	DFS470R5WD40M	47,00	1.850	47,00	283,0	235,0	1,2	SPPX15T5..	DFT0704..
—	DFS480R5WD40M	48,00	1.890	48,00	288,0	240,0	1,2	SPPX15T5..	DFT0704..

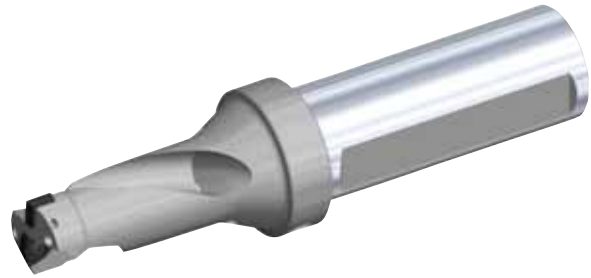
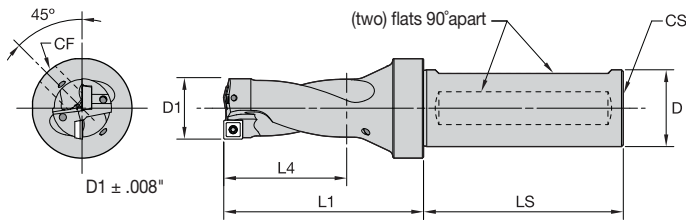
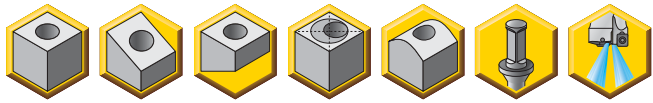
Indexable Drills

WARNING
 During through-hole operations, a slug or disc is produced as the tool breaks through the workpiece. When the drill is stationary and the workpiece is rotating, this slug may be hurled from the chuck by centrifugal force. Provide adequate shielding to protect bystanders.

D1 mm	inboard insert screw	outboard insert screw	Torx wrench	Torx size
24–25,9	192.432	192.432	170.028	8
26–32,9	191.924	191.924	170.024	9
33–43,9	191.916	191.916	170.025	15
44–49,9	192.433	192.433	170.025	15
50–56	192.433	192.433	170.025	15

D	LS	CS
32	58	R 1/4 BSP
40	68	R 1/4 BSP

- Drill shipped with insert screws, side pipe plug, and Torx wrench.
- See pages J100–J103 for inserts.



Indexable Drills

Flange Shank • 2 x D • Inch

D			D1			L			gage insert	
1.250	1.500	2.000	in	mm	max	L1	L4 max	L5	outside	inside
DFS1000R2SSF125	DFS1000R2SSF150	—	1.000	25,40	1.040	3.25	2.00	.02	SPGX0703..	DFT05T3..
DFS1031R2SSF125	—	—	1.031	26,19	1.071	3.44	2.06	.03	SPPX09T3..	DFT05T3..
DFS1063R2SSF125	—	—	1.063	27,00	1.103	3.50	2.13	.03	SPPX09T3..	DFT05T3..
DFS1094R2SSF125	—	—	1.094	27,79	1.134	3.56	2.19	.03	SPPX09T3..	DFT05T3..
DFS1125R2SSF125	—	—	1.125	28,58	1.165	3.75	2.25	.03	SPPX09T3..	DFT05T3..
DFS1156R2SSF125	—	—	1.156	29,36	1.196	3.81	2.31	.03	SPPX09T3..	DFT05T3..
DFS1188R2SSF125	—	—	1.188	30,18	1.228	3.88	2.38	.03	SPPX09T3..	DFT05T3..
DFS1219R2SSF125	DFS1219R2SSF150	—	1.219	30,96	1.259	4.06	2.44	.03	SPPX09T3..	DFT05T3..
DFS1250R2SSF125	DFS1250R2SSF150	—	1.250	31,75	1.290	4.13	2.50	.03	SPPX09T3..	DFT05T3..
DFS1281R2SSF125	DFS1281R2SSF150	—	1.281	32,54	1.321	4.19	2.56	.03	SPPX09T3..	DFT05T3..
DFS1313R2SSF125	DFS1313R2SSF150	—	1.313	33,35	1.353	4.25	2.63	.03	SPPX1204..	DFT06T3..
DFS1375R2SSF125	DFS1375R2SSF150	—	1.375	34,93	1.415	4.38	2.75	.03	SPPX1204..	DFT06T3..
DFS1406R2SSF125	DFS1406R2SSF150	—	1.406	35,71	1.446	4.44	2.81	.04	SPPX1204..	DFT06T3..
DFS1438R2SSF125	DFS1438R2SSF150	—	1.438	36,53	1.478	4.63	2.88	.04	SPPX1204..	DFT06T3..
DFS1469R2SSF125	DFS1469R2SSF150	—	1.469	37,31	1.509	4.69	2.94	.04	SPPX1204..	DFT06T3..
DFS1500R2SSF125	DFS1500R2SSF150	—	1.500	38,10	1.540	4.75	3.00	.04	SPPX1204..	DFT06T3..
DFS1531R2SSF125	DFS1531R2SSF150	—	1.531	38,89	1.571	4.81	3.06	.04	SPPX1204..	DFT06T3..
DFS1563R2SSF125	DFS1563R2SSF150	—	1.563	39,70	1.603	4.88	3.13	.04	SPPX1204..	DFT06T3..
DFS1625R2SSF125	DFS1625R2SSF150	—	1.625	41,28	1.665	5.00	3.25	.04	SPPX1204..	DFT0704..
DFS1688R2SSF125	DFS1688R2SSF150	—	1.688	42,88	1.728	5.13	3.38	.04	SPPX1204..	DFT0704..
—	DFS1750R2SSF150	—	1.750	44,45	1.790	5.25	3.50	.04	SPPX15T5..	DFT0704..
—	DFS1813R2SSF150	—	1.813	46,05	1.853	5.50	3.63	.04	SPPX15T5..	DFT0704..
—	DFS1875R2SSF150	—	1.875	47,63	1.915	5.63	3.75	.05	SPPX15T5..	DFT0704..
—	DFS1938R2SSF150	—	1.938	49,23	1.978	5.88	3.88	.05	SPPX15T5..	DFT0905..
—	DFS2000R2SSF150	DFS2000R2SSF200	2.000	50,80	2.040	6.00	4.00	.05	SPPX15T5..	DFT0905..
—	DFS2125R2SSF150	DFS2125R2SSF200	2.125	53,98	2.165	6.38	4.25	.05	SPPX15T5..	DFT0905..

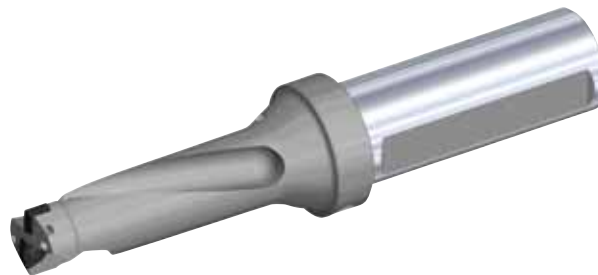
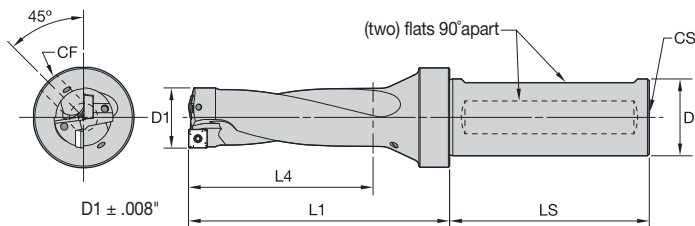
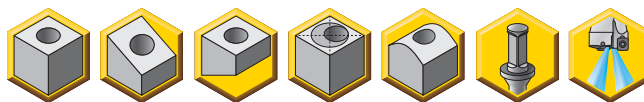
WARNING

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D1 in	inboard insert screw	outboard insert screw	Torx wrench	Torx size
1.000–1.030	193.491	192.432	170.028	8
1.031–1.312	191.924	191.924	170.024	9
1.313–1.749	191.916	191.916	170.025	15
1.750–1.937	191.698	192.433	170.025	15
1.938–2.165	192.433	192.433	170.025	15

D	LS	CF	CS
1.25	3.25	1/8-27 NPT	R 1/4-18 NPT
1.50	3.75	1/8-27 NPT	R 1/4-18 NPT
2.00	4.00	1/8-27 NPT	R 1/4-18 NPT

- Drill shipped with insert screws, side pipe plug, and Torx wrench.
- See pages J100–J103 for inserts. for inserts.


■ Flange Shank • 3 x D • Inch

D		2.000	D1 in	D1 mm	D1 max	L1	L4 max	L5	gage insert outside	gage insert inside
1.250	1.500									
DFS1000R3SSF125	DFS1000R3SSF150	—	1.000	25,40	1.040	4.25	3.00	.02	SPGX0703..	DFT05T3..
DFS1031R3SSF125	—	—	1.031	26,19	1.071	4.47	3.09	.03	SPPX09T3..	DFT05T3..
DFS1063R3SSF125	—	—	1.063	27,00	1.103	4.56	3.19	.03	SPPX09T3..	DFT05T3..
DFS1094R3SSF125	—	—	1.094	27,79	1.134	4.66	3.28	.03	SPPX09T3..	DFT05T3..
DFS1125R3SSF125	—	—	1.125	28,58	1.165	4.88	3.38	.03	SPPX09T3..	DFT05T3..
DFS1156R3SSF125	—	—	1.156	29,36	1.196	4.97	3.47	.03	SPPX09T3..	DFT05T3..
DFS1188R3SSF125	—	—	1.188	30,18	1.228	5.06	3.56	.03	SPPX09T3..	DFT05T3..
DFS1219R3SSF125	DFS1219R3SSF150	—	1.219	30,96	1.259	5.28	3.66	.03	SPPX09T3..	DFT05T3..
DFS1250R3SSF125	DFS1250R3SSF150	—	1.250	31,75	1.290	5.38	3.75	.03	SPPX09T3..	DFT05T3..
DFS1281R3SSF125	DFS1281R3SSF150	—	1.281	32,54	1.321	5.47	3.84	.03	SPPX09T3..	DFT05T3..
DFS1313R3SSF125	DFS1313R3SSF150	—	1.313	33,35	1.353	5.56	3.94	.03	SPPX1204..	DFT06T3..
DFS1375R3SSF125	DFS1375R3SSF150	—	1.375	34,93	1.415	5.75	4.13	.03	SPPX1204..	DFT06T3..
DFS1406R3SSF125	DFS1406R3SSF150	—	1.406	35,71	1.446	5.84	4.22	.04	SPPX1204..	DFT06T3..
DFS1438R3SSF125	DFS1438R3SSF150	—	1.438	36,53	1.478	6.06	4.31	.04	SPPX1204..	DFT06T3..
DFS1469R3SSF125	DFS1469R3SSF150	—	1.469	37,31	1.509	6.16	4.41	.04	SPPX1204..	DFT06T3..
DFS1500R3SSF125	DFS1500R3SSF150	—	1.500	38,10	1.540	6.25	4.50	.04	SPPX1204..	DFT06T3..
DFS1531R3SSF125	DFS1531R3SSF150	—	1.531	38,89	1.571	6.34	4.59	.04	SPPX1204..	DFT06T3..
DFS1563R3SSF125	DFS1563R3SSF150	—	1.563	39,70	1.603	6.44	4.69	.04	SPPX1204..	DFT06T3..
DFS1625R3SSF125	DFS1625R3SSF150	—	1.625	41,28	1.665	6.63	4.88	.04	SPPX1204..	DFT0704..
DFS1688R3SSF125	DFS1688R3SSF150	—	1.688	42,88	1.728	6.81	5.06	.04	SPPX1204..	DFT0704..
—	DFS1750R3SSF150	—	1.750	44,45	1.790	7.00	5.25	.04	SPPX15T5..	DFT0704..
—	DFS1813R3SSF150	—	1.813	46,05	1.853	7.31	5.44	.04	SPPX15T5..	DFT0704..
—	DFS1875R3SSF150	—	1.875	47,63	1.915	7.50	5.63	.05	SPPX15T5..	DFT0704..
—	DFS1938R3SSF150	—	1.938	49,23	1.978	7.81	5.81	.05	SPPX15T5..	DFT0905..
—	DFS2000R3SSF150	DFS2000R3SSF200	2.000	50,80	2.040	8.00	6.00	.05	SPPX15T5..	DFT0905..
—	DFS2125R3SSF150	DFS2125R3SSF200	2.125	53,98	2.165	8.50	6.38	.05	SPPX15T5..	DFT0905..

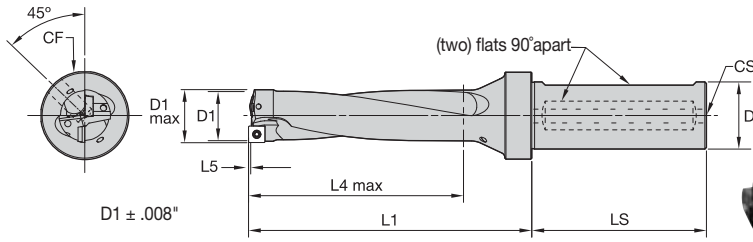
WARNING

During through-hole operations, a slug or disc is produced as the tool breaks through the workpiece. When the drill is stationary and the workpiece is rotating, this slug may be hurled from the chuck by centrifugal force. Provide adequate shielding to protect bystanders.

D1 in	inboard insert screw	outboard insert screw	Torx wrench	Torx size
1.000–1.030	193.491	192.432	170.028	8
1.031–1.312	191.924	191.924	170.024	9
1.313–1.749	191.916	191.916	170.025	15
1.750–1.937	191.698	192.433	170.025	15
1.938–2.165	192.433	192.433	170.025	15

D	LS	CF	CS
1.25	3.25	1/8-27 NPT	R 1/4-18 NPT
1.50	3.75	1/8-27 NPT	R 1/4-18 NPT
2.00	4.00	1/8-27 NPT	R 1/4-18 NPT

- Drill shipped with insert screws, side pipe plug, and Torx wrench.
- See pages J100–J103 for inserts.



Indexable Drills

Flange Shank • 4 x D • Inch

D			D1	D1 max	L1	L4 max	L5	gage insert outside	gage insert inside	
1.250	1.500	2.000	in	mm						
DFS1000R4SSF125	DFS1000R4SSF150	—	1.000	25,40	1.040	5.25	4.00	.02	SPGX0703..	DFT05T3..
DFS1031R4SSF125	—	—	1.031	26,19	1.071	5.50	4.12	.03	SPPX09T3..	DFT05T3..
DFS1063R4SSF125	—	—	1.063	27,00	1.103	5.63	4.25	.03	SPPX09T3..	DFT05T3..
DFS1094R4SSF125	—	—	1.094	27,79	1.134	5.75	4.38	.03	SPPX09T3..	DFT05T3..
DFS1125R4SSF125	—	—	1.125	28,58	1.165	6.00	4.50	.03	SPPX09T3..	DFT05T3..
DFS1156R4SSF125	—	—	1.156	29,36	1.196	6.12	4.62	.03	SPPX09T3..	DFT05T3..
DFS1188R4SSF125	—	—	1.188	30,18	1.228	6.25	4.75	.03	SPPX09T3..	DFT05T3..
DFS1219R4SSF125	DFS1219R4SSF150	—	1.219	30,96	1.259	6.50	4.88	.03	SPPX09T3..	DFT05T3..
DFS1250R4SSF125	DFS1250R4SSF150	—	1.250	31,75	1.290	6.63	5.00	.03	SPPX09T3..	DFT05T3..
DFS1281R4SSF125	DFS1281R4SSF150	—	1.281	32,54	1.321	6.75	5.12	.03	SPPX09T3..	DFT05T3..
DFS1313R4SSF125	DFS1313R4SSF150	—	1.313	33,35	1.353	6.88	5.25	.03	SPPX1204..	DFT06T3..
DFS1375R4SSF125	DFS1375R4SSF150	—	1.375	34,93	1.415	7.13	5.50	.03	SPPX1204..	DFT06T3..
DFS1406R4SSF125	DFS1406R4SSF150	—	1.406	35,71	1.446	7.25	5.62	.04	SPPX1204..	DFT06T3..
DFS1438R4SSF125	DFS1438R4SSF150	—	1.438	36,53	1.478	7.50	5.75	.04	SPPX1204..	DFT06T3..
DFS1469R4SSF125	DFS1469R4SSF150	—	1.469	37,31	1.509	7.63	5.88	.04	SPPX1204..	DFT06T3..
DFS1500R4SSF125	DFS1500R4SSF150	—	1.500	38,10	1.540	7.75	6.00	.04	SPPX1204..	DFT06T3..
DFS1531R4SSF125	DFS1531R4SSF150	—	1.531	38,89	1.571	7.87	6.12	.04	SPPX1204..	DFT06T3..
DFS1563R4SSF125	DFS1563R4SSF150	—	1.563	39,70	1.603	8.00	6.25	.04	SPPX1204..	DFT06T3..
DFS1625R4SSF125	DFS1625R4SSF150	—	1.625	41,28	1.665	8.25	6.50	.04	SPPX1204..	DFT0704..
DFS1688R4SSF125	DFS1688R4SSF150	—	1.688	42,88	1.728	8.50	6.75	.04	SPPX1204..	DFT0704..
—	DFS1750R4SSF150	—	1.750	44,45	1.790	8.75	7.00	.04	SPPX15T5..	DFT0704..
—	DFS1813R4SSF150	—	1.813	46,05	1.853	9.13	7.25	.04	SPPX15T5..	DFT0704..
—	DFS1875R4SSF150	—	1.875	47,63	1.915	9.38	7.50	.05	SPPX15T5..	DFT0704..
—	DFS1938R4SSF150	—	1.938	49,23	1.978	9.75	7.75	.05	SPPX15T5..	DFT0905..
—	DFS2000R4SSF150	DFS2000R4SSF200	2.000	50,80	2.040	10.00	8.00	.05	SPPX15T5..	DFT0905..
—	DFS2125R4SSF150	DFS2125R4SSF200	2.125	53,98	2.165	10.63	8.50	.05	SPPX15T5..	DFT0905..

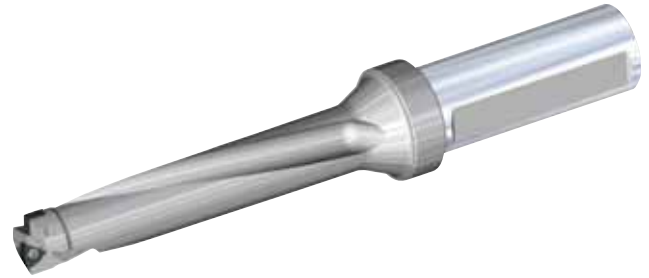
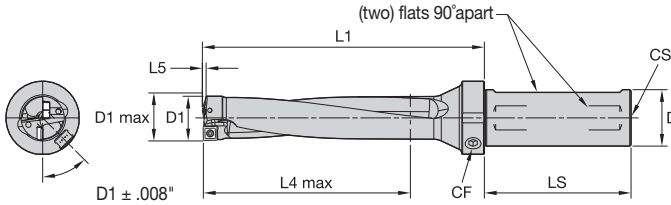
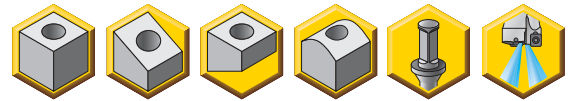
WARNING

During through-hole operations, a slug or disc is produced as the tool breaks through the workpiece. When the drill is stationary and the workpiece is rotating, this slug may be hurled from the chuck by centrifugal force. Provide adequate shielding to protect bystanders.

D1 in	inboard insert screw	outboard insert screw	Torx wrench	Torx size
1.000–1.030	193.491	192.432	170.028	8
1.031–1.312	191.924	191.924	170.024	9
1.313–1.749	191.916	191.916	170.025	15
1.750–1.937	191.698	192.433	170.025	15
1.938–2.165	192.433	192.433	170.025	15

D	LS	CF	CS
1.25	3.25	1/8-27 NPT	R 1/4-18 NPT
1.50	3.75	1/8-27 NPT	R 1/4-18 NPT
2.00	4.00	1/8-27 NPT	R 1/4-18 NPT

- Drill shipped with insert screws, side pipe plug, and Torx wrench.
- See pages J100–J103 for inserts.


■ Flange Shank • Right Hand • 5 x D • Inch

D				D1	D1	L1	L4	L5	gage insert	gage insert	
1.000	1.250	1.500	2.000	in	mm	max	max		outside	inside	
DFS1000R5SSF100	DFS1000R5SSF125	DFS1000R5SSF150		1.000	25,40	1.00	6.25	5.00	.02	SPGX0703..	DFT05T3..
—	DFS1031R5SSF125	—	—	1.031	26,19	1.03	6.53	5.16	.03	SPPX09T3..	DFT05T3..
—	DFS1063R5SSF125	—	—	1.063	27,00	1.06	6.69	5.32	.03	SPPX09T3..	DFT05T3..
—	DFS1094R5SSF125	—	—	1.094	27,79	1.09	6.85	5.47	.03	SPPX09T3..	DFT05T3..
—	DFS1125R5SSF125	—	—	1.125	28,58	1.13	7.13	5.63	.03	SPPX09T3..	DFT05T3..
—	DFS1156R5SSF125	—	—	1.156	29,36	1.16	7.28	5.78	.03	SPPX09T3..	DFT05T3..
—	DFS1188R5SSF125	—	—	1.188	30,18	1.19	7.44	5.94	.03	SPPX09T3..	DFT05T3..
—	DFS1219R5SSF125	DFS1219R5SSF150	—	1.219	30,96	1.22	7.55	5.92	.03	SPPX09T3..	DFT05T3..
—	DFS1250R5SSF125	DFS1250R5SSF150	—	1.250	31,75	1.25	7.88	6.25	.03	SPPX09T3..	DFT05T3..
—	DFS1281R5SSF125	DFS1281R5SSF150	—	1.281	32,54	1.28	8.03	6.41	.03	SPPX09T3..	DFT05T3..
—	DFS1313R5SSF125	DFS1313R5SSF150	—	1.313	33,35	1.31	8.19	6.57	.03	SPPX1204..	DFT06T3..
—	DFS1375R5SSF125	DFS1375R5SSF150	—	1.375	34,93	1.38	8.50	6.88	.03	SPPX1204..	DFT06T3..
—	DFS1406R5SSF125	DFS1406R5SSF150	—	1.406	35,71	1.41	8.66	7.03	.04	SPPX1204..	DFT06T3..
—	DFS1438R5SSF125	DFS1438R5SSF150	—	1.438	36,53	1.44	8.94	7.19	.04	SPPX1204..	DFT06T3..
—	DFS1469R5SSF125	DFS1469R5SSF150	—	1.469	37,31	1.47	9.09	7.34	.04	SPPX1204..	DFT06T3..
—	DFS1500R5SSF125	DFS1500R5SSF150	—	1.500	38,10	1.50	9.25	7.50	.04	SPPX1204..	DFT06T3..
—	DFS1531R5SSF125	DFS1531R5SSF150	—	1.531	38,89	1.53	9.41	7.66	.04	SPPX1204..	DFT06T3..
—	DFS1563R5SSF125	DFS1563R5SSF150	—	1.563	39,70	1.56	9.57	7.82	.04	SPPX1204..	DFT06T3..
—	DFS1625R5SSF125	DFS1625R5SSF150	—	1.625	41,28	1.63	9.88	8.13	.04	SPPX1204..	DFT0704..
—	DFS1688R5SSF125	DFS1688R5SSF150	—	1.688	42,88	1.69	10.19	8.44	.04	SPPX1204..	DFT0704..
—	—	DFS1750R5SSF150	—	1.750	44,45	1.75	10.50	8.75	.04	SPPX15T5..	DFT0704..
—	—	DFS1813R5SSF150	—	1.813	46,05	1.81	10.94	9.07	.04	SPPX15T5..	DFT0704..
—	—	DFS1875R5SSF150	—	1.875	47,63	1.88	11.25	9.38	.05	SPPX15T5..	DFT0704..
—	—	DFS1938R5SSF150	—	1.938	49,23	1.94	11.69	9.69	.05	SPPX15T5..	DFT0905..
—	—	DFS2000R5SSF150	DFS2000R5SSF200	2.000	50,80	2.00	12.00	10.00	.05	SPPX15T5..	DFT0905..
—	—	DFS2125R5SSF150	DFS2125R5SSF200	2.125	53,98	2.13	12.75	10.63	.05	SPPX15T5..	DFT0905..

Indexable Drills

WARNING

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D1 in	inboard insert screw	outboard insert screw	Torx wrench	Torx size
1.000–1.030	193.491	192.432	170.028	8
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1.750–1.937	191.698	192.433	170.025	15
1.938–2.165	192.433	192.433	170.025	15

D	LS	CF	CS
1.00	3.00	1/8-27 NPT	R 1/4-18 NPT
1.25	3.25	1/8-27 NPT	R 1/4-18 NPT
1.50	3.75	1/8-27 NPT	R 1/4-18 NPT
2.00	4.00	1/8-27 NPT	R 1/4-18 NPT

■ DFS™ • Metric

Indexable Drills

Material Group	Condition	Pocket Seat	Geometry	Grade	Cutting Speed – vc Range – m/min			Metric					
					min	Starting Value	max	Recommended Feed Rate (f) by Diameter					
								Ø (mm)	SPGX07 DFT05 22,00-25,99	SPGX09 DFT05 26,00-32,99	SPGX12 DFT06/..07 33,00-43,99	SPGX15 DFT07/..09 44,00-55,00	
P	1	S	O MD	KCPK10	310	325	360	mm/r	0,100 - 0,180	0,140 - 0,250	0,160 - 0,300	0,180 - 0,300	
			I MD	KC7140									
		U	O	FP	KCU25	200	215	230	mm/r	0,060 - 0,100	0,090 - 0,150	0,110 - 0,180	0,130 - 0,250
				I MD	KC7140								
	I		O HP	KCU40	130	135	150	mm/r	0,060 - 0,100	0,090 - 0,150	0,110 - 0,180	0,130 - 0,250	
			I MD	KC7140									
	2	S	O MD	KCPK10	310	325	360	mm/r	0,100 - 0,180	0,140 - 0,250	0,160 - 0,300	0,180 - 0,300	
			I MD	KC7140									
		U	O FP	KCU25	200	215	230	mm/r	0,060 - 0,100	0,090 - 0,150	0,110 - 0,180	0,130 - 0,250	
			I MD	KC7140									
	I	O HP	KCU40	130	135	150	mm/r	0,060 - 0,100	0,090 - 0,150	0,110 - 0,180	0,130 - 0,250		
		I MD	KC7140										
	3	S	O MD	KCPK10	260	285	320	mm/r	0,100 - 0,180	0,140 - 0,250	0,160 - 0,300	0,180 - 0,300	
			I MD	KC7140									
		U	O FP	KCU25	180	195	220	mm/r	0,060 - 0,100	0,090 - 0,150	0,110 - 0,180	0,130 - 0,250	
			I MD	KC7140									
	I	O HP	KCU40	110	120	140	mm/r	0,060 - 0,100	0,090 - 0,150	0,110 - 0,180	0,130 - 0,250		
		I MD	KC7140										
	4	S	O FP	KCPK10	220	250	300	mm/r	0,100 - 0,180	0,140 - 0,250	0,160 - 0,300	0,180 - 0,300	
			I MD	KC7140									
		U	O HP	KCU25	150	180	220	mm/r	0,060 - 0,100	0,090 - 0,150	0,110 - 0,180	0,130 - 0,250	
			I MD	KC7140									
	I	O HP	KCU40	90	110	140	mm/r	0,060 - 0,100	0,090 - 0,150	0,110 - 0,180	0,130 - 0,250		
		I MD	KC7140										
5	S	O HP	KCU25	180	200	220	mm/r	0,100 - 0,180	0,140 - 0,250	0,160 - 0,300	0,180 - 0,300		
		I MD	KC7140										
	U	O HP	KCU40	120	135	150	mm/r	0,060 - 0,100	0,090 - 0,150	0,110 - 0,180	0,130 - 0,250		
		I MD	KC7140										
I	O HP	KC7140	70	85	100	mm/r	0,060 - 0,100	0,090 - 0,150	0,110 - 0,180	0,130 - 0,250			
	I MD	KC7140											
6	S	O HP	KCU25	180	200	220	mm/r	0,100 - 0,180	0,140 - 0,250	0,160 - 0,300	0,180 - 0,300		
		I MD	KC7140										
	U	O HP	KCU40	120	135	150	mm/r	0,060 - 0,100	0,090 - 0,150	0,110 - 0,180	0,130 - 0,250		
		I MD	KC7140										
I	O HP	KC7140	70	85	100	mm/r	0,060 - 0,100	0,090 - 0,150	0,110 - 0,180	0,130 - 0,250			
	I MD	KC7140											
M	1	S	O FP	KCU25	150	190	230	mm/r	0,080 - 0,150	0,120 - 0,200	0,140 - 0,250	0,160 - 0,280	
			I MD	KC7140									
		U	O MD	KCU40	100	130	160	mm/r	0,050 - 0,090	0,070 - 0,130	0,080 - 0,160	0,100 - 0,200	
			I MD	KC7140									
	2	S	O FP	KCU25	150	180	210	mm/r	0,080 - 0,150	0,120 - 0,200	0,140 - 0,250	0,160 - 0,280	
			I MD	KC7140									
		U	O MD	KCU40	100	130	160	mm/r	0,050 - 0,090	0,070 - 0,130	0,080 - 0,160	0,100 - 0,200	
			I MD	KC7140									
	3	S	O MD	KC7140	60	80	100	mm/r	0,050 - 0,090	0,070 - 0,130	0,080 - 0,160	0,100 - 0,180	
			I MD	KC7140									
		U	O HP	KCU25	100	130	160	mm/r	0,080 - 0,150	0,120 - 0,200	0,140 - 0,250	0,160 - 0,280	
			I HP	KC7140									
I	O HP	KCU40	80	110	140	mm/r	0,050 - 0,090	0,070 - 0,130	0,080 - 0,160	0,100 - 0,200			
	I HP	KC7140											
I	O MD	KC7140	50	70	90	mm/r	0,050 - 0,090	0,070 - 0,130	0,080 - 0,160	0,100 - 0,180			
	I MD	KC7140											

NOTE: Applying Drill Fix™ DFS 5 x D requires high stability. It is highly recommended to be conservative in regard to speeds and feeds, and start with minimum values indicated.

Condition: S = Stable cutting conditions; U = Unstable cutting conditions; I = Interrupted cutting conditions

Pocket seat: I = Inboard insert; O = Outboard insert

DFS™ • Metric

Material Group	Condition	Pocket Seat	Geometry	Grade	Cutting Speed – vc Range – m/min			Metric					
					min	Starting Value	max	Recommended Feed Rate (f) by Diameter					
								Ø (mm)	SPGX07 DFT05 22,00-25,99	SPGX09 DFT05 26,00-32,99	SPGX12 DFT06/..07 33,00-43,99	SPGX15 DFT07/..09 44,00-55,00	
K	1	S	O	FP	KCPK10	200	240	300	mm/r	0,120 - 0,200	0,160 - 0,280	0,180 - 0,320	0,200 - 0,340
			I	HP	KCU40								
		U	O	FP	KCU25	120	155	200					
			I	HP	KC7140								
	I	O	FP	KC7140	80	100	125						
		I	HP	KC7140									
	2	S	O	FP	KCPK10	180	220	260					
				HP	KCU40								
		U	O	HP	KCU25	110	140	170					
			I	HP	KC7140								
	I	O	HP	KC7140	80	100	120						
		I	HP	KC7140									
3	S	O	HP	KCPK10	180	220	260						
			HP	KCU40									
	U	O	HP	KCU25	110	140	170						
		I	HP	KC7140									
I	O	HP	KC7140	80	100	120							
	I	HP	KC7140										
N	1	S	O	HP	KCPK10	350	500	650	mm/r	0,120 - 0,200	0,160 - 0,280	0,180 - 0,320	0,200 - 0,340
			I	HP	KMF								
		U	O	HP	KCU40	300	400	500					
			I	HP	KMF								
	2	S	O	HP	KCPK10	300	400	500					
				HP	KMF								
		U	O	HP	KCU40	250	350	450					
			I	HP	KMF								
	3	S	O	HP	KCPK10	300	400	500					
				HP	KMF								
		U	O	HP	KCU40	250	350	450					
			I	HP	KMF								
	4	S	O	HP	KCPK10	300	400	500					
				HP	KMF								
		U	O	HP	KCU40	250	350	450					
			I	HP	KC7140								
	5	S	O	HP	KCU40	400	450	500					
				HP	KMF								
		U	O	HP	KCU40	250	350	450					
			I	HP	KMF								
	6	S	O	HP	KCU40	400	450	500					
				HP	KMF								
		U	O	HP	KCU40	250	350	450					
			I	HP	KMF								



NOTE: Applying Drill Fix™ DFS 5 x D requires high stability. It is highly recommended to be conservative in regard to speeds and feeds, and start with minimum values indicated.

Condition: S = Stable cutting conditions; U = Unstable cutting conditions; I = Interrupted cutting conditions

Pocket seat: I = Inboard insert; O = Outboard insert

■ DFS™ • Metric

Indexable Drills

Material Group	Condition	Pocket Seat	Geometry	Grade	Cutting Speed – vc Range – m/min		Metric				
							Recommended Feed Rate (f) by Diameter				
					min	Starting Value	max	Ø (mm)	SPGX07 DFT05 22,00-25,99	SPGX09 DFT05 26,00-32,99	SPGX12 DFT06/..07 33,00-43,99
S	1	S	O HP KCU40	60	70	75	mm/r	0,050 - 0,100	0,080 - 0,120	0,100 - 0,150	0,120 - 0,180
			I MD KC7140								
	U	O HP KCU40	40	50	60	mm/r	0,030 - 0,050	0,040 - 0,060	0,050 - 0,080	0,060 - 0,100	
		I MD KC7140									
	I	O HP KCU40	25	30	40	mm/r	0,030 - 0,050	0,040 - 0,060	0,050 - 0,080	0,060 - 0,100	
		I MD KC7140									
	2	S	O HP KCU40	50	60	70	mm/r	0,050 - 0,100	0,080 - 0,120	0,100 - 0,150	0,120 - 0,180
			I MD KC7140								
		U	O HP KCU40	30	40	50	mm/r	0,030 - 0,050	0,040 - 0,060	0,050 - 0,080	0,060 - 0,100
	I MD KC7140										
	3	S	O HP KCU40	70	80	90	mm/r	0,050 - 0,100	0,080 - 0,120	0,100 - 0,150	0,120 - 0,180
			I MD KCU40								
U		O HP KCU40	50	60	70	mm/r	0,030 - 0,050	0,040 - 0,060	0,050 - 0,080	0,060 - 0,100	
I MD KCU40											
4	S	O HP KCU40	70	80	90	mm/r	0,050 - 0,100	0,080 - 0,120	0,100 - 0,150	0,120 - 0,180	
		I MD KCU40									
	U	O HP KCU40	50	60	70	mm/r	0,030 - 0,050	0,040 - 0,060	0,050 - 0,080	0,060 - 0,100	
I MD KCU40											
I	O HP KCU40	30	40	50	mm/r	0,030 - 0,050	0,040 - 0,060	0,050 - 0,080	0,060 - 0,100		
	I MD KCU40										

NOTE: Applying Drill Fix™ DFS 5 x D requires high stability. It is highly recommended to be conservative in regard to speeds and feeds, and start with minimum values indicated.

Condition: S = Stable cutting conditions; U = Unstable cutting conditions; I = Interrupted cutting conditions

Pocket seat: I = Inboard insert; O = Outboard insert

DFS™ • Inch

Material Group	Condition	Pocket Seat	Geometry	Grade	Cutting Speed – vc Range – SFM			Inch												
					min	Starting Value	max	Recommended Feed Rate (f) by Diameter												
								Ø (in)	SPGX07 DFT05 .866-1.023	SPGX09 DFT05 1.024-1.299	SPGX12 DFT06/..07 1.300-1.732	SPGX15 DFT07/..09 1.733-2.165								
P	1	S	O MD	KCPK10	1017	1066	1181	IPR	0.004 - 0.007	0.006 - 0.010	0.006 - 0.012	0.007 - 0.012								
			I MD	KC7140																
		U	O FP	KCU25									656	705	755	IPR	0.002 - 0.004	0.004 - 0.006	0.004 - 0.007	0.005 - 0.010
			I MD	KC7140																
		I	O HP	KCU40									427	443	492	IPR	0.002 - 0.004	0.004 - 0.006	0.004 - 0.007	0.005 - 0.010
			I MD	KC7140																
	2	S	O MD	KCPK10	1017	1066	1181	IPR	0.004 - 0.007	0.006 - 0.010	0.006 - 0.012	0.007 - 0.012								
			I MD	KC7140																
		U	O FP	KCU25									656	705	755	IPR	0.002 - 0.004	0.004 - 0.006	0.004 - 0.007	0.005 - 0.010
			I MD	KC7140																
		I	O HP	KCU40									427	443	492	IPR	0.002 - 0.004	0.004 - 0.006	0.004 - 0.007	0.005 - 0.010
			I MD	KC7140																
	3	S	O MD	KCPK10	853	935	1050	IPR	0.004 - 0.007	0.006 - 0.010	0.006 - 0.012	0.007 - 0.012								
			I MD	KC7140																
		U	O FP	KCU25									591	640	722	IPR	0.002 - 0.004	0.004 - 0.006	0.004 - 0.007	0.005 - 0.010
			I MD	KC7140																
		I	O HP	KCU40									361	394	459	IPR	0.002 - 0.004	0.004 - 0.006	0.004 - 0.007	0.005 - 0.010
			I MD	KC7140																
	4	S	O FP	KCPK10	722	820	984	IPR	0.004 - 0.007	0.006 - 0.010	0.006 - 0.012	0.007 - 0.012								
			I MD	KC7140																
		U	O HP	KCU25									492	591	722	IPR	0.002 - 0.004	0.004 - 0.006	0.004 - 0.007	0.005 - 0.010
			I MD	KC7140																
		I	O HP	KCU40									295	361	459	IPR	0.002 - 0.004	0.004 - 0.006	0.004 - 0.007	0.005 - 0.010
			I MD	KC7140																
5	S	O HP	KCU25	591	656	722	IPR	0.004 - 0.007	0.006 - 0.010	0.006 - 0.012	0.007 - 0.012									
		I MD	KC7140																	
	U	O HP	KCU40									394	443	492	IPR	0.002 - 0.004	0.004 - 0.006	0.004 - 0.007	0.005 - 0.010	
		I MD	KC7140																	
	I	O HP	KC7140									230	279	328	IPR	0.002 - 0.004	0.004 - 0.006	0.004 - 0.007	0.005 - 0.010	
		I MD	KC7140																	
6	S	O HP	KCU25	590	656	722	IPR	0.004 - 0.007	0.006 - 0.010	0.006 - 0.012	0.007 - 0.012									
		I MD	KC7140																	
	U	O HP	KCU40									394	443	492	IPR	0.002 - 0.004	0.004 - 0.006	0.004 - 0.007	0.005 - 0.010	
		I MD	KC7140																	
	I	O HP	KC7140									230	279	328	IPR	0.002 - 0.004	0.004 - 0.006	0.004 - 0.007	0.005 - 0.010	
		I MD	KC7140																	
M	1	S	O FP	KCU25	492	623	754	IPR	0.003 - 0.006	0.005 - 0.008	0.006 - 0.010	0.006 - 0.011								
			I MD	KC7140																
		U	O MD	KCU40									328	426	525	IPR	0.002 - 0.004	0.003 - 0.005	0.003 - 0.006	0.004 - 0.008
			I MD	KC7140																
		I	O MD	KC7140									197	262	328	IPR	0.002 - 0.004	0.003 - 0.005	0.003 - 0.006	0.004 - 0.007
			I MD	KC7140																
	2	S	O FP	KCU25	492	590	689	IPR	0.003 - 0.006	0.005 - 0.008	0.006 - 0.010	0.006 - 0.011								
			I MD	KC7140																
		U	O MD	KCU40									328	426	525	IPR	0.002 - 0.004	0.003 - 0.005	0.003 - 0.006	0.004 - 0.008
			I MD	KC7140																
		I	O MD	KC7140									197	262	328	IPR	0.002 - 0.004	0.003 - 0.005	0.003 - 0.006	0.004 - 0.007
			I MD	KC7140																
	3	S	O HP	KCU25	328	426	525	IPR	0.003 - 0.006	0.005 - 0.008	0.006 - 0.010	0.006 - 0.011								
			I HP	KC7140																
		U	O HP	KCU40									262	361	459	IPR	0.002 - 0.004	0.003 - 0.005	0.003 - 0.006	0.004 - 0.008
			I HP	KC7140																
		I	O MD	KC7140									164	230	295	IPR	0.002 - 0.004	0.003 - 0.005	0.003 - 0.006	0.004 - 0.007
			I MD	KC7140																

NOTE: Applying Drill Fix™ DFS 5 x D requires high stability. It is highly recommended to be conservative in regard to speeds and feeds, and start with minimum values indicated.

Condition: S = Stable cutting conditions; U = Unstable cutting conditions; I = Interrupted cutting conditions

Pocket seat: I = Inboard insert; O = Outboard insert



■ DFS™ • Inch

Indexable Drills

Material Group	Condition	Pocket Seat	Geometry	Grade	Cutting Speed – vc Range – SFM			Inch					
					min	Starting Value	max	Recommended Feed Rate (f) by Diameter					
								Ø (in)	SPGX07 DFT05 .866-1.023	SPGX09 DFT05 1.024-1.299	SPGX12 DFT06/..07 1.300-1.732	SPGX15 DFT07/..09 1.733-2.165	
K	1	S	O	FP	KCPK10	656	787	984	IPR	0.005 - 0.008	0.006 - 0.011	0.007 - 0.013	0.008 - 0.013
			I	HP	KCU40								
		U	O	FP	KCU25	394	509	656	IPR	0.003 - 0.006	0.005 - 0.008	0.006 - 0.010	0.006 - 0.011
			I	HP	KC7140								
		I	O	FP	KC7140	262	328	410	IPR	0.002 - 0.004	0.004 - 0.006	0.004 - 0.007	0.005 - 0.010
			I	HP	KC7140								
	2	S	O	FP	KCPK10	591	722	853	IPR	0.005 - 0.008	0.006 - 0.011	0.007 - 0.013	0.008 - 0.013
			I	HP	KCU40								
		U	O	HP	KCU25	361	459	558	IPR	0.003 - 0.006	0.005 - 0.008	0.006 - 0.010	0.006 - 0.011
			I	HP	KC7140								
		I	O	HP	KC7140	262	328	394	IPR	0.002 - 0.004	0.004 - 0.006	0.004 - 0.007	0.005 - 0.010
			I	HP	KC7140								
3	S	O	HP	KCPK10	591	722	853	IPR	0.005 - 0.008	0.006 - 0.011	0.007 - 0.013	0.008 - 0.013	
		I	HP	KCU40									
	U	O	HP	KCU25	361	459	558	IPR	0.003 - 0.006	0.005 - 0.008	0.006 - 0.010	0.006 - 0.011	
		I	HP	KC7140									
	I	O	HP	KC7140	262	328	394	IPR	0.002 - 0.004	0.004 - 0.006	0.004 - 0.007	0.005 - 0.010	
		I	HP	KC7140									
N	1	S	O	HP	KCPK10	1148	1640	2132	IPR	0.005 - 0.008	0.006 - 0.011	0.007 - 0.013	0.008 - 0.013
			I	HP	KMF								
		U	O	HP	KCU40	984	1312	1640	IPR	0.003 - 0.006	0.005 - 0.008	0.006 - 0.010	0.006 - 0.011
			I	HP	KMF								
		I	O	HP	KCU40	656	984	1312	IPR	0.002 - 0.004	0.004 - 0.006	0.004 - 0.007	0.005 - 0.010
			I	HP	KMF								
	2	S	O	HP	KCPK10	984	1312	1640	IPR	0.005 - 0.008	0.006 - 0.011	0.007 - 0.013	0.008 - 0.013
			I	HP	KMF								
		U	O	HP	KCU40	820	1148	1476	IPR	0.003 - 0.006	0.005 - 0.008	0.006 - 0.010	0.006 - 0.011
			I	HP	KMF								
		I	O	HP	KCU40	574	820	1066	IPR	0.002 - 0.004	0.004 - 0.006	0.004 - 0.007	0.005 - 0.010
			I	HP	KMF								
	3	S	O	HP	KCPK10	984	1312	1640	IPR	0.005 - 0.008	0.006 - 0.011	0.007 - 0.013	0.008 - 0.013
			I	HP	KMF								
		U	O	HP	KCU40	820	1148	1476	IPR	0.003 - 0.006	0.005 - 0.008	0.006 - 0.010	0.006 - 0.011
			I	HP	KMF								
		I	O	HP	KCU40	492	820	1148	IPR	0.002 - 0.004	0.004 - 0.006	0.004 - 0.007	0.005 - 0.010
			I	HP	KMF								
4	S	O	HP	KCU25	984	1312	1640	IPR	0.005 - 0.008	0.006 - 0.011	0.007 - 0.013	0.008 - 0.013	
		I	HP	KC7140									
	U	O	HP	KCU40	820	1148	1476	IPR	0.003 - 0.006	0.005 - 0.008	0.006 - 0.010	0.006 - 0.011	
		I	HP	KC7140									
	I	O	HP	KCU40	656	984	1312	IPR	0.002 - 0.004	0.004 - 0.006	0.004 - 0.007	0.005 - 0.010	
		I	HP	KC7140									
5	S	O	HP	KCU40	1312	1476	1640	IPR	0.005 - 0.008	0.006 - 0.011	0.007 - 0.013	0.008 - 0.013	
		I	HP	KMF									
	U	O	HP	KCU40	820	1148	1476	IPR	0.003 - 0.006	0.005 - 0.008	0.006 - 0.010	0.006 - 0.011	
		I	HP	KMF									
	I	O	HP	KCU40	656	984	1312	IPR	0.002 - 0.004	0.004 - 0.006	0.004 - 0.007	0.005 - 0.010	
		I	HP	KMF									

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Condition: S = Stable cutting conditions; U = Unstable cutting conditions; I = Interrupted cutting conditions

Pocket seat: I = Inboard insert; O = Outboard insert

■ DFS™ • Inch

Material Group	Condition	Pocket Seat	Geometry	Grade	Cutting Speed – vc Range – SFM			Inch					
					min	Starting Value	max	Recommended Feed Rate (f) by Diameter					
								Ø (in)	SPGX07 DFT05 .866-1.023	SPGX09 DFT05 1.024-1.299	SPGX12 DFT06/..07 1.300-1.732	SPGX15 DFT07/..09 1.733-2.165	
S	1	S	O	HP	KCU40	197	230	246	IPR	0.002 - 0.004	0.003 - 0.005	0.004 - 0.006	0.005 - 0.007
			I	MD	KC7140								
	1	U	O	HP	KCU40	131	164	197	IPR	0.001 - 0.002	0.002 - 0.002	0.002 - 0.003	0.002 - 0.004
			I	MD	KC7140								
	1	I	O	HP	KCU40	82	98	131	IPR	0.001 - 0.002	0.002 - 0.002	0.002 - 0.003	0.002 - 0.004
			I	MD	KC7140								
	2	S	O	HP	KCU40	164	197	230	IPR	0.002 - 0.004	0.003 - 0.005	0.004 - 0.006	0.005 - 0.007
			I	MD	KC7140								
	2	U	O	HP	KCU40	98	131	164	IPR	0.001 - 0.002	0.002 - 0.002	0.002 - 0.003	0.002 - 0.004
			I	MD	KC7140								
	2	I	O	HP	KCU40	82	98	131	IPR	0.001 - 0.002	0.002 - 0.002	0.002 - 0.003	0.002 - 0.004
			I	MD	KC7140								
	3	S	O	HP	KCU40	230	262	295	IPR	0.002 - 0.004	0.003 - 0.005	0.004 - 0.006	0.005 - 0.007
			I	MD	KC7140								
	3	U	O	HP	KCU40	164	197	230	IPR	0.001 - 0.002	0.002 - 0.002	0.002 - 0.003	0.002 - 0.004
			I	MD	KC7140								
3	I	O	HP	KCU40	98	131	164	IPR	0.001 - 0.002	0.002 - 0.002	0.002 - 0.003	0.002 - 0.004	
		I	MD	KC7140									
4	S	O	HP	KCU40	230	262	295	IPR	0.002 - 0.004	0.003 - 0.005	0.004 - 0.006	0.005 - 0.007	
		I	MD	KC7140									
4	U	O	HP	KCU40	164	197	230	IPR	0.001 - 0.002	0.002 - 0.002	0.002 - 0.003	0.002 - 0.004	
		I	MD	KC7140									
4	I	O	HP	KCU40	98	131	164	IPR	0.001 - 0.002	0.002 - 0.002	0.002 - 0.003	0.002 - 0.004	
		I	MD	KC7140									

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Condition: S = Stable cutting conditions; U = Unstable cutting conditions; I = Interrupted cutting conditions

Pocket seat: I = Inboard insert; O = Outboard insert



Drill Fix™ DFT™

Drill Fix DFT is available in the diameter range .625–3.250" (24–82mm) as a versatile and reliable tool solution with a large portfolio of lengths, insert geometries, and grades.

Balanced cutting forces, improved chip flute, and coolant-channel design enable high metal removal rates and long tool body life. The trigon-shaped DFT inserts are used for both inboard and outboard inserts and offer the highest centering capabilities and three cutting edges each.

Features and Benefits

Productivity and Profitability

- Achieve high hole accuracy with trigon-shaped inboard inserts that offer the highest centering capabilities.
- Use X-offset on turning machines to adjust the drill diameter, eliminating the need for specials in many applications and on machining centers to reach tolerance optimization.
- Same insert size is used in each pocket reducing inventory costs.

Versatility

Use Drill Fix DFT as most versatile and reliable indexable drilling tool:

- Diameter range covering .625–3.250" (24–82mm).
- 2.5 x D and 4 x D L/D ratios are standard.
- Various shanks available as standard: WD, SSF, and new KM-TS™.
- Trigon-shaped inserts offer three cutting edges.
- Large variety of DFT insert grades and geometries available.
- Apply DFT drills to straight holes, inclined entries and exits, interrupted cuts, and rough or welded entry surfaces.
- Eccentric chuck available as standard.

Reliability

- Highest centering capabilities due to trigon-shaped insert.
- Same insert can be used as inboard or outboard insert — no risk of mixing up inner and outer inserts.
- Benefit from improved chip flute and coolant-channel design resulting in long tool body life and excellent chip evacuation.

Customization

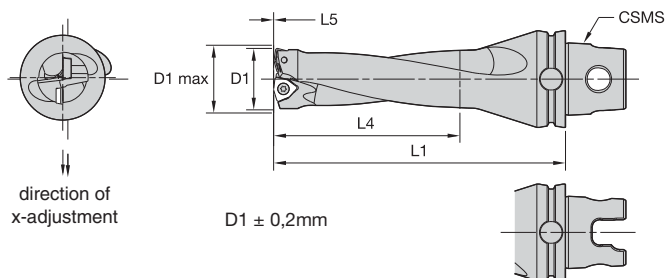
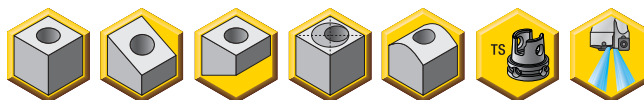
- Intermediate diameters available as semi-standards.
- Engineered solutions available.
- Multistep drills available upon request.
- Stacked material version.



To learn more, [scan here](#).

For instructions on how to scan, please see page xxix.

- Drill shipped with insert screws and Torx wrench.
- See pages J96–J99 for inserts.


■ KM40TS, KM50TS, KM63TS, and KM63XMZ Shanks • 3 x D • Metric

KM40TS		KM50TS		KM63TS		KM63XMZ		D1	D1				gage	
								mm	in	max	L1	L4 max	L5	insert
KM40TSDFT250R3M	KM50TSDFT250R3M	KM63TSDFT250R3M	KM63XMZDFT250R3YM	25,00	.984	27,00	119,0	75,0	0,9	DFT05T3..				
KM40TSDFT270R3M	KM50TSDFT270R3M	KM63TSDFT270R3M	KM63XMZDFT270R3YM	27,00	1.063	29,00	126,0	81,0	1,1	DFT05T3..				
KM40TSDFT290R3M	KM50TSDFT290R3M	KM63TSDFT290R3M	KM63XMZDFT290R3YM	29,00	1.142	31,00	133,0	87,0	1,2	DFT05T3..				
KM40TSDFT310R3M	KM50TSDFT310R3M	KM63TSDFT310R3M	KM63XMZDFT310R3YM	31,00	1.221	33,00	140,0	93,0	1,3	DFT05T3..				
—	KM50TSDFT330R3M	KM63TSDFT330R3M	KM63XMZDFT330R3YM	33,00	1.299	35,00	147,0	99,0	1,3	DFT06T3..				
—	KM50TSDFT350R3M	KM63TSDFT350R3M	KM63XMZDFT350R3YM	35,00	1.378	37,00	154,0	105,0	1,5	DFT06T3..				
—	KM50TSDFT380R3M	KM63TSDFT380R3M	KM63XMZDFT380R3YM	38,00	1.496	40,00	164,0	114,0	1,7	DFT06T3..				
—	—	KM63TSDFT410R3M	KM63XMZDFT410R3YM	41,00	1.614	43,00	175,0	123,0	1,8	DFT0704..				
—	—	KM63TSDFT440R3M	KM63XMZDFT440R3YM	44,00	1.732	46,00	185,0	132,0	2,0	DFT0704..				
—	—	KM63TSDFT470R3M	KM63XMZDFT470R3YM	47,00	1.850	49,00	196,0	141,0	2,2	DFT0704..				

■ KM40TS, KM50TS, KM63TS, and KM63XMZ Shanks • 3 x D • Inch

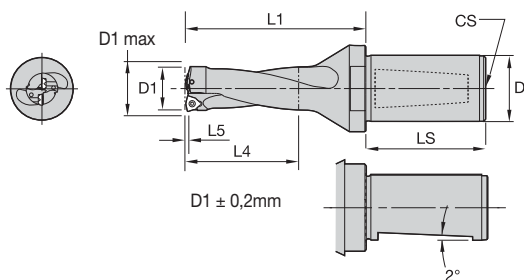
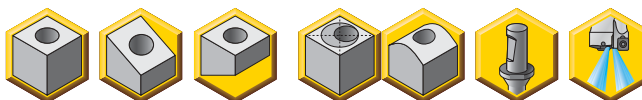
KM40TS		KM50TS		KM63TS		KM63XMZ		D1	D1				gage	
								in	mm	max	L1	L4 max	L5	insert
KM40TSDFT1000R3	KM50TSDFT1000R3	KM63TSDFT1000R3	KM63XMZDFT1000R3Y	1.000	25,40	1.040	4.75	3.00	.04	DFT05T3..				
KM40TSDFT1125R3	KM50TSDFT1125R3	KM63TSDFT1125R3	—	1.125	28,58	1.165	5.25	3.38	.05	DFT05T3..				
KM40TSDFT1250R3	KM50TSDFT1250R3	KM63TSDFT1250R3	—	1.250	31,75	1.290	5.63	3.75	.05	DFT05T3..				
—	KM50TSDFT1313R3	KM63TSDFT1313R3	KM63XMZDFT1313R3Y	1.313	33,35	1.353	5.88	3.94	.05	DFT06T3..				
—	KM50TSDFT1438R3	KM63TSDFT1438R3	KM63XMZDFT1438R3Y	1.438	36,53	1.478	6.38	4.31	.06	DFT06T3..				
—	KM50TSDFT1500R3	—	—	1.500	38,10	1.540	6.50	4.50	.07	DFT06T3..				
—	KM50TSDFT1563R3	KM63TSDFT1563R3	KM63XMZDFT1563R3Y	1.563	39,70	1.603	6.75	4.69	.07	DFT06T3..				
—	—	KM63TSDFT1688R3	KM63XMZDFT1688R3Y	1.688	42,88	1.728	7.25	5.06	.07	DFT0704..				
—	—	KM63TSDFT1750R3	—	1.750	44,45	1.790	7.38	5.25	.08	DFT0704..				
—	—	KM63TSDFT1875R3	KM63XMZDFT1875R3Y	1.875	47,63	1.915	7.88	5.63	.09	DFT0704..				

WARNING

During through-hole operations, a slug or disc is produced as the tool breaks through the workpiece. When the drill is stationary and the workpiece is rotating, this slug may be hurled from the chuck by centrifugal force. Provide adequate shielding to protect bystanders.

gage insert	insert screw	Torx wrench	Torx size
DFT05T3..	191.924	170.024	9
DFT06T3..	191.848	170.025	15
DFT0704..	191.698	170.025	15

- Drill shipped with insert screws and Torx wrench.
- See pages J96–J99 for inserts.



■ WN/WD Shank • 2.5 x D • Metric

Indexable Drills

D			D1		D1 max	L1	L4 max	L5	gage insert
32	40	50	mm	in					
DFT250R2WD32M	DFT250R2WD40M	—	25,00	.984	27,00	90,0	58,9	0,9	DFT05T3..
DFT260R2WD32M	DFT260R2WD40M	—	26,00	1.024	27,00	90,0	59,1	1,1	DFT05T3..
DFT270R2WD32M	DFT270R2WD40M	—	27,00	1.063	29,00	100,0	66,1	1,1	DFT05T3..
DFT280R2WD32M	DFT280R2WD40M	—	28,00	1.102	29,00	100,0	66,3	1,3	DFT05T3..
DFT290R2WD32M	DFT290R2WD40M	—	29,00	1.142	31,00	100,0	66,3	1,3	DFT05T3..
DFT300R2WD32M	DFT300R2WD40M	—	30,00	1.181	31,00	115,0	76,4	1,4	DFT05T3..
DFT310R2WD32M	DFT310R2WD40M	—	31,00	1.221	33,00	115,0	76,4	1,4	DFT05T3..
DFT320R2WD32M	DFT320R2WD40M	—	32,00	1.260	33,00	115,0	76,5	1,5	DFT05T3..
DFT330R2WD32M	DFT330R2WD40M	—	33,00	1.299	35,00	115,0	76,4	1,4	DFT06T3..
DFT340R2WD32M	DFT340R2WD40M	—	34,00	1.339	35,00	115,0	76,5	1,5	DFT06T3..
DFT350R2WD32M	DFT350R2WD40M	—	35,00	1.378	38,00	115,0	76,6	1,6	DFT06T3..
DFT360R2WD32M	DFT360R2WD40M	—	36,00	1.417	37,00	115,0	76,8	1,8	DFT06T3..
DFT370R2WD32M	DFT370R2WD40M	—	37,00	1.457	38,00	135,0	96,7	1,7	DFT06T3..
DFT380R2WD32M	DFT380R2WD40M	—	38,00	1.496	41,00	135,0	96,8	1,8	DFT06T3..
DFT390R2WD32M	DFT390R2WD40M	—	39,00	1.535	40,00	135,0	96,9	1,9	DFT06T3..
DFT400R2WD32M	DFT400R2WD40M	—	40,00	1.575	41,00	135,0	97,0	2,0	DFT06T3..
DFT410R2WD32M	DFT410R2WD40M	—	41,00	1.614	44,00	135,0	96,9	1,9	DFT0704..
DFT420R2WD32M	DFT420R2WD40M	—	42,00	1.654	43,00	135,0	96,9	2,0	DFT0704..
DFT430R2WD32M	DFT430R2WD40M	—	43,00	1.693	44,00	150,0	112,1	2,1	DFT0704..
DFT440R2WD32M	DFT440R2WD40M	—	44,00	1.732	47,00	150,0	112,1	2,1	DFT0704..
—	DFT450R2WD40M	DFT450R2WD50M	45,00	1.772	46,00	150,0	112,2	2,2	DFT0704..
—	DFT460R2WD40M	DFT460R2WD50M	46,00	1.811	47,00	150,0	112,0	2,3	DFT0704..
—	DFT470R2WD40M	DFT470R2WD50M	47,00	1.850	50,00	150,0	111,5	2,4	DFT0704..
—	DFT480R2WD40M	DFT480R2WD50M	48,00	1.890	49,00	150,0	111,0	2,4	DFT0704..
—	DFT490R2WD40M	DFT490R2WD50M	49,00	1.929	50,00	165,0	117,2	2,2	DFT0905..
—	DFT500R2WD40M	DFT500R2WD50M	50,00	1.969	54,00	165,0	117,2	2,2	DFT0905..
—	DFT510R2WD40M	DFT510R2WD50M	51,00	2.008	52,00	165,0	117,4	2,5	DFT0905..
—	DFT520R2WD40M	DFT520R2WD50M	52,00	2.047	53,00	165,0	117,5	2,6	DFT0905..
—	DFT530R2WD40M	DFT530R2WD50M	53,00	2.087	54,00	165,0	117,6	2,6	DFT0905..
—	DFT540R2WD40M	DFT540R2WD50M	54,00	2.126	58,00	165,0	117,7	2,7	DFT0905..
—	—	DFT550R2WD50M	55,00	2.165	56,00	180,0	125,0	2,7	DFT0905..
—	—	DFT560R2WD50M	56,00	2.205	57,00	180,0	125,0	2,8	DFT0905..
—	—	DFT570R2WD50M	57,00	2.244	58,00	180,0	125,0	2,9	DFT0905..
—	—	DFT580R2WD50M	58,00	2.284	62,00	180,0	125,0	3,0	DFT0905..
—	—	DFT590R2WD50M	59,00	2.323	60,00	180,0	125,0	3,0	DFT0905..
—	—	DFT600R2WD50M	60,00	2.362	61,00	180,0	125,0	3,1	DFT0905..
—	—	DFT610R2WD50M	61,00	2.402	62,00	180,0	125,0	3,2	DFT0905..
—	—	DFT620R2WD50M	62,00	2.441	65,00	180,0	125,0	3,2	DFT0905..
—	—	DFT630R2WD50M	63,00	2.480	64,00	180,0	125,0	3,3	DFT0905..
—	—	DFT640R2WD50M	64,00	2.520	65,00	180,0	125,0	3,4	DFT0905..



(continued)

(WN/WD Shank • 2.5 x D • Metric continued)

D			D1			L			gage insert
32	40	50	mm	in	D1 max	L1	L4 max	L5	
—	—	DFT650R2WD50M	65,00	2.559	66,00	180,0	125,0	3,4	DFT0905..
—	—	DFT660R2WD50M	66,00	2.598	69,00	180,0	125,0	3,5	DFT0905..
—	—	DFT670R2WD50M	67,00	2.638	67,00	180,0	125,0	3,5	DFT0905..
—	—	DFT680R2WD50M	68,00	2.677	69,00	180,0	125,0	3,6	DFT0905..
—	—	DFT690R2WD50M	69,00	2.717	73,00	205,0	140,0	3,6	DFT1105..
—	—	DFT700R2WD50M	70,00	2.756	71,00	205,0	140,0	3,6	DFT1105..
—	—	DFT710R2WD50M	71,00	2.795	72,00	205,0	140,0	3,9	DFT1105..
—	—	DFT720R2WD50M	72,00	2.835	73,00	205,0	140,0	3,9	DFT1105..
—	—	DFT730R2WD50M	73,00	2.874	79,00	205,0	140,0	4,0	DFT1105..
—	—	DFT740R2WD50M	74,00	2.913	75,00	205,0	140,0	4,1	DFT1105..
—	—	DFT750R2WD50M	75,00	2.953	76,00	205,0	140,0	4,2	DFT1105..
—	—	DFT760R2WD50M	76,00	2.992	77,00	205,0	140,0	4,2	DFT1105..
—	—	DFT770R2WD50M	77,00	3.032	78,00	205,0	140,0	4,3	DFT1105..
—	—	DFT780R2WD50M	78,00	3.071	79,00	205,0	140,0	4,3	DFT1105..
—	—	DFT790R2WD50M	79,00	3.110	82,00	205,0	140,0	4,4	DFT1105..
—	—	DFT800R2WD50M	80,00	3.150	81,00	205,0	140,0	4,5	DFT1105..
—	—	DFT810R2WD50M	81,00	3.189	82,00	205,0	140,0	4,5	DFT1105..
—	—	DFT820R2WD50M	82,00	3.228	83,00	205,0	140,0	4,5	DFT1105..

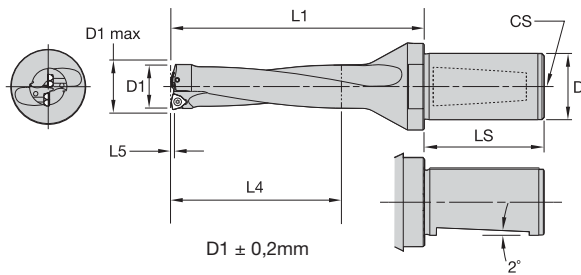
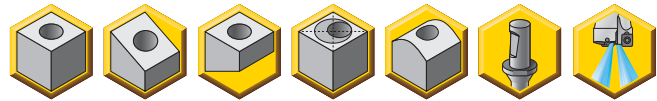
Indexable Drills

WARNING
 During through-hole operations, a slug or disc is produced as the tool breaks through the workpiece. When the drill is stationary and the workpiece is rotating, this slug may be hurled from the chuck by centrifugal force. Provide adequate shielding to protect bystanders.

gage insert	 insert screw	 Torx wrench	Torx size
DFT05T3..	191.924	170.024	9
DFT06T3..	191.848	170.025	15
DFT0704..	191.698	170.025	15
DFT0905..	191.726	170.026	20
DFT1105..	191.375	170.026	20

D	LS	CS
32	58	R 1/4 BSP
40	68	R 1/4 BSP
50	68	R 1/4 BSP

- Drill shipped with insert screws and Torx wrench.
- See pages J96–J99 for inserts.



WN/WD Shank • 4 x D • Metric

Indexable Drills

D		D1		D1 max	L1	L4 max	L5	gage insert
32	40	mm	in					
DFT250R4WD32M	DFT250R4WD40M	25,00	.984	27,00	135,0	100,0	0,8	DFT05T3..
DFT260R4WD32M	DFT260R4WD40M	26,00	1.024	27,00	139,0	104,0	0,9	DFT05T3..
DFT270R4WD32M	DFT270R4WD40M	27,00	1.063	29,00	143,0	108,0	1,0	DFT05T3..
DFT280R4WD32M	DFT280R4WD40M	28,00	1.102	29,00	156,0	112,0	1,1	DFT05T3..
DFT290R4WD32M	DFT290R4WD40M	29,00	1.142	31,00	151,0	116,0	1,1	DFT05T3..
DFT300R4WD32M	DFT300R4WD40M	30,00	1.181	31,00	160,0	120,0	1,2	DFT05T3..
DFT310R4WD32M	DFT310R4WD40M	31,00	1.221	33,00	164,0	124,0	1,3	DFT05T3..
DFT320R4WD32M	DFT320R4WD40M	32,00	1.260	33,00	168,0	128,0	1,3	DFT05T3..
—	DFT330R4WD40M	33,00	1.299	35,00	177,0	132,0	1,1	DFT06T3..
—	DFT340R4WD40M	34,00	1.339	35,00	181,0	136,0	1,3	DFT06T3..
—	DFT350R4WD40M	35,00	1.378	38,00	185,0	140,0	1,3	DFT06T3..
—	DFT360R4WD40M	36,00	1.417	37,00	189,0	144,0	1,4	DFT06T3..
—	DFT370R4WD40M	37,00	1.457	38,00	198,0	148,0	1,5	DFT06T3..
—	DFT380R4WD40M	38,00	1.496	41,00	202,0	152,0	1,5	DFT06T3..
—	DFT390R4WD40M	39,00	1.535	40,00	206,0	156,0	1,6	DFT06T3..
—	DFT400R4WD40M	40,00	1.575	41,00	210,0	160,0	1,7	DFT06T3..
—	DFT410R4WD40M	41,00	1.614	44,00	214,0	164,0	1,6	DFT0704..
—	DFT420R4WD40M	42,00	1.654	43,00	223,0	168,0	1,7	DFT0704..
—	DFT430R4WD40M	43,00	1.693	44,00	227,0	172,0	1,7	DFT0704..
—	DFT440R4WD40M	44,00	1.732	47,00	231,0	176,0	1,8	DFT0704..
—	DFT450R4WD40M	45,00	1.772	46,00	240,0	180,0	1,9	DFT0704..
—	DFT460R4WD40M	46,00	1.811	47,00	244,0	184,0	1,9	DFT0704..
—	DFT470R4WD40M	47,00	1.850	50,00	248,0	188,0	2,0	DFT0704..
—	DFT480R4WD40M	48,00	1.890	49,00	252,0	192,0	2,0	DFT0704..

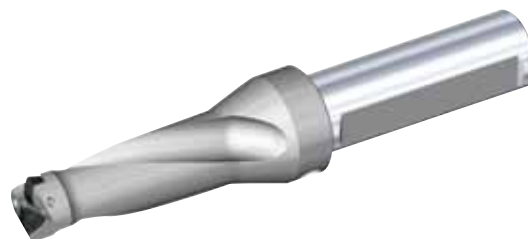
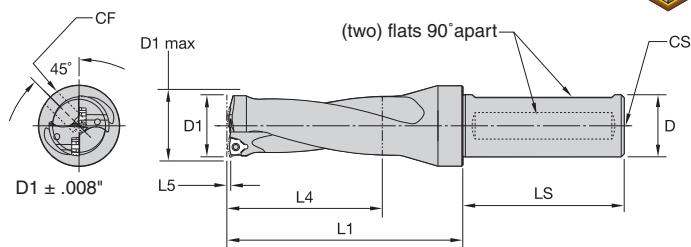
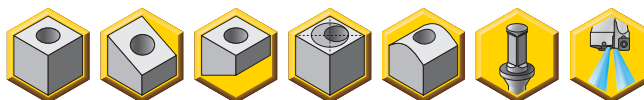
WARNING

During through-hole operations, a slug or disc is produced as the tool breaks through the workpiece. When the drill is stationary and the workpiece is rotating, this slug may be hurled from the chuck by centrifugal force. Provide adequate shielding to protect bystanders.

gage insert	insert screw	Torx wrench	Torx size
DFT05T3..	191.924	170.024	9
DFT06T3..	191.848	170.025	15
DFT0704..	191.698	170.025	15

D	LS	CS
32	58	R 1/4 BSP
40	68	R 1/4 BSP

- Drill shipped with insert screws, side pipe plug, and Torx wrench.
- See pages J96–J99 for inserts.



■ Flange Shank • 2.5 x D • Inch

D			D1		D1 max	L1	L4 max	L5	gage insert
1.250	1.500	2.000	in	mm					
DFT0984R2SSF125	—	—	.984	25,00	1.109	3.88	2.50	.04	DFT05T3..
DFT1000R2SSF125	DFT1000R2SSF150	—	1.000	25,40	1.125	4.00	2.50	.04	DFT05T3..
DFT1031R2SSF125	—	—	1.031	26,20	1.156	4.00	2.60	.04	DFT05T3..
DFT1063R2SSF125	—	—	1.063	26,99	1.188	4.13	2.65	.04	DFT05T3..
DFT1094R2SSF125	—	—	1.094	27,79	1.219	4.13	2.70	.05	DFT05T3..
DFT1125R2SSF125	—	—	1.125	28,58	1.250	4.38	2.85	.05	DFT05T3..
DFT1156R2SSF125	—	—	1.156	29,36	1.281	4.38	2.89	.05	DFT05T3..
DFT1188R2SSF125	—	—	1.188	30,16	1.288	4.50	3.00	.05	DFT05T3..
DFT1219R2SSF125	DFT1219R2SSF150	—	1.219	30,96	1.319	4.63	3.05	.06	DFT05T3..
DFT1250R2SSF125	DFT1250R2SSF150	—	1.250	31,75	1.325	4.75	3.13	.06	DFT05T3..
DFT1281R2SSF125	DFT1281R2SSF150	—	1.281	32,55	1.345	4.75	3.20	.06	DFT05T3..
DFT1313R2SSF125	DFT1313R2SSF150	—	1.313	33,34	1.438	4.88	3.30	.05	DFT06T3..
DFT1375R2SSF125	DFT1375R2SSF150	—	1.375	34,93	1.500	5.13	3.45	.06	DFT06T3..
DFT1406R2SSF125	DFT1406R2SSF150	—	1.406	35,71	1.531	5.13	3.50	.06	DFT06T3..
DFT1438R2SSF125	DFT1438R2SSF150	—	1.438	36,51	1.563	5.25	3.60	.07	DFT06T3..
DFT1469R2SSF125	DFT1469R2SSF150	—	1.469	37,31	1.594	5.38	3.70	.07	DFT06T3..
DFT1500R2SSF125	DFT1500R2SSF150	—	1.500	38,10	1.625	5.50	3.75	.07	DFT06T3..
DFT1531R2SSF125	DFT1531R2SSF150	—	1.531	38,89	1.656	5.50	3.85	.07	DFT06T3..
DFT1563R2SSF125	DFT1563R2SSF150	—	1.563	39,69	1.688	5.63	3.90	.07	DFT06T3..
DFT1625R2SSF125	DFT1625R2SSF150	—	1.625	41,28	1.750	5.88	4.10	.07	DFT0704..
DFT1688R2SSF125	DFT1688R2SSF150	—	1.688	42,86	1.813	6.00	4.25	.08	DFT0704..
—	DFT1750R2SSF150	—	1.750	44,45	1.875	6.25	4.38	.08	DFT0704..
—	DFT1813R2SSF150	—	1.813	46,04	1.938	6.38	4.55	.09	DFT0704..
—	DFT1875R2SSF150	—	1.875	47,63	2.000	6.63	4.70	.09	DFT0704..
—	DFT1938R2SSF150	—	1.938	49,21	2.188	6.75	4.85	.08	DFT0905..
—	DFT2000R2SSF150	DFT2000R2SSF200	2.000	50,80	2.250	7.00	5.00	.09	DFT0905..
—	DFT2125R2SSF150	DFT2125R2SSF200	2.125	53,98	2.375	7.38	5.35	.10	DFT0905..
—	—	DFT2250R2SSF200	2.250	57,15	2.500	7.75	5.63	.11	DFT0905..
—	—	DFT2375R2SSF200	2.375	60,33	2.590	8.13	5.95	.12	DFT0905..
—	—	DFT2500R2SSF200	2.500	63,50	2.650	8.50	6.25	.12	DFT0905..
—	—	DFT2750R2SSF200	2.750	69,85	3.050	9.13	6.88	.00	DFT1105..
—	—	DFT3000R2SSF200	3.000	76,20	3.150	10.00	7.50	.15	DFT1105..
—	—	DFT3250R2SSF200	3.250	82,55	3.260	10.26	8.13	.16	DFT1105..

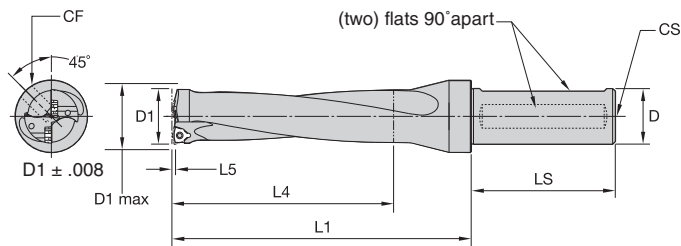
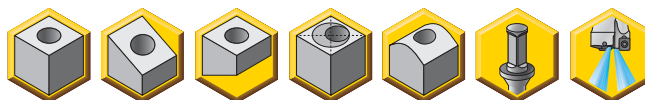
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DFT1105..	191.375	170.026	20

D	LS	CF	CS	pipe plug
1.25	3.25	1/8-27 NPT	R 1/4-18 NPT	HSFS0125
1.50	3.75	1/8-27 NPT	R 1/4-18 NPT	HSFS0125
2.00	4.00	1/8-27 NPT	R 1/4-18 NPT	HSFS0125

- Drill shipped with insert screws, side pipe plug, and Torx wrench.
- See pages J96–J99 for inserts.



■ Flange Shank • 4 x D • Inch

Indexable Drills

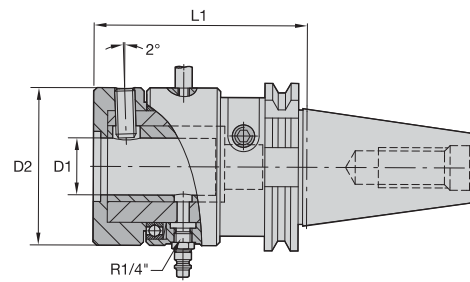
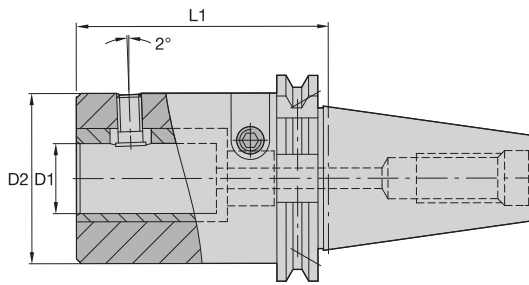
				D		D1		L4		L5		gage insert
1.000		1.250		1.500		2.000		in	mm	max	L1		max
DFT0984R4SSF100	—	—	—	—	—	.984	25,00	1.109	5.50	3.94	.03	DFT05T3..
DFT1000R4SSF100	DFT1000R4SSF125	DFT1000R4SSF150	—	—	—	1.000	25,40	1.125	5.63	4.00	.03	DFT05T3..
—	DFT1031R4SSF125	—	—	—	—	1.031	26,20	1.156	5.75	4.13	.04	DFT05T3..
—	DFT1063R4SSF125	—	—	—	—	1.063	26,99	1.188	5.88	4.25	.04	DFT05T3..
—	DFT1094R4SSF125	—	—	—	—	1.094	27,78	1.219	5.88	4.38	.04	DFT05T3..
—	DFT1125R4SSF125	DFT1125R4SSF150	—	—	—	1.125	28,58	1.250	6.13	4.50	.04	DFT05T3..
—	DFT1156R4SSF125	—	—	—	—	1.156	29,37	1.281	6.13	4.63	.05	DFT05T3..
—	DFT1188R4SSF125	—	—	—	—	1.188	30,16	1.288	6.50	4.75	.05	DFT05T3..
—	DFT1219R4SSF125	—	—	—	—	1.219	30,96	1.319	6.63	4.88	.05	DFT05T3..
—	DFT1250R4SSF125	DFT1250R4SSF150	—	—	—	1.250	31,75	1.325	6.75	5.00	.05	DFT05T3..
—	DFT1281R4SSF125	—	—	—	—	1.281	32,55	1.345	6.88	5.13	.05	DFT05T3..
—	DFT1313R4SSF125	—	—	—	—	1.313	33,34	1.438	7.00	5.25	.05	DFT06T3..
—	DFT1375R4SSF125	DFT1375R4SSF150	—	—	—	1.375	34,93	1.500	7.25	5.50	.05	DFT06T3..
—	DFT1406R4SSF125	—	—	—	—	1.406	35,72	1.531	7.25	5.63	.05	DFT06T3..
—	DFT1438R4SSF125	DFT1438R4SSF150	—	—	—	1.438	36,51	1.563	7.63	5.75	.06	DFT06T3..
—	DFT1469R4SSF125	—	—	—	—	1.469	37,31	1.594	7.75	5.88	.06	DFT06T3..
—	DFT1500R4SSF125	DFT1500R4SSF150	—	—	—	1.500	38,10	1.625	7.88	6.00	.06	DFT06T3..
—	DFT1531R4SSF125	DFT1531R4SSF150	—	—	—	1.531	38,90	1.656	7.88	6.13	.06	DFT06T3..
—	DFT1563R4SSF125	DFT1563R4SSF150	—	—	—	1.563	39,69	1.688	8.13	6.25	.06	DFT06T3..
—	DFT1625R4SSF125	DFT1625R4SSF150	—	—	—	1.625	41,28	1.750	8.38	6.50	.06	DFT0704..
—	DFT1688R4SSF125	DFT1688R4SSF150	—	—	—	1.688	42,86	1.813	8.75	6.75	.07	DFT0704..
—	—	DFT1750R4SSF150	—	—	—	1.750	44,45	1.875	9.00	7.00	.07	DFT0704..
—	—	DFT1813R4SSF150	—	—	—	1.813	46,04	1.938	9.25	7.25	.08	DFT0704..
—	—	DFT1875R4SSF150	—	—	—	1.875	47,63	2.000	9.50	7.50	.08	DFT0704..
—	—	DFT1938R4SSF150	—	—	—	1.938	49,21	2.188	9.88	7.75	.07	DFT0905..
—	—	DFT2000R4SSF150	DFT2000R4SSF200	—	—	2.000	50,80	2.250	10.13	8.00	.07	DFT0905..
—	—	DFT2125R4SSF150	DFT2125R4SSF200	—	—	2.125	53,98	2.375	10.63	8.50	.09	DFT0905..

WARNING

During through-hole operations, a slug or disc is produced as the tool breaks through the workpiece. When the drill is stationary and the workpiece is rotating, this slug may be hurled from the chuck by centrifugal force. Provide adequate shielding to protect bystanders.

gage insert	insert screw	Torx wrench	Torx size
DFT05T3..	191.924	170.024	9
DFT06T3..	191.848	170.025	15
DFT0704..	191.698	170.025	15
DFT0905..	191.726	170.026	20

D	LS	CF	CS	pipe plug
1.00	3.00	1/8-27 NPT	R 1/4-18 NPT	HSFS0125
1.25	3.25	1/8-27 NPT	R 1/4-18 NPT	HSFS0125
1.50	3.75	1/8-27 NPT	R 1/4-18 NPT	HSFS0125
2.00	4.00	1/8-27 NPT	R 1/4-18 NPT	HSFS0125



catalog number	D1	D2	L1	SK 40		SK 50		coolant ring	kg	lbs
				DIN 69871 A	MAS 403 BT	DIN 69871 A	MAS 403 BT			
BT40BEWD20096M	20,00	63,0	96,0	—	●	—	—	—	3,0	6.6
DV40BEWD20090M	20,00	63,0	96,0	●	—	—	—	—	3,0	6.6
DV50BEWD32108M	32,00	63,0	108,0	—	—	●	—	—	4,3	9.5
DV40RMEWD32108M	32,00	90,0	108,0	●	—	—	—	●	4,0	8.8
BT50BEWD32127M	32,00	63,0	108,0	—	—	—	●	—	4,3	9.5
DV40BEWD32108M	32,00	63,0	108,0	●	—	—	—	—	4,0	8.8
BT40BEWD32114M	32,00	63,0	114,0	—	●	—	—	—	3,4	7.5
BT40RMEWD32114M	32,00	90,0	114,0	—	●	—	—	●	4,0	8.8
DV50RMEWD32108M	32,00	90,0	108,0	—	—	●	—	●	6,9	15.2

NOTE: n_{max}: 4800 U/min; P_{max}: 20 bar

■ With Coolant Ring

D1	clamping screw	adjusting screw	bumper bar	eccentric bushing	dial key
32	192.941	570.850	169.974	536.088	170.236

■ Without Coolant Ring

D1	clamping screw	adjusting screw	eccentric bushing	dial key
20	193.203	570.850	536.090	170.236
32	193.204	570.850	536.091	170.236

SAFETY NOTE: Use only the supplied plug-in nipple with nominal breakage point: R 1/4" (6,35mm), catalog number 191.469.

Intermediate sleeve with dial key included (for coolant ring version, use dial key, bumper bar, and plug-in nipple with predetermined breaking point).

■ DFT™ • Metric

Indexable Drills

Material Group	Condition	Pocket Seat	Geometry	Grade	Cutting Speed – vc Range – m/min		Metric							
					min	Starting Value	max	Recommended Feed Rate (f) by Diameter						
								Ø (mm)	DFT03... 16,00-24,00	DFT05... 25,00-32,00	DFT06... 33,00-40,00	DFT07... 41,00-48,00	DFT09... 49,00-68,00	DFT11... 69,00-82,00
P	1	S	O MD	KCU25	310	325	360	mm/r	0,06 - 0,10	0,09 - 0,15	0,11 - 0,18	0,15 - 0,25	0,19 - 0,31	0,19 - 0,31
			I MD	KC7140										
	1	U	O MD	KCU25	200	215	230	mm/r	0,06 - 0,10	0,09 - 0,15	0,11 - 0,18	0,15 - 0,25	0,19 - 0,31	0,19 - 0,31
				I MD											KC7140
	1	I	O MD	KCU40	130	135	150	mm/r	0,06 - 0,10	0,09 - 0,15	0,11 - 0,18	0,15 - 0,25	0,19 - 0,31	0,19 - 0,31
				I MD											KC7140
	2	S	O HP	KCPK10	310	325	360	mm/r	0,06 - 0,10	0,09 - 0,15	0,11 - 0,18	0,15 - 0,25	0,19 - 0,31	0,19 - 0,31
				I HP											KC7140
		U	O HP	KCU25	200	215	230	mm/r	0,06 - 0,10	0,09 - 0,15	0,11 - 0,18	0,15 - 0,25	0,19 - 0,31	0,19 - 0,31
				I HP											KC7140
	I	O HP	KCU40	130	135	150	mm/r	0,06 - 0,10	0,09 - 0,15	0,11 - 0,18	0,15 - 0,25	0,19 - 0,31	0,19 - 0,31	
			I HP											KC7140
	3	S	O HP	KCPK10	260	285	320	mm/r	0,06 - 0,10	0,09 - 0,15	0,11 - 0,18	0,15 - 0,25	0,19 - 0,31	0,19 - 0,31
				I HP											KC7140
		U	O HP	KCU25	180	195	220	mm/r	0,06 - 0,10	0,09 - 0,15	0,11 - 0,18	0,15 - 0,25	0,19 - 0,31	0,19 - 0,31
				I HP											KC7140
	I	O HP	KCU40	110	120	140	mm/r	0,06 - 0,10	0,09 - 0,15	0,11 - 0,18	0,15 - 0,25	0,19 - 0,31	0,19 - 0,31	
			I HP											KC7140
	4	S	O HP	KCU25	220	250	300	mm/r	0,06 - 0,10	0,09 - 0,15	0,11 - 0,18	0,15 - 0,25	0,19 - 0,31	0,19 - 0,31
				I HP											KC7140
		U	O HP	KCU40	150	180	220	mm/r	0,06 - 0,10	0,09 - 0,15	0,11 - 0,18	0,15 - 0,25	0,19 - 0,31	0,19 - 0,31
				I HP											KC7140
	I	O HP	KC7140	90	110	140	mm/r	0,06 - 0,10	0,09 - 0,15	0,11 - 0,18	0,15 - 0,25	0,19 - 0,31	0,19 - 0,31	
			I HP											KC7140
5	S	O HP	KCU25	180	200	220	mm/r	0,05 - 0,10	0,07 - 0,13	0,09 - 0,15	0,11 - 0,18	0,12 - 0,23	0,12 - 0,23	
			I HP											KC7140
	U	O HP	KCU40	120	135	150	mm/r	0,05 - 0,10	0,07 - 0,13	0,09 - 0,15	0,11 - 0,18	0,12 - 0,23	0,12 - 0,23	
			I HP											KC7140
I	O HP	KC7140	70	85	100	mm/r	0,05 - 0,10	0,07 - 0,13	0,09 - 0,15	0,11 - 0,18	0,12 - 0,23	0,12 - 0,23		
		I HP											KC7140	
6	S	O HP	KCU25	180	200	220	mm/r	0,05 - 0,10	0,07 - 0,13	0,09 - 0,15	0,11 - 0,18	0,12 - 0,23	0,12 - 0,23	
			I HP											KC7140
	U	O HP	KCU40	120	135	150	mm/r	0,05 - 0,10	0,07 - 0,13	0,09 - 0,15	0,11 - 0,18	0,12 - 0,23	0,12 - 0,23	
			I HP											KC7140
I	O HP	KC7140	70	85	100	mm/r	0,05 - 0,10	0,07 - 0,13	0,09 - 0,15	0,11 - 0,18	0,12 - 0,23	0,12 - 0,23		
		I HP											KC7140	
M	1	S	O MD	KC7140	150	190	230	mm/r	0,05 - 0,09	0,07 - 0,13	0,08 - 0,16	0,10 - 0,18	0,11 - 0,21	0,11 - 0,21
			I MD	KC7140										
		U	O MD	KC7140	100	130	160	mm/r	0,05 - 0,09	0,07 - 0,13	0,08 - 0,16	0,10 - 0,18	0,11 - 0,21	0,11 - 0,21
			I MD	KC7140										
	2	S	O MD	KC7140	150	180	210	mm/r	0,05 - 0,09	0,07 - 0,13	0,08 - 0,16	0,10 - 0,18	0,11 - 0,21	0,11 - 0,21
				I MD											KC7140
		U	O MD	KC7140	100	130	160	mm/r	0,05 - 0,09	0,07 - 0,13	0,08 - 0,16	0,10 - 0,18	0,11 - 0,21	0,11 - 0,21
				I MD											KC7140
	3	S	O MD	KC7140	100	130	160	mm/r	0,05 - 0,09	0,07 - 0,13	0,08 - 0,16	0,10 - 0,18	0,11 - 0,21	0,11 - 0,21
				I MD											KC7140
		U	O MD	KC7140	80	110	140	mm/r	0,05 - 0,09	0,07 - 0,13	0,08 - 0,16	0,10 - 0,18	0,11 - 0,21	0,11 - 0,21
				I MD											KC7140
I	O MD	KC7140	50	70	90	mm/r	0,05 - 0,09	0,07 - 0,13	0,08 - 0,16	0,10 - 0,18	0,11 - 0,21	0,11 - 0,21		
		I MD											KC7140	

Condition: S = Stable cutting conditions; U = Unstable cutting conditions; I = Interrupted cutting conditions
 Pocket seat: I = Inboard insert; O = Outboard insert

DFT™ • Metric

Material Group	Condition	Pocket Seat	Geometry	Grade	Cutting Speed – vc Range – m/min		Metric								
							Recommended Feed Rate (f) by Diameter								
					min	Starting Value	max	Ø (mm)	DFT03... 16,00-24,00	DFT05... 25,00-32,00	DFT06... 33,00-40,00	DFT07... 41,00-48,00	DFT09... 49,00-68,00	DFT11... 69,00-82,00	
K	1	S	O	HP	KCPK10	200	240	300	mm/r	0,07 - 0,13	0,10 - 0,18	0,14 - 0,26	0,18 - 0,33	0,21 - 0,39	0,21 - 0,39
			I	HP	KCU40										
		U	O	HP	KCU25	120	155	200							
			I	HP	KCU40										
	2	S	O	HP	KCPK10	180	220	260	mm/r	0,07 - 0,13	0,10 - 0,18	0,14 - 0,26	0,18 - 0,33	0,21 - 0,39	0,21 - 0,39
			I	HP	KCU40										
		U	O	HP	KCU25	110	140	170							
			I	HP	KC7140										
	3	S	O	HP	KCPK10	180	220	260	mm/r	0,07 - 0,13	0,10 - 0,18	0,14 - 0,26	0,18 - 0,33	0,21 - 0,39	0,21 - 0,39
			I	HP	KCU40										
		U	O	HP	KCU25	110	140	170							
			I	HP	KC7140										
N	1	S	O	ST	KD1425	400	600	800	mm/r	0,05 - 0,07	0,07 - 0,09	0,10 - 0,14	0,12 - 0,16	0,14 - 0,18	0,14 - 0,18
			I	ST	KD1425										
		U	O	HP	KCU40	300	400	500							
			I	HP	KCU40										
	2	S	O	HP	KMF	200	300	400	mm/r	0,05 - 0,07	0,07 - 0,09	0,10 - 0,14	0,12 - 0,16	0,14 - 0,18	0,14 - 0,18
			I	HP	KMF										
		U	O	ST	KD1425	375	550	775							
			I	ST	KD1425										
	3	S	O	HP	KCU40	250	350	450	mm/r	0,05 - 0,07	0,07 - 0,09	0,10 - 0,14	0,12 - 0,16	0,14 - 0,18	0,14 - 0,18
			I	HP	KCU40										
		U	O	HP	KMF	175	250	325							
			I	HP	KMF										
	4	S	O	ST	KD1425	350	500	650	mm/r	0,05 - 0,07	0,07 - 0,09	0,10 - 0,14	0,12 - 0,16	0,14 - 0,18	0,14 - 0,18
			I	ST	KD1425										
		U	O	HP	KCU40	250	350	450							
			I	HP	KCU40										
	5	S	O	HP	KMF	200	300	400	mm/r	0,05 - 0,07	0,07 - 0,09	0,10 - 0,14	0,12 - 0,16	0,14 - 0,18	0,14 - 0,18
			I	HP	KMF										
		U	O	ST	KD1425	400	600	800							
			I	ST	KD1425										
5	S	O	HP	KCU40	250	350	450	mm/r	0,05 - 0,07	0,07 - 0,09	0,10 - 0,14	0,12 - 0,16	0,14 - 0,18	0,14 - 0,18	
		I	HP	KCU40											
	U	O	HP	KMF	200	300	400								
		I	HP	KMF											

Condition: S = Stable cutting conditions; U = Unstable cutting conditions; I = Interrupted cutting conditions
 Pocket seat: I = Inboard insert; O = Outboard insert



■ DFT™ • Metric

Indexable Drills

Material Group	Condition	Pocket Seat	Geometry	Grade	Cutting Speed – vc Range – m/min		Metric								
							Recommended Feed Rate (f) by Diameter								
					min	Starting Value	max	Ø (mm)	DFT03... 16,00-24,00	DFT05... 25,00-32,00	DFT06... 33,00-40,00	DFT07... 41,00-48,00	DFT09... 49,00-68,00	DFT11... 69,00-82,00	
S	1	S	O	HP	KCU40	60	70	75	mm/r	0,03 - 0,05	0,04 - 0,06	0,05 - 0,08	0,06 - 0,10	0,08 - 0,13	0,08 - 0,13
			I	HP	KCU40										
	1	U	O	HP	KCU40	40	50	60	mm/r	0,03 - 0,05	0,04 - 0,06	0,05 - 0,08	0,06 - 0,10	0,08 - 0,13	0,08 - 0,13
			I	HP	KC7140										
	1	I	O	MD	KC7140	25	30	40	mm/r	0,03 - 0,05	0,04 - 0,06	0,05 - 0,08	0,06 - 0,10	0,08 - 0,13	0,08 - 0,13
			I	MD	KC7140										
	2	S	O	HP	KCU40	50	60	70	mm/r	0,03 - 0,05	0,04 - 0,06	0,05 - 0,08	0,06 - 0,10	0,08 - 0,13	0,08 - 0,13
			I	HP	KCU40										
		U	O	HP	KCU40	30	40	50	mm/r	0,03 - 0,05	0,04 - 0,06	0,05 - 0,08	0,06 - 0,10	0,08 - 0,13	0,08 - 0,13
			I	HP	KC7140										
	I	O	MD	KC7140	25	30	40	mm/r	0,03 - 0,05	0,04 - 0,06	0,05 - 0,08	0,06 - 0,10	0,08 - 0,13	0,08 - 0,13	
		I	MD	KC7140											
	3	S	O	HP	KCU40	70	80	90	mm/r	0,04 - 0,06	0,05 - 0,08	0,06 - 0,10	0,06 - 0,10	0,09 - 0,15	0,09 - 0,15
			I	HP	KCU40										
		U	O	HP	KCU40	50	60	70	mm/r	0,04 - 0,06	0,05 - 0,08	0,06 - 0,10	0,06 - 0,10	0,09 - 0,15	0,09 - 0,15
			I	HP	KC7140										
I	O	MD	KC7140	30	40	50	mm/r	0,04 - 0,06	0,05 - 0,08	0,06 - 0,10	0,06 - 0,10	0,09 - 0,15	0,09 - 0,15		
	I	MD	KC7140												
4	S	O	HP	KCU40	70	80	90	mm/r	0,04 - 0,06	0,05 - 0,08	0,06 - 0,10	0,06 - 0,10	0,09 - 0,15	0,09 - 0,15	
		I	HP	KCU40											
	U	O	HP	KCU40	50	60	70	mm/r	0,04 - 0,06	0,05 - 0,08	0,06 - 0,10	0,06 - 0,10	0,09 - 0,15	0,09 - 0,15	
		I	HP	KC7140											
I	O	MD	KC7140	30	40	50	mm/r	0,04 - 0,06	0,05 - 0,08	0,06 - 0,10	0,06 - 0,10	0,09 - 0,15	0,09 - 0,15		
	I	MD	KC7140												

Condition: S = Stable cutting conditions; U = Unstable cutting conditions; I = Interrupted cutting conditions

Pocket seat: I = Inboard insert; O = Outboard insert

DFT™ • Inch

Material Group	Condition	Pocket Seat	Geometry	Grade	Cutting Speed – vc Range – SFM			Inch						
					min	Starting Value	max	Recommended Feed Rate (f) by Diameter						
								Ø (in)	DFT03... .625-.969	DFT05... .984-1.250	DFT06... 1.313-1.563	DFT07... 1.625 - 1.875	DFT09... 1.938-2.125	DFT011... 2.750-3.250
P	S	O	MD	KCU25	1017	1066	1181	IPR	.002 - .004	.004 - .006	.004 - .007	.006 - .010	.007 - .012	.007 - .012
		I	MD	KC7140										
	U	O	MD	KCU25	656	705	754	IPR	.002 - .004	.004 - .006	.004 - .007	.006 - .010	.007 - .012	.007 - .012
		I	MD	KC7140										
	I	O	MD	KCU40	426	443	492	IPR	.002 - .004	.004 - .006	.004 - .007	.006 - .010	.007 - .012	.007 - .012
		I	MD	KC7140										
	S	O	HP	KCPK10	1017	1066	1181	IPR	.002 - .004	.004 - .006	.004 - .007	.006 - .010	.007 - .012	.007 - .012
		I	HP	KC7140										
	U	O	HP	KCU25	656	705	754	IPR	.002 - .004	.004 - .006	.004 - .007	.006 - .010	.007 - .012	.007 - .012
		I	HP	KC7140										
	I	O	HP	KCU40	426	443	492	IPR	.002 - .004	.004 - .006	.004 - .007	.006 - .010	.007 - .012	.007 - .012
		I	HP	KC7140										
	S	O	HP	KCPK10	853	935	1050	IPR	.002 - .004	.004 - .006	.004 - .007	.006 - .010	.007 - .012	.007 - .012
		I	HP	KC7140										
	U	O	HP	KCU25	590	640	722	IPR	.002 - .004	.004 - .006	.004 - .007	.006 - .010	.007 - .012	.007 - .012
		I	HP	KC7140										
	I	O	HP	KCU40	361	394	459	IPR	.002 - .004	.004 - .006	.004 - .007	.006 - .010	.007 - .012	.007 - .012
		I	HP	KC7140										
	S	O	HP	KCU25	722	820	984	IPR	.002 - .004	.004 - .006	.004 - .007	.006 - .010	.007 - .012	.007 - .012
		I	HP	KC7140										
	U	O	HP	KCU40	492	590	722	IPR	.002 - .004	.004 - .006	.004 - .007	.006 - .010	.007 - .012	.007 - .012
		I	HP	KC7140										
	I	O	HP	KC7140	295	361	459	IPR	.002 - .004	.004 - .006	.004 - .007	.006 - .010	.007 - .012	.007 - .012
		I	HP	KC7140										
S	O	HP	KCU25	590	656	722	IPR	.002 - .004	.003 - .005	.004 - .006	.004 - .007	.005 - .009	.005 - .009	
	I	HP	KC7140											
U	O	HP	KCU40	394	443	492	IPR	.002 - .004	.003 - .005	.004 - .006	.004 - .007	.005 - .009	.005 - .009	
	I	HP	KC7140											
I	O	HP	KC7140	230	279	328	IPR	.002 - .004	.003 - .005	.004 - .006	.004 - .007	.005 - .009	.005 - .009	
	I	HP	KC7140											
S	O	HP	KCU25	590	656	722	IPR	.002 - .004	.004 - .006	.004 - .007	.006 - .010	.007 - .012	.007 - .012	
	I	HP	KC7140											
U	O	HP	KCU40	394	443	492	IPR	.002 - .004	.004 - .006	.004 - .007	.006 - .010	.007 - .012	.007 - .012	
	I	HP	KC7140											
I	O	HP	KC7140	230	279	328	IPR	.002 - .004	.004 - .006	.004 - .007	.006 - .010	.007 - .012	.007 - .012	
	I	HP	KC7140											
M	S	O	MD	KC7140	492	623	754	IPR	.002 - .004	.003 - .005	.003 - .006	.004 - .007	.004 - .008	.004 - .008
		I	MD	KC7140										
	U	O	MD	KC7140	328	426	525	IPR	.002 - .004	.003 - .005	.003 - .006	.004 - .007	.004 - .008	.004 - .008
		I	MD	KC7140										
	I	O	MD	KC7140	197	262	328	IPR	.002 - .004	.003 - .005	.003 - .006	.004 - .007	.004 - .008	.004 - .008
		I	MD	KC7140										
	S	O	MD	KC7140	492	590	689	IPR	.002 - .004	.003 - .005	.003 - .006	.004 - .007	.004 - .008	.004 - .008
		I	MD	KC7140										
	U	O	MD	KC7140	328	426	525	IPR	.002 - .004	.003 - .005	.003 - .006	.004 - .007	.004 - .008	.004 - .008
		I	MD	KC7140										
	I	O	MD	KC7140	197	262	328	IPR	.002 - .004	.003 - .005	.003 - .006	.004 - .007	.004 - .008	.004 - .008
		I	MD	KC7140										
S	O	MD	KC7140	328	426	525	IPR	.002 - .004	.003 - .005	.003 - .006	.004 - .007	.004 - .008	.004 - .008	
	I	MD	KC7140											
U	O	MD	KC7140	262	361	459	IPR	.002 - .004	.003 - .005	.003 - .006	.004 - .007	.004 - .008	.004 - .008	
	I	MD	KC7140											
I	O	MD	KC7140	164	230	295	IPR	.002 - .004	.003 - .005	.003 - .006	.004 - .007	.004 - .008	.004 - .008	
	I	MD	KC7140											

Condition: S = Stable cutting conditions; U = Unstable cutting conditions; I = Interrupted cutting conditions
 Pocket seat: I = Inboard insert; O = Outboard insert



■ DFT™ • Inch

Indexable Drills

Material Group	Condition	Pocket Seat	Geometry	Grade	Cutting Speed – vc Range – SFM			Inch							
								Recommended Feed Rate (f) by Diameter							
					min	Starting Value	max	Ø (in)	DFT03... .625-.969	DFT05... .984-1.250	DFT06... 1.313-1.563	DFT07... 1.625-1.875	DFT09... 1.938-2.125	DFT011... 2.750-3.250	
K	1	S	O	HP	KCPK10	656	787	984	IPR	.003 - .005	.004 - .007	.006 - .010	.007 - .013	.008 - .015	.008 - .015
			I	HP	KCU40										
	1	U	O	HP	KCU25	394	508	656	IPR	.003 - .005	.004 - .007	.006 - .010	.007 - .013	.008 - .015	.008 - .015
				I	HP											KCU40
	1	I	O	HP	KC7225	262	328	410	IPR	.003 - .005	.004 - .007	.006 - .010	.007 - .013	.008 - .015	.008 - .015
				I	HP											KC7140
	2	S	O	HP	KCPK10	590	722	853	IPR	.003 - .005	.004 - .007	.006 - .010	.007 - .013	.008 - .015	.008 - .015
				I	HP											KCU40
	2	U	O	HP	KCU25	361	459	558	IPR	.003 - .005	.004 - .007	.006 - .010	.007 - .013	.008 - .015	.008 - .015
				I	HP											KCU40
	2	I	O	HP	KC7225	262	328	394	IPR	.003 - .005	.004 - .007	.006 - .010	.007 - .013	.008 - .015	.008 - .015
				I	HP											KC7140
3	S	O	HP	KCPK10	590	722	853	IPR	.003 - .005	.004 - .007	.006 - .010	.007 - .013	.008 - .015	.008 - .015	
			I	HP											KCU40
3	U	O	HP	KCU25	361	459	558	IPR	.003 - .005	.004 - .007	.006 - .010	.007 - .013	.008 - .015	.008 - .015	
			I	HP											KCU40
3	I	O	HP	KC7225	262	328	394	IPR	.003 - .005	.004 - .007	.006 - .010	.007 - .013	.008 - .015	.008 - .015	
			I	HP											KC7140
N	1	S	O	ST	KD1425	1312	1968	2624	IPR	.002 - .003	.003 - .004	.004 - .006	.005 - .006	.006 - .007	.006 - .007
			I	ST	KD1425										
	1	U	O	HP	KCU40	984	1312	1640	IPR	.002 - .003	.003 - .004	.004 - .006	.005 - .006	.006 - .007	.006 - .007
				I	HP											KCU40
	1	I	O	HP	KMF	656	984	1312	IPR	.002 - .003	.003 - .004	.004 - .006	.005 - .006	.006 - .007	.006 - .007
				I	HP											KMF
	2	S	O	ST	KD1425	1230	1804	2542	IPR	.002 - .003	.003 - .004	.004 - .006	.005 - .006	.006 - .007	.006 - .007
				I	ST											KD1425
	2	U	O	HP	KCU40	820	1148	1476	IPR	.002 - .003	.003 - .004	.004 - .006	.005 - .006	.006 - .007	.006 - .007
				I	HP											KCU40
	2	I	O	HP	KMF	574	820	1066	IPR	.002 - .003	.003 - .004	.004 - .006	.005 - .006	.006 - .007	.006 - .007
				I	HP											KMF
3	S	O	ST	KD1425	1148	1640	2132	IPR	.002 - .003	.003 - .004	.004 - .006	.005 - .006	.006 - .007	.006 - .007	
			I	ST											KD1425
3	U	O	HP	KCU40	820	1148	1476	IPR	.002 - .003	.003 - .004	.004 - .006	.005 - .006	.006 - .007	.006 - .007	
			I	HP											KCU40
3	I	O	HP	KMF	492	820	1148	IPR	.002 - .003	.003 - .004	.004 - .006	.005 - .006	.006 - .007	.006 - .007	
			I	HP											KMF
4	S	O	ST	KD1425	1312	1968	2624	IPR	.002 - .003	.003 - .004	.004 - .006	.005 - .006	.006 - .007	.006 - .007	
			I	ST											KD1425
4	U	O	HP	KCU40	820	1148	1476	IPR	.002 - .003	.003 - .004	.004 - .006	.005 - .006	.006 - .007	.006 - .007	
			I	HP											KCU40
4	I	O	HP	KMF	656	984	1312	IPR	.002 - .003	.003 - .004	.004 - .006	.005 - .006	.006 - .007	.006 - .007	
			I	HP											KMF
5	S	O	ST	KD1425	1312	1968	2624	IPR	.002 - .003	.003 - .004	.004 - .006	.005 - .006	.006 - .007	.006 - .007	
			I	ST											KD1425
5	U	O	HP	KCU40	820	1148	1476	IPR	.002 - .003	.003 - .004	.004 - .006	.005 - .006	.006 - .007	.006 - .007	
			I	HP											KCU40
5	I	O	HP	KMF	656	984	1312	IPR	.002 - .003	.003 - .004	.004 - .006	.005 - .006	.006 - .007	.006 - .007	
			I	HP											KMF

Condition: S = Stable cutting conditions; U = Unstable cutting conditions; I = Interrupted cutting conditions
Pocket seat: I = Inboard insert; O = Outboard insert

■ DFT™ • Inch

Material Group	Condition	Pocket Seat	Geometry	Grade	Cutting Speed – vc Range – SFM			Inch							
								Recommended Feed Rate (f) by Diameter							
					min	Starting Value	max	Ø (in)	DFT03... .625-.969	DFT05... .984-1.250	DFT06... 1.313-1.563	DFT07... 1.625-1.875	DFT09... 1.938-2.125	DFT011... 2.750-3.250	
S	1	S	O	HP	KCU40	197	230	246	IPR	.001 - .002	.002 - .002	.002 - .003	.002 - .004	.003 - .005	.003 - .005
			I	HP	KCU40										
	1	U	O	HP	KCU40	131	164	197	IPR	.001 - .002	.002 - .002	.002 - .003	.002 - .004	.003 - .005	.003 - .005
			I	HP	KC7140										
	1	I	O	MD	KC7140	82	98	131	IPR	.001 - .002	.002 - .002	.002 - .003	.002 - .004	.003 - .005	.003 - .005
			I	MD	KC7140										
	2	S	O	HP	KCU40	164	197	230	IPR	.001 - .002	.002 - .002	.002 - .003	.002 - .004	.003 - .005	.003 - .005
			I	HP	KCU40										
	2	U	O	HP	KCU40	98	131	164	IPR	.001 - .002	.002 - .002	.002 - .003	.002 - .004	.003 - .005	.003 - .005
			I	HP	KC7140										
	2	I	O	MD	KC7140	82	98	131	IPR	.001 - .002	.002 - .002	.002 - .003	.002 - .004	.003 - .005	.003 - .005
			I	MD	KC7140										
	3	S	O	HP	KCU40	230	262	295	IPR	.002 - .002	.002 - .004	.002 - .003	.002 - .004	.004 - .006	.004 - .006
			I	HP	KCU40										
	3	U	O	HP	KCU40	164	197	230	IPR	.002 - .002	.002 - .003	.002 - .004	.002 - .004	.004 - .006	.004 - .006
			I	HP	KC7140										
	3	I	O	MD	KC7140	98	131	164	IPR	.002 - .002	.002 - .003	.002 - .004	.002 - .004	.004 - .006	.004 - .006
			I	MD	KC7140										
	4	S	O	HP	KCU40	230	262	295	IPR	.002 - .002	.002 - .003	.002 - .004	.002 - .004	.004 - .006	.004 - .006
			I	HP	KCU40										
4	U	O	HP	KCU40	164	197	230	IPR	.002 - .002	.002 - .003	.002 - .004	.002 - .004	.004 - .006	.004 - .006	
		I	HP	KC7140											
4	I	O	MD	KC7140	98	131	164	IPR	.002 - .002	.002 - .003	.002 - .004	.002 - .004	.004 - .006	.004 - .006	
		I	MD	KC7140											

Condition: S = Stable cutting conditions; U = Unstable cutting conditions; I = Interrupted cutting conditions
 Pocket seat: I = Inboard insert; O = Outboard insert





HTS Series Indexable Deep-Hole Drilling System

Primary Application

HTS series indexable drills are designed for deep-hole drilling up to 10 x D in steel, stainless steel, ductile iron, cast iron, and non-ferrous materials. The three HTS systems — HTS-C, HTS, HTS-R — cover a diameter range of .787–10.629" (20–270mm).

Features and Benefits

HTS-C Indexable Drill System

- Diameter range .750–1.750" (20–45mm) in 5 x D and 8 x D ratios.
- Used with pilot drills for best centering possibilities.
- Trigon-shaped inboard insert with three cutting edges, available in various geometries and grades.
- Up to four economic cutting edges with the squared-outboard insert.
- Variable flute helix provides excellent chip evacuation.
- Customized body design available.

HTS Indexable Drill System

- Large diameter range from 1.750–10.629" (45–270mm) with standard drill heads.
- Drill Fix™ DFT™ trigon inserts as outboard and inboard insert offer the best centering capabilities as well as square-outboard insert cartridges for increased surface and hole quality.
- Various insert geometries and grades available as standard.
- Adjust drilling depth and diameter range with suitable extensions and reducers.
- Diameter adjustment by shortening outer cartridge.
- Customized drilling heads up to 21.259" (540mm).

HTS-R Indexable Drill System

- Modular system that uses drill heads equipped with DFR™ insert cartridges.
- Five drill heads cover the diameter range 1.575–2.165" (40–55mm).
- Drill Fix™ DFR rectangular inboard and outboard inserts offer the highest feed rates at small diameters.
- Various insert geometries and grades available as standard.
- Adjustable drilling depth and diameters by using extensions and reducers.
- Diameter adjustment by shortening outer cartridge.



HTS-C Indexable Drill System

HTS-C indexable drills are designed for drilling 5 x D and 8 x D in steel, stainless steel, ductile iron, cast iron, and non-ferrous materials. The HTS-C covers a diameter range from 20–45mm (.750–1.750").

When using reduced feeds and cutting speeds, HTS-C can easily be applied on older or low-power machines.

Features and Benefits

Productivity

- Achieve high stability and hole straightness due to the pilot drill that offers the best centering capabilities.
- Benefit from flute helix design that provides excellent chip evacuation resulting in long tool body life.
- Suitable for older or low-power machines due to reduced feed and cutting speed capabilities.

Versatility

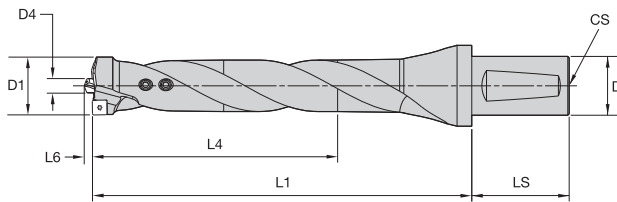
- Diameter range of 20–45mm (.750–1.750").
- 5 x D and 8 x D L/D ratio as standard.
- Inserts and pilot drills can be applied in various diameters and L/D ratios.
- Carbide and HSS pilot drills available for optimized productivity.

Customization

- Intermediate diameters available.
- Engineered solutions L/D up to 15 x D available.
- Carbide guidepads available.



- Drills shipped with insert, clamping, and adjusting screws and Torx wrench.
- Order pilot drills separately; see page J57.
- Order inserts separately; see pages J98–J103.



■ WN/WD Shank • 5 x D • Metric

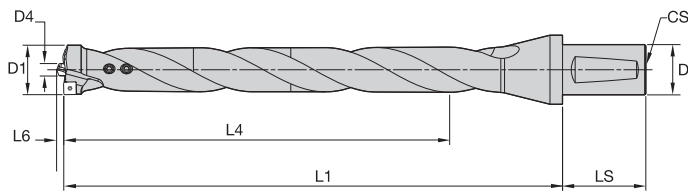
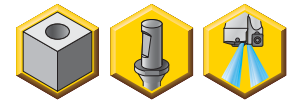


catalog number	D1	D	D4	L1	L4 max	L6	exterior insert	interior insert	adjusting screw	clamping screw	insert screw	wrench	Torx size
	mm	in											
3.75200R215	20,00	.787	20,0	5,0	130,0	100,0	SPGX / SPHX0602..	WOGX0302..	128.406	191.720	192.432	170.028	T8
3.75210R215	21,00	.827	20,0	5,0	130,0	105,0	SPGX / SPHX0602..	WOGX0302..	128.406	191.720	192.432	170.028	T8
3.75220R215	22,00	.866	20,0	5,0	144,0	110,0	SPGX / SPHX0602..	WOGX0302..	128.408	191.720	192.432	170.028	T8
3.75230R215	23,00	.906	20,0	5,0	144,0	115,0	SPGX / SPHX0602..	WOGX0302..	128.408	192.057	192.432	170.028	T8
3.75240R215	24,00	.945	20,0	5,0	144,0	120,0	SPGX / SPHX0602..	WOGX0302..	128.408	192.057	192.432	170.028	T8
3.75250R215	25,00	.984	25,0	6,0	164,0	125,0	SPGX / SPHX0703..	DFT0303..	128.508	190.114	192.432	170.028	T8
3.75260R215	26,00	1.024	25,0	6,0	164,0	130,0	SPGX / SPHX0703..	DFT0303..	128.508	190.114	192.432	170.028	T8
3.75270R215	27,00	1.063	25,0	6,0	164,0	135,0	SPGX / SPHX0703..	DFT0303..	128.510	190.114	192.432	170.028	T8
3.75280R215	28,00	1.102	25,0	6,0	184,0	140,0	SPGX / SPHX0703..	DFT0303..	128.510	190.125	192.432	170.028	T8
3.75290R215	29,00	1.142	25,0	6,0	184,0	145,0	SPGX / SPHX0703..	DFT0303..	128.510	190.125	192.432	170.028	T8
3.75300R215	30,00	1.181	25,0	6,0	184,0	150,0	SPGX / SPHX0703..	DFT0303..	128.510	190.125	192.432	170.028	T8
3.75310R215	31,00	1.221	32,0	8,0	206,0	155,0	SPGX / SPHX0903..	DFT05T3..	128.610	SS03M012	191.924	170.024	T9
3.75320R215	32,00	1.260	32,0	8,0	206,0	160,0	SPGX / SPHX0903..	DFT05T3..	128.610	SS03M012	191.924	170.024	T9
3.75330R215	33,00	1.299	32,0	8,0	206,0	165,0	SPGX / SPHX0903..	DFT05T3..	128.610	SS03M012	191.924	170.024	T9
3.75340R215	34,00	1.339	32,0	8,0	206,0	170,0	SPGX / SPHX0903..	DFT05T3..	128.612	SS03M012	191.924	170.024	T9
3.75350R215	35,00	1.378	32,0	8,0	228,0	175,0	SPGX / SPHX0903..	DFT05T3..	128.612	SS03M012	191.924	170.024	T9
3.75360R215	36,00	1.417	32,0	8,0	228,0	180,0	SPGX / SPHX0903..	DFT05T3..	128.612	SS03M012	191.924	170.024	T9
3.75370R215	37,00	1.457	32,0	8,0	228,0	185,0	SPGX / SPHX0903..	DFT05T3..	128.612	SS03M012	191.924	170.024	T9
3.75380R215	38,00	1.496	32,0	8,0	228,0	190,0	SPGX / SPHX0903..	DFT05T3..	128.612	SS03M012	191.924	170.024	T9
3.75390R215	39,00	1.535	32,0	8,0	228,0	195,0	SPGX / SPHX0903..	DFT05T3..	128.612	SS03M012	191.924	170.024	T9
3.75400R215	40,00	1.575	40,0	10,0	258,0	200,0	SPGX / SPHX1204..	DFT06T3..	128.812	SS03M014	191.916	170.025	T15
3.75410R215	41,00	1.614	40,0	10,0	258,0	205,0	SPGX / SPHX1204..	DFT06T3..	128.812	SS03M014	191.916	170.025	T15
3.75420R215	42,00	1.654	40,0	10,0	258,0	210,0	SPGX / SPHX1204..	DFT06T3..	128.812	SS03M014	191.916	170.025	T15
3.75430R215	43,00	1.693	40,0	10,0	258,0	215,0	SPGX / SPHX1204..	DFT06T3..	128.816	SS03M014	191.916	170.025	T15
3.75440R215	44,00	1.732	40,0	10,0	258,0	220,0	SPGX / SPHX1204..	DFT06T3..	128.816	SS03M014	191.916	170.025	T15
3.75450R215	45,00	1.771	40,0	10,0	258,0	225,0	SPGX / SPHX1204..	DFT06T3..	128.816	SS03M014	191.916	170.025	T15

WARNING
 During through-hole operations, a slug or disc is produced as the tool breaks through the workpiece. When the drill is stationary and the workpiece is rotating, this slug may be hurled from the chuck by centrifugal force. Provide adequate shielding to protect bystanders.

D	LS	CS
20	45	4
25	45	5
32	58	6
40	68	6

- Drills shipped with insert, clamping, and adjusting screws and Torx wrench.
- Order pilot drills separately; see page J57.
- Order inserts separately; see pages J98–J103.



■ WN/WD Shank • 8 x D • Metric

Indexable Drills



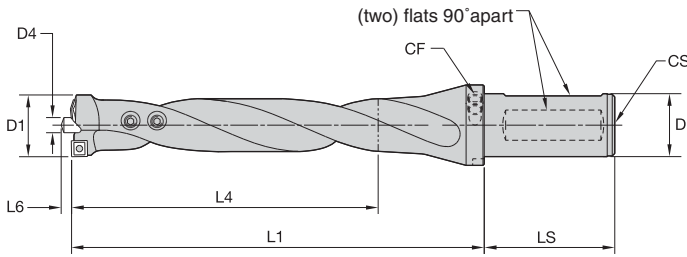
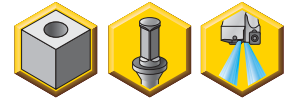
catalog number	D1		D	D4	L1	L4 max	L6	exterior insert	interior insert	adjusting screw	clamping screw	insert screw	wrench	Torx size
	mm	in												
3.75200R218	20,00	.787	20	5,0	202,0	160,0	2,3	SPGX / SPHX0602..	WOGX0302..	128.406	191.720	192.432	170.028	T8
3.75210R218	21,00	.827	20	5,0	202,0	168,0	2,3	SPGX / SPHX0602..	WOGX0302..	128.406	191.720	192.432	170.028	T8
3.75220R218	22,00	.866	20	5,0	224,0	176,0	2,5	SPGX / SPHX0602..	WOGX0302..	128.408	191.720	192.432	170.028	T8
3.75230R218	23,00	.906	20	5,0	224,0	184,0	2,5	SPGX / SPHX0602..	WOGX0302..	128.408	192.057	192.432	170.028	T8
3.75240R218	24,00	.945	20	5,0	224,0	192,0	2,5	SPGX / SPHX0602..	WOGX0302..	128.408	192.057	192.432	170.028	T8
3.75250R218	25,00	.984	25	6,0	250,0	200,0	3,0	SPGX / SPHX0703..	DFT0303..	128.508	190.114	192.432	170.028	T8
3.75260R218	26,00	1.024	25	6,0	250,0	208,0	3,0	SPGX / SPHX0703..	DFT0303..	128.508	190.114	192.432	170.028	T8
3.75270R218	27,00	1.063	25	6,0	250,0	216,0	3,0	SPGX / SPHX0703..	DFT0303..	128.510	190.114	192.432	170.028	T8
3.75280R218	28,00	1.102	25	6,0	279,0	224,0	3,2	SPGX / SPHX0703..	DFT0303..	128.510	190.125	192.432	170.028	T8
3.75290R218	29,00	1.142	25	6,0	279,0	232,0	3,2	SPGX / SPHX0703..	DFT0303..	128.510	190.125	192.432	170.028	T8
3.75300R218	30,00	1.181	25	6,0	279,0	240,0	3,2	SPGX / SPHX0703..	DFT0303..	128.510	190.125	192.432	170.028	T8
3.75310R218	31,00	1.221	32	8,0	316,0	248,0	4,0	SPGX / SPHX0903..	DFT05T3..	128.610	SS03M012	191.924	170.024	T9
3.75320R218	32,00	1.260	32	8,0	316,0	256,0	4,0	SPGX / SPHX0903..	DFT05T3..	128.610	SS03M012	191.924	170.024	T9
3.75330R218	33,00	1.299	32	8,0	316,0	264,0	4,0	SPGX / SPHX0903..	DFT05T3..	128.610	SS03M012	191.924	170.024	T9
3.75340R218	34,00	1.339	32	8,0	316,0	272,0	4,0	SPGX / SPHX0903..	DFT05T3..	128.612	SS03M012	191.924	170.024	T9
3.75350R218	35,00	1.378	32	8,0	351,0	280,0	4,0	SPGX / SPHX0903..	DFT05T3..	128.612	SS03M012	191.924	170.024	T9
3.75360R218	36,00	1.417	32	8,0	351,0	288,0	4,0	SPGX / SPHX0903..	DFT05T3..	128.612	SS03M012	191.924	170.024	T9
3.75370R218	37,00	1.457	32	8,0	351,0	296,0	4,0	SPGX / SPHX0903..	DFT05T3..	128.612	SS03M012	191.924	170.024	T9
3.75380R218	38,00	1.496	32	8,0	351,0	304,0	4,0	SPGX / SPHX0903..	DFT05T3..	128.612	SS03M012	191.924	170.024	T9
3.75390R218	39,00	1.535	32	8,0	351,0	312,0	4,0	SPGX / SPHX0903..	DFT05T3..	128.612	SS03M012	191.924	170.024	T9
3.75400R218	40,00	1.575	40	10,0	397,0	320,0	4,5	SPGX / SPHX1204..	DFT06T3..	128.812	SS03M014	191.916	170.025	T15
3.75410R218	41,00	1.614	40	10,0	397,0	328,0	4,5	SPGX / SPHX1204..	DFT06T3..	128.812	SS03M014	191.916	170.025	T15
3.75420R218	42,00	1.654	40	10,0	397,0	336,0	4,5	SPGX / SPHX1204..	DFT06T3..	128.812	SS03M014	191.916	170.025	T15
3.75430R218	43,00	1.693	40	10,0	397,0	344,0	4,5	SPGX / SPHX1204..	DFT06T3..	128.816	SS03M014	191.916	170.025	T15
3.75440R218	44,00	1.732	40	10,0	397,0	352,0	4,5	SPGX / SPHX1204..	DFT06T3..	128.812	SS03M014	191.916	170.025	T15
3.75450R218	45,00	1.771	40	10,0	397,0	360,0	4,5	SPGX / SPHX1204..	DFT06T3..	128.816	SS03M014	191.916	170.025	T15

WARNING

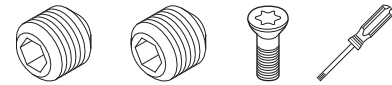
During through-hole operations, a slug or disc is produced as the tool breaks through the workpiece. When the drill is stationary and the workpiece is rotating, this slug may be hurled from the chuck by centrifugal force. Provide adequate shielding to protect bystanders.

D	LS	CS
20	45	4
25	45	5
32	58	6
40	68	6

- Drills shipped with insert, clamping, and adjusting screws and Torx wrench.
- Order pilot drills separately; see page J57.
- Order inserts separately; see pages J98–J103.



■ Flanged Shank • 5 x D • Inch



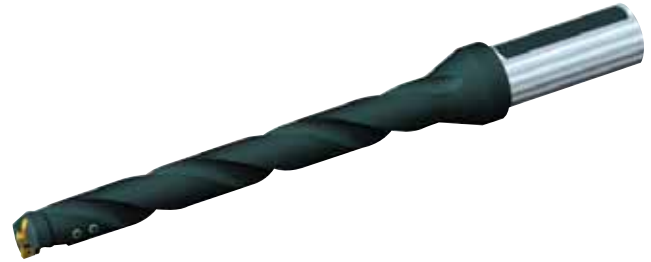
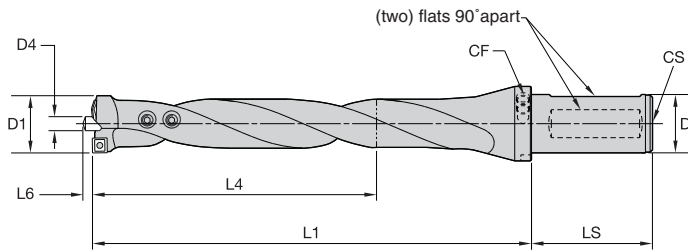
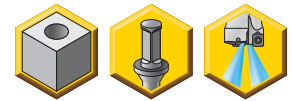
catalog number	D1		D	D4	L1	L4		exterior insert	interior insert	adjusting screw	clamping screw	insert screw	Torx size
	in	mm				max	L6						
HTSC0750R5SSF125	.750	19,05	1.25	.16	5.13	3.75	.07	SPGX0603..	DFT0303..	128.406	191.720	MS1152	170.023 T7
HTSC0813R5SSF125	.813	20,64	1.25	.16	5.13	4.06	.07	SPGX0603..	DFT0303..	128.406	191.720	MS1152	170.023 T7
HTSC0875R5SSF125	.875	22,23	1.25	.20	5.75	4.38	.08	SPGX0603..	DFT0303..	128.408	191.720	MS1152	170.023 T7
HTSC0938R5SSF125	.938	23,81	1.25	.20	5.75	4.69	.08	SPGX0603..	DFT0303..	128.408	191.720	MS1152	170.023 T7
HTSC1000R5SSF125	1.000	25,40	1.25	.24	6.50	5.00	.12	SPGX / SPHX0703..	DFT0303..	128.508	190.114	192.432	170.028 T8
HTSC1063R5SSF150	1.063	26,99	1.50	.24	6.50	5.31	.12	SPGX / SPHX0703..	DFT0303..	128.508	190.114	192.432	170.028 T8
HTSC1125R5SSF150	1.125	28,58	1.50	.24	7.25	5.63	.12	SPGX / SPHX0703..	DFT0303..	128.510	190.125	192.432	170.028 T8
HTSC1188R5SSF150	1.188	30,16	1.50	.24	7.25	5.94	.12	SPGX / SPHX0703..	DFT0303..	128.510	190.125	192.432	170.028 T8
HTSC1250R5SSF150	1.250	28,58	1.50	.32	8.13	6.25	.16	SPGX0903..	DFT05T3..	128.610	SS03M012	191.924	170.024 T9
HTSC1313R5SSF200	1.313	33,34	2.00	.32	8.13	6.56	.16	SPGX0903..	DFT05T3..	128.610	SS03M012	191.924	170.024 T9
HTSC1375R5SSF200	1.375	34,93	2.00	.32	9.00	6.88	.16	SPGX0903..	DFT05T3..	128.612	SS03M012	191.924	170.024 T9
HTSC1438R5SSF200	1.438	36,51	2.00	.32	9.00	7.19	.16	SPGX0903..	DFT05T3..	128.612	SS03M012	191.924	170.024 T9
HTSC1500R5SSF200	1.500	38,10	2.00	.32	9.00	7.50	.16	SPGX0903..	DFT05T3..	128.612	SS03M012	191.924	170.024 T9
HTSC1563R5SSF200	1.563	39,69	2.00	.39	10.25	7.81	.18	SPGX / SPHX1204..	DFT06T3..	128.812	SS03M014	191.916	170.025 T15
HTSC1625R5SSF200	1.625	41,28	2.00	.39	10.25	8.13	.18	SPGX / SPHX1204..	DFT06T3..	128.812	SS03M014	191.916	170.025 T15
HTSC1688R5SSF200	1.688	42,86	2.00	.39	10.25	8.44	.18	SPGX / SPHX1204..	DFT06T3..	128.816	SS03M014	191.916	170.025 T15
HTSC1750R5SSF200	1.750	44,45	2.00	.39	10.25	8.75	.18	SPGX / SPHX1204..	DFT06T3..	128.816	SS03M014	191.916	170.025 T15

WARNING

During through-hole operations, a slug or disc is produced as the tool breaks through the workpiece. When the drill is stationary and the workpiece is rotating, this slug may be hurled from the chuck by centrifugal force. Provide adequate shielding to protect bystanders.

D	LS	CF	CS
1.250	3.25	1/8-27 NPT	1/4-18NPT
1.500	3.75	1/8-27 NPT	1/4-18NPT
2.000	4.00	1/8-27 NPT	1/4-18NPT

- Drills shipped with insert, clamping, and adjusting screws and Torx wrench.
- Order pilot drills separately; see page J57.
- Order inserts separately; see pages J98–J103.



■ **Flanged Shank • 8 x D • Inch**

Indexable Drills

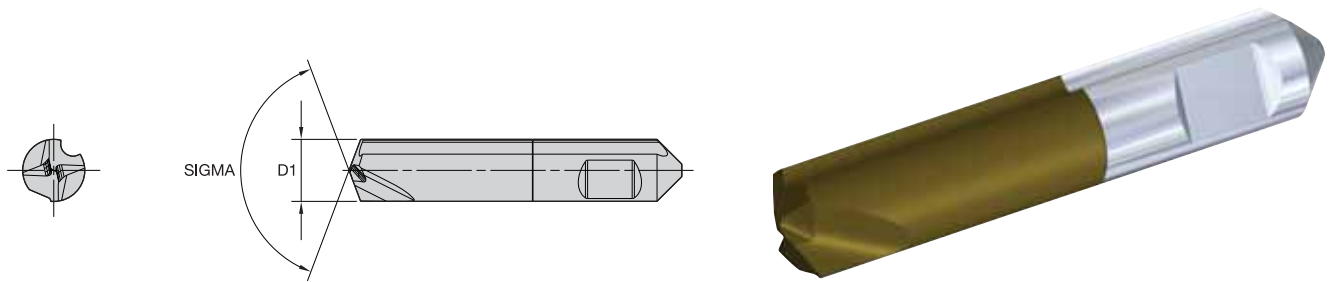
catalog number	D1		D	D4	L1	L4 max	L6	exterior insert	interior insert	adjusting screw	clamping screw	insert screw	wrench	Torx size
	in	mm												
HTSC0750R8SSF125	.750	19,05	1.250	.16	8.00	6.00	.07	SPGX0603..	DFT0303..	128.406	191.720	MS1152	170.023	T7
HTSC0813R8SSF125	.813	20,64	1.250	.16	8.00	6.50	.07	SPGX0603..	DFT0303..	128.406	191.720	MS1152	170.023	T7
HTSC0875R8SSF125	.875	22,23	1.250	.20	8.88	7.00	.08	SPGX0603..	DFT0303..	128.408	191.720	MS1152	170.023	T7
HTSC0938R8SSF125	.938	23,81	1.250	.20	8.88	7.50	.08	SPGX0603..	DFT0303..	128.408	191.720	MS1152	170.023	T7
HTSC1000R8SSF125	1.000	25,40	1.250	.24	9.88	8.00	.12	SPGX / SPHX0703..	DFT0303..	128.508	190.114	192.432	170.028	T8
HTSC1063R8SSF150	1.063	26,99	1.500	.24	9.88	8.50	.12	SPGX / SPHX0703..	DFT0303..	128.508	190.114	192.432	170.028	T8
HTSC1125R8SSF150	1.125	28,58	1.500	.24	11.00	9.00	.12	SPGX / SPHX0703..	DFT0303..	128.510	190.125	192.432	170.028	T8
HTSC1188R8SSF150	1.188	30,16	1.500	.24	11.00	9.50	.12	SPGX / SPHX0703..	DFT0303..	128.510	190.125	192.432	170.028	T8
HTSC1250R8SSF150	1.250	31,75	1.500	.32	12.50	10.00	.16	SPGX0903..	DFT05T3..	128.610	SS03M012	191.924	170.024	T9
HTSC1313R8SSF200	1.313	33,34	2.000	.32	12.50	10.50	.16	SPGX0903..	DFT05T3..	128.610	SS03M012	191.924	170.024	T9
HTSC1375R8SSF200	1.375	34,93	2.000	.32	13.88	11.00	.16	SPGX0903..	DFT05T3..	128.612	SS03M012	191.924	170.024	T9
HTSC1438R8SSF200	1.438	36,51	2.000	.32	13.88	11.50	.16	SPGX0903..	DFT05T3..	128.612	SS03M012	191.924	170.024	T9
HTSC1500R8SSF200	1.500	38,10	2.000	.32	13.88	12.00	.16	SPGX0903..	DFT05T3..	128.612	SS03M012	191.924	170.024	T9
HTSC1563R8SSF200	1.563	39,69	2.000	.39	15.63	12.50	.18	SPGX / SPHX1204..	DFT06T3..	128.812	SS03M014	191.916	170.025	T15
HTSC1625R8SSF200	1.625	41,28	2.000	.39	15.63	13.00	.18	SPGX / SPHX1204..	DFT06T3..	128.812	SS03M014	191.916	170.025	T15
HTSC1688R8SSF200	1.688	42,86	2.000	.39	15.63	13.50	.18	SPGX / SPHX1204..	DFT06T3..	128.816	SS03M014	191.916	170.025	T15
HTSC1750R8SSF200	1.750	44,45	2.000	.39	15.63	14.00	.18	SPGX / SPHX1204..	DFT06T3..	128.816	SS03M014	191.916	170.025	T15

WARNING

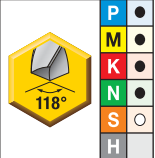
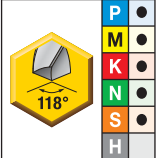
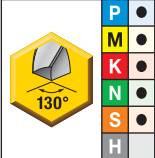
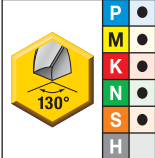
During through-hole operations, a slug or disc is produced as the tool breaks through the workpiece. When the drill is stationary and the workpiece is rotating, this slug may be hurled from the chuck by centrifugal force. Provide adequate shielding to protect bystanders.

D	LS	CF	CS
1.250	3.25	1/8-27 NPT	1/4-18NPT
1.500	3.75	1/8-27 NPT	1/4-18NPT
2.000	4.00	1/8-27 NPT	1/4-18NPT

• Use in metric and inch drill bodies; see pages J53–J56.



■ HTS-C • Pilot Drills

 high-speed steel uncoated A30		 high-speed steel coated AS3		 solid carbide uncoated G13		 solid carbide coated CS3		D1	
mm	in	mm	in	mm	in	mm	in	mm	in
B503S04000		B503S04000		—		—		4,00	.158
B503S05000		B503S05000		—		—		5,00	.197
B503S06000		B503S06000		—		—		6,00	.236
B503S08000		B503S08000		—		—		8,00	.315
B503S10000		B503S10000		—		—		10,00	.394
—		—		B504S04000		B504S04000		4,00	.158
—		—		B504S05000		B504S05000		5,00	.197
—		—		B504S06000		B504S06000		6,00	.236
—		—		B504S08000		B504S08000		8,00	.315
—		—		B504S10000		B504S10000		10,00	.394



■ Diameter Reference for Pilot Drill

D1		reference drill diameter			
		min		max	
mm	in	mm	in	mm	in
4	.158	—	.750	—	.812
5	.197	20	.787	24	.945
6	.236	25	.984	30	1.181
8	.315	31	1.220	39	1.535
10	.394	40	1.575	45	1.772

■ HTS-C • Metric

Material Group	Condition	Pocket Seat	Geometry	Grade	Cutting Speed – vc Range – m/min		Metric						
					min	Starting Value	max	Recommended Feed Rate (f) by Diameter					
								Ø (mm)	20,00-24,00	25,00-30,00	31,00-39,00	40,00-45,00	
P	1	S	O	SPHX...R-20	KC7215	107	200	244	mm/r	0,04 - 0,06	0,05 - 0,07	0,08 - 0,12	0,08 - 0,12
			I	DFT-HP	KCU40								
	1	U	O	SPHX...R-20	KC7140	74	140	170	mm/r	0,04 - 0,06	0,05 - 0,07	0,08 - 0,12	0,08 - 0,12
				I	DFT-HP									KCU40
	2	S	O	SPHX...R-20	KC7215	101	170	232	mm/r	0,04 - 0,06	0,05 - 0,07	0,08 - 0,12	0,10 - 0,16
				I	DFT-HP									KCU40
		U	O	SPHX...R-20	KC7140	69	119	158	mm/r	0,04 - 0,06	0,05 - 0,07	0,08 - 0,12	0,10 - 0,16
				I	DFT-HP									KC7140
	3	S	O	SPHX...R-20	KC7215	96	150	220	mm/r	0,05 - 0,08	0,06 - 0,1	0,08 - 0,13	0,09 - 0,17
				I	DFT-HP									KCU40
		U	O	SPHX...R-20	KC7140	64	105	146	mm/r	0,05 - 0,08	0,06 - 0,1	0,08 - 0,13	0,09 - 0,17
				I	DFT-HP									KC7140
	4	S	O	SPHX...R-20	KC7215	75	130	172	mm/r	0,04 - 0,07	0,05 - 0,08	0,07 - 0,12	0,08 - 0,13
				I	DFT-HP									KCU40
		U	O	SPHX...R-20	KC7140	52	89	120	mm/r	0,04 - 0,07	0,05 - 0,08	0,07 - 0,12	0,08 - 0,13
				I	DFT-HP									KC7140
	5	S	O	SPHX...R-20	KC7215	58	100	132	mm/r	0,04 - 0,06	0,04 - 0,07	0,06 - 0,10	0,06 - 0,11
				I	DFT-HP									KCU40
U		O	SPHX...R-20	KC7140	35	60	79	mm/r	0,04 - 0,06	0,04 - 0,07	0,06 - 0,10	0,06 - 0,11	
			I	DFT-HP									KC7140
6	S	O	SPHX...R-20	KC7215	75	95	172	mm/r	0,04 - 0,06	0,05 - 0,07	0,06 - 0,10	0,07 - 0,11	
			I	DFT-HP									KCU40
	U	O	SPHX...R-20	KC7140	52	75	120	mm/r	0,04 - 0,06	0,05 - 0,07	0,06 - 0,10	0,07 - 0,11	
			I	DFT-HP									KC7140
M	1	S	O	SPGX...-31	KC7140	55	112	137	mm/r	0,03 - 0,05	0,03 - 0,05	0,05 - 0,07	0,05 - 0,07
			I	DFT-HP	KC7140								
		U	O	SPGX...-31	KC7140	41	84	103	mm/r	0,03 - 0,05	0,03 - 0,05	0,05 - 0,07	0,05 - 0,07
				I	DFT-HP									KC7140
	2	S	O	SPGX...-31	KC7140	55	101	116	mm/r	0,03 - 0,05	0,03 - 0,05	0,05 - 0,07	0,05 - 0,07
				I	DFT-HP									KC7140
		U	O	SPGX...-31	KC7140	41	76	87	mm/r	0,03 - 0,05	0,03 - 0,05	0,05 - 0,07	0,05 - 0,07
				I	DFT-HP									KC7140
	3	S	O	SPGX...-31	KC7140	55	90	107	mm/r	0,03 - 0,05	0,03 - 0,05	0,05 - 0,07	0,05 - 0,07
				I	DFT-HP									KC7140
		U	O	SPGX...-31	KC7140	41	67	80	mm/r	0,03 - 0,05	0,03 - 0,05	0,05 - 0,07	0,05 - 0,07
				I	DFT-HP									KC7140

Condition: S = Stable cutting conditions; U = Unstable cutting conditions; I = Interrupted cutting conditions
Pocket seat: I = Inboard insert; O = Outboard insert

Indexable Drills

HTS-C • Metric

Material Group	Condition	Pocket Seat	Geometry	Grade	Cutting Speed – vc		Metric						
					Range – m/min		Recommended Feed Rate (f) by Diameter						
					min	Starting Value	max	Ø (mm)	20,00-24,00	25,00-30,00	31,00-39,00	40,00-45,00	
K	1	O	SPHX...R-21	KC7215	106	190	230	mm/r	0,08 - 0,13	0,09 - 0,15	0,10 - 0,16	0,12 - 0,20	
		I	DFT-GD	KCU40									
	U	O	SPHX...R-21	KC7215	74	130	160	mm/r	0,08 - 0,13	0,09 - 0,15	0,10 - 0,16	0,12 - 0,20	
		I	DFT-GD	KCU40									
	2	S	O	SPHX...R-21	KC7215	106	171	230	mm/r	0,08 - 0,13	0,09 - 0,15	0,10 - 0,16	0,12 - 0,20
		I	DFT-GD	KCU40									
	U	O	SPHX...R-21	KC7215	74	117	160	mm/r	0,08 - 0,13	0,09 - 0,15	0,10 - 0,16	0,12 - 0,20	
		I	DFT-GD	KCU40									
	3	S	O	SPHX...R-21	KC7215	101	152	218	mm/r	0,06 - 0,13	0,08 - 0,15	0,10 - 0,16	0,11 - 0,2
I		DFT-GD	KCU40										
U	O	SPHX...R-21	KC7215	67	104	145	mm/r	0,60 - 0,13	0,08 - 0,15	0,10 - 0,16	0,11 - 0,2		
	I	DFT-GD	KCU40										
N	1	O	SPHX...R-22	KM1	183	294	457	mm/r	0,04 - 0,06	0,04 - 0,06	0,09 - 0,12	0,10 - 0,14	
		I	DFT-HP	KMF									
	U	O	SPHX...R-20	KM1	121	196	304	mm/r	0,04 - 0,06	0,04 - 0,06	0,09 - 0,12	0,10 - 0,14	
		I	DFT-HP	KMF									
	2	S	O	SPHX...R-22	KM1	183	365	457	mm/r	0,04 - 0,06	0,04 - 0,06	0,09 - 0,12	0,10 - 0,14
		I	DFT-HP	KMF									
	U	O	SPHX...R-22	KM1	121	176	304	mm/r	0,04 - 0,06	0,04 - 0,06	0,09 - 0,12	0,10 - 0,14	
		I	DFT-HP	KMF									
	3	S	O	SPHX...R-22	KM1	113	235	283	mm/r	0,04 - 0,06	0,04 - 0,06	0,09 - 0,12	0,10 - 0,14
		I	DFT-HP	KMF									
	U	O	SPHX...R-22	KM1	79	157	198	mm/r	0,04 - 0,06	0,04 - 0,06	0,09 - 0,12	0,10 - 0,14	
		I	DFT-HP	KMF									
	4	S	O	SPHX...R-22	KM1	113	235	283	mm/r	0,04 - 0,06	0,04 - 0,06	0,09 - 0,12	0,10 - 0,14
		I	DFT-HP	KMF									
	U	O	SPHX...R-22	KM1	79	157	198	mm/r	0,04 - 0,06	0,04 - 0,06	0,09 - 0,12	0,10 - 0,14	
I		DFT-HP	KMF										
5	S	O	SPHX...R-20	KM1	137	265	360	mm/r	0,04 - 0,06	0,04 - 0,06	0,09 - 0,12	0,10 - 0,14	
	I	DFT-HP	KMF										
U	O	SPHX...R-20	KM1	92	176	242	mm/r	0,04 - 0,06	0,04 - 0,06	0,09 - 0,12	0,10 - 0,14		
	I	DFT-HP	KMF										
S	1	O	SPGX...-31	KC7215	21	40	49	mm/r	0,03 - 0,05	0,03 - 0,05	0,04 - 0,06	0,04 - 0,06	
		I	DFT-GD	KCU40									
	U	O	SPGX...-31	KC7215	18	30	37	mm/r	0,03 - 0,05	0,03 - 0,05	0,04 - 0,06	0,04 - 0,06	
		I	DFT-GD	KC7140									
	2	S	O	SPGX...-31	KC7215	19	35	42	mm/r	0,03 - 0,05	0,03 - 0,05	0,04 - 0,06	0,04 - 0,06
		I	DFT-GD	KCU40									
U	O	SPGX...-31	KC7215	18	25	34	mm/r	0,03 - 0,05	0,03 - 0,05	0,04 - 0,06	0,04 - 0,06		
	I	DFT-GD	KC7140										

Condition: S = Stable cutting conditions; U = Unstable cutting conditions; I = Interrupted cutting conditions
 Pocket seat: I = Inboard insert; O = Outboard insert



■ HTS-C • Inch

Indexable Drills

Material Group	Condition	Pocket Seat	Geometry	Grade	Cutting Speed – vc Range – SFM			Inch					
					min	Starting Value	max	Recommended Feed Rate (f) by Diameter					
								Ø (in)	.750-.945	.984-1.345	1.313-1.688	1.625-2.000	
P	1	S	O	SPHX...R-20	KC7215	350	656	800	IPR	.002 - .002	.002 - .003	.003 - .005	.003 - .005
			I	DFT-HP	KCU40								
	U	O	SPHX...R-20	KC7140	244	459	558	IPR	.002 - .002	.002 - .003	.003 - .005	.003 - .005	
			I	DFT-HP									KCU40
	2	S	O	SPHX...R-20	KC7215	333	558	760	IPR	.002 - .002	.002 - .003	.003 - .005	.004 - .006
				I	DFT-HP									KCU40
	U	O	SPHX...R-20	KC7140	226	390	517	IPR	.002 - .002	.002 - .003	.003 - .005	.004 - .006	
			I	DFT-HP									KC7140
	3	S	O	SPHX...R-20	KC7215	316	492	722	IPR	.002 - .003	.002 - .003	.003 - .005	.004 - .007
				I	DFT-HP									KCU40
	U	O	SPHX...R-20	KC7140	210	345	479	IPR	.002 - .003	.002 - .003	.003 - .005	.004 - .007	
			I	DFT-HP									KC7140
	4	S	O	SPHX...R-20	KC7215	246	427	563	IPR	.002 - .003	.002 - .003	.003 - .005	.003 - .005
				I	DFT-HP									KCU40
	U	O	SPHX...R-20	KC7140	172	293	393	IPR	.002 - .003	.002 - .003	.003 - .005	.003 - .005	
			I	DFT-HP									KC7140
	5	S	O	SPHX...R-20	KC7215	190	328	434	IPR	.002 - .002	.002 - .003	.002 - .004	.002 - .004
				I	DFT-HP									KCU40
U	O	SPHX...R-20	KC7140	114	197	260	IPR	.002 - .002	.002 - .003	.002 - .004	.002 - .004		
		I	DFT-HP									KC7140	
6	S	O	SPHX...R-20	KC7215	146	312	563	IPR	.002 - .002	.002 - .003	.002 - .004	.003 - .004	
			I	DFT-HP									KCU40
U	O	SPHX...R-20	KC7140	172	246	393	IPR	.002 - .002	.002 - .003	.002 - .004	.003 - .004		
		I	DFT-HP									KC7140	
M	1	S	O	SPGX...-31	KC7140	180	367	450	IPR	.001 - .002	.001 - .002	.002 - .003	.002 - .003
			I	DFT-HP	KC7140								
	U	O	SPGX...-31	KC7140	135	276	337	IPR	.001 - .002	.001 - .002	.002 - .003	.002 - .003	
			I	DFT-HP									KC7140
	2	S	O	SPGX...-31	KC7140	180	331	380	IPR	.001 - .002	.001 - .002	.002 - .003	.002 - .003
				I	DFT-HP									KC7140
	U	O	SPGX...-31	KC7140	135	248	284	IPR	.001 - .002	.001 - .002	.002 - .003	.002 - .003	
			I	DFT-HP									KC7140
	3	S	O	SPGX...-31	KC7140	180	394	350	IPR	.001 - .002	.001 - .002	.002 - .003	.002 - .003
				I	DFT-HP									KC7140
	U	O	SPGX...-31	KC7140	135	220	262	IPR	.001 - .002	.001 - .002	.002 - .003	.002 - .003	
			I	DFT-HP									KC7140
K	1	S	O	SPHX...R-21	KC7215	348	623	754	IPR	.003 - .005	.004 - .006	.004 - .006	.005 - .008
			I	DFT-GD	KCU40								
	U	O	SPHX...R-21	KC7215	243	427	527	IPR	.003 - .005	.004 - .006	.004 - .006	.005 - .008	
			I	DFT-GD									KCU40
	2	S	O	SPHX...R-21	KC7215	348	561	754	IPR	.003 - .005	.004 - .006	.004 - .006	.005 - .008
				I	DFT-GD									KCU40
	U	O	SPHX...R-21	KC7215	243	384	527	IPR	.003 - .005	.004 - .006	.004 - .006	.005 - .008	
			I	DFT-GD									KCU40
	3	S	O	SPHX...R-21	KC7215	331	499	716	IPR	.002 - .005	.003 - .006	.004 - .006	.004 - .008
				I	DFT-GD									KCU40
	U	O	SPHX...R-21	KC7215	220	341	476	IPR	.002 - .005	.003 - .006	.004 - .006	.004 - .008	
			I	DFT-GD									KCU40

Condition: S = Stable cutting conditions; U = Unstable cutting conditions; I = Interrupted cutting conditions
Pocket seat: I = Inboard insert; O = Outboard insert

■ HTS-C • Inch

Material Group	Condition	Pocket Seat	Geometry	Grade	Cutting Speed – vc Range – SFM		Inch						
							Recommended Feed Rate (f) by Diameter						
					min	Starting Value	max	Ø (in)	.750-.945	.984-1.345	1.313-1.688	1.625-2.000	
N	1	O	SPHX...R-22	KM1	600	965	1500	IPR	.002 - .003	.002 - .003	.004 - .005	.004 - .006	
		I	DFT-HP	KMF									
	U	O	SPHX...R-20	KM1	398	643	996	IPR	.002 - .003	.002 - .003	.004 - .005	.004 - .006	
		I	DFT-HP	KMF									
	2	S	O	SPHX...R-22	KM1	600	868	1500	IPR	.002 - .003	.002 - .003	.004 - .005	.004 - .006
		I	DFT-HP	KMF									
	U	O	SPHX...R-22	KM1	398	579	996	IPR	.002 - .003	.002 - .003	.004 - .005	.004 - .006	
		I	DFT-HP	KMF									
	3	S	O	SPHX...R-22	KM1	372	772	930	IPR	.002 - .003	.002 - .003	.004 - .005	.004 - .006
		I	DFT-HP	KMF									
	U	O	SPHX...R-22	KM1	259	514	648	IPR	.002 - .003	.002 - .003	.004 - .005	.004 - .006	
		I	DFT-HP	KMF									
	4	S	O	SPHX...R-22	KM1	372	772	930	IPR	.002 - .003	.002 - .003	.004 - .005	.004 - .006
		I	DFT-HP	KMF									
	U	O	SPHX...R-22	KM1	259	514	648	IPR	.002 - .003	.002 - .003	.004 - .005	.004 - .006	
I		DFT-HP	KMF										
5	S	O	SPHX...R-20	KM1	450	868	1181	IPR	.001 - .002	.001 - .002	.004 - .005	.004 - .006	
	I	DFT-HP	KMF										
U	O	SPHX...R-20	KM1	302	579	793	IPR	.001 - .002	.001 - .002	.004 - .005	.004 - .006		
	I	DFT-HP	KMF										
S	1	O	SPGX...-31	KC7215	70	131	160	IPR	.001 - .002	.001 - .002	.002 - .002	.002 - .002	
		I	DFT-GD	KCU40									
	U	O	SPGX...-31	KC7215	60	98	120	IPR	.001 - .002	.001 - .002	.002 - .002	.002 - .002	
		I	DFT-GD	KC7140									
	2	S	O	SPGX...-31	KC7215	61	115	139	IPR	.001 - .002	.001 - .002	.002 - .002	.002 - .002
		I	DFT-GD	KCU40									
U	O	SPGX...-31	KC7215	58	82	112	IPR	.001 - .002	.001 - .002	.002 - .002	.002 - .002		
	I	DFT-GD	KC7140										

Condition: S = Stable cutting conditions; U = Unstable cutting conditions; I = Interrupted cutting conditions
Pocket seat: I = Inboard insert; O = Outboard insert



HTS Indexable Drill System

The HTS indexable drill system is one of the most reliable deep-hole drilling systems available. Drilling up to 10 x D can be easily achieved in materials like steel, stainless steel, ductile iron, cast iron, and non-ferrous materials. Various drilling heads cover the diameter range 1.77–10.63" (45–270mm).

HTS drill heads are equipped with pilot drills and cartridges using trigon-shaped Drill Fix™ DFT™ inserts. Use HTS extensions and reducers to achieve various diameters and depths of drilling.

For improved surface qualities and increased reliability, finishing HTS cartridges with a squared-outboard insert are available as standard.

Features and Benefits

Productivity

- Achieve high hole accuracy by using pilot drills and trigon-shaped inserts.
- Benefit from improved surface qualities using finishing cartridges with squared-outboard inserts.
- Adjust outer cartridge to produce the desired cutting diameter, reducing inventory.
- Same insert size is used in each insert cartridge, reducing inventory costs.

Versatility

- Diameter range covering 1.77–10.63" (45–270mm).
- L/D ratio up to 10 x D as standard.
- Inserts and pilot drills can be applied in various heads and cartridges, covering various diameters.
- Large variety of DFT insert grades and geometries available.
- Finishing cartridge with squared-outboard insert offering four cutting edges for high process stability.
- Carbide pilot drills are available upon request.

Customization

- Wear pads can be added for increased stability.
- Fully engineered solutions available.
- Custom solutions covering diameter range up to 21.259" (540mm) are possible.



HTS-R Indexable Drill System

The HTS-R extends the HTS system by covering diameters between 1.575–2.165" (40–55mm).

Up to 30% higher feed rates achievable with rectangular-shaped Drill Fix™ DFR™ inserts with the added benefit of improved chip control.

Features and Benefits

Productivity

- Benefit from better chip control and higher insert stability for longer tool body life.
- Same insert size is used in each insert cartridge.

Versatility

- Diameter range covering 1.575–2.165" (40–55mm) with five drilling heads.
- Large variety of DFR insert grades and geometries available.
- Outer cartridges can be adjusted to produce the desired cutting diameter.
- Extensions and reducers are available as standard.
- Solid carbide and HSS pilot drills are available to match the cutting conditions to your specific applications.

Customization

- Wear pads can be added for increased stability.
- Fully engineered solutions available.



Pilot drill should be installed and set to the proper length before installing the inner cartridge.



Install inner cartridge, then the outer insert.



Install inner insert into cartridge.

HTS-R

inner cartridge

pilot drill

outer cartridge



HTS Ø 45–102mm/1.77–4.02"

inner cartridge*

pilot drill

outer cartridge*

*for Ø 180–186mm/
7.09–7.32": 2 inner
and outer cartridges
are used

HTS Ø 102–170mm/4.02–6.69"

inner cartridge

pilot drill

outer cartridge

HTS Ø 195–270mm/7.68–10.63"

inner cartridge

pilot drill

outer cartridge

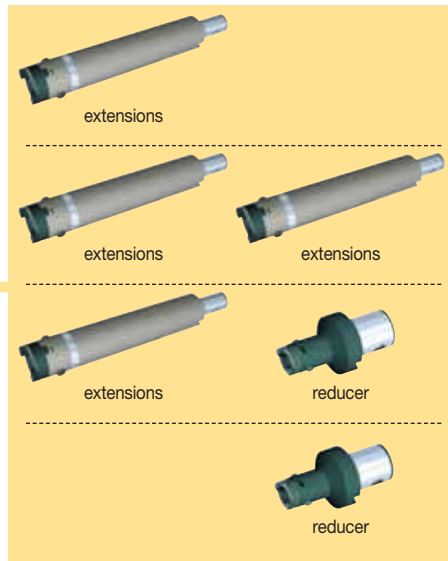
**HTS with SPHX
outboard insert**

inner cartridge

pilot drill

outer cartridge**

**for Ø 102–170mm/4.02–6.69" & Ø 195–240mm/
7.68–9.45": the outer cartridge uses 3 inserts



WARNING

- DO NOT exceed 2 extensions or 1 extension plus reducer.



HTS-R

inner cartridge

pilot drill

outer cartridge



HTS Ø 45–102mm/1.77–4.02"

inner cartridge*

pilot drill

outer cartridge*

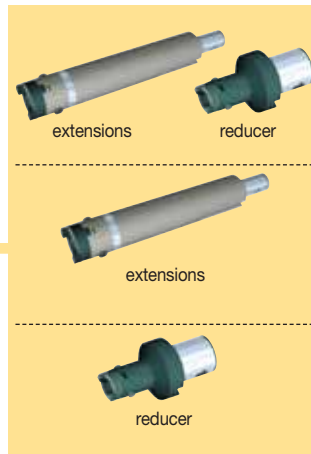
*for Ø 180–186mm/
7.09–7.32": 2 inner
and outer cartridges
are used

HTS Ø 102–170mm/4.02–6.69"

inner cartridge

pilot drill

outer cartridge



Indexable Drills

HTS Ø 195–270mm/7.68–10.63"

inner cartridge

pilot drill

outer cartridge



HTS with SPHX outboard insert

inner cartridge

pilot drill

outer cartridge**

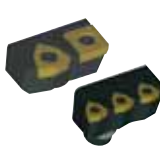






**for Ø 102–170mm/4.02–6.69" & Ø 195–240mm/
7.68–9.45": the outer cartridge uses 3 inserts

To assemble your HTS(-R) head, choose the desired drill diameter range from the left-hand column. Next, follow the columns to the right, and select the appropriate component from each column to complete your HTS(-R) head.

Indexable Drills

drilling range		HTS head	L1		HTS(-R) head with DFR/ DFT inserts									
					inner cartridge					outer cartridge				
mm	in		mm	in	cartridge	n	insert	n	cartridge	n	insert	n	pilot drill	
40-43	1.57-1.69	HTSR040R025M	60	2.36	HTSR10CI	1	DFR0302.	2	HTSR10CE	1	DFR0302.	2	B513S08.	
43-46	1.69-1.81	HTSR043R025M	70	2.76	HTSR11CI	1	DFR0302.	2	HTSR11CE	1	DFR0302.	2	B513S10.	
46-49	1.81-1.93	HTSR046R028M			HTSR12CI	1	DFR0403.	2	HTSR12CE	1	DFR0403.	2	B513S10.	
49-52	1.93-2.05	HTSR049R028M			HTSR13CI	1	DFR0403.	2	HTSR13CE	1	DFR0403..	2	B513S10.	
52-55	2.05-2.17	HTSR052R028M			HTSR14CI	1	DFR0403.	2	HTSR14CE	1	DFR0403..	2	B513S10.	
45-50	1.77-1.97	3.76045R028V	50	1.97	3.77000R050V	1	DFT0303.	2	3.77000R051V	1	DFT0303.	2	B510S08.	
50-55	1.97-2.17	3.76050R028V	60	2.36	3.77000R052V	1	DFT0303.	2	3.77000R053V	1	DFT0303.	2	B510S08.	
55-58	2.17-2.28	3.76055R032V			3.77000R038V	1	DFT05T3.	2	3.77000R039V	1	DFT05T3.	2	B510S08.	
58-63	2.28-2.48	3.76058R032V	70	2.76	3.77000R023V	1	DFT05T3.	2	3.77000R024V	1	DFT05T3.	2	B510S10.	
63-68	2.48-2.68	3.76063R032V			3.77000R025V	1	DFT05T3.	2	3.77000R024V	1	DFT05T3.	2	B510S10.	
63-68	2.48-2.68	3.76063R040V*			3.77000R025V	1	DFT05T3.	2	3.77000R024V	1	DFT05T3.	2	B510S10.	
68-73	2.68-2.87	3.76068R040V			3.77000R026V	1	DFT05T3.	2	3.77000R027V	1	DFT05T3.	2	B510S10.	
73-78	2.87-3.07	3.76073R040V			3.77000R026V	1	DFT05T3.	2	3.77000R027V	1	DFT05T3.	2	B510S15.	
78-84	3.07-3.31	3.76078R040V	70	2.76	3.77000R028V	1	DFT06T3.	2	3.77000R029V	1	DFT06T3.	2	B510S15.	
78-84	3.07-3.31	3.76078R048V*			3.77000R028V	1	DFT06T3.	2	3.77000R029V	1	DFT06T3.	2	B510S15.	
84-90	3.31-3.54	3.76084R048V			3.77000R028V	1	DFT06T3.	2	3.77000R029V	1	DFT06T3.	2	B510S15.	
90-94°	3.54-3.70	3.76090R048V			—	—	—	—	—	—	—	—	—	
90-96	3.54-3.78	3.76090R048V			3.77000R030V	1	DFT06T3.	2	3.77000R031V	1	DFT06T3.	2	B510S15.	
96-100°	3.78-3.93	3.76096R048V			—	—	—	—	—	—	—	—	—	
96-102	3.78-4.02	3.76096R048V			3.77000R030V	1	DFT06T3.	2	3.77000R031V	1	DFT06T3.	2	B510S20.	
96-100°	3.78-3.93	3.76096R058V*			—	—	—	—	—	—	—	—	—	
96-102	3.78-4.02	3.76096R058V*			3.77000R030V	1	DFT06T3.	2	3.77000R031V	1	DFT06T3.	2	B510S20.	
102-108	4.02-4.25	3.76102R058V			3.77000R081V	1	DFT05T3.	3	3.77000R082V	1	DFT05T3.	3	B510S20.	
108-115	4.25-4.53	3.76108R058V	3.77000R083V	1	DFT06T3.	3	3.77000R084V	1	DFT06T3.	3	B510S20.			
115-122	4.53-4.80	3.76115R070V	3.77000R085V	1	DFT06T3.	3	3.77000R086V	1	DFT06T3.	3	B510S25.			
122-130	4.80-5.12	3.76122R070V	3.77000R079V	1	DFT06T3.	3	3.77000R080V	1	DFT06T3.	3	B510S25.			
130-140	5.12-5.51	3.76130R070V	3.77000R087V	1	DFT06T3.	3	3.77000R088V	1	DFT06T3.	3	B510S25.			
140-150	5.51-5.91	3.76140R080V	3.77000R077V	1	DFT0704.	3	3.77000R078V	1	DFT0704.	3	B510S25.			
150-158	5.91-6.22	3.76150R080V	3.77000R075V	1	DFT0704.	3	3.77000R076V	1	DFT0704.	3	B510S25.			
158-162	6.22-6.38	3.76158R080V	3.77000R073V	1	DFT0704.	3	3.77000R074V	1	DFT0704.	3	B510S25.			
162-170	6.38-6.70	3.76162R080V	3.77000R048V	1	DFT0704.	3	3.77000R049V	1	DFT0704.	3	B510S30.			
180-184°	7.08-7.24	3.76180R110	—	—	—	—	—	—	—	—	—			
180-186	7.08-7.32	3.76180R110	3.77000R030V	3	DFT06T3.	4	3.77000R031V	1	DFT06T3.	4	B510S30.			
195-201	7.68-7.91	3.76195R110	3.77000R081V	3	DFT05T3.	6	3.77000R082V	1	DFT05T3.	6	B510S30.			
213-220	8.39-8.66	3.76213R125	3.77000R083V	3	DFT06T3.	6	3.77000R084V	1	DFT06T3.	6	B510S30.			
230-240	9.06-9.45	3.76230R160	3.77000R079V	2	DFT06T3.	6	3.77000R080V	2	DFT06T3.	6	B510S30.			
260-270	10.24-10.63	3.76260R160	3.77000R077V	2	DFT06T3.	6	3.77000R078V	2	DFT06T3.	6	B510S30.			

° Decreased diameter range by using SPHX insert in exterior cartridge.
 * Drill heads with reinforced body for short-chipping materials.
 n = Required quantity.

HTS head with DFT inserts and SPHX outboard insert												
inner cartridge						outer cartridge						
												
cartridge	n	cartridge	n	insert	n	cartridge	n	insert	n	insert	n	pilot drill
—		—		—		—		—		—		—
—		—		—		—		—		—		—
—		—		—		—		—		—		—
—		—		—		—		—		—		—
—		—		—		—		—		—		—
3.77000R250V	1	—		DFT0303.	2	3.77000R251V	1	DFT0303.	1	SPHX0703.	1	B510S08.
3.77000R252V	1	—		DFT0303.	2	3.77000R253V	1	DFT0303.	1	SPHX0703.	1	B510S08.
3.77000R038V	1	—		DFT05T3.	2	3.77000R239V	1	DFT05T3.	1	SPHX0903.	1	B510S08.
3.77000R023V	1	—		DFT05T3.	2	3.77000R224V	1	DFT05T3.	1	SPHX0903.	1	B510S10.
3.77000R025V	1	—		DFT05T3.	2	3.77000R224V	1	DFT05T3.	1	SPHX0903.	1	B510S10.
3.77000R025V	1	—		DFT05T3.	2	3.77000R224V	1	DFT05T3.	1	SPHX0903.	1	B510S10.
3.77000R026V	1	—		DFT05T3.	2	3.77000R227V	1	DFT05T3.	1	SPHX0903.	1	B510S10.
3.77000R026V	1	—		DFT05T3.	2	3.77000R227V	1	DFT05T3.	1	SPHX0903.	1	B510S15.
3.77000R028V	1	—		DFT06T3.	2	3.77000R229V	1	DFT06T3.	1	SPHX0903.	1	B510S15.
3.77000R028V	1	—		DFT06T3.	2	3.77000R229V	1	DFT06T3.	1	SPHX0903.	1	B510S15.
3.77000R228V	1	—		DFT06T3.	2	3.77000R229V	1	DFT06T3.	1	SPHX0903.	1	B510S15.
3.77000R230V	1	—		DFT06T3.	2	3.77000R231V	1	DFT06T3.	1	SPHX0903.	1	B510S15.
—		—		—		—		—		—		—
3.77000R230V	1	—		DFT06T3.	2	3.77000R231V	1	DFT06T3.	1	SPHX0903.	1	B510S20.
—		—		—		—		—		—		—
3.77000R230V	1	—		DFT06T3.	2	3.77000R231V	1	DFT06T3.	1	SPHX0903.	1	B510S20.
—		—		—		—		—		—		—
3.77000R081V	1	—		DFT05T3.	3	3.77000R282V	1	DFT05T3.	2	SPHX0903.	1	B510S20.
3.77000R083V	1	—		DFT06T3.	3	3.77000R284V	1	DFT06T3.	2	SPHX1204.	1	B510S20.
3.77000R085V	1	—		DFT06T3.	3	3.77000R286V	1	DFT06T3.	2	SPHX1204.	1	B510S25.
3.77000R079V	1	—		DFT06T3.	3	3.77000R280V	1	DFT06T3.	2	SPHX1204.	1	B510S25.
3.77000R087V	1	—		DFT06T3.	3	3.77000R288V	1	DFT06T3.	2	SPHX1204.	1	B510S25.
3.77000R077V	1	—		DFT0704.	3	3.77000R278V	1	DFT0704.	2	SPHX1505.	1	B510S25.
3.77000R075V	1	—		DFT0704.	3	3.77000R276V	1	DFT0704.	2	SPHX1204.	1	B510S25.
3.77000R073V	1	—		DFT0704.	3	3.77000R274V	1	DFT0704.	2	SPHX1204.	1	B510S25.
3.77000R248V	1	—		DFT0704.	3	3.77000R249V	1	DFT0704.	2	SPHX1505.	1	B510S30.
3.77000R230V	3	—		DFT06T3.	4	3.77000R231V	1	DFT06T3.	3	SPHX0903.	1	B510S30.
—		—		—		—		—		—		—
3.77000R081V	3	—		DFT05T3.	9	3.77000R282V	1	DFT05T3.	2	SPHX0903.	1	B510S30.
3.77000R083V	3	—		DFT06T3.	9	3.77000R284V	1	DFT06T3.	2	SPHX1204.	1	B510S30.
3.77000R079V	2	3.77000R080V	1	DFT06T3.	9	3.77000R280V	1	DFT06T3.	2	SPHX1204.	1	B510S30.
—		—		—		—		—		—		B510S30



HTS tool assembly combinations

- Select your appropriate drill diameter range.
- Choose the appropriate adaptor and shank size.
- Follow the columns to the right, and select the appropriate components from each column to complete your HTS(-R) tool.

Indexable Drills

drilling range		shank		DV		BT		CV		HSK														
				assembly details		assembly details		assembly details		assembly details														
				40	50	40	50	40	50	50/63/100														
mm	in		D1																					
HTS heads with DFR™ inserts													40-43 43-46	1.57-1.69 1.69-1.81	WD/ WN	32	DV40BWD32075M DV40RMWD32115M**	DV50BWD32060M DV50RMWD32140M**	BT40BWD32070M	BT50BWD32080M	CV40BWD32M343 CV40RMWD32M453**	CV50BWD32M343 CV50RMWD32M453**	HSK50ASWN32110M HSK63ASWN32090M HSK100ASWN32100M	
																50	—	DV50BWD50075M DV50RMWD50144M**	—	BT50BWD50085M BT50RMWD50162M**	—	CV50BWD50M343 CV50RMWD50M472**	—	
													46-49 49-52 52-55	1.81-1.93 1.93-2.05 2.05-2.17	SS(F)	1.50	—	—	—	—	CV40BSSF150575	CV50SS150400 (AD) CV50SS150600 (AD) CV50SS150800 (AD) CV50BSSF150450	—	
																WD/ WN	32	DV40BWD32075M DV40RMWD32115M**	DV50BWD32060M DV50RMWD32140M**	—	BT50BWD32080M	CV40BWD32M343 CV40RMWD32M453**	CV50BWD32M343 CV50RMWD32M453**	—
													50	—	2.00		50	—	DV50BWD50075M DV50RMWD50144M**	—	BT50BWD50085M BT50RMWD50162M**	—	CV50BWD50M343 CV50RMWD50M472**	—
																SS(F)	2.00	—	—	—	—	—	CV50SS200562 (AD) CV50SS200762 (AD) CV50BSSF200550	—
													50	—	HTS		50	—	5.36050-154050	—	BT50BHTS50080M	—	CV50BHTS50M314 CV50RMHTS50M413**	—
																50	—	5.36050-154050	—	BT50BHTS50080M	—	CV50BHTS50M314 CV50RMHTS50M413**	—	
HTS heads with DFT™/SPHX inserts													45-50 50-55	1.77-1.97 1.97-2.17	WD/ WN	32	DV40BWD32075M DV40RMWD32115M**	DV50BWD32060M DV50RMWD32140M**	BT40BWD32070M	BT50BWD32080M	CV40BWD32M343 CV40RMWD32M453**	CV50BWD32M343 CV50RMWD32M453**	HSK50ASWN32110M HSK63ASWN32090M HSK100ASWN32100M	
																50	—	DV50BWD50075M DV50RMWD50144M**	—	BT50BWD50085M BT50RMWD50162M**	—	CV50BWD50M343 CV50RMWD50M472**	—	HSK100ASWN50110M
													55-58 58-63 63-68	2.17-2.28 2.28-2.48 2.48-2.68	SS(F)	2.00	—	—	—	—	—	CV50SS200562 (AD) CV50SS200762 (AD) CV50BSSF200550	—	
																WD/ WN	32	DV40BWD32075M DV40RMWD32115M**	DV50BWD32060M DV50RMWD32140M**	BT40BWD32070M	BT50BWD32080M	CV40BWD32M343 CV40RMWD32M453**	CV50BWD32M343 CV50RMWD32M453**	HSK50ASWN32110M HSK63ASWN32090M HSK100ASWN32100M
													50	—	2.00		50	—	DV50BWD50075M DV50RMWD50144M**	—	BT50BWD50085M BT50RMWD50162M**	—	CV50BWD50M343 CV50RMWD50M472**	HSK100ASWN50110M
																SS(F)	2.00	—	—	—	—	—	CV50SS200562 (AD) CV50SS200762 (AD) CV50BSSF200550	—
													63-68* 68-73 73-78 78-84	2.48-2.68 2.68-2.87 2.87-3.07 3.07-3.31	HTS		50	—	5.36050-154050	—	BT50BHTS50080M	—	CV50BHTS50M314 CV50RMHTS50M413**	—
																HTS	50	—	5.36050-154050	—	BT50BHTS50080M	—	CV50BHTS50M314 CV50RMHTS50M413**	—

* HTS drilling head with reinforced body for short-chipping materials.
 ** Adapter with coolant ring.
 The shown combinations are not complete. Ask your Kennametal representative to get the most reasonable solution for your application.
 Please note that the assembled total length of the drilling tool is not necessarily the total achievable drilling depth.

assembly details	KM	basic shank				reducer			for use with coolant adapter		extension			HTS head	
		80	metric	L4		L1	L1		coolant adapter	shell mill DV/BT	L1				
				mm	inch		mm	in			mm	in			
		5.34032-025115 5.34032-025200	110 195	-	-	-	-	-	-	-	-	5.34125R025150	160	6.30	HTSR040R025M HTSR043R025M
		5.34050-025300 5.34050-025450	270 420	-	-	-	-	-	-	-	-				
				SSF150HTS130239 SSF150HTS130664 SSF150HTS131114 SSF150HTS131764	.39 4.65 9.14 15.64	-	-	-	-	-	-				
		5.34032-028115 5.34032-028200	110 195	-	-	-	-	-	-	-	-				
		.34050-028300 5.34050-028450	265 415	-	-	-	-	-	-	-	-				
				SSF200HTS130239 SSF200HTS130664 SSF200HTS131114 SSF200HTS131764	.39 4.65 9.14 15.64	-	-	-	-	-	-	5.34128R028150	160	6.30	HTSR046R028M HTSR049R028M HTSR052R028M
	KM80ATCHTS50085M KM80ATCHTS50100M					5.34280R028080	90	3.54	5.34350-090100	DV50SM60070M BT50SM60090M					



		5.34032-028115 5.34032-028200	110 195	-	-	-	-	-	-	-	-				
		5.34050-028300 5.34050-028450	265 415	-	-	-	-	-	-	-	-				
				SSF200HTS130239 SSF200HTS130664 SSF200HTS131114 SSF200HTS131764	.39 4.65 9.14 15.64	-	-	-	-	-	-				3.76045R028V 3.76050R028V
	KM80ATCHTS50085M KM80ATCHTS50100M					5.34280R028080	90	3.54	5.34350-090100	DV50SM60070M BT50SM60090M					
		5.34032-032125	120	-	-	-	-	-	-	-	-				
		5.34050-032500 5.34050032350 5.34050032350	165 315 465	-	-	-	-	-	-	-	-				
				SSF200HTS160239 SSF200HTS160714 SSF200HTS161214 SSF200HTS161964	.39 5.14 10.14 17.64	-	-	-	-	-	-	5.34132R032100 5.34132R032200	110 210	4.33 8.27	3.76055R032V 3.76058R032V 3.76063R032V
	KM80ATCHTS50085M KM80ATCHTS50100M					5.34280R032080	90	3.5	5.34350-090100	DV50SM60070M BT50SM60090M					
		5.34050-040148 5.34050-040300 5.34050-040450 5.34050-040600	140 267 417 567	-	-	-	-	-	-	-	-				
				SSF200HTS220297 SSF200HTS220922 SSF200HTS221572 SSF200HTS222572	.47 7.22 13.72 23.72	-	-	-	-	-	-	5.34140R040200	212	8.35	3.76063R040V* 3.76068R040V 3.76073R040V 3.76078R040V
	KM80ATCHTS50085M KM80ATCHTS50100M					5.34280R040080	92	3.62	5.34350-090100	DV50SM60070M BT50SM60090M					

(continued)

(continued)

HTS Tool Assembly Combinations

- Select your appropriate drill diameter range.
- Choose the appropriate adaptor and shank size.
- Follow the columns to the right, and select the appropriate components from each column to complete your HTS(-R) tool.

Indexable Drills

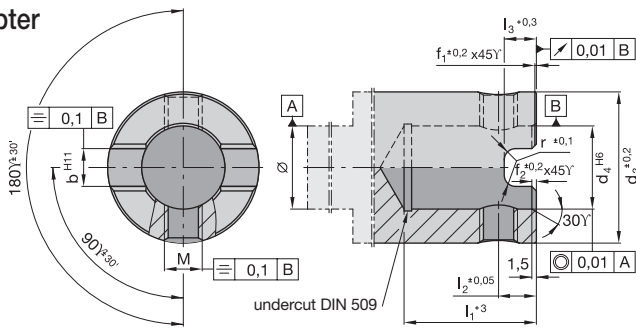
drilling range		shank		DV		BT		CV		HSK	
				assembly details		assembly details		assembly details		assembly details	
				40	50	40	50	40	50	50/63/100	
mm	in		D1								
78-84* 84-90 90-96 96-102	3.07-3.31 3.31-3.54 3.54-3.70 3.78-4.02	WD / WN	50	—	DV50BWD50075M DV50RMWD50144M**	—	BT50BWD50085M BT50RMWD50162M**	—	CV50BWD50M343 CV50RMWD50M472**	HSK100ASWN50110M	
		SS(F)	2.00	—	—	—	—	—	CV50SS200562 (AD) CV50SS200762 (AD) CV50BSSF200550	—	
		HTS	50	—	5.36050-154050	—	BT50BHSTS50080M	—	V50BHSTS50M314 CV50RMHTS50M413**	—	
96-102* 102-108 108-115	3.78-4.02 4.02-4.25 4.25-4.53	WD / WN	50	—	DV50BWD50075M DV50RMWD50144M**	—	BT50BWD50085M BT50RMWD50162M**	—	CV50BWD50M343 CV50RMWD50M472**	HSK100ASWN50110M	
		SS(F)	2.00	—	—	—	—	—	50SS200562 (AD) CV50SS200762 (AD) CV50BSSF200550	—	
		HTS	50	—	5.36050-154050	—	BT50BHSTS50080M	—	CV50BHSTS50M314 CV50RMHTS50M413**	—	
115-122 122-130 130-140	4.53-4.80 4.80-5.12 5.12-5.51	SS(F)	40	—	—	—	—	—	CV50SS250800	—	
		HTS	40	—	5.36050154040	—	BT50BHSTS40080M	—	V50BHSTS40M314 CV50RMHTS40M412**	—	HSK100AHTS40085M
			50	—	5.36050-154050	—	BT50BHSTS50080M	—	CV50BHSTS50M314 CV50RMHTS50M413**	—	HSK100AHTS50090M
140-150 150-158 158-162 162-170	5.51-5.91 5.91-6.22 6.22-6.38 6.38-6.70	HTS	50	—	5.36050-154050	—	BT50BHSTS50080M	—	CV50BHSTS50M314 CV50RMHTS50M413**	—	HSK100AHTS50090M
180-186 195-201 213-220	7.08-7.32 7.68-7.91 8.39-8.66	customized solutions available upon request									
230-240 260-270	9.06-9.45 10.24-10.63	customized solutions available upon request									

* HTS drilling head with reinforced body for short-chipping materials.
 ** Adapter with coolant ring.
 The shown combinations are not complete. Ask your Kennametal representative to get the most reasonable solution for your application.
 Please note that the assembled total length of the drilling tool is not necessarily the total achievable drilling depth.

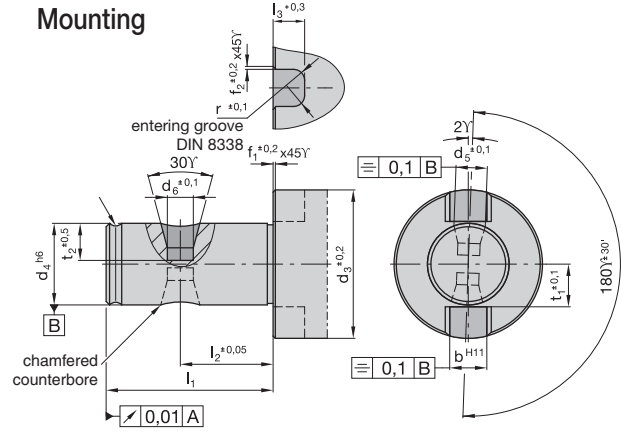
assembly details	basic shank					reducer			for use with coolant adapter		extension			HTS head
	80	metric		inch		L1		coolant adapter	shell mill DV/BT	L1				
		mm	inch	mm	in	mm	in			mm	in			
-	5.34050-048168 5.34050-048300 5.34050-048450 5.34050-048600	160 267 417 567	-	-	-	-	-	-	-	-	5.34140R048200	212	8.35	3.76078R048V* 3.76084R048V 3.76090R048V 3.76096R048V
-	-	-	SSF200HTS270297 SSF200HTS271122 SSF200HTS271922 SSF200HTS273122	1.47 9.22 17.22 29.22	-	-	-	-	-	-	-	-	-	-
KM80ATCHTS50085M KM80ATCHTS50100M	-	-	-	-	5.34280R048080	92	3.62	5.34350-090100	DV50SM60070M BT50SM60090M	-	-	-	-	
-	5.34050-058186 5.34050-058300 5.34050-058450 5.34050-058600	180 254 404 554	-	-	-	-	-	-	-	-	5.34158R058300	314	12.36	3.76096R058V* 3.76102R058V 3.76108R058V
-	-	-	SSF200HTS160239 SSF200HTS160714 SSF200HTS161214 SSF200HTS161964	.39 5.14 10.14 17.64	-	-	-	-	-	-	-	-	-	-
KM80ATCHTS50085M KM80ATCHTS50100M	-	-	-	-	5.34280R058080	94	3.70	5.34350-090100	DV50SM60070M BT50SM60090M	-	-	-	-	
-	-	-	SSF250HTS400355 SSF250HTS401055 SSF250HTS401555 SSF250HTS402555	1.63 8.21 13.21 23.21	-	-	-	-	-	-	-	-	-	3.76115R070V 3.76122R070V 3.76130R070V
KM80ATCHTS40085M KM80ATCHTS40100M	-	-	-	-	5.34280R070150	164	6.45	5.34350-090100	DV50SM60070M BT50SM60090M	5.34170R070300 5.34170R070500	314 514	12.36 20.24	-	
KM80ATCHTS50085M KM80ATCHTS50100M	-	-	-	-	-	-	-	-	-	-	-	-	-	
KM80ATCHTS50085M KM80ATCHTS50100M	-	-	SSF300HTS500413 SSF300HTS501313 SSF300HTS502113 SSF300HTS503113	1.87 10.55 18.55 28.55	-	-	-	5.34350-090100	DV50SM60070M BT50SM60090M	5.34180R080204 5.34180R080300 5.34180R080500	220 316 516	8.66 12.44 20.32	3.76140R080V 3.76150R080V 3.76158R080V 3.76162R080V	
customized solution available upon request													3.76180R110 3.76195R110 3.76213R125	
customized solution available upon request													3.76230R160 3.76260R160	



Adapter



Mounting



Adapter Dimensions



Indexable Drills

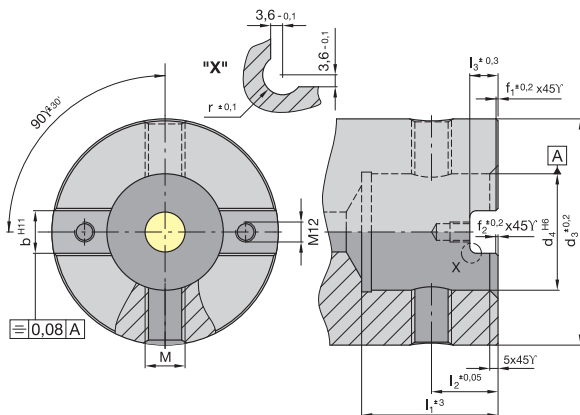
d3	d4	l1	l2	l3	M	b	r	f1	f2	drive ring	clamping screw	thread	MAN* Nm	sliding block	clamping screw M 12 x 25 for sliding block
25	13	28	12,4	7,0	M 8 x 1,0	8,0	3	0,5	0,5	193.371	193.372	M 8 x 1,0	10	—	—
28	13	28	12,4	7,0	M 8 x 1,0	8,0	3	0,5	0,5	192.419	193.372	M 8 x 1,0	10	—	—
32	16	32	14,4	7,5	M 8 x 1,0	8,0	3	0,5	0,5	192.420	192.156	M 8 x 1,0	10	—	—
40	22	35	13,4	8,5	M 10 x 1,0	10,0	3	0,5	0,5	192.421	192.157	M 10 x 1,0	16	—	—
48	27	40	15,4	9,0	M 12 x 1,0	12,0	3	1,0	1,0	192.422	191.727	M 10 x 1,0	16	—	—
58	32	38	15,4	10,0	M 12 x 1,0	14,0	3	1,0	1,0	192.423	191.727	M 12 x 1,0	20	—	—
70	40	43	16,4	10,0	M 16 x 1,5	16,0	3	1,0	1,0	192.424	191.728	M 16 x 1,5	34	—	—
80	50	46	20,4	12,5	M 16 x 1,5	18,0	4	1,0	1,0	192.425	191.728	M 16 x 1,5	34	—	—
90	50	46	20,4	12,5	M 16 x 1,5	18,0	4	1,0	1,0	192.426	191.729	M 16 x 1,5	34	—	—
110	60	46	20,4	12,5	M 16 x 1,5	20,0	4	1,0	1,0	192.427	191.729	M 16 x 1,5	34	—	—
1251)	60	77	40,0	12,5	M 24 x 2,0	25,5	4	1,0	1,0	—	193.107	M 24 x 2,0	120	191.019	125.225
1401)	70	82	40,0	12,5	M 24 x 2,0	25,5	4	1,0	1,0	—	193.107	M 24 x 2,0	120	191.019	125.225
1601)	80	82	40,0	12,5	M 24 x 2,0	25,5	4	1,0	1,0	—	193.107	M 24 x 2,0	120	191.019	125.225

* MAN = Clamping torque of clamping screw in Nm.

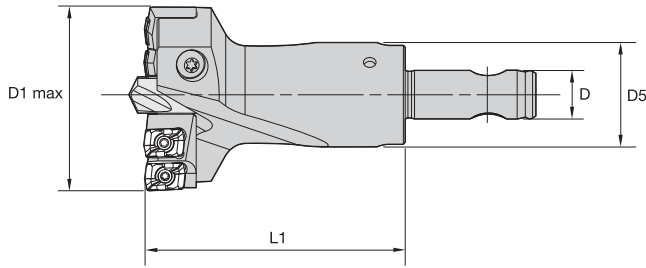
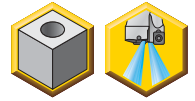
Mounting Dimensions

d3	d4	d5	d6	l1	l2	l3	t1	t2	b	r	f1	f2
25	13	8,50	6,5	35	22,0	7,00	6,7	6,50	8,0	3	0,5	0,5
28	13	8,50	6,5	35	22,0	7,00	7,0	6,50	8,0	3	0,5	0,5
32	16	8,30	6,5	40	24,0	7,50	8,5	7,50	8,0	3	0,5	0,5
40	22	10,50	7,0	45	25,0	8,50	11,5	10,00	10,0	3	0,5	0,5
48	27	12,75	9,0	50	27,0	9,00	14,0	12,00	12,0	3	1,0	1,0
58	32	11,50	9,0	50	29,0	10,00	16,5	7,25	14,0	3	1,0	1,0
70	40	15,25	12,2	55	30,0	10,50	20,5	10,00	16,0	3	1,0	1,0
80	50	15,25	12,2	60	36,0	12,50	25,5	12,50	18,0	4	1,0	1,0
90	50	16,50	12,2	60	36,0	12,50	25,5	12,50	18,0	4	1,0	1,0
110	60	14,50	12,2	60	36,0	13,65	30,5	10,00	20,0	4	1,0	1,0
1251)	60	25,00	18,0	75	39,5	17,00	35,0	20,25	25,5	6	1,0	1,0
1401)	70	25,00	18,0	80	39,5	17,00	42,0	20,25	25,5	6	1,0	1,0
1601)	80	25,00	18,0	80	39,5	17,00	42,0	20,25	25,5	6	1,0	1,0

1) Adapter for d3 = 125, 140, and 160



- Head shipped with clamping and adjusting screws.
- Order pilot drill and cartridges separately; see page J74 for pilot drill.



HTS Adjustable Heads with DFR™ Inserts

catalog number	D1		D1 max		D5		L1		pilot drill HSS	pilot drill carbide	cartridge interior	n	cartridge exterior	n	gage insert	ni	
	mm	in	mm	in	mm	in	D	mm in									
HTSR040R025M	40	1.57	43	1.69	25	.98	13A	60	2.36	B513S08..	B514S08..	HTSR10CI	1	HTSR10CE	1	DFR0302..	4
HTSR043R025M	43	1.69	46	1.81	25	.98	13A	70	2.76	B513S10..	B514S10..	HTSR11CI	1	HTSR11CE	1	DFR0302..	4
HTSR046R028M	46	1.81	49	1.93	28	1.10	13B	70	2.76	B513S10..	B514S10..	HTSR12CI	1	HTSR12CE	1	DFR0403..	4
HTSR049R028M	49	1.93	52	2.05	28	1.10	13B	70	2.76	B513S10..	B514S10..	HTSR13CI	1	HTSR13CE	1	DFR0403..	4
HTSR052R028M	52	2.05	55	2.17	28	1.10	13B	70	2.76	B513S10..	B514S10..	HTSR14CI	1	HTSR14CE	1	DFR0403..	4

NOTE: n: number of cartridges required by head.
ni: number of inserts required by head.

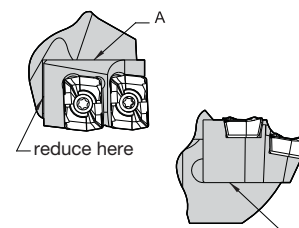
D1 diameter		clamping screw	adjusting screw
mm	in		
40-42	1.57-1.68	190.116	128.610
43-52	1.69-2.05	193.397	190.458

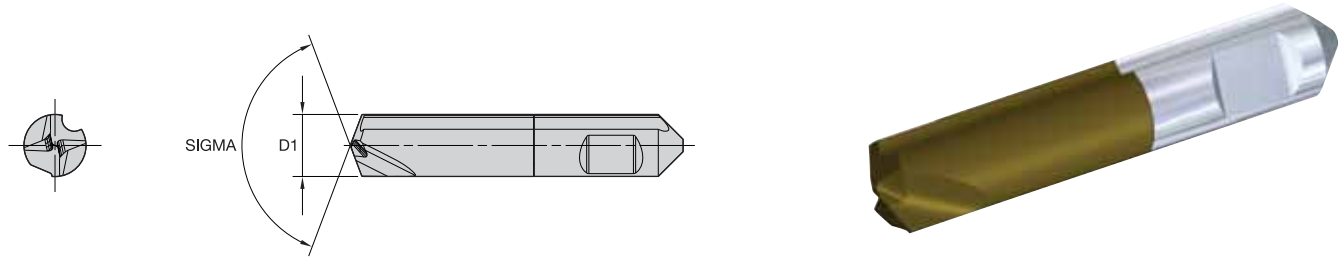


HTS DFR Cartridges

catalog number	gage insert	Nm	ft. lbs.	insert screw	cartridge screw	washer
HTSR10CE	DFR0302..	5,0	3.69	192.416	192.592	192.902
HTSR10CI	DFR0302..	5,0	3.69	192.416	192.592	192.902
HTSR11CE	DFR0302..	5,0	3.69	192.416	192.592	192.902
HTSR11CI	DFR0302..	5,0	3.69	192.416	192.592	192.902
HTSR12CE	DFR0403..	5,0	3.69	192.432	192.592	192.902
HTSR12CI	DFR0403..	5,0	3.69	192.432	192.592	192.902
HTSR13CE	DFR0403..	5,0	3.69	192.432	192.592	192.902
HTSR13CI	DFR0403..	5,0	3.69	192.432	192.592	192.902
HTSR14CE	DFR0403..	5,0	3.69	192.432	192.592	192.902
HTSR14CI	DFR0403..	5,0	3.69	192.432	192.592	192.902

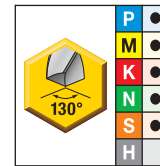
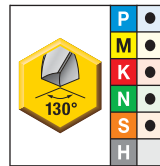
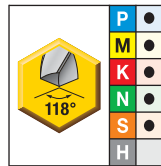
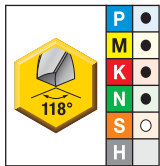
- Change drill diameter by shortening the outer cartridge.
- Shorten at 90° to the contact face A and the support face B.
- Shortening reduces the effective drill diameter by 2x the amount removed.



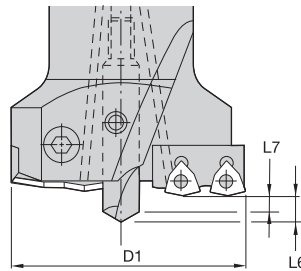


■ HTS DFR™ • Pilot Drills

Indexable Drills



high-speed steel uncoated A30	high-speed steel coated AS3	solid carbide uncoated G13	solid carbide coated KC7030	D1	
				mm	in
B513S08000	B513S08000	—	—	8	.32
B513S10000	B513S10000	—	—	10	.39
—	—	B514S08000	B514S08000	8	.32
—	—	B514S10000	B514S10000	10	.39



■ Pilot Drill Setting Lengths



D1		high-speed steel				solid carbide			
mm	in	L6		L7		L6		L7	
mm	in	mm	in	mm	in	mm	in	mm	in
8,00	.315	4,14	.163	1,73	.068	3,61	.142	1,73	.068
10,00	.394	4,88	.192	1,88	.074	4,19	.165	1,88	.074

HTS DFR™ • Metric

Material Group	Condition	Pocket Seat	Geometry	Grade	Cutting Speed – vc Range – m/min			Metric		
					min	Starting Value	max	Recommended Feed Rate (f) by Diameter		
								Ø (mm)	DFR03... 40,00-46,00	DFR04 46,00-55,00
P	1	S	O MD	KCU25	79	190	229	mm/r	0,10 - 0,14	0,12 - 0,18
			I MD	KCU25						
		U	O MD	KCU40	71	130	171			
			I MD	KCU40						
	I	O MD	KC7140	44	80	106				
		I MD	KC7140							
	2	S	O GD	KCU25	75	180	217			
			I GD	KCU25						
		U	O GD	KCU40	71	120	271			
			I GD	KCU40						
	I	O GD	KC7140	44	70	106				
		I GD	KC7140							
	3	S	O GD	KCU25	60	140	169			
			I GD	KCU25						
		U	O GD	KCU40	50	100	121			
			I GD	KCU40						
	I	O GD	KC7140	30	60	72				
		I GD	KC7140							
	4	S	O GD	KCU25	79	120	229			
			I GD	KCU25						
		U	O GD	KCU40	71	100	171			
			I GD	KCU40						
	I	O GD	KC7140	44	80	106				
		I GD	KC7140							
5	S	O GD	KCU40	62	100	190				
		I GD	KCU40							
	U	O GD	KC7140	47	60	114				
		I GD	KC7140							
I	O GD	KC7140	31	40	76					
	I GD	KC7140								
6	S	O GD	KCU40	59	95	180				
		I GD	KCU40							
	U	O GD	KC7140	45	57	108				
		I GD	KC7140							
I	O GD	KC7140	30	38	72					
	I GD	KC7140								
M	1	S	O MD	KCU40	40	110	134	mm/r	0,07 - 0,11	0,12 - 0,18
			I MD	KC7140						
		U	O MD	KC7140	31	70	86			
			I MD	KC7140						
	2	S	O MD	KCU40	38	99	127			
			I MD	KC7140						
		U	O MD	KC7140	31	63	86			
			I MD	KC7140						
	I	O MD	KC7140	22	45	61				
		I MD	KC7140							
	3	S	O MD	KCU40	32	88	107			
			I MD	KC7140						
U		O MD	KC7140	31	56	86				
		I MD	KC7140							
I	O MD	KC7140	22	40	61					
	I MD	KC7140								

Condition: S = Stable cutting conditions; U = Unstable cutting conditions; I = Interrupted cutting conditions
 Pocket seat: I = Inboard insert; O = Outboard insert



■ HTS DFR™ • Metric

Indexable Drills

Material Group	Condition	Pocket Seat	Geometry	Grade	Cutting Speed – vc Range – m/min			Metric		
					min	Starting Value	max	Recommended Feed Rate (f) by Diameter		
								Ø (mm)	DFR03... 40,00-46,00	DFR04 46,00-55,00
K	1	S	O GD	KCPK10	79	171	229	mm/r	0,11 - 0,20	0,13 - 0,27
			I GD	KCPK10						
		U	O LD	KCU25	64	117	156	mm/r	0,11 - 0,20	0,13 - 0,27
	I LD		KCU25							
	I	O LD	KCU40	40	72	96	mm/r	0,11 - 0,20	0,13 - 0,27	
		I LD	KCU40							
	2	S	O GD	KCPK10	75	162	217	mm/r	0,11 - 0,20	0,13 - 0,27
			I GD	KCPK10						
		U	O GD	KCU25	64	111	156	mm/r	0,11 - 0,20	0,13 - 0,27
			I GD	KCU25						
		I	O LD	KCU40	40	68	96	mm/r	0,11 - 0,20	0,13 - 0,27
			I LD	KCU40						
3	S	O GD	KCPK10	68	146	195	mm/r	0,11 - 0,20	0,13 - 0,27	
		I GD	KCPK10							
	U	O GD	KCU25	59	100	144	mm/r	0,11 - 0,20	0,13 - 0,27	
		I GD	KCU25							
	I	O GD	KCU40	35	62	84	mm/r	0,11 - 0,20	0,13 - 0,27	
		I GD	KCU40							
N	1	S	O ST	KD1425	128	240	358	mm/r	0,06 - 0,09	0,11 - 0,19
			I ST	KD1425						
		U	O LD	KCU40	102	160	239	mm/r	0,06 - 0,09	0,11 - 0,19
	I LD		KCU40							
	I	O LD	KCU40	67	104	155	mm/r	0,06 - 0,09	0,11 - 0,19	
		I LD	KCU40							
	2	S	O ST	KD1425	119	223	333	mm/r	0,06 - 0,09	0,11 - 0,19
			I ST	KD1425						
		U	O LD	KCU40	102	149	239	mm/r	0,06 - 0,09	0,11 - 0,19
			I LD	KCU40						
		I	O LD	KCU40	67	97	155	mm/r	0,06 - 0,09	0,11 - 0,19
			I LD	KCU40						
	3	S	O ST	KD1425	110	206	308	mm/r	0,06 - 0,09	0,11 - 0,19
			I ST	KD1425						
		U	O LD	KCU40	102	138	239	mm/r	0,06 - 0,09	0,11 - 0,19
			I LD	KCU40						
		I	O LD	KCU40	67	89	155	mm/r	0,06 - 0,09	0,11 - 0,19
			I LD	KCU40						
4	S	O ST	KD1425	119	223	333	mm/r	0,06 - 0,09	0,11 - 0,19	
		I ST	KD1425							
	U	O LD	KCU40	102	149	239	mm/r	0,06 - 0,09	0,11 - 0,19	
		I LD	KCU40							
	I	O LD	KCU40	67	97	155	mm/r	0,06 - 0,09	0,11 - 0,19	
		I LD	KCU40							
5	S	O ST	KD1425	92	220	262	mm/r	0,06 - 0,09	0,11 - 0,19	
		I ST	KD1425							
	U	O LD	KCU40	72	140	167	mm/r	0,06 - 0,09	0,11 - 0,19	
		I LD	KCU40							
	I	O LD	KCU40	46	90	107	mm/r	0,06 - 0,09	0,11 - 0,19	
		I LD	KCU40							

Condition: S = Stable cutting conditions; U = Unstable cutting conditions; I = Interrupted cutting conditions
 Pocket seat: I = Inboard insert; O = Outboard insert

HTS DFR™ • Inch

Material Group	Condition	Pocket Seat	Geometry	Grade	Cutting Speed – vc Range – SFM			Inch			
					min	Starting Value	max	Recommended Feed Rate (f) by Diameter			
								Ø (in)	DFR03... .688-.750	DFR04... .813-1.00	
P	1	S	O MD	KCU25	260	623	750	IPR	.004 - .006	.005 - .007	
			I MD	KCU25							
		U	O MD	KCU40	231	427	561		IPR	.004 - .006	.005 - .007
			I MD	KCU40							
	I	O MD	KC7140	143	262	348	IPR	.003 - .006	.004 - .008		
		I MD	KC7140								
	2	S	O GD	KCU25	247	591	712	IPR	.004 - .006	.005 - .007	
			I GD	KCU25							
		U	O GD	KCU40	231	394	561		IPR	.004 - .006	.005 - .007
			I GD	KCU40							
	I	O GD	KC7140	143	230	348	IPR	.004 - .006	.005 - .007		
		I GD	KC7140								
	3	S	O GD	KCU25	197	459	555	IPR	.004 - .006	.005 - .007	
			I GD	KCU25							
		U	O GD	KCU40	163	328	396		IPR	.004 - .006	.005 - .007
			I GD	KCU40							
	I	O GD	KC7140	98	197	238	IPR	.004 - .006	.005 - .007		
		I GD	KC7140								
	4	S	O GD	KCU25	260	394	750	IPR	.004 - .006	.005 - .007	
			I GD	KCU25							
		U	O GD	KCU40	231	328	561		IPR	.004 - .006	.005 - .007
			I GD	KCU40							
	I	O GD	KC7140	143	262	348	IPR	.004 - .006	.005 - .007		
		I GD	KC7140								
5	S	O GD	KCU40	205	328	622	IPR	.002 - .004	.003 - .006		
		I GD	KCU40								
	U	O GD	KC7140	154	197	373		IPR	.002 - .004	.003 - .006	
		I GD	KC7140								
I	O GD	KC7140	103	131	250	IPR	.002 - .004	.003 - .006			
	I GD	KC7140									
6	S	O GD	KCU40	195	312	591	IPR	.003 - .004	.003 - .005		
		I GD	KCU40								
	U	O GD	KC7140	146	187	355		IPR	.003 - .004	.003 - .005	
		I GD	KC7140								
I	O GD	KC7140	98	125	238	IPR	.003 - .004	.003 - .005			
	I GD	KC7140									
M	1	S	O MD	KCU40	130	361	439	IPR	.003 - .004	.005 - .007	
			I MD	KC7140							
		U	O MD	KC7140	101	230	281		IPR	.003 - .004	.005 - .007
			I MD	KC7140							
	2	S	O MD	KCU40	124	325	417	IPR	.003 - .004	.005 - .007	
			I MD	KC7140							
		U	O MD	KC7140	101	207	281		IPR	.003 - .004	.005 - .007
			I MD	KC7140							
	3	S	O MD	KCU40	104	289	351	IPR	.003 - .004	.005 - .007	
			I MD	KC7140							
		U	O MD	KC7140	101	184	281		IPR	.003 - .004	.005 - .007
			I MD	KC7140							
I	O MD	KC7140	72	131	199	IPR	.003 - .004	.005 - .007			
	I MD	KC7140									

Condition: S = Stable cutting conditions; U = Unstable cutting conditions; I = Interrupted cutting conditions
 Pocket seat: I = Inboard insert; O = Outboard insert



■ HTS DFR™ • Inch

Indexable Drills

Material Group	Condition	Pocket Seat	Geometry	Grade	Cutting Speed – vc Range – SFM			Inch			
					min	Starting Value	max	Recommended Feed Rate (f) by Diameter			
								Ø (in)	DFR03... .688-.750	DFR04... .813-1.00	
K	1	S	O	GD	KCPK10	260	561	750	IPR	.004 - .008	.005 - .011
			I	GD	KCPK10						
		U	O	LD	KCU25	211	384	510	IPR	.004 - .008	.005 - .011
	I		LD	KCU25							
	I	O	LD	KCU40	131	236	316	IPR	.004 - .008	.005 - .011	
		I	LD	KCU40							
	2	S	O	GD	KCPK10	247	533	712	IPR	.004 - .008	.005 - .011
			I	GD	KCPK10						
		U	O	GD	KCU25	211	365	510	IPR	.004 - .008	.005 - .011
			I	GD	KCU25						
		I	O	LD	KCU40	131	224	316	IPR	.004 - .008	.005 - .011
			I	LD	KCU40						
3	S	O	GD	KCPK10	222	480	641	IPR	.004 - .008	.005 - .011	
		I	GD	KCPK10							
	U	O	GD	KCU25	195	328	473	IPR	.004 - .008	.005 - .011	
		I	GD	KCU25							
	I	O	GD	KCU40	113	202	274	IPR	.004 - .008	.005 - .011	
		I	GD	KCU40							
N	1	S	O	ST	KD1425	420	787	1176	IPR	.002 - .004	.004 - .007
			I	ST	KD1425						
		U	O	LD	KCU40	336	525	784	IPR	.002 - .004	.004 - .007
	I		LD	KCU40							
	2	S	O	ST	KD1425	391	732	1094	IPR	.002 - .004	.004 - .007
			I	ST	KD1425						
		U	O	LD	KCU40	336	488	784	IPR	.002 - .004	.004 - .007
	I		LD	KCU40							
	3	S	O	ST	KD1425	361	677	1011	IPR	.002 - .004	.004 - .007
			I	ST	KD1425						
		U	O	LD	KCU40	336	451	784	IPR	.002 - .004	.004 - .007
	I		LD	KCU40							
	4	S	O	ST	KD1425	391	732	1094	IPR	.002 - .004	.004 - .007
			I	ST	KD1425						
		U	O	LD	KCU40	336	488	784	IPR	.002 - .004	.004 - .007
	I		LD	KCU40							
	5	S	O	ST	KD1425	302	722	858	IPR	.002 - .004	.004 - .007
			I	ST	KD1425						
U		O	LD	KCU40	235	459	549	IPR	.002 - .004	.004 - .007	
	I	LD	KCU40								
I	O	LD	KCU40	151	295	351	IPR	.002 - .004	.004 - .007		
	I	LD	KCU40								

Condition: S = Stable cutting conditions; U = Unstable cutting conditions; I = Interrupted cutting conditions

Pocket seat: I = Inboard insert; O = Outboard insert

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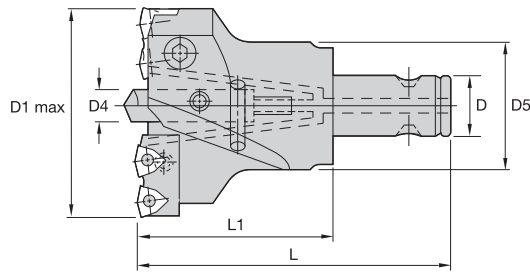


Holemaking

Online product catalog available 24/7

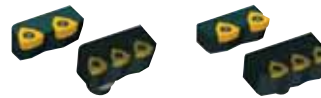
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- Head shipped with clamping and adjusting screws.
- Order pilot drill separately; see page J84.
- Order cartridges separately; see pages J82–J83.



■ HTS Adjustable Heads with DFT™ Inserts

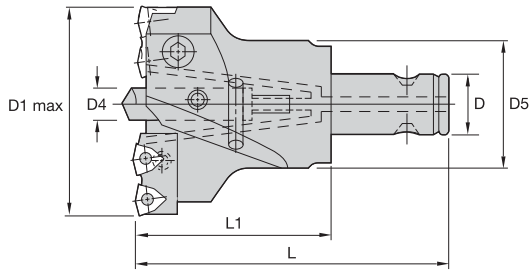
Indexable Drills



catalog number	D1		D1 max		D5	D	L	L1	pilot drill	cartridge interior		cartridge exterior		gage insert	ni	kg	lbs
	mm	in	mm	in						n	n	n	n				
3.76045R028V	45	1.770	50	1.970	28	13	85	50	B510S08.	3.77000R050V	1	3.77000R051V	1	DFT0303.	4	0,3	0.66
3.76050R028V	50	1.970	55	2.170	28	13	85	50	B510S08.	3.77000R052V	1	3.77000R053V	1	DFT0303.	4	0,4	0.88
3.76055R032V	55	2.170	58	2.280	33	16	100	60	B510S08.	3.77000R038V	1	3.77000R039V	1	DFT05T3.	4	0,4	0.88
3.76058R032V	58	2.280	63	2.480	33	16	100	60	B510S10.	3.77000R023V	1	3.77000R024V	1	DFT05T3.	4	0,4	0.88
3.76063R032V	63	2.480	68	2.680	33	16	100	60	B510S10.	3.77000R025V	1	3.77000R024V	1	DFT05T3.	4	0,4	0.88
3.76063R040V	63	2.480	68	2.680	41	22	115	70	B510S10.	3.77000R025V	1	3.77000R024V	1	DFT05T3.	4	0,5	1.10
3.76068R040V	68	2.680	73	2.870	41	22	115	70	B510S10.	3.77000R026V	1	3.77000R027V	1	DFT05T3.	4	0,8	1.76
3.76073R040V	73	2.870	78	3.070	41	22	115	70	B510S15.	3.77000R026V	1	3.77000R027V	1	DFT05T3.	4	0,8	1.76
3.76078R040V	78	3.070	84	3.310	41	22	115	70	B510S15.	3.77000R028V	1	3.77000R029V	1	DFT06T3.	4	0,8	1.76
3.76078R048V	78	3.070	84	3.310	49	27	120	70	B510S15.	3.77000R028V	1	3.77000R029V	1	DFT06T3.	4	0,9	1.98
3.76084R048V	84	3.310	90	3.540	49	27	120	70	B510S15.	3.77000R028V	1	3.77000R029V	1	DFT06T3.	4	1,0	2.20
3.76090R048V	90	3.540	96	3.780	49	27	120	70	B510S15.	3.77000R030V	1	3.77000R031V	1	DFT06T3.	4	1,0	2.20
3.76096R048V	96	3.780	102	4.020	49	27	120	70	B510S20.	3.77000R030V	1	3.77000R031V	1	DFT06T3.	4	1,1	2.43
3.76096R058V	96	3.780	102	4.020	59	32	130	80	B510S20.	3.77000R030V	1	3.77000R031V	1	DFT06T3.	4	1,2	2.65
3.76102R058V	102	4.020	108	4.250	59	32	130	80	B510S20.	3.77000R081V	1	3.77000R082V	1	DFT05T3.	6	1,7	3.75
3.76108R058V	108	4.250	115	4.530	59	32	130	80	B510S20.	3.77000R083V	1	3.77000R084V	1	DFT06T3.	6	1,8	3.97
3.76115R070V	115	4.530	122	4.800	71	40	145	90	B510S25.	3.77000R085V	1	3.77000R086V	1	DFT06T3.	6	2,9	6.39
3.76122R070V	122	4.800	130	5.120	71	40	145	90	B510S25.	3.77000R079V	1	3.77000R080V	1	DFT06T3.	6	2,9	6.39
3.76130R070V	130	5.120	140	5.510	71	40	145	90	B510S25.	3.77000R087V	1	3.77000R088V	1	DFT06T3.	6	3,0	6.61
3.76140R080V	140	5.510	150	5.910	81	50	160	100	B510S25.	3.77000R077V	1	3.77000R078V	1	DFT0704.	6	4,3	9.48
3.76150R080V	150	5.910	158	6.220	81	50	160	100	B510S25.	3.77000R075V	1	3.77000R076V	1	DFT0704.	6	4,5	9.92
3.76158R080V	158	6.220	162	6.380	81	50	160	100	B510S25.	3.77000R073V	1	3.77000R074V	1	DFT0704.	6	4,5	9.92
3.76162R080V	162	6.380	170	6.690	80	50	160	100	B510S30.	3.77000R048V	1	3.77000R049V	1	DFT0704.	6	4,5	9.92
3.76180R110	180	7.090	186	7.320	110	60	185	125	B510S30.	3.77000R030V	3	3.77000R031V	1	DFT06T3.	8	6,0	13.23
3.76195R110	195	7.680	201	7.910	110	60	185	125	B510S30.	3.77000R081V	3	3.77000R082V	1	DFT05T3.	12	6,5	14.33
3.76213R125	213	8.390	220	8.660	125	60	200	125	B510S30.	3.77000R083V	3	3.77000R084V	1	DFT06T3.	12	7,5	16.53
3.76230R160	230	9.060	240	9.450	160	80	230	150	B510S30.	3.77000R079V	2	3.77000R080V	2	DFT06T3.	12	8,5	18.74
3.76260R160	260	10.240	270	10.630	160	80	230	150	B510S30.	3.77000R077V	2	3.77000R078V	2	DFT06T3.	12	9,0	19.84

NOTE: n: number of cartridges required by head.
ni: number of inserts required by head.

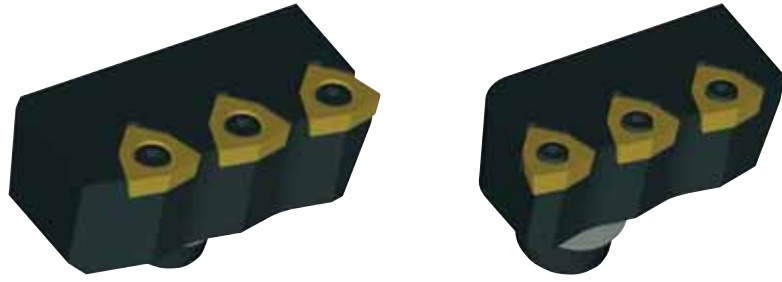
- Head shipped with clamping and adjusting screws.
- Order pilot drill separately; see page J84.
- Order cartridges separately; see pages J82–J83.



HTS Adjustable Heads • DFT™ and SPHX Inserts

catalog number	D1		D1 max		pilot drill	cartridge interior		n	cartridge interior 2		n	gage insert		ni	cartridge exterior SPHX		n	gage insert		ni
	mm	in	mm	in		cartridge interior	cartridge interior 2		gage insert	ni		cartridge exterior SPHX	gage insert							
3.76045R028V	45	1.770	50	1.970	B510S08.	3.77000R250V	—	—	DFT0303.	3	3.77000R251V	1	SPHX0703.	1						
3.76050R028V	50	1.970	55	2.170	B510S08.	3.77000R252V	—	—	DFT0303.	3	3.77000R253V	1	SPHX0703.	1						
3.76055R032V	55	2.170	58	2.280	B510S08.	3.77000R038V	—	—	DFT05T3.	3	3.77000R239V	1	SPHX0903.	1						
3.76058R032V	58	2.280	63	2.480	B510S10.	3.77000R023V	—	—	DFT05T3.	3	3.77000R224V	1	SPHX0903.	1						
3.76063R032V	63	2.480	68	2.680	B510S10.	3.77000R025V	—	—	DFT05T3.	3	3.77000R224V	1	SPHX0903.	1						
3.76063R040V	63	2.480	68	2.680	B510S10.	3.77000R025V	—	—	DFT05T3.	3	3.77000R224V	1	SPHX0903.	1						
3.76068R040V	68	2.680	73	2.870	B510S10.	3.77000R026V	—	—	DFT05T3.	3	3.77000R227V	1	SPHX0903.	1						
3.76073R040V	73	2.870	78	3.070	B510S15.	3.77000R026V	—	—	DFT05T3.	3	3.77000R227V	1	SPHX0903.	1						
3.76078R040V	78	3.070	84	3.310	B510S15.	3.77000R028V	—	—	DFT06T3.	3	3.77000R229V	1	SPHX0903.	1						
3.76078R048V	78	3.070	84	3.310	B510S15.	3.77000R028V	—	—	DFT06T3.	3	3.77000R229V	1	SPHX0903.	1						
3.76084R048V	84	3.310	90	3.540	B510S15.	3.77000R228V	—	—	DFT06T3.	3	3.77000R229V	1	SPHX0903.	1						
3.76090R048V	90	3.540	94	3.700	B510S15.	3.77000R230V	—	—	DFT06T3.	3	3.77000R231V	1	SPHX0903.	1						
3.76096R048V	96	3.780	100	3.920	B510S20.	3.77000R230V	—	—	DFT06T3.	3	3.77000R231V	1	SPHX0903.	1						
3.76096R058V	96	3.780	100	3.920	B510S20.	3.77000R230V	—	—	DFT06T3.	3	3.77000R231V	1	SPHX0903.	1						
3.76102R058V	102	4.020	108	4.250	B510S20.	3.77000R081V	—	—	DFT05T3.	5	3.77000R282V	1	SPHX0903.	1						
3.76108R058V	108	4.250	115	4.530	B510S20.	3.77000R083V	—	—	DFT06T3.	5	3.77000R284V	1	SPHX1204.	1						
3.76115R070V	115	4.530	122	4.800	B510S25.	3.77000R085V	—	—	DFT06T3.	5	3.77000R286V	1	SPHX1204.	1						
3.76122R070V	122	4.800	130	5.120	B510S25.	3.77000R079V	—	—	DFT06T3.	5	3.77000R280V	1	SPHX1204.	1						
3.76130R070V	130	5.120	140	5.510	B510S25.	3.77000R087V	—	—	DFT06T3.	5	3.77000R288V	1	SPHX1204.	1						
3.76140R080V	140	5.510	150	5.910	B510S25.	3.77000R077V	—	—	DFT0704.	5	3.77000R278V	1	SPHX1505.	1						
3.76150R080V	150	5.910	158	6.220	B510S25.	3.77000R075V	—	—	DFT0704.	5	3.77000R276V	1	SPHX1505.	1						
3.76158R080V	158	6.220	162	6.380	B510S25.	3.77000R073V	—	—	DFT0704.	5	3.77000R274V	1	SPHX1505.	1						
3.76162R080V	162	6.380	170	6.690	B510S30.	3.77000R248V	—	—	DFT0704.	5	3.77000R249V	1	SPHX1505.	1						
3.76180R110	180	7.090	184	7.240	B510S30.	3.77000R230V	—	—	DFT06T3.	7	3.77000R231V	1	SPHX0903.	1						
3.76195R110	195	7.680	201	7.910	B510S30.	3.77000R081V	—	—	DFT05T3.	11	3.77000R282V	1	SPHX0903.	1						
3.76213R125	213	8.390	220	8.660	B510S30.	3.77000R083V	—	—	DFT06T3.	11	3.77000R284V	1	SPHX1204.	1						
3.76230R160	230	9.060	240	9.450	B510S30.	3.77000R079V	2	3.77000R080V	1	DFT06T3.	11	3.77000R280V	1	SPHX1204.	1					

NOTE: n: number of cartridges required by head.
ni: number of inserts required by head



Indexable Drills

■ HTS Interior and Exterior Cartridges • DFT™ Inserts



catalog number	gage insert	number of inserts	insert screw	cartridge screw	fan washer	Nm	ft. lbs.
3.77000R023V	DFT05T3..	2	191.924	192.593	192.903	5,0	3.69
3.77000R024V	DFT05T3..	2	191.924	192.593	192.903	5,0	3.69
3.77000R025V	DFT05T3..	2	191.924	192.593	192.903	5,0	3.69
3.77000R026V	DFT05T3..	2	191.924	192.593	192.903	5,0	3.69
3.77000R027V	DFT05T3..	2	191.924	192.593	192.903	5,0	3.69
3.77000R028V	DFT06T3..	2	191.848	129.612	192.111	10,0	7.38
3.77000R029V	DFT06T3..	2	191.848	129.612	192.111	10,0	7.38
3.77000R030V	DFT06T3..	3	191.848	129.616	192.111	10,0	7.38
3.77000R031V	DFT06T3..	3	191.848	129.612	192.111	10,0	7.38
3.77000R038V	DFT05T3..	2	191.924	192.593	192.903	5,0	3.69
3.77000R039V	DFT05T3..	2	191.924	192.593	192.903	5,0	3.69
3.77000R048V	DFT0704..	3	191.698	125.830	192.112	35,0	25.81
3.77000R049V	DFT0704..	3	191.698	125.830	192.112	35,0	25.81
3.77000R050V	DFT0303..	2	192.432	192.592	192.902	5,0	3.69
3.77000R051V	DFT0303..	2	192.432	192.592	192.902	5,0	3.69
3.77000R052V	DFT0303..	2	192.432	192.592	192.902	5,0	3.69
3.77000R053V	DFT0303..	2	192.432	192.592	192.902	5,0	3.69
3.77000R073V	DFT0704..	3	191.698	125.825	192.112	35,0	25.81
3.77000R074V	DFT0704..	3	191.698	125.825	192.112	35,0	25.81
3.77000R075V	DFT0704..	3	191.698	125.825	192.112	35,0	25.81
3.77000R076V	DFT0704..	3	191.698	125.825	192.112	35,0	25.81
3.77000R077V	DFT0704..	3	191.698	125.825	192.112	35,0	25.81
3.77000R078V	DFT0704..	3	191.698	125.825	192.112	35,0	25.81
3.77000R079V	DFT06T3..	3	191.848	125.820	192.112	35,0	25.81
3.77000R080V	DFT06T3..	3	191.848	125.820	192.112	35,0	25.81
3.77000R081V	DFT05T3..	3	191.924	125.820	192.112	35,0	25.81
3.77000R082V	DFT05T3..	3	191.924	125.820	192.112	35,0	25.81
3.77000R083V	DFT06T3..	3	191.924	125.820	192.112	35,0	25.81
3.77000R084V	DFT06T3..	3	191.924	125.820	192.112	35,0	25.81
3.77000R085V	DFT06T3..	3	191.848	125.825	192.112	35,0	25.81
3.77000R086V	DFT06T3..	3	191.924	125.820	192.112	35,0	25.81
3.77000R087V	DFT06T3..	3	191.848	125.820	192.112	35,0	25.81
3.77000R088V	DFT06T3..	3	191.848	125.820	192.112	35,0	25.81

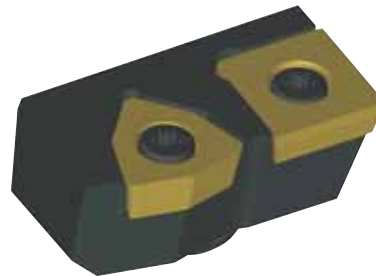


■ HTS Finishing Interior Cartridges • For Use with Exterior Cartridges Equipped with SPHX Inserts

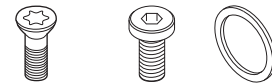


catalog number	gage insert	number of inserts	insert screw	washer	Nm	ft. lbs.
3.77000R228V	DFT06T3..	2	191.848	192.111	10,0	7.00
3.77000R230V	DFT06T3..	2	191.848	192.111	10,0	7.00
3.77000R248V	DFT0704..	3	191.698	192.112	35,0	25.00
3.77000R250V	DFT0303..	2	192.432	192.902	5,0	3.00
3.77000R252V	DFT0303..	2	192.432	192.902	5,0	3.00

NOTE: Modified interior cartridges for use with SPHX-equipped exterior cartridges only.

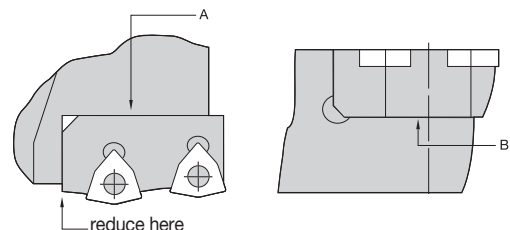


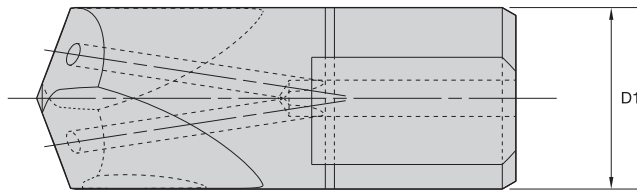
■ HTS Finishing Exterior Cartridges • SPHX Inserts



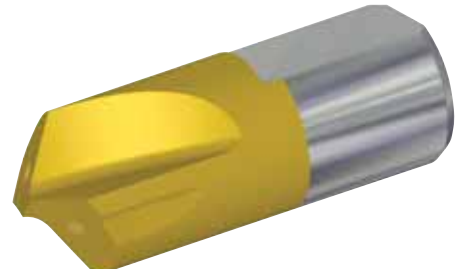
catalog number	gage insert inside	number of inserts	gage insert outside	number of inserts	insert screw	screw	washer	Nm	ft. lbs.
3.77000R224V	DFT05T3..	1	SPHX0903..	1	191.924	193.451	192.903	5,0	3.69
3.77000R227V	DFT05T3..	1	SPHX0903..	1	191.924	192.593	192.903	5,0	3.69
3.77000R229V	DFT06T3..	1	SPHX0903..	1	191.916	129.612	192.111	10,0	7.38
3.77000R231V	DFT06T3..	1	SPHX0903..	1	191.916	129.616	192.111	10,0	7.38
3.77000R239V	DFT05T3..	1	SPHX0903..	1	191.924	193.451	192.903	5,0	3.69
3.77000R249V	DFT0704..	2	SPHX1505..	1	192.433	125.830	192.112	35,0	25.81
3.77000R251V	DFT0303..	1	SPHX0703..	1	192.432	193.450	192.902	5,0	3.69
3.77000R253V	DFT0303..	1	SPHX0703..	1	192.432	193.450	192.902	5,0	3.69
3.77000R274V	DFT0704..	2	SPHX1505..	1	192.433	125.825	192.112	35,0	25.81
3.77000R276V	DFT0704..	2	SPHX1505..	1	192.433	125.825	192.112	35,0	25.81
3.77000R278V	DFT0704..	2	SPHX1505..	1	192.433	125.825	192.112	35,0	25.81
3.77000R280V	DFT06T3..	2	SPHX1204..	1	191.916	125.820	192.112	35,0	25.81
3.77000R282V	DFT05T3..	2	SPHX0903..	1	191.924	125.820	192.112	35,0	25.81
3.77000R284V	DFT06T3..	2	SPHX1204..	1	191.916	125.820	192.112	35,0	25.81
3.77000R286V	DFT06T3..	2	SPHX1204..	1	191.916	125.825	192.112	35,0	25.81
3.77000R288V	DFT06T3..	2	SPHX1204..	1	191.916	125.820	192.112	35,0	25.81

- Change drill diameter by shortening the outer cartridge.
- Shorten at 90° to the contact face A and the support face B.
- Shortening reduces the effective drill diameter by two times the amount removed.



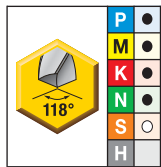


8–10mm sizes are without coolant.

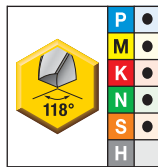


Indexable Drills

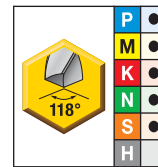
■ HTS DFT™ • Pilot Drills



high-speed steel uncoated



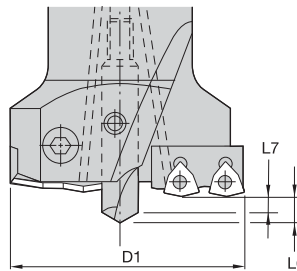
high-speed steel coated



carbide drills

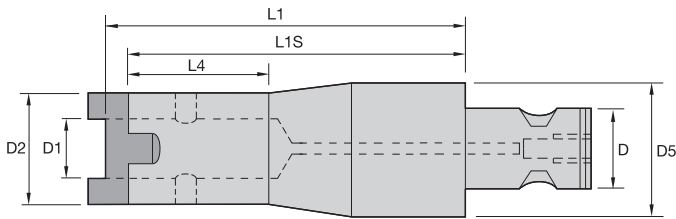
			D1	
			mm	in
A30	B510S08000	B510S08000	8,00	.315
	B510S10000	B510S10000	10,00	.394
AS3	B510S15000	B511S15000	15,00	.591
	B510S20000	B511S20000	20,00	.787
KC7315	B510S25000	B511S25000	25,00	.984
	B510S30000	B511S30000	30,00	1.181

■ Pilot Drill Setting Lengths



D1		2–4 x D1				4–6 x D1				>6 x D1			
		L6		L7		L6		L7		L6		L7	
mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in
8,00	.315	3,00	.118	0,80	.032	3,40	.134	1,20	.047	3,80	.150	1,60	.063
10,00	.394	4,00	.158	1,30	.051	4,30	.169	1,60	.063	4,60	.181	1,90	.075
15,00	.591	6,20	.244	2,10	.083	6,50	.256	2,40	.095	6,80	.268	2,70	.106
20,00	.787	8,10	.319	2,60	.102	8,40	.331	2,90	.114	8,70	.343	3,20	.126
25,00	.984	10,50	.413	3,50	.138	7,40	.429	3,90	.154	11,30	.445	4,30	.169
30,00	1.181	12,30	.484	4,10	.158	12,80	.504	4,50	.177	13,20	.520	5,00	.197

- Reducers are shipped with drive ring and clamping screws.

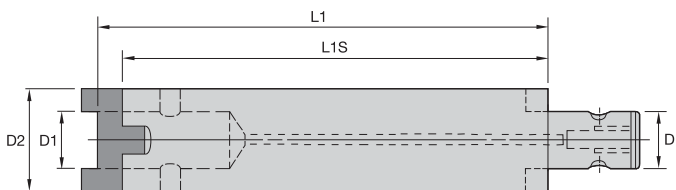


Reducers

catalog number	D1 coupling size	D coupling size	D2		D5		L1		L1S		L4		drive ring	clamping screw	Nm	ft. lbs.
			mm	in	mm	in	mm	in	mm	in	mm	in				
5.34280R028080	13B	50	27,6	1.09	80,0	3.15	90,0	3.54	80,0	3.15	50,0	1.97	192.419	192.156	10,2	7.5
5.34240R032100	16	22	31,6	1.24	40,0	1.57	110,0	4.33	100,0	3.94	55,0	2.17	192.420	192.156	10,2	7.5
5.34280R032080	16	50	31,6	1.24	80,0	3.15	90,0	3.54	80,0	3.15	55,0	2.17	192.420	192.156	10,2	7.5
5.34248R040100	22	27	39,6	1.56	48,0	1.89	112,0	4.41	100,0	3.94	57,0	2.24	192.421	192.157	16,3	12.0
5.34280R040080	22	50	39,6	1.56	80,0	3.15	92,0	3.62	80,0	3.15	57,0	2.24	192.421	192.157	16,3	12.0
5.34258R048100	27	32	47,6	1.87	58,0	2.28	112,0	4.41	100,0	3.94	57,0	2.24	192.422	191.727	20,3	15.0
5.34280R048080	27	50	47,6	1.87	80,0	3.15	92,0	3.62	80,0	3.15	57,0	2.24	192.422	191.727	20,3	15.0
5.34270R058100	32	40	57,6	2.27	70,0	2.76	113,9	4.48	100,0	3.94	58,9	2.32	192.423	191.727	20,3	15.0
5.34280R058080	32	50	57,6	2.27	80,0	3.15	93,9	3.70	80,0	3.15	58,9	2.32	192.423	191.727	20,3	15.0
5.34280R070150	40	50	69,6	2.74	80,0	3.15	163,9	6.45	150,0	5.91	68,9	2.71	192.424	191.728	33,9	25.0

NOTE: Assemble components using recommended torque values.

- Extensions are shipped with drive ring and clamping screws.

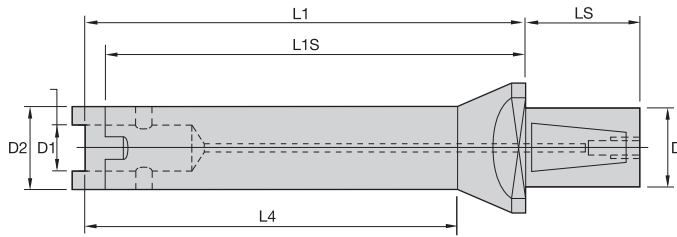


Extensions

catalog number	D1 coupling size	D coupling size	D2		L1		L1S		drive ring	clamping screw	Nm	ft. lbs.
			mm	in	mm	in	mm	in				
5.34125R025150	13A	13A	25,0	.0	160,0	6.3	150,0	5.9	193.371	193.372	10,2	7.5
5.34128R028150	13B	13B	28,0	1.1	160,0	6.3	150,0	5.9	192.419	192.156	10,2	7.5
5.34132R032100	16	16	32,0	1.3	110,0	4.3	100,0	3.9	192.420	192.156	10,2	7.5
5.34132R032200	16	16	32,0	1.3	210,0	8.3	200,0	7.9	192.420	192.156	10,2	7.5
5.34140R040200	22	22	40,0	1.6	212,0	8.3	200,0	7.9	192.421	192.157	16,3	12.0
5.34148R048200	27	27	48,0	1.9	212,0	8.3	200,0	7.9	192.422	191.727	20,3	15.0
5.34158R058300	32	32	58,0	2.3	314,0	12.4	300,0	11.8	192.423	191.727	33,9	25.0
5.34170R070186	40	40	70,0	2.8	200,0	7.9	186,0	7.3	192.424	191.728	33,9	25.0
5.34170R070300	40	40	70,0	2.8	314,0	12.4	300,0	11.8	192.424	191.728	33,9	25.0
5.34170R070500	40	40	70,0	2.8	514,0	20.2	500,0	19.7	192.424	191.728	33,9	25.0
5.34180R080204	50	50	80,0	3.1	220,0	8.7	204,0	8.0	192.425	191.728	33,9	25.0
5.34180R080300	50	50	80,0	3.1	316,0	12.4	300,0	11.8	192.425	191.728	33,9	25.0
5.34180R080500	50	50	80,0	3.1	516,0	20.3	500,0	19.7	192.425	191.728	33,9	25.0

NOTE: Assemble components using recommended torque values.

• Shanks are shipped with drive ring and clamping screws.



Indexable Drills

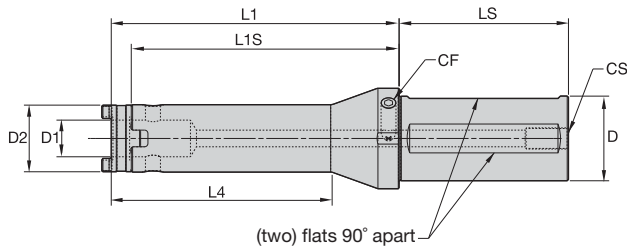
■ Basic Shank WN/WD • Metric



catalog number	D1 coupling size	D	D2	L1	L1S	L4	LS	drive ring	clamping screw	Nm
5.34032-025115	13A	32,0	25,0	125,0	115,0	110,0	58,0	193.371	193.372	10,2
5.34032-025200	13A	32,0	25,0	210,0	200,0	195,0	58,0	193.371	193.372	10,2
5.34050-025300	13A	50,0	25,0	310,0	300,0	270,0	68,0	193.371	193.372	10,2
5.34050-025450	13A	50,0	25,0	460,0	450,0	420,0	68,0	193.371	193.372	10,2
5.34032-028115	13B	32,0	28,0	125,0	115,0	110,0	58,0	192.419	192.156	10,2
5.34032-028200	13B	32,0	28,0	210,0	200,0	195,0	58,0	192.419	192.156	10,2
5.34050-028300	13B	50,0	28,0	310,0	300,0	265,0	68,0	192.419	192.156	10,2
5.34050-028450	13B	50,0	28,0	460,0	450,0	415,0	68,0	192.419	192.156	10,2
5.34032-032125	16	32,0	32,0	135,0	125,0	120,0	58,0	192.420	192.156	10,2
5.34050-032200	16	50,0	32,0	210,0	200,0	165,0	68,0	192.420	192.156	10,2
5.34050-032500	16	50,0	32,0	510,0	500,0	465,0	68,0	192.420	192.156	10,2
5.34050032350	16	50,0	32,0	360,0	350,0	315,0	68,0	192.420	192.156	10,2
5.34050-040148	22	50,0	40,0	160,0	148,0	140,0	68,0	192.421	192.157	16,3
5.34050-040300	22	50,0	40,0	312,0	300,0	267,0	68,0	192.421	192.157	10,2
5.34050-040450	22	50,0	40,0	462,0	450,0	417,0	68,0	192.421	192.157	10,2
5.34050-040600	22	50,0	40,0	612,0	600,0	567,0	68,0	192.422	192.157	10,2
5.34050-048168	27	50,0	48,0	175,0	168,0	160,0	68,0	192.422	191.727	20,3
5.34050-048300	27	50,0	48,0	312,0	300,0	267,0	68,0	192.422	191.727	16,3
5.34050-048450	27	50,0	48,0	462,0	450,0	417,0	68,0	192.422	191.727	16,3
5.34050-048600	27	50,0	48,0	612,0	600,0	567,0	68,0	192.422	191.727	16,3
5.34050-058186	32	50,0	58,0	200,0	186,0	180,0	68,0	192.423	191.727	20,3
5.34050-058300	32	50,0	58,0	314,0	300,0	254,0	68,0	192.423	191.727	20,3
5.34050-058450	32	50,0	58,0	464,0	450,0	404,0	68,0	192.423	191.727	20,3
5.34050-058600	32	50,0	58,0	614,0	600,0	554,0	68,0	192.423	191.727	20,3

NOTE: Assemble components using recommended torque values.

- Shipped with drive ring and clamping screw.



■ Flanged Shank • Inch



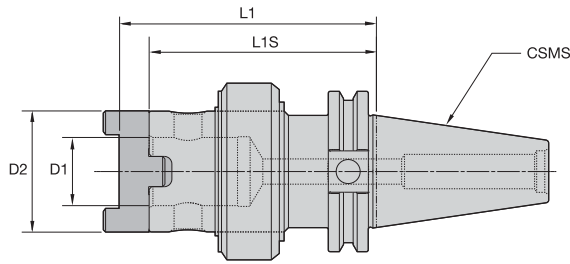
catalog number	D1 coupling size	D	D2	L1	L1S	L4	LS	drive ring	clamping screw	ft. lbs.
SSF150HTS130239	13A	1.50	.98	2.39	2.00	.39	3.75	193.371	193.372	7.5
SSF150HTS130450	13A	1.50	.98	4.50	4.11	2.50	3.75	193.371	193.372	7.5
SSF150HTS130664	13A	1.50	.98	6.64	6.25	4.65	3.75	193.371	193.372	7.5
SSF150HTS131114	13A	1.50	.98	11.14	10.75	9.14	3.75	193.371	193.372	7.5
SSF150HTS131764	13A	1.50	.98	17.64	17.25	15.64	3.75	193.371	193.372	7.5
SSF200HTS130239	13B	2.00	1.10	2.39	2.00	.39	4.00	192.419	192.156	7.5
SSF200HTS130450	13B	2.00	1.10	4.50	4.11	2.50	4.00	192.419	192.156	7.5
SSF200HTS130664	13B	2.00	1.10	6.64	6.25	4.65	4.00	192.419	192.156	7.5
SSF200HTS131114	13B	2.00	1.10	11.14	10.75	9.14	4.00	192.419	192.156	7.5
SSF200HTS131764	13B	2.00	1.10	17.64	17.25	15.64	4.00	192.419	192.156	7.5
SSF200HTS160239	16	2.00	1.26	2.39	2.00	.39	4.00	192.420	192.156	7.5
SSF200HTS160450	16	2.00	1.26	4.50	4.11	2.50	4.00	192.420	192.156	7.5
SSF200HTS160714	16	2.00	1.26	7.14	6.75	5.14	4.00	192.420	192.156	7.5
SSF200HTS161214	16	2.00	1.26	12.14	11.75	10.14	4.00	192.420	192.156	7.5
SSF200HTS161964	16	2.00	1.26	19.64	19.25	17.64	4.00	192.420	192.156	7.5
SSF200HTS220297	22	2.00	1.57	2.97	2.50	.47	4.00	192.421	192.157	12.0
SSF200HTS220550	22	2.00	1.57	5.50	5.03	3.50	4.00	192.421	192.157	12.0
SSF200HTS220922	22	2.00	1.57	9.22	8.75	7.22	4.00	192.421	192.157	12.0
SSF200HTS221572	22	2.00	1.57	15.72	15.25	13.72	4.00	192.421	192.157	12.0
SSF200HTS222572	22	2.00	1.57	25.72	25.25	23.72	4.00	192.421	192.157	12.0
SSF200HTS270297	27	2.00	1.89	2.97	2.50	1.47	4.00	192.422	191.727	15.0
SSF200HTS270550	27	2.00	1.89	5.50	5.03	3.50	4.00	192.422	191.727	15.0
SSF200HTS271122	27	2.00	1.89	11.22	10.75	9.22	4.00	192.422	191.727	15.0
SSF200HTS271922	27	2.00	1.89	19.22	18.75	17.22	4.00	192.422	191.727	15.0
SSF200HTS273122	27	2.00	1.89	31.22	30.75	29.22	4.00	192.422	191.727	15.0
SSF200HTS320305	32	2.00	2.28	3.05	2.50	1.55	4.00	192.423	191.727	15.0
SSF200HTS320550	32	2.00	2.28	5.50	4.95	3.50	4.00	192.423	191.727	15.0
SSF200HTS320805	32	2.00	2.28	8.05	7.50	6.05	4.00	192.423	191.727	15.0
SSF200HTS321305	32	2.00	2.28	13.05	12.50	11.05	4.00	192.423	191.727	15.0
SSF200HTS321805	32	2.00	2.28	18.05	17.50	16.05	4.00	192.423	191.727	15.0
SSF250HTS400355	40	2.50	2.76	3.55	3.00	1.63	4.25	192.424	191.728	26.0
SSF250HTS400650	40	2.50	2.76	6.50	5.95	4.50	4.25	192.424	191.728	26.0
SSF250HTS401055	40	2.50	2.76	10.55	10.00	8.21	4.25	192.424	191.728	26.0
SSF250HTS401555	40	2.50	2.76	15.55	15.00	13.21	4.25	192.424	191.728	26.0
SSF250HTS402555	40	2.50	2.76	25.55	25.00	23.21	4.25	192.424	191.728	26.0
SSF300HTS500413	50	3.00	3.15	4.13	3.50	1.87	4.50	192.425	191.728	26.0
SSF300HTS500700	50	3.00	3.15	7.00	6.37	5.00	4.50	192.425	191.728	26.0
SSF300HTS501313	50	3.00	3.15	13.13	12.50	10.55	4.50	192.425	191.728	26.0
SSF300HTS502113	50	3.00	3.15	21.13	20.50	18.55	4.50	192.425	191.728	26.0
SSF300HTS503113	50	3.00	3.15	31.13	30.50	28.55	4.50	192.425	191.728	26.0

NOTE: Assemble components using recommended torque values.



D	CF	CS	side pipe plug
1.500	1/8-27 NPT	1/4-18 NPT	HSFS0125
2.000	1/8-27 NPT	1/4-18 NPT	HSFS0125
2.500	1/8-27 NPT	1/4-18 NPT	HSFS0125
3.000	1/8-27 NPT	1/4-18 NPT	HSFS0125

• Shanks are shipped with drive ring and clamping screws.



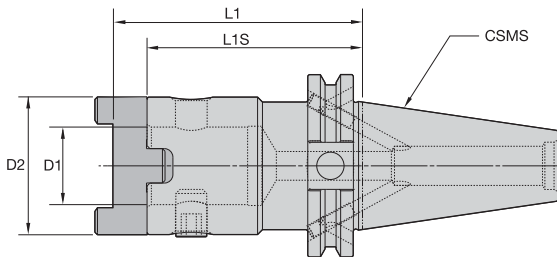
Indexable Drills

■ CV Taper Shank • Form AD • Rotary Coolant Ring

catalog number	CSMS system size	D1 coupling size	D2	L1	L1S	clamping screw	hex wrench	drive ring	coolant ring	ft. lbs.
CV50RMHTS13M394	CV50	13B	1.09	4.33	3.94	192.156	170.004	192.419	302.011	7.0
CV50RMHTS16M394	CV50	16	1.25	4.33	3.94	192.156	170.004	192.420	302.011	7.0
CV50RMHTS22M394	CV50	22	1.54	4.41	3.94	192.157	170.004	192.421	302.011	12.0
CV50RMHTS27M394	CV50	27	1.88	4.41	3.94	191.727	170.006	192.422	302.011	15.0
CV50RMHTS32M394	CV50	32	2.27	4.49	3.94	191.727	170.006	192.423	302.011	15.0
CV50RMHTS40M413	CV50	40	2.74	4.69	4.13	191.728	170.008	192.424	302.009	26.0
CV50RMHTS50M413	CV50	50	3.13	4.76	4.13	191.728	170.008	192.425	302.010	26.0

NOTE: Assemble components using recommended torque values.

• Shanks are shipped with drive ring and clamping screws.

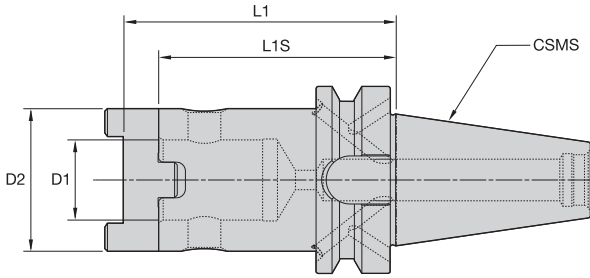


■ CV Taper Shank • Form B/AD Coolant

catalog number	CSMS system size	D1 coupling size	D2	L1	L1S	clamping screw	hex wrench	drive ring	ft. lbs.
CV50BHTS13M295	CV50	13B	1.10	3.35	2.95	192.156	170.004	192.419	7.0
CV50BHTS16M295	CV50	16	1.26	3.35	2.95	192.156	170.004	192.420	7.0
CV50BHTS22M295	CV50	22	1.57	3.43	2.95	192.157	170.004	192.421	12.0
CV50BHTS27M295	CV50	27	1.89	3.43	2.95	191.727	170.006	192.422	15.0
CV50BHTS32M314	CV50	32	2.28	3.70	3.15	191.727	170.006	192.423	15.0
CV50BHTS40M314	CV50	40	2.76	3.70	3.15	191.728	170.008	192.424	26.0
CV50BHTS50M314	CV50	50	3.15	3.78	3.15	191.728	170.008	192.425	26.0

NOTE: Assemble components using recommended torque values.

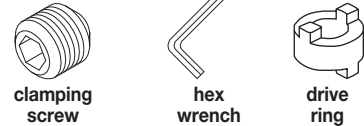
• Shanks are shipped with drive ring and clamping screw.



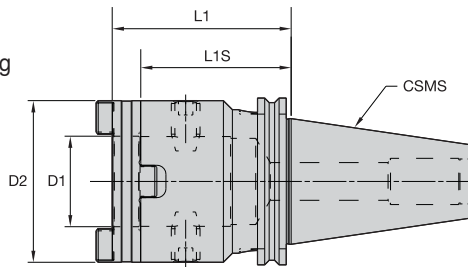
■ **BT Taper Shank • Form B/AD Coolant**

catalog number	CSMS system size	D1 coupling size	D2	L1		L1S		clamping screw	hex wrench	drive ring	Nm ft. lbs.	
				mm	in	mm	in					
BT50BHTS22075M	BT50	22	40,0	87,0	3.4	75,0	3,0	192.157	170.005	192.421	16,0	12,0
BT50BHTS32080M	BT50	32	58,0	94,0	3.7	80,0	3.1	191.727	170.006	192.423	20,0	15,0
BT50BHTS40080M	BT50	40	70,0	94,0	3.7	80,0	3.1	191.728	170.008	192.424	34,0	26,0
BT50BHTS50080M	BT50	50	80,0	96,0	3.8	80,0	3.1	191.728	170.008	192.425	34,0	26,0

NOTE: Assemble components using recommended torque values.



• Shanks are shipped with drive ring and clamping screws.



■ **DV Taper Shank • Form B/AD Coolant**

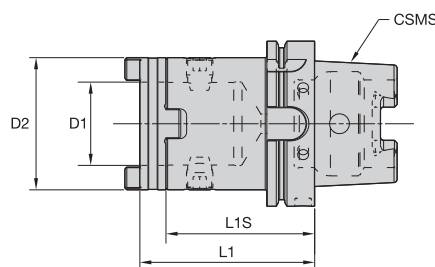
catalog number	CSMS system size	D1	D2		L1		L1S		clamping screw	hex wrench	drive ring	Nm ft. lbs.	
			mm	in	mm	in	mm	in					
5.36050154040	DV50	40	70,0	2.8	100,0	3.9	84,0	3.3	191.728	170.008	192.424	—	—
5.36050-154050	DV50	50	90,0	3.5	100,0	3.9	84,0	3.3	191.729	170.008	192.426	—	—

NOTE: Assemble components using recommended torque values.



Form AD				
Form B				
	40	(2x) MS2221S	2,5mm	
	50	(2x) MS1296S	3mm	

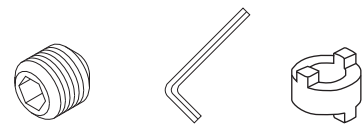
• Shanks are shipped with drive ring and clamping screws.



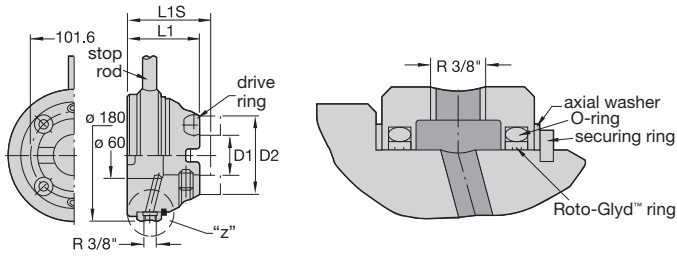
■ **HSK100A Taper Shank**

catalog number	CSMS system size	D1 coupling size	D2	L1		L1S		clamping screw	hex wrench	drive ring	Nm ft. lbs.		
				mm	in	mm	in						
HSK100AHTS40085M	HSK100A	40	70,0	2.8	99,0	3.9	85,0	3.3	191.728	170.008	192.424	35,0	25,0
HSK100AHTS50090M	HSK100A	50	80,0	3.1	106,0	4.2	90,0	3.5	191.728	170.008	192.425	35,0	25,0

NOTE: Assemble components using recommended torque values.



Clamping Chucks












■ Flanged Adapter (Including Drive Ring)

Indexable Drills

catalog number	D1		D2		L1		L1S		kg	lbs
	mm	in	mm	in	mm	in	mm	in		
5.34350-090100	50,00	90,0	3.54	116,0	4.57	100,0	3.94	10,0	21.94	

NOTE: Adapter includes all items shown except the nipple. Nipple must be ordered separately.
If replacement becomes necessary, the nipple is manufactured with a predetermined breaking point for safety purposes.
Maximum RPM is 1500. Maximum pressure is 72 psi or 5 bar.

■ Spare Parts

catalog number	 drive ring	 clamping screw	 coolant ring	 O-ring	 securing ring	 axial washer	 Roto-Glyd ring	 stop rod	 nipple
5.34350-090100	192.426	191.729	302.014	192.731	192.126	192.158	192.730	460.716	192.759

HTS DFT™ • Metric

Material Group	Condition	Pocket Seat	Geometry	Grade	Cutting Speed – vc Range – m/min			Metric				
					min	Starting Value	max	Recommended Feed Rate (f) by Diameter				
								Ø (mm)	DFT03... 45,00-55,00	DFT05... 55,00-78,00	DFT06... 78,00-140,00	DFT07... 140,00-270,00
P	1	S	O MD	KCU25	94	190	229	mm/r	0,06 - 0,10	0,08 - 0,12	0,10 - 0,14	0,13 - 0,19
			I MD	KCU40								
		U	O MD	KCU40	71	130	171	mm/r	0,06 - 0,10	0,08 - 0,12	0,10 - 0,14	0,13 - 0,19
			I MD	KC7140								
	2	S	O HP	KCU25	94	180	229	mm/r	0,10 - 0,14	0,12 - 0,18	0,12 - 0,18	0,12 - 0,20
				KCU40								
		U	O HP	KCU40	71	120	1714	mm/r	0,10 - 0,14	0,12 - 0,18	0,12 - 0,18	0,12 - 0,20
			I HP	KC7140								
	3	S	O HP	KCU25	70	140	169	mm/r	0,10 - 0,14	0,12 - 0,18	0,12 - 0,18	0,12 - 0,20
				I HP									KCU40
		U	O HP	KCU40	50	100	121	mm/r	0,10 - 0,14	0,12 - 0,18	0,12 - 0,18	0,12 - 0,20
			I HP	KC7140								
	4	S	O HP	KCU25	94	120	229	mm/r	0,10 - 0,14	0,12 - 0,18	0,12 - 0,18	0,12 - 0,20
				I HP									KCU40
		U	O HP	KCU40	71	100	171	mm/r	0,10 - 0,14	0,12 - 0,18	0,12 - 0,18	0,12 - 0,20
			I HP	KC7140								
	5	S	O HP	KCU25	78	100	190	mm/r	0,05 - 0,07	0,06 - 0,08	0,06 - 0,10	0,08 - 0,12
				I HP									KCU40
		U	O HP	KCU40	47	60	114	mm/r	0,05 - 0,07	0,06 - 0,08	0,06 - 0,10	0,08 - 0,12
			I HP	KC7140								
	6	S	O HP	KCU25	74	95	180	mm/r	0,04 - 0,07	0,05 - 0,08	0,06 - 0,10	0,08 - 0,12
				I HP									KCU40
		U	O HP	KCU40	45	57	108	mm/r	0,04 - 0,07	0,05 - 0,08	0,06 - 0,10	0,08 - 0,12
			I HP	KC7140								
M	1	S	O MD	KCU25	48	110	134	mm/r	0,07 - 0,11	0,12 - 0,18	0,14 - 0,20	0,16 - 0,22
			I MD	KCU40								
		U	O MD	KCU40	31	70	86	mm/r	0,07 - 0,11	0,12 - 0,18	0,14 - 0,20	0,16 - 0,22
			I MD	KC7140								
	2	S	O MD	KCU25	48	99	134	mm/r	0,07 - 0,11	0,12 - 0,18	0,14 - 0,20	0,16 - 0,22
				I MD									KCU40
		U	O MD	KCU40	31	63	86	mm/r	0,07 - 0,11	0,12 - 0,18	0,14 - 0,20	0,16 - 0,22
			I MD	KC7140								
	3	S	O MD	KCU25	48	88	134	mm/r	0,07 - 0,11	0,12 - 0,18	0,14 - 0,20	0,16 - 0,22
				I MD									KCU40
		U	O MD	KCU40	31	56	86	mm/r	0,07 - 0,11	0,12 - 0,18	0,14 - 0,20	0,16 - 0,22
			I MD	KC7140								

Condition: S = Stable cutting conditions; U = Unstable cutting conditions; I = Interrupted cutting conditions

Pocket seat: I = Inboard insert; O = Outboard insert



■ HTS DFT™ • Metric

Indexable Drills

Material Group	Condition	Pocket Seat	Geometry	Grade	Cutting Speed – vc Range – m/min			Metric				
					min	Starting Value	max	Recommended Feed Rate (f) by Diameter				
								Ø (mm)	DFT03... 45,00-55,00	DFT05... 55,00-78,00	DFT06... 78,00-140,00	DFT07... 140,00-270,00
K	1	S	O HP	KCPK10	94	171	229	mm/r	0,11 - 0,20	0,13 - 0,27	0,15 - 0,31	0,17 - 0,33
			I HP	KCPK10								
		U	O HP	KCU25	64	117	156	mm/r	0,11 - 0,20	0,13 - 0,27	0,15 - 0,31	0,17 - 0,33
			I HP	KCU25								
		I	O HP	KCU40	40	72	96	mm/r	0,11 - 0,20	0,13 - 0,27	0,15 - 0,31	0,17 - 0,33
			I HP	KCU40								
	2	S	O HP	KCPK10	94	162	229	mm/r	0,11 - 0,20	0,13 - 0,27	0,15 - 0,31	0,17 - 0,33
			I HP	KCPK10								
		U	O HP	KCU25	64	111	156	mm/r	0,11 - 0,20	0,13 - 0,27	0,15 - 0,31	0,17 - 0,33
			I HP	KCU25								
		I	O HP	KCU40	40	68	96	mm/r	0,11 - 0,20	0,13 - 0,27	0,15 - 0,31	0,17 - 0,33
			I HP	KCU40								
3	S	O HP	KCPK10	90	146	217	mm/r	0,11 - 0,20	0,13 - 0,27	0,15 - 0,31	0,15 - 0,31	
		I HP	KCPK10									
	U	O HP	KCU25	59	100	144	mm/r	0,11 - 0,20	0,13 - 0,27	0,15 - 0,31	0,15 - 0,31	
		I HP	KCU25									
	I	O HP	KCU40	35	62	84	mm/r	0,11 - 0,20	0,13 - 0,27	0,15 - 0,31	0,15 - 0,31	
		I HP	KCU40									
N	1	S	O ST	KD1425	154	240	358	mm/r	0,06 - 0,09	0,11 - 0,19	0,12 - 0,20	0,14 - 0,25
			I ST	KD1425								
		U	O HP	KC7140	102	160	239	mm/r	0,06 - 0,09	0,11 - 0,19	0,12 - 0,20	0,14 - 0,25
			I HP	KC7140								
		I	O HP	KC7140	67	104	155	mm/r	0,06 - 0,09	0,11 - 0,19	0,12 - 0,20	0,14 - 0,25
			I HP	KC7140								
	2	S	O ST	KD1425	154	223	358	mm/r	0,06 - 0,09	0,11 - 0,19	0,12 - 0,20	0,14 - 0,25
			I ST	KD1425								
		U	O HP	KCU40	102	149	239	mm/r	0,06 - 0,09	0,11 - 0,19	0,12 - 0,20	0,14 - 0,25
			I HP	KCU40								
		I	O HP	KCU40	67	97	155	mm/r	0,06 - 0,09	0,11 - 0,19	0,12 - 0,20	0,14 - 0,25
			I HP	KCU40								
	3	S	O ST	KD1425	154	206	358	mm/r	0,06 - 0,09	0,11 - 0,19	0,12 - 0,20	0,14 - 0,25
			I ST	KD1425								
		U	O HP	KCU40	102	138	239	mm/r	0,06 - 0,09	0,11 - 0,19	0,12 - 0,20	0,14 - 0,25
			I HP	KCU40								
		I	O HP	KCU40	67	89	155	mm/r	0,06 - 0,09	0,11 - 0,19	0,12 - 0,20	0,14 - 0,25
			I HP	KCU40								
	4	S	O ST	KD1425	154	223	358	mm/r	0,06 - 0,09	0,11 - 0,19	0,12 - 0,20	0,14 - 0,25
			I ST	KD1425								
		U	O LD	KC7140	102	149	239	mm/r	0,06 - 0,09	0,11 - 0,19	0,12 - 0,20	0,14 - 0,25
			I LD	KC7140								
		I	O LD	KC7140	67	97	155	mm/r	0,06 - 0,09	0,11 - 0,19	0,12 - 0,20	0,14 - 0,25
			I LD	KC7140								
5	S	O ST	KD1425	112	220	262	mm/r	0,06 - 0,09	0,11 - 0,19	0,12 - 0,20	0,14 - 0,25	
		I ST	KD1425									
	U	O HP	KCU40	72	140	167	mm/r	0,06 - 0,09	0,11 - 0,19	0,12 - 0,20	0,14 - 0,25	
		I HP	KCU40									
	I	O HP	KCU40	46	90	107	mm/r	0,06 - 0,09	0,11 - 0,19	0,12 - 0,20	0,14 - 0,25	
		I HP	KCU40									
S	1	S	O HP	KC7140	24	40	49	mm/r	0,04 - 0,07	0,05 - 0,08	0,07 - 0,10	0,07 - 0,10
			I HP	KC7140								
		U	O HP	KC7140	18	30	37	mm/r	0,04 - 0,07	0,05 - 0,08	0,07 - 0,10	0,07 - 0,10
			I HP	KC7140								
		I	O HP	KC7140	15	25	30	mm/r	0,04 - 0,07	0,05 - 0,08	0,07 - 0,10	0,07 - 0,10
			I HP	KC7140								
	2	S	O HP	KC7140	25	35	48	mm/r	0,04 - 0,07	0,05 - 0,08	0,07 - 0,10	0,07 - 0,10
			I HP	KC7140								
		U	O HP	KC7140	18	25	34	mm/r	0,04 - 0,07	0,05 - 0,08	0,07 - 0,10	0,07 - 0,10
			I HP	KC7140								
		I	O HP	KC7140	14	20	27	mm/r	0,04 - 0,07	0,05 - 0,08	0,07 - 0,10	0,07 - 0,10
			I HP	KC7140								

Condition: S = Stable cutting conditions; U = Unstable cutting conditions; I = Interrupted cutting conditions

Pocket seat: I = Inboard insert; O = Outboard insert

HTS DFT™ • Inch

Material Group	Condition	Pocket Seat	Geometry	Grade	Cutting Speed – vc Range – SFM			Inch					
					min	Starting Value	max	Recommended Feed Rate (f) by Diameter					
								Ø (in)	DFT03... 1.77-2.17	DFT05... 2.17-3.07	DFT06... 3.07-5.51	DFT07... 5.51-10.63	
P	1	S	O MD	KCU25	309	623	750	IPR	.002 - .004	.003 - .005	.004 - .006	.005 - .007	
			I MD	KCU40									
		U	O MD	KCU40	231	427	561	IPR	.002 - .004	.003 - .005	.004 - .006	.005 - .007	
			I MD	KC7140									
	I	O MD	KCU40	143	262	348	IPR	.002 - .004	.003 - .005	.004 - .006	.005 - .007		
		I MD	KC7140										
	2	S	O	HP	KCU25	309	591	750	IPR	.004 - .006	.005 - .007	.005 - .007	.005 - .008
				HP	KCU40								
		U	O	HP	KCU40	231	394	561	IPR	.004 - .006	.005 - .007	.005 - .007	.005 - .008
			I	HP	KC7140								
	I	O	HP	KCU40	143	230	348	IPR	.004 - .006	.005 - .007	.005 - .007	.005 - .008	
		I	HP	KC7140									
	3	S	O	HP	KCU25	229	459	555	IPR	.004 - .006	.005 - .007	.005 - .007	.005 - .008
				HP	KCU40								
		U	O	HP	KCU40	163	328	396	IPR	.004 - .006	.005 - .007	.005 - .007	.005 - .008
			I	HP	KC7140								
	I	O	HP	KCU40	98	197	238	IPR	.004 - .006	.005 - .007	.005 - .007	.005 - .008	
		I	HP	KC7140									
	4	S	O	HP	KCU25	309	394	750	IPR	.004 - .006	.005 - .007	.005 - .007	.005 - .008
				HP	KCU40								
		U	O	HP	KCU40	231	328	561	IPR	.004 - .006	.005 - .007	.005 - .007	.005 - .008
			I	HP	KC7140								
	I	O	HP	KCU40	143	262	348	IPR	.004 - .006	.005 - .007	.005 - .007	.005 - .008	
		I	HP	KC7140									
5	S	O	HP	KCU25	257	328	622	IPR	.002 - .003	.002 - .003	.002 - .004	.003 - .005	
			HP	KCU40									
	U	O	HP	KCU40	154	197	373	IPR	.002 - .003	.002 - .003	.002 - .004	.003 - .005	
		I	HP	KC7140									
I	O	HP	KCU40	103	131	250	IPR	.002 - .003	.002 - .003	.002 - .004	.003 - .005		
	I	HP	KC7140										
6	S	O	HP	KCU25	244	312	591	IPR	.002 - .003	.002 - .003	.002 - .004	.003 - .005	
			HP	KCU40									
	U	O	HP	KCU40	146	187	355	IPR	.002 - .003	.002 - .003	.002 - .004	.003 - .005	
		I	HP	KC7140									
I	O	HP	KCU40	98	125	238	IPR	.002 - .003	.002 - .003	.002 - .004	.003 - .005		
	I	HP	KC7140										
M	1	S	O MD	KCU25	159	361	439	IPR	.003 - .004	.005 - .007	.006 - .008	.006 - .009	
			I MD	KCU40									
		U	O MD	KCU40	101	230	281	IPR	.003 - .004	.005 - .007	.006 - .008	.006 - .009	
			I MD	KC7140									
	I	O MD	KC7140	72	164	199	IPR	.003 - .004	.005 - .007	.006 - .008	.006 - .009		
		I MD	KC7140										
	2	S	O	MD	KCU25	159	325	439	IPR	.003 - .004	.005 - .007	.006 - .008	.006 - .009
				MD	KCU40								
		U	O	MD	KCU40	101	207	281	IPR	.003 - .004	.005 - .007	.006 - .008	.006 - .009
			I	MD	KC7140								
	I	O	MD	KC7140	72	148	199	IPR	.003 - .004	.005 - .007	.006 - .008	.006 - .009	
		I	MD	KC7140									
3	S	O	MD	KCU25	159	289	439	IPR	.003 - .004	.005 - .007	.006 - .008	.006 - .009	
			MD	KCU40									
	U	O	MD	KCU40	101	184	281	IPR	.003 - .004	.005 - .007	.006 - .008	.006 - .009	
		I	MD	KC7140									
I	O	MD	KC7140	72	131	199	IPR	.003 - .004	.005 - .007	.006 - .008	.006 - .009		
	I	MD	KC7140										

Condition: S = Stable cutting conditions; U = Unstable cutting conditions; I = Interrupted cutting conditions
 Pocket seat: I = Inboard insert; O = Outboard insert

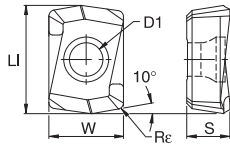


■ HTS DFT™ • Inch

Indexable Drills

Material Group	Condition	Pocket Seat	Geometry	Grade	Cutting Speed – vc Range – SFM		Inch						
							Recommended Feed Rate (f) by Diameter						
							min	Starting Value	max	Ø (in)	DFT03... 1.77-2.17	DFT05... 2.17-3.07	DFT06... 3.07-5.51	DFT07... 5.51-10.63
K	1	S	O	HP	KCPK10	309	561	750	IPR	.004 - .008	.005 - .011	.006 - .012	.007 - .013
			I	HP	KCPK10								
		U	O	HP	KCU25	211	384	510	IPR	.004 - .008	.005 - .011	.006 - .012	.007 - .013
			I	HP	KCU25								
		I	O	HP	KCU40	131	236	316	IPR	.004 - .008	.005 - .011	.006 - .012	.007 - .013
			I	HP	KCU40								
	2	S	O	HP	KCPK10	309	533	750	IPR	.004 - .008	.005 - .011	.006 - .012	.007 - .013
			I	HP	KCPK10								
		U	O	HP	KCU25	211	365	510	IPR	.004 - .008	.005 - .011	.006 - .012	.007 - .013
			I	HP	KCU25								
		I	O	HP	KCU40	131	224	316	IPR	.004 - .008	.005 - .011	.006 - .012	.007 - .013
			I	HP	KCU40								
3	S	O	HP	KCPK10	294	480	712	IPR	.004 - .008	.005 - .011	.006 - .012	.007 - .013	
		I	HP	KCPK10									
	U	O	HP	KCU25	195	328	473	IPR	.004 - .008	.005 - .011	.006 - .012	.007 - .013	
		I	HP	KCU25									
	I	O	HP	KCU40	113	202	274	IPR	.004 - .008	.005 - .011	.006 - .012	.007 - .013	
		I	HP	KCU40									
N	1	S	O	ST	KD1425	504	787	1176	IPR	.002 - .004	.004 - .007	.005 - .008	.006 - .010
			I	ST	KD1425								
		U	O	HP	KC7140	336	525	784	IPR	.002 - .004	.004 - .007	.005 - .008	.006 - .010
			I	HP	KC7140								
		I	O	HP	KC7140	218	341	510	IPR	.002 - .004	.004 - .007	.005 - .008	.006 - .010
			I	HP	KC7140								
	2	S	O	ST	KD1425	504	732	1176	IPR	.002 - .004	.004 - .007	.005 - .008	.006 - .010
			I	ST	KD1425								
		U	O	HP	KCU40	336	488	784	IPR	.002 - .004	.004 - .007	.005 - .008	.006 - .010
			I	HP	KCU40								
		I	O	HP	KCU40	218	317	510	IPR	.002 - .004	.004 - .007	.005 - .008	.006 - .010
			I	HP	KCU40								
	3	S	O	ST	KD1425	504	677	1176	IPR	.002 - .004	.004 - .007	.005 - .008	.006 - .010
			I	ST	KD1425								
		U	O	HP	KCU40	336	451	784	IPR	.002 - .004	.004 - .007	.005 - .008	.006 - .010
			I	HP	KCU40								
		I	O	HP	KCU40	218	293	510	IPR	.002 - .004	.004 - .007	.005 - .008	.006 - .010
			I	HP	KCU40								
	4	S	O	ST	KD1425	504	732	1176	IPR	.002 - .004	.004 - .007	.005 - .008	.006 - .010
			I	ST	KD1425								
		U	O	LD	KC7140	336	488	784	IPR	.002 - .004	.004 - .007	.005 - .008	.006 - .010
			I	LD	KC7140								
		I	O	LD	KC7140	218	317	510	IPR	.002 - .004	.004 - .007	.005 - .008	.006 - .010
			I	LD	KC7140								
5	S	O	ST	KD1425	368	722	858	IPR	.002 - .004	.004 - .007	.005 - .008	.006 - .010	
		I	ST	KD1425									
	U	O	HP	KC7140	235	459	549	IPR	.002 - .004	.004 - .007	.005 - .008	.006 - .010	
		I	HP	KC7140									
	I	O	HP	KC7140	151	295	351	IPR	.002 - .004	.004 - .007	.005 - .008	.006 - .010	
		I	HP	KC7140									
S	1	S	O	HP	KC7140	80	131	160	IPR	.002 - .003	.002 - .003	.003 - .004	.003 - .004
			I	HP	KC7140								
		U	O	HP	KC7140	60	98	120	IPR	.002 - .003	.002 - .003	.003 - .004	.003 - .004
			I	HP	KC7140								
		I	O	HP	KC7140	50	82	100	IPR	.002 - .003	.002 - .003	.003 - .004	.003 - .004
			I	HP	KC7140								
	2	S	O	HP	KC7140	82	115	158	IPR	.002 - .003	.002 - .003	.003 - .004	.003 - .004
			I	HP	KC7140								
		U	O	HP	KC7140	58	82	112	IPR	.002 - .003	.002 - .003	.003 - .004	.003 - .004
			I	HP	KC7140								
		I	O	HP	KC7140	46	66	90	IPR	.002 - .003	.002 - .003	.003 - .004	.003 - .004
			I	HP	KC7140								

Condition: S = Stable cutting conditions; U = Unstable cutting conditions; I = Interrupted cutting conditions
 Pocket seat: I = Inboard insert; O = Outboard insert



- first choice
- alternate choice



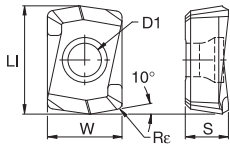
beyond

P	●	●	●	●	●
M	○	○	○	○	○
K	●	●	○	○	○
N	○	○	○	○	○
S	○	○	●	●	●
H	○	○	○	○	○
	KCPK10*	KCU25*	KCU40*	KCT140	KCT225

■ DFR-GD

catalog number	LI		W		D1		S		Re						
	mm	in	mm	in	mm	in	mm	in	mm	in					
DFR020204GD	7,12	.280	4,90	.193	2,30	.091	2,79	.110	0,40	.016	●	●	●	●	●
DFR030204GD	8,71	.343	6,00	.236	2,50	.098	2,88	.113	0,40	.016	●	●	●	●	●
DFR040304GD	10,76	.424	7,38	.291	2,85	.112	3,79	.149	0,40	.016	●	●	●	●	●

*Beyond™ grade.



- first choice
- alternate choice



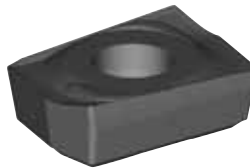
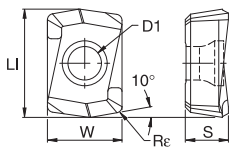
beyond

P	●	●	●	●	●
M	○	○	○	○	○
K	○	○	○	○	○
N	○	○	○	○	○
S	○	○	●	●	●
H	○	○	○	○	○
	KCPK10*	KCU25*	KCU40*	KCT140	KCT225

■ DFR-MD

catalog number	LI		W		D1		S		Re						
	mm	in	mm	in	mm	in	mm	in	mm	in					
DFR020204MD	7,12	.280	4,90	.193	2,30	.091	2,79	.110	0,40	.016	○	○	○	○	○
DFR030204MD	8,71	.343	6,00	.236	2,50	.098	2,88	.113	0,40	.016	○	○	○	○	○
DFR040304MD	10,76	.424	7,38	.291	2,85	.112	3,79	.149	0,40	.016	○	○	○	○	○

*Beyond™ grade.



- first choice
- alternate choice



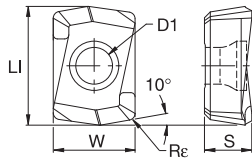
beyond

P	○	○	○	○	○
M	○	○	○	○	○
K	○	○	○	○	○
N	○	○	○	○	○
S	○	○	○	○	○
H	○	○	○	○	○
	KCPK10*	KCU25*	KCU40*	KCT140	KCT225

■ DFR-LD

catalog number	LI		W		D1		S		Re						
	mm	in	mm	in	mm	in	mm	in	mm	in					
DFR020204LD	7,12	.280	4,90	.193	2,30	.091	2,79	.110	0,40	.016	○	○	○	○	○
DFR030204LD	8,71	.343	6,00	.236	2,50	.098	2,86	.113	0,40	.016	○	○	○	○	○
DFR040304LD	10,76	.424	7,38	.291	2,85	.112	3,76	.148	0,40	.016	○	○	○	○	○

*Beyond™ grade.



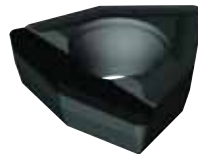
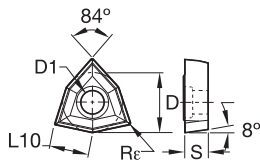
- first choice
- alternate choice

P	■	■
M	■	■
K	■	■
N	■	●
S	■	■
H	■	■

■ DFR • PCD • Single Tipped

catalog number	LI		W		D1		S		Re		KD1425
	mm	in	mm	in	mm	in	mm	in	mm	in	
DFR040304ST	10,50	.413	7,40	.291	2,85	.112	3,18	.125	0,40	.015	●

Indexable Drills



- first choice
- alternate choice

P	■	■
M	■	■
K	■	■
N	■	●
S	■	■
H	■	■

■ DFT • PCD • Single Tipped • Full Face

catalog number	L10		D		D1		S		Re		KD1425
	mm	in	mm	in	mm	in	mm	in	mm	in	
DFT030304C	3,93	.155	6,00	.236	2,65	.104	2,95	.116	0,40	.016	●
DFT05T308ST	5,19	.205	8,00	.315	3,40	.134	3,75	.148	0,80	.031	●
DFT06T308ST	6,52	.257	10,00	.394	4,40	.173	3,75	.148	0,80	.031	●
DFT070408ST	7,84	.309	12,00	.472	4,40	.173	4,75	.187	0,80	.031	●
DFT090508ST	9,83	.387	15,00	.591	5,50	.217	5,19	.204	0,80	.031	●
DFT110508ST	11,53	.454	17,60	.693	5,85	.230	4,81	.189	0,80	.031	●

Drilling of Rotor Blades

Drill Fix DFT and DFR with PCD Inserts

- Improved cycle times by piloting and drilling on a single operation.
- PCD-tipped carbide inserts for long tool life.
- High speed cutting.
- In-stock system with standard tooling.

These remarkably long components range from 40–200' (13–60m). In addition to material handling constraints, rotor blades require five to six hours of machining time with changeover requirements up to two hours.

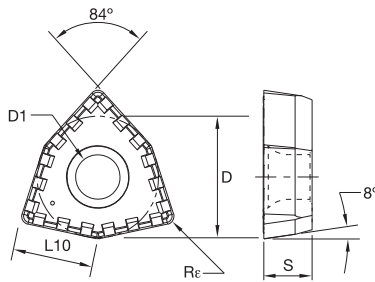


DFR™ • PCD

Material Group	Condition	Pocket Seat	Geometry	Grade	Cutting Speed – vc Range – m/min			Metric	
					min	Starting Value	max	Recommended Feed Rate (f) by Diameter	
								Ø (mm)	DFR04 20,50-24,00
N	S	O	ST	KD1425	396	720	841	mm/r	0,06 - 0,08
		I	ST	KD1425	396	720	841	mm/r	0,06 - 0,08
	S	O	ST	KD1425	369	670	782	mm/r	0,12 - 0,18
		I	ST	KD1425	369	670	782	mm/r	0,12 - 0,18
	S	O	ST	KD1425	341	619	723	mm/r	0,12 - 0,18
		I	ST	KD1425	341	619	723	mm/r	0,12 - 0,18
	S	O	ST	KD1425	475	720	841	mm/r	0,12 - 0,18
		I	ST	KD1425	475	720	841	mm/r	0,12 - 0,18
	S	O	ST	KD1425	480	720	864	mm/r	0,06 - 0,08
		I	ST	KD1425	480	720	864	mm/r	0,06 - 0,08
Material Group	Condition	Pocket Seat	Geometry	Grade	Cutting Speed – vc Range – SFM			Inch	
					min	Starting Value	max	Recommended Feed Rate (f) by Diameter	
								Ø (in)	DFR04 .813-1.00
N	S	O	ST	KD1425	1300	2362	2760	IPR	.002 - .003
		I	ST	KD1425	1300	2362	2760	IPR	.002 - .003
	S	O	ST	KD1425	1209	2197	2567	IPR	.005 - .007
		I	ST	KD1425	1209	2197	2567	IPR	.005 - .007
	S	O	ST	KD1425	1118	2032	2374	IPR	.005 - .007
		I	ST	KD1425	1118	2032	2374	IPR	.005 - .007
	S	O	ST	KD1425	1560	2362	2760	IPR	.005 - .007
		I	ST	KD1425	1560	2362	2760	IPR	.005 - .007
	S	O	ST	KD1425	1575	2362	2834	IPR	.002 - .003
		I	ST	KD1425	1575	2362	2834	IPR	.002 - .003

DFT™ • PCD

Material Group	Condition	Pocket Seat	Geometry	Grade	Cutting Speed – vc Range – m/min			Metric						
					min	Starting Value	max	Recommended Feed Rate (f) by Diameter						
								Ø (mm)	DFT03 16,00-24,00	DFT05 25,00-32,00	DFT06 33,00-40,00	DFT07 41,00-48,00	DFT09 49,00-68,00	DFT11 69,00-82,00
N	S	O	ST / C	KD1425	480	720	864	mm/r	0,05 - 0,07	0,07 - 0,09	0,10 - 0,14	0,12 - 0,16	0,14 - 0,18	0,14 - 0,18
		I	ST / C	KD1425	480	720	864	mm/r	0,05 - 0,07	0,07 - 0,09	0,10 - 0,14	0,12 - 0,16	0,14 - 0,18	0,14 - 0,18
	S	O	ST / C	KD1425	447	670	804	mm/r	0,05 - 0,07	0,07 - 0,09	0,10 - 0,14	0,12 - 0,16	0,14 - 0,18	0,14 - 0,18
		I	ST / C	KD1425	447	670	804	mm/r	0,05 - 0,07	0,07 - 0,09	0,10 - 0,14	0,12 - 0,16	0,14 - 0,18	0,14 - 0,18
	S	O	ST / C	KD1425	413	619	743	mm/r	0,05 - 0,07	0,07 - 0,09	0,10 - 0,14	0,12 - 0,16	0,14 - 0,18	0,14 - 0,18
		I	ST / C	KD1425	413	619	743	mm/r	0,05 - 0,07	0,07 - 0,09	0,10 - 0,14	0,12 - 0,16	0,14 - 0,18	0,14 - 0,18
	S	O	ST / C	KD1425	447	670	804	mm/r	0,05 - 0,07	0,07 - 0,09	0,10 - 0,14	0,12 - 0,16	0,14 - 0,18	0,14 - 0,18
		I	ST / C	KD1425	447	670	804	mm/r	0,05 - 0,07	0,07 - 0,09	0,10 - 0,14	0,12 - 0,16	0,14 - 0,18	0,14 - 0,18
	S	O	ST / C	KD1425	480	720	864	mm/r	0,05 - 0,07	0,07 - 0,09	0,10 - 0,14	0,12 - 0,16	0,14 - 0,18	0,14 - 0,18
		I	ST / C	KD1425	480	720	864	mm/r	0,05 - 0,07	0,07 - 0,09	0,10 - 0,14	0,12 - 0,16	0,14 - 0,18	0,14 - 0,18
Material Group	Condition	Pocket Seat	Geometry	Grade	Cutting Speed – vc Range – SFM			Inch						
					min	Starting Value	max	Recommended Feed Rate (f) by Diameter						
								Ø (in)	DFT03 .625-.969	DFT05 .984-1.250	DFT06 1.313-1.563	DFT07 1.625-1.875	DFT09 1.938-2.125	DFT11 2.750-3.250
N	S	O	ST / C	KD1425	1575	2362	2834	IPR	.002 - .003	.003 - .004	.004 - .006	.005 - .006	.006 - .007	.006 - .007
		I	ST / C	KD1425	1575	2362	2834	IPR	.002 - .003	.003 - .004	.004 - .006	.005 - .006	.006 - .007	.006 - .007
	S	O	ST / C	KD1425	1465	2197	2636	IPR	.002 - .003	.003 - .004	.004 - .006	.005 - .006	.006 - .007	.006 - .007
		I	ST / C	KD1425	1465	2197	2636	IPR	.002 - .003	.003 - .004	.004 - .006	.005 - .006	.006 - .007	.006 - .007
	S	O	ST / C	KD1425	1355	2032	2438	IPR	.002 - .003	.003 - .004	.004 - .006	.005 - .006	.006 - .007	.006 - .007
		I	ST / C	KD1425	1355	2032	2438	IPR	.002 - .003	.003 - .004	.004 - .006	.005 - .006	.006 - .007	.006 - .007
	S	O	ST / C	KD1425	1465	2197	2636	IPR	.002 - .003	.003 - .004	.004 - .006	.005 - .006	.006 - .007	.006 - .007
		I	ST / C	KD1425	1465	2197	2636	IPR	.002 - .003	.003 - .004	.004 - .006	.005 - .006	.006 - .007	.006 - .007
	S	O	ST / C	KD1425	1575	2362	2834	IPR	.002 - .003	.003 - .004	.004 - .006	.005 - .006	.006 - .007	.006 - .007
		I	ST / C	KD1425	1575	2362	2834	IPR	.002 - .003	.003 - .004	.004 - .006	.005 - .006	.006 - .007	.006 - .007

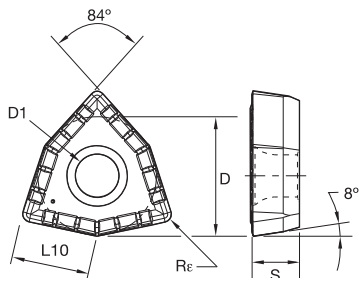


● first choice
○ alternate choice

P	M	K	N	S	H	KC7820	KC7215	KC7225	KC7935	KC7140	KC7815	KC720	KMF
●	○	○	○	○	○								
○	○	○	○	○	○								
○	○	○	○	○	○								
○	○	○	○	○	○								
○	○	○	○	○	○								
○	○	○	○	○	○								

■ DFT-LD

catalog number	L10		D		D1		S		Re		KC7820	KC7215	KC7225	KC7935	KC7140	KC7815	KC720	KMF	
	mm	in	mm	in	mm	in	mm	in	mm	in									
DFT030204LD	3,97	.156	6,00	.236	2,25	.089	2,45	.096	0,40	.016									
DFT030304LD	3,97	.156	6,00	.236	2,65	.104	2,95	.116	0,40	.016									
DFT05T308LD	5,29	.208	8,00	.315	3,40	.134	3,75	.148	0,80	.031									
DFT06T308LD	6,62	.260	10,00	.394	4,40	.173	3,75	.148	0,80	.031									
DFT070408LD	7,94	.313	12,00	.472	4,40	.173	4,75	.187	0,80	.031									
DFT090508LD	9,92	.391	15,00	.591	5,50	.217	5,25	.207	0,80	.031									



● first choice
○ alternate choice

beyond

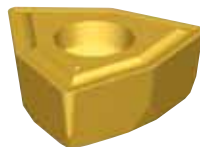
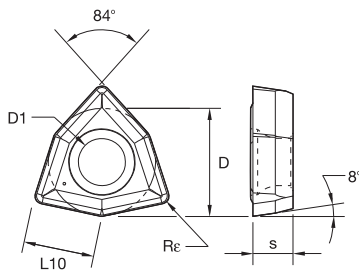
P	M	K	N	S	H	KGPK10*	KCU25*	KCU40*	KC7140	KC7225	KC720	KMF
●	○	○	○	○	○							
○	○	○	○	○	○							
○	○	○	○	○	○							
○	○	○	○	○	○							
○	○	○	○	○	○							
○	○	○	○	○	○							

NEW!

■ DFT-MD

catalog number	L10		D		D1		S		Re		KGPK10*	KCU25*	KCU40*	KC7140	KC7225	KC720	KMF	
	mm	in	mm	in	mm	in	mm	in	mm	in								
DFT030204MD	3,97	.156	6,00	.236	2,25	.089	2,45	.096	0,40	.016								
DFT030304MD	3,97	.156	6,00	.236	2,65	.104	2,95	.116	0,40	.016								
DFT05T308MD	5,29	.208	8,00	.315	3,40	.134	3,75	.148	0,80	.031								
DFT06T308MD	6,62	.260	10,00	.394	4,40	.173	3,75	.148	0,80	.031								
DFT070408MD	7,94	.313	12,00	.472	4,40	.173	4,75	.187	0,80	.031								
DFT090508MD	9,92	.391	15,00	.591	5,50	.217	5,25	.207	0,80	.031								

*Beyond™ grade.

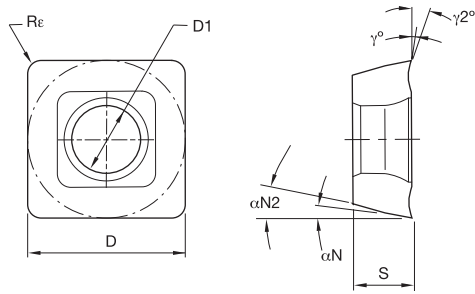


● first choice
○ alternate choice

P	M	K	N	S	H	KC7820	KC7215	KC7225	KC7935	KC7140	KC7815	KC720	KMF	CS5
○	○	○	○	○	○									
○	○	○	○	○	○									
○	○	○	○	○	○									
○	○	○	○	○	○									
○	○	○	○	○	○									
○	○	○	○	○	○									

■ WOGX...24

catalog number	L10		D		D1		S		Re		KC7820	KC7215	KC7225	KC7935	KC7140	KC7815	KC720	KMF	CS5	
	mm	in	mm	in	mm	in	mm	in	mm	in										
WOGX03020424	3,94	.156	6,00	.236	2,65	.104	2,50	.098	0,40	.016										



● first choice
○ alternate choice

beyond

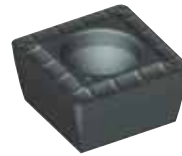
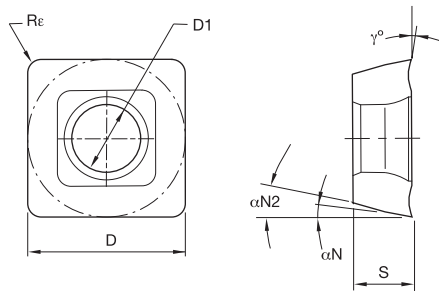
P	●	●	●	●
M	○	○	○	○
K	●	●	●	●
N	○	○	○	○
S	○	○	○	○
H				
			KCPK10*	KCU25*
				KCU40*

■ SP.X..HP

Indexable Drills

catalog number	D		D1		S		Re		γ^o	γ^{2o}	αN	$\alpha N2$	KCPK10*	KCU25*	KCU40*
	mm	in	mm	in	mm	in	mm	in							
SPGX070308HP	7,80	.307	2,85	.112	3,18	.125	0,80	.031	10	24	7	11	●	●	●
SPPX09T310HP	9,38	.369	3,60	.142	3,97	.156	1,00	.039	10	24	7	11	●	●	●
SPPX120412HP	12,56	.494	4,60	.181	4,76	.188	1,20	.047	10	24	7	11	●	●	●
SPPX15T512HP	15,73	.619	5,50	.217	5,95	.234	1,20	.047	10	24	7	11	●	●	●

*Beyond™ grade.



● first choice
○ alternate choice

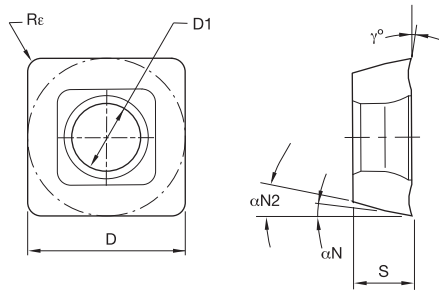
beyond

P	●	●	●	●
M	○	○	○	○
K	●	●	●	●
N	○	○	○	○
S	○	○	○	○
H				
			KCPK10*	KCU25*
				KCU40*

■ SP.X..MD

catalog number	D		D1		S		Re		γ^o	αN	$\alpha N2$	KCPK10*	KCU25*	KCU40*
	mm	in	mm	in	mm	in	mm	in						
SPGX070308MD	7,80	.307	2,85	.112	3,18	.125	0,80	.031	16	7	11	●	●	●
SPPX09T310MD	9,38	.369	3,60	.142	3,97	.156	1,00	.039	16	7	11	●	●	●
SPPX120412MD	12,56	.494	4,60	.181	4,76	.188	1,20	.047	16	7	11	●	●	●
SPPX15T512MD	15,73	.619	5,50	.217	5,95	.234	1,20	.047	16	7	11	●	●	●

*Beyond™ grade.



● first choice
○ alternate choice

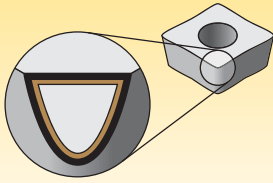
beyond

P	●	●	●	●
M	○	○	○	○
K	●	●	●	●
N	○	○	○	○
S	○	○	○	○
H				
			KCPK10*	KCU25*
				KCU40*

■ SP.X..FP

catalog number	D		D1		S		Re		γ^o	αN	$\alpha N2$	KCPK10*	KCU25*	KCU40*
	mm	in	mm	in	mm	in	mm	in						
SPGX070308FP	7,80	.307	2,85	.112	3,18	.125	0,80	.031	6	7	11	●	●	●
SPPX09T310FP	9,38	.369	3,60	.142	3,97	.156	1,00	.039	6	7	11	●	●	●
SPPX120412FP	12,56	.494	4,60	.181	4,76	.188	1,20	.047	6	7	11	●	●	●
SPPX15T512FP	15,73	.619	5,50	.217	5,95	.234	1,20	.047	6	7	11	●	●	●

*Beyond™ grade.



Coatings provide high-speed capability and are engineered for finishing to light roughing.

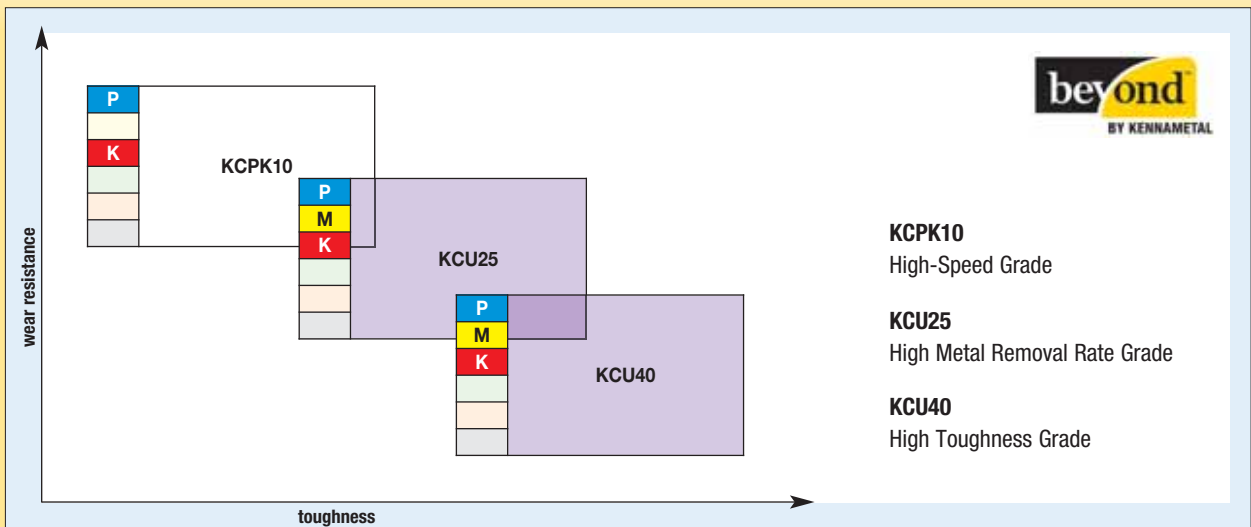
P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous Materials
S	High-Temp Alloys
H	Hardened Materials

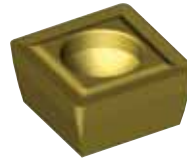
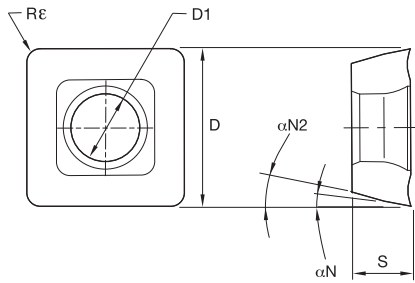
wear resistance ← → toughness

Grade	Coating	Grade Description	Material																		
			05	10	15	20	25	30	35	40	45										
KCPK10		<p>Composition: With an advanced CVD TiCN-Al₂O₃ coating combined with a cobalt-enriched carbide substrate, this grade offers a balanced combination of deformation resistance and edge toughness.</p> <p>Application: The KCPK10 grade offers outstanding abrasion and crater wear resistance for high-speed machining of steels and cast irons. Use for very high cutting speeds with low to medium feed rates.</p>	P																		
	Al ₂ O ₃ TiCN																				
KCU25		<p>Composition: This advanced CVD TiCN-Al₂O₃ coating together with a newly engineered tough carbide substrate, adequate deformation resistance along with excellent edge strength is ensured and offers very good wear resistance over a wide range of machining conditions.</p> <p>Application: KCU25, as a high productivity grade with high speeds and feeds, is the first choice for productive process with very good reliability in steels, stainless steels, and cast irons.</p>	P																		
	Al ₂ O ₃ TiCN																				
KCU40		<p>Composition: With a multilayered PVD TiN-TiAlN coating and a tough substrate, this grade withstands interruptions and provides high wear resistance for long tool life.</p> <p>Application: The KCU40 grade is the first choice for high reliability in most materials. This grade should be used at medium speeds and high feeds due to sharper edges and as a grade for high toughness applications. It covers steel, stainless steel, cast iron, and high-temp alloys under certain conditions.</p>	P																		
	PVD TiN_TiAlN																				



Drill Fix™ Inserts





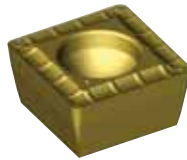
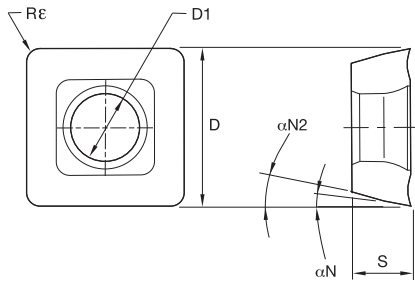
● first choice
○ alternate choice

P	●	○	○	○	○
M	○	○	○	○	○
K	●	●	●	●	○
N	○	○	○	○	○
S	○	○	○	○	○
H	○	○	○	○	○

■ SP..X..FP

catalog number	D		D1		S		Re		γ°	αN	αN2	KC7210	KC7215	KC7140	KC7815	KM1
	mm	in	mm	in	mm	in	mm	in								
SPGX060304FP	6,35	.250	2,85	.112	3,18	.125	0,40	.016	6	7	11	●	●	○	○	○
SPGX070304FP	7,94	.312	2,85	.112	3,18	.125	0,40	.016	6	7	11	●	●	○	○	○
SPPX09T308FP	9,53	.375	3,60	.142	3,97	.156	0,80	.031	6	7	11	●	●	○	○	○
SPPX120408FP	12,70	.500	4,60	.181	4,76	.188	0,80	.031	6	7	11	●	●	○	○	○
SPPX15T508FP	15,73	.619	5,50	.234	5,95	.234	0,80	.031	6	7	11	●	●	○	○	○

Indexable Drills

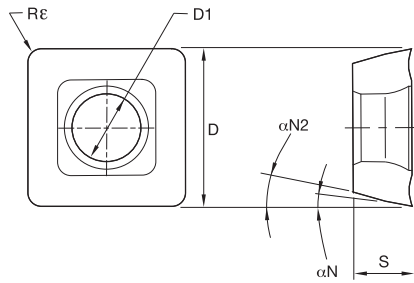


● first choice
○ alternate choice

P	○	○	○	○	○
M	○	○	○	○	○
K	○	○	○	○	○
N	○	○	○	○	○
S	○	○	○	○	○
H	○	○	○	○	○

■ SP..X..MD

catalog number	D		D1		S		Re		γ°	αN	αN2	KC7210	KC7215	KC7140	KC7815	KM1
	mm	in	mm	in	mm	in	mm	in								
SPGX060304MD	6,35	.250	2,65	.104	3,18	.125	0,40	.016	20	7	11	○	○	○	○	○
SPGX070304MD	7,94	.312	2,85	.112	3,18	.125	0,40	.016	16	7	11	○	○	○	○	○
SPPX09T308MD	9,53	.375	3,60	.142	3,97	.156	0,80	.031	16	7	11	○	○	○	○	○
SPPX120408MD	12,70	.500	4,60	.181	4,76	.188	0,80	.031	16	7	11	○	○	○	○	○
SPPX15T508MD	15,73	.619	5,50	.234	5,95	.234	0,80	.031	16	7	11	○	○	○	○	○

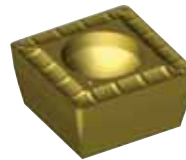
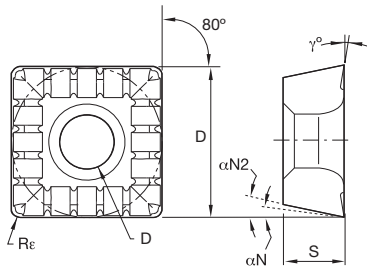


● first choice
○ alternate choice

P	●	●	●	●
M	○	○	○	○
K	○	○	○	○
N	○	○	○	○
S	○	○	○	○
H	○	○	○	○

■ SP..X..RHP

catalog number	D		D1		S		Re		γ°	αN	αN2	KC7210	KC7215	KC7140	KC7815	KM1
	mm	in	mm	in	mm	in	mm	in								
SPGX060304RHP	6,35	.250	2,65	.104	3,18	.125	0,40	.016	10	7	11	●	●	●	●	●
SPGX070304RHP	7,94	.312	2,85	.112	3,18	.125	0,40	.016	10	7	11	●	●	●	●	●
SPPX09T308RHP	9,53	.375	3,60	.142	3,97	.156	0,80	.031	10	7	11	●	●	●	●	●
SPPX120408RHP	12,70	.500	4,60	.181	4,76	.188	0,80	.031	10	7	11	●	●	●	●	●
SPPX15T508RHP	15,73	.619	5,50	.234	5,95	.234	0,80	.031	10	7	11	●	●	●	●	●



● first choice
○ alternate choice

P	●	●	○	○
M	○	○	○	○
K	○	○	○	○
N	○	○	○	○
S	○	○	○	○
H	○	○	○	○

■ SPGX...-31(ISO) • SPGT...MD/MDT (ANSI)

ISO catalog number	ANSI catalog number	D		D1		S		Re		γ°	KC7210	KC7215	KC7140	KC7815	KM1
		mm	in	mm	in	mm	in	mm	in						
SPGX06020431	SPGT060204MD	6,35	.250	2,65	.104	2,38	.094	0,40	.016	—	●	●	○	○	○
SPGX07030431	SPGT070304MDT	7,94	.313	2,85	.112	3,18	.125	0,40	.016	12	●	●	○	○	○
SPGX09030831	SPGT090308MDT	9,53	.375	3,50	.138	3,18	.125	0,79	.031	12	●	●	○	○	○
SPGX12040831	SPGT120408MDT	12,70	.500	4,50	.177	4,76	.187	0,79	.031	12	●	●	○	○	○

NOTE: SPGX (ISO code)/SPGT (ANSI code) are only to be used for HTS-C.

Indexable Drills

CTR™ Counterboring Tools

CTR Counterboring Tools are designed for high-production screw-head counterbores and similar counterboring operations. Tools can be adapted to almost all applications resulting in optimum cutting performance and long tool life.

Extremely unequal insert positioning and flutes prevent chattering and generates less noise. A precise 90° bottom can be achieved with the S2 S inserts.

Features and Benefits

Productivity and Reliability

- S2 S inserts reduce additional drill operations to achieve a precise 90° bottom.
- Chatter-free operations for improved surface quality due to extremely unequal insert positioning and flutes.
- Yield high metal removal rates to reduce machine time and manufacturing costs.

Versatility

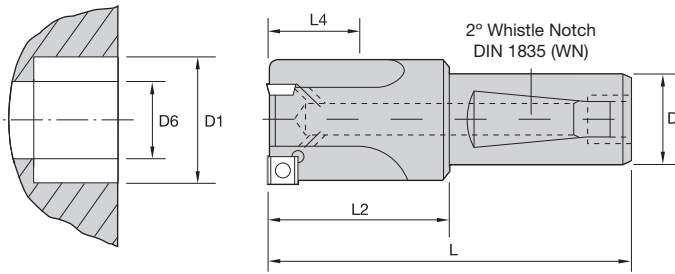
- Counterboring tools can be applied for steel, stainless steel, non-ferrous materials, cast irons, and heat-resistant alloy applications.
- Toolholders are double- or triple-fluted at a diameter range starting at 15–46mm (.591–1.811") offering through-coolant capabilities.
- S2 S standard inserts are double edged and available in various grades and geometries.

Customization

- Length and diameter variations with and without adjustable cartridges available.
- Combination and multistep tooling based on drilling tools, like Drill Fix™, with short distance and small diameter steps.
- Various radii and customized grades available upon request.



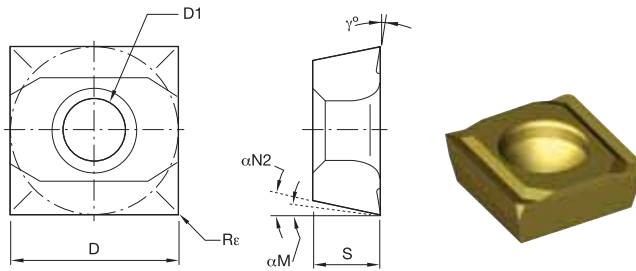
- Counterboring tool shipped with insert screws and Torx wrench.
- Order inserts separately; see pages J106–J107.


■ S2 S Whistle Notch™ WN Shank • Metric

catalog number	D1		mm		in		D	D6	L	L2	L4 max	gage insert	number of inserts
	mm	in	tol min D1	tol max D1	tol min D1	tol max D1							
CBTF150R2WD20N2M	15,14	.596	-0,135	0,135	-0.005	.005	20	6,0	81	31	8,5	SPHX060204R..	2
CBTF160R2WD20N2M	16,14	.635	-0,135	0,135	-0.005	.005	20	7,0	81	31	8,5	SPHX060204R..	2
CBTF170R2WD20N2M	17,14	.675	-0,135	0,135	-0.005	.005	20	8,0	86	36	13,5	SPHX060204R..	2
CBTF180R2WD20N2M	18,14	.714	-0,135	0,135	-0.005	.005	20	8,4	86	36	13,5	SPHX070304R..	2
CBTF180R2WD20N3M	18,14	.714	-0,135	0,135	-0.005	.005	20	8,4	86	36	13,5	SPHX060204R..	3
CBTF200R2WD20N2M	20,17	.794	-0,165	0,165	-0.007	.007	20	8,5	86	36	16,0	SPHX070304R..	2
CBTF200R2WD20N3M	20,17	.794	-0,165	0,165	-0.007	.007	20	8,5	86	36	16,0	SPHX060204R..	3
CBTF210R2WD20N2M	21,17	.833	-0,165	0,165	-0.007	.007	20	8,5	86	36	16,0	SPHX070304R..	2
CBTF210R2WD20N3M	21,17	.833	-0,165	0,165	-0.007	.007	20	10,5	86	36	11,0	SPHX060204R..	3
CBTF220R2WD20N2M	22,17	.873	-0,165	0,165	-0.007	.007	20	10,4	86	36	16,0	SPHX070304R..	2
CBTF220R2WD20N3M	22,17	.873	-0,165	0,165	-0.007	.007	20	10,5	86	36	16,0	SPHX060204R..	3
CBTF230R2WD20N2M	23,17	.912	-0,165	0,165	-0.007	.007	20	10,5	91	41	21,0	SPHX090304R..	2
CBTF230R2WD20N3M	23,17	.912	-0,165	0,165	-0.007	.007	20	10,5	91	41	16,0	SPHX070304R..	3
CBTF240R2WD20N2M	24,17	.951	-0,165	0,165	-0.007	.007	20	10,5	91	41	18,5	SPHX090304R..	2
CBTF240R2WD20N3M	24,17	.951	-0,165	0,165	-0.007	.007	20	10,5	91	41	16,0	SPHX070304R..	3
CBTF250R2WD20N2M	25,17	.991	-0,165	0,165	-0.007	.007	20	12,0	96	46	23,5	SPHX090304R..	2
CBTF250R2WD20N3M	25,17	.991	-0,165	0,165	-0.007	.007	20	10,5	96	46	21,0	SPHX070304R..	3
CBTF260R2WD20N2M	26,17	1.030	-0,165	0,165	-0.007	.007	20	13,0	96	46	23,5	SPHX090304R..	2
CBTF270R2WD20N3M	27,17	1.070	-0,165	0,165	-0.007	.007	20	10,5	96	46	21,0	SPHX090304R..	3
CBTF280R2WD20N3M	28,17	1.109	-0,165	0,165	-0.007	.007	20	15,0	101	51	23,5	SPHX090304R..	3
CBTF300R2WD20N3M	30,17	1.188	-0,165	0,165	-0.007	.007	20	15,0	101	51	23,0	SPHX090304R..	3
CBTF320R2WD20N3M	32,20	1.268	-0,195	0,195	-0.008	.008	20	17,0	101	51	23,0	SPHX090304R..	3
CBTF330R2WD20N3M	33,20	1.307	-0,195	0,195	-0.008	.008	20	17,0	101	51	25,5	SPHX090304R..	3
CBTF340R2WD32N3M	34,20	1.346	-0,195	0,195	-0.008	.008	32	18,0	111	51	25,5	SPHX090304R..	3
CBTF350R2WD32N3M	35,20	1.386	-0,195	0,195	-0.008	.008	32	19,0	111	51	25,5	SPHX090304R..	3
CBTF360R2WD32N3M	36,20	1.425	-0,195	0,195	-0.008	.008	32	19,0	116	56	27,5	SPHX090304R..	3
CBTF380R2WD32N3M	38,20	1.504	-0,195	0,195	-0.008	.008	32	22,0	121	61	30,0	SPHX120404R..	3
CBTF400R2WD32N3M	40,20	1.582	-0,195	0,195	-0.008	.008	32	21,0	121	61	30,5	SPHX120404R..	3
CBTF420R2WD32N3M	42,20	1.661	-0,195	0,195	-0.008	.008	32	22,0	126	66	33,5	SPHX120404R..	3
CBTF460R2WD32N3M	46,20	1.819	-0,195	0,195	-0.008	.008	32	25,0	126	66	33,5	SPHX120404R..	3

■ Spare Parts

gage insert	insert screw	wrench	Torx size
SPHX060204R..	192.432	170.028	T8
SPHX070304R..	192.432	170.028	T8
SPHX090304R..	191.924	170.024	T9
SPHX070304R..	192.432	170.028	T8
SPHX120404R..	191.916	170.025	T15



● first choice
○ alternate choice

P	●	●		
M	○	●		
K	○	○		
N	○	○		
S	○			
H				

■ SPHX..R-20

Indexable Drills

catalog number	D		D1		S		Re		γ^p	αN	αM	KC7210	KC7215	KC7140	KC7815	KM1
	mm	in	mm	in	mm	in	mm	in								
SPHX060202R20	6,35	.250	2,85	.112	2,38	.094	0,20	.008	12	11	7	●	●			
SPHX060204R20	6,35	.250	2,85	.112	2,38	.094	0,40	.016	12	11	7	●	●			
SPHX060206R20	6,35	.250	2,85	.112	2,38	.094	0,60	.024	12	11	7	●				
SPHX060208R20	6,35	.250	2,85	.112	2,38	.094	0,80	.031	12	11	7	●				
SPHX070302R20	7,94	.313	2,85	.112	3,18	.125	0,20	.008	12	11	7	●	●			
SPHX070304R20	7,94	.313	2,85	.112	3,18	.125	0,40	.016	12	11	7	●	●			
SPHX070306R20	7,94	.313	2,85	.112	3,18	.125	0,60	.024	12	11	7	●				
SPHX070308R20	7,94	.313	2,85	.112	3,18	.125	0,80	.031	12	11	7	●				
SPHX070310R20	7,94	.313	2,85	.112	3,18	.125	1,00	.039	12	11	7	●				
SPHX070312R20	7,94	.313	2,85	.112	3,18	.125	1,20	.047	12	11	7	●				
SPHX090304R20	9,53	.375	3,50	.138	3,18	.125	0,40	.016	12	11	7	●	●			
SPHX090308R20	9,53	.375	3,50	.138	3,18	.125	0,80	.031	12	11	7	●				
SPHX090310R20	9,53	.375	3,50	.138	3,18	.125	1,00	.039	12	11	7	●				
SPHX090312R20	9,53	.375	3,50	.138	3,18	.125	1,20	.047	12	11	7	●				
SPHX090316R20	9,53	.375	3,50	.138	3,18	.125	1,60	.063	12	11	7	●				
SPHX120404R20	12,70	.500	4,50	.177	4,76	.187	0,40	.016	12	11	7	●	●			
SPHX120408R20	12,70	.500	4,50	.177	4,76	.187	0,80	.031	12	11	7	●				
SPHX120410R20	12,70	.500	4,50	.177	4,76	.187	1,00	.039	12	11	7	●				
SPHX120412R20	12,70	.500	4,50	.177	4,76	.187	1,20	.047	12	11	7	●				
SPHX120416R20	12,70	.500	4,50	.177	4,76	.187	1,60	.063	12	11	7	●				
SPHX120420R20	12,70	.500	4,50	.177	4,76	.187	2,00	.079	12	11	7	●				
SPHX150508R20	15,88	.625	5,50	.217	5,95	.234	0,80	.031	12	11	7	●				
SPHX150512R20	15,88	.625	5,50	.217	5,95	.234	1,20	.047	12	11	7	●				
SPHX150516R20	15,88	.625	5,50	.217	5,95	.234	1,60	.063	12	11	7	●				
SPHX150520R20	15,88	.625	5,50	.217	5,95	.234	2,00	.079	12	11	7	●				

NOTE: SPHX...R-20: This geometry is first choice for steel applications.



Hole Finishing

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RMBK98-K101
RHMK102-K112
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ModBORE Boring SystemsK182-K211





Hole Finishing with Kennametal

Owning the entire process chain from raw materials all the way to reconditioning means Kennametal is almost the only source in the metalworking industry where you can get all types of Hole Finishing tooling, from reaming and fine boring to motion tooling, directly from one hand. Kennametal is capable of offering you customized solutions for your application that are the best fit for your machining challenge without any limitations, in regard to portfolio or capacity.

PCD Tooling

- Extremely productive and tailored for satisfying your high-volume production needs.
- Several standard PCD grades, like KD1415™ and KD1425™, are available to provide the highest tool life and cutting data as well as unmatched surface and diameter tolerance quality.
- Platforms are available depending on your application and preference from steel to carbide based, adjustable pocket seats, fine-boring components like Romicon™ or FB cartridges, spindle couplings, or SIF™ steerable adapters.



Multiflute Reaming

- RMS™, RMB™, and RHM™.
- Highly productive and easy to apply.
- Large, standard, off-the-shelf portfolio of solid carbide, cermet, carbide-tipped, and modular reaming tools, all ground to achieve H7 without any customization.
- Complex Specials with multiple steps, coupling, and length variations are available.
- Intermediate sizes, grades, and lead chamfers available with short delivery.



Padded Reaming

- RIQ™ Quattro Cut™ and RIR™.
- Highest precision and surface quality achievable but still easy to apply.
- RIQ is the market-leading reaming technology, enabling you to leave out any back taper adjustment, dramatically reducing setup time and effort while still offering highest accuracy and surface quality and four cutting edges with PCD, CBN, carbide, or cermet.
- RIR provides you the most stable pocket seat and fail-safe clamping, from smallest to largest diameters.
- Combine the large, standard RIQ and RIR insert offering with your customized tool body.



Fine Boring

- Romicon™ and ModBORE™.
- Extremely flexible, covering a very large diameter and length range.
- Offers the latest grade technology by using standard turning inserts.
- Romicon enables diameter modifications directly at the machine by hand without setup equipment or accuracy affecting lock screws.
- ModBORE offers a very large diameter range with each type of tool along with roughing to finishing tooling and can be easily and safely adapted to every KM™ spindle.



Motion Tooling

- Sophisticated tooling achieves most challenging tasks.
- Large, customized Complex Solution portfolio of:
 - Linear feed out heads.
 - Eccentric actuating heads.
 - Pivot heads.
 - Cylinder boring tools.
 - Line boring bars.
 - Bottle boring tools.
 - Valve seat and guide tools.
 - Machining center tools.
- Depending on your application and preference, tools are based on the positive-stop-principle; use drawbars, like with engineered solution machines, or don't require machining center modifications at all.



● first choice
○ alternate choice

						standard diameter		engineered solution diameter				
						range	accuracy	range	accuracy			
reaming tools		RMS™ reaming monoblock — solid carbide	●	●	●	○	5–14mm .196–.551"	IT7	1,4–25,4mm .056–1.00"	IT6 >10mm >.39"	10 µm .0004"	7 µm .0003"
		RMB™ reaming monoblock — brazed carbide/cermet	●	●	●	○	14–20mm .551–.787"	IT7	14–65mm .551–2.55"	IT6	10 µm .0004"	7 µm .0003"
		RMB-E™ (expandable) reaming monoblock — brazed carbide/cermet	●	●	●	○	14–42mm .551–1.65"	IT6	14–42mm .551–1.65"	IT5–IT6	10 µm .0004"	7 µm .0003"
		RHM™ reaming head — modular carbide/cermet	●	●	●	○	14–42mm .551–1.65"	IT7	14–50mm .551–1.96"	IT6	10 µm .0004"	7 µm .0003"
		RHM-E™ (expandable) reaming head — modular carbide/cermet	●	●	●	○	14–42mm .551–1.65"	IT6	14–42mm .551–1.65"	IT5–IT6	10 µm .0004"	7 µm .0003"
		RIR™ reamer insert — rectangular carbide	●	●	●	○	—	—	6–300mm .236–11.8"	IT5	10 µm .0004"	4 µm .0002"
		Quattro Cut™ RIQ™ reamer insert — Quattro Cut carbide/cermet/PCD/CBN	●	●	●	○	—	—	16–300mm .630–11.8"	IT5	10 µm .0004"	4 µm .0002"
		RIQ MicroFinish reamer insert — Quattro Cut carbide/cermet/PCD/CBN	●	●	●	○	—	—	16–300mm .630–11.8"	IT5	10 µm .0004"	4 µm .0002"
fine-boring tools		Romicron™ SVU BB fine boring carbide/cermet/PCD/CBN	●	●	●	○	4–100mm .157–3.93"	IT6	1,6–100mm .062–3.93"	IT6	5 µm .0002"	5–10 µm .0002–.0004"
		Romicron SVS00B — 6B fine boring carbide/cermet/PCD/CBN	●	●	●	●	25–139mm .984–5.47"	IT6	25–183mm .984–7.2"	IT6	5 µm .0002"	5–10 µm .0002–.0004"
		Romicron SVU65/92 fine boring carbide/cermet/PCD/CBN	●	●	●	○	71–213mm 2.79–8.38"	IT6	10–326mm .394–12.83"	IT6	5 µm .0002"	5–10 µm .0002–.0004"
		Romicron SVS M fine boring carbide/cermet/PCD/CBN	●	●	○	○	>40mm >1.57"	IT6	40–1600mm 1.57–63.0"	IT6	5 µm .0002"	5–10 µm .0002–.0004"
		Romicron Multicron fine boring carbide/cermet/PCD/CBN	●	●	●	○	—	—	70–180mm 2.75–7.0"	IT6	5 µm .0002"	10–15 µm .0004–.0006"
		ModBORE™ RBHT roughing carbide/cermet/PCD/CBN	●	●	●	○	23,5–153mm .925–6.024"	IT9	23,5–153mm .925–6.0"	IT9	10 µm .0004"	>20 µm >.0008"
		ModBORE FBHO fine boring carbide/cermet/PCD/CBN	●	●	●	○	9,75–88,1mm .383–3.469"	IT7	3,0–88,1mm .118–3.4"	IT7	5 µm .0002"	5–10 µm .0002–.0004"
		ModBORE FBHM fine boring carbide/cermet/PCD/CBN	●	●	●	○	9,75–320mm .383–12.598"	IT7	3,0–320mm .118–12.5"	IT7	5 µm .0002"	5–10 µm .0002–.0004"
		ModBORE FBHS fine boring carbide/cermet/PCD/CBN	●	●	●	○	23,5–153mm .925–6.024"	IT7	23,5–153mm .925–6.0"	IT7	5 µm .0002"	5–10 µm .0002–.0004"
		ModBORE Bridge Tools roughing carbide/cermet/PCD/CBN	●	●	●	○	150–2205mm 5.9–86.8"	IT9	150–2205mm 5.9–86.8"	IT9	10 µm .0004"	>20 µm >.0008"
	ModBORE Bridge Tools fine boring carbide/cermet/PCD/CBN	●	●	●	○	150–2205mm 5.9–86.8"	IT7	150–2205mm 5.9–86.8"	IT7	5 µm .0002"	>10 µm >.0004"	
	Fine Boring Cartridges fine boring carbide/cermet/PCD/CBN	●	○	●	○	>28mm >1.10"	IT7	>28mm >1.10"	IT7	5 µm .0002"	5–10 µm .0002–.0004"	
PCD		PCD round tools — steel base			●		—	—	10–100mm .394–4.00"	IT6	10 µm .0004"	10 µm .0004"
		PCD round tools — carbide base			●		—	—	5–25mm .197–1.00"	IT6	5 µm .0002"	7 µm .0003"

Hole Finishing



Cylindricity
NOTE: Process and application dependant.
Highly dependant on the premachine hole accuracy.
Use of high-performance drilling/premachining tools mandatory to reach values.



Position
NOTE: Process and application dependant.
Highly dependant on the premachine hole accuracy.
Use of high-performance drilling/premachining tools mandatory to reach values.

achievable surface quality Ra						capability				cost/part	cycle time	required operator experience	page(s)
P	M	K	N	S	H								
0,5–1,0 µm 20–40 µ-in	0,5–1,0 µm 20–40 µ-in	0,5–1,5 µm 20–60 µ-in	–	0,5–1,0 µm 20–40 µ-in	–	●	●	●	●	moderate	low	low	K94–K97
0,5–1,0 µm 20–40 µ-in	0,5–1,0 µm 20–40 µ-in	0,5–1,5 µm 20–60 µ-in	–	0,5–1,0 µm 20–40 µ-in	–	●	●	● carbide only	● carbide only	moderate	low	low	K98–K101
0,5–1,0 µm 20–40 µ-in	0,5–1,0 µm 20–40 µ-in	0,5–1,5 µm 20–60 µ-in	–	0,5–1,0 µm 20–40 µ-in	–	●	●	● carbide only	● carbide only	moderate	low	moderate	please contact us
0,5–1,0 µm 20–40 µ-in	0,5–1,0 µm 20–40 µ-in	0,5–1,5 µm 20–60 µ-in	–	0,5–1,0 µm 20–40 µ-in	–	●	●	● carbide only	● carbide only	moderate	low	low	K103–K106
0,5–1,0 µm 20–40 µ-in	0,5–1,0 µm 20–40 µ-in	0,5–1,5 µm 20–60 µ-in	–	0,5–1,0 µm 20–40 µ-in	–	●	●	● carbide only	● carbide only	moderate	low	moderate	please contact us
0,5–1,6 µm 20–63 µ-in	0,5–1,6 µm 20–63 µ-in	0,5–1,8 µm 20–72 µ-in	0,1–0,6 µm 4–24 µ-in	<0,8 µm <32 µ-in	<0,8 µm <32 µ-in	●	●	●	●	low	moderate	high	K118–K119
0,5–1,6 µm 20–63 µ-in	0,5–1,6 µm 20–63 µ-in	0,5–1,8 µm 20–72 µ-in	0,1–0,6 µm 4–24 µ-in	<0,8 µm <32 µ-in	<0,8 µm <32 µ-in	●	●	●	●	low	moderate	moderate	K119–K121
0,3–1,6 µm 12–63 µ-in	0,3–1,6 µm 12–63 µ-in	0,5–1,8 µm 20–72 µ-in	0,1–0,6 µm 4–24 µ-in	<0,8 µm <32 µ-in	–	●	●	●	●	low	moderate	moderate	K119–K121
0,8–2,0 µm 32–80 µ-in	0,8–2,0 µm 32–80 µ-in	0,8–2,0 µm 32–80 µ-in	0,8–2,0 µm 32–80 µ-in	0,8–2,0 µm 32–80 µ-in	<1,2 µm <48 µ-in	●	●	○	○	low	moderate	low	K144–K149
0,8–2,0 µm 32–80 µ-in	0,8–2,0 µm 32–80 µ-in	0,8–2,0 µm 32–80 µ-in	0,8–2,0 µm 32–80 µ-in	0,8–2,0 µm 32–80 µ-in	<1,2 µm <48 µ-in	●	●	●	●	low	moderate	low	K150–K151
0,8–2,0 µm 32–80 µ-in	0,8–2,0 µm 32–80 µ-in	0,8–2,0 µm 32–80 µ-in	0,8–2,0 µm 32–80 µ-in	0,8–2,0 µm 32–80 µ-in	<1,2 µm <48 µ-in	●	●	○	○	low	moderate	low	K152–K154
0,8–2,0 µm 32–80 µ-in	0,8–2,0 µm 32–80 µ-in	0,8–2,0 µm 32–80 µ-in	0,8–2,0 µm 32–80 µ-in	0,8–2,0 µm 32–80 µ-in	<1,2 µm <48 µ-in	●	●	●	●	low	moderate	low	K155–K156
0,8–2,0 µm 32–80 µ-in	0,8–2,0 µm 32–80 µ-in	0,8–2,0 µm 32–80 µ-in	0,8–2,0 µm 32–80 µ-in	0,8–2,0 µm 32–80 µ-in	<1,2 µm <48 µ-in	●	●	○	○	low	low–moderate	low	please contact us
1,0–5,0 µm 40–200 µ-in	1,0–5,0 µm 40–200 µ-in	1,0–5,0 µm 40–200 µ-in	1,0–2,0 µm 40–80 µ-in	1,0–5,0 µm 40–200 µ-in	–	●	●	●	●	low	low	low–moderate	K185–K188
0,8–2,0 µm 32–80 µ-in	0,8–2,0 µm 32–80 µ-in	0,8–2,0 µm 32–80 µ-in	0,8–2,0 µm 32–80 µ-in	0,8–2,0 µm 32–80 µ-in	<1,2 µm <48 µ-in	●	●	●	●	low	moderate	low–moderate	K189
0,8–2,0 µm 32–80 µ-in	0,8–2,0 µm 32–80 µ-in	0,8–2,0 µm 32–80 µ-in	0,8–2,0 µm 32–80 µ-in	0,8–2,0 µm 32–80 µ-in	<1,2 µm <48 µ-in	●	●	●	●	low	moderate	low–moderate	K190–K191
0,8–2,0 µm 32–80 µ-in	0,8–2,0 µm 32–80 µ-in	0,8–2,0 µm 32–80 µ-in	0,8–2,0 µm 32–80 µ-in	0,8–2,0 µm 32–80 µ-in	<1,2 µm <48 µ-in	●	●	●	●	low	moderate	low–moderate	K194
1,0–5,0 µm 40–200 µ-in	1,0–5,0 µm 40–200 µ-in	1,0–5,0 µm 40–200 µ-in	1,0–2,0 µm 40–80 µ-in	1,0–5,0 µm 40–200 µ-in	–	●	●	●	●	low	low	low–moderate	K196–K197
0,8–2,0 µm 32–80 µ-in	0,8–2,0 µm 32–80 µ-in	0,8–2,0 µm 32–80 µ-in	0,8–2,0 µm 32–80 µ-in	0,8–2,0 µm 32–80 µ-in	–	●	●	●	●	low	moderate	low–moderate	K196–K197
0,8–2,0 µm 32–80 µ-in	0,8–2,0 µm 32–80 µ-in	0,8–2,0 µm 32–80 µ-in	0,8–2,0 µm 32–80 µ-in	0,8–2,0 µm 32–80 µ-in	–	●	●	○	○	low	moderate	low–moderate	K200
–	–	–	0,1–0,8 µm 4–32 µ-in	–	–	●	●	●	●	low	very low	moderate	K135–K138
–	–	–	0,1–0,8 µm 4–32 µ-in	–	–	●	●	●	●	low	very low	moderate	K135–K138

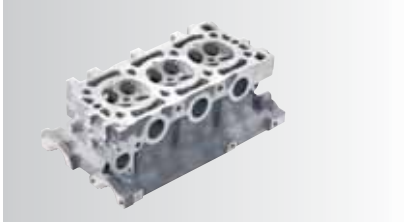


Hole Finishing

Ra Surface roughness

NOTE: Surface roughness values are guidelines and depend on the application, coolant situation, machine, and cutting data applied.

Cylinder Head



Hole Finishing

RIQ™ QUATTRO CUT™ VALVE SEAT & GUIDE PARENT BORE

CHALLENGE

- Valve seat and guide parent bore machining combined.
- Tolerance range 8 µm.
- Cast iron.
- Machining center with internal coolant.

SOLUTION

- RIQ padded reamer with integrated hydraulic chuck.
- RIQ Full face CBN KB1630™ insert.
- RMS™ reamer for guide parent bore.

CUTTING DATA

- vc 425 m/min f 0,10 mm/rev valve seat.
- vc 130 m/min f 0,60 mm/rev valve guide.

RESULT

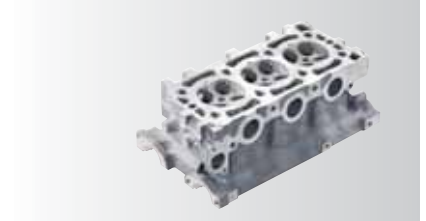
- Four usable cutting edges per CBN insert.
- CBN RIQ insert with 28,000 bore tool life.
- 1,400 bores with regrindable RMS reamer.

BENEFIT

- Cost savings due to four edged full face CBN insert.
- No insert back taper adjustment needed.
- Same RPM at both stages saving time of spindle acceleration and deceleration.



Cylinder Head



Polished flutes
for improved
chip evacuation

Hole Finishing

PCD SEAT & GUIDE PARENT BORE PCDRSC04RLE

CHALLENGE

- Valve seat and guide parent bore machining combined.
- Tolerance range H7.
- Aluminum.
- Machining center with internal coolant.

SOLUTION

- PCD tipped, steel based tool (valve seat) with shrink in PCD tip, carbide based reamer (valve guide) with less than 4 µm total run out.

CUTTING DATA

- vc 344 m/min f 0,60 mm/rev valve seat.
- vc 985 m/min f 0,60 mm/rev valve guide.

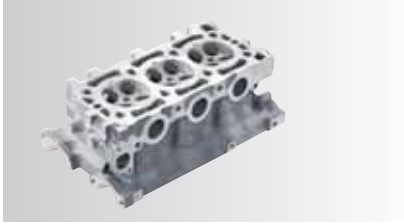
RESULT

- Tool life of 456,000 bores.

BENEFIT

- Productivity increases as same RPM applied to both seat and guide stages.
- Lowest possible run out resulting in higher tool life.

Cylinder Head



RIQ serration defines valve seat angle

Hole Finishing

RIQ™ QUATTRO CUT™ VALVE SEAT & GUIDE MACHINING

- Valve guide machining combined with primary and secondary seat angles.
- Sinter metal.
- Concentricity of seat to guide less than 50 µm.
- Machining center with internal coolant.

CHALLENGE

- RIQ Valve Seat tooling with integrated hydraulic chuck.
- RIQ K68™ carbide inserts and solid carbide RMS™ multiflute reamer.

SOLUTION

- vc 80 m/min f 0,10 mm/rev valve seat.
- vc 80 m/min f 0,32 mm/rev valve guide.

CUTTING DATA

- Tool life of 12,000 valve seats per insert.

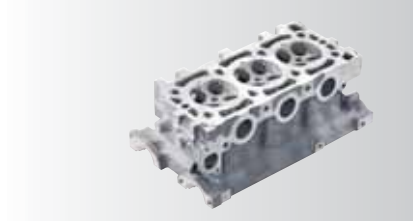
RESULT

- Twelve usable cutting edges per carbide insert.
- Due to high precision RIQ pocket seat there is less setup effort as no angular adjustment of the insert is needed.
- Able to adapt RIR™ padded reamer machining the valve guide.

BENEFIT



Cylinder Head



RIQ serration defines valve seat angle

Hole Finishing



RIQ™ QUATTRO CUT™ VALVE SEAT & GUIDE MACHINING

CHALLENGE

- Valve guide machining combined with primary and secondary seat angles.
- Sinter metal.
- Concentricity of seat to guide less than 50 µm.
- Transfer line with internal coolant.

SOLUTION

- RIQ Valve Seat tooling with carbide bushing for Valve Guide reaming tools.
- RIQ KB1630™ insert with TiN wear indicator.
- RIR™ padded reamer machining.

CUTTING DATA

- vc 80 m/min f 0,07 mm/rev valve seat.
- vc 60 m/min f 0,14 mm/rev valve guide.

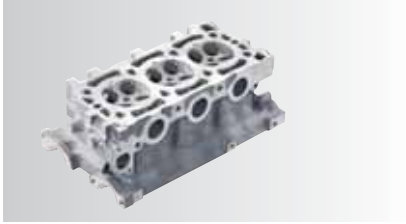
RESULT

- Tool life of 18,000 valve seats per roughing insert.
- Tool life of 12,000 valve seats per roughing insert.

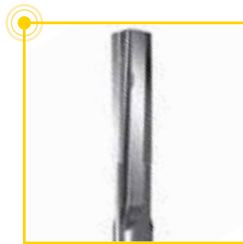
BENEFIT

- Twelve usable cutting edges per full face CBN insert.
- Due to high precision RIQ pocket seat there is less setup effort as no angular adjustment of the insert is needed.
- Able to adapt RMS™ solid carbide reamer machining the valve guide.

Cylinder Head



Hole Finishing



Semi finish stage after pilot hole



PCD insert with chipbreaker

RMS™ VALVE GUIDE MACHINING

- Valve guide bore \varnothing 6mm (.236").
- Tolerance range 12 μ m H7.
- Brass material, lead free.
- Concentricity of seat to guide less than 50 μ m.

CHALLENGE

- RMS solid carbide reamer — engineered solution.
- Machining center — with semi finish stage for picking up pilot hole.
- Transfer line — without semi finish stage.

SOLUTION

- vc 30 m/min (98 SFM).
- f 0,42 mm/rev (.017 IPR).

CUTTING DATA

- Tool life of 3,000 bores.

RESULT

- No presetting is needed.
- Productivity increases due to four effective cutting edges compared to one with padded reamers.

BENEFIT

RIR™ VALVE GUIDE MACHINING

- Valve guide bore \varnothing 6mm (.236").
- Tolerance range 12 μ m H7.
- Brass material, lead free.
- Concentricity of seat to guide less than 50 μ m.

CHALLENGE

- RIR padded reamer with PCD guide pads.
- Single edged KD1415™ PCD insert with chip breaker.

SOLUTION

- vc 60 m/min (197 SFM).
- f 0,14 mm/rev (.006 IPR).

CUTTING DATA

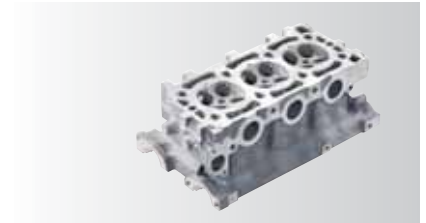
- Tool life of 100 bores.
- Surface finish Rz 6.3 μ m.

RESULT

- Secure process due to very good chip control on lead free brass.

BENEFIT

Cylinder Head



Hole Finishing

MOTION TOOLING VALVE SEAT & GUIDE MACHINING

CHALLENGE

- Semi-finish and finish machining of primary seat angle and valve guide in one operation.
- Sinter metal.
- Transfer line with internal coolant.

SOLUTION

- Taper turning head with quill for reamer.

CUTTING DATA

- vc 271 m/min f 0,05 mm/rev valve seat.
- vc 60 m/min f 0,11 mm/rev valve guide.

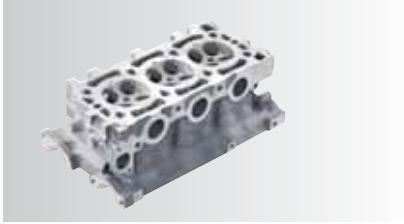
RESULT

- Run out of guide to seat 7 μ m.
- Cylindricity of guide 12 μ m.

BENEFIT

- Higher accuracy of valve seat angles as machining result is independent from insert wear.
- Time saving combination with valve guide reamer.

Cylinder Head



Polished flutes in for improved chip evacuation



Chipformer in carbide body

Hole Finishing

PCD STEP REAMING PCDSC22RLE

- Valve lifter bore \varnothing 12mm (.472").
- Tolerance range 18 μ m G7.
- Aluminum AISI7Mg.
- Machining center with internal coolant.

CHALLENGE

- PCD tipped, carbide based reamer and counter sinker with internal coolant.
- Four effective cutting and chamfering teeth.
- KD1415™.

SOLUTION

- vc 400 m/min (1.312 SFM).
- f 0,10 mm/rev (.004 IPR).

CUTTING DATA

- Tool life of 125,000 holes.
- Surface finish better than Rz 1.5 μ m.

RESULT

- Secure process and very good concentricity.

BENEFIT

PCD STEP REAMING PCDSC02RLE

- Injector bore \varnothing 7,75–19,5mm (.305–.768").
- Tolerance range 5 μ m.
- Aluminum G-AISI7Mg.
- Machining center with internal coolant.

CHALLENGE

- PCD tipped, carbide based tool with PCD guide pads at \varnothing 19,5mm and internal coolant.
- Two effective cutting and chamfering teeth.
- KD1415™.

SOLUTION

- vc 220 m/min (722 SFM).
- f 0,35 mm/rev (.014 IPR).

CUTTING DATA

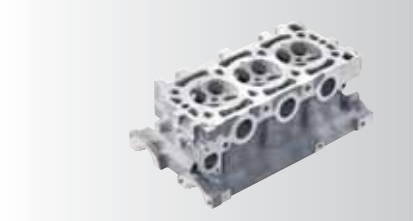
- Tool life of 400,000 bores.
- Surface finish better than Rz 3 μ m.

RESULT

- Secure process due to chipformer in carbide body improving chip formation.

BENEFIT

Cylinder Head



RIQ pocket for indexing without adjustment

Hole Finishing

RIQ™ QUATTRO CUT™ /RIR™ PADDED REAMING

CHALLENGE

- Injector bore \varnothing 10,3–41 mm (.406–1.614").
- Tolerance range 18–25 μ m H7.
- Cast iron GG25.
- Quick-change interface between first and second machining stage.

SOLUTION

- First stage: RIR reamer with RIQ profile insert.
- Second stage: RIQ padded multi step reamer.
- Radial actuated KST interface as stages have different tool life due to different diameters.

CUTTING DATA

- v_c 23–90 m/min $n = 700$ RPM.
- f 0,32 mm/rev (.025 IPR).

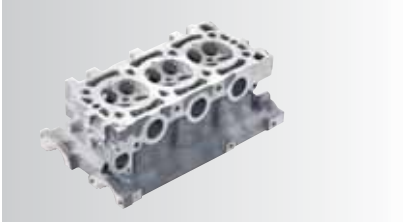
RESULT

- Tool life of 1,000 components per insert edge.
- Surface finish better than Rz 16 μ m.

BENEFIT

- No back taper adjustment needed with RIQ inserts.
- Front and back end of tool can be handled independently.
- RIQ pocket seat allows insert indexing without adjustment reaching < 20 μ m axial run out.

Cylinder Head



Self aligning
padded reamer

Hole Finishing

RIQ™ QUATTRO CUT™ PADDED REAMING

- Oil seal bore finishing \varnothing 56,4mm (2.220").
- Tolerance range 30 μ m H7.
- Aluminum.
- Cambore to oil seal bore self alignment.
- Transfer line with internal coolant.

CHALLENGE

SOLUTION

- RIQ padded reamer with two PCD KD1415™ full-face inserts floating on finish machined cam bore.
- Self-aligning reamer body to ensure cam bore to oil seal bore concentricity.

CUTTING DATA

- vc 326 m/min (1.070 SFM).
- f 0,32 mm/rev (.004 IPR).

RESULT

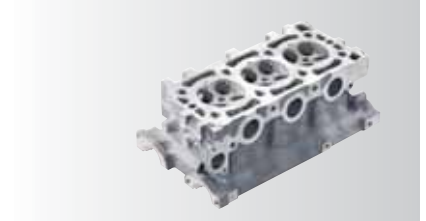
- Tool life of 80,000 cylinder heads.

BENEFIT

- No insert back taper adjustment needed.
- Cost savings due to four edged full face PCD RIQ insert.



Cylinder Head



Semi finish and finish stage combined

Hole Finishing

RIQ™ QUATTRO CUT™ PADDED REAMING

CHALLENGE

- Cambore finishing \varnothing 25mm (.984").
- Tolerance range 21 μ m H7.
- Aluminum.
- Deflection less than 20 μ m over total length.
- Machining center with internal coolant.

SOLUTION

- RIQ padded reamer with two PCD KD1415™ full-face inserts for semi-finishing and two PCD KD1415 full-face inserts for finishing.

CUTTING DATA

- vc 334 m/min (1.096 SFM).
- f 0,16 mm/rev (.006 IPR).

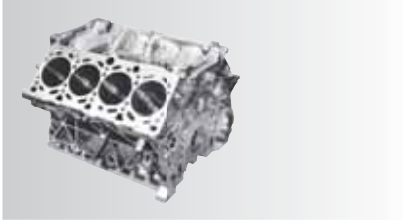
RESULT

- Tool life of 160,000 cylinder heads.
- Surface finish Ra 0.3 μ m.

BENEFIT

- No insert back taper adjustment is needed.
- Cost savings due to four edged full face PCD RIQ insert.
- Setup time reduction from 8 h with competitive tooling to less than 1/2 h with RIQ.

Cylinder Block



Individual and simultaneous CLB adjustment

Hole Finishing

ROMICRON™ FINE BORING

- Cylinder bore \varnothing 78,45mm (3.089").
- Tolerance range 20 μ m.
- Cast iron GG26.
- Replace low productivity reaming process.
- Machining center HSK100 with internal coolant.

CHALLENGE

SOLUTION

- Multicron engineered solutions tool with three finishing cartridges with individual set up and automatic wear compensation with front CLB knob.
- CPGW060204S01015C KB1630.

CUTTING DATA

- vc 1.281 m/min (4.200 SFM).
- f 0,42 mm/rev (.017 IPR).

RESULT

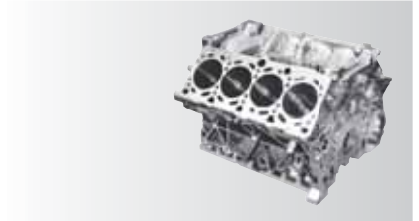
- Tool life of 2,000 components per setup.
- Cylindricity 13 μ m.
- Surface finish Ra 2.4 μ m.

BENEFIT

- High productivity due to three cutting edges and automatic wear compensation inside of machine.
- Bore tolerance range of 20 μ m easily and consistently achieved due to 1 μ m per click in radius adjustment executed by machine.



Cylinder Block



CLB screw for automatic wear compensation



MOTION TOOLING

CHALLENGE

- Cylinder bore \varnothing 75mm (2.953").
- Cast iron GG25.
- Semi-finish and finish operation combined in one tool with coolant pressure activated finish stage.
- Machining center with internal coolant.

SOLUTION

- Motion tool with feed out cartridges.
- Two channel coolant system with coolant supply for inserts and feed out cartridges.
- Solid CBN inserts with eight cutting edges KB1340™.

CUTTING DATA

- v_c 600 m/min f 0,05 mm/rev semi-finish.
- v_c 600 m/min f 0,11 mm/rev finish.

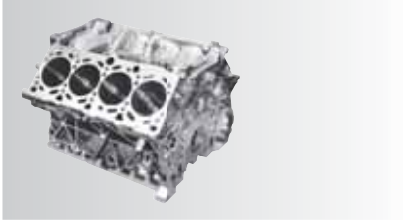
RESULT

- Tool life of 2,000 bores per tooling setup.
- Cylindricity better than 8 μ m.

BENEFIT

- Higher productivity as roughing at forward and finishing at backward movement — with coolant feed out.
- Finish diameter adjustable with CLB process.
- Improved cylindricity than two separate operations.

Cylinder Block



Bayonet quick change system

Hole Finishing

ROMICRON™ FINE BORING

- Cylinder bore \varnothing 78,933mm (3.108").
- Cast iron GG25.
- Reduce setup and adjustment effort with roughing and finishing at various cylinder blocks.
- Engineered solutions vertical mill with internal coolant.

CHALLENGE

SOLUTION

- Romicon engineered solutions tool with quick-change interface and drawbar actuated finish cartridge.
- SNGN090308T00520 KY1615 roughing insert.
- CPMT09T308LF KT315™ finishing insert.

CUTTING DATA

- vc 580 m/min f 0,26 mm/rev roughing.
- vc 580 m/min f 0,19 mm/rev finishing.

RESULT

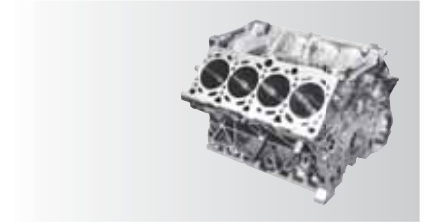
- Tool life of 100 components per setup.
- Cylindricity 13 μ m.
- Surface finish Ra 1.5 μ m.

BENEFIT

- Bore tolerance easily and consistently achieved due to 1 μ m per click in radius adjustment.
- Weight reduction from 11 kg to 1.8 kg.
- Setup time reduction from 1.5 h to 15 min.
- Secure process resulting in higher cpk value.



Cylinder Block



Hole Finishing

ROMICRON™ FINE BORING

CHALLENGE

- Piston bore \varnothing 68mm (2.677").
- Tolerance range 30 μ m.
- Cast iron.
- Machining center HSK100A with internal coolant.

SOLUTION

- Engineered solution SVS4B head.
- Two semi-finish and one finish cutting edge.
- TPGW110204S01015C KB1630™.

CUTTING DATA

- vc 595 m/min (1.952 SFM).
- f 0,15 mm/rev (.006 IPR).

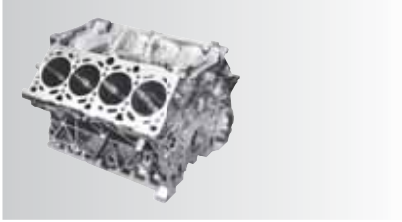
RESULT

- Surface finish Ra 0.8 μ m.
- Roundness better than 8 μ m.

BENEFIT

- 80% less adjustment time needed.
- Bore tolerance range of 30 μ m easily and consistently achieved due to 1 μ m per click in radius adjustment.

Cylinder Block



Hole Finishing

ROMICRON™ FINE BORING

- Cylinder bore \varnothing 96,9mm (3.815").
- Tolerance range 30 μ m.
- Cast iron.
- Machining center with internal coolant.

CHALLENGE

SOLUTION

- Romicon standard KR50SVS4B094M head with engineered solution steep taper adaptor with chamfering inserts.
- CPGW060208S01015C KB1630™.

CUTTING DATA

- vc 600 m/min (1,969 SFM).
- f 0,30 mm/rev (.012 IPR).

RESULT

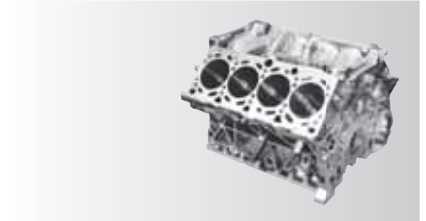
- Tool life of 800 components.
- Surface finish Ra 3 μ m.

BENEFIT

- High productivity increase as a result of 2x cutting speed and 40% higher feed rate compared to previous solution.
- Bore tolerance range of 30 μ m easily and consistently achieved due to 1 μ m per click in radius adjustment.



Cylinder Block



Semi and finishing stages combined



Hole Finishing

ROMICRON™ FINE BORING

CHALLENGE

- Cylinder bore \varnothing 103,17mm (4.062").
- Tolerance range 50 μ m.
- Cast iron.
- Semi-finish and finish operation combined.
- Machining center HSK100A with internal coolant.

SOLUTION

- Romicon engineered solutions tool with two semi-finishing, one finishing and one chamfering cartridges.
- Automatic wear compensation with CLB.
- SCGW09T308S01015C KB1630™.

CUTTING DATA

- vc 1.000 m/min (3,281 SFM).
- f 0,25 mm/rev (.010 IPR).

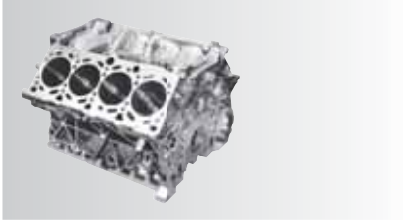
RESULT

- Tool life of 450 components per cutting edge.
- Cylindricity less than 17 μ m.
- Surface finish Ra 2,4 μ m.

BENEFIT

- High productivity due to automatic wear compensation inside of machine.
- 1 μ m per click in radius adjustment.

Cylinder Block



Individual and simultaneous CLB adjustment

Hole Finishing

ROMICRON™ FINE BORING

- Cylinder liner Ø 127,94mm (5.037").
- Cast iron GGzCrMo250.
- Increase productivity, reduce amount of constant stock for following honing process.
- Custom vertical lathe with internal coolant.

CHALLENGE

SOLUTION

- Multicron engineered solution tool with five finishing cartridges with HSK80C adaptor for facing and boring through feed-out system included.
- CPGW060204S01015C KB1630™.

CUTTING DATA

- vc 1.200 m/min (3,937 SFM).
- f 0,50 mm/rev (.020 IPR).

RESULT

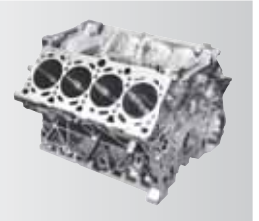
- Tool life of 4,000 components per setup.
- Cylindricity 8 µm.
- Surface finish Ra 2.0 µm.

BENEFIT

- High productivity due to five cutting edges.
- Bore tolerance range of 20 µm easily and consistently achieved due to 1 µm per click in radius adjustment.



Cylinder Block



1 μm per click
in radius adjustment

ROMICRON™ FINE BORING

CHALLENGE

- Crank bore finishing \varnothing 60mm (2.362").
- Tolerance range 30 μm .
- Cast iron GG25.
- Reduce setup and cycle time.
- Transfer line with internal coolant.

SOLUTION

- Line boring bar with Romicon standard cartridges KRMSVS00M055M.
- Semi-finishing and finishing operations in one.
- CPGT060204LF KC5010™.

CUTTING DATA

- vc 150 m/min f 0,2 mm/rev semi finish.
- vc 150 m/min f 0,12 mm/rev finish.

RESULT

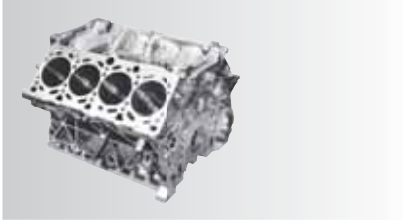
- Tool life of 120 components.
- Surface finish better than Rz 16 μm .
- Roundness better than 5 μm .

BENEFIT

- Semi-finishing operation during forward movement and finishing operation during backward movement of the workpiece.
- Use of standard of the shelf Romicon tooling with engineered solution line boring bar.
- Time saving due to low presetting effort with 1 μm per click in radius adjustment.

Hole Finishing

Cylinder Block



Semi finish and finish stage combined



Hole Finishing

FINE BORING

- Crank bore finishing \varnothing 37mm (1.457").
- Tolerance range 5 μ m.
- Cast iron.
- Maintain tolerance for minimum of 50 bores.
- Machining center with internal coolant.

CHALLENGE

SOLUTION

- Line boring bar with tool bits adjusted by differential screw for more sensitivity.
- Dynamically balanced by design with axial holes ensuring highest stiffness of tool.

CUTTING DATA

- vc 160 m/min f 0,12 mm/rev semi-finish.
- vc 160 m/min f 0,08 mm/rev finish.

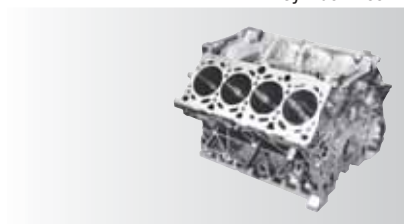
RESULT

- Customer proprietary information.

BENEFIT

- Use of standard C-style inserts in LF reduce tooling costs in KCK15.
- Reduction of cycle time.
- Easy and fine adjustments ensure a stable process.

Cylinder Block



RIQ chamfering, plunging and reaming insert



RIQ™ QUATTRO CUT™ PADDED REAMING

CHALLENGE

- Balancing shaft bore \varnothing 31–39mm.
- Cast iron.
- Reaming of three diameters, machining of three chamfers and one facing operation in one tool.
- Minimum quantity lubrication MQL.

SOLUTION

- RIQ padded reamer with one effective cutting edge combining chamfering, counter sinking and reaming stage in one tool, using two reaming RIQ and one special RIQ insert.

CUTTING DATA

- v_c 100 m/min (328 SFM).
- f 0,14 mm/rev (.006 IPR).

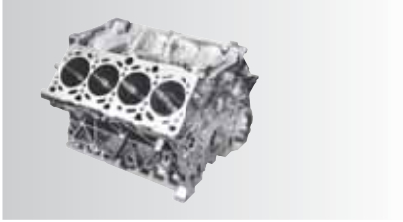
RESULT

- Tool life of 8,000 bores per insert.
- Surface finish Rz 10 μ m.

BENEFIT

- No insert back taper adjustment needed.
- Highest angular precision without any adjustment with RIQ at chamfering stage.

Cylinder Block



Hole Finishing



KST pre-loaded taper face contact interface

RIQ™ QUATTRO CUT™ PADDED REAMING

- Dowel pin bore Ø 15,341mm (.604").
- Tolerance range 50 µm.
- Cast iron GG26Cr.
- Machining center with internal coolant.

CHALLENGE

- RIQ padded reamer with HSK interface.
- Coated carbide KC6105™ RIQ inserts with four edges.

SOLUTION

- vc 70 m/min (328 SFM).
- f 0,13 mm/rev (.005 IPR).

CUTTING DATA

- Tool life of 96,000 bores per insert.

RESULT

- No insert back taper adjustment needed.

BENEFIT

RHM™ MODULAR REAMING

- Position bore Ø 20mm (.787").
- Tolerance range 21 µm N7.
- Cast iron GG26Cr.
- Replace padded double-edged reamer.
- Machining center with internal coolant.

CHALLENGE

- Special RHM head with six cutting edges.
- Engineered solution KC6105 TIN coated carbide grade.

SOLUTION

- vc 63 m/min (207 SFM).
- f 0,84 mm/rev (.033 IPR).

CUTTING DATA

- Tool life of 336m.

RESULT

- 8x higher productivity due to higher feed rate.
- Tool life increased by 240% when compared to previous solution.

BENEFIT

Conrod



ROMICRON™ FINE BORING

- Pin bore \varnothing 58,033mm (2.285").
- Brass.
- Combine finishing of crank and pin bore into one tool to increase productivity.
- Machining center with internal coolant.

CHALLENGE

- Romicon engineered solution tool with two Romicon mechanism in one tool body.
- KC5010™.

SOLUTION

- vc 450 m/min (1.476 SFM).
- f 0,10 mm/rev (.004 IPR).

CUTTING DATA

- Tool life of 350 pin bores per insert.
- Surface finish better than Ra 1.0 μ m.
- Cylindricity 5 μ m.

RESULT

- Combination tool increases productivity.
- Bore tolerance range of 26 μ m easily and consistently achieved due to 1 μ m per click in radius adjustment.

BENEFIT

ROMICRON™ FINE BORING

- Crank bore \varnothing 93,777mm (3.692").
- Steel C70.
- Combine finishing of crank and pin bore into one tool to increase productivity.
- Machining center with internal coolant.

CHALLENGE

- Romicon engineered solution tool with two Romicon mechanism in one tool body.
- KT315™.

SOLUTION

- vc 400 m/min (1.312 SFM).
- f 0,10 mm/rev (.004 IPR).

CUTTING DATA

- Tool life of 260 crank bores per insert.
- Surface finish better than Ra 1.0 μ m.
- Cylindricity 5 μ m.

RESULT

- Combination tool increases productivity.
- Bore tolerance range of 26 μ m easily and consistently achieved due to 1 μ m per click in radius adjustment.

BENEFIT

Hole Finishing



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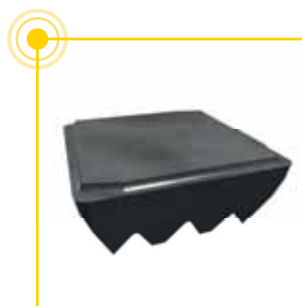
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www.kennametal.com.



Conrod



RIQ cermet insert with chip former geometry



RIQ™ QUATTRO CUT™ PADDED REAMING

CHALLENGE

- Pin bore \varnothing 19mm (.748").
- Tolerance range 33 μ m H8.
- Steel C70.
- Entry/exit inclined and chip control improvement.
- Transfer line with MQL internal coolant.

SOLUTION

- RIQ padded reamer with two axial staggered RIQ inserts in microfinishing setup.
- Coated cermet RIQ inserts with four edges and special chip former.

CUTTING DATA

- v_c 200 m/min (328 SFM).
- f 0,20 mm/rev (.006 IPR).

RESULT

- Tool life of more than 5,000 components per insert.
- Surface finish Rz 12–14 μ m.
- Cylindricity 5 μ m.

BENEFIT

- No insert back taper adjustment needed.
- High productivity increase due to higher feed rate when compared to previous fine boring tools.
- Very short chips improve chip evacuation.
- Secure process as surface requirement of Rz 8 μ m to Rz 16 μ m are achieved.

Hole Finishing

Conrod



Individual and simultaneous CLB adjustment

Hole Finishing

ROMICRON™ FINE BORING

- Crank bore \varnothing 91,24mm (3.592").
- Steel C70.
- Increase productivity with semi-finishing and finishing operations.
- Transfer line with internal coolant.

CHALLENGE

SOLUTION

- Multicron quick-change engineered-solution tool with three semi-finishing and three finishing cartridges.
- Drawbar CLB adjustment of finishing inserts.
- SCMT09T308LF KT315™.

CUTTING DATA

- v_c 230 m/min (820 SFM).
- f 0,36 mm/rev (.014 IPR).

RESULT

- Tool life of 2,320 conrods per insert.
- Surface finish R_a 1,0 μm .
- Cylindricity 2 μm .

BENEFIT

- High productivity due to three cutting edges.
- Quick-change coupling to enable individual cartridge setup at multicron finishing stage.
- Bore tolerance range of 22 μm easily and consistently achieved due to 1 μm per click in radius adjustment.



Conrod



Double feed out mechanism



Hole Finishing

ROMICRON™ MOTION TOOLING

CHALLENGE

- Crank bore \varnothing 98,82mm (3.891").
- Tolerance range 26 μ m.
- Steel C70.
- Drawbar actuated solution to semi-finish, finish, and chamfer both sides of the crank bore.

SOLUTION

- Motion tool based on Romicon with double feed out mechanism and fixed insert cartridges.
- SCMT09T308LF KC5010™.

CUTTING DATA

- v_c 230 m/min (755 SFM).
- f 0,12 mm/rev (.005 IPR).

RESULT

- Tool life of 600 conrods per insert.
- Surface finish Ra 1.0 μ m.
- Cylindricity 2 μ m.

BENEFIT

- Very stable and highly productive process as multiple operations are combined.
- Blue print solution for various types of conrods at customer site.

Conrod



Hole Finishing

ROMICRON™ FINE BORING

- Pin bore Ø 16,77mm (.660").
- Crank bore Ø 20,77mm (.818").
- Steel C70.
- Combines roughing, semi-finishing, and finishing operation into one tool.

CHALLENGE

SOLUTION

- Romicon standard head HSK63ASVUBB2116M with engineered-solution boring bar.
- CPMT060204LF KC5010™.

CUTTING DATA

- vc 120 m/min f 0,10 mm/rev roughing.
- vc 120 m/min f 0,05 mm/rev finishing.

RESULT

- Tool life of 2,500 components per insert edge.
- Surface finish Ra 0.5 µm.
- Cylindricity 3 µm.

BENEFIT

- Productivity increase due to combination tool.
- Bore tolerance range of 20 µm easily and consistently achieved due to 1 µm per click in radius adjustment.



Steering Column



Adjustable cartridge with PCD insert

Hole Finishing

PCD COUNTERSINKING PDCSTM03RLE

CHALLENGE

- Bore \varnothing 26,2; 37,6; and 44mm.
- Tolerance range 21 μ m N7.
- Aluminum G-ALSi9Cu3.
- Varying depth of cut ca. 1,5mm.
- Machining center with internal coolant.

SOLUTION

- PCD tipped, steel-based tool with internal coolant.
- Three effective cutting teeth; KD1415™.
- Standard cartridge SCFCR08CA06 achieves required surface finish range.

CUTTING DATA

- v_c 500 m/min (1,640 SFM).
- f 0,30 mm/rev (.012 IPR).

RESULT

- Surface finish Ra 1.6–2.3 μ m.

BENEFIT

- Secure process.

Steering Column



Hole Finishing

PCD COUNTERSINKING PDCSTA03RLE

- Bore \varnothing 17,07; 39,1; and 50,9mm.
- Tolerance range $21 \mu\text{m N7}$.
- Aluminum G- AlSi10Mg .
- Varying depth of cut ca. 2,5mm.
- Machining center with internal coolant.

CHALLENGE

SOLUTION

- PCD tipped, steel-based tool with SIF™ steerable interface and internal coolant.
- Three effective cutting and chamfering teeth.
- KD1415™.

CUTTING DATA

- v_c 600 m/min (1,969 SFM).
- f 0,30 mm/rev (.012 IPR).

RESULT

- Tool life of 2,000 meters.

BENEFIT

- Productivity increased due to higher cutting data.



Gear Housing



Hole Finishing

PCD STEP REAMING PCDRSCA04RLE

CHALLENGE

- Bearing bore \varnothing 13,5 and 18mm.
- Tolerance range 18 μ m H7.
- Aluminum G-ALSi10Mg.
- Varying depth of cut ca. 0,5mm.
- Machining center with internal coolant.

SOLUTION

- PCD tipped, carbide-based tool shrunk in SIF™ steerable interface with internal coolant.
- Four effective cutting teeth.
- KD1415™.

CUTTING DATA

- v_c 230 m/min (755 SFM).
- f 0,25 mm/rev (.010 IPR).

RESULT

- Surface finish Ra 0.2 μ m.

BENEFIT

- Secure process.

Gear Housing



Adjustable PCD
pocket seat

Hole Finishing

PCD COUNTERSINKING PCDSTMJ04RLE

- Bearing bore \varnothing 40, 62, 85mm.
- Tolerance range 25 μ m S7.
- Aluminum AISi9Cu3.
- Machine three different diameters with one tool.
- Machining center with internal coolant.

CHALLENGE

SOLUTION

- PCD tipped, steel-based tool with adjustable pocket seats, SIF™ steerable interface and internal coolant.
- Four effective cutting and chamfering teeth; KD1415™.

CUTTING DATA

- v_c 630–1,340 m/min $n = 5,010$ RPM.
- f 0,32 mm/rev (.013 IPR).

RESULT

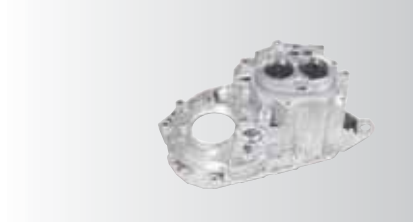
- Tool life of 500 workpieces.

BENEFIT

- Secure process with only 1.2 sec cutting time per operation.
- Higher productivity due to combining three operations into one tool.
- Very stable process without chip control issues.



Gear Housing



Highly uneven spacing

Hole Finishing



PCD STEP REAMING PCDRSTM06RLE

CHALLENGE

- Bearing bore \varnothing 130mm.
- Tolerance range 25 μ m S6.
- Aluminum AlSi8Cu3.
- Varying depth of cut ca. 0,5–5mm.
- Machining center with internal coolant.

SOLUTION

- PCD tipped, steel-based tool with HSK interface and internal coolant.
- Six effective cutting and chamfering teeth in positive cutting position; KD1415™.

CUTTING DATA

- v_c 350 m/min (1,148 SFM).
- f 0,60 mm/rev (.024 IPR).

RESULT

- Tool life increase versus previous solution.
- Surface finish Ra 0.2 μ m.

BENEFIT

- Secure process.

Gear Housing



Hole Finishing

PCD REAMING PCDRSTA03RLE

- Bearing bore \varnothing 35mm (.984").
- Tolerance range 21 μ m H7.
- Aluminum G-ALSi10Mg.
- Pre-drilled hole with 0,5mm depth of cut.
- Machining center HSK63A with internal coolant.

CHALLENGE

SOLUTION

- PCD tipped, steel-based tool with SIF™ steerable interface and internal coolant.
- Three effective cutting and chamfering teeth.
- KD1415™.

CUTTING DATA

- vc 235 m/min (771 SFM).
- f 0,30 mm/rev (.012 IPR).

RESULT

- Tool life of 100,000 holes.
- Surface finish Ra 0.2 μ m.

BENEFIT

- Secure process despite high L/D ratio.
- Very good surface quality.



Gear Housing



PCD REAMING PCDRSC02RLE

CHALLENGE

- Index bore \varnothing 11,5mm (.435").
- Tolerance range 18 μ m H7.
- Aluminum G-AlSi10Mg.
- Varying depth of cut ca. 3mm.
- Machining center HSK63A with internal coolant.

SOLUTION

- PCD tipped, carbide based tool with shrink in HSK63A adapter with internal coolant.
- Two effective cutting and chamfering teeth.
- KD1415™.

CUTTING DATA

- v_c 1,005 m/min (3,297 SFM).
- f 0,16 mm/rev (.024 IPR).

RESULT

- Tool life of 200,000 holes.
- Surface finish Ra 0.2 μ m.

BENEFIT

- Secure process and very good surface quality.
- Very short overhang length resulting in very good stability.

Gear Housing



Hole Finishing

PCD REAMING PCDRSTA04RLE

- Bearing bore \varnothing 80mm (3.150").
- Tolerance range 30 μ m H7.
- Aluminum G-AISI10Mg.
- Pre-drilled hole with 0,5mm depth of cut.
- Machining center HSK63A with internal coolant.

CHALLENGE

SOLUTION

- PCD tipped, steel-based tool with SIF™ steerable interface and internal coolant.
- Four effective cutting and chamfering teeth.
- KD1415™.

CUTTING DATA

- v_c 400 m/min (1,312 SFM).
- f 0,32 mm/rev (.013 IPR).

RESULT

- Tool life of more than 30,000 components.
- Surface finish Ra 0.2 μ m.

BENEFIT

- Secure process and very good surface quality.



Gear Housing



Hole Finishing

PCD MULTI-OPERATION TOOL PCDMSTA04RLE

CHALLENGE

- Bearing bore \varnothing 28 and 90mm.
- Tolerance range 21 and 35 μ m H7.
- Aluminum G-AlSi10Mg.
- Pre-drilled hole with 0,5mm depth of cut.
- Machining center HSK63A with internal coolant.

SOLUTION

- PCD tipped, steel-based tool with two individual adjustable SIF™ steerable interfaces and internal coolant.
- Four effective cutting teeth.
- KD1415™.

CUTTING DATA

- v_c 400 m/min (1,312 SFM).
- f 0,32 mm/rev (.013 IPR).

RESULT

- Tool life of more than 95,000 holes.
- Surface finish Ra 0.2 μ m.

BENEFIT

- Secure process and very good surface quality.

Gear Housing



Hole Finishing

PCD STEP REAMING PCDRSTM04RLE

- Bearing bore \varnothing 80 and 120mm.
- Tolerance range 30 and 35 μ m H7.
- Aluminum G-ALSi7Mg.
- Pre-drilled hole with 0,5mm depth of cut.
- Machining center HSK63A with internal coolant.

CHALLENGE

SOLUTION

- PCD tipped, steel-based tool with HSK63A interface and internal coolant.
- Four effective cutting teeth.
- KD1415™.

CUTTING DATA

- v_c 800 m/min (2,625 SFM).
- f 0,32 mm/rev (.013 IPR).

RESULT

- Tool life of more than 400 min.
- Surface finish Ra 0.2 μ m.

BENEFIT

- Secure process and very good surface quality.
- Tool life increase versus previous solution.



Gear Housing



PCD COUNTERSINKING PDCSTA03RLE

CHALLENGE

- Bearing bore \varnothing 81,25 and 90,3mm.
- Tolerance range 30 and 35 μ m H7.
- Aluminum G-AISI7Mg.
- Pre drilled hole with 0,5mm depth of cut.
- Machining center HSK63A with internal coolant.

SOLUTION

- PCD tipped, steel-based tool with SIF™ steerable interface and internal coolant.
- Three effective cutting and chamfering teeth.
- KD1415™.

CUTTING DATA

- v_c 400 m/min (1,312 SFM).
- f 0,30 mm/rev (.012 IPR).

RESULT

- Tool life of 10,000 components.
- Surface finish Ra 0.2 μ m.

BENEFIT

- Secure process and very good surface quality.

Hole Finishing

Gear Housing



Hole Finishing

PCD STEP REAMING PCDRSTA03RLE

- Bearing bore \varnothing 17,984 and 66,037mm.
- Tolerance range 8 and 20 μ m.
- Aluminum GD-AISI7.
- Pre-drilled hole with 0,5mm depth of cut.
- Machining center HSK63A with internal coolant.

CHALLENGE

SOLUTION

- PCD tipped, steel-based tool with SIF™ steerable interface and internal coolant.
- Three effective cutting teeth.
- KD1415™.

CUTTING DATA

- vc 315 m/min f 0,24 mm/rev \varnothing 17,984 mm.
- vc 1.156 m/min f 0,15 mm/rev \varnothing 66,037 mm.

RESULT

- Tool life of 35,000 components.
- Surface finish Ra 0.2 μ m.

BENEFIT

- Secure process and very good surface quality.
- Achieves high concentricity and straightness.



Gear Housing



PCD PROFILE MILLING PCDPSTM04E

- CHALLENGE**
- Retraining grooves \varnothing 60,4 and 90,7mm.
 - Tolerance range 60 μ m.
 - Aluminum G-AISI10Mg.
 - Pre drilled hole with 0,5mm depth of cut.
 - Machining center HSK63A with internal coolant.

- SOLUTION**
- PCD tipped, steel-based tool with HSK63A interface and internal coolant.
 - Four effective cutting teeth.
 - KD1415™.

- CUTTING DATA**
- vc 1,500 m/min (4,921 SFM).
 - f 0,06 mm/rev (.002 IPR).

- RESULT**
- Tool life of 50,000 parts.
 - Surface finish better than Ra 0.4 μ m.

- BENEFIT**
- Secure process.
 - Combining two operations in one tool increases productivity.
 - High accuracy in the distance between the two machined grooves.

PCD PROFILE MILLING PCDPSTM04E

- CHALLENGE**
- Retraining grooves \varnothing 58, 58,6 and 60mm.
 - Tolerance range 25 μ m.
 - Aluminum G-AISI10Mg.
 - Pre drilled hole with 0,5mm depth of cut.
 - Machining center HSK63A with internal coolant.

- SOLUTION**
- PCD tipped, steel based tool with HSK63A interface and internal coolant.
 - Four effective cutting teeth.
 - KD1415™.

- CUTTING DATA**
- vc 1,500 m/min (4,921 SFM).
 - f 0,06 mm/rev (.002 IPR).

- RESULT**
- Tool life of 50,000 work pieces.
 - Surface finish better than Ra 0.2 μ m.

- BENEFIT**
- Combining machining operations increases productivity.
 - Excellent dimensional accuracy.



Differential Housing



Hole Finishing

ROMICRON™ FINE BORING

- Bearing bores \varnothing 60,22 and 88,85mm.
- Tolerance range 17 μ m.
- Ductile cast iron GGG50.
- Finishing, back boring, and chamfering in one tool.
- Machining center HSK100A with internal coolant.

CHALLENGE

SOLUTION

- Dynamically balanced Romicon engineered solution.
- Individual adjustment of fine boring and back boring stages.
- CPGT060204LF KC5010™.

CUTTING DATA

- v_c 200 m/min (656 SFM).
- f 0,12 mm/rev (.005 IPR).

RESULT

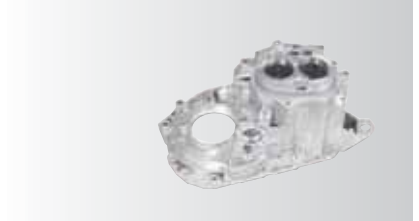
- Tool life of 240 components per insert.
- Surface finish Ra 1.6 μ m.

BENEFIT

- Bore tolerance range of 17 μ m easily and consistently achieved due to 1 μ m per click in radius adjustment.



Differential Housing



SPHX insert for precise 90° shoulder



Hole Finishing

PCD STEP REAMING

CHALLENGE

- Pin bore \varnothing 60mm (2.362").
- Tolerance range 19 μ m H6.
- Ductile cast iron GGG40.
- Finishing bore and 90° shoulder to \varnothing 55mm.
- Machining center with internal coolant.

SOLUTION

- Standard Romicon KM50SVS2B107M head with engineered solution cartridge.
- SPHX060204R21 KC7215™ standard double-edged countersinking insert.

CUTTING DATA

- vc 180 m/min (590 SFM).
- f 0,05 mm/rev (.002 IPR).

RESULTS

- Tool life of 4,000 components per insert.
- Surface finish Ra 1.6 μ m.

BENEFITS

- All requirements regarding perpendicularity achieved.
- Bore tolerance range of 19 μ m easily and consistently achieved due to 1 μ m per click in radius adjustment.

Differential Housing



Adjustable pocket seat

Hole Finishing

PCD STEP REAMING PCDRSTA04RLE

- Bore \varnothing 40 and 55mm (1.575 and 2.165").
- Tolerance range 30 μ m R7.
- Aluminum GD-AISI10Mg.
- Fine boring two diameters with one tool.
- Machining center with internal coolant.

CHALLENGE

SOLUTION

- PCD steel-based fine boring tool with four effective cutting edges, adjustable pocket seats at \varnothing 55mm, SIF™ steerable interface, and internal coolant.
- CCMT060202 KM™ one uncoated carbide.

CUTTING DATA

- v_c 340 and 520 m/min $n = 3,000$ RPM.
- f 0,60 mm/rev (.024 IPR).

RESULT

- Tool life of more than 15,000 components per insert.
- Surface finish Rz 10–12 μ m.
- Cylindricity better than 20 μ m.

BENEFIT

- All requirements regarding perpendicularity, roundness, and surface quality between Rz 8 μ m and Rz 16 μ m continuously achieved.
- Higher productivity due to combining three operations in one tool.



Water Pump Housing



PCD COUNTERSINKING PDCSTA03RLE

CHALLENGE

- Bore positions of $\varnothing 21$ and 24mm (.827 and .945").
- Tolerance range 13 and 33 μm .
- Aluminum AlSi9Cu3.
- Pre drilled hole with 0,5mm depth of cut.
- Machining center HSK63A with internal coolant.

SOLUTION

- PCD tipped, steel-based tool with adjustable pocket seats, SIF™ steerable interface and internal coolant.
- Four effective cutting teeth; KD1415™.

CUTTING DATA

- v_c 600 m/min (1,969 SFM).
- f 0,12 mm/rev (.005 IPR).

RESULT

- Tool life of 80000 components.
- Surface finish Rz 0.8 μm with $\varnothing 21\text{mm}$ and Rz 12 μm with $\varnothing 24\text{mm}$.

BENEFIT

- All requirements regarding perpendicularity, roundness, and surface quality between Rz 8 μm and Rz 15 μm at $\varnothing 24\text{mm}$ are continuously achieved.

Water Pump Housing



Hole Finishing

PCD MULTI-OPERATION TOOL PCDMSC02CCE

- Position bore \varnothing 7,9mm (.311").
- Tolerance range 22 μ m H8.
- Aluminum AlSi9Cu3.
- Combine drilling, back chamfering, and facing.
- Machining center BT40 with internal coolant.

CHALLENGE

- Solid carbide, PCD tipped, steel-based tool with back chamfering capability and internal coolant.
- Two effective cutting teeth.
- KD1415™.

SOLUTION

- vc 350 m/min (1,148 SFM).
- f 0,20 mm/rev (.008 IPR).

CUTTING DATA

- Tool life of 50000 components.
- Surface finish Rz 0.8 μ m.

RESULT

- Higher productivity due to combining three operations in one tool.

BENEFIT



Water Pump Housing



PCD STEP REAMING PCDRSTM04RLE

CHALLENGE

- Bearing bores \varnothing 10,14–18,45mm.
- Tolerance range 3–10 μ m.
- Aluminum GD-ALSi9Cu3.
- Pre-casted hole with 0,3mm depth of cut.
- Machining center HSK32A with internal coolant.

SOLUTION

- PCD tipped, steel-based tool with adjustable pocket seats, SIF™ steerable interface and internal coolant.
- Four effective cutting teeth.
- KD1415™.

CUTTING DATA

- v_c 89–162 m/min $n = 2800$ RPM.
- f 0,4 mm/rev (.015 IPR).

RESULT

- Tool life of 40,000 components.
- Surface finish Rz 0.8 μ m.

BENEFIT

- The quality criterion with an exact alignment of rightness, concentricity, and a high value of surface quality was reached.

Hole Finishing

Water Pump Housing



Hole Finishing

PCD END MILLING PCDESTM05E

- Face milling of connection face \varnothing 32mm.
- Aluminum AISi10Mg.
- Casted face with 2,5mm depth of cut.
- Machining center HSK63A with internal coolant.

CHALLENGE

SOLUTION

- PCD tipped, steel-based end mill with HSK63A interface and internal coolant.
- Five effective cutting teeth.
- KD1415™.

CUTTING DATA

- v_c 1,005 m/min (3,294 SFM).
- f 0,06 mm/rev (.002 IPR).

RESULT

- Tool life of 3,000 min.
- Surface finish Ra 0.3 μ m.

BENEFIT

- Very low burr formation.





Planetary Gear Carrier



Chip control geometry



RMS™ MULTIFLUTE REAMING

CHALLENGE

- Bearing bores \varnothing 8,8mm (.346").
- Tolerance range 9 μ m M6.
- Steel 42CrMo4 and 31CrMoV9.
- Increase tool life with long chipping material.
- Machining center with internal coolant.

SOLUTION

- RMS engineered-solution reamer with four effective cutting edges, internal coolant hole, and coolant channels at shank.
- KC6305™ TiAlN coated carbide.

CUTTING DATA

- v_c 70 m/min (230 SFM.).
- f 0,30 mm/rev (.012 IPR).

RESULT

- Tool life of 300 components.
- Surface finish R_z 1.0–2.0 μ m.

BENEFIT

- All requirements regarding perpendicularity, roundness, and surface quality below R_z 4 μ m are continuously achieved.

Planetary Gear Carrier



Hole Finishing

ROMICRON™ FINE BORING

- Bearing bores Ø 35 and 36,5mm.
- Tolerance range 20 µm.
- Steel 20MnCr5.
- Replace padded step reamer.
- Machining center with internal coolant.

CHALLENGE

- Romicon standard heads KR32SVS0B93M and HSK63ASVS0B117M.
- CCMT06020411 KT315™ cermet insert.

SOLUTION

- v_c 290 m/min (230 SFM).
- f 0,10 mm/rev (.012 IPR).

CUTTING DATA

- Surface finish better than Ra 1.0 µm.
- Cylindricity better than 5 µm.

RESULT

- More than 25% reduction in machining time.
- Removing setup of padded reamer outside of the machine results in increased up time.
- Bore tolerance range of 20 µm easily and consistently achieved due to 1 µm per click in radius adjustment.

BENEFIT



Planetary Gear Carrier



Padded reaming
pin machining

RIQ™ QUATTRO CUT™ PADDED REAMING

CHALLENGE

- Bearing pin machining \varnothing 45mm (1.772").
- Tolerance range 16 μ m k6.
- Ductile cast iron GGG40.
- Surface quality of Rmax 10 μ m to achieve.
- Special dimensional accuracy requirement.

SOLUTION

- RIQ padded reamer with SIF™ steerable tooling interface and special gashing for external coolant supply.
- Balanced by design and fine balanced.

CUTTING DATA

- vc 105 m/min (344 SFM).
- f 0,06 mm/rev (.002 IPR).

RESULT

- Surface finish better than Rz 2.5 μ m.
- Roundness 3 μ m.
- Cylindricity 6 μ m.

BENEFIT

- No insert back taper adjustment needed.
- Faster setup and less scrap.



Brake Caliper



Hole Finishing

RMB™ MULTIFLUTE REAMING

- Main bore \varnothing 54mm (2.126").
- Tolerance range 50 μ m.
- Cast iron.
- Machining center BT50 with internal coolant.

CHALLENGE

SOLUTION

- UpSharp engineered-solution carbide tipped reamer with 12 cutting edges, clamped in standard Shrink Fit holder.
- TiCN coated carbide.

CUTTING DATA

- vc 90 m/min (295 SFM).
- f 1,21 mm/rev (.048 IPR).

RESULT

- Tool life of 1,500–2,000 components.
- Surface finish Ra 2–2.4 μ m.

BENEFIT

- Rigid design enables high feed rates increasing productivity.
- Reduces setup effort by using standard tooling with Shrink Fit adapter.
- Regrindable up to 5x.



Brake Caliper



RMS™ MULTIFLUTE REAMING

CHALLENGE

- Pin hole Ø 12mm (.472").
- Tolerance range 30 µm.
- Cast iron.
- Machining center HSK63A with internal coolant.

SOLUTION

- UpSharp engineered-solution solid carbide reamer with six cutting edges.
- TiCN coated carbide.

CUTTING DATA

- v_c 75 m/min (246 SFM).
- f 0,8 mm/rev (.031 IPR).

RESULT

- Tool life of 5,000 holes.
- Surface finish Ra 1.0 µm.

BENEFIT

- Productivity increase.
- Longer tool life than competition.
- Ease of use due to shrink technology.

Brake Caliper



Hole Finishing

RIR™ PADDED REAMING

- Main bore \varnothing 60mm (2.362").
- Tolerance range 46 μ m H8.
- Cast iron.
- Obsolete honing process and produce undercut in the caliper bore.

CHALLENGE

SOLUTION

- RIR padded reamer with end cutting radius profile insert.
- Coated carbide RIR insert with two edges.
- KC6305™.

CUTTING DATA

- v_c 70 m/min (230 SFM).
- f 0,12 mm/rev (.005 IPR).

RESULT

- Tool life of 800 components per insert.
- Surface finish better than Ra 1.6 μ m.

BENEFIT

- Bore tolerance range of 46 μ m easily and consistently achieved.
- Cuts cost by eliminating honing and additional undercut operations.



Brake Caliper



RIQ™ QUATTRO CUT™ PADDED REAMING

CHALLENGE

- Main bore \varnothing 54,02mm (2.127").
- Tolerance range 40 μ m.
- Cast iron GGG.
- Reduce setup time and cost per part.

SOLUTION

- RIQ padded reamer with customer specific shank.
- Coated carbide RIQ insert with four edges.
- KC6305™.

CUTTING DATA

- v_c 80 m/min (262 SFM).
- f 0,40 mm/rev (.016 IPR).

RESULT

- Tool life of 16,000 bores per insert.
- Surface finish better than Ra 1.6 μ m.

BENEFIT

- No insert back taper adjustment needed.
- High cost savings due to more than 100% increase in tool life.

Brake Caliper



Hole Finishing

PCD REAMING PCDRSTM04RLE

- Main bore \varnothing 42mm (1.654").
- Tolerance range 8 μ m.
- Aluminum.
- Varying depth of cut between 1–2mm.
- Machining center with internal coolant.

CHALLENGE

SOLUTION

- PCD tipped, steel-based tool with HSK63A interface and internal coolant.
- Four effective cutting teeth.
- KD1415™.

CUTTING DATA

- v_c 500 m/min (1,640 SFM).
- f 1 mm/rev (.039 IPR).

RESULT

- Tool life of 400,000–600,000 bores.
- Surface finish better than Ra 1.6 μ m.

BENEFIT

- Secure process and high tool life.
- Productivity increase compared to previous solution.



Brake Caliper



Producing two different diameter



RMB™ MULTIFLUTE REAMING

CHALLENGE

- Location holes \varnothing 39 and 40mm.
- Tolerance range 39 μ m H8.
- Cast iron GGG60.
- Produce both diameters with one tool.
- Machining center with internal coolant.

SOLUTION

- RMB engineered-solution carbide tipped reamer with 10 teeth and internal coolant supply.
- KC6305™ TiAlN coated carbide.

CUTTING DATA

- vc 70 m/min (230 SFM).
- f 3,30 mm/rev (.130 IPR).

RESULT

- Tool life of 5,000 holes.
- Surface finish Rz 20 μ m better than required Rz 25 μ m.

BENEFIT

- Very stable and highly productive process as multiple operations are combined at very high cutting data.

Brake Master Cylinder



RIQ PCD insert with chip former geometry

Hole Finishing

RIQ™ QUATTRO CUT™ PADDED REAMING

- Piston bore \varnothing 25,431mm (1.001").
- Tolerance range 10 μ m.
- Aluminum AISi7.
- Combine multiflute and padded reaming process.
- Round table machine with internal coolant.

CHALLENGE

SOLUTION

- RIQ padded reamer in angular micro finishing setup with semi- and fine-finishing inserts.
- RIQ full face PCD KD1415™ as finishing insert.

CUTTING DATA

- v_c 360 m/min (1,181 SFM).
- f 0,24 mm/rev (.009 IPR).

RESULT

- Tool life of 1,600 bores per insert.
- Surface finish better than Ra 0.4 μ m.
- Cylindricity 7 μ m.

BENEFIT

- No insert back taper adjustment needed.
- Higher productivity due to combining two operations in one tool and increasing feed by more than 30%.
- Very stable process without chip control issues.
- Better cylindricity than requested.



Brake Master Cylinder



Hole Finishing

RIQ™ QUATTRO CUT™ PADDED REAMING

CHALLENGE

- Piston bore \varnothing 25,431mm (1.001").
- Tolerance range 10 μ m.
- Ductile cast iron.
- Replace honing process with reaming.
- Machining center with internal coolant.

SOLUTION

- RIQ padded reamer in angular micro-finishing setup with semi- and fine-finishing insert.
- RIQ full face PCD KD1415™ as finishing insert.

CUTTING DATA

- vc 120 m/min (394 SFM).
- f 0,20 mm/rev (.008 IPR).

RESULT

- Tool life of 1,600 bores per insert.
- Surface finish better than Ra 0.4 μ m.
- Cylindricity 6 μ m.

BENEFIT

- No insert back taper adjustment needed.
- Higher productivity due to combining two operations in one tool.



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Steering Knuckle



Hole Finishing

ROMICRON™ FINE BORING

CHALLENGE

- Main bearing bore \varnothing 82mm (3.228").
- Replace setup of padded reamer and cover various diameters with one tool.
- Machining center with internal coolant.

SOLUTION

- Romicon engineered solution. HSK80ASVSB156M SVS4B head.
- CPMT 060204 FW KCK20™.

CUTTING DATA

- vc 400 m/min (1,312 SFM).
- f 0,20 mm/rev (.008 IPR).

RESULT

- Tool life of 1,000 components.
- Surface finish 1.2 μ m.
- Cylindricity better than 6 μ m.

BENEFIT

- Reduce setup time and cost reduction when standard inserts are used.
- Bore tolerance range of 30 μ m easily and consistently achieved due to 1 μ m per click in radius adjustment.

Steering Knuckle



Very uneven spacing

Hole Finishing

RMB™ MULTIFLUTE REAMING

- Axle arm \varnothing 52,935mm (2.084").
- Tolerance range 20 μ m.
- Steel St52-3 and 30MnVS6.
- Surface finish and chip control improvements.
- Machining center with internal coolant.

CHALLENGE

SOLUTION

- RMB engineered-solution cermet tipped reamer with wide chip flutes.
- 6° left hand helix and special lead geometry.
- KT6215™ TiAlN coated cermet.

CUTTING DATA

- vc 20 m/min f 2 mm/rev entering hole.
- vc 90 m/min f 2 mm/rev finish hole.

RESULT

- Tool life of 460 components.
- Surface finish Rz 1.3 μ m.

BENEFIT

- More than 30% increase in tool life compared to previous competitive tooling.
- Surface finish Rz 1.3 μ m better than requested Rz 6.3 μ m.



Suspension Subframe



Hole Finishing

RIR™ PADDED REAMING

CHALLENGE

- Location hole \varnothing 18,5–23,0mm (.728–.906").
- Tolerance range 0,1°.
- Steel.
- Improvement in roundness and angularity.
- Transfer line with internal coolant.

SOLUTION

- RIR taper reamer with HSK interface.
- R904S00771 KC6005™ with two edges.

CUTTING DATA

- v_c 32 m/min (105 SFM).
- f 0,133 mm/rev (.005 IPR).

RESULT

- Tool life of 800 bores per insert.
- Surface finish Ra 1.6 μ m.

BENEFIT

- Predictable performance and cost savings because inserts can be reconditioned.
- Easy to set with three clock padded reamer setting fixtures.
- Roundness improvement over competitive solid carbide multiflute reamer.

Mounting Lever



Hole Finishing

PCD COUNTERSINKING PCDCSTM04RLE

- Reaming pre-casted hole \varnothing 20mm (.787").
- Tolerance range 21 μ m H7.
- Aluminum AlSi9Cu3.
- 220mm over hang due to workpiece fixture.
- Machining center with internal coolant.

CHALLENGE

SOLUTION

- PCD tipped, steel-based tool with HSK63A interface and internal coolant.
- Four effective cutting teeth.
- KD1415™.

CUTTING DATA

- v_c 125 m/min (410 SFM).
- f 0,70 mm/rev (.003 IPR).

RESULT

- Tool life of 60,000 components.
- Surface finish Ra 0.2 μ m.

BENEFIT

- Secure process and less scrap than previous competitive solution.
- No adjustment effort due to solid solution.



CV Joint



ROMICRON™ FINE BORING

CHALLENGE

- Central bore \varnothing 28mm (1.102").
- Tolerance range 18 μ m.
- Steel, hardened.
- Material hardness 61–70 HRC.
- Machining center with MQL internal coolant.

SOLUTION

- Romicon standard head HSK63ASVS00B096M.
- CPGW060208S01015M KB5625™.

CUTTING DATA

- v_c 110 m/min (361 SFM).
- f 0,08 mm/rev (.003 IPR).

RESULT

- Tool life of 500 bores per insert.
- Surface finish Ra 0.3 μ m.

BENEFIT

- Fine adjustments increases productivity resulting in less manufacturing interruptions.
- Bore tolerance range of 18 μ m easily and consistently achieved due to 1 μ m per click in radius adjustment.

Hole Finishing

Turbocharger



Hole Finishing

RIR™ PADDED REAMING

- Bearing bore \varnothing 9,6mm (.378").
- Tolerance range 9 μ m H6.
- Cast iron.
- Interrupted cut.
- Lathe with internal coolant.

CHALLENGE

SOLUTION

- RIR padded reamer in floating toolholder.
- RIR01E1300 KC6005™ coated carbide insert.

CUTTING DATA

- v_c 50 m/min (164 SFM).
- f 0,33 mm/rev (.013 IPR).

RESULT

- Surface finish better than Rz 16 μ m.
- Cylindricity 10 μ m.

BENEFIT

- Increased productivity due to 2x the feed rate when compared to previous competitive tool.



Turbocharger



RMS™ MULTIFLUTE REAMING

CHALLENGE

- Mounting holes \varnothing 12mm (.472").
- Tolerance range 18 μ m H7.
- Ductile cast iron.
- Machining center with internal coolant.

SOLUTION

- RMS standard reamer with six effective cutting edges and internal coolant.
- KC6305™ TiAlN coated carbide.

CUTTING DATA

- v_c 20 m/min (66 SFM).
- f 0,30 mm/rev (.012 IPR).

RESULT

- Tool life of 1,000 components.
- Surface finish better than Rz 10 μ m.

BENEFIT

- Productivity and tool life increase compared to previous solution.

Compressor



Hole Finishing

ROMICRON™ FINE BORING

- Piston bore Ø 23,5mm (.925").
- Tolerance range 18 µm.
- Aluminum 12% Si.
- Machining center BT40 with external coolant.

CHALLENGE

- Standard SVUBB2 head with KR coupling.
- Standard steel boring bar.
- CPGW060204FST KD1400™.

SOLUTION

- v_c 367 m/min (1,204 SFM).
- f 0,07 mm/rev (.003 IPR).

CUTTING DATA

- Surface finish Ra 0.6 µm.
- Roundness better than 5 µm.

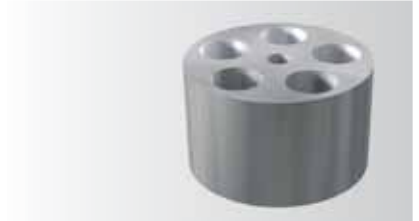
RESULT

- 2x the productivity compared to the current solution.
- 80% less adjustment time needed.
- Bore tolerance range of 18 µm easily and consistently achieved due to 1 µm per click in radius adjustment.

BENEFIT



Compressor



ROMICRON™ FINE BORING

CHALLENGE

- Piston bore \varnothing 25mm (.984").
- Tolerance range 21 μ m.
- Aluminum 15% Si.
- Machining center BT40 with external coolant.

SOLUTION

- Engineered-solution SVS00B head with straight shank clamped in hydraulic chuck.
- CPGW060204FST KD1425™.

CUTTING DATA

- vc 391 m/min (1,283 SFM).
- f 0,20 mm/rev (.008 IPR).

RESULT

- Surface finish better than Ra 2.0 μ m.
- Roundness better than 20 μ m.

BENEFIT

- More than 60% reduction in machining time.
- 80% less adjustment time needed.
- Amortization in less than two months.
- Bore tolerance range of 21 μ m easily and consistently achieved due to 1 μ m per click in radius adjustment.

Compressor



Polished flutes improving chip evacuation



Hole Finishing

PCD COUNTERSINKING PDCSCG22RLE

- Bearing hole \varnothing 12–31mm (.472–1.220").
- Tolerance range 50 μ m.
- Aluminum G-ALSi12.
- Machining center HSK40 with internal coolant.

CHALLENGE

SOLUTION

- PCD tipped, carbide-based tool with four guiding lands, flat-bottom drilling point, and internal coolant.
- Two effective cutting and chamfering teeth; KD1415™.

CUTTING DATA

- v_c 440 m/min (1,444 SFM).
- f 0,20 mm/rev (.008 IPR).

RESULT

- Surface finish Rz 1–2 μ m.
- Roundness better than 5 μ m.

BENEFIT

- Productivity increases due to combining different tools in one.
- Tool life increase versus previous solution.

Compressor



KST pre-loaded taper face contact interface



RHM MODULAR REAMING

CHALLENGE

- Piston bore \varnothing 23,5mm (1.220").
- Tolerance range 10 μ m.
- Cast iron GGG60.
- Machining center HSK63 with internal coolant.

SOLUTION

- RHM modular reamer with six cutting edges.
- KT325™ uncoated cermet.
- Standard lead geometry.
- SIF™ steerable tooling.

CUTTING DATA

- v_c 125 m/min (410 SFM).
- f 0,75 mm/rev (.030 IPR).

RESULT

- Surface finish better than Rz 4 μ m.

BENEFIT

- Higher productivity than single-edged padded reamer.

Hydraulic Valve Block



Hole Finishing

RIR™ PADDED REAMING

- Spool bore \varnothing 18,5mm (.728").
- Tolerance range 10 μ m.
- Cast iron.
- Up to 4mm varying depth of cut.
- Machining center with internal coolant.

CHALLENGE

SOLUTION

- RIR padded reamer with up to 100mm long cermet guide pads.
- Engineered solution RIR insert with modified chipformer.

CUTTING DATA

- v_c 70 m/min (230 SFM).
- f 0,125 mm/rev (.005 IPR).

RESULT

- Tool life of 400 min per double-edged insert.
- Roundness and straightness within 10 μ m.

BENEFIT

- Very stable process control and predictable performance.



Hydraulic Valve Block



Hole Finishing

RMS™ MULTIFLUTE REAMING

CHALLENGE

- Rinse slider bore Ø 9,534mm (.375").
- Tolerance range 6 µm.
- Ductile cast iron 0.7060.
- Three interrupted cuts at a reaming depth of 100mm.
- Special dimensional accuracy requirement.

SOLUTION

- RMS solid carbide reamer engineered solution.
- Special back taper configuration and support margins lands.
- KC6305™ TiAlN coated carbide.

CUTTING DATA

- vc 150 m/min (492 SFM).
- f 0,72 mm/rev (.028 IPR).

RESULT

- Tool life of 500 pieces.

BENEFIT

- Speed and feed rates are almost 30x faster resulting in higher productivity.
- Less scrap due to consistent accuracy.

Hydraulic Valve Block



Hole Finishing

PCD COUNTERSINKING PCDCSC02RLE

- Thread core hole \varnothing 24mm (.945").
- Tolerance range 21 μ m F7.
- Aluminum AISi9Cu3.
- Pre-drilled hole.
- Machining center DV40 with internal coolant.

CHALLENGE

SOLUTION

- PCD tipped, carbide-based tool with internal coolant.
- Two effective cutting and chamfering teeth.
- KD1415™.

CUTTING DATA

- vc 360–750 m/min n = 7,500 RPM.
- f 0,20 mm/rev (.008 IPR).

RESULT

- Tool life of 100,000 holes.
- Surface finish Ra 0.1 μ m.

BENEFIT

- Productivity increase due to combining two operations into one.
- Carbide base increases tool life and accuracy.



ABS Valve Block



PCD COUNTERSINKING PDCSTA02RLE

CHALLENGE

- Bearing bores \varnothing 20,99 and 24,275mm.
- Tolerance range 20 μ m.
- Aluminum AISi1.
- Pre-casted hole with 0,15mm depth of cut.
- Machining center HSK63A with internal coolant.

SOLUTION

- PCD tipped, steel-based tool with SIF™ steerable interface and internal coolant.
- Two effective cutting and chamfering teeth.
- KD1415™.

CUTTING DATA

- vc 300 m/min (984 SFM).
- f 0,35 mm/rev (.014 IPR).

RESULT

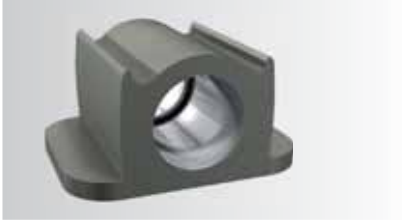
- Tool life of 150,000 components.
- Surface finish Ra 0.4–0.6 μ m.

BENEFIT

- Very stable process control and predictable performance.
- Very favorable chip creation.

Hole Finishing

Bearing Seat



KST pre-loaded taper face contact interface

Hole Finishing

RHM™ MODULAR REAMING

- Reaming Ø 35mm (1.378").
- Tolerance range 20 µm.
- Carbon steel, annealed, long-chipping.
- Blind hole limiting chip evacuation.
- Machining center with internal coolant.

CHALLENGE

SOLUTION

- RHM modular reamer with eight cutting edges.
- KT325™ uncoated cermet.
- Standard lead geometry.
- Short engineered-solution axial clamping tool body.

CUTTING DATA

- v_c 120 m/min (394 SFM).
- f 1,18 mm/rev (.046 IPR).

RESULT

- Tool life of 145,000 holes.
- Surface finish better than Rz 6.3 µm.

BENEFIT

- Predictable tool life as only 2 µm diameter deviation after 10,000 holes.



Bearing Seat



RIQ single adjustment screw setup



FB easy to setup fine-boring cartridges



RIQ™ QUATTRO CUT™ PADDED REAMING

- Reaming Ø 47mm (1.850").
- Tolerance range 19 µm N6.
- Aluminum AISi9Cu3.
- Machine four different diameters, two spot faces, and four different chamfers with one tool.

CHALLENGE

- RIQ padded reamer with full-face PCD KD1415™ insert having four cutting edges.
- SIF™ steerable interface between reaming and fine boring section.

SOLUTION

- vc 236 m/min (774 SFM).
- f 0,08 mm/rev (.003 IPR).

CUTTING DATA

- Surface finish better than Rz 16 µm.

RESULT

- No insert back taper adjustment needed.
- Less operations increase productivity.
- Higher accuracy than multiple operations.
- Full-face PCD inserts reduce cost per hole.

BENEFIT

FB CARTRIDGE FINEBORING

- Reaming Ø 144mm (5.669").
- Tolerance range 40 µm H7.
- Aluminum AISi9Cu3.
- Machine two different diameters.

CHALLENGE

- Standard FB fine-boring cartridges with almost back lash free fine adjustment.
- CCGW060204 KD1415™.

SOLUTION

- vc 723 m/min (2,372 SFM).
- f 0,08 mm/rev (.003 IPR).

CUTTING DATA

- Surface finish better than Rz 16 µm.

RESULT

- Radial adjustment does not influence axial adjustment of inserts resulting in faster setup.
- Productivity increase with less operations.
- More accurate than previous solution.

BENEFIT

Heat Exchanger Plates



KST pre-loaded taper face contact interface

Hole Finishing

RHM™ MODULAR REAMING

- Tube holes Ø 25,25mm (.994").
- Tolerance range 21 µm H7.
- Stainless Steel 304L.
- Machining center with external coolant.

CHALLENGE

- Special RHM head with six cutting edges.
- KC6305™ TiAlN coated carbide.
- Standard tool body with SIF™ steerable backend.

SOLUTION

- vc 36 m/min (118 SFM).
- f 0,79 mm/rev (.031 IPR).

CUTTING DATA

- Tool life of 167 m.

RESULT

- Higher productivity as a result of a 50% higher feed rate and 2x speed.
- 200% more tool life than previous competitive solution.

BENEFIT

RHM™ MODULAR REAMING

- Tube holes Ø 25,25mm (.994").
- Tolerance range 100 µm.
- Alloy steel, long-chipping.
- Machining center with internal coolant.

CHALLENGE

- Special RHM head with six cutting edges.
- KT6215™ TiAlN coated cermet.
- Standard 5xD body clamped into hydraulic chuck.
- KSEM HPGM used for drilling into solid.

SOLUTION

- vc 90 m/min (295 SFM).
- f 0,48 mm/rev (.019 IPR).

CUTTING DATA

- After more than 30 minutes only minor wear is visible.

RESULT

- Reduced machining time to less than 60 min per 180 holes.
- Predictable tool life as only 2 µm diameter deviation after 30 minutes.

BENEFIT

Heat Exchanger Plates



KST pre-loaded taper face contact interface

Hole Finishing

RHM™ MODULAR REAMING

- Tube holes \varnothing 25,25mm (.994").
- Tolerance range 21 μ m H7.
- Steel, annealed, long-chipping.
- Replace HSS shot core drilling.
- Machining center with internal coolant.

CHALLENGE

- Special RHM head with six cutting edges.
- KT325™ uncoated cermet.
- Standard 5 x D body clamped into hydraulic chuck.

SOLUTION

- vc 84 m/min (276 SFM).
- f 0,49 mm/rev (.019 IPR).

CUTTING DATA

- Tool life of 189 m.

RESULT

- 10x faster when compared to previous competitive core drilling solution.
- 16x higher tool life.

BENEFIT

RHM™ MODULAR REAMING

- Tube holes \varnothing 32mm (1.260").
- Tolerance range 25 μ m H7.
- Low alloy steel, annealed.
- Interrupted cut.
- Machining center with internal coolant.

CHALLENGE

- Standard RHM head with eight cutting edges.
- KC6305™ TiAlN coated carbide.
- Standard 5 x D body clamped into hydraulic chuck.
- KSEM HPGM used for drilling into solid.

SOLUTION

- vc 60 m/min (197 SFM).
- f 1,12 mm/rev (.044 IPR).

CUTTING DATA

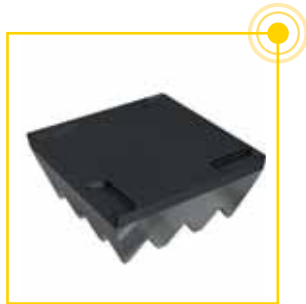
- Tool life of 624 holes.

RESULT

- Almost 29% productivity increase.
- Close to 25% overall cost reduction due to higher tool life and higher cutting data.

BENEFIT

Pump Housing



Full-face PCD insert with chipformer geometry



Hole Finishing

RIQ™ QUATTRO CUT™ PADDED REAMING

CHALLENGE

- Piston bore Ø 18,5mm (.728").
- Tolerance range 21 µm H7.
- Aluminum.
- Heavy interrupted cut and surface finish Rz 6.3.
- Machining center with internal coolant.

SOLUTION

- RIQ padded reamer with helical chip flute and helical solid carbide guide pad.
- Full-face KD1415™ insert having four cutting edges.
- Positive wiper insert geometry.

CUTTING DATA

- vc 230 m/min (755 SFM).
- f 0,15 mm/rev (.006 IPR).

RESULT

- No chip evacuation issues.
- No burr, marks, or scratches at entrance or exit of interruptions.

BENEFIT

- No insert back taper adjustment needed.
- Half cycle time compared to previous competitive tooling.

Hydraulic Pump



RIR™ PADDED REAMING

CHALLENGE

- Piston bore \varnothing 9,365mm (.369").
- Tolerance range 10 μ m.
- Ductile cast iron GGG40.
- Machining center with internal coolant.

SOLUTION

- RIR padded reamer with cermet guide pads.
- R901EGS06F AlTiN coated carbide.

CUTTING DATA

- v_c 53 m/min (174 SFM).
- f 0,043 mm/rev (.002 IPR).

RESULT

- 294 bores per double-edged insert.
- Surface finish Ra 0.8 μ m.

BENEFIT

- 200% tool life increase.
- More than 10% reduction in cycle time.
- Consistent quality and stable process due to better chip formation.
- Tolerance achieved was a 50% improvement compared to the previous competitive solution.

Valve Housing



Hole Finishing

ROMICRON™ FINE BORING

- Various bore \varnothing 170–480mm (6.7–18.9").
- Tolerance range 75 μ m.
- Cast iron GG25.
- Automated wear compensation at interrupted cut.
- Machining center HSK100 with internal coolant.

CHALLENGE

- Semi-standard SVU120 CLB head with engineered-solution diameter extender and automatic wear compensation with CLB.
- CPGW09T308S01015C KB1630™.

SOLUTION

- vc 800 m/min (2,625 SFM).
- f 0,12 mm/rev (.005 IPR).

CUTTING DATA

- Tool life of 1,200 minutes per insert.
- Surface finish better than Rz 16 μ m.

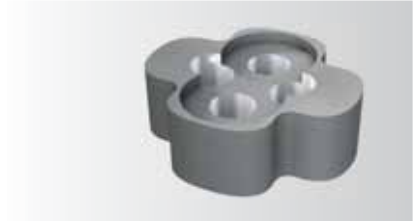
RESULT

- More than 30% reduction in manufacturing lead time.
- Third shift and weekend without operators.
- 1 μ m per click in radius adjustment executed by machine.

BENEFIT



Pump Housing



Hole Finishing

ROMICRON™ FINE BORING

CHALLENGE

- Bore Ø 38,1mm (1.500").
- Tolerance range 18 µm.
- Cast iron.
- Interrupted cut at figure eight hole.

SOLUTION

- Romicon KM50SVS0B103M standard head.
- CPGW2151S0415C KB1645™.

CUTTING DATA

- vc 197 m/min (646 SFM).
- f 0,05 mm/rev (.002 IPR).

RESULT

- Tool life of 450 workpieces.
- Surface finish better than Ra 32 µm.
- Roundness better than 8 µm.

BENEFIT

- Secure finishing process with no oversized bores.
- Less adjustment effort.
- Amortization in less than four months.
- Bore tolerance range of 18 µm easily and consistently achieved due to 1 µm per click in radius adjustment.

Wind Energy Housing



Multiple boring heads based on KM63™ shank

Hole Finishing

KM™ FINE BORING

- Bearing seat Ø 2.700mm (106.3").
- Tolerance range 210 µm H7.
- Cast iron GGG40.
- Pull machining – spindle needs to adapt bridge inside workpiece.

CHALLENGE

SOLUTION

- Welded space frame bridge with KM coupling to adapt cutting units.
- One base bridge to adapt roughing, semi-finish, and fine finish head.

CUTTING DATA

- vc 240 m/min (787 SFM).
- f 0,28 mm/rev (.011 IPR).

RESULT

- Customer proprietary information.

BENEFIT

- Machining in one workpiece results in a productivity increase.
- Investment saving as only one base bridge needed.
- Ease of use due to KM coupling for fast and accurate cutting unit change.



Wind Energy Housing



Multiple boring heads based on KM63™ shank



KM™ FINE BORING

CHALLENGE

- Bearing seat Ø 3000mm (118.1").
- Tolerance range 210 µm H7.
- Ductile cast iron GGG40.
- Machining center without coolant.
- Tolerance range 210 µm H7.

SOLUTION

- Welded space frame bridge with KM coupling to adapt cutting units.
- One base bridge to adapt roughing, semi-finish, and fine finish head.

CUTTING DATA

- vc 240 m/min (787 SFM).
- f 0,28 mm/rev (.011 IPR).

RESULT

- Customer proprietary information.

BENEFIT

- Investment saving as only one base bridge and KM cutting units are used for diameter 2.700mm and 3.000mm.
- Ease of use due to KM coupling for fast and accurate cutting unit change.

Wind Energy Housing



1 μm per click in radius adjustment

Hole Finishing

ROMICRON™ FINE BORING

- Flange \varnothing 1260–1400mm (49.6–55.1").
- Tolerance range 125 μm H7.
- Cast iron GGG40.
- One base bridge for multiple diameters.
- Machining center without coolant.

CHALLENGE

SOLUTION

- Romicon standard modular MF40 element with engineered-solution aluminum bridge.
- CPGT060204/08HP KC5410™.

CUTTING DATA

- v_c 200 m/min (650 SFM).
- f 0,12 mm/rev (.005 IPR).

RESULT

- Tool life of 73 min.

BENEFIT

- Investment saving as only one base bridge needed.
- Use of standard off the shelf Romicon tool.
- Ease of use due to Romicon.



Synchronous Joint



Balanced by design



ROMICRON™ FINE BORING

CHALLENGE

- Pin machining \varnothing 13mm (.512").
- Tolerance range 6 μ m.
- Steel 42CrMo4 (4140).
- Machining center with internal coolant.

SOLUTION

- Romicon standard HSK63ASVUBB1095MCLB head with engineered solution pin boring bar.
- TCMT110202FP KTP10™.

CUTTING DATA

- v_c 160 m/min (525 SFM).
- f 0,1 mm/rev (.004 IPR).

RESULT

- Tool life of 300–450 components per insert.
- Surface finish Ra 0.3 μ m.
- Cpk value \geq 1,33.

BENEFIT

- Use of standard off-the-shelf Romicon tooling.
- Bore tolerance of 6 μ m consistently achieved due to 1 μ m per click in radius adjustment.

Hole Finishing

Landing Gear



Feed out slide

Hole Finishing

MOTION TOOLING

- Bottle boring \varnothing 65–85,3mm (2.559–3.358").
- Steel 34CrNiMo6; 4340M.
- Generate complex rotationally symmetric shape inside pre-machined workpiece.
- Custom machining center with internal coolant.

CHALLENGE

SOLUTION

- Motion tool with two slides activated by drawbar.
- Hole shape generated while tool is retracted.
- Engineered-solution insert to improve chip formation.

CUTTING DATA

- v_c 31 m/min (102 SFM).
- f 0,20 mm/rev (.008 IPR).

RESULT

- Customer proprietary information.

BENEFIT

- Time savings compared to previous boring bar.
- Bottle boring \varnothing 65–85,3mm (2.559–3.358").
- Steel 34CrNiMo6; 4340M.
- Generate complex rotationally symmetric shape.





Ream to the Extreme

The RHM™ Modular Reaming System offers performance levels commonly achieved with solid carbide reaming tools. With a unique, preloaded KST coupling, it is best suited to ream IT6 and IT7 high-quality holes in steel, stainless steel, and cast irons.

RHM offers you:

- A market-leading runout accuracy.
- A strong proprietary coupling that enables higher feed rates.
- Latest technology carbide and cermet grades for high cutting speeds and extended tool life.

Experience the advantages at your Authorized Kennametal Distributor or at www.kennametal.com.

www.kennametal.com.





RMS™ Multiflute Reaming Tools

RMS™ Multiflute Reaming Tools achieve highest metal removal rates from diameter 5–14mm with no customization. All standard reamers are ground to an ISO H7 tolerance class hole to address most common applications. Specific coatings and lead configurations enable high-speed machining of steel, stainless steel, cast iron, and non-ferrous materials at accelerated speeds.

Primary Application

Use standard SIF™ Steerable Hydraulic Chucks or SIF Adapters for easy compensation of radial runout and angular inaccuracies of the spindle to achieve the highest possible hole straightness and surface quality.

Features and Benefits

Higher Productivity and Profitability

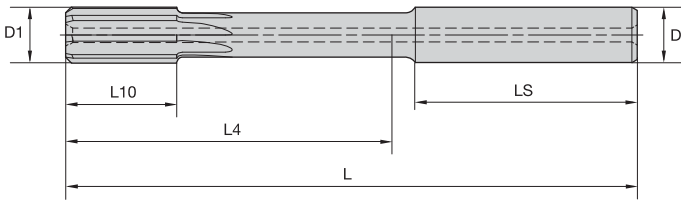
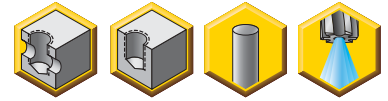
- Longer tool life with increased hole and surface quality due to lapped ground leads.
- Highest metal removal rate at higher speeds and feeds due to reaming-specific grades and substrates.
- Improved straightness and cylindrical form compared to competitive tools and reduced vibration tendency due to unequal flutes.
- All RMS reamers offer internal coolant supply.

Customization

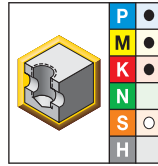
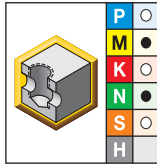
- Diameters .055–.557" (1,40–14,15mm) available with and without internal coolant in .00004" (0,001mm) steps.
- Intermediate diameters of standard program available as Simple Specials with short delivery time.
- Solid cermet reaming tools and tooling for heat-resistant materials are available on request.



- For hole tolerance H7.
- Intermediate sizes ground to achieve IT7 hole tolerance class available.
- Starting with Ø 10mm (.393") in IT6 hole tolerance available.



■ RMS with Straight Flutes and Internal Coolant



- first choice
- alternate choice

		D1		D	L	L4		L10	LS	Z
		mm	in			mm	in			
K605	KC6305									
RMS05000H7SF	RMS05000H7SF	5,00	.197	6,00	74,0	18,0	.709	12,0	36,0	4
RMS05500H7SF	RMS05500H7SF	5,50	.217	6,00	74,0	18,0	.709	12,0	36,0	4
RMS06000H7SF	RMS06000H7SF	6,00	.236	6,00	74,0	18,0	.709	12,0	36,0	4
RMS06500H7SF	RMS06500H7SF	6,50	.256	8,00	91,0	35,0	1.378	16,0	36,0	4
RMS07000H7SF	RMS07000H7SF	7,00	.276	8,00	91,0	35,0	1.378	16,0	36,0	4
RMS08000H7SF	RMS08000H7SF	8,00	.315	8,00	91,0	35,0	1.378	16,0	36,0	6
RMS09000H7SF	RMS09000H7SF	9,00	.354	10,00	103,0	43,0	1.693	20,0	40,0	6
RMS10000H7SF	RMS10000H7SF	10,00	.394	10,00	103,0	43,0	1.693	20,0	40,0	6
RMS11000H7SF	RMS11000H7SF	11,00	.433	12,00	118,0	53,0	2.087	24,0	45,0	6
RMS12000H7SF	RMS12000H7SF	12,00	.472	12,00	118,0	53,0	2.087	24,0	45,0	6
RMS13000H7SF	RMS13000H7SF	13,00	.512	14,00	132,0	67,0	2.638	28,0	45,0	6
RMS14000H7SF	RMS14000H7SF	14,00	.551	14,00	132,0	67,0	2.638	28,0	45,0	6

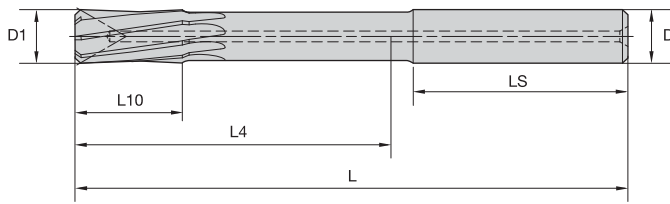
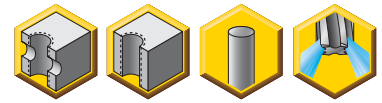
Hole Finishing

Dimensions for Engineered-Solution Reamers

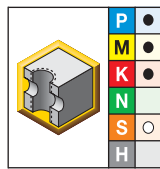
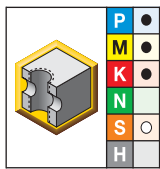
D1 min		D1 max		D	L	L4	L10	LS	Z	
mm	in	mm	in							
4,16	0.1638	4,79	0.1886	6	74	32	1.2598	10	36	4
4,80	0.1890	5,79	0.2280	6	74	32	1.2598	12	36	4
5,80	0.2283	6,15	0.2421	6	74	33	1.2992	12	36	4
6,16	0.2425	7,15	0.2815	8	91	49	1.9291	16	36	4
7,16	0.2819	7,69	0.3028	8	91	49	1.9291	16	36	6
7,70	0.3031	8,15	0.3209	8	91	50	1.9685	16	36	6
8,16	0.3213	9,59	0.3776	10	103	57	2.2441	20	40	6
9,60	0.3780	10,15	0.3996	10	103	58	2.2835	20	40	6
10,16	0.4000	11,59	0.4563	12	118	67	2.6378	24	45	6
11,60	0.4567	12,15	0.4783	12	118	68	2.6772	24	45	6
12,16	0.4787	14,15	0.5571	14	118	81	3.1890	28	45	6

NOTE: The above dimensions are used when ordering engineered-solution reamers on this page unless otherwise specified.

- For hole tolerance H7.
- Intermediate sizes ground to achieve IT7 hole tolerance class available.
- Starting with Ø 10mm (.393") in IT6 hole tolerance available.



■ RMS with Helical Flutes and Internal Coolant



- first choice
- alternate choice

Hole Finishing

		D1		L		L4		L10	LS	Z
		mm	in	mm	in	mm	in	mm	mm	
K605	RMS05000H7HF	5,00	.197	6,00	74,0	18,0	.709	12,0	36,0	4
	RMS05500H7HF	5,50	.217	6,00	74,0	18,0	.709	12,0	36,0	4
	RMS06000H7HF	6,00	.236	6,00	74,0	18,0	.709	12,0	36,0	4
	RMS06500H7HF	6,50	.256	8,00	91,0	35,0	1.378	16,0	36,0	4
	RMS07000H7HF	7,00	.276	8,00	91,0	35,0	1.378	16,0	36,0	4
	RMS08000H7HF	8,00	.315	8,00	91,0	35,0	1.378	16,0	36,0	6
	RMS09000H7HF	9,00	.354	10,00	103,0	43,0	1.693	20,0	40,0	6
	RMS10000H7HF	10,00	.394	10,00	103,0	43,0	1.693	20,0	40,0	6
	RMS11000H7HF	11,00	.433	12,00	118,0	53,0	2.087	24,0	45,0	6
	RMS12000H7HF	12,00	.472	12,00	118,0	53,0	2.087	24,0	45,0	6
	RMS13000H7HF	13,00	.512	14,00	132,0	67,0	2.638	28,0	45,0	6
	RMS14000H7HF	14,00	.551	14,00	132,0	67,0	2.638	28,0	45,0	6
KC6305	RMS05000H7HF	5,00	.197	6,00	74,0	18,0	.709	12,0	36,0	4
	RMS05500H7HF	5,50	.217	6,00	74,0	18,0	.709	12,0	36,0	4
	RMS06000H7HF	6,00	.236	6,00	74,0	18,0	.709	12,0	36,0	4
	RMS06500H7HF	6,50	.256	8,00	91,0	35,0	1.378	16,0	36,0	4
	RMS07000H7HF	7,00	.276	8,00	91,0	35,0	1.378	16,0	36,0	4
	RMS08000H7HF	8,00	.315	8,00	91,0	35,0	1.378	16,0	36,0	6
	RMS09000H7HF	9,00	.354	10,00	103,0	43,0	1.693	20,0	40,0	6
	RMS10000H7HF	10,00	.394	10,00	103,0	43,0	1.693	20,0	40,0	6
	RMS11000H7HF	11,00	.433	12,00	118,0	53,0	2.087	24,0	45,0	6
	RMS12000H7HF	12,00	.472	12,00	118,0	53,0	2.087	24,0	45,0	6
	RMS13000H7HF	13,00	.512	14,00	132,0	67,0	2.638	28,0	45,0	6
	RMS14000H7HF	14,00	.551	14,00	132,0	67,0	2.638	28,0	45,0	6

Dimensions for Engineered-Solution Reamers

D1 min		D1 max		D	L	L4	L10	LS	Z	
mm	in	mm	in							
4,16	0.1638	4,79	0.1886	6	74	32	1.2598	10	36	4
4,80	0.1890	5,79	0.2280	6	74	32	1.2598	12	36	4
5,80	0.2283	6,15	0.2421	6	74	33	1.2992	12	36	4
6,16	0.2425	7,15	0.2815	8	91	49	1.9291	16	36	4
7,16	0.2819	7,69	0.3028	8	91	49	1.9291	16	36	6
7,70	0.3031	8,15	0.3209	8	91	50	1.9685	16	36	6
8,16	0.3213	9,59	0.3776	10	103	57	2.2441	20	40	6
9,60	0.3780	10,15	0.3996	10	103	58	2.2835	20	40	6
10,16	0.4000	11,59	0.4563	12	118	67	2.6378	24	45	6
11,60	0.4567	12,15	0.4783	12	118	68	2.6772	24	45	6
12,16	0.4787	14,15	0.5571	14	118	81	3.1890	28	45	6

NOTE: The above dimensions are used when ordering engineered-solution reamers on this page unless otherwise specified.

■ RMS™

Material Group		K605			KC6305			Metric							
		Cutting Speed – vc			Cutting Speed – vc			Recommended Feed Rate per Tooth							
		Range – m/min			Range – m/min			Tool Diameter (mm)	4,16-7,15		7,16-9,59		9,60-14,00		
		min	Starting Value	max	min	Starting Value	max		Feed/Tooth	min	max	min	max	min	max
P	1	40	60	70	90	120	155	mm/z	0,05	0,10	0,05	0,12	0,05	0,15	
	2	40	60	70	90	120	155	mm/z	0,05	0,10	0,05	0,12	0,05	0,15	
	3	35	50	60	75	100	130	mm/z	0,05	0,10	0,05	0,12	0,05	0,15	
	4	25	40	45	60	80	105	mm/z	0,05	0,10	0,05	0,12	0,05	0,15	
	4	15	20	25	30	40	55	mm/z	0,04	0,08	0,04	0,10	0,04	0,12	
	6	15	20	25	30	40	55	mm/z	0,04	0,08	0,04	0,10	0,04	0,12	
M	1	8	10	15	15	20	28	mm/z	0,04	0,08	0,04	0,09	0,04	0,10	
	2	8	10	15	15	20	28	mm/z	0,04	0,08	0,04	0,09	0,04	0,10	
	3	8	10	15	15	20	28	mm/z	0,04	0,08	0,04	0,09	0,04	0,10	
K	1	35	50	60	75	100	130	mm/z	0,05	0,16	0,05	0,18	0,05	0,20	
	2	25	40	50	60	90	110	mm/z	0,05	0,14	0,05	0,16	0,05	0,18	
	3	20	30	45	60	80	105	mm/z	0,05	0,12	0,05	0,14	0,05	0,16	
N	1	110	150	195	–	–	–	mm/z	0,06	0,16	0,06	0,18	0,06	0,20	
	2	110	150	195	–	–	–	mm/z	0,06	0,16	0,06	0,18	0,06	0,20	
	3	110	150	195	–	–	–	mm/z	0,06	0,16	0,06	0,18	0,06	0,20	
	4	110	150	195	–	–	–	mm/z	0,06	0,16	0,06	0,18	0,06	0,20	
	5	105	140	180	–	–	–	mm/z	0,06	0,16	0,06	0,18	0,06	0,20	
S	1	8	10	15	15	20	28	mm/z	0,04	0,08	0,04	0,10	0,04	0,12	
	2	8	10	15	15	20	28	mm/z	0,04	0,08	0,04	0,10	0,04	0,12	
	3	15	20	30	20	30	40	mm/z	0,05	0,10	0,05	0,12	0,05	0,15	
	4	15	20	30	20	30	40	mm/z	0,05	0,10	0,05	0,12	0,05	0,15	



Material Group		K605			KC6305			Inch							
		Cutting Speed – vc			Cutting Speed – vc			Recommended Feed Rate per Tooth							
		Range – SFM			Range – SFM			Tool Diameter (inch)	.164-.281		.282-.378		.378-.551		
		min	Starting Value	max	min	Starting Value	max		Feed/Tooth	min	max	min	max	min	max
P	1	131	197	230	295	394	508	inch/z	.002	.004	.002	.005	.002	.006	
	2	131	197	230	295	394	508	inch/z	.002	.004	.002	.005	.002	.006	
	3	115	164	197	246	328	426	inch/z	.002	.004	.002	.005	.002	.006	
	4	82	131	148	197	262	344	inch/z	.002	.004	.002	.005	.002	.006	
	4	49	66	82	98	131	180	inch/z	.002	.003	.002	.004	.002	.005	
	6	49	66	82	98	131	180	inch/z	.002	.003	.002	.004	.002	.005	
M	1	26	33	49	49	66	92	inch/z	.002	.003	.002	.004	.002	.004	
	2	26	33	49	49	66	92	inch/z	.002	.003	.002	.004	.002	.004	
	3	26	33	49	49	66	92	inch/z	.002	.003	.002	.004	.002	.004	
K	1	115	164	197	246	328	426	inch/z	.002	.006	.002	.007	.002	.008	
	2	82	131	164	197	295	361	inch/z	.002	.006	.002	.006	.002	.007	
	3	66	98	148	197	262	344	inch/z	.002	.005	.002	.006	.002	.006	
N	1	361	492	640	–	–	–	inch/z	.002	.006	.002	.007	.002	.008	
	2	361	492	640	–	–	–	inch/z	.002	.006	.002	.007	.002	.008	
	3	361	492	640	–	–	–	inch/z	.002	.006	.002	.007	.002	.008	
	4	361	492	640	–	–	–	inch/z	.002	.006	.002	.007	.002	.008	
	5	344	459	590	–	–	–	inch/z	.002	.006	.002	.007	.002	.008	
S	1	26	33	49	49	66	92	inch/z	.002	.003	.002	.004	.002	.005	
	2	26	33	49	50	66	92	inch/z	.002	.003	.002	.004	.002	.005	
	3	49	66	98	66	98	131	inch/z	.002	.004	.002	.005	.002	.006	
	4	49	66	98	66	98	131	inch/z	.002	.004	.002	.005	.002	.006	

RMB™ Multiflute Reaming

The RMB Multiflute Reaming System achieves solid carbide and solid cermet metal removal rates from 14–20mm with no customization required. All standard reamers are ground to an ISO H7 tolerance class hole to address most applications, giving you an economical solution for large diameter sizes compared to solid carbide reamers. Specific coatings and lead configurations enable high-speed machining of steel, stainless steel, cast iron, and non-ferrous materials at accelerated speeds.

Primary Application

Use SIF™ Steerable Hydraulic Chucks or SIF Adapters for easy compensation of radial runout and angular inaccuracies of the spindle to achieve the highest possible hole straightness and surface quality.

Features and Benefits

Higher Productivity and Profitability

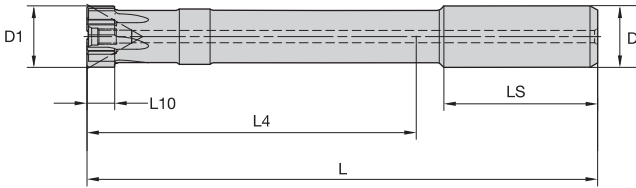
- Longer tool life with increased hole and surface quality due to lapped ground leads.
- Highest metal removal rate at higher speeds and feeds due to reaming specific grades and substrates.
- Improved straightness and cylindrical form compared to competitive tools and reduced vibration tendency due to unequal flutes.
- Adjustment screw at straight-fluted RMB reamers to change internal coolant supply from axial to radial.

Customization

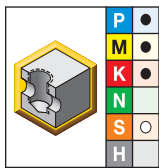
- Diameters up to 1.968" (50mm) available with and without internal coolant in .00004" (0,001mm) steps.
- Intermediate diameters of standard program available as Simple Specials with short delivery time.
- RMB tooling for machining heat-resistant materials is available on request.



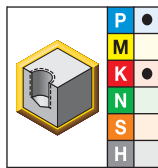
- For hole tolerance H7.
- Intermediate sizes ground to achieve IT6 or IT7 hole tolerance class available.
- Adjustment screw to change internal coolant supply from axial to radial.



RMB with Straight Flutes and Internal Coolant



KC6305



KT6215

- first choice
- alternate choice

		D1		D	L	L4		L10	LS	Z
		mm	in			mm	in			
RMB14000H7SF	RMB14000H7SF	14,00	.551	16,00	145,0	76,0	2.992	8,0	49,0	6
RMB15000H7SF	RMB15000H7SF	15,00	.591	16,00	145,0	76,0	2.992	8,0	49,0	6
RMB16000H7SF	RMB16000H7SF	16,00	.630	20,00	157,0	86,0	3.386	8,0	51,0	6
RMB17000H7SF	RMB17000H7SF	17,00	.669	20,00	157,0	86,0	3.386	10,0	51,0	6
RMB18000H7SF	RMB18000H7SF	18,00	.709	20,00	171,0	100,0	3.937	10,0	51,0	6
RMB19000H7SF	RMB19000H7SF	19,00	.748	20,00	171,0	100,0	3.937	10,0	51,0	6
RMB20000H7SF	RMB20000H7SF	20,00	.787	20,00	200,0	129,0	5.079	10,0	51,0	6

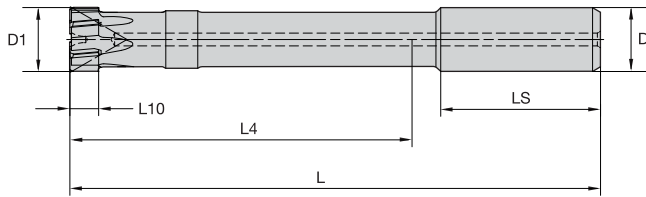
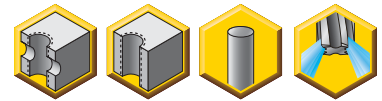
NOTE: Uncoated carbide grade K605™ and uncoated cermet grade KT325™ are available on request.

Dimensions for Engineered-Solution Reamers

D1 min		D1 max		D	L	L4		L10	LS	Z
mm	in	mm	in	mm	mm	mm	in	mm	mm	
14,00	0.5512	15,99	0.6295	16,00	145	97	3.8189	9	48	6
16,00	0.6299	17,99	0.7083	20,00	157	107	4.2126	9	50	6
18,00	0.7087	19,99	0.7870	20,00	171	121	4.7638	9	50	6
20,00	0.7874	21,99	0.8657	20,00	200	150	5.9055	9	50	6
22,00	0.8661	25,99	1.0232	20,00	210	160	6.2992	11	50	6
26,00	1.0236	29,99	1.1807	25,00	240	184	7.2441	11	56	8
30,00	1.1811	32,00	1.2598	25,00	270	214	8.4252	11	56	8

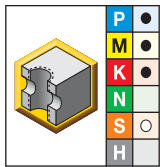
NOTE: The above dimensions are used when ordering engineered-solution reamers on this page unless otherwise specified.

- For hole tolerance H7.
- Intermediate sizes ground to achieve IT6 or IT7 hole tolerance class available.

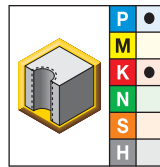


RMB with Helical Flutes and Internal Coolant

Hole Finishing



KC6305



KT6215

- first choice
- alternate choice

	D1		D	L	L4		L10	LS	Z
	mm	in			mm	in			
RMB14000H7HF	14,00	.551	16,00	145,0	76,0	2.992	8,0	49,0	6
RMB15000H7HF	15,00	.591	16,00	145,0	76,0	2.992	8,0	49,0	6
RMB16000H7HF	16,00	.630	20,00	157,0	86,0	3.386	8,0	51,0	6
RMB17000H7HF	17,00	.669	20,00	157,0	86,0	3.386	10,0	51,0	6
RMB18000H7HF	18,00	.709	20,00	171,0	100,0	3.937	10,0	51,0	6
RMB19000H7HF	19,00	.748	20,00	171,0	100,0	3.937	10,0	51,0	6
RMB20000H7HF	20,00	.787	20,00	200,0	129,0	5.079	10,0	51,0	6

NOTE: Uncoated carbide grade K605™ and uncoated cermet grade KT325™ are available on request.

Dimensions for Engineered-Solution Reamers

D1 min		D1 max		D	L	L4		L10	LS	Z
mm	in	mm	in			mm	in				mm	mm
14,00	0.5512	15,99	0.6295	16,00	145	97	3.8189	9	48	6
16,00	0.6299	17,99	0.7083	20,00	157	107	4.2126	9	50	6
18,00	0.7087	19,99	0.7870	20,00	171	121	4.7638	9	50	6
20,00	0.7874	21,99	0.8657	20,00	200	150	5.9055	9	50	6
22,00	0.8661	25,99	1.0232	20,00	210	160	6.2992	11	50	6
26,00	1.0236	29,99	1.1807	25,00	240	184	7.2441	11	56	8
30,00	1.1811	32,00	1.2598	25,00	270	214	8.4252	11	56	8

NOTE: The above dimensions are used when ordering engineered-solution reamers on this page unless otherwise specified.

RMB™

Material Group		KT325			KT6215			K605			KC6305			Metric				
		Cutting Speed – vc			Cutting Speed – vc			Cutting Speed – vc			Cutting Speed – vc			Recommended Feed Rate per Tooth				
		Range – m/min			Range – m/min			Range – m/min			Range – m/min			Tool Diameter (mm)	14,00-19,99		20,00-32,00	
		min	Starting Value	max	min	Starting Value	max	min	Starting Value	max	min	Starting Value	max	Feed/Tooth	min	max	min	max
P	1	150	180	210	180	210	240	40	60	70	90	120	155	mm/z	0,10	0,22	0,10	0,25
	2	150	180	210	180	210	240	40	60	70	90	120	155	mm/z	0,10	0,22	0,10	0,25
	3	130	160	180	150	180	210	30	40	50	75	100	130	mm/z	0,10	0,22	0,10	0,25
	4	100	130	150	120	150	170	25	40	45	50	80	105	mm/z	0,10	0,22	0,10	0,25
	4	80	100	120	100	130	150	10	20	30	30	40	55	mm/z	0,08	0,2	0,08	0,22
	6	80	100	120	100	130	150	10	20	30	30	40	55	mm/z	0,08	0,2	0,08	0,22
M	1	–	–	–	–	–	–	8	10	15	15	20	28	mm/z	0,08	0,18	0,08	0,2
	2	–	–	–	–	–	–	8	10	15	15	20	28	mm/z	0,08	0,18	0,08	0,2
	3	–	–	–	–	–	–	8	10	15	15	20	28	mm/z	0,08	0,18	0,08	0,2
K	1	150	180	200	180	210	240	30	50	60	80	110	130	mm/z	0,10	0,22	0,10	0,25
	2	130	160	180	150	180	210	25	40	45	65	90	110	mm/z	0,10	0,22	0,10	0,25
	3	100	130	160	120	150	170	20	30	40	50	70	90	mm/z	0,10	0,2	0,10	0,22
N	1	–	–	–	–	–	–	110	150	195	–	–	–	mm/z	0,10	0,30	0,10	0,30
	2	–	–	–	–	–	–	110	150	195	–	–	–	mm/z	0,10	0,30	0,10	0,30
	3	–	–	–	–	–	–	110	150	195	–	–	–	mm/z	0,10	0,30	0,10	0,30
	4	–	–	–	–	–	–	110	150	195	–	–	–	mm/z	0,10	0,30	0,10	0,30
	5	–	–	–	–	–	–	105	140	180	–	–	–	mm/z	0,10	0,30	0,10	0,30
S	1	–	–	–	–	–	–	8	10	15	15	20	28	mm/z	0,10	0,18	0,10	0,20
	2	–	–	–	–	–	–	8	10	15	15	20	28	mm/z	0,10	0,18	0,10	0,20
	3	–	–	–	–	–	–	15	20	30	20	30	40	mm/z	0,10	0,20	0,10	0,20
	4	–	–	–	–	–	–	15	20	30	20	30	40	mm/z	0,10	0,20	0,10	0,20



Material Group		KT325			KT6215			K605			KC6305			Inch				
		Cutting Speed – vc			Cutting Speed – vc			Cutting Speed – vc			Cutting Speed – vc			Recommended Feed Rate per Tooth				
		Range – SFM			Range – SFM			Range – SFM			Range – SFM			Tool Diameter (inch)	.551-.787		.787-1.260	
		min	Starting Value	max	min	Starting Value	max	min	Starting Value	max	min	Starting Value	max	Feed/Tooth	min	max	min	max
P	1	492	590	689	590	689	787	131	197	230	295	394	508	inch/z	.004	.009	.004	.010
	2	492	590	689	590	689	787	131	197	230	295	394	508	inch/z	.004	.009	.004	.010
	3	426	525	590	492	590	689	98	131	164	246	328	426	inch/z	.004	.009	.004	.010
	4	328	426	492	394	492	558	82	131	148	164	262	344	inch/z	.004	.009	.004	.010
	4	262	328	394	328	426	492	33	66	98	98	131	180	inch/z	.003	.008	.003	.009
	6	262	328	394	328	426	492	33	66	98	98	131	180	inch/z	.003	.008	.003	.009
M	1	–	–	–	–	–	–	26	33	49	49	66	92	inch/z	.003	.007	.003	.008
	2	–	–	–	–	–	–	26	33	49	49	66	92	inch/z	.003	.007	.003	.008
	3	–	–	–	–	–	–	26	33	49	49	66	92	inch/z	.003	.007	.003	.008
K	1	492	590	656	590	689	787	98	164	197	262	361	426	inch/z	.004	.009	.004	.010
	2	426	525	590	492	590	689	82	131	148	213	295	361	inch/z	.004	.009	.004	.010
	3	328	426	525	394	492	558	66	98	131	164	230	295	inch/z	.004	.008	.004	.009
N	1	–	–	–	–	–	–	361	492	640	–	–	–	inch/z	.004	.012	.004	.012
	2	–	–	–	–	–	–	361	492	640	–	–	–	inch/z	.004	.012	.004	.012
	3	–	–	–	–	–	–	361	492	640	–	–	–	inch/z	.004	.012	.004	.012
	4	–	–	–	–	–	–	361	492	640	–	–	–	inch/z	.004	.012	.004	.012
	5	–	–	–	–	–	–	344	459	590	–	–	–	inch/z	.004	.012	.004	.012
S	1	–	–	–	–	–	–	26	33	49	49	66	92	inch/z	.004	.007	.004	.008
	2	–	–	–	–	–	–	26	33	49	49	66	92	inch/z	.004	.007	.004	.008
	3	–	–	–	–	–	–	49	66	98	66	98	131	inch/z	.004	.008	.004	.008
	4	–	–	–	–	–	–	49	66	98	66	98	131	inch/z	.004	.008	.004	.008



RHM™ Modular Reaming System

The RHM Modular Reaming System achieves solid reamer metal removal rates from diameter 14–50mm with no customization required. All standard reamer heads are ground to achieve an ISO H7 tolerance class addressing most applications. This system gives you fast and easy change of heads using axial actuation toolholders, and replaceable heads eliminate the need for repeating runout check. Specific coatings and lead configurations enable high-speed machining of steel, stainless steel, cast iron, and non-ferrous materials at accelerated speeds.

Primary Application

Use SIF™ Steerable Hydraulic Chucks or SIF Adapters for easy compensation of radial runout and angular inaccuracies of the spindle to achieve the highest possible hole straightness and surface quality. Radial or axial actuation tool bodies are available at diameter 20mm.

Features and Benefits

Taper-Face Contact with KST Coupling

- Symmetrical torque transmission near head.
- Higher feed rate than conventional reaming tools.
- Better surface quality and tool life due to less tendency to vibrate.
- No need for head to body orientation.

Higher Productivity and Profitability

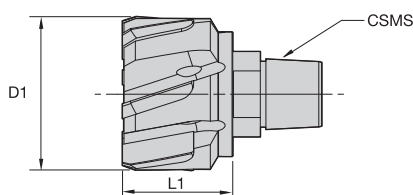
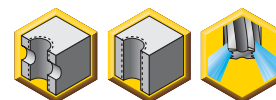
- Longer tool life with increased hole and surface quality due to lapped ground leads.
- Highest metal removal rate at higher speeds and feeds due to reaming specific grades and substrates.
- Improved straightness and cylindrical form compared to competitive tools and reduced vibration tendency due to unequal flutes.

Customization

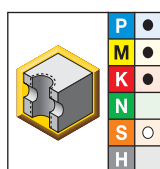
- Diameters up to 1.968" (50mm) available with and without internal coolant in .00004" (1 μm) steps.
- Intermediate diameters of standard program available with short delivery time.
- RHM tooling for machining heat-resistant materials, as well as different lengths and couplings or shanks, available on request.



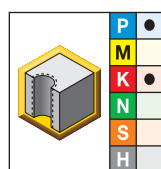
- For hole tolerance H7.
- Intermediate sizes ground to achieve IT6 or IT7 hole tolerance class available.
- Please order screw for axial use or pull stud separately.



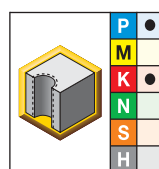
■ RHM Heads with Helical Flutes and Internal Coolant



KC6305



KT325

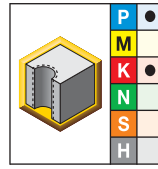
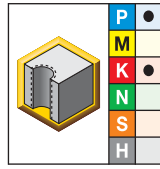
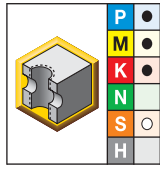


KT6215

		CSMS system size		D1		L1		Z	
		mm	in	mm	in	mm	in		
RHM14000KST115H7HF	RHM14000KST115H7HF	RHM14000KST115H7HF	KST115	14,00	—	.551	13,50	.531	6
RHM14288KST115H7HF	RHM14288KST115H7HF	RHM14288KST115H7HF	KST115	14,29	9/16	.563	13,50	.531	6
RHM15000KST115H7HF	RHM15000KST115H7HF	RHM15000KST115H7HF	KST115	15,00	—	.591	13,50	.531	6
RHM15875KST115H7HF	RHM15875KST115H7HF	RHM15875KST115H7HF	KST115	15,88	5/8	.625	13,50	.531	6
RHM16000KST135H7HF	RHM16000KST135H7HF	RHM16000KST135H7HF	KST135	16,00	—	.630	13,50	.531	6
RHM17000KST135H7HF	RHM17000KST135H7HF	RHM17000KST135H7HF	KST135	17,00	—	.669	15,50	.610	6
RHM17463KST135H7HF	RHM17463KST135H7HF	RHM17463KST135H7HF	KST135	17,46	11/16	.688	15,50	.610	6
RHM18000KST155H7HF	RHM18000KST155H7HF	RHM18000KST155H7HF	KST155	18,00	—	.709	15,50	.610	6
RHM19000KST155H7HF	RHM19000KST155H7HF	RHM19000KST155H7HF	KST155	19,00	—	.748	15,50	.610	6
RHM19050KST155H7HF	RHM19050KST155H7HF	RHM19050KST155H7HF	KST155	19,05	3/4	.750	15,50	.610	6
RHM20000KST175H7HF	RHM20000KST175H7HF	RHM20000KST175H7HF	KST175	20,00	—	.787	15,50	.610	6
RHM20640KST175H7HF	RHM20640KST175H7HF	RHM20640KST175H7HF	KST175	20,64	13/16	.813	15,50	.610	6
RHM21000KST175H7HF	RHM21000KST175H7HF	RHM21000KST175H7HF	KST175	21,00	—	.827	15,50	.610	6
RHM22000KST175H7HF	RHM22000KST175H7HF	RHM22000KST175H7HF	KST175	22,00	—	.866	15,50	.610	6
RHM22230KST175H7HF	RHM22230KST175H7HF	RHM22230KST175H7HF	KST175	22,23	7/8	.875	15,50	.610	6
RHM22500KST200H7HF	RHM22500KST200H7HF	RHM22500KST200H7HF	KST200	22,50	—	.886	16,50	.650	6
RHM23000KST200H7HF	RHM23000KST200H7HF	RHM23000KST200H7HF	KST200	23,00	—	.906	16,50	.650	6
RHM23810KST200H7HF	RHM23810KST200H7HF	RHM23810KST200H7HF	KST200	23,81	15/16	.937	16,50	.650	6
RHM24000KST200H7HF	RHM24000KST200H7HF	RHM24000KST200H7HF	KST200	24,00	—	.945	16,50	.650	6
RHM25000KST200H7HF	RHM25000KST200H7HF	RHM25000KST200H7HF	KST200	25,00	—	.984	16,50	.650	6
RHM25400KST200H7HF	RHM25400KST200H7HF	RHM25400KST200H7HF	KST200	25,40	1	1.000	16,50	.650	6
RHM26000KST200H7HF	RHM26000KST200H7HF	RHM26000KST200H7HF	KST200	26,00	—	1.024	16,50	.650	8
RHM26990KST200H7HF	RHM26990KST200H7HF	RHM26990KST200H7HF	KST200	26,99	1 1/16	1.063	16,50	.650	8
RHM27000KST200H7HF	RHM27000KST200H7HF	RHM27000KST200H7HF	KST200	27,00	—	1.063	16,50	.650	8
RHM27500KST250H7HF	RHM27500KST250H7HF	RHM27500KST250H7HF	KST250	27,50	—	1.083	16,50	.650	8
RHM28000KST250H7HF	RHM28000KST250H7HF	RHM28000KST250H7HF	KST250	28,00	—	1.102	16,50	.650	8

(continued)

(RHM Heads with Helical Flutes and Internal Coolant continued)

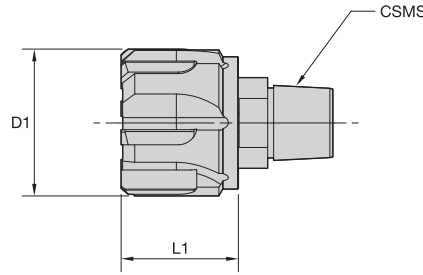
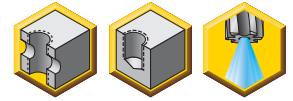


Hole Finishing

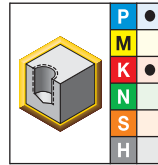
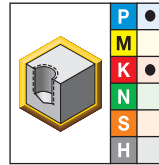
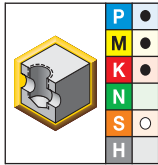
KC6305		KT325		KT6215		CSMS system size	D1		L1		Z	
						mm	in	in	mm	in		
RHM14000KST115H7HF	RHM14000KST115H7HF	RHM14000KST115H7HF	RHM14000KST115H7HF	RHM14000KST115H7HF	RHM14000KST115H7HF	KST115	14,00	—	.551	13,50	.531	6
RHM14288KST115H7HF	RHM14288KST115H7HF	RHM14288KST115H7HF	RHM14288KST115H7HF	RHM14288KST115H7HF	RHM14288KST115H7HF	KST115	14,29	9/16	.563	13,50	.531	6
RHM15000KST115H7HF	RHM15000KST115H7HF	RHM15000KST115H7HF	RHM15000KST115H7HF	RHM15000KST115H7HF	RHM15000KST115H7HF	KST115	15,00	—	.591	13,50	.531	6
RHM15875KST115H7HF	RHM15875KST115H7HF	RHM15875KST115H7HF	RHM15875KST115H7HF	RHM15875KST115H7HF	RHM15875KST115H7HF	KST115	15,88	5/8	.625	13,50	.531	6
RHM16000KST135H7HF	RHM16000KST135H7HF	RHM16000KST135H7HF	RHM16000KST135H7HF	RHM16000KST135H7HF	RHM16000KST135H7HF	KST135	16,00	—	.630	13,50	.531	6
RHM17000KST135H7HF	RHM17000KST135H7HF	RHM17000KST135H7HF	RHM17000KST135H7HF	RHM17000KST135H7HF	RHM17000KST135H7HF	KST135	17,00	—	.669	15,50	.610	6
RHM17463KST135H7HF	RHM17463KST135H7HF	RHM17463KST135H7HF	RHM17463KST135H7HF	RHM17463KST135H7HF	RHM17463KST135H7HF	KST135	17,46	11/16	.688	15,50	.610	6
RHM18000KST155H7HF	RHM18000KST155H7HF	RHM18000KST155H7HF	RHM18000KST155H7HF	RHM18000KST155H7HF	RHM18000KST155H7HF	KST155	18,00	—	.709	15,50	.610	6
RHM19000KST155H7HF	RHM19000KST155H7HF	RHM19000KST155H7HF	RHM19000KST155H7HF	RHM19000KST155H7HF	RHM19000KST155H7HF	KST155	19,00	—	.748	15,50	.610	6
RHM19050KST155H7HF	RHM19050KST155H7HF	RHM19050KST155H7HF	RHM19050KST155H7HF	RHM19050KST155H7HF	RHM19050KST155H7HF	KST155	19,05	3/4	.750	15,50	.610	6
RHM20000KST175H7HF	RHM20000KST175H7HF	RHM20000KST175H7HF	RHM20000KST175H7HF	RHM20000KST175H7HF	RHM20000KST175H7HF	KST175	20,00	—	.787	15,50	.610	6
RHM20640KST175H7HF	RHM20640KST175H7HF	RHM20640KST175H7HF	RHM20640KST175H7HF	RHM20640KST175H7HF	RHM20640KST175H7HF	KST175	20,64	13/16	.813	15,50	.610	6
RHM21000KST175H7HF	RHM21000KST175H7HF	RHM21000KST175H7HF	RHM21000KST175H7HF	RHM21000KST175H7HF	RHM21000KST175H7HF	KST175	21,00	—	.827	15,50	.610	6
RHM22000KST175H7HF	RHM22000KST175H7HF	RHM22000KST175H7HF	RHM22000KST175H7HF	RHM22000KST175H7HF	RHM22000KST175H7HF	KST175	22,00	—	.866	15,50	.610	6
RHM22230KST175H7HF	RHM22230KST175H7HF	RHM22230KST175H7HF	RHM22230KST175H7HF	RHM22230KST175H7HF	RHM22230KST175H7HF	KST175	22,23	7/8	.875	15,50	.610	6
RHM22500KST200H7HF	RHM22500KST200H7HF	RHM22500KST200H7HF	RHM22500KST200H7HF	RHM22500KST200H7HF	RHM22500KST200H7HF	KST200	22,50	—	.886	16,50	.650	6
RHM23000KST200H7HF	RHM23000KST200H7HF	RHM23000KST200H7HF	RHM23000KST200H7HF	RHM23000KST200H7HF	RHM23000KST200H7HF	KST200	23,00	—	.906	16,50	.650	6
RHM23810KST200H7HF	RHM23810KST200H7HF	RHM23810KST200H7HF	RHM23810KST200H7HF	RHM23810KST200H7HF	RHM23810KST200H7HF	KST200	23,81	15/16	.937	16,50	.650	6
RHM24000KST200H7HF	RHM24000KST200H7HF	RHM24000KST200H7HF	RHM24000KST200H7HF	RHM24000KST200H7HF	RHM24000KST200H7HF	KST200	24,00	—	.945	16,50	.650	6
RHM25000KST200H7HF	RHM25000KST200H7HF	RHM25000KST200H7HF	RHM25000KST200H7HF	RHM25000KST200H7HF	RHM25000KST200H7HF	KST200	25,00	—	.984	16,50	.650	6
RHM25400KST200H7HF	RHM25400KST200H7HF	RHM25400KST200H7HF	RHM25400KST200H7HF	RHM25400KST200H7HF	RHM25400KST200H7HF	KST200	25,40	1	1.000	16,50	.650	6
RHM26000KST200H7HF	RHM26000KST200H7HF	RHM26000KST200H7HF	RHM26000KST200H7HF	RHM26000KST200H7HF	RHM26000KST200H7HF	KST200	26,00	—	1.024	16,50	.650	8
RHM26990KST200H7HF	RHM26990KST200H7HF	RHM26990KST200H7HF	RHM26990KST200H7HF	RHM26990KST200H7HF	RHM26990KST200H7HF	KST200	26,99	1 1/16	1.063	16,50	.650	8
RHM27000KST200H7HF	RHM27000KST200H7HF	RHM27000KST200H7HF	RHM27000KST200H7HF	RHM27000KST200H7HF	RHM27000KST200H7HF	KST200	27,00	—	1.063	16,50	.650	8
RHM27500KST250H7HF	RHM27500KST250H7HF	RHM27500KST250H7HF	RHM27500KST250H7HF	RHM27500KST250H7HF	RHM27500KST250H7HF	KST250	27,50	—	1.083	16,50	.650	8
RHM28000KST250H7HF	RHM28000KST250H7HF	RHM28000KST250H7HF	RHM28000KST250H7HF	RHM28000KST250H7HF	RHM28000KST250H7HF	KST250	28,00	—	1.102	16,50	.650	8

NOTE: Uncoated carbide grade K605™ is available on request.

- For hole tolerance H7.
- Intermediate sizes ground to achieve IT6 hole tolerance class available.
- Please order screw for axial use or pull stud separately.



RHM Heads with Straight Flutes and Internal Coolant

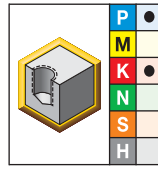
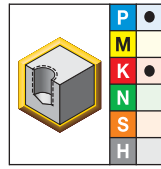
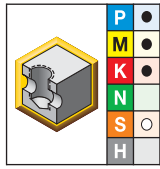


- first choice
- alternate choice

			CSMS		D1		L1		Z
			system size	mm	in	in	mm	in	
KC6305			KT325		KT6215				
RHM14000KST115H7SF	RHM14000KST115H7SF	RHM14000KST115H7SF	KST115	14,00	—	.551	13,50	.531	6
RHM14288KST115H7SF	RHM14288KST115H7SF	RHM14288KST115H7SF	KST115	14,29	9/16	.563	13,50	.531	6
RHM15000KST115H7SF	RHM15000KST115H7SF	RHM15000KST115H7SF	KST115	15,00	—	.591	13,50	.531	6
RHM15875KST115H7SF	RHM15875KST115H7SF	RHM15875KST115H7SF	KST115	15,88	5/8	.625	13,50	.531	6
RHM16000KST135H7SF	RHM16000KST135H7SF	RHM16000KST135H7SF	KST135	16,00	—	.630	13,50	.531	6
RHM17000KST135H7SF	RHM17000KST135H7SF	RHM17000KST135H7SF	KST135	17,00	—	.669	15,50	.610	6
RHM17463KST135H7SF	RHM17463KST135H7SF	RHM17463KST135H7SF	KST135	17,46	11/16	.688	15,50	.610	6
RHM18000KST155H7SF	RHM18000KST155H7SF	RHM18000KST155H7SF	KST155	18,00	—	.709	15,50	.610	6
RHM19000KST155H7SF	RHM19000KST155H7SF	RHM19000KST155H7SF	KST155	19,00	—	.748	15,50	.610	6
RHM19050KST155H7SF	RHM19050KST155H7SF	RHM19050KST155H7SF	KST155	19,05	3/4	.750	15,50	.610	6
RHM20000KST175H7SF	RHM20000KST175H7SF	RHM20000KST175H7SF	KST175	20,00	—	.787	15,50	.610	6
RHM20640KST175H7SF	RHM20640KST175H7SF	RHM20640KST175H7SF	KST175	20,64	13/16	.813	15,50	.610	6
RHM21000KST175H7SF	RHM21000KST175H7SF	RHM21000KST175H7SF	KST175	21,00	—	.827	15,50	.610	6
RHM22000KST175H7SF	RHM22000KST175H7SF	RHM22000KST175H7SF	KST175	22,00	—	.866	15,50	.610	6
RHM22230KST175H7SF	RHM22230KST175H7SF	RHM22230KST175H7SF	KST175	22,23	7/8	.875	15,50	.610	6
RHM22500KST200H7SF	RHM22500KST200H7SF	RHM22500KST200H7SF	KST200	22,50	—	.886	16,50	.650	6
RHM23000KST200H7SF	RHM23000KST200H7SF	RHM23000KST200H7SF	KST200	23,00	—	.906	16,50	.650	6
RHM23810KST200H7SF	RHM23810KST200H7SF	RHM23810KST200H7SF	KST200	23,81	15/16	.937	16,50	.650	6
RHM24000KST200H7SF	RHM24000KST200H7SF	RHM24000KST200H7SF	KST200	24,00	—	.945	16,50	.650	6
RHM25000KST200H7SF	RHM25000KST200H7SF	RHM25000KST200H7SF	KST200	25,00	—	.984	16,50	.650	6
RHM25400KST200H7SF	RHM25400KST200H7SF	RHM25400KST200H7SF	KST200	25,40	1	1.000	16,50	.650	6
RHM26000KST200H7SF	RHM26000KST200H7SF	RHM26000KST200H7SF	KST200	26,00	—	1.024	16,50	.650	8
RHM26990KST200H7SF	RHM26990KST200H7SF	RHM26990KST200H7SF	KST200	26,99	1 1/16	1.063	16,50	.650	8
RHM27000KST200H7SF	RHM27000KST200H7SF	RHM27000KST200H7SF	KST200	27,00	—	1.063	16,50	.650	8
RHM27500KST250H7SF	RHM27500KST250H7SF	RHM27500KST250H7SF	KST250	27,50	—	1.083	16,50	.650	8
RHM28000KST250H7SF	RHM28000KST250H7SF	RHM28000KST250H7SF	KST250	28,00	—	1.102	16,50	.650	8

(continued)

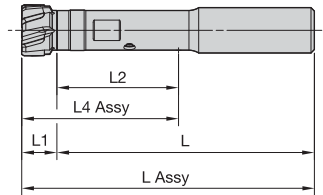
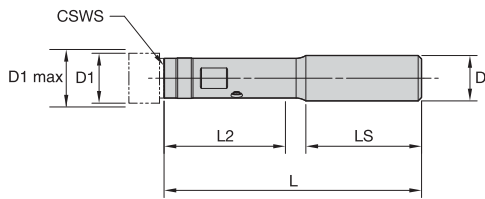
(RHM Heads with Straight Flutes and Internal Coolant continued)



Hole Finishing

KC6305		KT325		KT6215		CSMS system size	D1		L1		Z	
						mm	in	in	mm	in		
RHM28580KST250H7SF	RHM28580KST250H7SF	RHM28580KST250H7SF	RHM28580KST250H7SF	RHM28580KST250H7SF	RHM28580KST250H7SF	KST250	28,58	1 1/8	1.125	16,50	.650	8
RHM29000KST250H7SF	RHM29000KST250H7SF	RHM29000KST250H7SF	RHM29000KST250H7SF	RHM29000KST250H7SF	RHM29000KST250H7SF	KST250	29,00	—	1.142	16,50	.650	8
RHM30000KST250H7SF	RHM30000KST250H7SF	RHM30000KST250H7SF	RHM30000KST250H7SF	RHM30000KST250H7SF	RHM30000KST250H7SF	KST250	30,00	—	1.181	16,50	.650	8
RHM30160KST250H7SF	RHM30160KST250H7SF	RHM30160KST250H7SF	RHM30160KST250H7SF	RHM30160KST250H7SF	RHM30160KST250H7SF	KST250	30,16	1 3/16	1.187	16,50	.650	8
RHM31000KST250H7SF	RHM31000KST250H7SF	RHM31000KST250H7SF	RHM31000KST250H7SF	RHM31000KST250H7SF	RHM31000KST250H7SF	KST250	31,00	—	1.221	16,50	.650	8
RHM31750KST250H7SF	RHM31750KST250H7SF	RHM31750KST250H7SF	RHM31750KST250H7SF	RHM31750KST250H7SF	RHM31750KST250H7SF	KST250	31,75	1 1/4	1.250	16,50	.650	8
RHM32000KST250H7SF	RHM32000KST250H7SF	RHM32000KST250H7SF	RHM32000KST250H7SF	RHM32000KST250H7SF	RHM32000KST250H7SF	KST250	32,00	—	1.260	16,50	.650	8
RHM32500KST300H7SF	RHM32500KST300H7SF	RHM32500KST300H7SF	RHM32500KST300H7SF	RHM32500KST300H7SF	RHM32500KST300H7SF	KST300	32,50	—	1.280	18,00	.709	8
RHM33000KST300H7SF	RHM33000KST300H7SF	RHM33000KST300H7SF	RHM33000KST300H7SF	RHM33000KST300H7SF	RHM33000KST300H7SF	KST300	33,00	—	1.299	18,00	.709	8
RHM33340KST300H7SF	RHM33340KST300H7SF	RHM33340KST300H7SF	RHM33340KST300H7SF	RHM33340KST300H7SF	RHM33340KST300H7SF	KST300	33,34	1 5/16	1.313	18,00	.709	8
RHM34000KST300H7SF	RHM34000KST300H7SF	RHM34000KST300H7SF	RHM34000KST300H7SF	RHM34000KST300H7SF	RHM34000KST300H7SF	KST300	34,00	—	1.339	18,00	.709	8
RHM34930KST300H7SF	RHM34930KST300H7SF	RHM34930KST300H7SF	RHM34930KST300H7SF	RHM34930KST300H7SF	RHM34930KST300H7SF	KST300	34,93	1 3/8	1.375	18,00	.709	8
RHM35000KST300H7SF	RHM35000KST300H7SF	RHM35000KST300H7SF	RHM35000KST300H7SF	RHM35000KST300H7SF	RHM35000KST300H7SF	KST300	35,00	—	1.378	18,00	.709	8
RHM36000KST300H7SF	RHM36000KST300H7SF	RHM36000KST300H7SF	RHM36000KST300H7SF	RHM36000KST300H7SF	RHM36000KST300H7SF	KST300	36,00	—	1.417	18,00	.709	8
RHM36510KST300H7SF	RHM36510KST300H7SF	RHM36510KST300H7SF	RHM36510KST300H7SF	RHM36510KST300H7SF	RHM36510KST300H7SF	KST300	36,51	1 7/16	1.437	18,00	.709	8
RHM37000KST300H7SF	RHM37000KST300H7SF	RHM37000KST300H7SF	RHM37000KST300H7SF	RHM37000KST300H7SF	RHM37000KST300H7SF	KST300	37,00	—	1.457	18,00	.709	8
RHM37500KST350H7SF	RHM37500KST350H7SF	RHM37500KST350H7SF	RHM37500KST350H7SF	RHM37500KST350H7SF	RHM37500KST350H7SF	KST350	37,50	—	1.476	18,00	.709	8
RHM38000KST350H7SF	RHM38000KST350H7SF	RHM38000KST350H7SF	RHM38000KST350H7SF	RHM38000KST350H7SF	RHM38000KST350H7SF	KST350	38,00	—	1.496	18,00	.709	8
RHM38100KST350H7SF	RHM38100KST350H7SF	RHM38100KST350H7SF	RHM38100KST350H7SF	RHM38100KST350H7SF	RHM38100KST350H7SF	KST350	38,10	1 1/2	1.500	18,00	.709	8
RHM39000KST350H7SF	RHM39000KST350H7SF	RHM39000KST350H7SF	RHM39000KST350H7SF	RHM39000KST350H7SF	RHM39000KST350H7SF	KST350	39,00	—	1.535	18,00	.709	8
RHM39690KST350H7SF	RHM39690KST350H7SF	RHM39690KST350H7SF	RHM39690KST350H7SF	RHM39690KST350H7SF	RHM39690KST350H7SF	KST350	39,69	1 9/16	1.563	18,00	.709	8
RHM40000KST350H7SF	RHM40000KST350H7SF	RHM40000KST350H7SF	RHM40000KST350H7SF	RHM40000KST350H7SF	RHM40000KST350H7SF	KST350	40,00	—	1.575	18,00	.709	8
RHM41000KST350H7SF	RHM41000KST350H7SF	RHM41000KST350H7SF	RHM41000KST350H7SF	RHM41000KST350H7SF	RHM41000KST350H7SF	KST350	41,00	—	1.614	18,00	.709	8
RHM41280KST350H7SF	RHM41280KST350H7SF	RHM41280KST350H7SF	RHM41280KST350H7SF	RHM41280KST350H7SF	RHM41280KST350H7SF	KST350	41,28	1 5/8	1.625	18,00	.709	8
RHM42000KST350H7SF	RHM42000KST350H7SF	RHM42000KST350H7SF	RHM42000KST350H7SF	RHM42000KST350H7SF	RHM42000KST350H7SF	KST350	42,00	—	1.654	18,00	.709	8

- Tool body shipped with screw for axial use.
- Order reamer head separately.



L Assy = L1 (RHM Head) + L (Shank)

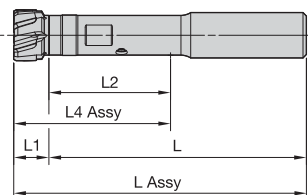
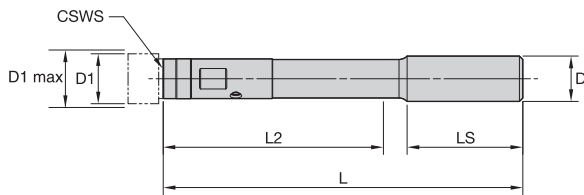


■ Round Shank Axial Actuation • Metric • 3 x D

order number	catalog number	CSWS system size	D1		D1 max		D	L	L2	LS	central lock screw	Torx wrench	Nm	ft. lbs.
			mm	in	mm	in								
4056174	SS16KST115AR3M	KST115	14,00	.551	15,999	.63	16,00	91,00	35,00	48,00	KST115115AS	170.028	3,0	2.2
4056175	SS20KST135AR3M	KST135	16,00	.630	17,999	.71	20,00	99,00	39,00	51,00	KST135155AS	170.085	4,0	3.0
4056176	SS20KST155AR3M	KST155	18,00	.709	19,999	.79	20,00	106,00	45,00	51,00	KST135155AS	170.085	4,0	3.0
3861185	SS20KST175AR3M	KST175	20,00	.787	22,499	.89	20,00	113,50	51,50	51,00	KST175200AS	TT15	5,0	3.7
3861186	SS20KST200AR3M	KST200	22,50	.886	27,499	1.08	20,00	130,50	65,50	51,00	KST175200AS	TT15	5,0	3.7
3861187	SS25KST250AR3M	KST250	27,50	1.083	32,499	1.28	25,00	152,50	80,50	56,00	KST250250AS	TT25	9,0	6.7
3861188	SS32KST300AR3M	KST300	32,50	1.280	37,499	1.48	32,00	174,00	94,00	61,00	KST300350AS	TT30	13,0	9.7
3861189	SS32KST350AR3M	KST350	37,50	1.476	42,000	1.65	32,00	190,00	108,00	61,00	KST300350AS	TT30	13,0	9.7

Hole Finishing

- Tool body shipped with screw for axial use.
- Order reamer head separately.



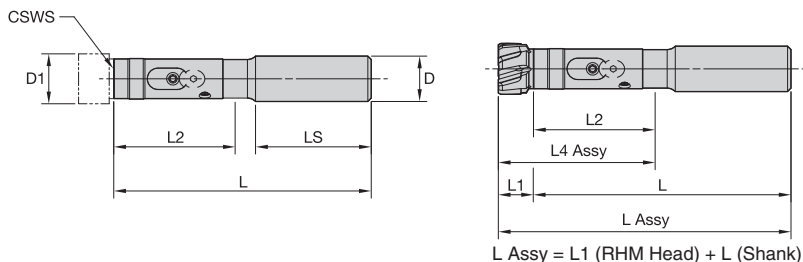
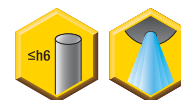
L Assy = L1 (RHM Head) + L (Shank)



■ Round Shank Axial Actuation • Metric • 5 x D

order number	catalog number	CSWS system size	D1		D1 max		D	L	L2	LS	central lock screw	Torx wrench	Nm	ft. lbs.
			mm	in	mm	in								
4056177	SS16KST115AR5M	KST115	14,00	.551	15,999	.630	16,00	123,00	67,00	48,00	KST115115AS	170.028	3,0	2.2
4056178	SS20KST135AR5M	KST135	16,00	.630	17,999	.709	20,00	135,00	75,00	51,00	KST135155AS	170.085	4,0	3.0
4056179	SS20KST155AR5M	KST155	18,00	.709	19,999	.787	20,00	146,00	85,00	51,00	KST135155AS	170.085	4,0	3.0
3861190	SS20KST175AR5M	KST175	20,00	.787	22,499	.886	20,00	158,50	96,50	51,00	KST175200AS	TT15	5,0	3.7
3861191	SS20KST200AR5M	KST200	22,50	.886	27,499	1.083	20,00	185,50	120,50	51,00	KST175200AS	TT15	5,0	3.7
3861192	SS25KST250AR5M	KST250	27,50	1.083	32,499	1.280	25,00	217,50	145,50	56,00	KST250250AS	TT25	9,0	6.7
3861193	SS32KST300AR5M	KST300	32,50	1.280	37,499	1.476	32,00	249,00	169,00	61,00	KST300350AS	TT30	13,0	9.7
3861194	SS32KST350AR5M	KST350	37,50	1.476	42,000	1.654	32,00	274,00	192,00	61,00	KST300350AS	TT30	13,0	9.7

- Tool body shipped with pull stud for radial use.
- Order reamer head separately.



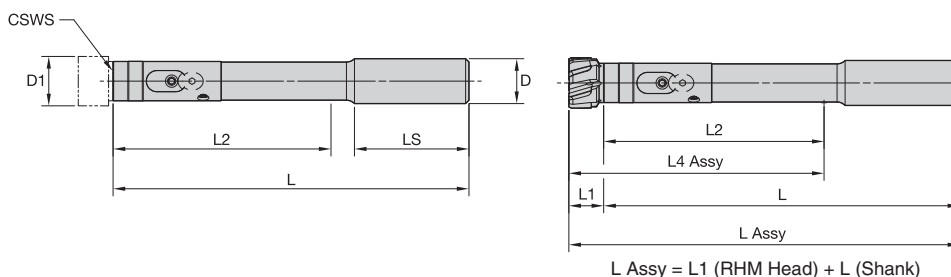
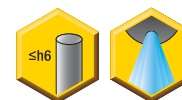
■ Round Shank Radial Actuation • Metric • 3 x D

Hole Finishing

order number	catalog number	CSWS system size	D1		D1 max		D	L	L2	LS	retention knob	clamp set	Torx wrench	Nm	ft. lbs.
			mm	in	mm	in									
3861195	SS20KST175RR3M	KST175	20,00	.787	22,50	.886	20,00	113,50	51,50	51,00	KST175200RK	KST175CS	TT15	5,0	3,7
3861196	SS20KST200RR3M	KST200	22,50	.886	27,50	1.083	20,00	130,50	65,50	51,00	KST175200RK	KST200CS	TT15	5,0	3,7
3861197	SS25KST250RR3M	KST250	27,50	1.083	32,50	1.280	25,00	152,50	80,50	56,00	KST250250RK	KST250CS	TT25	9,0	6,7
3861198	SS32KST300RR3M	KST300	32,50	1.280	37,50	1.476	32,00	174,00	94,00	61,00	KST300350RK	KST300CS	TT30	13,0	9,7
3861199	SS32KST350RR3M	KST350	37,50	1.476	42,00	1.654	32,00	190,00	108,00	61,00	KST300350RK	KST350CS	TT30	13,0	9,7



- Tool body shipped with pull stud for radial use.
- Order reamer head separately.

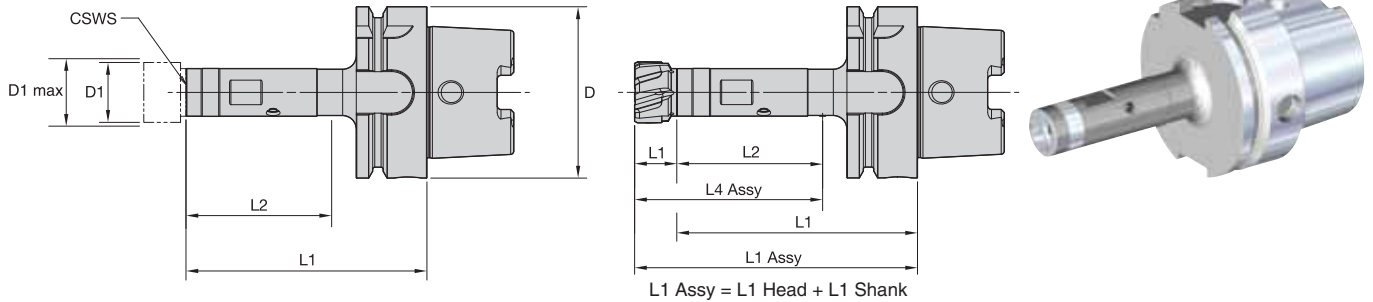


■ Round Shank Radial Actuation • Metric • 5 x D

order number	catalog number	CSWS system size	D1		D1 max		D	L	L2	LS	retention knob	clamp set	Torx wrench	Nm	ft. lbs.
			mm	in	mm	in									
3861200	SS20KST175RR5M	KST175	20,00	.787	22,50	.886	20,00	158,50	96,50	51,00	KST175200RK	KST175CS	TT15	5,0	3,7
3861201	SS20KST200RR5M	KST200	22,50	.886	27,50	1.083	20,00	185,50	120,50	51,00	KST175200RK	KST200CS	TT15	5,0	3,7
3861202	SS25KST250RR5M	KST250	27,50	1.083	32,50	1.280	25,00	217,50	145,50	56,00	KST250250RK	KST250CS	TT25	9,0	6,7
3861203	SS32KST300RR5M	KST300	32,50	1.280	37,50	1.476	32,00	249,00	169,00	61,00	KST300350RK	KST300CS	TT30	13,0	9,7
3861204	SS32KST350RR5M	KST350	37,50	1.476	42,00	1.654	32,00	274,00	192,00	61,00	KST300350RK	KST350CS	TT30	13,0	9,7



- Tool body shipped with screw for axial use.
- Order reamer head separately.

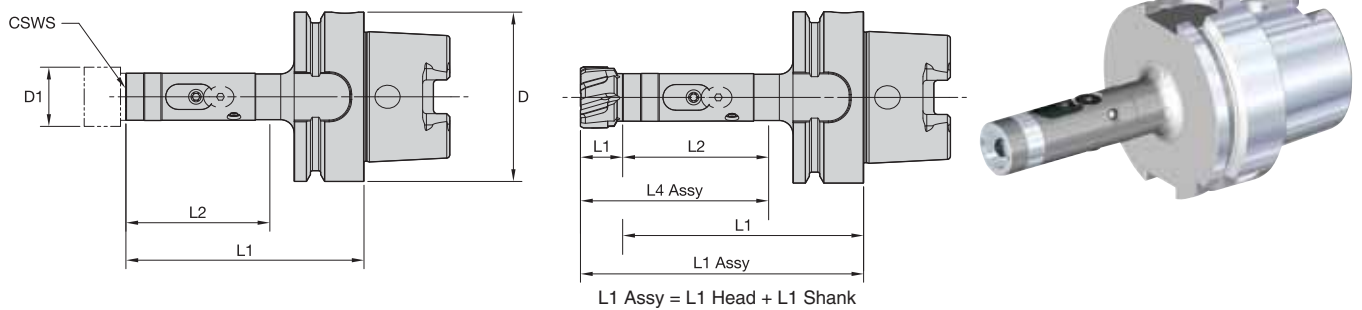


■ HSK63A Shank Axial Actuation • 3 x D

order number	catalog number	CSWS system size	D1		D1 max		D	L1	L2	central lock screw	Torx wrench	Nm ft. lbs.	
			mm	in	mm	in						Nm	ft. lbs.
4056180	HSK63AKST115AR3M	KST115	14,00	.551	15,999	.630	63,00	69,00	35,00	KST115115AS	170.028	3,0	2.2
4056181	HSK63AKST135AR3M	KST135	16,00	.630	17,999	.709	63,00	74,00	39,00	KST135155AS	170.085	4,0	3.0
4056182	HSK63AKST155AR3M	KST155	18,00	.709	19,999	.787	63,00	81,00	45,00	KST135155AS	170.085	4,0	3.0
3860911	HSK63AKST175AR3M	KST175	20,00	.787	22,499	.886	63,00	88,50	51,50	KST175200AS	TT15	5,0	3.7
3860912	HSK63AKST200AR3M	KST200	22,50	.886	27,499	1.083	63,00	105,50	65,50	KST175200AS	TT15	5,0	3.7
3860963	HSK63AKST250AR3M	KST250	27,50	1.083	32,499	1.280	63,00	122,50	80,50	KST250250AS	TT25	9,0	6.7
3860964	HSK63AKST300AR3M	KST300	32,50	1.280	37,499	1.476	63,00	139,00	94,00	KST300350AS	TT30	13,0	9.7
3860965	HSK63AKST350AR3M	KST350	37,50	1.476	42,000	1.654	63,00	155,00	108,00	KST300350AS	TT30	13,0	9.7



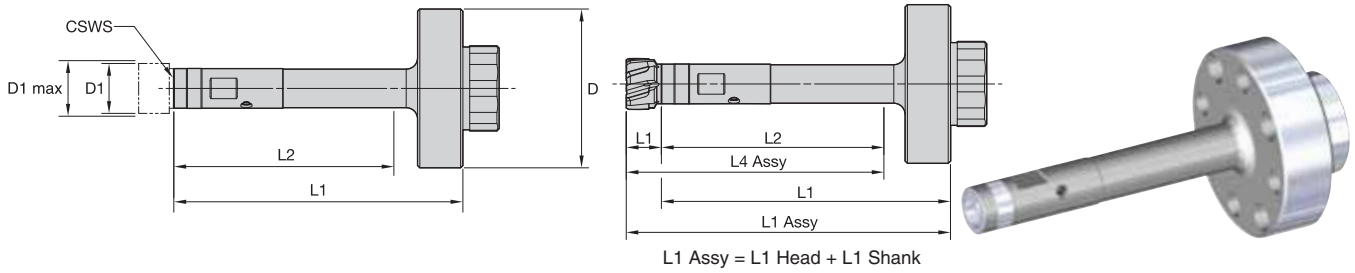
- Tool body shipped with pull stud for radial use.
- Order reamer head separately.



■ HSK63A Shank Radial Actuation • 3 x D

order number	catalog number	CSWS system size	D1		D1 max		D	L1	L2	retention knob	clamp set	Torx wrench	Nm ft. lbs.	
			mm	in	mm	in							Nm	ft. lbs.
3860966	HSK63AKST175RR3M	KST175	20,00	.787	22,49	.885	63,00	88,50	51,50	KST175200RK	KST175CS	TT15	5,0	3.7
3860967	HSK63AKST200RR3M	KST200	22,50	.886	27,49	1.082	63,00	105,50	65,50	KST175200RK	KST200CS	TT15	5,0	3.7
3860968	HSK63AKST250RR3M	KST250	27,50	1.083	32,49	1.279	63,00	122,50	80,50	KST250250RK	KST250CS	TT25	9,0	6.7
3860969	HSK63AKST300RR3M	KST300	32,50	1.280	37,49	1.476	63,00	139,00	94,00	KST300350RK	KST300CS	TT30	13,0	9.7
3860970	HSK63AKST350RR3M	KST350	37,50	1.476	42,00	1.654	63,00	155,00	108,00	KST300350RK	KST350CS	TT30	13,0	9.7

- Tool body shipped with screw for axial use.
- Order reamer head separately.
- Order taper shank separately, see page K129.

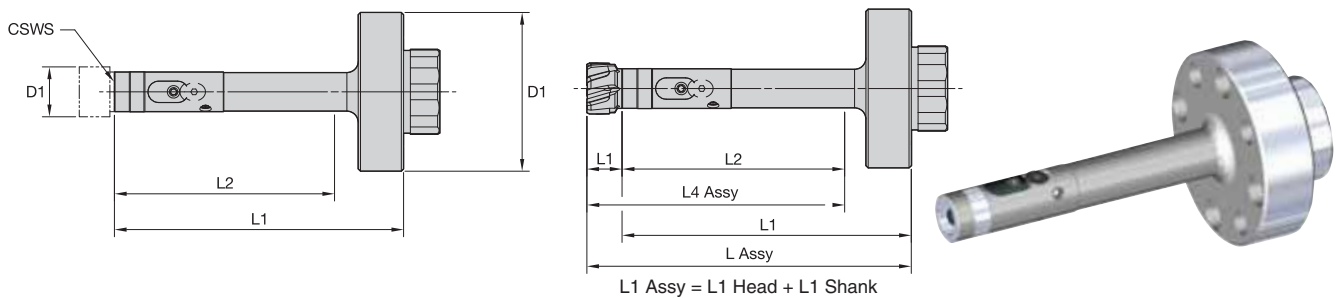


■ SIF70 Shank Axial Actuation • 5 x D

Hole Finishing

order number	catalog number	CSWS system size	D1		D1 max		D	L1	L2	central lock screw	Torx wrench	Nm	ft. lbs.
			mm	in	mm	in							
4056183	SIF70KST115AR5M	KST115	14,00	.551	15,999	.630	70,00	95,00	67,00	KST115115AS	170.028	3,0	2.2
4056184	SIF70KST135AR5M	KST135	16,00	.630	17,999	.709	70,00	104,00	75,00	KST135155AS	170.085	4,0	3.0
4056185	SIF70KST155AR5M	KST155	18,00	.709	19,999	.787	70,00	115,00	85,00	KST135155AS	170.085	4,0	3.0
3860971	SIF70KST175AR5M	KST175	20,00	.787	22,499	.886	70,00	127,50	96,50	KST175200AS	TT15	5,0	3.7
3860972	SIF70KST200AR5M	KST200	22,50	.886	27,499	1.083	70,00	154,50	120,50	KST175200AS	TT15	5,0	3.7
3860973	SIF70KST250AR5M	KST250	27,50	1.083	32,499	1.280	70,00	181,50	145,50	KST250250AS	TT25	9,0	6.7
3860974	SIF70KST300AR5M	KST300	32,50	1.280	37,499	1.476	70,00	208,00	169,00	KST300350AS	TT30	13,0	9.7
3860975	SIF70KST350AR5M	KST350	37,50	1.476	42,000	1.654	70,00	233,00	192,00	KST300350AS	TT30	13,0	9.7

- Tool body shipped with pull stud for radial use.
- Order reamer head separately.
- Order taper shank separately, see page K129.



■ SIF70 Shank Radial Actuation • 5 x D

order number	catalog number	CSWS system size	D1		D1 max		D	L1	L2	retention knob	clamp set	Torx wrench	Nm	ft. lbs.
			mm	in	mm	in								
3860976	SIF70KST175RR5M	KST175	20,00	.787	22,49	.885	70,00	127,50	96,50	KST175200RK	KST175CS	TT15	5,0	3.7
3860977	SIF70KST200RR5M	KST200	22,50	.886	27,49	1.082	70,00	154,50	120,50	KST175200RK	KST200CS	TT15	5,0	3.7
3860978	SIF70KST250RR5M	KST250	27,50	1.083	32,49	1.279	70,00	181,50	145,50	KST250250RK	KST250CS	TT25	9,0	6.7
3860979	SIF70KST300RR5M	KST300	32,50	1.280	37,49	1.476	70,00	208,00	169,00	KST300350RK	KST300CS	TT30	13,0	9.7
3860980	SIF70KST350RR5M	KST350	37,50	1.476	42,00	1.654	70,00	233,00	192,00	KST300350RK	KST350CS	TT30	13,0	9.7

RHM™

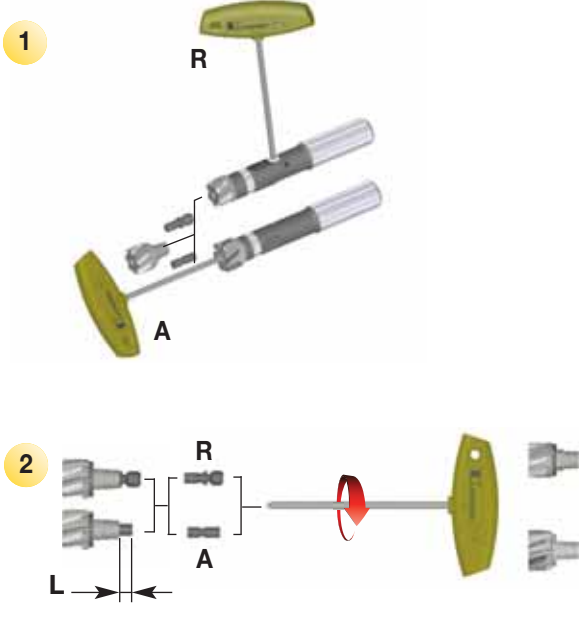
Material Group	KT325			KT6215			K605			KC6305			Metric							
	Cutting Speed – vc			Cutting Speed – vc			Cutting Speed – vc			Cutting Speed – vc			Recommended Feed Rate per Tooth							
	Range – m/min			Range – m/min			Range – m/min			Range – m/min			Tool Diameter (mm)	14.00-19.99		20.00-32.00		32.50-42.00		
	min	Starting Value	max	min	Starting Value	max	min	Starting Value	max	min	Starting Value	max		Feed/Tooth	min	max	min	max	min	max
P	1	150	180	210	180	210	240	40	60	70	90	120	155	mm/z	0,10	0,20	0,10	0,22	0,10	0,25
	2	150	180	210	180	210	240	40	60	70	90	120	155	mm/z	0,10	0,20	0,10	0,22	0,10	0,25
	3	130	160	180	150	180	210	30	40	50	75	100	130	mm/z	0,10	0,20	0,10	0,22	0,10	0,25
	4	100	130	150	120	150	170	25	40	45	50	80	105	mm/z	0,10	0,20	0,10	0,22	0,10	0,25
	4	80	100	120	100	130	150	10	20	30	30	40	55	mm/z	0,08	0,18	0,08	0,20	0,08	0,22
	4	80	100	120	100	130	150	10	20	30	30	40	55	mm/z	0,08	0,18	0,08	0,20	0,08	0,22
M	1	–	–	–	–	–	–	8	10	15	15	20	28	mm/z	0,08	0,15	0,08	0,18	0,08	0,20
	2	–	–	–	–	–	–	8	10	15	15	20	28	mm/z	0,08	0,15	0,08	0,18	0,08	0,20
	3	–	–	–	–	–	–	8	10	15	15	20	28	mm/z	0,08	0,15	0,08	0,18	0,08	0,20
K	1	150	180	200	180	210	240	30	50	60	80	110	130	mm/z	0,10	0,20	0,10	0,22	0,10	0,25
	2	130	160	180	150	180	210	25	40	45	65	90	110	mm/z	0,10	0,20	0,10	0,22	0,10	0,25
	3	100	130	160	120	150	170	20	30	40	50	70	90	mm/z	0,10	0,18	0,10	0,20	0,10	0,22
N	1	–	–	–	–	–	–	110	150	195	–	–	–	mm/z	0,10	0,30	0,10	0,30	0,10	0,30
	2	–	–	–	–	–	–	110	150	195	–	–	–	mm/z	0,10	0,30	0,10	0,30	0,10	0,30
	3	–	–	–	–	–	–	110	150	195	–	–	–	mm/z	0,10	0,30	0,10	0,30	0,10	0,30
	4	–	–	–	–	–	–	110	150	195	–	–	–	mm/z	0,10	0,30	0,10	0,30	0,10	0,30
	5	–	–	–	–	–	–	105	140	180	–	–	–	mm/z	0,10	0,30	0,10	0,30	0,10	0,30
S	1	–	–	–	–	–	–	8	10	15	15	20	28	mm/z	0,06	0,15	0,10	0,18	0,10	0,20
	2	–	–	–	–	–	–	8	10	15	15	20	28	mm/z	0,06	0,15	0,10	0,18	0,10	0,20
	3	–	–	–	–	–	–	15	20	30	20	30	40	mm/z	0,08	0,18	0,10	0,20	0,10	0,20
	4	–	–	–	–	–	–	15	20	30	20	30	40	mm/z	0,08	0,18	0,10	0,20	0,10	0,20



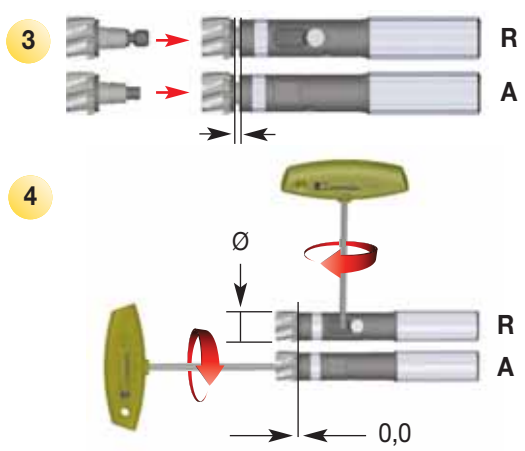
Material Group	KT325			KT6215			K605			KC6305			Inch							
	Cutting Speed – vc			Cutting Speed – vc			Cutting Speed – vc			Cutting Speed – vc			Recommended Feed Rate per Tooth							
	Range – SFM			Range – SFM			Range – SFM			Range – SFM			Tool Diameter (inch)	.551-.787		.787-1.260		1.280-1.654		
	min	Starting Value	max	min	Starting Value	max	min	Starting Value	max	min	Starting Value	max		Feed/Tooth	min	max	min	max	min	max
P	1	492	590	689	590	689	787	131	197	230	295	394	508	inch/z	.004	.008	.004	.009	.004	.010
	2	492	590	689	590	689	787	131	197	230	295	394	508	inch/z	.004	.008	.004	.009	.004	.010
	3	426	525	590	492	590	689	98	131	164	246	328	426	inch/z	.004	.008	.004	.009	.004	.010
	4	328	426	492	394	492	558	82	131	148	164	262	344	inch/z	.004	.008	.004	.009	.004	.010
	4	262	328	394	328	426	492	33	66	98	98	131	180	inch/z	.003	.007	.003	.008	.003	.009
	4	262	328	394	328	426	492	33	66	98	98	131	180	inch/z	.003	.007	.003	.008	.003	.009
M	1	–	–	–	–	–	–	26	33	49	49	66	92	inch/z	.003	.006	.003	.007	.003	.008
	2	–	–	–	–	–	–	26	33	49	49	66	92	inch/z	.003	.006	.003	.007	.003	.008
	3	–	–	–	–	–	–	26	33	49	49	66	92	inch/z	.003	.006	.003	.007	.003	.008
K	1	492	590	656	590	689	787	98	164	197	262	361	426	inch/z	.004	.008	.004	.009	.004	.010
	2	426	525	590	492	590	689	82	131	148	213	295	361	inch/z	.004	.008	.004	.009	.004	.010
	3	328	426	525	394	492	558	66	98	131	164	230	295	inch/z	.004	.007	.004	.008	.004	.009
N	1	–	–	–	–	–	–	361	492	640	–	–	–	inch/z	.004	.012	.004	.012	.004	.012
	2	–	–	–	–	–	–	361	492	640	–	–	–	inch/z	.004	.012	.004	.012	.004	.012
	3	–	–	–	–	–	–	361	492	640	–	–	–	inch/z	.004	.012	.004	.012	.004	.012
	4	–	–	–	–	–	–	361	492	640	–	–	–	inch/z	.004	.012	.004	.012	.004	.012
	5	–	–	–	–	–	–	344	459	590	–	–	–	inch/z	.004	.012	.004	.012	.004	.012
S	1	–	–	–	–	–	–	26	33	49	49	66	92	inch/z	.002	.006	.004	.007	.004	.008
	2	–	–	–	–	–	–	26	33	49	49	66	92	inch/z	.002	.006	.004	.007	.004	.008
	3	–	–	–	–	–	–	49	66	98	66	98	131	inch/z	.003	.007	.004	.008	.004	.008
	4	–	–	–	–	–	–	49	66	98	66	98	131	inch/z	.003	.007	.004	.008	.004	.008

Hole Finishing

Assemble



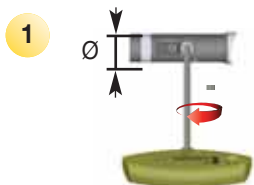
\emptyset (mm)	\emptyset (mm)	\emptyset (in)	L (mm)
14,000	27,499	0.549	1.078
27,500	42,000	1.078	1.647
			5-5.5
			5.5-6



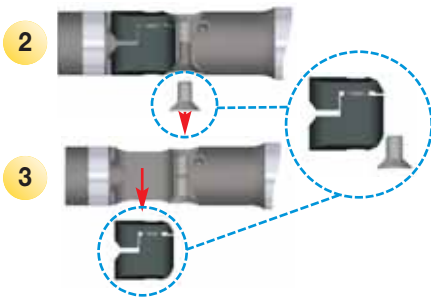
\emptyset (mm)	\emptyset (in)			
			(Nm)	(ft. lbs.)
14,000	15,999	DT - 8	2	1.5
16,000	19,999	DT - 10	3	2.2
20,000	27,499	TT - 15	5	3.7
27,500	32,499	TT - 25	9	6.7
32,500	42,000	TT - 30	13	9.7

Disassemble 4 → 3 → 2 → 1

Disassemble



\emptyset (mm)	\emptyset (in)				
				(Nm)	(ft. lbs.)
17,5	0.686	KST175CS	2,5	2,5	1.9
20	0.784	KST200CS	2,5	2,5	1.9
25	0.980	KST250CS	3	5	3.7
30	1.176	KST300CS	4	9	6.7
35	1.373	KST350CS	4	9	6.7

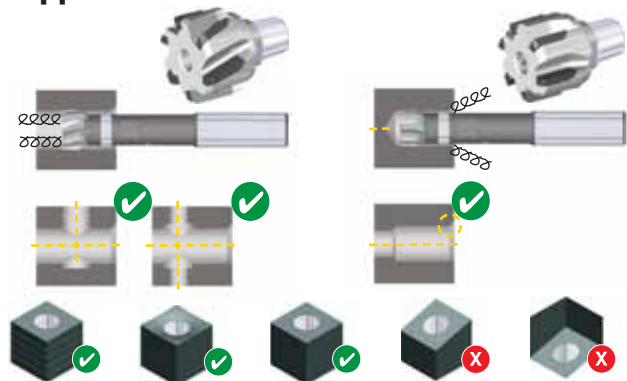


Assemble 3 → 2 → 1

SIF™



Application



Coolant flow

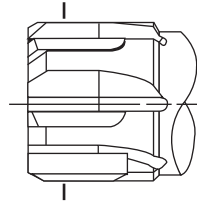
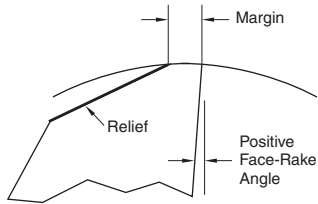


max 80 bar/1160 psi

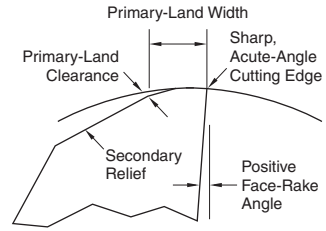
Basic Design Overview • Multiflute Reaming Tooling

Kennametal offers two basic reaming designs, cylindrical margin land and up sharp. The cylindrical margin land design is used for all standard items of the RMS™, RMB™, and RHM™ reaming platforms. Engineered-solution tooling based on up sharp reaming design offers high hole quality and long tool life in exotic cases and high-temp alloys as only the sharp cutting edges contact with the workpiece.

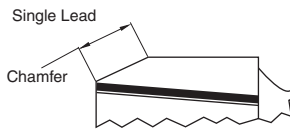
Cylindrical Margin Reaming “C”



Up Sharp Reaming “U” & “NC”

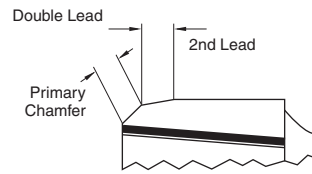


Basic Lead Differences



Single Lead

The single lead chamfer design is used with all standard RMS, RMB, and RHM reaming tooling and enables the tool to be applied on various materials without customization. Design can be modified to meet specific applications such as thin walls, straightness correction, etc.



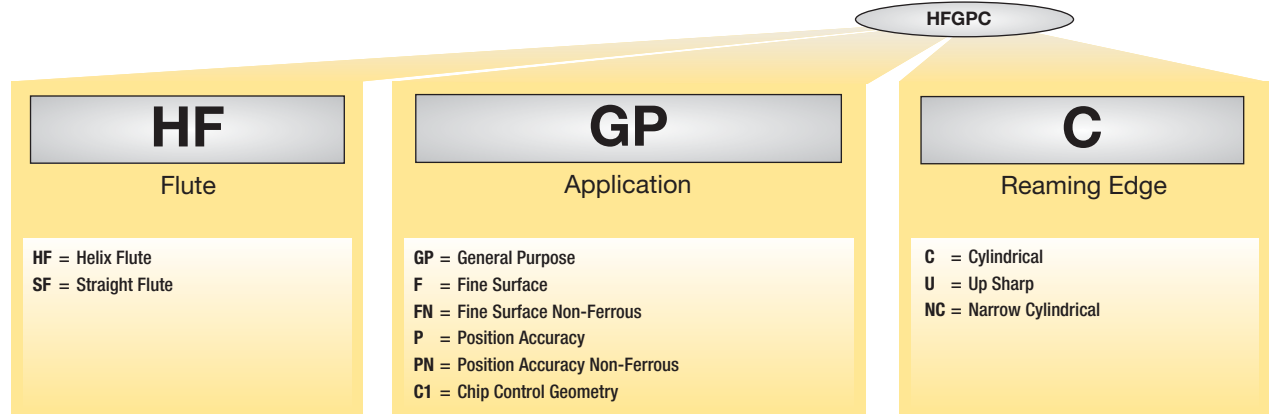
Double Lead

Double lead designs are available as engineered solutions and enable higher surface quality and feed rates in general. Lead dimensions require customization regarding the material to be machined for best machining results.

Lead Design Overview

General Purpose	Surface Finish		Hole Position
<p>HFGP</p> <p>SFGP</p>	<p>HFF</p> <p>SFF</p>	<p>HFFN</p> <p>SFFN</p>	<p>SFP</p> <p>SFPN</p>

Lead Nomenclature



General Purpose

workpiece material	hole type	surface requirement	recommended geometry	design	recommended grade
P steel	through	IT 7, Ra <0.8 steel	HFGP	C	KT325 and KT6215 (Ra < 0.8), KC6305 (Ra <1.6)
	blind		SFGP		
K cast iron	through	It 7, Ra <1.6 CI	HFGP	C	KT325 and KT6215 (Ra < 0.8), KC6305 (Ra <1.6)
	blind		SFGP		
M stainless steel	through	IT 7, Ra <1.0	HFGP	C	KC6305
	blind		SFGP		
S high-temp alloys	through	IT 7, Ra <0.6	HFGP	U	KC6305
	blind		SFGP		
N non-ferrous	through	IT 7, Ra <0.8	HFGP	C	K605, KD1415
				U	
	blind		SFGP	C	
				U	

Extra Surface Finish

workpiece material	hole type	surface requirement	recommended geometry	design	recommended grade
P steel	through	IT 7, Ra <0.8	HFFN	C	KT325 and KT6215 (Ra <0.4), KC6305 (Ra <0.8)
	blind		SFFN		
K cast iron	through	IT 7, Ra <0.8	HFFN	C	KT325 and KT6215 (Ra <0.4), KC6305 (Ra <0.8)
	blind		SFFN		
N non-ferrous	through	IT 7, Ra <0.4	HFFN	C	K605, KD1415
				U	
	blind		SFFN	C	
				U	

Additional Hole Position Accuracy

workpiece material	hole type	surface requirement	recommended geometry	design	recommended grade
P steel	through	IT 7, Ra <0.8 steel	SFP	C	KT325, KT6215, KC6305
	blind				
K cast iron	through	It 7, Ra <1.6 CI	SFP	C	KT325, KT6215, KC6305
	blind				
M stainless steel	through	IT 7, Ra <1.0	SFP	C	KC6305
	blind			NC	
S high-temp alloys	through	IT 7, Ra <0.6	SFP	U	KC6305
	blind				
N non-ferrous	through	Ra <0.8	SFP	C	K605, KD1415
	blind			U	
	through	Ra <0.4	SFPN	C	
	blind			U	

Extra Chip Control

workpiece material	hole type	surface requirement	recommended geometry	design	recommended grade
P steel (long chipping)	blind	Ra 0.4–1.6	SFC1	C	KT325, KT6215, KC6305
				U	

Hole Finishing



RIQ™ Quattro Cut™ and RIR™ Padded Reamers

Primary Application

Master the highest precision reaming applications with standard inserts in almost all materials with two unique systems available: RIR for small diameter and RIQ for easy setup in larger diameters.

The RIQ reamers are available starting at diameter 16mm with four edges for lowest cost per hole. They contain a proprietary pocket seat only requiring setup of the diameter, which is a huge benefit in terms of simplicity over other systems that require the diameter and back taper to be adjusted simultaneously. The RIR padded reamers are also proprietary and are available starting at diameter 6mm with two edges.

Features and Benefits

Higher Productivity and Profitability

- Higher tool life with Kennametal grades.
- User friendly — RIQ padded reamers reduce setup time.
- Make use of four full edges even in PCD or PCBN when using RIQ inserts.



Complete Insert Portfolio

- Large offering of available lead geometries — E13, EDS, EGU, EKS, radius, and taper inserts.
- Large offering of grades — coated and uncoated carbide, cermet, PCBN, and PCD.

Customization

- All RIQ tooling is engineered according to your specific needs in diameters .630–13.780" (16–350mm) with internal coolant.
- All RIR tooling is engineered according to your specific needs in diameters .237–13.780" (6–350mm) with internal coolant.
- RIR taper reamer for cone-shaped holes is available on request.
- Multiflute and step reaming applications and special blade shapes are available upon request.
- Necessary measuring and adjustment equipment is available as standard.



Application recommendation	RIR	RIQ
	<p>Bore tolerances less than 10 µm (can be greater). Geometric tolerancing down to 2 µm. Skilled workforce experience required. Multidiameter bore possible but less stability during end face machining.</p> 	<p>Bore tolerances less than 10 µm. Geometric tolerancing down to 2 µm. Lower skilled workforce, easier adjustment. Multidiameter bores. Blind bore end face machining, greater stability of insert.</p> 
Pocket seat	Flat with clamping groove in blade.	Serrated. Greater insert stability.
Cutting edges	2 (1 with PCD or CBN and 1 within diameter range 6–8mm [0.236–0.315"])	4 (Including PCD, CBN, and cermet)
Special blade forms	yes	yes
Multiple insets on diameter	no	yes
Blade adjustment	Diameter and back taper.	Diameter only, back taper preset.
Blade adjusting screws	2	1
Number of insert sizes	5	3
Chamfer or seat machining	Possible, but adjustment required on length and angle.	Yes. Angle preset into body. Minimal adjustment for length.
General comments	Requires end users to be familiar with adjusting single blade reamers. High accuracy for single or multiple diameters.	Requires end users not to be familiar with typical adjusting single blade padded reamers. Complex multidiameter bores with chamfers and leads between bores. Multidiameter for high accuracy and higher productivity (feed rate).



Micro-Finishing Tool



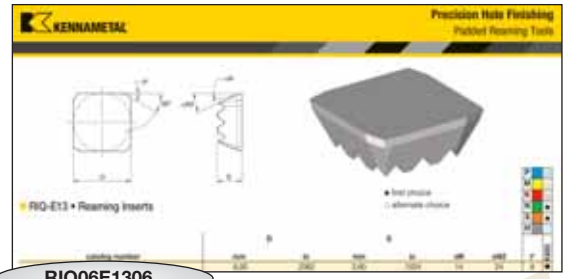
Valve Seat Tool



Tool for Differential Housing

Blade Identification System

The RIR and RIQ blade part numbers are made up of 10 numbers selected from 5 categories. The first three digits indicate the reamer type, the next two digits are determined by reamer size, and the balance of the numbers allow specific blade configurations and grades.



RIQ

Type

RIR = Reamer Insert Rectangular
RIQ = Reamer Insert Quattro Cut™

06

Size

Blade Size		
Ø [mm]	RIQ	
16,0–24,99	06	6,0 x 6,0mm
Valve Seat	B7	6,5 x 6,5mm
Valve Seat	07	7,0 x 7,0mm
>25	09	9,0 x 9,0mm
>25	12	12,0 x 12,0mm
Ø [mm]	RIR	
6,0–7,99	A0	10,5 x 2,50mm
8,0–10,99	01	15,0 x 2,80mm
11,0–13,99	02	18,0 x 4,00mm
14,0–17,99	03	20,0 x 4,76mm
18,0–45,99	04	27,0 x 5,56mm
>46	05	27,0 x 6,75mm
Taper Reamer	T4	45,0 x 5,56mm

E13

Lead

Cutting Lead

06

Rake

Rake Angle

00

06

12

K605

Grade

Grade	
Carbide uncoated	K605
Carbide TiN	KC6005
Carbide TiCN	KC6105
Carbide TiAlN	KC6305
Cermet uncoated	KT325
Cermet TiCN	KT6115
Cermet TiAlN	KT6215
PCD	KD1415
CBN	KB1610

E30

E13

E06

EKS

EDS

Blade Size	0	1	2	3	4
Lead Length	.75	.85	1.0	1.1	1.2

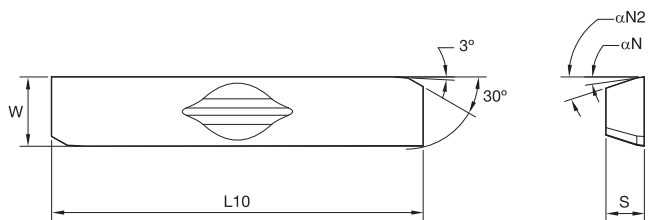
EGS

Blade Size	0	1	2	3	4
Lead Length	.25	.35	.50	.60	.70

S — Special Blade

R — Radius Blade





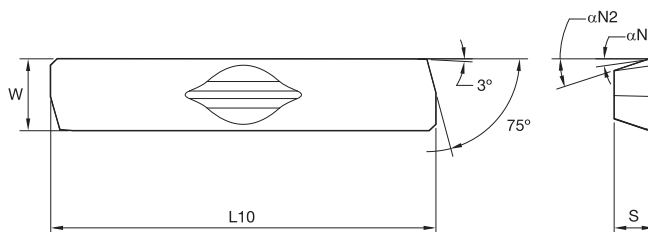
● first choice
○ alternate choice

P	●	○	○	○	○
M	○	○	○	○	○
K	○	○	○	○	○
N	○	○	○	○	○
S	○	○	○	○	○
H	○	○	○	○	○

■ RIR-E13 • Reaming Inserts

catalog number	L10		S		W		αN	αN2	γ°	K605	KC6005	KC6105	KC6305
	mm	in	mm	in	mm	in							
RIR00E1300	10,50	.4130	1,15	.0450	2,00	.0790	10	25	—	●	○	○	○
RIRA0E1300	10,50	.4130	1,15	.0450	2,44	.0960	10	27	—	●	○	○	○
RIR01E1312	15,00	.5910	1,53	.0600	2,80	.1100	8	18	12	●	●	●	●
RIR01E1300	15,00	.5910	1,55	.0610	2,80	.1100	8	18	—	●	●	●	●
RIR02E1312	18,00	.7090	1,93	.0760	4,00	.1575	8	18	12	●	●	●	●
RIR02E1300	18,00	.7090	1,95	.0770	4,00	.1575	8	18	—	●	●	●	●
RIR03E1312	20,00	.7870	2,33	.0920	4,76	.1870	8	18	12	●	●	●	●
RIR03E1300	20,00	.7870	2,35	.0930	4,76	.1870	8	18	—	●	●	●	●
RIR04E1312	27,00	1.0630	3,13	.1230	5,56	.2190	8	18	12	●	●	●	●
RIR04E1300	27,00	1.0630	3,15	.1240	5,56	.2190	8	18	—	●	●	●	●
RIR05E1300	27,00	1.0630	3,15	.1240	6,75	.2660	8	18	—	●	○	○	○

Hole Finishing



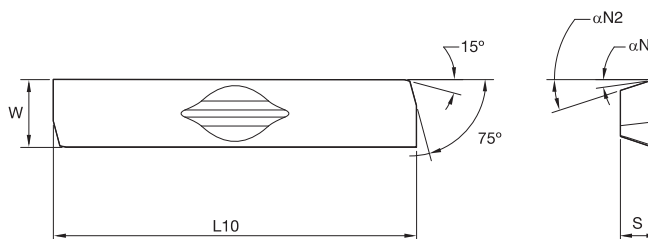
● first choice
○ alternate choice

P	○	○	○	○	○
M	○	○	○	○	○
K	○	○	○	○	○
N	○	○	○	○	○
S	○	○	○	○	○
H	○	○	○	○	○

■ RIR-EDS • Reaming Inserts

catalog number	L10		S		W		αN	αN2	γ°	K605	KC6005	KC6105	KD1415
	mm	in	mm	in	mm	in							
RIR01EDS12	15,00	.5910	1,53	.0600	2,80	.1100	8	18	12	●	●	●	○
RIR01EDS00	15,00	.5910	1,55	.0610	2,80	.1100	8	18	—	○	○	○	○
RIR02EDS12	18,00	.7090	1,93	.0760	4,00	.1575	8	18	12	●	●	●	○
RIR02EDS06	18,00	.7090	1,95	.0768	4,00	.1575	8	18	6	○	○	○	○
RIR03EDS12	20,00	.7870	2,33	.0920	4,76	.1870	8	18	12	●	●	●	○
RIR03EDS06	20,00	.7870	2,35	.0925	4,76	.1870	8	18	6	○	○	○	○
RIR04EDS12	27,00	1.0630	3,13	.1230	5,56	.2190	8	18	12	●	●	●	○
RIR04EDS06	27,00	1.0630	3,15	.1240	5,56	.2190	8	18	6	○	○	○	○

NOTE: All KD1415™ inserts are single tipped except full face at size RIR01.

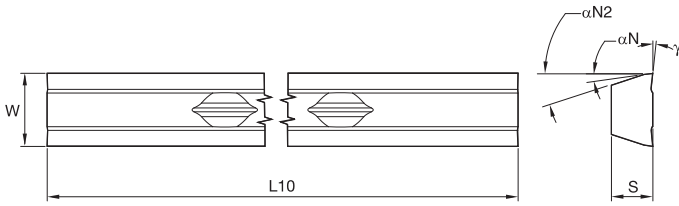


● first choice
○ alternate choice

P	○	○	○	○	○
M	○	○	○	○	○
K	○	○	○	○	○
N	○	○	○	○	○
S	○	○	○	○	○
H	○	○	○	○	○

■ RIR-EGU • Reaming Inserts

catalog number	L10		S		W		αN	αN2	γ°	KC6105
	mm	in	mm	in	mm	in				
RIR01EGU00	15,00	.5910	1,55	.0610	2,80	.1100	8	18	—	○
RIR02EGU00	18,00	.7090	1,95	.0770	4,00	.1575	8	18	—	○
RIR03EGU00	20,00	.7870	2,35	.0930	4,76	.1870	8	18	—	○
RIR04EGU00	27,00	1.0630	3,15	.1240	5,56	.2190	8	18	—	○
RIR05EGU00	27,00	1.0630	3,15	.1240	6,75	.2660	8	18	—	○



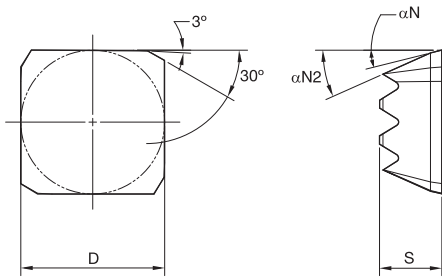
● first choice
○ alternate choice

P	●
M	○
K	●
N	○
S	○
H	○

RIR-C45 • Reaming Inserts

catalog number	L10		S		W		αN	αN2	γ°	KC6005
	mm	in	mm	in	mm	in				
RIRT4C4506	45,00	1.7720	3,15	.1240	5,56	.2190	8	18	6	●
RIRT4C4512	45,00	1.7720	3,15	.1240	5,56	.2190	8	18	12	●

NOTE: For use with taper reamer bodies.

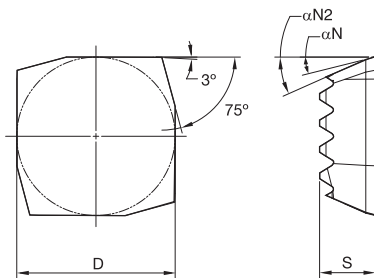


● first choice
○ alternate choice

P	○
M	○
K	○
N	●
S	●
H	○

RIQ-E13 • Reaming Inserts

catalog number	D		S		αN	αN2	γ°	K605
	mm	in	mm	in				
RIQ06E1306	6,00	.2362	2,60	.1024	14	24	6	●
RIQ09E1306	9,00	.3543	3,15	.1240	14	24	6	●
RIQ12E1306	12,00	.4724	3,70	.1457	14	18	6	●



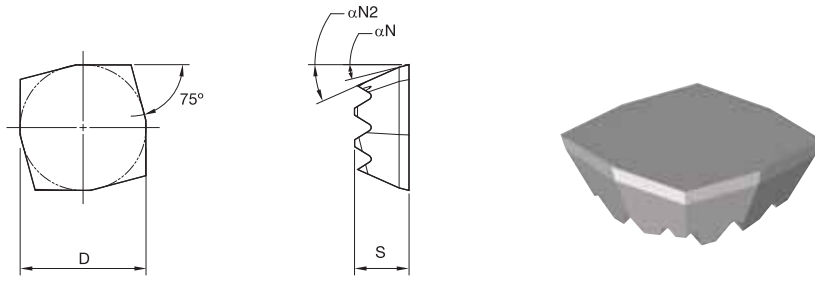
● first choice
○ alternate choice

P	○	○	○	○
M	○	○	○	○
K	○	○	○	○
N	○	○	○	○
S	○	○	○	○
H	○	○	○	○

RIQ-EDS • Reaming Inserts

catalog number	D		S		αN	αN2	γ°	K605	KC6005	KC6105	KD1415
	mm	in	mm	in							
RIQ06EDS06	6,00	.2362	2,60	.1024	14	24	6	●	○	○	○
RIQ06EDS12	6,00	.2362	2,60	.1024	20	30	12	●	○	○	○
RIQ09EDS06	9,00	.3543	3,15	.1240	14	24	6	●	○	○	○
RIQ09EDS12	9,00	.3543	3,15	.1240	20	30	12	●	○	○	○
RIQ12EDS06	12,00	.4724	3,70	.1457	14	18	6	●	○	○	○
RIQ12EDS12	12,00	.4724	3,70	.1457	20	24	12	●	○	○	○

NOTE: All KD1415™ inserts are full face.



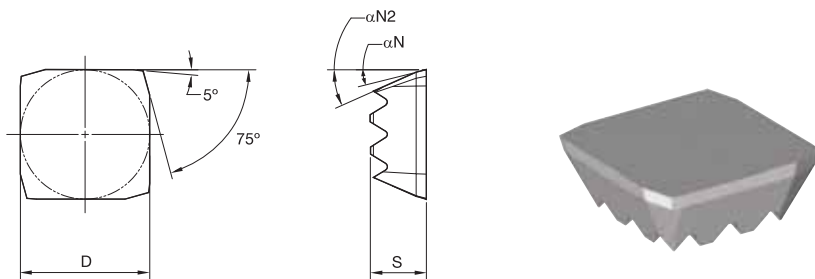
● first choice
○ alternate choice

P	●	○
M	●	○
K	●	○
N	●	○
S	●	○
H	●	○

■ RIQ-EGS • Reaming Inserts

catalog number	D		S		αN	$\alpha N2$	γ°	K605
	mm	in	mm	in				
RIQ06EGS06	6,00	.2362	2,60	.1024	14	24	6	●
RIQ09EGS06	9,00	.3543	3,15	.1240	14	24	6	●
RIQ12EGS06	12,00	.4724	3,70	.1457	14	18	6	●

Hole Finishing

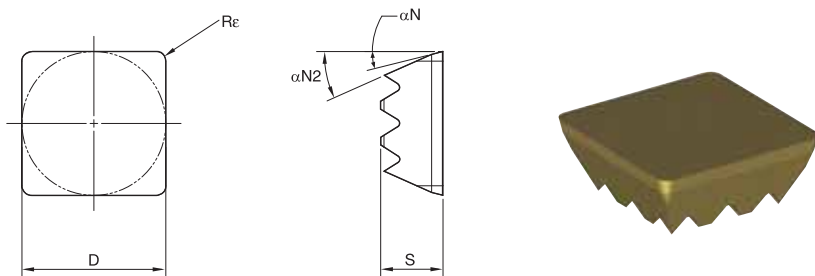


● first choice
○ alternate choice

P	●	○
M	●	○
K	●	○
N	●	○
S	●	○
H	●	○

■ RIQ-EKS • Reaming Inserts

catalog number	D		S		αN	$\alpha N2$	γ°	K605
	mm	in	mm	in				
RIQ06EKS06	6,00	.2362	2,60	.1024	14	24	6	●
RIQ09EKS06	9,00	.3543	3,15	.1240	14	24	6	●
RIQ12EKS06	12,00	.4724	3,70	.1457	14	18	6	●



● first choice
○ alternate choice

P	●	○
M	●	○
K	●	○
N	●	○
S	●	○
H	●	○

■ RIQ-R04 • Reaming Inserts

catalog number	D		S		Re		αN	$\alpha N2$	γ°	KT325	KB1610
	mm	in	mm	in	mm	in					
RIQ06R0406	6,00	.2362	2,60	.1024	0,40	.0160	14	24	6	●	●
RIQ09R0400T	9,00	.354	3,15	.1240	0,40	.0160	8	18	—	●	●
RIQ09R0406	9,00	.3543	3,15	.1240	0,40	.0160	14	24	6	●	●
RIQ12R0406	12,00	.4724	3,70	.1457	0,40	.0160	14	18	6	●	●

■ RIR™/RIQ™

Material Group	Grade	Cutting Speed – vc			Hole Types							
		Range – m/min			Metric							
		min	Starting Value	max	Type	Recommended Feed Rate per Tooth						
						1, 3	1, 3	2, 4	1, 3, 5	1, 3, 5	1, 3, 5	
				E13	E30	E06	EDS	EGS	EGU			
P	1	KC6005	30	60	100	mm/r	0,10 - 0,30	0,10 - 0,40	0,10 - 0,20	—	—	—
	2	KC6005	20	50	90	mm/r	0,10 - 0,30	0,10 - 0,40	0,10 - 0,20	—	—	—
	3	KC6005	20	40	80	mm/r	0,05 - 0,25	0,10 - 0,30	0,10 - 0,20	—	—	—
	4	KC6105	15	30	50	mm/r	0,05 - 0,25	0,10 - 0,30	0,05 - 0,20	—	—	—
	4	KC6105	10	25	40	mm/r	0,05 - 0,20	—	0,05 - 0,20	—	—	—
	6	KC6105	10	25	40	mm/r	0,05 - 0,20	—	0,05 - 0,20	—	—	—
M	1	KC6305	10	25	40	mm/r	0,05 - 0,20	0,10 - 0,25	0,05 - 0,20	—	—	—
	2	KC6305	10	25	40	mm/r	0,05 - 0,20	0,10 - 0,25	0,05 - 0,20	—	—	—
	3	KC6305	10	25	40	mm/r	0,05 - 0,20	—	0,05 - 0,20	—	—	—
K	1	KC6005	20	70	100	mm/r	0,09 - 0,17	0,11 - 0,19	0,12 - 0,21	0,15 - 0,31	0,18 - 0,35	0,20 - 0,39
	2	KC6305	20	60	100	mm/r	0,09 - 0,15	0,11 - 0,18	0,12 - 0,21	0,15 - 0,26	0,18 - 0,30	0,20 - 0,39
	3	KC6305	20	60	100	mm/r	0,07 - 0,13	0,09 - 0,16	0,11 - 0,19	0,13 - 0,23	0,15 - 0,27	0,17 - 0,30
N	1	K605	50	100	250	mm/r	0,10 - 0,40	—	0,10 - 0,25	0,05 - 0,25	0,05 - 0,20	—
	2	K605	50	100	250	mm/r	0,10 - 0,40	—	0,10 - 0,25	0,15 - 0,25	0,05 - 0,20	—
	3	K605	50	100	250	mm/r	0,10 - 0,40	—	0,10 - 0,25	0,15 - 0,25	0,05 - 0,20	—
	4	K605	50	100	250	mm/r	upon request	—	upon request	upon request	upon request	—
	5	K605	50	100	250	mm/r	0,10 - 0,40	—	0,10 - 0,20	0,10 - 0,20	0,05 - 0,15	—
S	1	KC6305	10	25	40	mm/r	0,10 - 0,40	—	0,10 - 0,20	0,15 - 0,25	—	—
	2	KC6305	10	25	40	mm/r	0,10 - 0,40	—	0,10 - 0,20	0,15 - 0,25	—	—
	3	K605	20	20	20	mm/r	0,20 - 0,25	—	0,20 - 0,20	0,10 - 0,20	—	—
	4	K605	20	20	20	mm/r	0,20 - 0,25	—	0,20 - 0,20	0,10 - 0,20	—	—
H	1	KB1610	40	50	80	mm/r	0,20 - 0,25	—	0,10 - 0,20	—	—	—

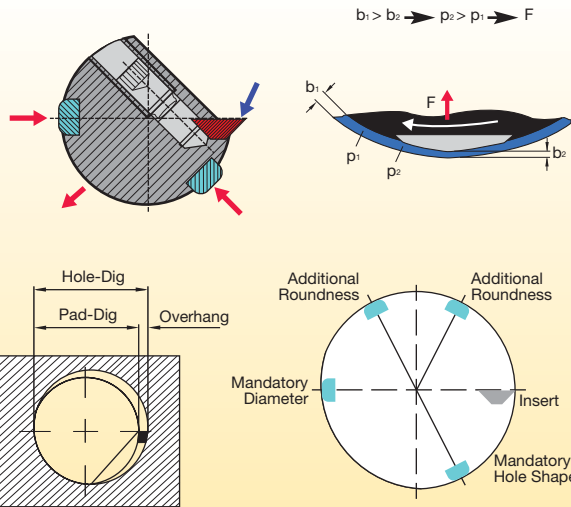


Material Group	Grade	Cutting Speed – vc			Hole Types							
		Range – SFM			Inch							
		min	Starting Value	max	Type	Recommended Feed Rate per Tooth						
						1, 3	1, 3	2, 4	1, 3, 5	1, 3, 5	1, 3, 5	
				E13	E30	E06	EDS	EGS	EGU			
P	1	KC6005	98	197	328	IPR	.004 - .012	.004 - .016	.004 - .008	—	—	—
	2	KC6005	66	164	295	IPR	.004 - .012	.004 - .016	.004 - .008	—	—	—
	3	KC6005	66	131	262	IPR	.002 - .010	.004 - .012	.004 - .008	—	—	—
	4	KC6105	49	98	164	IPR	.002 - .010	.004 - .012	.004 - .008	—	—	—
	4	KC6105	33	82	131	IPR	.002 - .008	—	.002 - .008	—	—	—
	6	KC6105	33	82	131	IPR	.002 - .008	—	.002 - .008	—	—	—
M	1	KC6305	33	82	131	IPR	.002 - .008	.004 - .010	.002 - .008	—	—	—
	2	KC6305	33	82	131	IPR	.002 - .008	.004 - .010	.002 - .008	—	—	—
	3	KC6305	33	82	131	IPR	.002 - .008	—	.002 - .008	—	—	—
K	1	KC6005	66	230	328	IPR	.004 - .007	.004 - .007	.005 - .008	.006 - .012	.007 - .014	.008 - .015
	2	KC6305	66	197	328	IPR	.004 - .006	.004 - .007	.005 - .008	.006 - .010	.007 - .012	.008 - .013
	3	KC6305	66	197	328	IPR	.003 - .005	.004 - .006	.004 - .007	.005 - .009	.006 - .010	.007 - .012
N	1	K605	164	328	820	IPR	.004 - .016	—	.004 - .010	.006 - .010	.002 - .008	—
	2	K605	164	328	820	IPR	.004 - .016	—	.004 - .010	.006 - .010	.002 - .008	—
	3	K605	164	328	820	IPR	.004 - .016	—	.004 - .010	.006 - .010	.002 - .008	—
	4	K605	164	328	820	IPR	upon request	—	upon request	upon request	upon request	—
	5	K605	164	328	820	IPR	.004 - .016	—	.004 - .008	.004 - .008	.002 - .006	—
S	1	KC6305	33	82	131	IPR	.004 - .016	—	.004 - .008	.006 - .010	—	—
	2	KC6305	33	82	131	IPR	.004 - .016	—	.004 - .008	.006 - .010	—	—
	3	K605	66	66	66	IPR	.008 - .010	—	.008 - .008	.004 - .008	—	—
	4	K605	66	66	66	IPR	.008 - .010	—	.008 - .008	.004 - .008	—	—
H	1	KB1610	131	164	262	IPR	.008 - .010	—	.004 - .008	—	—	—

Basic Principle

Kennametal's padded reaming tools follow two basic rules. The result, perfectly cylindrical bores with exceptional straightness and superior surface finishes combined with a bore diameter tolerance held to microns:

1. A SINGLE-POINT BORING TOOL SUPPORTED BY BEARING PADS, FLOATING ON A COOLANT FILM.
2. A TOOL MUST DEFLECT ONTO THE PADS, ON ENTERING THE HOLE, IN ORDER TO OBTAIN THE CORRECT SIZE.



Each padded reamer hosts a selection of guide pads that are positioned to resist the cutting forces created during machining. A minimum of two guide pads are necessary guiding the reamer in the predrilled hole.

The lubricant, in the form of coolant, gets between the pad and component surface, resulting in frictionless stability during cutting.

Guide pads are ground slightly smaller than the targeted diameter to machine a certain overhang between guide pads and insert cutting edge necessary for the machining process. Most common is a 10 µm overhang but can vary depending on the material to be cut.

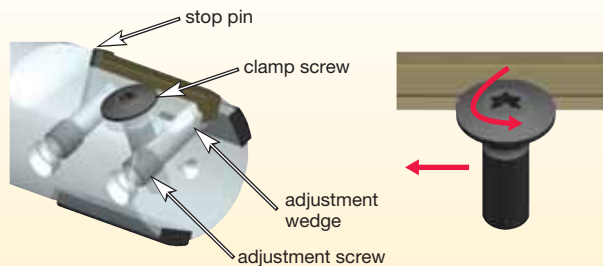
As padded reamers are specifically ground, relative to diameter and tolerance, guide pads are not flexible or adjustable. The pad below the insert ensures hole roundness while the pad opposite to the insert defines the bore diameter. Each further pad improves the roundness, straightness, and bridges over interruptions in the bore area.

These carbide, cermet, PCD, and ceramic guide pads are selected and brazed or bonded to the body depending on coolant availability/type and abrasiveness of the material to be cut. Especially with high L/D ratio tooling (e.g., cam and crank boring bars), bonding of guide pads offers higher precision due to less thermal influence to the steel base body.

● first choice ○ alternate choice

material	P	M	K	N	S	H	MQL
carbide	●	○	●	●		○	
cermet	●	○	●			○	
ceramic			●		●		
PCD			○		●		●

RIR Clamping



RIR reaming inserts are clamped by a single screw to avoid weakening of the pocket seat against common clamping wedges. This clamp screw has a left-hand thread to securely move the insert axially towards the stop pin until the insert aligns there. The stop pin ensures correct advancement of cutting insert to guiding pad.

Like other types of padded reamers using rectangular reaming inserts, two adjustment screws and wedges are required to adjust diameter and back taper accurately. Therefore, RIR is the preferred solution for diameters below RIQ range.

RIQ Clamping



There is no need to adjust back taper as this is already predefined by the serrations. Only the overhang of the cutting edge, relative to the guide pads, needs to be adjusted.

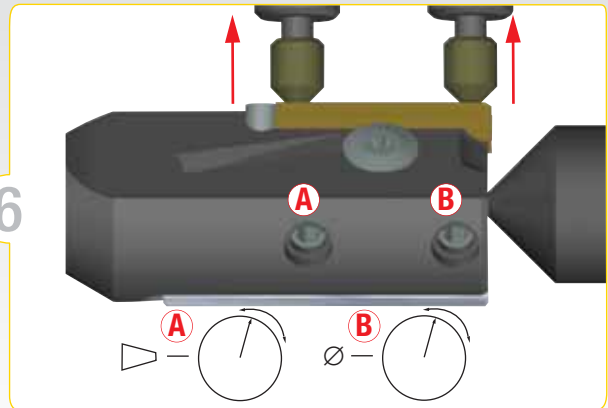
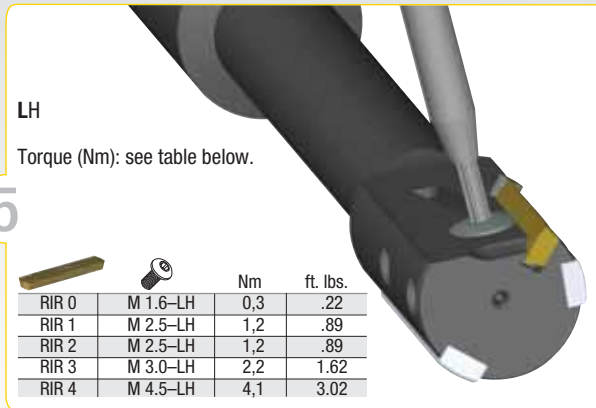
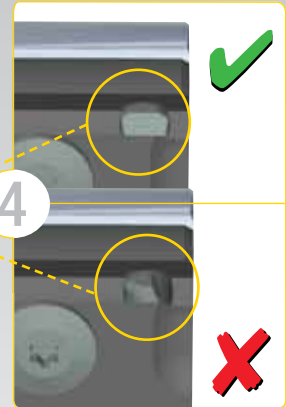
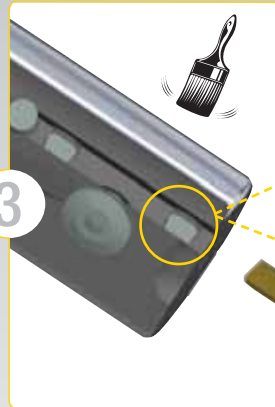
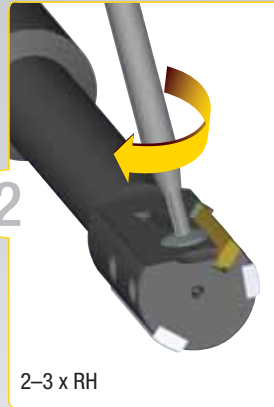
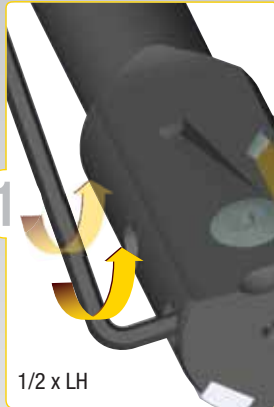
The right-hand clamp screw locks the insert securely onto the high-precision serration. The three cutting edges that are not in use are completely covered by the body while not touching them. All four cutting edges of full-face CBN and PCD inserts can be completely used without the danger of accidentally losing one of them.

Adjustment Wedge and Screw

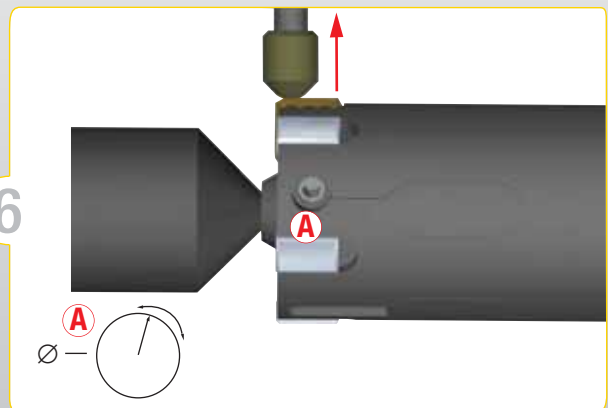
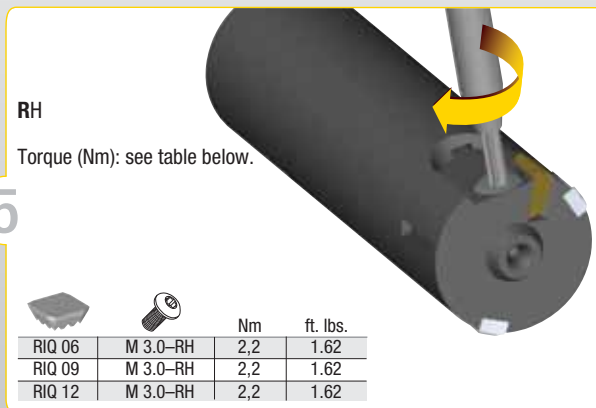
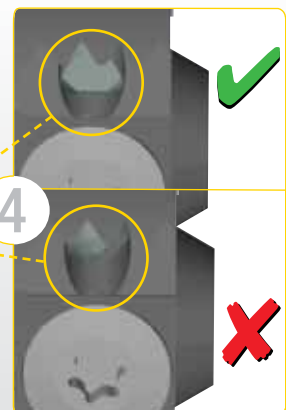
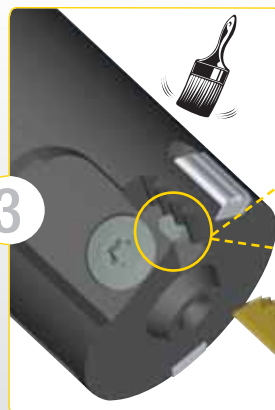
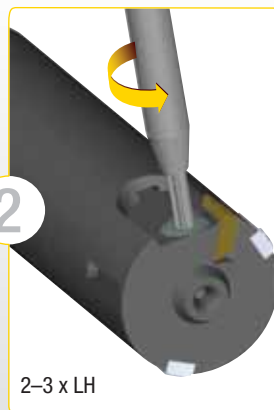
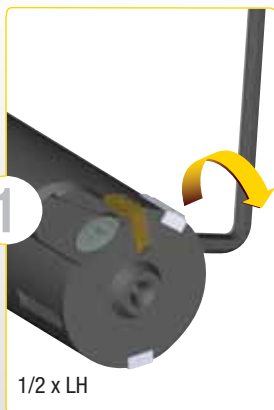


The proprietary adjustment wedge prevents any unpredictable rotation. This avoids errors during setup that cause tool damages.

RIR Tooling Setup



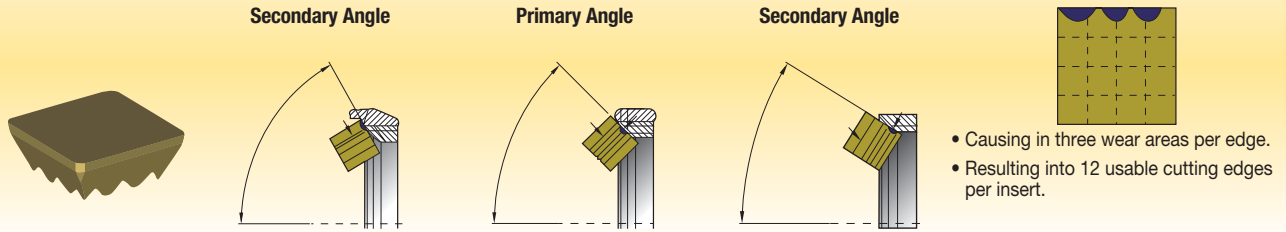
RIQ Tooling Setup



Hole Finishing

Valve Seat Tools • RIQ™ Quattro Cut™ Based Tooling

RIQ technology enables bypassing any angular adjustment of the insert and provides up to 12 cutting edges.



Valve Seat Tools • Machining Center Solutions

RIQ valve seat tooling with integrated hydraulic chuck to clamp multiflute RMS™ or RIR™ guide pad reamer.

Machining Center • Integrated Hydraulic Chuck

RMS Multiflute Reamer

for regular runout accuracy of valve seat to value guide demands



RIR Guide Pad Reamer

for highest runout accuracy of valve seat to value guide demands



Machining Center Process • All Angles Formed to Finish Specifications in TWO PASSES

Process A (Preferred)

Tool 1 • Semi-Finish:

- Finish of secondary angles.
- Semi-finish of primary angles.
- Create pilot bore (short version of RMS or RIR reamer).

Tool 2 • Finish:

- Finish of primary angles.
- Finish of guide bore (short version of RMS or RIR reamer).

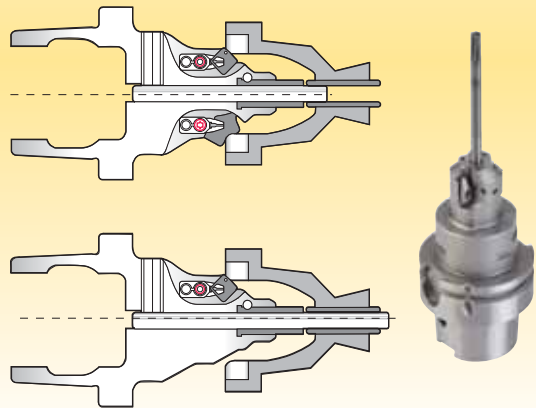
Process B (Alternate)

Tool 1 • Finish Valve Seat:

- Finish of primary and secondary angles.
- Create pilot bore (short version of RMS or RIR reamer).

Tool 2 • Finish Valve Guide:

- Finish of guide bore (short version of RMS or RIR reamer).



Valve Seat Tools • Transfer Line Solutions

RIQ valve seat tooling with carbide bushing guiding RMS or RIR reamer machining the valve guide on transfer lines.

Transfer Line • Integrated Carbide Bushing

Multiflute Reamer RMS

for regular runout accuracy of valve seat to value guide demands



RIR Guide Pad Reamer

for highest runout accuracy of valve seat to value guide demands



Transfer Line Process • All Angles Formed to Finish Specifications in ONE PASS

Process A (Preferred)

Tool 1 • Semi-Finish:

- Semi-finish of secondary angles.
- Semi-finish of primary angles.

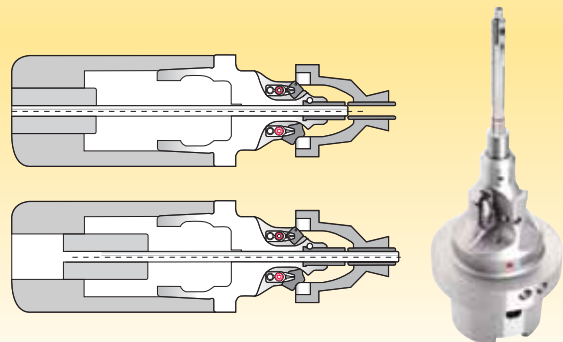
Tool 2 • Finish:

- Finish of primary angles.
- Finish of secondary angles.
- Finish of guide bore with feed out multiflute or guide pad reamer (squirt-through type).

Process B (Alternate)

Tool 1 • Semi-Finish and Finish Combined:

- Finish of primary and secondary seat angles.
- Finish of guide bore with feed out multiflute or guide pad reamer (squirt-through type).



Application Sheet for Hole Finishing

Sales Eng.:	Sheet:
Q-Number:	Date:
Customer:	Contact person:
Location:	Fax number/e-mail:

Quotation Processing *Only* with Workpiece Drawing and Filled Out Form

Mandatory Fields

Workpiece material:	Hardness/ tensile strength:	(N/mm ² , HRC, etc.)
Number of holes/year:		
Tool: <input type="checkbox"/> Rotating <input type="checkbox"/> Stationary	Spindle connection: (HSK80A, CV50, BT40, etc.)	
Spindle orientation: <input type="checkbox"/> Horizontal <input type="checkbox"/> Vertical	Tool int. interface: <input type="checkbox"/> No <input type="checkbox"/> SIF <input type="checkbox"/> SIF+HydCh <input type="checkbox"/> SIF+HSK	
Machine situation: <input type="checkbox"/> Rigid <input type="checkbox"/> Weak		
Machine type: <input type="checkbox"/> Machining center <input type="checkbox"/> Transfer line <input type="checkbox"/> Special purpose machine <input type="checkbox"/> Lathe		
Coolant supply: <input type="checkbox"/> Internal <input type="checkbox"/> External <input type="checkbox"/> No	Coolant concentrate: %	
Coolant flow: gal/min	Coolant pressure: psi	
Coolant type: <input type="checkbox"/> Soluble <input type="checkbox"/> Semisynthetic <input type="checkbox"/> Synthetic <input type="checkbox"/> MQL		

Hole Finishing

Mandatory Fields if not Defined in the Workpiece Drawing

Nominal hole diameter:	Surface finish:	(N/mm ² , HRC, etc.)
Hole tolerance: in (H7, ±0,01, etc.)	Hole type: <input type="checkbox"/> Blind <input type="checkbox"/> Through	
Tolerance target: <input type="checkbox"/> Upper third	Interrupted cut: <input type="checkbox"/> Yes <input type="checkbox"/> No	
<input type="checkbox"/> Middle third	Facing included: <input type="checkbox"/> Yes <input type="checkbox"/> No	
<input type="checkbox"/> Lower third	Maximum lead length: in	
CpK-value:	Radial stock: in	
Straightness: in	Taper: in	
Roundness:	Cylindricity: in	
Concentricity: in	Position: in	

Additional Information

Similar tool:	Required feed rate: IFR
Required tool life: in	Required speed: SFM
Required CPP: \$/hole	Required cycle time: sec

Additional information: (e.g., step tool diameters, interferences, weight, or dimensional restrictions, customer reason for change, etc.)

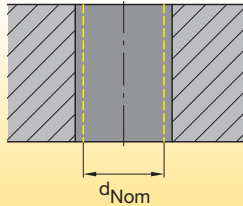
Reaming Allowances for Multi-Blade Reaming

		reaming allowance					
mm	in	mm			in		
		min	middle	max	min	middle	max
1,40–4,80	.055–.189	0,08	0,12	0,20	.003	.005	.008
4,81–9,59	.189–.378	0,10	0,15	0,25	.004	.006	.010
9,60–15,00	.378–.591	0,15	0,20	0,30	.006	.008	.012
15,00–20,00	.591–.787	0,15	0,25	0,35	.006	.010	.014
20,00–50,00	.787–1.969	0,20	0,30	0,40	.008	.012	.016

Causes of and Remedies for Reaming Problems

problem

Drill diameter too large



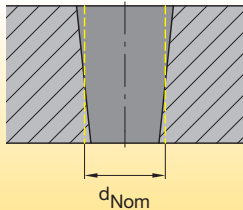
cause

1. Reaming tool running out-of-center.
2. Concentricity of pilot hole and ream machining unsatisfactory.
3. Built-up edge.
4. Unsuitable cooling lubricant.
5. Reaming tool Ø too large.

possible remedy

- Use SIF™ equalizing adapter.
- Re-align, use floating head.
- Change cooling lubricant.
- Change cutting speed.
- Measure reamers and send for repairs.

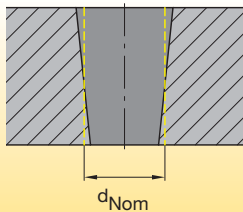
Drill diameter too small



1. Reamer worn.
2. Unsuitable cooling lubricant.
3. Reaming allowance too small.

- Replace and refit tool.
- Change cooling lubricant.
- Increase reaming allowance.

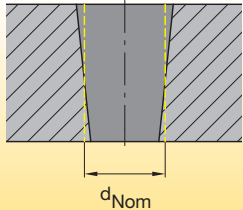
Conical drill profile wider towards drill runout



1. Concentricity of pilot hole and reaming unsatisfactory.
2. Positioning accuracy of pilot hole to reaming.

- Re-align, use SIF equalizing adapter.
- Correct positioning accuracy.

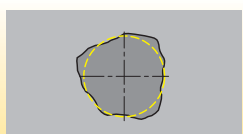
Conical drill profile wider at drill entry point



1. Concentricity of pilot hole and reaming unsatisfactory.
2. Reaming tool skim cutting with ledger.

- Re-align, use floating head.
- Securely clamp reaming tool axially.

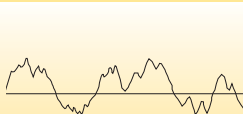
Hole out-of-center and/or showing chatter marks



1. Reaming tool running out-of-center.
2. Slanted cutting surface/asymmetrical cutting.
3. Workpiece twisted.

- Use SIF equalizing adapter.
- Flatten surface before drilling or reaming.
- Take the direction of impact into account when clamping the workpiece.

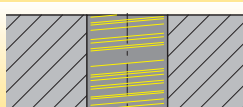
Surface quality does not meet specification



1. Tool cutters worn.
2. Reaming tool running out-of-center.
3. Incorrect technology data (cutting parameters).
4. Inadequate chip evacuation.

- Replace and refit tool.
- Use SIF equalizing adapter.
- Change cutting parameters in machining range.
- Optimize coolant supply; increase coolant pressure and volume.

Feed grooves



1. Built-up edge.

- Change cooling lubricant.
- Change cutting speed.

Hole Finishing

SIF™ Steerable Toolholder

Primary Application

SIF Steerable Toolholders should be used for easy compensation of radial runout and angular inaccuracies caused by the machine spindle or gravity. SIF tooling improves hole roundness for highest possible hole straightness and surface quality. Runout-optimized reaming tools provide higher process stability and longer tool life.

Use a separate SIF tooling package for each machine to ensure best configuration between reaming tool and spindle and HSK bushes for faster tool change to avoid repeating adjustments.

Features and Benefits

Higher Productivity and Profitability

- Easy compensation of radial runout and angular inaccuracies increases process control and tool life.
- Less time-consuming adjustment due to eight radial screws.
- Increase stability due to fewer interfaces by use of RIQ™ Quattro Cut™, RIR™, and RHM™ reaming tooling with SIF backend.

Versatility

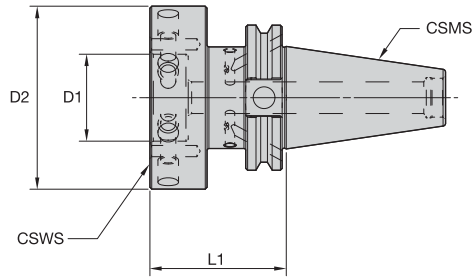
- Standard DV, BT, CV, and HSK adapters can be used in combination with SIF hydraulic chucks for most precise concentric clamping, highest accuracy, and flexible clamping method using hydraulic chuck sleeves.
- HSK bushes with SIF coupling enables fast tool exchange and eliminates the need for repeated runout adjustment, reducing downtime.

Customization

- Different length versions and coupling size combinations are available.

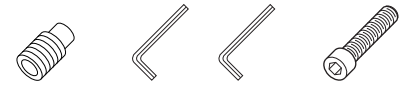


- Through-the-toolholder coolant capability — form AD or form B.
- Suitable for SIF adapters.



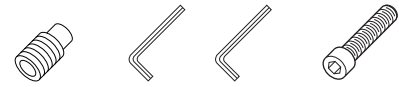
■ SIF-CV40 Form B/AD

order number	catalog number	CSMS system size	CSWS system size	D2	D1		L1		dog-point set screw	hex wrench	hex wrench	socket-head cap screw	kg	lbs
					mm	in	mm	in						
3738505	CV40BSIF80248	CV40	SIF80	80	38	1.496	63	2.480	121.812	170.004	170.005	125.625	1,77	3.900



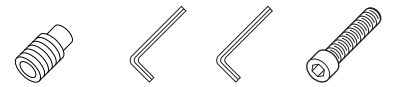
■ SIF-CV50 Form B/AD

order number	catalog number	CSMS system size	CSWS system size	D2	D1		L1		dog-point set screw	hex wrench	hex wrench	socket-head cap screw	kg	lbs
					mm	in	mm	in						
3738506	CV50BSIF70236	CV50	SIF70	70	38	1.496	60	2.362	121.808	170.004	170.005	125.625	3,58	7.880
3738507	CV50BSIF100236	CV50	SIF100	100	58	2.283	60	2.362	121.812	170.004	170.006	125.825	4,14	9.140



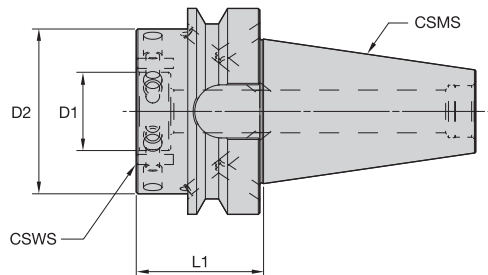
■ SIF-BT40 Form B/AD

order number	catalog number	CSMS system size	CSWS system size	D2	D1		L1		dog-point set screw	hex wrench	hex wrench	socket-head cap screw	kg	lbs
					mm	in	mm	in						
3738492	BT40BSIF80063M	BT40	SIF80	80	38	1.496	63	2.480	121.812	170.004	170.005	125.625	1,86	4.110



Form	Image	Image	Image	Image	Image
Form AD					
Form B				40	(2x) MS2221S, 2,5mm
				50	(2x) MS1296S, 3mm

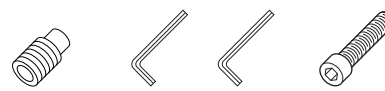
- Through-the-toolholder coolant capability — form AD or form B.
- Suitable for SIF adapters.



▶ **SIF-BT50 Form B/AD**

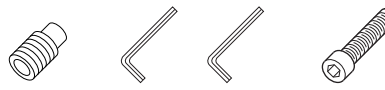
Hole Finishing

order number	catalog number	CSMS system size	CSWS system size	D2	D1		L1		dog-point set screw	hex wrench	hex wrench	socket-head cap screw	kg	lbs
					mm	in	mm	in						
3738503	BT50BSIF70063M	BT50	SIF70	70	38	1.496	63	2.480	121.808	170.004	170.005	125.625	4,08	9.000
3738504	BT50BSIF100068M	BT50	SIF100	100	58	2.283	68	2.677	121.812	170.004	170.006	125.825	4,94	10.890



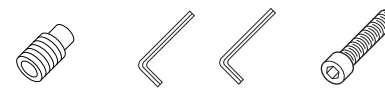
▶ **SIF-DV40 Form B/AD**

order number	catalog number	CSMS system size	CSWS system size	D2	D1		L1		dog-point set screw	hex wrench	hex wrench	socket-head cap screw	kg	lbs
					mm	in	mm	in						
3738488	DV40BSIF80061M	DV40	SIF80	80	38	1.496	61	2.402	121.812	170.004	170.005	125.625	1,83	4.020



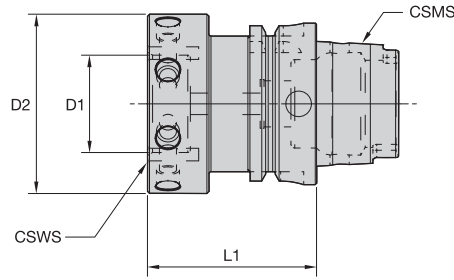
▶ **SIF-DV50 Form B/AD**

order number	catalog number	CSMS system size	CSWS system size	D2	D1		L1		dog-point set screw	hex wrench	hex wrench	socket-head cap screw	kg	lbs
					mm	in	mm	in						
3738490	DV50BSIF70060M	DV50	SIF70	70	38	1.496	60	2.362	121.808	170.004	170.005	125.625	3,60	7.930
3738491	DV50BSIF100060M	DV50	SIF100	100	58	2.283	60	2.362	121.812	170.004	170.006	125.825	4,30	9.480



	Form AD					
	Form B					
				40	(2x) MS2221S	2,5mm
				50	(2x) MS1296S	3mm

- Through-the-toolholder coolant capability.
- Suitable for SIF adapters.



■ SIF-HSK63 Form A

order number	catalog number	CSMS system size	CSWS system size	D2	D1		L1		dog-point set screw	hex wrench	hex wrench	socket-head cap screw	kg	lbs
					mm	in	mm	in						
3738508	HSK63ASIF70066M	HSK63A	SIF70	70	38	1.496	66	2.598	121.808	170.004	170.005	125.625	1,44	3.180
3878347	HSK63ASIF80063M	HSK63A	SIF80	80	38	1.496	63	2.480	—	170.004	170.005	125.625	1,50	3.320

NOTE: HSK coolant unit and wrench are available and must be ordered separately.



■ SIF-HSK80 Form A

order number	catalog number	CSMS system size	CSWS system size	D2	D1		L1		dog-point set screw	hex wrench	hex wrench	socket-head cap screw	kg	lbs
					mm	in	mm	in						
3738510	HSK80ASIF70066M	HSK80A	SIF70	70	38	1.496	66	2.598	121.808	170.004	170.005	125.625	2,05	4.520

NOTE: HSK coolant unit and wrench are available and must be ordered separately.



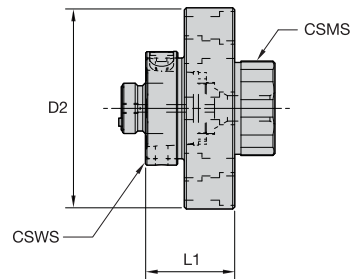
■ SIF-HSK100 Form A

order number	catalog number	CSMS system size	CSWS system size	D2	D1		L1		dog-point set screw	hex wrench	hex wrench	socket-head cap screw	kg	lbs
					mm	in	mm	in						
3738511	HSK100ASIF70050M	HSK100A	SIF70	70	38	1.496	50	1.969	121.808	170.004	170.005	125.625	2,43	5.360
3738512	HSK100ASIF100070M	HSK100A	SIF100	100	58	2.283	70	2.756	121.812	170.004	170.006	125.825	3,84	8.460

NOTE: HSK coolant unit and wrench are available and must be ordered separately.



- Through-the-toolholder coolant capability.
- Suitable for SIF adapters.



■ HSK • SIF80

Hole Finishing

order number	catalog number	CSMS system size	CSWS system size	D2	L1
3755429	SIF80HSK32032M	SIF80	HSK32	32	32
3755430	SIF80HSK40035M	SIF80	HSK40	40	35
3755431	SIF80HSK50040M	SIF80	HSK50	50	40

NOTE: HSK coolant unit and wrench are available and must be ordered separately.
IMPORTANT: Do not overtorque actuation screw. Use torque recommendations above.
Supplied with actuation mechanism and sealing ring.

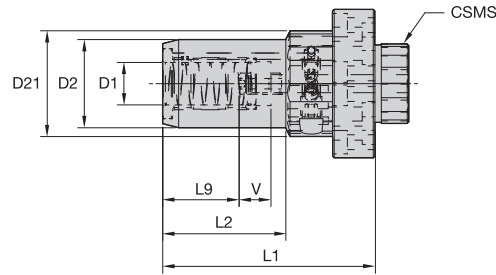


■ HSK • SIF100

order number	catalog number	CSMS system size	CSWS system size	D2	L1
3755432	SIF100HSK32032M	SIF100	HSK32	32	32
3755453	SIF100HSK40035M	SIF100	HSK40	40	35
3755454	SIF100HSK50040M	SIF100	HSK50	50	40
3755455	SIF100HSK63055M	SIF100	HSK63	63	55

NOTE: HSK coolant unit and wrench are available and must be ordered separately.
IMPORTANT: Do not overtorque actuation screw. Use torque recommendations above.
Supplied with actuation mechanism and sealing ring.

- Runout <0,003mm (.0001").
- External side actuation adjustment stop, giving 10mm (3/8") axial adjustment.



■ HC HP Line • SIF70

order number	catalog number	CSMS system size	D1	D2	D21	L1	L2	L9	V	hex wrench	T-handle hex wrench	kg	lbs
3667056	SIF70HC12090M	SIF70	12	32	44	90	45	36	10	170.002	170.135	1,13	2.49
3667057	SIF70HC20100M	SIF70	20	42	44	100	58	41	10	170.003	170.135	1,35	2.98

NOTE: HSK coolant unit and wrench are available and must be ordered separately.
 IMPORTANT: Do not overtorque clamp screw. Use supplied wrench and tighten by hand until stop is felt.



Hole Finishing

■ HC HP Line • SIF80

order number	catalog number	CSMS system size	D1	D2	D21	L1	L2	L9	V	hex wrench	T-handle hex wrench	kg	lbs
3667058	SIF80HC12090M	SIF80	12	32	50	90	45	36	10	170.002	170.135	9,00	19.84
3667059	SIF80HC20100M	SIF80	20	42	50	100	58	41	10	170.003	170.135	1,60	3.53
3667060	SIF80HC25100M	SIF80	25	50	54	100	51	47	10	170.003	170.136	1,83	4.03

NOTE: HSK coolant unit and wrench are available and must be ordered separately.
 IMPORTANT: Do not overtorque clamp screw. Use supplied wrench and tighten by hand until stop is felt.



■ HC HP Line • SIF100

order number	catalog number	CSMS system size	D1	D2	D21	L1	L2	L9	V	hex wrench	T-handle hex wrench	kg	lbs
3667061	SIF100HC12090M	SIF100	12	32	50	90	45	36	10	170.002	170.135	1,98	4.37
3667062	SIF100HC20100M	SIF100	20	42	50	100	58	41	10	170.003	170.135	2,20	4.85
3668023	SIF100HC25100M	SIF100	25	50	63	100	51	47	10	170.004	170.136	2,56	5.64

NOTE: HSK coolant unit and wrench are available and must be ordered separately.
 IMPORTANT: Do not overtorque clamp screw. Use supplied wrench and tighten by hand until stop is felt.

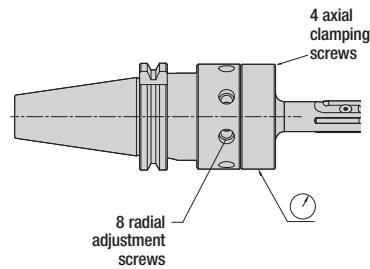


SIF Tooling Setup

Step 1: Rough setup of runout at flange

- Set gage (TIR) at SIF flange.
- Tight axial clamping screws 6–8 Nm (4.4–5.9 ft. lbs.).
- Use radial adjustment screws to achieve 5 μm (.0002") runout.

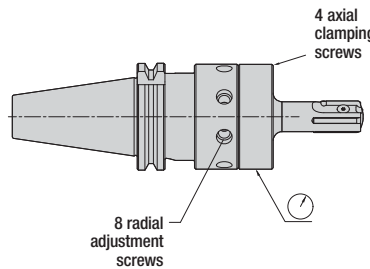
1



Step 2: Fine setup of runout at flange

- Tight axial clamping screws crosswise:
SIF70/80 18 Nm (13.3 ft. lbs.)
SIF100 32 Nm (23.6 ft. lbs.)
- Use radial adjustment screws to achieve 2 μm (.00008") runout.
- All radial adjustment screws to be clamped tight at 4 Nm (3.0 ft. lbs.).

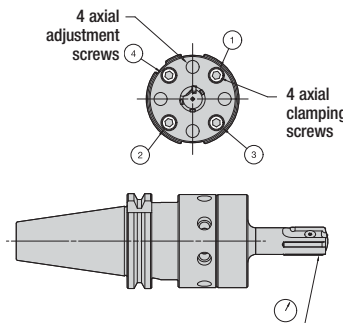
2



Step 3: Adjustment of runout at front

- Set gage (TIR) at control grind, cylindrical land, or guide pads.
- Use axial adjustment screws to achieve a maximum runout error of 2 μm (.00008").
- All axial adjustment screws to be clamped tight at 4 Nm (3.0 ft. lbs.).

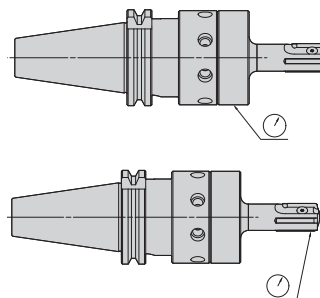
3



Step 4: Final runout check

- Check using gage (TIR) at flange; no deviation by theory.
- If needed, use radial adjustment screws to set runout below 2 μm (.00008").
- Any modification of radial setup demands an axial runout check and adjustment, if necessary.

4



PCD Customized Tooling

PCD tooling offers the highest productivity and accuracy, reduced tooling costs due to long tool life, and secure process control due to close tolerances, increasing your overall quality and reducing scrap rate and inspection costs.

Primary Application

Use Kennametal PCD tooling for machining aluminum and aluminum alloys, magnesium, copper, brass, bronze, plastics (GFRP, CFRP), MMC (Metal Matrix Composite), graphite, tungsten carbide green-stages, and ceramic. Choose from various standardized PCD product platforms for drilling, counterboring, and reaming. Steel- and solid carbide-based tool body designs are available for direct spindle coupling with or without adjustable PCD pocket seats or with steerable SIF™ backend.

Features and Benefits

Higher Productivity and Profitability

- Highest chip removal rates and less tool changes by using multistep tooling.
- Extremely long tool life even when maintaining very tight tolerances.
- Reduced built-up edge and burr formation, improved concentric hole shape with multistep tooling, and less influence on surface microstructure of the workpiece.

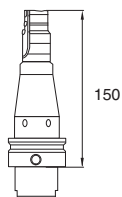
Product Platform Versatility

- All PCD drilling, counterboring, and reaming tools are engineered according to your specific needs in diameter, shape, radii, and steps.
- Various PCD grades are available to match your specific material.
- Multistep drilling, profiling, countersinking, and reaming platforms available.
- Coolant channel design for optimized chip evacuation with regular and MQL.
- Steel-based tool body designs are available for direct spindle coupling or enable adjustable pocket seat design for highest accuracy even at larger sizes.
- Carbide-based tool bodies enable highest accuracy and tool life at high L/D ratio applications.
- Tooling designs with SIF steerable interface optimizes runout and enables highest accuracy and tool life.
- All PCD tooling is prebalanced by design. Further precision balancing is available on request.

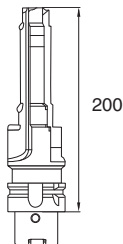


PCD Tooling Basic Design Overview

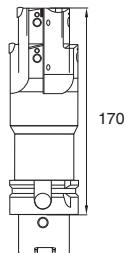
Kennametal offers you certain PCD design platforms to optimally fulfill your machining task. These basic designs are independent, whether you are drilling, countersinking, profiling, reaming, or milling. All tooling designs are capable of internal coolant, MQL coolant, and are balanced by design



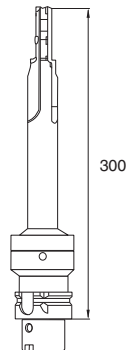
PCD .. ST —
Steel body
PCD .. SC —
Solid carbide body



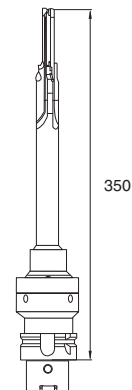
PCD .. STM —
Steel body monoblock



PCD .. STMJ —
Steel body monoblock
Ø adjustable



PCD .. STA —
Steel body with steerable
SIF™ backend



PCD .. SCA —
Solid carbide shank and
steerable SIF backend

Hole Finishing

PCDRSC02CCE

PCD

- HF** = Helix Flute
- SF** = Straight Flute

R

Technology

- D** = Drilling
- R** = Reaming
- C** = Countersinking
- E** = End milling
- F** = Face milling
- P** = Profile milling
- M** = Multioperation tool

SC

Type

- SC** = Solid carbide body
- ST** = Steel body
- STM** = Steel monoblock
- STMJ** = Steel monoblock adjustable
- STA** = Steel steerable
- SCA** = Carbide steerable

02

Teeth

- 02**
- 03**
- 04**
- ...
- 12**
- ...
- 22***

CC

Point Geometry

- RL** = Reaming lead
- CC** = Center cut
- CT** = Drill point
- CTE** = Drill point
- SW** = Drill point
- MT** = Drill point

E

Coolant

- E** = Emulsion
- M** = MQL
- A** = Air
- D** = Dry

* Exception for **Type Reamer 22** = 2 teeth + 2 additional land = 4 guiding lands.

Runout of the Spindle

Depending on spindle runout and/or higher L/D ratios

runout <= 0,005mm		runout >= 0,006mm	
	PCD-ST PCD-SC		PCD-ST or PCD-SC with hydraulic chuck and SIF shank
	PCD-STM		PCD-STA with SIF PCD-SCA with SIF

PCD Drill-Point Design Overview

CT

- PCD corner tipped.
- Carbide-based body design.
- Diameter >4,2mm (.166").



Use for general application at moderate cutting speeds up to 12 x D drilling depth.

CTE

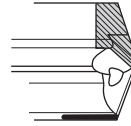
- PCD corner tipped, E point.
- Carbide-based body design.
- Diameter >4,2mm (.166").



Use at precasted holes at moderate cutting speeds up to 12 x D drilling depth.

SW

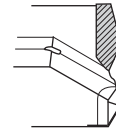
- Full-face sandwich PCD.
- Carbide-based body design.
- Diameter >5mm (.197").



Use at high cutting speeds and abrasive materials up to 5 x D drilling depth.

MT

- PCD corner tipped.
- Steel- and carbide-based body design.
- Diameter >12mm (.473").



Use for drilling casted surfaces up to 3 x D drilling depth.

Cutting Edge and Margin Land Requirements

Determine correlations between spindle to edge overhang, amount of cutting, and margin lands for guidance and increased precision.

		number of cutting edges				
		2 flutes	2 flutes	3 flutes	4 flutes	6 flutes
application/shape of bore	overhang	2 lands	2 lands	3 lands	4 lands	6 lands
	short					
	long					
	short					
	long					
	short					
	long					
	short					
	long					

First Choice

Suitable with Limitations

Not Recommended

Cutting Grade, Tooling Design

Select cutting data and tooling design based on stability and surface quality demands.

material	coolant	drilling	counterboring	reaming	milling	grade
Al <7%	MQL, emulsion	vc = 350–600 m/min	vc = 650–900 m/min	vc = 400–900 m/min	vc = 1.500–5.000 m/min	KD1415
		fz = 0,004–0,016 IPR	fz = 0,004–0,031 IPR	fz = 0,004–0,016 IPR	fz = 0,004–0,010 IPR	
Al <12%	MQL, emulsion	vc = 200–800 m/min	vc = 650–900 m/min	vc = 400–600 m/min	vc = 1.500–4.000 m/min	KD1415
		fz = 0,004–0,016 IPR	fz = 0,004–0,010 IPR	fz = 0,004–0,010 IPR	fz = 0,004–0,010 IPR	
Al >12%	emulsion	vc = 100–700 m/min	vc = 650–900 m/min	vc = 400–600 m/min	vc = 1.500–3000 m/min	KD1415
		fz = 0,004–0,012 IPR	fz = 0,004–0,010 IPR	fz = 0,004–0,010 IPR	fz = 0,004–0,010 IPR	
mg alloys	emulsion	vc = 350–1.000 m/min	vc = 650–900 m/min	vc = 400–600 m/min	vc = 1.500–6.000 m/min	KD1415
		fz = 0,004–0,016 IPR	fz = 0,004–0,010 IPR	fz = 0,004–0,010 IPR	fz = 0,004–0,010 IPR	
CFRP, GFRP	dry, air	vc = 350–1.800 m/min	vc = 650–900 m/min	vc = 60–200 m/min	vc = 1.500–4.000 m/min	KD1425
		fz = 0,004–0,010 IPR	fz = 0,004–0,010 IPR	fz = 0,004–0,010 IPR	fz = 0,004–0,010 IPR	

Quick-Ship Delivery • Tooling Ranges

Please contact us if this special service is available in your region.

Hole Finishing

PCD tool		flutes ¹	chip flute length ²	cutting diameter	max steps	through coolant	step difference
	 reamer, corner tipped	2–6	max 5 x D		2	axial and radial	max 20%
	 countersinker, corner tipped	2–4	max 5 x D	.236–1.26"	3		max 40%
	 milling tool, corner tipped	1–6	max 5 x D		2		max 50%

PCD tool		flutes ¹	chip flute length ²	cutting diameter	max steps	through coolant	step difference
	 drilling tool, center cut	2	max 20 x D	.197–1.26"	3	axial and radial	max 50%
	 countersinker, center cut	2–4	max 10 x D				
	 drilling tool, center cut	2	max 12 x D	.197–.472"			

NOTE: 310mm max overall
¹ Depending on the diameter

² Based on the max diameter

Romicron™ Fine-Boring System

Primary Application

The Romicron PCD tooling portfolio has a diameter range of 4–213mm and reduces setup time and scrap rates while increasing your overall equipment efficiency. This premium fine-boring system can be used in most materials commonly found in metalcutting environments by applying the latest Kennametal Standard ISO Turning Inserts. Its closed loop boring (CLB) provides a unique possibility to automate the insert wear compensation with minimal investment due to the precise 2 µm diameter adjustment per increment. Romicron should be used where extremely close tolerances are critical to the overall process or where fast and easy diameter adjustments are needed.

Features and Benefits

Higher Productivity and Profitability

- Reduce scrap rates and setup time due to the backlash-free adjustment.
- Make use of the entire tool life of used inserts as diameter adjustment can be done inside of the machine, avoiding routine insert changes in the setup room.
- Avoid time-consuming control cuts or sister tooling.
- No training or experience is needed, resulting in less stress during adjustments.

Versatility

- Retrofit existing machines to automated wear compensation using the standard CLB pin without any electronic equipment needed besides a measuring device of holes produced.
- Use SVS00B-SVS6B prebalanced heads as the preferred solution for diameter .984–5.472" (25–139mm).
- SVUBB1 tooling for high-speed applications .157–.650" (4–16,5mm).
- Large diameter range of .236–3.937" (6–100mm) using SVUBB2 tooling.
- SVU65 and SVU92 for larger diameters of 2.79–8.386" (71–213mm).

Ease of Adjustment














- No tools are needed so adjustment can take place on the machine tool. Eliminates the need to remove and return the boring head to the presetting area providing increased productivity.
- SEE, FEEL, and HEAR the adjustment mechanism for fail-safe size control.

Customization

- Engineered solutions available for multistep or high length-to-diameter tooling.
- Anti-chatter devices and various non-standard machine spindle coupling sizes are available.



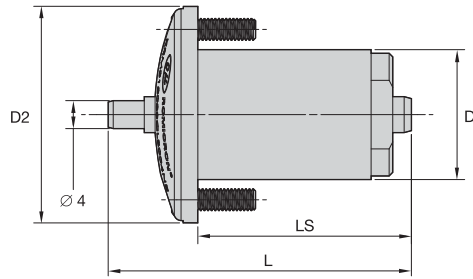
Boring range, coolant capacity, and maximum RPM features for all Romicron boring heads.

	head size	bore range	
<ul style="list-style-type: none"> • 25,000 RPM max. • Balanceable. • 1,050 psi coolant capacity. • 1,050 psi/70 bar coolant capacity. • Movable zero reference. 	SVUBB1 .157" 4mm  .650" 16,5mm		
<ul style="list-style-type: none"> • 10,000 RPM max. • Balanceable. • 1,050 psi coolant capacity. • 1,050 psi/70 bar coolant capacity. • Movable zero reference. 	SVUBB2 .236" 6mm  1.00" 25,5mm		
<ul style="list-style-type: none"> • 10,000 RPM. • Prebalanced. • 1,050 psi/70 bar coolant capacity. 	SVS00B .984" 25mm  1.26" 32mm		
<ul style="list-style-type: none"> • 8,000 RPM. • Prebalanced. • 1,050 psi/70 bar coolant capacity. 	SVS0B 1.24" 31,5mm  1.67" 42,5mm		
Hole Finishing	<ul style="list-style-type: none"> • 6,000 RPM. • Prebalanced. • 225 psi/15 bar coolant capacity. 	SVS1B 1.65" 42mm  2.08" 53mm	
	<ul style="list-style-type: none"> • 6,000 RPM. • Prebalanced. • 225 psi/15 bar coolant capacity. 	SVS2B 2.04" 52mm  2.59" 66mm	
	<ul style="list-style-type: none"> • 6,000 RPM. • Prebalanced. • 225 psi/15 bar coolant capacity. 	SVS3B 2.55" 65mm  3.11" 79mm	
	<ul style="list-style-type: none"> • 4,500 RPM. • Prebalanced. • 300 psi/20 bar coolant capacity. 	SVS4B 3.07" 78mm  3.85" 98mm	
	<ul style="list-style-type: none"> • 4,500 RPM. • Prebalanced. • 300 psi/20 bar coolant capacity. 	SVS5B 3.81" 97mm  4.60" 117mm	
	<ul style="list-style-type: none"> • 3,500 RPM. • Prebalanced. • 300 psi/20 bar coolant capacity. 	SVS6B 4.56" 116mm  5.47" 139mm	
<ul style="list-style-type: none"> • 6,000 RPM. • Balanceable. • 300 psi/20 bar coolant capacity. • Movable zero reference. 	SVU65 2.79" 71mm  4.37" 111mm		
<ul style="list-style-type: none"> • 6,000 RPM. • Balanceable. • 300 psi/20 bar coolant capacity. • Movable zero reference. 	SVU92 3.97" 101mm  8.38" 213mm		
<ul style="list-style-type: none"> • 6,000 RPM max. • Balanceable. • 300 psi/20 bar coolant capacity. • Movable zero reference. 	SVU120 5.47" 139mm  12.83" 326mm		

range		order number	catalog number	content	img	
mm	in					
4,00–16,50	.1575–.6496	4046076	SVUBB1KR32KIT	KR32SVUBB1060M KRBB10FADRS102C KRBB10SCLDRS4060C KRBB10SCFPR06085C KRBB10SCFPR06110C KRBB10SCFPR06135C		
6,00–25,50	.2362–1.0040	4046077	SVUBB2KR32KITD025M	KR32SVUBB2085M KRBB16SCLDRS4060A KRBB16SCFPR06085A KRBB16SCFPR06110A KRBB16SCFPR06135A KRBB16SCFPR06160A KRBB16SCFPR06190A KRBB16SCFPR06220A		
6,00–25,50	.2362–1.0040	4046078	SVUBB2KR50KITD025M	KR50SVUBB2075M KRBB16SCLDRS4060A KRBB16SCFPR06085A KRBB16SCFPR06110A KRBB16SCFPR06135A KRBB16SCFPR06160A KRBB16SCFPR06190A KRBB16SCFPR06220A		
6,00–100,00	.2362–3.9370	4052608	SVUBB2KR32KITD100M	KR32SVUBB2085M KRBB16SCLDRS4060A KRBB16SCFPR06085A KRBB16SCFPR06110A KRBB16SCFPR06135A KRBB16SCFPR06160A KRBB16SCFPR06190A KRBB16SCFPR06220A	KRDEA046AM KRDE025010M KRDE033010M KRDEA051AM KRDE043010M KRDEA012AM KRDE065012M KRCW032A	
6,00–100,00	.2362–3.9370	4052609	SVUBB2KR50KITD100M	KR50SVUBB2075M KRBB16SCLDRS4060A KRBB16SCFPR06085A KRBB16SCFPR06110A KRBB16SCFPR06135A KRBB16SCFPR06160A KRBB16SCFPR06190A KRBB16SCFPR06220A	KRDEA046AM KRDE025010M KRDE033010M KRDEA051AM KRDE043010M KRDEA012AM KRDE065012M KRCW032A	
25,00–32,00	.9842–1.2598	4046079	SVS00BKR32KIT	KR32SVS00B072M KRCSCFPR061L KRCSCFPR062L KRCSCFPR063L		
31,50–42,50	1.2402–1.6732	4046080	SVS0BKR32KIT	KR32SVS0B093M KRCSCFPR061A KRCSCFPR062A KRCSCFPR063A		
42,00–53,00	1.6535–2.0866	4046081	SVS1BKR32KIT	KR32SVS1B076M KRCSCFPR061A KRCSCFPR062A KRCSCFPR063A		
52,00–66,00	2.0472–2.5984	4046082	SVS2BKR32KIT	KR32SVS2B085M KRCSCFPR061B KRCSCFPR062B KRCSCFPR063B		
65,00–79,00	2.5590–3.1102	4046103	SVS3BKR32KIT	KR32SVS3B085M KRCSCFPR061B KRCSCFPR062B KRCSCFPR063B		
78,00–98,00	3.0708–3.8582	4046104	SVS4BKR50KIT	KR50SVS4B094M KRCSCFPR061C KRCSCFPR062C KRCSCFPR063C		

Hole Finishing

- For use with SVU CLB (Closed Loop Boring) heads.
- Retractable CLB pin is spring loaded.

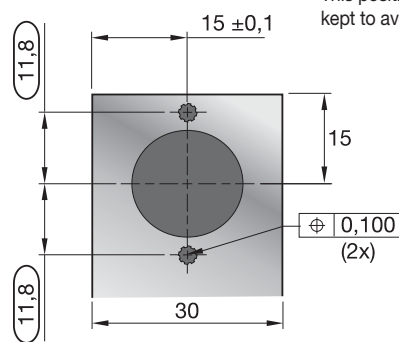
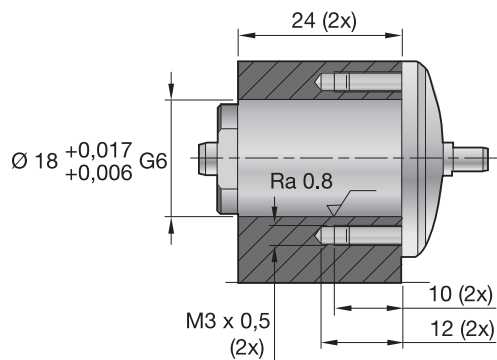


■ Romicron CLB Pin

order number	catalog number	D		D2		LS		L		kg	lbs
		mm	in	mm	in	mm	in	mm	in		
4052592	KRM018030CLB004NE	18,0	.71	30,0	1.18	29,6	1.17	42,0	1.65	0,1	.15

Hole Finishing

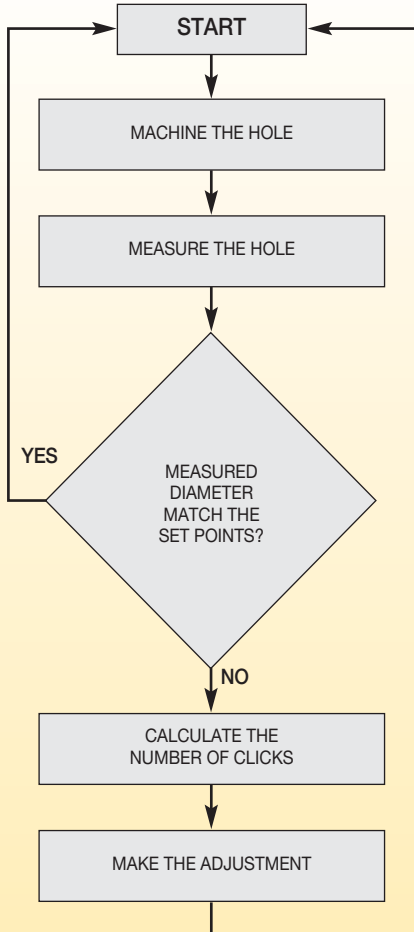
Mounting Dimensions of the Romicron CLB Pin



WARNING:
This position must be kept to avoid collisions.

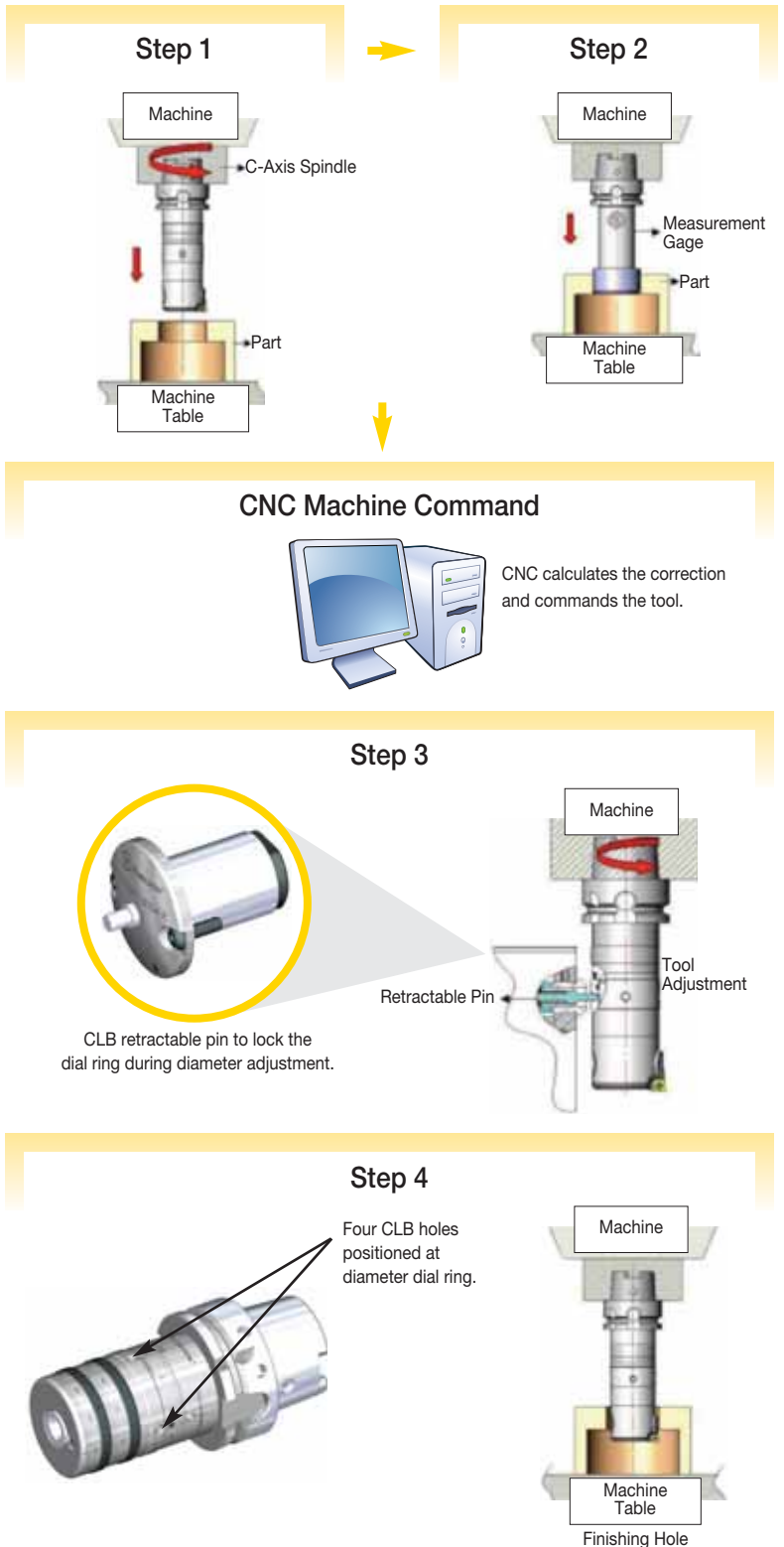
The Romicron Closed Loop Boring Process

Closed Loop Boring (CLB) provides the unique possibility to automate the insert wear compensation with minimal investment due to the precise 2 µm adjustment in diameter of these tools per increment. Retrofit existing machines to automated wear compensation using the standard CLB pin without any electronic equipment needed besides a measuring device of holes produced.



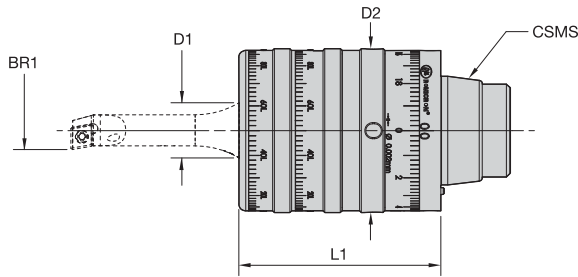
NOTE: This process is only possible with the Romicron system because it does not require tools to make the adjustment.

1. A precision system measures the holes after the machine process. The data is sent to the CNC.
2. The values are compared to the set points.
3. If the diameter is in the range of the specified set points, the machine goes to the next hole. Otherwise, the software calculates the necessary increment and automatically adjusts the Romicron using the CLB pin.



Hole Finishing

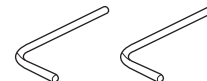
- For correct balance ring settings, see page K166.
- Order boring bar separately; see page K145.
- Order taper shank separately; see page K157.



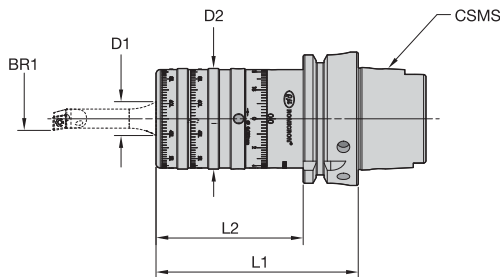
■ SVU BB1 • KR Boring Head with CLB Capability

Hole Finishing

order number	catalog number	BR1 bore range		CSMS system size	D1		D2		L1		Torx wrench	hex wrench	kg	lbs
		mm	in		mm	in	mm	in						
4054737	KR32SVUBB1060MCLB	4,000-16,500	.1575-0.6496	KR32	10,0	.39	46,5	1.83	58,6	2.31	KT8	170.000	0,94	2.07

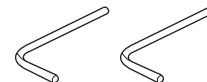


- For correct balance ring settings, see page K166.
- Order boring bar separately; see page K145.

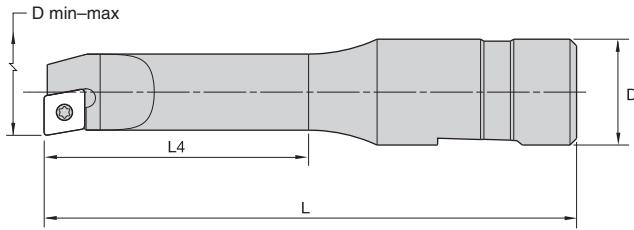
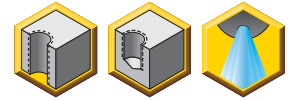


■ SVU BB1 • HSK Boring Head with CLB Capability

order number	catalog number	BR1 bore range		CSMS system size	D1		D2		L1		L2		Torx wrench	radial adjusting screw	kg	lbs
		mm	in		mm	in	mm	in	mm	in						
4054734	HSK63ASVUBB1095MCLB	4,000-16,500	.1575-0.6496	HSK63A	10,0	.39	46,5	1.83	95,5	3.76	69,4	2.73	KT15	191.282	1,45	3.20



• Order inserts separately.



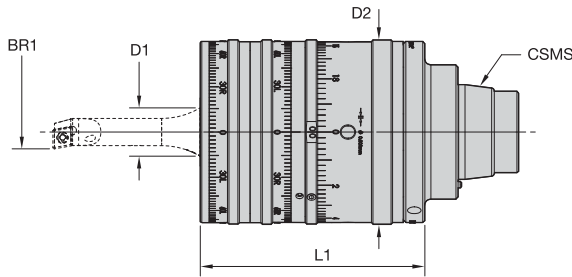
■ SVU BB1 • Universal Boring Bars

order number	catalog number	D min		D max		D		L		L4		gage insert	insert screw	Torx wrench	kg lbs	
		mm	in	mm	in	mm	in	mm	in	mm	in					
2202438	KRBB10FABDRS204C	4,00	.158	7,00	.276	10	.394	57	2.23	14	.56	—	—	—	0,05	.11
2202439	KRBB10SCLDR4060C	6,00	.236	9,00	.354	10	.394	54	2.13	22	.85	CD..S4T0../CD..1206..	MS1454	FT5	0,05	.11
2202440	KRBB10SCFPR06085C	8,50	.335	11,50	.453	10	.394	58	2.28	31	1.20	CP..0602../CP..215...	MS1153	FT7	0,08	.17
2202450	KRBB10SCFPR06110C	11,00	.433	14,00	.551	10	.394	60	2.36	33	1.28	CP..0602../CP..215...	MS1153	FT7	0,08	.18
2202451	KRBB10SCFPR06135C	13,50	.532	16,50	.650	10	.394	65	2.56	39	1.52	CP..0602../CP..215...	MS1153	FT7	0,09	.20

NOTE: Carbide shank and customized boring bars are available upon request to meet your specific requirements. Please contact Kennametal for a design and quotation.



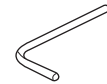
- For correct balance ring settings, see page K168.
- Order boring bar separately; see page K147.
- Order taper shank separately; see page K157.



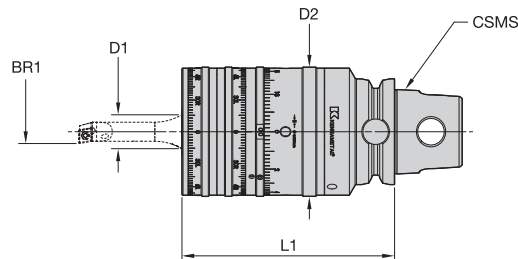
■ SVU BB2 • KR Boring Head with CLB Capability

Hole Finishing

order number	catalog number	BR1 bore range		CSMS system size	D1		D2		L1		Torx wrench	kg	lbs
		mm	in		mm	in	mm	in					
4054738	KR32SVUBB2085MCLB	6,000-25,500	.2362-1.0039	KR32	16,0	.63	60,0	2.36	85,0	3.35	KT27	1,81	3.99
4054739	KR50SVUBB2075MCLB	6,000-25,500	.2362-1.0039	KR50	16,0	.63	60,0	2.36	75,0	2.95	KT27	1,61	3.55

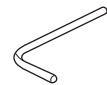


- For correct balance ring settings, see page K168.
- Order boring bar separately; see page K147.

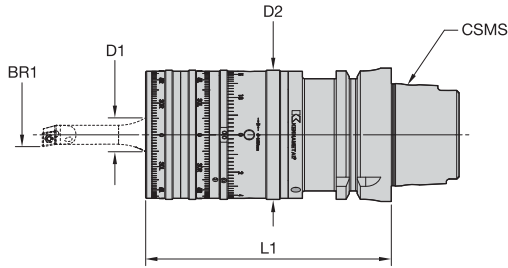


■ SVU BB2 • KM™ Boring Head with CLB Capability

order number	catalog number	BR1 bore range		CSMS system size	D1		D2		L1		Torx wrench	kg	lbs
		mm	in		mm	in	mm	in					
4054736	KM50TSSVUBB2100MCLB	6,000-25,500	.2362-1.0039	KM50TS	16,0	.63	60,0	2.36	100,0	3.94	KT27	1,91	4.21

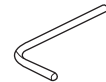


- For correct balance ring settings, see page K168.
- Order boring bar separately; see below.

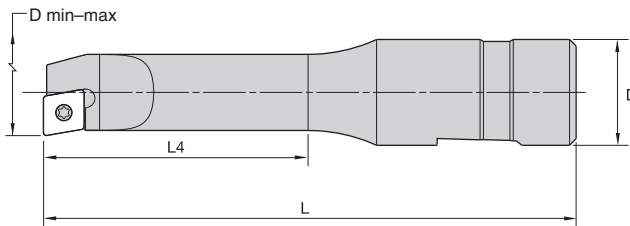
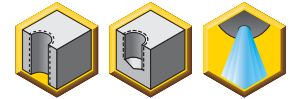


■ SVU BB2 • HSK Boring Head with CLB Capability

order number	catalog number	BR1 bore range		CSMS system size	D1		D2		L1		Torx wrench	kg	lbs
		mm	in		mm	in	mm	in					
4054735	HSK63ASVUBB2116MCLB	6,000-25,500	.2362-1.0039	HSK63A	16,0	.63	60,0	2.36	116,0	4.57	KT27	2,52	5.56
4054733	HSK100ASVUBB2124MCLB	6,000-25,500	.2362-1.0039	HSK100A	16,0	.63	60,0	2.36	124,4	4.90	KT27	4,21	9.28



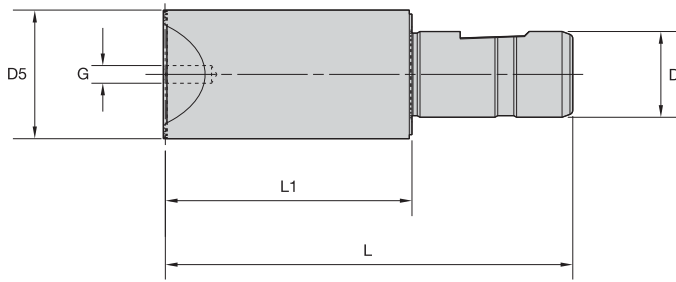
- Order inserts separately.



■ SVU BB2 • Universal Boring Bars

order number	catalog number	D min		D max		D		L		L4		gage insert	insert screw	Torx wrench	kg
		mm	in	mm	in	mm	in	mm	in	mm	in				
1522062	KRBB16SCLDRS406A	6,00	9,50	.236	.374	16	.63	62	2.44	20	.79	CD..S4T0../CD..1206..	MS1454	FT5	0,06
1522063	KRBB16SCFPR06085A	8,60	12,00	.339	.472	16	.63	68	2.68	26	1.02	CP..0602../CP..215...	MS1153	FT7	0,06
1522064	KRBB16SCFPR0611A	11,00	14,50	.433	.571	16	.63	78	3.07	36	1.42	CP..0602../CP..215...	MS1153	FT7	0,08
1522068	KRBB16SCFPR06135A	13,50	17,00	.532	.669	16	.63	80	3.15	40	1.57	CP..0602../CP..215...	MS1153	FT7	0,09
1522069	KRBB16SCFPR0616A	16,00	19,50	.630	.768	16	.63	90	3.54	55	2.17	CP..0602../CP..215...	MS1153	FT7	0,11
1522070	KRBB16SCFPR0619A	19,00	22,50	.748	.886	16	.63	90	3.54	60	2.36	CP..0602../CP..215...	MS1153	FT7	0,12
1522071	KRBB16SCFPR0622A	22,00	25,50	.866	1.004	16	.63	90	3.54	60	2.36	CP..0602../CP..215...	MS1153	FT7	0,15

NOTE: Carbide shank and customized boring bars are available upon request to meet your specific requirements. Please contact Kennametal for a design and quotation.

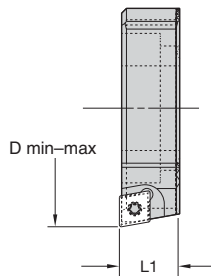


■ SVU BB2 • Universal Adapters

order number	catalog number	BR1 bore range		D		D5		G	L		L1		kg	lbs
		mm	in	mm	in	mm	in		mm	in	mm	in		
2541200	KRDEA046AM	25,500-43,500	1.0039-1.7126	16	.63	24,0	.94	M4X0.70	76,4	3.01	46,4	1.83	0,2	.50
2541201	KRDEA051AM	43,000-65,000	1.6929-2.5591	16	.63	25,0	.98	M6X1.00	81,7	3.22	51,7	2.04	0,2	.52
2541202	KRDEA012AM	65,000-100,000	2.5591-3.9371	16	.63	63,5	2.50	M8X1.25	42,5	1.67	12,5	.49	0,2	.42

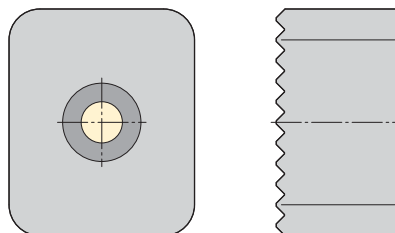
Hole Finishing

• Order inserts separately.



■ SVU BB2 • Universal Diameter Extenders

order number	catalog number	D min		D max		L1		gage insert	insert screw	Torx wrench	kg	lbs
		mm	in	mm	in	mm	in					
2541213	KRDE025010M	25,50	33,50	1.004	1.319	10,0	.39	CP..0602../CP..215...	MS1153	FT7	0,02	.04
2541214	KRDE033010M	33,50	43,50	1.319	1.713	10,0	.39	CP..0602../CP..215...	MS1153	FT7	0,02	.05
2541215	KRDE043010M	43,00	65,00	1.693	2.559	10,0	.39	CP..0602../CP..215...	MS1153	FT7	0,03	.07
2541216	KRDE065012M	65,00	100,00	2.559	3.937	12,0	.47	CP..0602../CP..215...	MS1153	FT7	0,05	.10



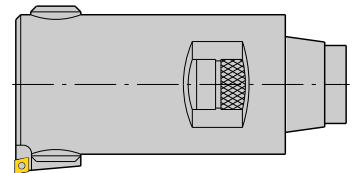
■ SVU BB2 • Counterweight

order number	catalog number	L		kg	lbs
		mm	in		
2541217	KRCW032A	12,0	.47	0,04	.08

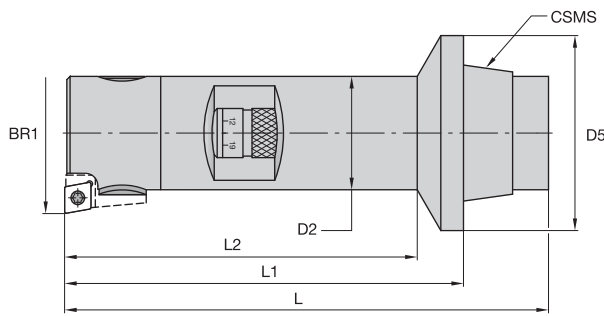
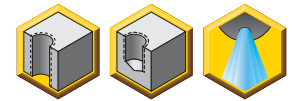
NOTE: Counterweight must be used with KRDEA012M adapter and KRDEA065012M extender.

■ SVS System • Tooling Tree

cartridge range	cartridge size	bore range	head size
.984–1.083" (25–27,5mm)	1L	.984–1.260" (25–32mm)	SVS00B
1.073–1.171" (27,25–29,75mm)	2L		
1.161–1.260" (29,5–32mm)	3L		
1.240–1.398" (31,5–35,5mm)	1A	1.240–1.673" (31,5–42,5mm)	SVS0B
1.378–1.535" (35–39mm)	2A		
1.516–1.673" (38,5–42,5mm)	3A		
1.654–1.811" (42–46mm)	1A	1.654–2.087" (42–53mm)	SVS1B
1.791–1.949" (45,5–49,5mm)	2A		
1.929–2.087" (49–53mm)	3A		
2.047–2.244" (52–57mm)	1B	2.047–2.598" (52–66mm)	SVS2B
2.224–2.421" (56,5–61,5mm)	2B		
2.402–2.598" (61–66mm)	3B		
2.559–2.756" (65–70mm)	1B	2.559–3.110" (65–79mm)	SVS3B
2.736–2.933" (69,5–74,5mm)	2B		
2.913–3.110" (74–79mm)	3B		
3.071–3.346" (78–85mm)	1C	3.017–3.858" (78–98mm)	SVS4B
3.327–3.602" (84,5–91,5mm)	2C		
3.583–3.858" (91–98mm)	3C		
3.819–4.094" (97–104mm)	1C	3.819–4.606" (97–117mm)	SVS5B
4.075–4.350" (103,5–110,5mm)	2C		
4.331–4.606" (110–117mm)	3C		
4.567–4.882" (116–124mm)	1D	4.567–5.472" (116–139mm)	SVS6B
4.862–5.177" (123,5–131,5mm)	2D		
5.157–5.472" (131–139mm)	3D		



- Order cartridges separately; see page K151.
- Order taper shank separately; see pages K157.

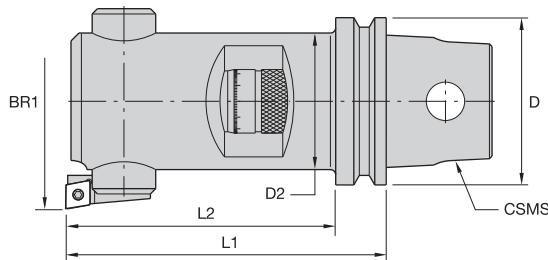
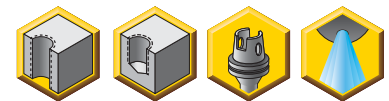


■ SVS • KR Boring Heads

Hole Finishing

order number	catalog number	BR1 bore range		CSMS system size	D2		D5		L		L1		L2		kg	lbs
		mm	in		mm	in	mm	in	mm	in	mm	in	mm	in		
1500262	KR32SVS00B072M	25,000-32,000	.9840-1.2600	KR32	23,5	.93	38,0	1.50	92,0	3.62	72,0	2.83	65,0	2.56	0,7	1.43
1501372	KR32SVS00B093M	31,500-43,500	1.2402-1.7126	KR32	30,0	1.18	47,0	1.85	113,0	4.45	93,0	3.66	85,0	3.35	0,8	1.65
1192277	KR32SVS1B076M	42,000-53,000	1.6535-2.0866	KR32	38,5	1.52	—	—	96,0	3.78	76,0	2.99	—	—	0,8	1.80
1192278	KR32SVS2B085M	52,000-66,000	2.0472-2.5984	KR32	47,0	1.85	—	—	105,0	4.13	85,0	3.48	—	—	1,2	2.60
1192279	KR32SVS3B085M	65,000-79,000	2.5591-3.1102	KR32	47,0	1.85	—	—	105,0	4.13	85,0	3.48	—	—	1,2	2.68
1192281	KR50SVS4B094M	78,000-98,000	3.0709-3.8583	KR50	65,0	2.56	—	—	119,0	4.69	94,0	3.70	—	—	2,4	5.21
1279787	KR50SVS5B094M	97,000-117,000	3.8189-4.6063	KR50	65,0	2.56	—	—	119,0	4.69	94,0	3.70	—	—	3,0	6.49
1279793	KR63SVS6B126M	116,000-139,000	4.5669-5.4724	KR63	85,0	3.35	—	—	162,0	6.38	126,0	4.96	—	—	5,7	12.63

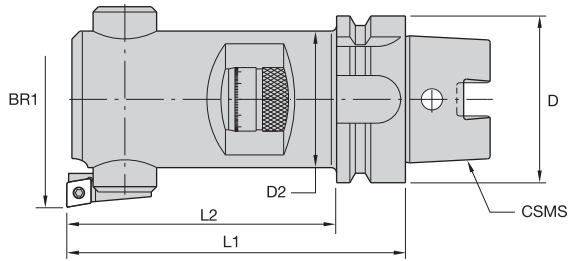
- Order cartridges separately; see page K151.



■ SVS • KM™ Boring Heads

order number	catalog number	BR1 bore range		CSMS system size	D		D2		L1		L2		kg	lbs
		mm	in		mm	in	mm	in	mm	in				
1763133	KM40SVS00B080M	25,000-32,000	.9840-1.2600	KM40	40,000	1.5748	23,5	.93	80,0	3.15	65,0	2.56	0,7	1.50
1746909	KM50SVS00B083M	25,000-32,000	.9840-1.2600	KM50	50,000	1.9685	23,5	.93	83,0	3.27	65,0	2.56	0,7	1.50
1763333	KM40SVS0B101M	31,500-42,500	1.2400-1.6730	KM40	40,000	1.5748	30,0	1.18	101,0	3.98	85,0	3.35	0,8	1.70
1763334	KM50SVS0B103M	31,500-42,500	1.2400-1.6730	KM50	50,000	1.9685	30,0	1.18	103,0	4.06	85,0	3.35	0,9	2.00
1763336	KM40SVS1B100M	42,000-53,000	1.6540-2.0870	KM40	40,000	1.5748	38,0	1.50	100,0	3.94	88,0	3.46	1,1	2.50
1763338	KM50SVS1B105M	42,000-53,000	1.6540-2.0870	KM50	50,000	1.9685	38,0	1.50	105,0	4.13	90,0	3.54	1,3	2.90
1763339	KM40SVS2B104M	52,000-66,000	2.0470-2.5980	KM40	40,000	1.5748	47,0	1.85	104,0	4.09	92,0	3.62	1,5	3.20
1746981	KM50SVS2B107M	52,000-66,000	2.0470-2.5980	KM50	50,000	1.9685	47,0	1.85	107,0	4.21	92,0	3.62	1,5	3.30
1763373	KM50SVS3B107M	65,000-79,000	2.5590-3.1100	KM50	50,000	1.9685	47,0	1.85	107,0	4.21	92,0	3.62	1,9	4.20
1763374	KM63SVS3B107M	65,000-79,000	2.5590-3.1100	KM63	63,000	2.4803	47,0	1.85	107,0	4.21	92,0	3.62	2,1	4.60
1763375	KM50SVS4B125M	78,000-98,000	3.0710-3.8580	KM50	50,000	1.9685	65,0	2.56	125,0	4.92	110,0	4.33	2,2	4.90
1763378	KM50SVS5B125M	97,000-117,000	3.8190-4.6060	KM50	50,000	1.9685	65,0	2.56	125,0	4.92	110,0	4.33	3,2	7.10
1763379	KM63SVS5B110M	97,000-117,000	3.8190-4.6060	KM63	63,000	2.4803	65,0	2.56	110,0	4.33	92,0	3.62	3,2	7.10
1763376	KM63SVS4B110M	78,000-98,000	3.0710-3.8580	KM63	63,000	2.4803	65,0	2.56	110,0	4.33	92,0	3.62	2,4	5.30
1763382	KM80SVS6B150M	116,000-139,000	4.5670-5.4720	KM80	80,000	3.1496	85,0	3.35	150,0	5.91	128,0	5.04	7,8	17.20

• Order cartridges separately.

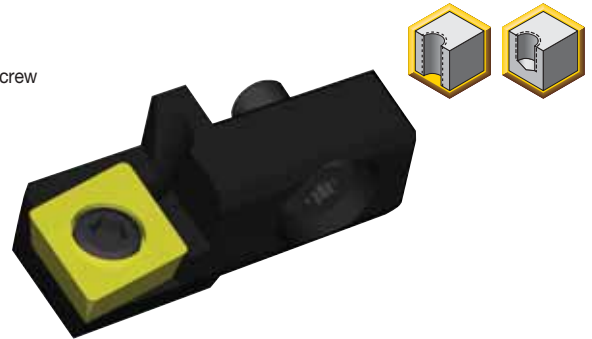
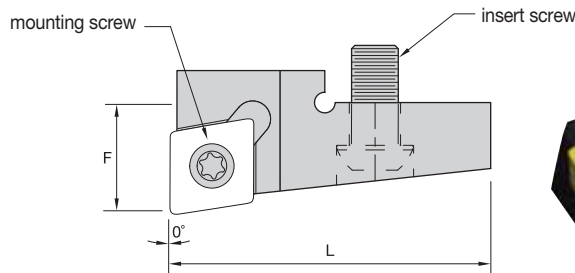


■ SVS • HSK Boring Heads

order number	catalog number	BR1 bore range		CSMS system size	D		D2		L1		L2		kg	lbs
		mm	in		mm	in	mm	in	mm	in				
1763096	HSK63ASVS00B096M	25,000-32,000	.9840-1.2600	HSK63A	63,0	2.48	23,5	.93	96,0	3.78	66,0	2.60	1,1	2.40
1763098	HSK63ASVS00B117M	31,500-42,500	1.2400-1.6730	HSK63A	63,0	2.48	30,0	1.18	117,0	4.61	88,0	3.46	1,4	3.00
1763100	HSK63ASVS1B116M	42,000-53,000	1.6540-2.0870	HSK63A	63,0	2.48	38,0	1.50	116,0	4.57	88,0	3.46	1,6	3.40
1763114	HSK63ASVS3B121M	65,000-79,000	2.5590-3.1100	HSK63A	63,0	2.48	47,0	1.85	121,0	4.76	95,0	3.74	1,9	4.10
1763112	HSK63ASVS2B121M	52,000-66,000	2.0470-2.5980	HSK63A	63,0	2.48	47,0	1.85	121,0	4.76	95,0	3.74	1,9	4.20
1763118	HSK63ASVS5B139M	97,000-117,000	3.8190-4.6060	HSK63A	63,0	2.48	65,0	2.56	139,0	5.47	113,0	4.45	5,9	13.00
1763116	HSK63ASVS4B139M	78,000-98,000	3.0710-3.8580	HSK63A	63,0	2.48	65,0	2.56	139,0	5.47	113,0	4.45	3,6	8.00



• Order inserts separately.



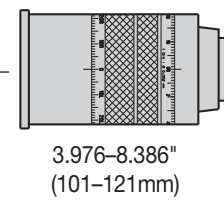
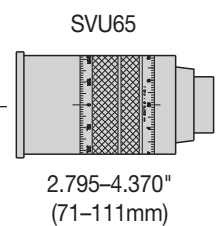
■ SVS • Cartridges SCF

order number	catalog number	L		F		gage insert	reference head	cartridge size	kg	lbs
		mm	in	mm	in					
1501356	KRCSCFPR061L	19,15	.75	4,76	.19	CP..0602../CP..215...	SVS00B	1L.	0,01	.02
1500650	KRCSCFPR062L	19,15	.75	5,90	.23	CP..0602../CP..215...	KRMSVS00M50049M,SVS00B	2L.	0,01	.02
1501357	KRCSCFPR063L	19,15	.75	7,01	.28	CP..0602../CP..215...	SVS00B	3L.	0,01	.03
1099162	KRCSCFPR061A	23,70	.93	6,45	.25	CP..0602../CP..215...	SVS1B,SVS0B	1A.	0,01	.02
1099163	KRCSCFPR062A	23,70	.93	8,20	.32	CP..0602../CP..215...	SVS1B,SVS0B	2A.	0,01	.02
1099164	KRCSCFPR063A	23,70	.93	9,95	.39	CP..0602../CP..215...	SVS1B,SVS0B	3A.	0,01	.03
1099165	KRCSCFPR061B	24,70	.97	6,45	.25	CP..0602../CP..215...	SVS3B,SVS2B	1B.	0,01	.02
1099166	KRCSCFPR062B	24,70	.97	8,70	.34	CP..0602../CP..215...	SVS3B,SVS2B	2B.	0,01	.03
1099167	KRCSCFPR063B	24,70	.97	10,95	.43	CP..0602../CP..215...	SVS3B,SVS2B	3B.	0,02	.03
1099168	KRCSCFPR061C	30,70	1.21	8,45	.33	CP..0602../CP..215...	SVS5B,SVS4B	1C.	0,02	.05
1099169	KRCSCFPR062C	30,70	1.21	11,70	.46	CP..0602../CP..215...	SVS5B,SVS4B	2C.	0,03	.06
1099170	KRCSCFPR063C	30,70	1.21	14,95	.59	CP..0602../CP..215...	SVS5B,SVS4B	3C.	0,04	.08
1099171	KRCSCFPR061D	38,70	1.52	8,45	.33	CP..0602../CP..215...	SVS8B,SVS7B,SVS6B	1D.	0,03	.07
1099172	KRCSCFPR062D	38,70	1.52	12,20	.48	CP..0602../CP..215...	SVS8B,SVS7B,SVS6B	2D.	0,05	.10
1099173	KRCSCFPR063D	38,70	1.52	15,95	.63	CP..0602../CP..215...	SVS8B,SVS7B,SVS6B	3D.	0,06	.13

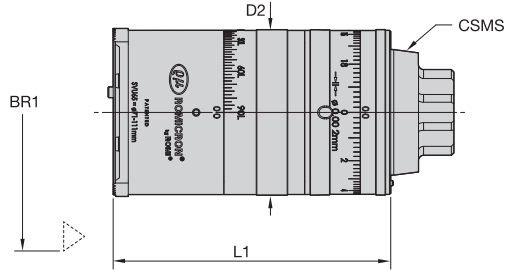
■ SVU System • Tooling Tree

Hole Finishing

cartridge range	cartridge size	bore range	head size
2.795–2.992" (71–76mm) 2.972–3.209" (75,5–81,5mm) 3.149–3.346" (80–85mm)	1E 2E 3E	2.795–3.346" (71–85mm)	070
3.307–3.504" (84–89mm) 3.484–3.681" (88,5–93,5mm) 3.661–3.858" (93–98mm)	1E 2E 3E	3.307–3.858" (84–98mm)	083
3.819–4.016" (97–102mm) 3.996–4.193" (101,5–106,5mm) 4.173–4.370" (106–111mm)	1E 2E 3E	3.819–4.370" (97–111mm)	096
3.976–4.252" (101–108mm) 4.232–4.508" (107,5–114,5mm) 4.488–4.764" (114–121mm)	1F 2F 3F	3.976–4.764" (101–121mm)	101
4.724–5.000" (120–127mm) 4.980–5.256" (126,5–133,5mm) 5.236–5.512" (133–140mm)	1F 2F 3F	4.724–5.512" (120–140mm)	120
5.472–5.748" (139–146mm) 5.728–6.004" (145,5–152,5mm) 5.984–6.260" (152–159mm)	1F 2F 3F	5.472–6.260" (139–159mm)	139
6.142–6.417" (156–163mm) 6.398–6.673" (162,5–169,5mm) 6.654–6.929" (169–176mm)	1F 2F 3F	6.142–6.929" (156–176mm)	156
6.890–7.165" (175–182mm) 7.146–7.421" (181,5–188,5mm) 7.402–7.677" (188–195mm)	1F 2F 3F	6.890–7.677" (175–195mm)	175
7.598–7.874" (193–200mm) 7.854–8.130" (199,5–206,5mm) 8.110–8.386" (206–213mm)	1F 2F 3F	7.598–8.386" (193–213mm)	193



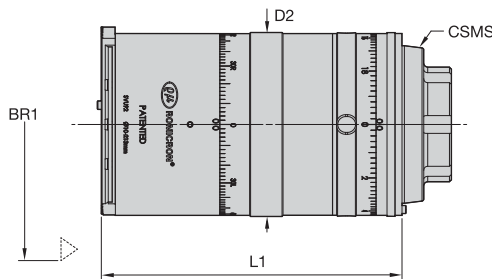
- For correct balance ring settings, see page K174.
- Order diameter extenders, cartridges, and taper shanks separately.



■ SVU65 • KR Boring Head with CLB Capability

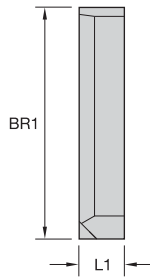
order number	catalog number	BR1 bore range		CSMS system size	D2		L1		Torx wrench	kg	lbs
		mm	in		mm	in	mm	in			
1582600	KR50SVU65110MCLB	71,000-111,000	2.7950-4.3700	KR50	65,0	2.56	110,0	4.33	KT27	2,8	6.20

- For correct balance ring settings, see page K176.
- Order diameter extenders, cartridges, and taper shanks separately.



■ SVU92 • KR Boring Head with CLB Capability

order number	catalog number	BR1 bore range		CSMS system size	D2		L1		Torx wrench	kg	lbs
		mm	in		mm	in	mm	in			
4054740	KR80SVU92152MCLB	101,000-213,000	3.9764-8.3858	KR80	92,0	3.62	152,0	5.98	KT27	7,5	16.54

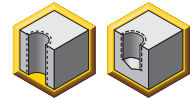
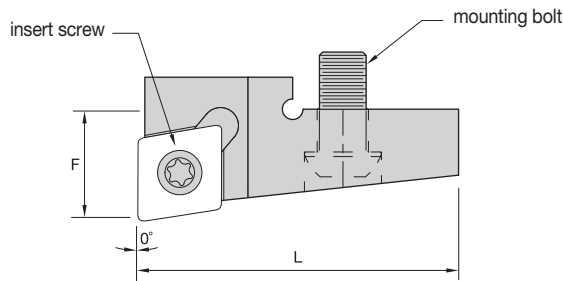


■ SVU 65/SVU 92 • Diameter Extenders

order number	catalog number	BR1 bore range		L1		kg	lbs
		mm	in	mm	in		
1279736	KRDE070019M	70,000-85,000	2.7559-3.3465	19,20	.76	0,22	.48
1279739	KRDE083019M	83,000-98,000	3.2677-3.8583	19,20	.76	0,28	.62
1279740	KRDE096019M	96,000-111,000	3.7795-4.3701	19,20	.76	0,34	.76
1279741	KRDE101023M	101,000-121,000	3.9764-4.7638	23,20	.91	0,57	1.25
1279742	KRDE120023M	120,000-140,000	4.7244-5.5118	23,20	.91	0,70	1.54
1279743	KRDE139026M	139,000-159,000	5.4724-6.2598	26,20	1.03	0,98	2.15
1279745	KRDE156026M	156,000-176,000	6.1417-6.9291	26,20	1.03	1,14	2.51
1279746	KRDE175026M	175,000-195,000	3.8898-7.6772	26,20	1.03	1,28	2.83
1279748	KRDE193026M	193,000-213,000	7.5984-8.3858	26,20	1.03	1,42	3.14

Hole Finishing

• Order inserts separately.

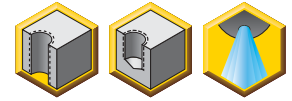
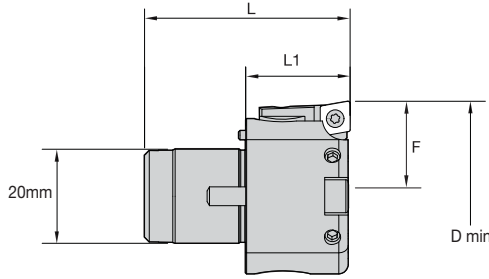


■ SVU • Cartridges SCF

order number	catalog number	reference head	F		L		gage insert	insert screw	mounting screw	insert Torx wrench	Torx wrench	kg	lbs
			mm	in	mm	in							
1099174	KRCSCFPR061E	SVU65	6,75	.27	19,70	.78	CP..0602../CP..215...	MS1375	MS1153	FT7	KT15	0,01	.02
1099175	KRCSCFPR062E	SVU65	9,00	.35	19,70	.78	CP..0602../CP..215...	MS1375	MS1153	FT7	KT15	0,01	.02
1099176	KRCSCFPR063E	SVU65	11,25	.44	19,70	.78	CP..0602../CP..215...	MS1375	MS1153	FT7	KT15	0,01	.03
1099177	KRCSCFPR061F	SVU92	6,75	.27	19,70	.78	CP..0602../CP..215...	MS1375	MS1153	FT7	KT15	0,01	.02
1099178	KRCSCFPR062F	SVU92	10,00	.39	19,70	.78	CP..0602../CP..215...	MS1375	MS1153	FT7	KT15	0,01	.03
1099179	KRCSCFPR063F	SVU92	13,25	.52	19,70	.78	CP..0602../CP..215...	MS1375	MS1153	FT7	KT15	0,02	.03



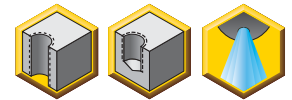
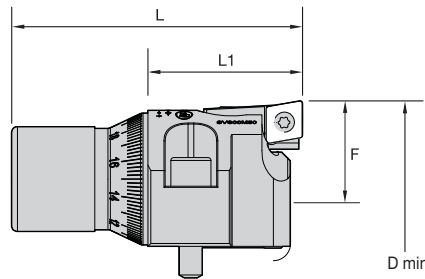
- Cartridge included.



■ Axial Mount Modular Unit

order number	catalog number	D min		L		L1		F		kg	lbs
		mm	in	mm	in	mm	in	mm	in		
2541222	KRMSVS00MF40039M	40,0	1.57	43,7	1.72	22,2	.87	20,2	.80	0,20	.50
2541223	KRMSVS00MF60055M	60,0	2.36	57,7	2.27	26,0	1.02	15,6	.61	0,25	.60

- Cartridge included.

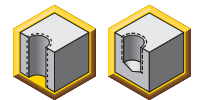
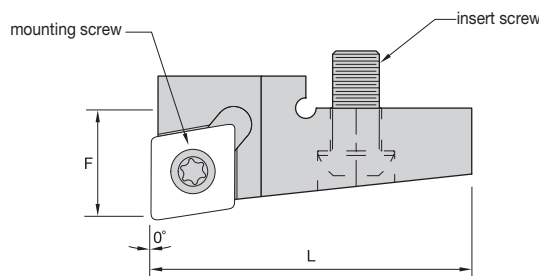


Hole Finishing

■ Radial Mount Modular Unit

order number	catalog number	D min		L		L1		F		kg	lbs
		mm	in	mm	in	mm	in	mm	in		
2541218	KRMSVS00M50049M	50,0	1.97	50,8	2.00	27,0	1.06	25,4	1.00	0,17	.40
2202444	KRMSVS00M055M	60,0	2.36	55,8	2.20	32,0	1.26	27,6	1.09	0,25	.55
2541219	KRMSVS2M100080M	100,0	3.94	80,0	3.15	47,7	1.88	48,0	1.89	0,97	2.10

- Order inserts separately.

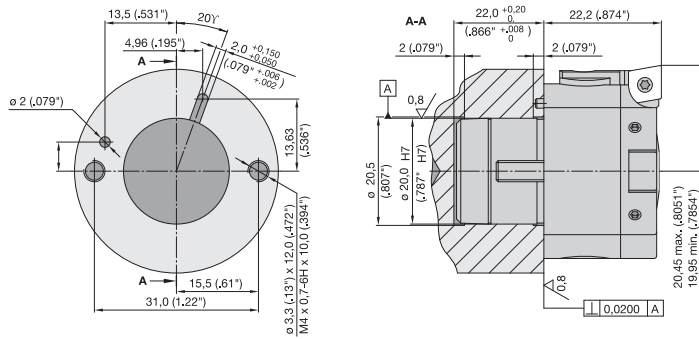


■ SVS • Cartridges SCF for Axial and Radial Mount Modular Units

order number	catalog number	reference head	gage insert	mounting screw	insert screw	Torx wrench	Torx size	kg	lbs
2202449	KRCSCFPR061M	KRMSVS00MF60055M, KRMSVS00M055M, SVS00M	CP..0602../CP..215...	MS2006PKG	MS2005PKG	FT7	T7	0,02	.03
2541220	KRCSCFPR061N	KRMSVS00M50049M	CP..0602../CP..215...	MS2006PKG	MS1153	FT7	T7	0,01	.02
2541221	KRCSCFPR061O	KRMSVS2M100080M	CP..0602../CP..215...	MS1897	MS1153	KT27	T7	0,03	.06
1500650	KRCSCFPR062L	KRMSVS00M50049M, SVS00B	CP..0602../CP..215...	MS2006PKG	MS2005PKG	FT7	T7	0,01	.02

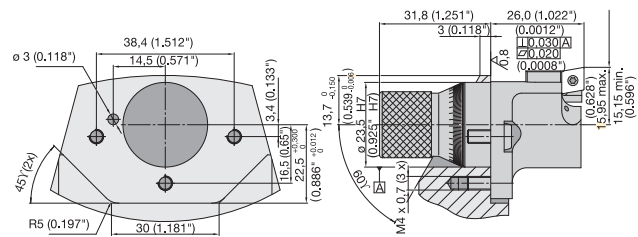


Mounting Dimensions — Axial model KRMSVS00MF40039M



Dimensions in mm (inches)

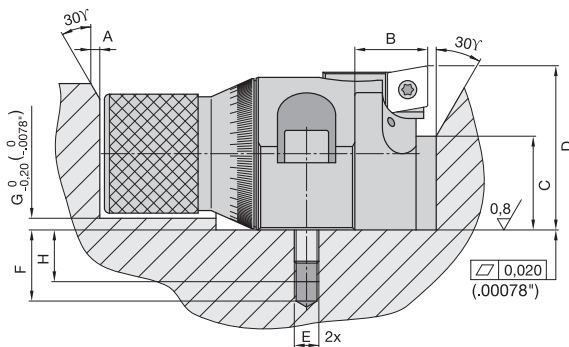
Mounting Dimensions — Axial model KRMSVS00MF60055M



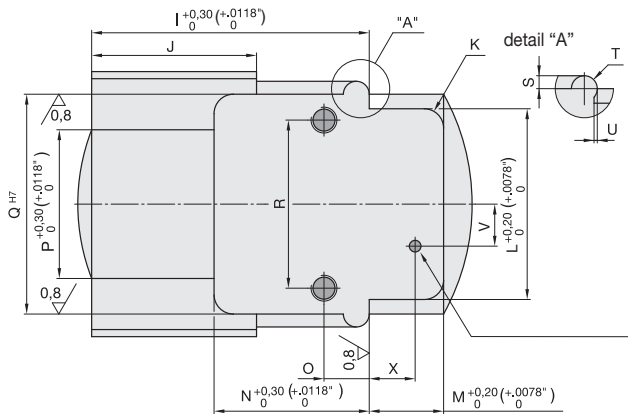
Dimensions in mm (inches)

Mounting Dimensions — Radial Models

Hole Finishing



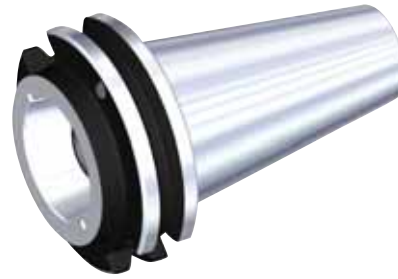
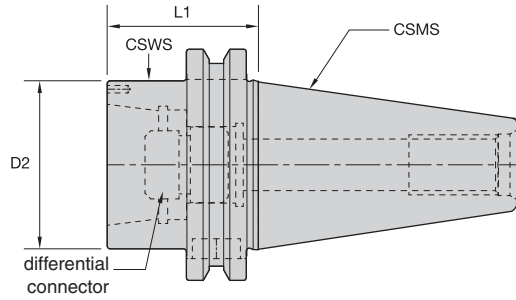
Dimensions in mm (inches)



Dimensions in mm (inches)

dimensions	KRMSVS00M50049M		KRMSVS00M055M		KRMSVS2M100080M	
	mm	inch	mm	inch	mm	inch
A	1,7	.067	1,7	.067	4,0	.157
B	12,5	.492	15,0	.590	22,7	1.385
C	14,5	.570	14,5	.623	28,0	1.102
D (mean dimension)	25,4	1.000	27,6	1.086	48,0	1.889
E	M4 x 0,7		M4 x 0,7		M8 x 1,25	
F	11,0	.433	12,0	.472	25,0	.984
G	1,5	.059	1,5	.059	1,5	.059
H	8,0	.314	10,0	.393	22,0	.866
I	40,0	1.496	41,5	1.633	59,0	2.322
J	25,5	.944	24,0	.964	34,0	1.338
K	3,0	.118	3,0	.118	4,0	.157
L	29,5	1.161	30,5	1.200	55,0	2.165
M	12,0	.472	15,0	.669	24,5	.964
N	20,0	.787	21,0	.826	31,0	1.220
O	7,0	.257	11,0	.433	12,5	.492
P	23,0	.905	23,0	.905	40,0	1.574
Q	34,0	1.228	40,0	1.574	65,0	2.559
R	26,0	1.023	30,5	1.200	50,0	1.968
S	2,0	.078	1,5	.056	4,0	.157
T	2,0	.078	3,0	.118	4,0	.157
U	0,0	.000	0,5	.19	0,0	.000
V	6,5	.393	7,0	.393	10,2	.402
X	7,1	.118	10,0	.216	15,7	.236

• Differential connector included.



CV to KR Adapters AD/B



order number	catalog number	CSMS system size	CSWS system size	D2		L1		differential connector	kg	lbs	reference head
				mm	in	mm	in				
3554366	CV40BKR32157	CV40	KR32	47	1.85	40	1.581	KRDCKR32M	1,08	2.40	SVS00B,0B,1B,2B,3B,SVUBB1,BB2
3554367	CV40BKR50236	CV40	KR50	65	2.56	60	2.368	KRDCKR50M	1,23	2.70	SVS4B,5B,SVU65,SVUBB2
3554368	CV50BKR32157	CV50	KR32	50	1.97	40	1.571	KRDCKR32M	3,25	7.20	SVS00B,0B,1B,2B,3B,SVUBB1,BB2
3554369	CV50BKR50157	CV50	KR50	65	2.56	40	1.571	KRDCKR50M	3,05	6.70	SVS4B,5B,SVU65,SVUBB2
3554370	CV50BKR63236	CV50	KR63	85	3.35	60	2.358	KRDCKR63M	3,50	7.70	SVS6B,7B,8B
3554371	CV50BKR80275	CV50	KR80	95	3.74	70	2.752	KRDCKR80M	4,28	9.40	SVU92,120

Hole Finishing

DV to KR DIN 69871 AD/B



order number	catalog number	CSMS system size	CSWS system size	D2		L1		differential connector	kg	lbs	reference head
				mm	in	mm	in				
1263815	DV40BKR32040M	DV40	KR32	44	1.75	40	1.57	KRDCKR32M	1,00	2.20	SVS0B, SVS2B, SVS3B
1539005	DV40BKR32041M	DV40	KR32	44	1.75	41	1.61	KRDCKR32M	1,00	2.20	SVS00B,0B,1B,2B,3B,SVUBB1,BB2
1263816	DV40BKR50060M	DV40	KR50	65	2.56	60	2.36	KRDCKR50M	1,40	3.08	SVS4B,5B,SVU65,SVUBB2
1191970	DV50BKR32040M	DV50	KR32	50	1.96	40	1.57	KRDCKR32M	2,80	6.16	SVS0B, SVS2B, SVS3B
1528328	DV50BKR32041M	DV50	KR32	50	1.96	41	1.61	KRDCKR32M	2,80	6.16	SVS00B,0B,1B,2B,3B,SVUBB1,BB2
1191971	DV50BKR50040M	DV50	KR50	65	2.56	40	1.57	KRDCKR50M	2,80	6.16	SVS4B,5B,SVU65,SVUBB2
1264135	DV50BKR63060M	DV50	KR63	85	3.34	60	2.36	KRDCKR63M	3,30	7.26	SVS6B,7B,8B
1264136	DV50BKR80070M	DV50	KR80	95	3.73	70	2.76	KRDCKR80M	4,10	9.02	SVU92,120

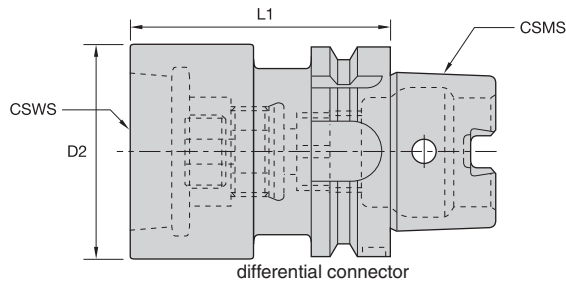
BT to KR JIS B6339 Adapters AD/B



order number	catalog number	CSMS system size	CSWS system size	D2		L1		differential connector	kg	lbs	reference head
				mm	in	mm	in				
3554372	BT40BKR32030M	BT40	KR32	50	1.97	30	1.18	KRDCKR32M	1,20	2.63	SVS00B,0B,1B,2B,3B,SVUBB1,BB2
3554373	BT40BKR50050M	BT40	KR50	63	2.48	50	1.97	KRDCKR50M	1,26	2.80	SVS4B,5B,SVU65,SVUBB2
3554374	BT50BKR32040M	BT50	KR32	50	1.97	40	1.57	KRDCKR32M	3,90	8.60	SVS00B,0B,1B,2B,3B,SVUBB1,BB2
3554375	BT50BKR50040M	BT50	KR50	65	2.56	40	1.57	KRDCKR50M	3,17	7.00	SVS4B,5B,SVU65,SVUBB2
3554376	BT50BKR63060M	BT50	KR63	85	3.35	60	2.36	KRDCKR63M	4,31	9.50	SVS6B,7B,8B
3554377	BT50BKR80060M	BT50	KR80	95	3.74	60	2.36	KRDCKR80M	4,53	9.98	SVU92,120

	Form AD					
	Form B					
			40	(2x) MS2221S	2,5mm	
			50	(2x) MS1296S	3mm	

- Differential connector included.



■ HSK Form A to KR Adapters

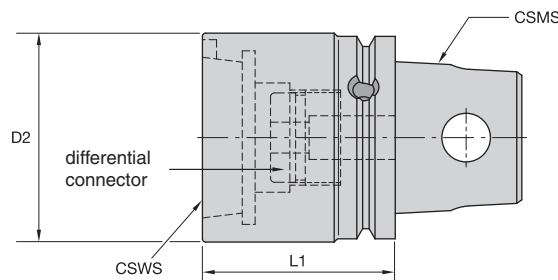


Hole Finishing

order number	catalog number	CSMS system size	CSWS system size	D2		L1		differential connector	kg lbs	reference head
				mm	in	mm	in			
1153403	HSK63AKR32075M	HSK63A	KR32	50	1.96	75	2.95	KRDCKR32M	1,20 2.64	SVS00B,0B,1B,2B,3B,SVUBB1,BB2
1153604	HSK63AKR50080M	HSK63A	KR50	65	2.56	80	3.15	KRDCKR50M	1,60 3.52	SVS4B,5B,SVU65,SVUBB2
1153606	HSK100AKR32075M	HSK100A	KR32	50	1.96	75	2.95	KRDCKR32M	2,20 4.84	SVS00B,0B,1B,2B,3B,SVUBB1,BB2
1107188	HSK100AKR50085M	HSK100A	KR50	65	2.56	85	3.35	KRDCKR50M	3,10 6.82	SVS4B,5B,SVU65,SVUBB2
1173988	HSK100AKR63100M	HSK100A	KR63	95	3.73	90	3.54	KRDCKR63M	4,40 9.68	SVS6B,7B,8B
1153612	HSK100AKR80090M	HSK100A	KR80	50	1.96	75	2.95	KRDCKR80M	2,60 5.72	SVU92,120

NOTE: Plug may need to be removed to access the differential screw drive through the HSK taper.

- Differential connector included.

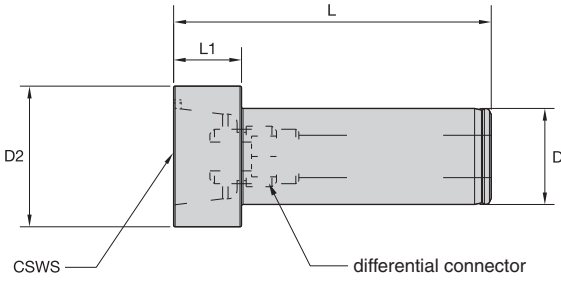


■ KM63XMZ to KR Adapters



order number	catalog number	CSMS system size	CSWS system size	D2		L1		differential connector	kg lbs	reference head size
				mm	in	mm	in			
1831590	KM63XMZKR5060Y	KM63XMZ	KR50	65	2.56	60	2.36	KRDCKR50M	1,40 3.01	SVS4B,5B,SVU65,SVUBB2

- Differential connector included.

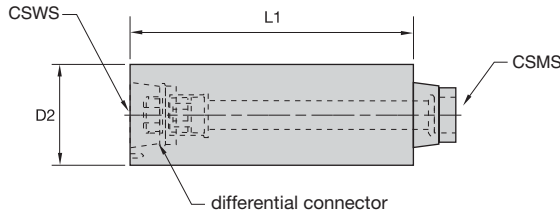


■ Straight Shank to KR Adapters • Inch

order number	catalog number	CSWS system size	D mm	D2 mm	L mm	L1 mm	differential connector	kg lbs	reference head					
3562940	SS100KR32043	KR32	25,40	1.000	46,50	1.831	125,00	4.921	42,5	1.67	KRDCKR32M	0,60	1.30	SVS00B,0B,1B,2B,3B,SVUBB1,BB2
3562941	SS125KR32023	KR32	31,75	1.250	46,50	1.831	105,00	4.134	22,5	.89	KRDCKR32M	0,65	1.40	SVS00B,0B,1B,2B,3B,SVUBB1,BB2
3562942	SS125KR50033	KR50	31,75	1.250	60,00	2.362	115,00	4.528	32,5	1.28	KRDCKR50M	0,75	1.70	SVS4B,5B,SVU65,SVUBB2



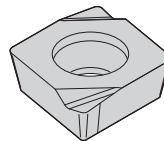
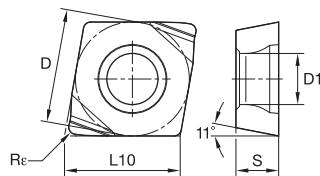
- Differential connector included.



Hole Finishing

■ Length Extenders and Spare Differential Connectors

order number	catalog number	CSWS system size	CSMS system size	D2 mm	L1 mm	differential connector	kg lbs	reference head			
1279772	KR32KR32038050M	KR32	KR32	38	1.50	50	1.97	KRDCKR32M	0,45	.99	SVS00B,1B
1192275	KR32KR32038100M	KR32	KR32	38	1.50	100	3.94	KRDCKR32M	0,82	1.81	SVS00B,1B
1279775	KR32KR32047050M	KR32	KR32	47	1.85	50	1.97	KRDCKR32M	0,69	1.52	SVS0B,2B,3B,SVUBB1
1192276	KR32KR32047100M	KR32	KR32	47	1.85	100	3.94	KRDCKR32M	1,28	2.82	SVS0B,2B,3B,SVUBB1
1279785	KR50KR50065050M	KR50	KR50	65	2.56	50	1.97	KRDCKR50M	1,16	2.56	SVS4B,5B,SVU65,SVUBB2
1192280	KR50KR50065100M	KR50	KR50	65	2.56	100	3.94	KRDCKR50M	2,25	4.96	SVS4B,5B,SVU65,SVUBB2
1279791	KR63KR63085050M	KR63	KR63	85	3.35	50	1.97	KRDCKR63M	2,00	4.41	SVS6B,7B,8B
1279792	KR63KR63085100M	KR63	KR63	85	3.35	100	3.94	KRDCKR63M	4,02	8.86	SVS6B,7B,8B
1279797	KR80KR80095050M	KR80	KR80	95	3.74	50	1.97	KRDCKR80M	2,50	5.51	SVU92,120
1279798	KR80KR80095100M	KR80	KR80	95	3.74	100	3.94	KRDCKR80M	5,00	11.02	SVU92,120



- first choice
- alternate choice

P	■	■
M	■	■
K	■	■
N	■	●
S	■	■
H	■	■

■ CPGT - FWL20

ISO catalog number	ANSI catalog number	D mm	D1 mm	L10 mm	S mm	Re mm	KC5410					
CPGT060204FWL20	CPGT2151FWL20	6,35	.250	2,85	.112	6,45	.254	2,38	.094	0,40	.016	●

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Material Group	Condition	Geometry				Cutting Speed SFM			Feed Rate IPR			
		-LF	-UF	-FP	-FW	min	Starting Value	max	-LF	-UF	-FP	-FW
P	1	KCP05				590	1430	1620	.002 - .010	.002 - .006	.002 - .010	—
				KTP10		590	1430	1620	—	—	.002 - .010	—
		KT315			KT315	590	1310	1620	.002 - .010	—	—	.003 - .012
	1	KCP10				590	1300	1530	.002 - .010	.002 - .006	.002 - .010	—
		KC9110				590	1300	1620	.002 - .010	.002 - .006	—	—
		KCP25				460	920	1180	.002 - .004	.002 - .003	.002 - .005	.003 - .006
	2	KCP05				590	870	1310	.002 - .010	.002 - .006	.002 - .010	—
				KTP10		590	870	1310	—	—	.002 - .010	—
		KT315			KT315	620	890	1280	.002 - .010	—	—	.003 - .012
	2	KCP10				590	790	1080	.002 - .010	.002 - .006	.002 - .010	—
		KC9110				590	790	1080	.002 - .010	.002 - .006	—	—
		KCP25				480	640	1050	.002 - .004	.002 - .003	.002 - .005	.003 - .006
	3	KCP05				590	670	900	.002 - .010	.002 - .006	.002 - .010	—
				KTP10		590	670	900	—	—	.002 - .010	—
		KT315			KT315	590	690	900	.002 - .010	—	—	.003 - .012
	3	KCP10				520	620	820	.002 - .010	.002 - .006	.002 - .010	—
		KC9110				510	620	790	.002 - .010	.002 - .006	—	—
		KCP25				440	510	740	.002 - .004	.002 - .003	.002 - .005	.003 - .006
	4	KCP05				300	520	720	.002 - .010	.002 - .006	.002 - .010	—
				KTP10		300	520	720	—	—	.002 - .010	—
		KT315			KT315	300	590	720	.002 - .010	—	—	.003 - .012
	4	KCP10				300	480	640	.002 - .010	.002 - .006	.002 - .010	—
		KC9110				300	480	640	.002 - .010	.002 - .006	—	—
		KCP25				250	340	590	.002 - .004	.002 - .003	.002 - .005	.003 - .006
5	KCP05				490	790	1030	.002 - .010	.002 - .006	.002 - .010	—	
			KTP10		490	790	1030	—	—	.002 - .010	—	
	KT315			KT315	490	820	1030	.002 - .010	—	—	.003 - .012	
5	KCP10				490	710	980	.002 - .010	.002 - .006	.002 - .010	—	
	KC9110				490	710	980	.002 - .010	.002 - .006	—	—	
	KCP25				390	640	840	.002 - .004	.002 - .003	.002 - .005	.003 - .006	
6	KCP05				460	660	980	.002 - .010	.002 - .006	.002 - .010	—	
			KTP10		460	660	980	—	—	.002 - .010	—	
	KT315			KT315	460	660	980	.002 - .010	—	—	.003 - .012	
6	KCP10				390	590	900	.002 - .010	.002 - .006	.002 - .010	—	
	KC9110				390	590	740	.002 - .010	.002 - .006	—	—	
	KCP25				340	490	740	.002 - .004	.002 - .003	.002 - .005	.003 - .006	
6	KCP05				460	660	980	.002 - .010	.002 - .006	.002 - .010	—	
			KTP10		460	660	980	—	—	.002 - .010	—	
	KT315			KT315	460	660	980	.002 - .010	—	—	.003 - .012	
6	KCP10				390	590	900	.002 - .010	.002 - .006	.002 - .010	—	
	KC9110				390	590	740	.002 - .010	.002 - .006	—	—	
	KCP25				340	490	740	.002 - .004	.002 - .003	.002 - .005	.003 - .006	
6	KCP05				460	660	980	.002 - .010	.002 - .006	.002 - .010	—	
			KTP10		460	660	980	—	—	.002 - .010	—	
	KT315			KT315	460	660	980	.002 - .010	—	—	.003 - .012	
6	KCP10				390	590	900	.002 - .010	.002 - .006	.002 - .010	—	
	KC9110				390	590	740	.002 - .010	.002 - .006	—	—	
	KCP25				340	490	740	.002 - .004	.002 - .003	.002 - .005	.003 - .006	

Material Group	Condition	Geometry				Cutting Speed SFM			Feed Rate IPR			
		-LF	-UF	-FP	-FW	min	Starting Value	max	-LF	-UF	-FP	-FW
M	1			KTP10		460	750	1030	—	—	.002 - .010	—
		KT315			KT315	460	750	1030	.002 - .010	—	—	.003 - .012
		KC5010				430	710	800	.002 - .010	—	—	.003 - .012
		KCM15		KCM15		340	590	790	.002 - .005	—	.002 - .005	—
	2	KC9225				340	590	790	.002 - .005	—	—	.003 - .006
				KTP10		460	710	970	—	—	.002 - .010	—
		KT315			KT315	460	710	970	.002 - .010	—	—	.003 - .012
		KC5010				430	660	800	.002 - .010	—	—	.003 - .012
	3	KCM15				340	540	820	.002 - .005	—	.002 - .005	—
		KC9225				330	520	750	.002 - .005	—	—	.003 - .006
				KTP10		460	660	980	—	—	.002 - .010	—
		KT315			KT315	460	660	980	.002 - .010	—	—	.003 - .012
3	KC5010				430	610	750	.002 - .010	—	—	.003 - .012	
	KCM15		KCM15		380	490	840	.002 - .005	—	.002 - .005	—	
	KC9225				360	490	750	.002 - .005	—	—	.003 - .006	
			KTP10		460	660	980	—	—	.002 - .010	—	

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Material Group	Condition	Geometry				Cutting Speed SFM			Feed Rate IPR			
		-LF	-UF	-FP	-FW	min	Starting Value	max	-LF	-UF	-FP	-FW
K	1	KCK20		KCK20		660	980	1770	.002 - .010	—	.002 - .010	.003 - .012
		KT315		KT315		540	900	1610	.002 - .010	—	—	.003 - .012
		KC9315				360	900	1480	.002 - .010	—	—	—
		KC9320				330	790	1310	.002 - .005	—	—	—
	2	KCK20		KCK20		490	790	1380	.002 - .010	—	.002 - .010	.003 - .012
		KT315		KT315		590	900	1180	.002 - .010	—	—	.003 - .012
		KC5010		KC5010		330	660	870	.002 - .010	.002 - .006	—	.003 - .012
		KC9315				480	850	1180	.002 - .010	—	—	—
	3	KCK20		KCK20		460	690	1150	.002 - .010	—	.002 - .010	.003 - .012
		KT315		KT315		590	750	1050	.002 - .010	—	—	.003 - .012
		KC5010		KC5010		390	490	740	.002 - .010	.002 - .006	—	.003 - .012
		KC9315				480	710	900	.002 - .010	—	—	—
		KC9320				460	690	850	.002 - .005	—	—	

Material Group	Condition	Geometry				Cutting Speed SFM			Feed Rate IPR			
		-LF	-UF	-FP	-FW	min	Starting Value	max	-LF	-UF	-FP	-FW
N	1	KC5410				660	1800	3280	.004 - .016	.008 - .020	—	—
		KC5410				660	1800	3280	.004 - .008	—	—	—
				KD1400		1480	2510	9840	—	—	.002 - .006	—
	2			KD1425		1230	1900	3770	—	—	.002 - .010	—
				KD1400		1310	2130	4100	—	—	.002 - .006	—
	3	KC5410				410	900	1720	.004 - .016	.008 - .020	—	—
				KD1425		820	1640	2870	—	—	.002 - .010	—
		KC5410				410	900	1720	.004 - .008	—	—	—
	5			KD1400		1230	1710	3280	—	—	.002 - .005	—
		KC5410				410	660	1230	.004 - .016	—	—	—
		KC5410				410	660	1230	.004 - .008	—	—	—

Material Group	Condition	Geometry				Cutting Speed SFM			Feed Rate IPR			
		-LF	-UF	-FP	-FW	min	Starting Value	max	-LF	-UF	-FP	-FW
S	1			KCU10		100	180	410	—	—	.002 - .010	—
		K313				30	100	200	.002 - .010	—	—	—
		KC5010		KC5010		100	180	390	.002 - .010	.002 - .006	—	.003 - .012
				KCU10		100	180	410	—	—	.002 - .010	—
		KC5010		KC5010		100	180	390	.002 - .010	.002 - .006	—	.003 - .012
		KC5025		KCU25		30	130	160	—	—	.002 - .005	—
	2			KCU10		100	110	410	—	—	.002 - .010	—
		K313				30	110	200	.002 - .010	—	—	—
		KC5010		KC5010		100	200	390	.002 - .010	.002 - .006	—	.003 - .012
				KCU10		100	110	410	—	—	.002 - .010	—
		KC5010		KC5010		100	200	390	.002 - .010	.002 - .006	—	.003 - .012
		KC5025		KCU25		30	100	160	—	—	.002 - .005	—
	3			KCU10		100	230	410	—	—	.002 - .010	—
		K313				30	130	200	.002 - .010	—	—	—
		KC5010		KC5010		100	230	390	.002 - .010	.002 - .006	—	.003 - .012
				KCU10		100	110	410	—	—	.002 - .010	—
		KC5010		KC5010		100	230	390	.002 - .010	.002 - .006	—	.003 - .012
		KC5025		KCU25		80	130	200	—	—	.002 - .005	—
	4			KCU10		150	230	460	—	—	.002 - .010	—
		K313				50	150	210	.002 - .010	—	—	—
		KC5010		KC5010		150	230	460	.002 - .010	.002 - .006	—	.003 - .012
				KCU10		150	230	460	—	—	.002 - .010	—
		KC5010		KC5010		150	230	460	.002 - .010	.002 - .006	—	.003 - .012
		KC5025		KCU25		80	180	300	—	—	.002 - .005	—
		KC5025				50	180	300	.002 - .004	—	—	



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Material Group	Condition	Geometry				Cutting Speed m/min			Feed Rate mm/r			
		-LF	-UF	-FP	-FW	min	Starting Value	max	-LF	-UF	-FP	-FW
P	1	KCP05				180	435	495	0,06 - 0,25	0,04 - 0,16	0,06 - 0,25	—
				KTP10		180	435	495	—	—	0,06 - 0,25	—
		KT315			KT315	180	400	495	0,06 - 0,25	—	—	0,08 - 0,30
	2	KCP10				180	395	465	0,06 - 0,25	0,04 - 0,16	0,06 - 0,25	—
		KC9110				180	395	495	0,06 - 0,25	0,04 - 0,16	—	—
		KCP25				140	280	360	0,06 - 0,10	0,04 - 0,08	0,06 - 0,12	0,08 - 0,16
	3	KCP05				180	265	400	0,06 - 0,25	0,04 - 0,16	0,06 - 0,25	—
				KTP10		180	265	400	—	—	0,06 - 0,25	—
		KT315			KT315	190	270	390	0,06 - 0,25	—	—	0,08 - 0,30
	4	KCP10				180	240	330	0,06 - 0,25	0,04 - 0,16	0,06 - 0,25	—
		KC9110				180	240	330	0,06 - 0,25	0,04 - 0,16	—	—
		KCP25				145	195	320	0,06 - 0,10	0,04 - 0,08	0,06 - 0,12	0,08 - 0,16
	5	KCP05				180	205	275	0,06 - 0,25	0,04 - 0,16	0,06 - 0,25	—
				KTP10		180	205	275	—	—	0,06 - 0,25	—
		KT315			KT315	180	210	275	0,06 - 0,25	—	—	0,08 - 0,30
	6	KCP10				160	190	250	0,06 - 0,25	0,04 - 0,16	0,06 - 0,25	—
		KC9110				155	190	240	0,06 - 0,25	0,04 - 0,16	—	—
		KCP25				135	155	225	0,06 - 0,10	0,04 - 0,08	0,06 - 0,12	0,08 - 0,16
	7	KCP05				90	160	220	0,06 - 0,25	0,04 - 0,16	0,06 - 0,25	—
				KTP10		90	160	220	—	—	0,06 - 0,25	—
		KT315			KT315	90	180	220	0,06 - 0,25	—	—	0,08 - 0,30
	8	KCP10				90	145	195	0,06 - 0,25	0,04 - 0,16	0,06 - 0,25	—
		KC9110				90	145	195	0,06 - 0,25	0,04 - 0,16	—	—
		KCP25				75	105	180	0,06 - 0,10	0,04 - 0,08	0,06 - 0,12	0,08 - 0,16
9	KCP05				150	240	315	0,06 - 0,25	0,04 - 0,16	0,06 - 0,25	—	
			KTP10		150	240	315	—	—	0,06 - 0,25	—	
	KT315			KT315	150	250	315	0,06 - 0,25	—	—	0,08 - 0,30	
10	KCP10				150	215	300	0,06 - 0,25	0,04 - 0,16	0,06 - 0,25	—	
	KC9110				150	215	300	0,06 - 0,25	0,04 - 0,16	—	—	
	KCP25				120	195	255	0,06 - 0,10	0,04 - 0,08	0,06 - 0,12	0,08 - 0,16	
11	KCP05				120	195	255	0,06 - 0,10	0,04 - 0,08	—	—	
	KC9125				120	195	255	0,06 - 0,10	0,04 - 0,08	—	—	
	KCP25				105	150	225	0,06 - 0,10	0,04 - 0,08	0,06 - 0,12	0,08 - 0,16	
12	KCP05				140	200	300	0,06 - 0,25	0,04 - 0,16	0,06 - 0,25	—	
			KTP10		140	200	300	—	—	0,06 - 0,25	—	
	KT315			KT315	140	200	300	0,06 - 0,25	—	—	0,08 - 0,30	
13	KCP10				120	180	275	0,06 - 0,25	0,04 - 0,16	0,06 - 0,25	—	
	KC9110				120	180	225	0,06 - 0,25	0,04 - 0,16	—	—	
	KCP25				105	150	225	0,06 - 0,10	0,04 - 0,08	0,06 - 0,12	0,08 - 0,16	
14	KCP05				105	150	225	0,06 - 0,10	0,04 - 0,08	—	—	
	KC9125				105	150	225	0,06 - 0,10	0,04 - 0,08	—	—	
	KCP25				105	150	225	0,06 - 0,10	0,04 - 0,08	—	—	

Material Group	Condition	Geometry				Cutting Speed m/min			Feed Rate mm/r			
		-LF	-UF	-FP	-FW	min	Starting Value	max	-LF	-UF	-FP	-FW
M	1			KTP10		140	230	315	—	—	0,06 - 0,25	—
		KT315			KT315	140	230	315	0,06 - 0,25	—	—	0,08 - 0,30
		KC5010		KC5010		130	215	245	0,06 - 0,25	—	—	0,08 - 0,30
		KCM15	KCM15		105	180	240	0,06 - 0,12	—	0,06 - 0,12	—	
	2			KTP10		140	215	295	—	—	0,06 - 0,25	—
		KT315			KT315	140	215	295	0,06 - 0,25	—	—	0,08 - 0,30
		KC5010		KC5010		130	200	245	0,06 - 0,25	—	—	0,08 - 0,30
		KCM15	KCM15		105	165	250	0,06 - 0,12	—	0,06 - 0,12	—	
	3			KTP10		140	200	300	—	—	0,06 - 0,25	—
		KT315			KT315	140	200	300	0,06 - 0,25	—	—	0,08 - 0,30
		KC5010		KC5010		130	185	230	0,06 - 0,25	—	—	0,08 - 0,30
		KCM15	KCM15		115	150	255	0,06 - 0,12	—	0,06 - 0,12	—	
4			KTP10		140	200	300	—	—	0,06 - 0,25	—	
	KT315			KT315	140	200	300	0,06 - 0,25	—	—	0,08 - 0,30	
5			KTP10		140	200	300	—	—	0,06 - 0,25	—	
	KT315			KT315	140	200	300	0,06 - 0,25	—	—	0,08 - 0,30	
6			KTP10		140	200	300	—	—	0,06 - 0,25	—	
	KT315			KT315	140	200	300	0,06 - 0,25	—	—	0,08 - 0,30	
7			KTP10		140	200	300	—	—	0,06 - 0,25	—	
	KT315			KT315	140	200	300	0,06 - 0,25	—	—	0,08 - 0,30	

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Material Group	Condition	Geometry				Cutting Speed m/min			Feed Rate mm/r			
		-LF	-UF	-FP	-FW	min	Starting Value	max	-LF	-UF	-FP	-FW
K	1	KCK20		KCK20		200	300	540	0,06 - 0,25	—	0,06 - 0,25	0,08 - 0,30
		KT315		KT315		165	275	490	0,06 - 0,25	—	—	0,08 - 0,30
		KC9315				110	275	450	0,06 - 0,25	—	—	—
		KC9320				100	240	400	0,06 - 0,12	—	—	—
	2	KCK20		KCK20		150	240	420	0,06 - 0,25	—	0,06 - 0,25	0,08 - 0,30
		KT315		KT315		180	275	360	0,06 - 0,25	—	—	0,08 - 0,30
		KC5010		KC5010		100	200	265	0,06 - 0,25	0,04 - 0,16	—	0,08 - 0,30
		KC9315				145	260	360	0,06 - 0,25	—	—	—
	3	KCK20		KCK20		140	210	350	0,06 - 0,25	—	0,06 - 0,25	0,08 - 0,30
		KT315		KT315		180	230	320	0,06 - 0,25	—	—	0,08 - 0,30
		KC5010		KC5010		120	150	225	0,06 - 0,25	0,04 - 0,16	—	0,08 - 0,30
		KC9315				145	215	275	0,06 - 0,25	—	—	—
		KC9320				140	210	260	0,06 - 0,12	—	—	

Material Group	Condition	Geometry				Cutting Speed m/min			Feed Rate mm/r			
		-LF	-FWL20	—	—	min	Starting Value	max	-LF	-FWL20	—	—
N	1	KC5410				200	550	1000	0,10 - 0,40	0,20 - 0,50	—	—
		KC5410				200	550	1000	0,10 - 0,20	—	—	—
				KD1400		450	765	3000	—	—	0,06 - 0,15	—
	2			KD1425		375	580	1150	—	—	0,06 - 0,25	—
				KD1400		400	650	1250	—	—	0,06 - 0,15	—
	3	KC5410				125	275	525	0,10 - 0,40	0,20 - 0,50	—	—
				KD1425		250	500	875	—	—	0,06 - 0,25	—
		KC5410				125	275	525	0,10 - 0,20	—	—	—
	5			KD1400		375	520	1000	—	—	0,06 - 0,12	—
		KC5410				125	200	375	0,10 - 0,40	—	—	—
		KC5410				125	200	375	0,10 - 0,20	—	—	—

Material Group	Condition	Geometry				Cutting Speed m/min			Feed Rate mm/r			
		-LF	-UF	-FP	-FW	min	Starting Value	max	-LF	-UF	-FP	-FW
S	1			KCU10		30	55	125	—	—	0,06 - 0,25	—
		K313				10	30	60	0,06 - 0,25	—	—	—
		KC5010		KC5010		30	55	120	0,06 - 0,25	0,04 - 0,16	—	0,08 - 0,30
				KCU10		30	55	125	—	—	0,06 - 0,25	—
		KC5010		KC5010		30	55	120	0,06 - 0,25	0,04 - 0,16	—	0,08 - 0,30
		KC5025				10	40	50	—	—	0,06 - 0,12	—
	2			KCU10		30	35	125	—	—	0,06 - 0,25	—
		K313				10	35	60	0,06 - 0,25	—	—	—
		KC5010		KC5010		30	60	120	0,06 - 0,25	0,04 - 0,16	—	0,08 - 0,30
				KCU10		30	35	125	—	—	0,06 - 0,25	—
		KC5010		KC5010		30	60	120	0,06 - 0,25	0,04 - 0,16	—	0,08 - 0,30
		KC5025				10	30	50	—	—	0,06 - 0,12	—
	3			KCU10		30	70	125	—	—	0,06 - 0,25	—
		K313				10	40	60	0,06 - 0,25	—	—	—
		KC5010		KC5010		30	70	120	0,06 - 0,25	0,04 - 0,16	—	0,08 - 0,30
				KCU10		30	35	125	—	—	0,06 - 0,25	—
		KC5010		KC5010		30	70	120	0,06 - 0,25	0,04 - 0,16	—	0,08 - 0,30
		KC5025				25	40	60	—	—	0,06 - 0,12	—
	4			KCU10		25	40	60	0,06 - 0,10	—	—	—
		K313				45	70	140	—	—	0,06 - 0,25	—
		KC5010		KC5010		45	70	140	0,06 - 0,25	0,04 - 0,16	—	0,08 - 0,30
				KCU10		45	70	140	—	—	0,06 - 0,25	—
		KC5010		KC5010		45	70	140	0,06 - 0,25	0,04 - 0,16	—	0,08 - 0,30
		KC5025				25	55	90	—	—	0,06 - 0,12	—
		KC5025				15	55	90	0,06 - 0,10	—	—	



Hole Finishing

Romicron Assembly Instructions

The required parts for the adaptor assembly are identified on Figures 1 and 2. The SVS model is shown. The instructions are also valid to the SVU and SVUBB models.

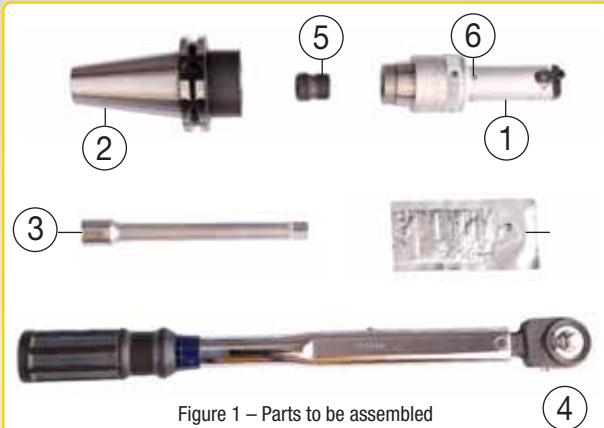


Figure 1 – Parts to be assembled

1	Boring head
2	Taper shank
3	Square extension (3/8" or 1/2")
4	Torque wrench
5	Differential connector
6	Positioning pin
7	Lubricant ASL-3G

WARNING:
Before starting the assembly procedure, ensure that all surfaces to be assembled together are free of dirt and completely clean.



Figure 2 – Assembled Tool



A. Remove the Differential Connector (5) from the Taper Shank (2).



B. Lubricate the thread on the Differential Connector (5) with Lubricant ASL-3G (7), supplied with the Taper Shank (2).



C. Screw the Differential Connector (5) into the rear thread on the Boring Head (1) until the end of the thread. At this time it is not necessary to tighten the Differential Connector (5). Remember that the Differential Connector (5) has two different screws, so there is no way to assemble the wrong side.

Romicron Assembly Instructions



D. Screw the front end of the Taper Shank (2) onto the Differential Connector (5), now located at the back on the Boring Head (1). Screw carefully until the Positioning Pin (6) gently touches the Taper (2) face. Stop!



F. Insert the square end of the Extension (3) through the Taper Shank (2) and into the Differential Connector (5). Keeping the Positioning Pin (6) and the positioning slot aligned, turn the Extensions (3) counter-clockwise until you see that two Romicron faces are meshing. Ensure that the Positioning Pin (6) is inserted into the slot on the Taper Shank (2).



E. Unscrew the Taper Shank (2) a little bit until the Positioning Pin (6) is aligned with the positioning slot mark in the Taper Shank (2) face.



G. Tighten the Differential Connector (5) with the specified required torque, as shown on the table below. Use the Torque Wrench (4) to do this.

Tightening Torque Specifications

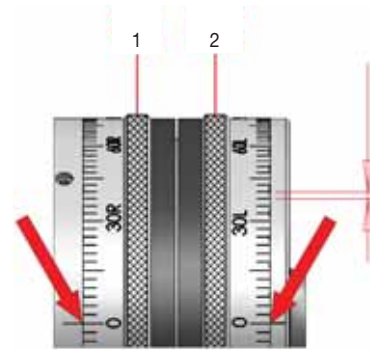
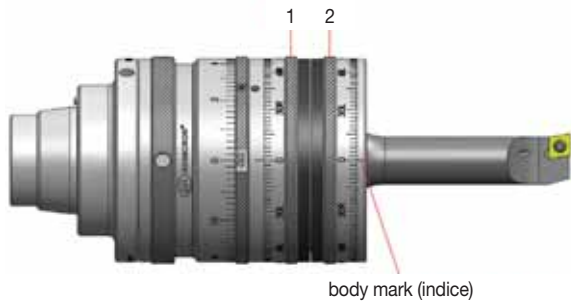
joint size	Torque		drive square
	in. lbs.	Nm	
KR32	262	30	3/8"
KR50	350	40	3/8"
KR63	481	55	1/2"
KR80	569	65	1/2"

Following these procedures will result in a rigid surface contact between the taper and the boring head face.

1. The balancing dials are identified on the figure below.

2. Ensure that the zero mark of dial 02 is coincident with Romicon Body Mark, and the zero mark dial 01 is coincident with the zero mark on dial 02.

3. Read the position values of the dials 01 and 02 on the table. For example, to machine a 10mm diameter, the positions are 01 = 17,5L and 20,0L.



■ Balancing Table • SVU-BB1 Boring Head

Hole Finishing

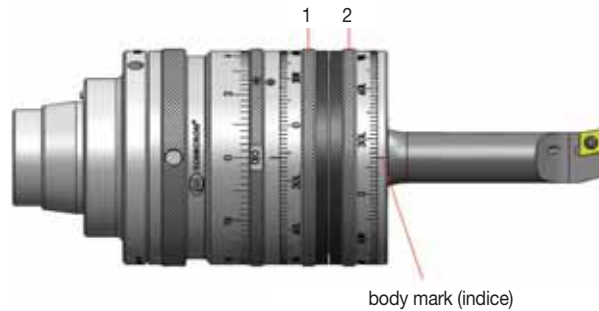
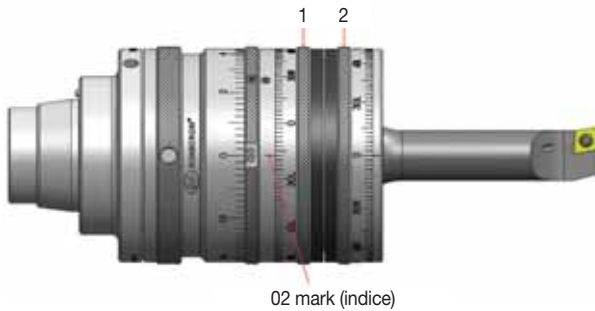
KRBB10FABDRS204C 4-6,4mm					KRBB10SCLDR4060C 6-9mm					KRBB10SCFPR06085C 8,5-11,5mm							
diameter		ring 1		ring 2	diameter		ring 1		ring 2	diameter		ring 1		ring 2			
mm	in				mm	in				mm	in						
4	0.1575	40	L	58	L	6	0.2362	34	L	66	L	8,5	0.3346	34	L	66	L
4,1	0.1614	42	L	58	L	6,1	0.2402	36	L	66	L	8,6	0.3386	36	L	68	L
4,2	0.1654	42	L	54	L	6,2	0.2441	36	L	64	L	8,7	0.3425	36	L	64	L
4,3	0.1693	44	L	54	L	6,3	0.2480	38	L	62	L	8,8	0.3465	38	L	62	L
4,4	0.1732	44	L	50	L	6,4	0.2520	38	L	62	L	8,9	0.3504	36	L	60	L
4,5	0.1772	46	L	50	L	6,5	0.2559	40	L	60	L	9	0.3543	40	L	60	L
4,6	0.1811	46	L	48	L	6,6	0.2598	40	L	58	L	9,1	0.3583	40	L	58	L
4,7	0.1850	46	L	46	L	6,7	0.2638	40	L	56	L	9,2	0.3622	42	L	56	L
4,8	0.1890	46	L	42	L	6,8	0.2677	40	L	54	L	9,3	0.3661	40	L	54	L
4,9	0.1929	46	L	40	L	6,9	0.2717	42	L	52	L	9,4	0.3701	42	L	52	L
5	0.1969	22	R	20	R	7	0.2756	42	L	54	L	9,5	0.3740	42	L	50	L
5,1	0.2008	32	R	26	R	7,1	0.2795	54	R	60	R	9,6	0.3780	40	L	46	L
5,2	0.2047	40	R	32	R	7,2	0.2835	54	R	60	R	9,7	0.3819	38	L	42	L
5,3	0.2087	44	R	34	R	7,3	0.2874	60	R	60	R	9,8	0.3858	30	L	32	L
5,4	0.2126	48	R	36	R	7,4	0.2913	70	R	72	R	9,9	0.3898	24	R	22	R
5,5	0.2165	50	R	36	R	7,5	0.2953	42	R	40	R	10	0.3937	24	R	22	R
5,6	0.2205	52	R	34	R	7,6	0.2992	48	R	44	R	10,1	0.3976	26	R	22	R
5,7	0.2244	54	R	34	R	7,7	0.3031	50	R	42	R	10,2	0.4016	44	R	38	R
5,8	0.2283	56	R	32	R	7,8	0.3071	50	R	42	R	10,3	0.4055	48	R	38	R
5,9	0.2323	58	R	32	R	7,9	0.3110	52	R	40	R	10,4	0.4094	52	R	38	R
6	0.2362	60	R	30	R	8	0.3150	54	R	40	R	10,5	0.4134	52	R	38	R
6,1	0.2402	62	R	30	R	8,1	0.3189	54	R	38	R	10,6	0.4173	56	R	36	R
6,2	0.2441	64	R	28	R	8,2	0.3228	56	R	38	R	10,7	0.4213	56	R	36	R
6,3	0.2480	66	R	28	R	8,3	0.3268	58	R	36	R	10,8	0.4252	58	R	34	R
6,4	0.2520	68	R	24	R	8,4	0.3307	58	R	34	R	10,9	0.4291	58	R	32	R
—	—	—	—	—	—	8,5	0.3346	60	R	36	R	11	0.4331	62	R	32	R
—	—	—	—	—	—	8,6	0.3386	62	R	34	R	11,1	0.4370	60	R	30	R
—	—	—	—	—	—	8,7	0.3425	62	R	32	R	11,2	0.4409	62	R	28	R
—	—	—	—	—	—	8,8	0.3465	62	R	32	R	11,3	0.4449	62	R	28	R
—	—	—	—	—	—	8,9	0.3504	66	R	28	R	11,4	0.4488	68	R	26	R
—	—	—	—	—	—	9	0.3543	66	R	28	R	11,5	0.4528	68	R	26	R

(continued)

(Balancing Table • SVU-BB1 Boring Head continued)

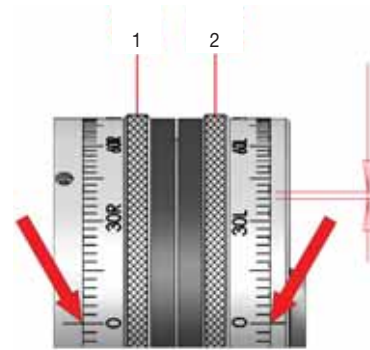
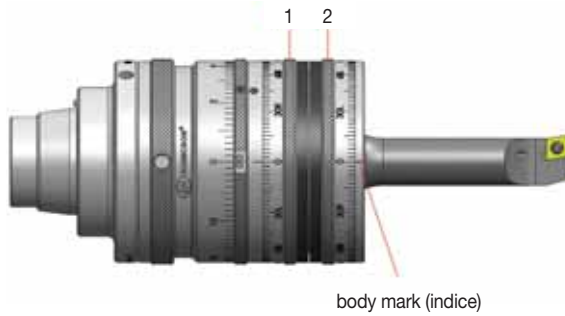
4. The dial 01 must be positioned first. Moving the dial, adjust the position of dial 01. Use the mark reference located on dial 02. The dial resolution is 2 units of table values.

5. Now adjust the position for dial 02. Use the mark reference located on the Romicron body. After the adjustment of dial 02, the Romicron is correctly balanced.



KRBB10SCFPR06110C 11–14mm					KRBB10SCFPR06135C 13,5–16,5mm						
diameter		ring 1		ring 2	diameter		ring 1		ring 2		
mm	in				mm	in					
11	0.4331	32	L	66	L	13,5	0.5315	34	L	62	L
11,1	0.4370	34	L	64	L	13,6	0.5354	36	L	60	L
11,2	0.4409	34	L	62	L	13,7	0.5394	38	L	58	L
11,3	0.4449	36	L	60	L	13,8	0.5433	38	L	56	L
11,4	0.4488	36	L	58	L	13,9	0.5472	40	L	56	L
11,5	0.4528	38	L	58	L	14	0.5512	42	L	44	L
11,6	0.4567	38	L	56	L	14,1	0.5551	42	L	52	L
11,7	0.4606	40	L	54	L	14,2	0.5591	44	L	50	L
11,8	0.4646	40	L	52	L	14,3	0.5630	42	L	46	L
11,9	0.4685	40	L	52	L	14,4	0.5669	34	L	36	L
12	0.4724	38	L	46	L	14,5	0.5709	18	L	20	L
12,1	0.4764	34	L	42	L	14,6	0.5748	10	R	6	R
12,2	0.4803	26	L	30	L	14,7	0.5787	18	R	10	R
12,3	0.4843	24	R	22	R	14,8	0.5827	40	R	30	R
12,4	0.4882	28	L	26	L	14,9	0.5866	44	R	32	R
12,5	0.4921	44	L	38	R	15	0.5906	48	R	34	R
12,6	0.4961	44	R	36	R	15,1	0.5945	48	R	32	R
12,7	0.5000	50	R	40	R	15,2	0.5984	50	R	30	R
12,8	0.5039	50	R	38	R	15,3	0.6024	52	R	30	R
12,9	0.5079	52	R	36	R	15,4	0.6063	56	R	32	R
13	0.5118	52	R	36	R	15,5	0.6102	54	R	28	R
13,1	0.5157	54	R	34	R	15,6	0.6142	58	R	28	R
13,2	0.5197	54	R	32	R	15,7	0.6181	60	R	26	R
13,3	0.5236	56	R	32	R	15,8	0.6220	64	R	26	R
13,4	0.5276	56	R	30	R	15,9	0.6260	64	R	26	R
13,5	0.5315	60	R	28	R	16	0.6299	66	R	24	R
13,6	0.5354	60	R	28	R	16,1	0.6339	66	R	22	R
13,7	0.5394	62	R	26	R	16,2	0.6378	70	R	20	R
13,8	0.5433	64	R	26	R	16,3	0.6417	74	R	18	R
13,9	0.5472	68	R	24	R	16,4	0.6457	76	R	16	R
14	0.5512	68	R	24	R	16,5	0.6496	78	R	14	R

1. The balancing dials are identified on the figure below.
2. Ensure that the zero mark of dial 02 is coincident with Romicon Body Mark, and the zero mark of dial 01 is coincident with the zero mark on dial 02.
3. Read the position values of the dials 01 and 02 on the table. For example, to machine a 10mm diameter, the positions are 01 = 17L and 02 = 20LR.



Balancing Table • SVU-BB2 Boring Head

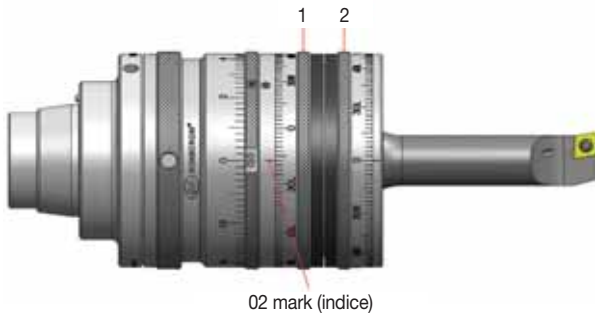
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KRBB16SCLDRS406A 6–9,5mm				KRBB16SCFPR06085A 8,5–12mm				KRBB16SCFPR0611A 11–14,5mm				KRBB16SCFPR06135A 13,5–17mm					
diameter		ring 1		ring 2		diameter		ring 1		ring 2		diameter		ring 1		ring 2	
mm	in					mm	in					mm	in				
6	0.2362	67.5 L	67.5 L	8,5	0.3346	67.5 L	67.5 L	11	0.4331	67.5 L	70 L	13,5	0.5315	65 L	70 L		
6,1	0.2402	62.5 L	62.5 L	8,6	0.3386	62.5 L	62.5 L	11,1	0.4370	60 L	62.5 L	13,6	0.5354	60 L	65 L		
6,2	0.2441	57.5 L	57.5 L	8,7	0.3425	57.5 L	57.5 L	11,2	0.4409	57.5 L	60 L	13,7	0.5394	55 L	60 L		
6,3	0.2480	55 L	55 L	8,8	0.3465	52.5 L	55 L	11,3	0.4449	52.5 L	55 L	13,8	0.5433	50 L	55 L		
6,4	0.2520	50 L	50 L	8,9	0.3504	50 L	50 L	11,4	0.4488	47.5 L	50 L	13,9	0.5472	47.5 L	52.5 L		
6,5	0.2559	47.5 L	47.5 L	9	0.3543	47.5 L	47.5 L	11,5	0.4528	45 L	47.5 L	14	0.5512	42.5 L	47.5 L		
6,6	0.2598	45 L	45 L	9,1	0.3583	42.5 L	45 L	11,6	0.4567	42.5 L	45 L	14,1	0.5551	40 L	45 L		
6,7	0.2638	40 L	40 L	9,2	0.3622	40 L	40 L	11,7	0.4606	37.5 L	42.5 L	14,2	0.5591	35 L	42.5 L		
6,8	0.2677	37.5 L	37.5 L	9,3	0.3661	37.5 L	37.5 L	11,8	0.4646	35 L	37.5 L	14,3	0.5630	32.5 L	40 L		
6,9	0.2717	35 L	35 L	9,4	0.3701	35 L	35 L	11,9	0.4685	32.5 L	35 L	14,4	0.5669	30 L	37.5 L		
7	0.2756	32.5 L	32.5 L	9,5	0.3740	30 L	32.5 L	12	0.4724	30 L	32.5 L	14,5	0.5709	25 L	35 L		
7,1	0.2795	30 L	30 L	9,6	0.3780	27.5 L	30 L	12,1	0.4764	27.5 L	30 L	14,6	0.5748	22.5 L	32.5 L		
7,2	0.2835	27.5 L	27.5 L	9,7	0.3819	25 L	27.5 L	12,2	0.4803	25 L	27.5 L	14,7	0.5787	20 L	30 L		
7,3	0.2874	25 L	25 L	9,8	0.3858	22.5 L	25 L	12,3	0.4843	22.5 L	25 L	14,8	0.5827	17.5 L	27.5 L		
7,4	0.2913	22.5 L	22.5 L	9,9	0.3898	20 L	22.5 L	12,4	0.4882	17.5 L	25 L	14,9	0.5866	15 L	25 L		
7,5	0.2953	20 L	20 L	10	0.3937	17.5 L	20 L	12,5	0.4921	15 L	22.5 L	15	0.5906	10 L	25 L		
7,6	0.2992	17.5 L	17.5 L	10,1	0.3976	15 L	17.5 L	12,6	0.4961	12.5 L	20 L	15,1	0.5945	7.5 L	22.5 L		
7,7	0.3031	15 L	15 L	10,2	0.4016	12.5 L	15 L	12,7	0.5000	10 L	17.5 L	15,2	0.5984	2.5 L	22.5 L		
7,8	0.3071	12.5 L	12.5 L	10,3	0.4055	10 L	15 L	12,8	0.5039	5 L	17.5 L	15,3	0.6024	2.5 R	22.5 L		
7,9	0.3110	10 L	12.5 L	10,4	0.4094	7.5 L	12.5 L	12,9	0.5079	2.5 L	15 L	15,4	0.6063	7.5 R	22.5 L		
8	0.3150	7.5 L	10 L	10,5	0.4134	5 L	10 L	13	0.5118	2.5 R	15 L	15,5	0.6102	17.5 R	27.5 L		
8,1	0.3189	5 L	7.5 L	10,6	0.4173	0 L	10 L	13,1	0.5157	10 R	17.5 L	15,6	0.6142	37.5 R	42.5 L		
8,2	0.3228	2.5 L	5 L	10,7	0.4213	5 R	10 L	13,2	0.5197	25 R	30 L	15,7	0.6181	85 L	90 R		
8,3	0.3268	2.5 R	5 L	10,8	0.4252	45 R	45 L	13,3	0.5236	62.5 L	65 R	15,8	0.6220	35 L	42.5 R		
8,4	0.3307	10 L	12.5 R	10,9	0.4291	10 L	15 R	13,4	0.5276	17.5 L	22.5 R	15,9	0.6260	17.5 L	27.5 R		
8,5	0.3346	0 R	5 R	11	0.4331	2.5 L	10 R	13,5	0.5315	5 L	15 R	16	0.6299	7.5 L	22.5 R		
8,6	0.3386	2.5 R	7.5 R	11,1	0.4370	2.5 R	10 R	13,6	0.5354	0 R	15 R	16,1	0.6339	2.5 L	22.5 R		
8,7	0.3425	7.5 R	7.5 R	11,2	0.4409	5 R	12.5 R	13,7	0.5394	5 R	15 R	16,2	0.6378	2.5 R	22.5 R		
8,8	0.3465	10 R	10 R	11,3	0.4449	10 R	12.5 R	13,8	0.5433	7.5 R	17.5 R	16,3	0.6417	7.5 R	22.5 R		
8,9	0.3504	12.5 R	12.5 R	11,4	0.4488	12.5 R	15 R	13,9	0.5472	10 R	20 R	16,4	0.6457	10 R	25 R		
9	0.3543	12.5 R	15 R	11,5	0.4528	15 R	17.5 R	14	0.5512	15 R	20 R	16,5	0.6496	15 R	25 R		
9,1	0.3583	15 R	17.5 R	11,6	0.4567	17.5 R	20 R	14,1	0.5551	17.5 R	22.5 R	16,6	0.6535	17.5 R	27.5 R		
9,2	0.3622	17.5 R	20 R	11,7	0.4606	20 R	22.5 R	14,2	0.5591	20 R	25 R	16,7	0.6575	20 R	30 R		
9,3	0.3661	20 R	22.5 R	11,8	0.4646	22.5 R	25 R	14,3	0.5630	22.5 R	27.5 R	16,8	0.6614	22.5 R	32.5 R		
9,4	0.3701	22.5 R	25 R	11,9	0.4685	25 R	27.5 R	14,4	0.5669	25 R	30 R	16,9	0.6654	27.5 R	35 R		
9,5	0.3740	25 R	27.5 R	12	0.4724	27.5 R	30 R	14,5	0.5709	27.5 R	32.5 R	17	0.6693	30 R	37.5 R		

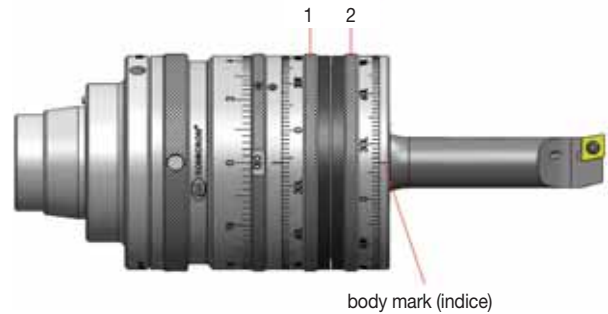
(continued)

(Balancing Table • SVU-BB2 Boring Head continued)

4. The dial O1 must be positioned first. Moving the dial, adjust the position of dial O1. Use the mark reference located on dial O2. The dial resolution is 2,5 units of table values.



5. Now adjust the position for dial O2. Use the mark reference located on the Romicron body. After the adjustment of dial O2, the Romicron is correctly balanced.



KRBB16SCFPR0616A 16–19,5mm				KRBB16SCFPR0619A 19–22,5mm				KRBB16SCFPR0622A 22–25,5mm			
diameter		ring 1	ring 2	diameter		ring 1	ring 2	diameter		ring 1	ring 2
mm	in			mm	in			mm	in		
16	0.6299	65 L	72.5 L	19	0.7480	60 L	75 L	22	0.8661	57.5 L	80 L
16,1	0.6339	57.5 L	65 L	19,1	0.7520	55 L	70 L	22,1	0.8701	50 L	72.5 L
16,2	0.6378	52.5 L	62.5 L	19,2	0.7559	50 L	65 L	22,2	0.8740	45 L	70 L
16,3	0.6417	47.5 L	57.5 L	19,3	0.7598	45 L	60 L	22,3	0.8780	37.5 L	65 L
16,4	0.6457	42.5 L	52.5 L	19,4	0.7638	40 L	57.5 L	22,4	0.8819	32.5 L	62.5 L
16,5	0.6496	40 L	50 L	19,5	0.7677	35 L	52.5 L	22,5	0.8858	27.5 L	60 L
16,6	0.6535	35 L	47.5 L	19,6	0.7717	30 L	50 L	22,6	0.8898	22.5 L	57.5 L
16,7	0.6575	32.5 L	45 L	19,7	0.7756	27.5 L	47.5 L	22,7	0.8937	20 L	55 L
16,8	0.6614	27.5 L	42.5 L	19,8	0.7795	22.5 L	45 L	22,8	0.8976	15 L	52.5 L
16,9	0.6654	25 L	40 L	19,9	0.7835	20 L	42.5 L	22,9	0.9016	10 L	52.5 L
17	0.6693	20 L	37.5 L	20	0.7874	15 L	42.5 L	23	0.9055	5 L	50 L
17,1	0.6732	17.5 L	35 L	20,1	0.7913	10 L	40 L	23,1	0.9094	0 R	50 L
17,2	0.6772	12.5 L	32.5 L	20,2	0.7953	5 L	40 L	23,2	0.9134	7.5 R	52.5 L
17,3	0.6811	10 L	30 L	20,3	0.7992	0 L	40 L	23,3	0.9173	12.5 R	52.5 L
17,4	0.6850	5 L	30 L	20,4	0.8031	5 R	40 L	23,4	0.9213	20 R	55 L
17,5	0.6890	0 L	30 L	20,5	0.8071	10 R	40 L	23,5	0.9252	30 R	60 L
17,6	0.6929	5 R	30 L	20,6	0.8110	17.5 R	42.5 L	23,6	0.9291	40 R	65 L
17,7	0.6969	12.5 R	32.5 L	20,7	0.8150	27.5 R	47.5 L	23,7	0.9331	52.5 R	75 L
17,8	0.7008	22.5 R	37.5 L	20,8	0.8189	40 R	57.5 L	23,8	0.9370	67.5 R	90 L
17,9	0.7047	35 R	47.5 L	20,9	0.8228	57.5 R	72.5 L	23,9	0.9409	77.5 L	97.5 R
18	0.7087	60 R	67.5 L	21	0.8268	80 R	92.5 L	24	0.9449	60 L	82.5 R
18,1	0.7126	75 L	82.5 R	21,1	0.8307	65 L	77.5 R	24,1	0.9488	47.5 L	72.5 R
18,2	0.7165	45 L	55 R	21,2	0.8346	45 L	60 R	24,2	0.9528	35 L	62.5 R
18,3	0.7205	25 L	40 R	21,3	0.8386	30 L	50 R	24,3	0.9567	25 L	57.5 R
18,4	0.7244	15 L	32.5 R	21,4	0.8425	20 L	45 R	24,4	0.9606	17.5 L	55 R
18,5	0.7283	7.5 L	30 R	21,5	0.8465	12.5 L	40 R	24,5	0.9646	10 L	52.5 R
18,6	0.7323	2.5 L	30 R	21,6	0.8504	5 L	40 R	24,6	0.9685	5 L	50 R
18,7	0.7362	2.5 R	30 R	21,7	0.8543	0 L	40 R	24,7	0.9724	2.5 R	50 R
18,8	0.7402	7.5 R	30 R	21,8	0.8583	5 R	40 R	24,8	0.9764	7.5 R	50 R
18,9	0.7441	12.5 R	32.5 R	21,9	0.8622	10 R	40 R	24,9	0.9803	12.5 R	52.5 R
19	0.7480	15 R	35 R	22	0.8661	12.5 R	42.5 R	25	0.9843	17.5 R	52.5 R
19,1	0.7520	20 R	35 R	22,1	0.8701	17.5 R	42.5 R	25,1	0.9882	20 R	55 R
19,2	0.7559	22.5 R	37.5 R	22,2	0.8740	22.5 R	45 R	25,2	0.9921	25 R	57.5 R
19,3	0.7598	27.5 R	40 R	22,3	0.8780	25 R	47.5 R	25,3	0.9961	30 R	60 R
19,4	0.7638	30 R	42.5 R	22,4	0.8819	30 R	50 R	25,4	1.0000	35 R	62.5 R
19,5	0.7677	35 R	45 R	22,5	0.8858	35 R	52.5 R	25,5	1.0039	40 R	67.5 R

(continued)

(Balancing Table • Universal Applications SVU-BB2 Boring Head continued)

KRDEA046AM • KRDE025010M 25,5–34,4mm

diameter					diameter					diameter				
mm	in	ring 1	ring 2		mm	in	ring 1	ring 2		mm	in	ring 1	ring 2	
25,5	1.0039	62.5 L	65 L		28,5	1.1220	57.5 L	60 L		31,5	1.2402	52.5 L	55 L	
25,6	1.0079	57.5 L	60 L		28,6	1.1260	52.5 L	55 L		31,6	1.2441	47.5 L	50 L	
25,7	1.0118	50 L	52.5 L		28,7	1.1299	45 L	50 L		31,7	1.2480	42.5 L	45 L	
25,8	1.0157	45 L	47.5 L		28,8	1.1339	40 L	45 L		31,8	1.2520	37.5 L	42.5 L	
25,9	1.0197	40 L	45 L		28,9	1.1378	37.5 L	40 L		31,9	1.2559	32.5 L	37.5 L	
26,0	1.0236	35 L	40 L		29,0	1.1417	32.5 L	37.5 L		32,0	1.2598	27.5 L	35 L	
26,1	1.0276	32.5 L	35 L		29,1	1.1457	27.5 L	32.5 L		32,1	1.2638	25 L	30 L	
26,2	1.0315	27.5 L	32.5 L		29,2	1.1496	25 L	30 L		32,2	1.2677	20 L	27.5 L	
26,3	1.0354	22.5 L	30 L		29,3	1.1535	20 L	27.5 L		32,3	1.2717	17.5 L	22.5 L	
26,4	1.0394	20 L	25 L		29,4	1.1575	15 L	25 L		32,4	1.2756	12.5 L	22.5 L	
26,5	1.0433	62.5 L	65 L		29,5	1.1614	55 L	57.5 L		32,5	1.2795	50 L	55 L	
26,6	1.0472	55 L	57.5 L		29,6	1.1654	50 L	52.5 L		32,6	1.2835	45 L	50 L	
26,7	1.0512	50 L	52.5 L		29,7	1.1693	45 L	47.5 L		32,7	1.2874	40 L	45 L	
26,8	1.0551	45 L	47.5 L		29,8	1.1732	40 L	45 L		32,8	1.2913	37.5 L	40 L	
26,9	1.0591	40 L	42.5 L		29,9	1.1772	35 L	40 L		32,9	1.2953	32.5 L	37.5 L	
27,0	1.0630	35 L	40 L		30,0	1.1811	32.5 L	35 L		33,0	1.2992	27.5 L	32.5 L	
27,1	1.0669	30 L	35 L		30,1	1.1850	27.5 L	32.5 L		33,1	1.3031	22.5 L	30 L	
27,2	1.0709	25 L	32.5 L		30,2	1.1890	22.5 L	30 L		33,2	1.3071	20 L	25 L	
27,3	1.0748	22.5 L	27.5 L		30,3	1.1929	20 L	25 L		33,3	1.3110	15 L	22.5 L	
27,4	1.0787	17.5 L	25 L		30,4	1.1969	15 L	22.5 L		33,4	1.3150	12.5 L	20 L	
27,5	1.0827	60 L	62.5 L		30,5	1.2008	55 L	57.5 L		33,5	1.3189	50 L	52.5 L	
27,6	1.0866	52.5 L	55 L		30,6	1.2047	47.5 L	52.5 L		33,6	1.3228	45 L	47.5 L	
27,7	1.0906	47.5 L	50 L		30,7	1.2087	42.5 L	47.5 L		33,7	1.3268	40 L	42.5 L	
27,8	1.0945	42.5 L	45 L		30,8	1.2126	37.5 L	42.5 L		33,8	1.3307	35 L	40 L	
27,9	1.0984	37.5 L	42.5 L		30,9	1.2165	35 L	37.5 L		33,9	1.3346	30 L	35 L	
28,0	1.1024	32.5 L	37.5 L		31,0	1.2205	30 L	35 L		34,0	1.3386	27.5 L	32.5 L	
28,1	1.1063	30 L	35 L		31,1	1.2244	25 L	32.5 L		34,1	1.3425	22.5 L	27.5 L	
28,2	1.1102	25 L	30 L		31,2	1.2283	22.5 L	27.5 L		34,2	1.3465	20 L	25 L	
28,3	1.1142	20 L	27.5 L		31,3	1.2323	17.5 L	25 L		34,3	1.3504	15 L	22.5 L	
28,4	1.1181	17.5 L	25 L		31,4	1.2362	12.5 L	22.5 L		34,4	1.3543	10 L	20 L	

KRDEA046AM • KRDE033010M 33,5–44,4mm

diameter				diameter				diameter				diameter			
mm	in	ring 1	ring 2	mm	in	ring 1	ring 2	mm	in	ring 1	ring 2	mm	in	ring 1	ring 2
33,5	1.3189	55 L	57.5 L	36,5	1.4370	47.5 L	52.5 L	39,5	1.5551	42.5 L	47.5 L	42,5	1.6732	37.5 L	40 L
33,6	1.3228	50 L	52.5 L	36,6	1.4409	42.5 L	47.5 L	39,6	1.5591	37.5 L	42.5 L	42,6	1.6772	32.5 L	37.5 L
33,7	1.3268	45 L	47.5 L	36,7	1.4449	37.5 L	42.5 L	39,7	1.5630	32.5 L	37.5 L	42,7	1.6811	27.5 L	35 L
33,8	1.3307	40 L	42.5 L	36,8	1.4488	35 L	37.5 L	39,8	1.5669	27.5 L	35 L	42,8	1.6850	25 L	30 L
33,9	1.3346	35 L	40 L	36,9	1.4528	30 L	35 L	39,9	1.5709	25 L	30 L	42,9	1.6890	20 L	27.5 L
34,0	1.3386	30 L	35 L	37,0	1.4567	25 L	32.5 L	40,0	1.5748	20 L	27.5 L	43,0	1.6929	15 L	25 L
34,1	1.3425	25 L	32.5 L	37,1	1.4606	22.5 L	27.5 L	40,1	1.5787	15 L	25 L	43,1	1.6969	10 L	22.5 L
34,2	1.3465	22.5 L	27.5 L	37,2	1.4646	17.5 L	25 L	40,2	1.5827	10 L	22.5 L	43,2	1.7008	5 L	20 L
34,3	1.3504	17.5 L	25 L	37,3	1.4685	12.5 L	22.5 L	40,3	1.5866	7.5 L	20 L	43,3	1.7047	0 L	17.5 L
34,4	1.3543	12.5 L	22.5 L	37,4	1.4724	7.5 L	20 L	40,4	1.5906	2.5 L	17.5 L	43,4	1.7087	7.5 R	20 L
34,5	1.3583	52.5 L	57.5 L	37,5	1.4764	47.5 L	50 L	40,5	1.5945	40 L	45 L	43,5	1.7126	35 L	40 L
34,6	1.3622	47.5 L	50 L	37,6	1.4803	42.5 L	45 L	40,6	1.5984	35 L	40 L	43,6	1.7165	30 L	35 L
34,7	1.3661	42.5 L	47.5 L	37,7	1.4843	37.5 L	40 L	40,7	1.6024	30 L	37.5 L	43,7	1.7205	25 L	32.5 L
34,8	1.3701	37.5 L	42.5 L	37,8	1.4882	32.5 L	37.5 L	40,8	1.6063	27.5 L	32.5 L	43,8	1.7244	22.5 L	27.5 L
34,9	1.3740	32.5 L	37.5 L	37,9	1.4921	27.5 L	35 L	40,9	1.6102	22.5 L	30 L	43,9	1.7283	17.5 L	25 L
35,0	1.3780	27.5 L	35 L	38,0	1.4961	25 L	30 L	41,0	1.6142	17.5 L	27.5 L	44,0	1.7323	15 L	22.5 L
35,1	1.3819	25 L	30 L	38,1	1.5000	20 L	27.5 L	41,1	1.6181	15 L	22.5 L	44,1	1.7362	10 L	20 L
35,2	1.3858	20 L	27.5 L	38,2	1.5039	15 L	25 L	41,2	1.6220	10 L	20 L	44,2	1.7402	5 L	17.5 L
35,3	1.3898	15 L	25 L	38,3	1.5079	10 L	22.5 L	41,3	1.6260	5 L	20 L	44,3	1.7441	2.5 R	17.5 L
35,4	1.3937	10 L	22.5 L	38,4	1.5118	5 L	20 L	41,4	1.6299	0 R	17.5 L	44,4	1.7480	12.5 R	22.5 L
35,5	1.3976	50 L	55 L	38,5	1.5157	45 L	47.5 L	41,5	1.6339	37.5 L	42.5 L	—	—	—	—
35,6	1.4016	45 L	50 L	38,6	1.5197	40 L	42.5 L	41,6	1.6378	35 L	37.5 L	—	—	—	—
35,7	1.4055	40 L	45 L	38,7	1.5236	35 L	40 L	41,7	1.6417	30 L	35 L	—	—	—	—
35,8	1.4094	35 L	40 L	38,8	1.5276	30 L	35 L	41,8	1.6457	25 L	32.5 L	—	—	—	—
35,9	1.4134	30 L	37.5 L	38,9	1.5315	25 L	32.5 L	41,9	1.6496	22.5 L	27.5 L	—	—	—	—
36,0	1.4173	27.5 L	32.5 L	39,0	1.5354	22.5 L	27.5 L	42,0	1.6535	17.5 L	25 L	—	—	—	—
36,1	1.4213	22.5 L	30 L	39,1	1.5394	17.5 L	25 L	42,1	1.6575	12.5 L	22.5 L	—	—	—	—
36,2	1.4252	17.5 L	27.5 L	39,2	1.5433	15 L	22.5 L	42,2	1.6614	7.5 L	20 L	—	—	—	—
36,3	1.4291	15 L	22.5 L	39,3	1.5472	10 L	20 L	42,3	1.6654	2.5 L	17.5 L	—	—	—	—
36,4	1.4331	10 L	20 L	39,4	1.5512	5 L	17.5 L	42,4	1.6693	5 R	20 L	—	—	—	—

(continued)

(Balancing Table • Universal Applications SVU-BB2 Boring Head continued)

KRDEA051AM • KRDE043010M 43–65,9mm

diameter		ring 1				ring 2				diameter		ring 1				ring 2				diameter		ring 1				ring 2			
mm	in	mm		in		mm		in		mm	in	mm		in		mm		in		mm	in	mm		in		mm		in	
43,0	1.6929	55	L	65	L	46,0	1.8110	42,5	L	55	L	49,0	1.9291	32,5	L	47,5	L	52,0	2.0472	25	L	40	L	52,0	2.0472	25	L	40	L
43,1	1.6969	47,5	L	57,5	L	46,1	1.8150	37,5	L	50	L	49,1	1.9331	27,5	L	42,5	L	52,1	2.0512	20	L	37,5	L	52,1	2.0512	20	L	37,5	L
43,2	1.7008	40	L	52,5	L	46,2	1.8189	30	L	45	L	49,2	1.9370	22,5	L	40	L	52,2	2.0551	12,5	L	35	L	52,2	2.0551	12,5	L	35	L
43,3	1.7047	35	L	47,5	L	46,3	1.8228	25	L	42,5	L	49,3	1.9409	17,5	L	35	L	52,3	2.0591	7,5	L	32,5	L	52,3	2.0591	7,5	L	32,5	L
43,4	1.7087	30	L	42,5	L	46,4	1.8268	20	L	37,5	L	49,4	1.9449	12,5	L	32,5	L	52,4	2.0630	0	L	32,5	L	52,4	2.0630	0	L	32,5	L
43,5	1.7126	22,5	L	40	L	46,5	1.8307	15	L	35	L	49,5	1.9488	5	L	32,5	L	52,5	2.0669	7,5	R	32,5	L	52,5	2.0669	7,5	R	32,5	L
43,6	1.7165	17,5	L	37,5	L	46,6	1.8346	7,5	L	32,5	L	49,6	1.9528	2,5	R	32,5	L	52,6	2.0709	20	R	37,5	L	52,6	2.0709	20	R	37,5	L
43,7	1.7205	12,5	L	32,5	L	46,7	1.8386	2,5	L	30	L	49,7	1.9567	12,5	R	35	L	52,7	2.0748	42,5	R	52,5	L	52,7	2.0748	42,5	R	52,5	L
43,8	1.7244	5	L	32,5	L	46,8	1.8425	7,5	R	32,5	L	49,8	1.9606	27,5	R	42,5	L	52,8	2.0787	85	L	92,5	R	52,8	2.0787	85	L	92,5	R
43,9	1.7283	2,5	R	32,5	L	46,9	1.8465	17,5	R	35	L	49,9	1.9646	60	R	70	L	52,9	2.0827	40	L	52,5	R	52,9	2.0827	40	L	52,5	R
44,0	1.7323	50	L	60	L	47,0	1.8504	40	L	52,5	L	50,0	1.9685	30	L	45	L	53,0	2.0866	22,5	L	37,5	L	53,0	2.0866	22,5	L	37,5	L
44,1	1.7362	42,5	L	55	L	47,1	1.8543	35	L	47,5	L	50,1	1.9724	25	L	40	L	53,1	2.0906	17,5	L	35	L	53,1	2.0906	17,5	L	35	L
44,2	1.7402	37,5	L	50	L	47,2	1.8583	27,5	L	42,5	L	50,2	1.9764	20	L	37,5	L	53,2	2.0945	10	L	32,5	L	53,2	2.0945	10	L	32,5	L
44,3	1.7441	32,5	L	45	L	47,3	1.8622	22,5	L	40	L	50,3	1.9803	12,5	L	35	L	53,3	2.0984	2,5	L	32,5	L	53,3	2.0984	2,5	L	32,5	L
44,4	1.7480	25	L	42,5	L	47,4	1.8661	17,5	L	35	L	50,4	1.9843	7,5	L	32,5	L	53,4	2.1024	5	R	32,5	L	53,4	2.1024	5	R	32,5	L
44,5	1.7520	20	L	37,5	L	47,5	1.8701	12,5	L	32,5	L	50,5	1.9882	0	L	32,5	L	53,5	2.1063	15	R	35	L	53,5	2.1063	15	R	35	L
44,6	1.7559	15	L	35	L	47,6	1.8740	5	L	32,5	L	50,6	1.9921	7,5	R	32,5	L	53,6	2.1102	30	R	45	L	53,6	2.1102	30	R	45	L
44,7	1.7598	10	L	32,5	L	47,7	1.8780	2,5	R	32,5	L	50,7	1.9961	20	R	37,5	L	53,7	2.1142	62,5	R	72,5	L	53,7	2.1142	62,5	R	72,5	L
44,8	1.7638	2,5	L	30	L	47,8	1.8819	12,5	R	35	L	50,8	2.0000	40	R	52,5	L	53,8	2.1181	57,5	L	67,5	R	53,8	2.1181	57,5	L	67,5	R
44,9	1.7677	7,5	R	32,5	L	47,9	1.8858	27,5	R	42,5	L	50,9	2.0039	87,5	R	95	L	53,9	2.1220	27,5	L	42,5	R	53,9	2.1220	27,5	L	42,5	R
45,0	1.7717	47,5	L	57,5	L	48,0	1.8898	37,5	L	50	L	51,0	2.0079	27,5	L	42,5	L	54,0	2.1260	20	L	37,5	L	54,0	2.1260	20	L	37,5	L
45,1	1.7756	40	L	52,5	L	48,1	1.8937	30	L	45	L	51,1	2.0118	22,5	L	40	L	54,1	2.1299	12,5	L	35	L	54,1	2.1299	12,5	L	35	L
45,2	1.7795	35	L	47,5	L	48,2	1.8976	25	L	40	L	51,2	2.0157	17,5	L	35	L	54,2	2.1339	7,5	L	32,5	L	54,2	2.1339	7,5	L	32,5	L
45,3	1.7835	30	L	42,5	L	48,3	1.9016	20	L	37,5	L	51,3	2.0197	10	L	35	L	54,3	2.1378	0	L	32,5	L	54,3	2.1378	0	L	32,5	L
45,4	1.7874	22,5	L	40	L	48,4	1.9055	15	L	35	L	51,4	2.0236	5	L	32,5	L	54,4	2.1417	7,5	R	32,5	L	54,4	2.1417	7,5	R	32,5	L
45,5	1.7913	17,5	L	35	L	48,5	1.9094	7,5	L	32,5	L	51,5	2.0276	2,5	R	30	L	54,5	2.1457	20	R	37,5	L	54,5	2.1457	20	R	37,5	L
45,6	1.7953	12,5	L	32,5	L	48,6	1.9134	0	L	32,5	L	51,6	2.0315	12,5	R	32,5	L	54,6	2.1496	45	R	55	L	54,6	2.1496	45	R	55	L
45,7	1.7992	5	L	32,5	L	48,7	1.9173	7,5	R	32,5	L	51,7	2.0354	30	R	45	L	54,7	2.1535	82,5	L	90	R	54,7	2.1535	82,5	L	90	R
45,8	1.8031	2,5	R	32,5	L	48,8	1.9213	20	R	37,5	L	51,8	2.0394	60	R	70	L	54,8	2.1575	40	L	52,5	R	54,8	2.1575	40	L	52,5	R
45,9	1.8071	12,5	R	35	L	48,9	1.9252	40	R	52,5	L	51,9	2.0433	60	L	70	R	54,9	2.1614	20	L	37,5	R	54,9	2.1614	20	L	37,5	R
55,0	2.1654	17,5	L	35	L	58,0	2.2835	7,5	L	32,5	L	61,0	2.4016	5	R	32,5	L	64,0	2.5197	25	R	40	L	64,0	2.5197	25	R	40	L
55,1	2.1693	10	L	32,5	L	58,1	2.2874	0	R	30	L	61,1	2.4055	15	R	35	L	64,1	2.5236	55	R	65	L	64,1	2.5236	55	R	65	L
55,2	2.1732	2,5	L	32,5	L	58,2	2.2913	10	R	32,5	L	61,2	2.4094	35	R	47,5	L	64,2	2.5276	67,5	L	77,5	R	64,2	2.5276	67,5	L	77,5	R
55,3	2.1772	5	R	32,5	L	58,3	2.2953	22,5	R	40	L	61,3	2.4134	75	R	82,5	L	64,3	2.5315	32,5	L	45	R	64,3	2.5315	32,5	L	45	R
55,4	2.1811	15	R	35	L	58,4	2.2992	47,5	R	57,5	L	61,4	2.4173	50	L	60	R	64,4	2.5354	15	L	35	R	64,4	2.5354	15	L	35	R
55,5	2.1850	32,5	R	45	L	58,5	2.3031	75	L	82,5	R	61,5	2.4213	25	L	40	R	64,5	2.5394	5	L	32,5	R	64,5	2.5394	5	L	32,5	R
55,6	2.1890	65	R	75	L	58,6	2.3071	35	L	47,5	R	61,6	2.4252	10	L	32,5	R	64,6	2.5433	2,5	R	32,5	R	64,6	2.5433	2,5	R	32,5	R
55,7	2.1929	55	L	65	R	58,7	2.3110	17,5	L	37,5	R	61,7	2.4291	0	L	30	R	64,7	2.5472	10	R	32,5	R	64,7	2.5472	10	R	32,5	R
55,8	2.1969	27,5	L	42,5	R	58,8	2.3150	5	L	32,5	R	61,8	2.4331	5	R	32,5	R	64,8	2.5512	15	R	35	R	64,8	2.5512	15	R	35	R
55,9	2.2008	12,5	L	35	R	58,9	2.3189	2,5	R	32,5	R	61,9	2.4370	12,5	R	35	R	64,9	2.5551	22,5	R	37,5	R	64,9	2.5551	22,5	R	37,5	R
56,0	2.2047	12,5	L	35	L	59,0	2.3228	2,5	L	32,5	L	62,0	2.4409	10	R	32,5	L	65,0	2.5591	37,5	R	50	L	65,0	2.5591	37,5	R	50	L
56,1	2.2087	7,5	L	32,5	L	59,1	2.3268	5	R	32,5	L	62,1	2.4449	25	R	40	L	65,1	2.5630	80	R	87,5	L	65,1	2.5630	80	R	87,5	L
56,2	2.2126	0	R	32,5	L	59,2	2.3307	15	R	35	L	62,2	2.4488	52,5	R	62,5	L	65,2	2.5669	47,5	L	57,5	R	65,2	2.5669	47,5	L	57,5	R
56,3	2.2165	10	R	32,5	L	59,3	2.3346	35	R	47,5	L	62,3	2.4528	70	L	77,5	R	65,3	2.5709	22,5	L	40	R	65,3	2.5709	22,5	L	40	R
56,4	2.2205	22,5	R	40	L	59,4	2.3386	72,5	R	80	L	62,4	2.4567	35	L	47,5	R	65,4	2.5748	7,5	L	32,5	R	65,4	2.5748	7,5	L	32,5	R
56,5	2.2244	47,5	R	57,5	L	59,5	2.3425	52,5	L	62,5	R	62,5	2.4606	15	L	35	R	65,5	2.5787	0	L	32,5	R	65,5	2.5787	0	L	32,5	R
56,6	2.2283	80	L	87,5	R	59,6	2.3465	25	L	40	R	62,6	2.4646	5	L	32,5	R	65,6	2.5827	7,5	R	32,5	R	65,6	2.5827	7,5	R	32,5	R
56,7	2.2323	37,5	L	50	R	59,7	2.3504	10	L	32,5	R	62,7	2.4685	2,5	R	32,5	R	65,7	2.5866	12,5	R	35	R	65,7	2.5866	12,5	R	35	R
56,8	2.2362	17,5	L	35	R	59,8	2.3543	2,5	L	32,5	R	62,8	2.4724	10	R	32,5	R	65,8	2.5906	17,5	R	37,5	R	65,8	2.5906	17,5	R	37,5	R
56,9	2.2402	7,5	L	32,5	R	59,9	2.3583	5	R	32,5	R	62,9	2.4764	15	R	35	R	65,9	2.5945	25	R	40	R	65,9	2.5945	25	R	40	R
57,0	2.2441	10	L	32,5	L	60,0	2.3622	0	R	30	L	63,0																	

(Balancing Table • Universal Applications SVU-BB2 Boring Head continued)

KRDEA012AM • KRDE065012M 65–82,9mm

diameter		ring 1				ring 2				diameter		ring 1				ring 2			
mm	in					mm	in					mm	in						
65,0	2.5591	5	L	37.5	R	68,0	2.6772	12.5	R	37.5	R	71,0	2.7953	25	R	45	R		
65,1	2.5630	2.5	R	37.5	R	68,1	2.6811	17.5	R	40	R	71,1	2.7992	32.5	R	47.5	R		
65,2	2.5669	10	R	37.5	R	68,2	2.6850	22.5	R	42.5	R	71,2	2.8031	37.5	R	52.5	R		
65,3	2.5709	15	R	40	R	68,3	2.6890	27.5	R	47.5	R	71,3	2.8071	42.5	R	57.5	R		
65,4	2.5748	20	R	42.5	R	68,4	2.6929	32.5	R	50	R	71,4	2.8110	47.5	R	62.5	R		
65,5	2.5787	25	R	45	R	68,5	2.6969	40	R	55	R	71,5	2.8150	55	R	67.5	R		
65,6	2.5827	30	R	47.5	R	68,6	2.7008	45	R	60	R	71,6	2.8189	65	R	77.5	R		
65,7	2.5866	35	R	52.5	R	68,7	2.7047	52.5	R	65	R	71,7	2.8228	65	R	77.5	R		
65,8	2.5906	42.5	R	57.5	R	68,8	2.7087	60	R	72.5	R	71,8	2.8268	65	R	77.5	R		
65,9	2.5945	47.5	R	62.5	R	68,9	2.7126	70	R	82.5	R	71,9	2.8307	65	R	77.5	R		
66,0	2.5984	2.5	R	35	R	69,0	2.7165	17.5	R	40	R	72,0	2.8346	30	R	47.5	R		
66,1	2.6024	7.5	R	37.5	R	69,1	2.7205	22.5	R	42.5	R	72,1	2.8386	35	R	52.5	R		
66,2	2.6063	12.5	R	40	R	69,2	2.7244	27.5	R	45	R	72,2	2.8425	40	R	55	R		
66,3	2.6102	20	R	40	R	69,3	2.7283	32.5	R	50	R	72,3	2.8465	47.5	R	60	R		
66,4	2.6142	25	R	45	R	69,4	2.7323	37.5	R	52.5	R	72,4	2.8504	55	R	67.5	R		
66,5	2.6181	30	R	47.5	R	69,5	2.7362	45	R	57.5	R	72,5	2.8543	62.5	R	75	R		
66,6	2.6220	35	R	52.5	R	69,6	2.7402	50	R	62.5	R	72,6	2.8583	80	R	90	R		
66,7	2.6260	40	R	55	R	69,7	2.7441	57.5	R	70	R	72,7	2.8622	80	R	90	R		
66,8	2.6299	47.5	R	60	R	69,8	2.7480	67.5	R	80	R	72,8	2.8661	80	R	90	R		
66,9	2.6339	55	R	67.5	R	69,9	2.7520	67.5	R	80	R	72,9	2.8701	80	R	90	R		
67,0	2.6378	7.5	R	37.5	R	70,0	2.7559	22.5	R	42.5	R	73,0	2.8740	40	R	55	R		
67,1	2.6417	12.5	R	40	R	70,1	2.7598	27.5	R	45	R	73,1	2.8780	47.5	R	60	R		
67,2	2.6457	17.5	R	42.5	R	70,2	2.7638	32.5	R	50	R	73,2	2.8819	52.5	R	65	R		
67,3	2.6496	22.5	R	45	R	70,3	2.7677	37.5	R	52.5	R	73,3	2.8858	62.5	R	75	R		
67,4	2.6535	30	R	47.5	R	70,4	2.7717	42.5	R	57.5	R	73,4	2.8898	75	R	87.5	R		
67,5	2.6575	35	R	50	R	70,5	2.7756	50	R	62.5	R	73,5	2.8937	75	R	87.5	R		
67,6	2.6614	40	R	55	R	70,6	2.7795	57.5	R	70	R	73,6	2.8976	75	R	87.5	R		
67,7	2.6654	45	R	60	R	70,7	2.7835	65	R	77.5	R	73,7	2.9016	75	R	87.5	R		
67,8	2.6693	52.5	R	65	R	70,8	2.7874	65	R	77.5	R	73,8	2.9055	75	R	87.5	R		
67,9	2.6732	60	R	72.5	R	70,9	2.7913	65	R	77.5	R	73,9	2.9094	75	R	87.5	R		
74,0	2.9134	40	R	55	R	77,0	3.0315	55	R	67.5	R	80,0	3.1496	22.5	L	45	L		
74,1	2.9173	45	R	60	R	77,1	3.0354	65	R	77.5	R	80,1	3.1535	17.5	L	42.5	L		
74,2	2.9213	52.5	R	65	R	77,2	3.0394	65	R	77.5	R	80,2	3.1575	12.5	L	40	L		
74,3	2.9252	60	R	72.5	R	77,3	3.0433	65	R	77.5	R	80,3	3.1614	5	L	40	L		
74,4	2.9291	70	R	82.5	R	77,4	3.0472	65	R	77.5	R	80,4	3.1654	2.5	R	40	L		
74,5	2.9331	70	R	82.5	R	77,5	3.0512	65	R	77.5	R	80,5	3.1693	10	R	40	L		
74,6	2.9370	70	R	82.5	R	77,6	3.0551	65	R	77.5	R	80,6	3.1732	22.5	R	45	L		
74,7	2.9409	70	R	82.5	R	77,7	3.0591	65	R	77.5	R	80,7	3.1772	37.5	R	55	L		
74,8	2.9449	70	R	82.5	R	77,8	3.0630	65	R	77.5	R	80,8	3.1811	65	R	77.5	L		
74,9	2.9488	70	R	82.5	R	77,9	3.0669	65	R	77.5	R	80,9	3.1850	70	L	82.5	R		
75,0	2.9528	52.5	R	65	R	78,0	3.0709	62.5	R	75	R	81,0	3.1890	20	L	42.5	L		
75,1	2.9567	57.5	R	70	R	78,1	3.0748	82.5	R	92.5	R	81,1	3.1929	12.5	L	40	L		
75,2	2.9606	70	R	82.5	R	78,2	3.0787	82.5	R	92.5	R	81,2	3.1969	5	L	40	L		
75,3	2.9646	70	R	82.5	R	78,3	3.0827	82.5	R	92.5	R	81,3	3.2008	0	R	37.5	L		
75,4	2.9685	70	R	82.5	R	78,4	3.0866	82.5	R	92.5	R	81,4	3.2047	10	R	40	L		
75,5	2.9724	70	R	82.5	R	78,5	3.0906	82.5	R	92.5	R	81,5	3.2087	20	R	45	L		
75,6	2.9764	70	R	82.5	R	78,6	3.0945	82.5	R	92.5	R	81,6	3.2126	35	R	52.5	L		
75,7	2.9803	70	R	82.5	R	78,7	3.0984	82.5	R	92.5	R	81,7	3.2165	57.5	R	72.5	L		
75,8	2.9843	70	R	82.5	R	78,8	3.1024	82.5	R	92.5	R	81,8	3.2205	75	L	87.5	R		
75,9	2.9882	70	R	82.5	R	78,9	3.1063	82.5	R	92.5	R	81,9	3.2244	45	L	60	R		
76,0	2.9921	50	R	62.5	R	79,0	3.1102	75	R	87.5	R	82,0	3.2283	15	L	40	L		
76,1	2.9961	57.5	R	70	R	79,1	3.1142	75	R	87.5	R	82,1	3.2323	7.5	L	40	L		
76,2	3.0000	67.5	R	80	R	79,2	3.1181	75	R	87.5	R	82,2	3.2362	0	L	40	L		
76,3	3.0039	67.5	R	80	R	79,3	3.1220	75	R	87.5	R	82,3	3.2402	7.5	R	40	L		
76,4	3.0079	67.5	R	80	R	79,4	3.1260	75	R	87.5	R	82,4	3.2441	17.5	R	42.5	L		
76,5	3.0118	67.5	R	80	R	79,5	3.1299	75	R	87.5	R	82,5	3.2480	30	R	50	L		
76,6	3.0157	67.5	R	80	R	79,6	3.1339	75	R	87.5	R	82,6	3.2520	52.5	R	67.5	L		
76,7	3.0197	67.5	R	80	R	79,7	3.1378	75	R	87.5	R	82,7	3.2559	82.5	L	95	R		
76,8	3.0236	67.5	R	80	R	79,8	3.1417	75	R	87.5	R	82,8	3.2598	50	L	65	R		
76,9	3.0276	67.5	R	80	R	79,9	3.1457	75	R	87.5	R	82,9	3.2638	30	L	50	R		

(continued)

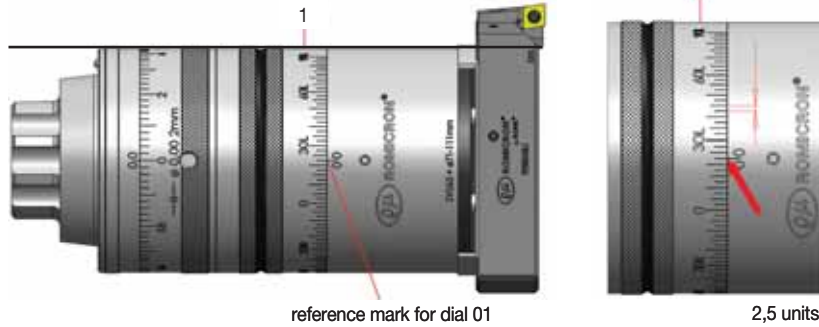
Hole Finishing

(Balancing Table • Universal Applications SVU-BB2 Boring Head continued)

KRDEA012AM • KRDE065012M 83–100mm																			
diameter		ring 1				ring 2				diameter		ring 1				ring 2			
mm	in	ring 1		ring 2		mm	in	ring 1		ring 2		mm	in	ring 1		ring 2			
83,0	3.2677	10	L	40	L	86,0	3.3858	10	R	40	L	89,0	3.5039	42.5	R	57.5	L		
83,1	3.2717	2.5	L	37.5	L	86,1	3.3898	20	R	45	L	89,1	3.5079	72.5	R	85	L		
83,2	3.2756	5	R	40	L	86,2	3.3937	35	R	52.5	L	89,2	3.5118	62.5	L	75	R		
83,3	3.2795	15	R	42.5	L	86,3	3.3976	57.5	R	72.5	L	89,3	3.5157	37.5	L	55	R		
83,4	3.2835	27.5	R	47.5	L	86,4	3.4016	75	L	87.5	R	89,4	3.5197	22.5	L	45	R		
83,5	3.2874	47.5	R	62.5	L	86,5	3.4055	45	L	60	R	89,5	3.5236	10	L	40	R		
83,6	3.2913	77.5	R	90	L	86,6	3.4094	27.5	L	47.5	R	89,6	3.5276	0	L	37.5	R		
83,7	3.2953	55	L	70	R	86,7	3.4134	15	L	42.5	R	89,7	3.5315	5	R	40	R		
83,8	3.2992	32.5	L	50	R	86,8	3.4173	5	L	40	R	89,8	3.5354	12.5	R	40	R		
83,9	3.3031	17.5	L	42.5	R	86,9	3.4213	2.5	R	40	R	89,9	3.5394	17.5	R	42.5	R		
84,0	3.3071	5	L	37.5	L	87,0	3.4252	17.5	R	42.5	L	90,0	3.5433	65	R	77.5	L		
84,1	3.3110	2.5	R	37.5	L	87,1	3.4291	30	R	50	L	90,1	3.5472	70	L	82.5	R		
84,2	3.3150	12.5	R	40	L	87,2	3.4331	52.5	R	67.5	L	90,2	3.5512	40	L	57.5	R		
84,3	3.3189	25	R	47.5	L	87,3	3.4370	82.5	L	95	R	90,3	3.5551	22.5	L	45	R		
84,4	3.3228	42.5	R	57.5	L	87,4	3.4409	50	L	65	R	90,4	3.5591	12.5	L	40	R		
84,5	3.3268	72.5	R	85	L	87,5	3.4449	30	L	50	R	90,5	3.5630	2.5	L	37.5	R		
84,6	3.3307	62.5	L	75	R	87,6	3.4488	17.5	L	42.5	R	90,6	3.5669	5	R	37.5	R		
84,7	3.3346	37.5	L	55	R	87,7	3.4528	7.5	L	40	R	90,7	3.5709	10	R	40	R		
84,8	3.3386	22.5	L	45	R	87,8	3.4567	2.5	R	37.5	R	90,8	3.5748	17.5	R	42.5	R		
84,9	3.3425	10	L	40	R	87,9	3.4606	7.5	R	40	R	90,9	3.5787	22.5	R	45	R		
85,0	3.3465	2.5	R	40	L	88,0	3.4646	27.5	R	47.5	L	91,0	3.5827	75	L	87.5	R		
85,1	3.3504	10	R	40	L	88,1	3.4685	47.5	R	62.5	L	91,1	3.5866	47.5	L	62.5	R		
85,2	3.3543	22.5	R	45	L	88,2	3.4724	77.5	R	90	L	91,2	3.5906	27.5	L	47.5	R		
85,3	3.3583	37.5	R	55	L	88,3	3.4764	55	L	70	R	91,3	3.5945	15	L	42.5	R		
85,4	3.3622	65	R	77.5	L	88,4	3.4803	35	L	52.5	R	91,4	3.5984	5	L	40	R		
85,5	3.3661	70	L	82.5	R	88,5	3.4843	17.5	L	42.5	R	91,5	3.6024	2.5	R	40	R		
85,6	3.3701	40	L	57.5	R	88,6	3.4882	7.5	L	40	R	91,6	3.6063	10	R	40	R		
85,7	3.3740	22.5	L	45	R	88,7	3.4921	0	R	40	R	91,7	3.6102	15	R	42.5	R		
85,8	3.3780	12.5	L	40	R	88,8	3.4961	7.5	R	40	R	91,8	3.6142	22.5	R	45	R		
85,9	3.3819	2.5	L	37.5	R	88,9	3.5000	12.5	R	42.5	R	91,9	3.6181	27.5	R	47.5	R		
92,0	3.6220	50	L	65	R	95,0	3.7402	12.5	L	40	R	98,0	3.8583	7.5	R	40	R		
92,1	3.6260	30	L	50	R	95,1	3.7441	2.5	L	37.5	R	98,1	3.8622	12.5	R	42.5	R		
92,2	3.6299	17.5	L	42.5	R	95,2	3.7480	5	R	37.5	R	98,2	3.8661	20	R	42.5	R		
92,3	3.6339	7.5	L	40	R	95,3	3.7520	10	R	40	R	98,3	3.8701	25	R	47.5	R		
92,4	3.6378	2.5	R	37.5	R	95,4	3.7559	17.5	R	42.5	R	98,4	3.8740	30	R	50	R		
92,5	3.6417	7.5	R	40	R	95,5	3.7598	22.5	R	45	R	98,5	3.8780	37.5	R	55	R		
92,6	3.6457	15	R	40	R	95,6	3.7638	27.5	R	47.5	R	98,6	3.8819	42.5	R	60	R		
92,7	3.6496	20	R	45	R	95,7	3.7677	35	R	52.5	R	98,7	3.8858	50	R	65	R		
92,8	3.6535	25	R	47.5	R	95,8	3.7717	40	R	57.5	R	98,8	3.8898	57.5	R	72.5	R		
92,9	3.6575	32.5	R	50	R	95,9	3.7756	47.5	R	62.5	R	98,9	3.8937	70	R	82.5	R		
93,0	3.6614	35	L	52.5	R	96,0	3.7795	5	L	40	R	99,0	3.8976	12.5	R	40	R		
93,1	3.6654	17.5	L	42.5	R	96,1	3.7835	2.5	R	40	R	99,1	3.9016	17.5	R	42.5	R		
93,2	3.6693	7.5	L	40	R	96,2	3.7874	10	R	40	R	99,2	3.9055	25	R	45	R		
93,3	3.6732	0	R	37.5	R	96,3	3.7913	15	R	42.5	R	99,3	3.9094	30	R	50	R		
93,4	3.6772	7.5	R	40	R	96,4	3.7953	22.5	R	45	R	99,4	3.9134	35	R	52.5	R		
93,5	3.6811	12.5	R	42.5	R	96,5	3.7992	27.5	R	47.5	R	99,5	3.9173	42.5	R	57.5	R		
93,6	3.6850	20	R	42.5	R	96,6	3.8031	32.5	R	52.5	R	99,6	3.9213	47.5	R	62.5	R		
93,7	3.6890	25	R	47.5	R	96,7	3.8071	40	R	55	R	99,7	3.9252	55	R	70	R		
93,8	3.6929	30	R	50	R	96,8	3.8110	45	R	60	R	99,8	3.9291	67.5	R	80	R		
93,9	3.6969	37.5	R	55	R	96,9	3.8150	52.5	R	67.5	R	99,9	3.9331	67.5	R	80	R		
94,0	3.7008	22.5	L	45	R	97,0	3.8189	2.5	R	37.5	R	100,0	3.9370	17.5	R	42.5	R		
94,1	3.7047	10	L	40	R	97,1	3.8228	7.5	R	40	R	100,1	3.9409	22.5	R	45	R		
94,2	3.7087	2.5	L	40	R	97,2	3.8268	15	R	40	R	100,2	3.9449	27.5	R	47.5	R		
94,3	3.7126	5	R	40	R	97,3	3.8307	20	R	45	R	100,3	3.9488	35	R	52.5	R		
94,4	3.7165	12.5	R	40	R	97,4	3.8346	25	R	47.5	R	100,4	3.9528	40	R	57.5	R		
94,5	3.7205	17.5	R	42.5	R	97,5	3.8386	32.5	R	50	R	100,5	3.9567	47.5	R	62.5	R		
94,6	3.7244	25	R	45	R	97,6	3.8425	37.5	R	55	R	100,6	3.9606	55	R	70	R		
94,7	3.7283	30	R	50	R	97,7	3.8465	45	R	60	R	100,7	3.9646	65	R	77.5	R		
94,8	3.7323	35	R	52.5	R	97,8	3.8504	50	R	65	R	100,8	3.9685	65	R	77.5	R		
94,9	3.7362	42.5	R	57.5	R	97,9	3.8543	60	R	72.5	R	100,9	3.9724	65	R	77.5	R		



■ **Balancing Table • SVU-65 Boring Head**



1. The balancing dial 01 is identified on the figure below. The dial resolution is 2,5 units of table values.

2. Read the position value of the dial 01 on the table. For example, to machine a 76mm diameter, the position is 01 = 30R.

3. By moving dial 01, adjust its position, observing its proper reference mark, according to the read value.

Hole Finishing

KRDE070019M										KRDE083019M									
KRCSCFPR061E 71–76mm				KRCSCFPR062E 75,5–81,5mm				KRCSCFPR063E 80–85mm				KRCSCFPR061E 84–89mm			KRCSCFPR062E 88,5–93,5mm				
diameter mm	diameter in	balancing ring setting		diameter mm	diameter in	balancing ring setting		diameter mm	diameter in	balancing ring setting		diameter mm	diameter in	balancing ring setting		diameter mm	diameter in	balancing ring setting	
70,99	2.795	40	L	75,49	2.972	35	L	80,01	3.150	30	L	84,00	3.307	47.5	L	88,49	3.484	40	L
71,12	2.800	37.5	L	75,59	2.976	32.5	L	80,16	3.156	27.5	L	84,12	3.312	45	L	88,65	3.490	37.5	L
71,27	2.806	35	L	75,77	2.983	30	L	80,34	3.163	25	L	84,25	3.317	42.5	L	88,80	3.496	35	L
71,42	2.812	32.5	L	75,95	2.990	27.5	L	80,52	3.170	22.5	L	84,38	3.322	40	L	88,95	3.502	32.5	L
71,60	2.819	30	L	76,10	2.996	25	L	80,70	3.177	20	L	84,51	3.327	37.5	L	89,08	3.507	30	L
71,78	2.826	27.5	L	76,28	3.003	22.5	L	80,87	3.184	17.5	L	84,66	3.333	35	L	89,26	3.514	27.5	L
71,96	2.833	25	L	76,48	3.011	20	L	81,08	3.192	15	L	84,81	3.339	32.5	L	89,41	3.520	25	L
72,14	2.840	22.5	L	76,66	3.018	17.5	L	81,25	3.199	12.5	L	84,96	3.345	30	L	89,56	3.526	22.5	L
72,31	2.847	20	L	76,84	3.025	15	L	81,46	3.207	10	L	85,12	3.351	27.5	L	89,74	3.533	20	L
72,49	2.854	17.5	L	77,04	3.033	12.5	L	81,64	3.214	7.5	L	85,27	3.357	25	L	89,89	3.539	17.5	L
72,69	2.862	15	L	77,22	3.040	10	L	81,84	3.222	5	L	85,42	3.363	22.5	L	90,07	3.546	15	L
72,87	2.869	12.5	L	77,42	3.048	7.5	L	82,02	3.229	2.5	L	85,60	3.370	20	L	90,22	3.552	12.5	L
73,08	2.877	10	L	77,62	3.056	5	L	82,22	3.237	0	–	85,78	3.377	17.5	L	90,40	3.559	10	L
73,25	2.884	7.5	L	77,80	3.063	2.5	L	82,42	3.245	2.5	R	85,93	3.383	15	L	90,58	3.566	7.5	L
73,46	2.892	5	L	78,00	3.071	0	–	82,60	3.252	5	R	86,11	3.390	12.5	L	90,75	3.573	5	L
73,66	2.900	2.5	L	78,21	3.079	2.5	R	82,80	3.260	7.5	R	86,28	3.397	10	L	90,93	3.580	2.5	L
73,86	2.908	0	–	78,38	3.086	5	R	82,98	3.267	10	R	86,46	3.404	7.5	L	91,11	3.587	0	–
74,04	2.915	2.5	R	78,59	3.094	7.5	R	83,19	3.275	12.5	R	86,64	3.411	5	L	91,29	3.594	2.5	R
74,24	2.923	5	R	78,77	3.101	10	R	83,36	3.282	15	R	86,82	3.418	2.5	L	91,47	3.601	5	R
74,45	2.931	7.5	R	78,97	3.109	12.5	R	83,57	3.290	17.5	R	87,00	3.425	0	–	91,64	3.608	7.5	R
74,63	2.938	10	R	79,15	3.116	15	R	83,74	3.297	20	R	87,17	3.432	2.5	R	91,80	3.614	10	R
74,83	2.946	12.5	R	79,35	3.124	17.5	R	83,92	3.304	22.5	R	87,33	3.438	5	R	91,97	3.621	12.5	R
75,01	2.953	15	R	79,53	3.131	20	R	84,10	3.311	25	R	87,50	3.445	7.5	R	92,15	3.628	15	R
75,21	2.961	17.5	R	79,71	3.138	22.5	R	84,28	3.318	27.5	R	87,68	3.452	10	R	92,33	3.635	17.5	R
75,39	2.968	20	R	79,88	3.145	25	R	84,46	3.325	30	R	87,86	3.459	12.5	R	92,48	3.641	20	R
75,57	2.975	22.5	R	80,06	3.152	27.5	R	84,61	3.331	32.5	R	88,04	3.466	15	R	92,66	3.648	22.5	R
75,74	2.982	25	R	80,24	3.159	30	R	84,79	3.338	35	R	88,21	3.473	17.5	R	92,81	3.654	25	R
75,92	2.989	27.5	R	80,42	3.166	32.5	R	84,94	3.344	37.5	R	88,37	3.479	20	R	92,96	3.660	27.5	R
76,00	2.992	30	R	80,49	3.169	35	R	84,99	3.346	40	R	88,54	3.486	22.5	R	93,12	3.666	30	R
–	–	–	–	–	–	–	–	–	–	–	–	88,70	3.492	25	R	93,27	3.672	32.5	R
–	–	–	–	–	–	–	–	–	–	–	–	88,85	3.498	27.5	R	93,42	3.678	35	R
–	–	–	–	–	–	–	–	–	–	–	–	89,00	3.504	30	R	93,50	3.681	37.5	R

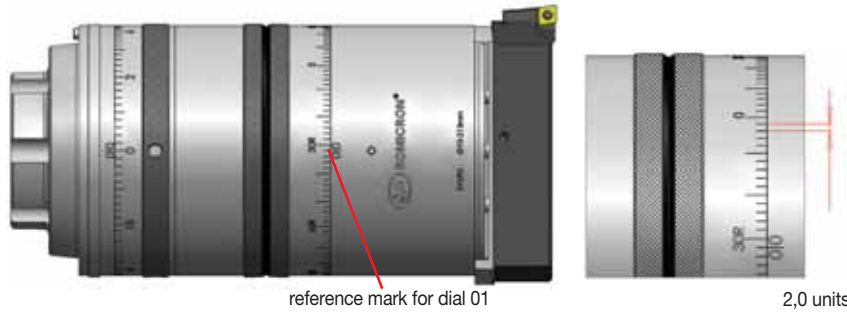
(continued)

(Balancing Table • SVU-65 Boring Head continued)

KRDE083019M				KRDE096019M											
KRCSCFPR063E 93–98mm				KRCSCFPR061E 97–102mm				KRCSCFPR062E 101,5–106,5mm				KRCSCFPR063E 106–111mm			
diameter mm	in	balancing ring setting		diameter mm	in	balancing ring setting		diameter mm	in	balancing ring setting		diameter mm	in	balancing ring setting	
92,99	3.661	35	L	97,00	3.819	55	L	101,50	3.996	45	L	105,99	4.173	37.5	L
93,14	3.667	32.5	L	97,05	3.821	52.5	L	101,60	4.000	42.5	L	106,17	4.180	35	L
93,29	3.673	30	L	97,16	3.825	50	L	101,73	4.005	40	L	106,32	4.186	32.5	L
93,45	3.679	27.5	L	97,28	3.830	47.5	L	101,85	4.010	37.5	L	106,45	4.191	30	L
93,60	3.685	25	L	97,38	3.834	45	L	101,98	4.015	35	L	106,58	4.196	27.5	L
93,78	3.692	22.5	L	97,51	3.839	42.5	L	102,13	4.021	32.5	L	106,73	4.202	25	L
93,93	3.698	20	L	97,61	3.843	40	L	102,26	4.026	30	L	106,88	4.208	22.5	L
94,11	3.705	17.5	L	97,74	3.848	37.5	L	102,41	4.032	27.5	L	107,04	4.214	20	L
94,26	3.711	15	L	97,87	3.853	35	L	102,54	4.037	25	L	107,19	4.220	17.5	L
94,44	3.718	12.5	L	98,02	3.859	32.5	L	102,69	4.043	22.5	L	107,34	4.226	15	L
94,62	3.725	10	L	98,15	3.864	30	L	102,84	4.049	20	L	107,49	4.232	12.5	L
94,79	3.732	7.5	L	98,30	3.870	27.5	L	103,00	4.055	17.5	L	107,65	4.238	10	L
94,95	3.738	5	L	98,45	3.876	25	L	103,15	4.061	15	L	107,82	4.245	7.5	L
95,12	3.745	2.5	L	98,58	3.881	22.5	L	103,30	4.067	12.5	L	107,98	4.251	5	L
95,30	3.752	0	—	98,73	3.887	20	L	103,48	4.074	10	L	108,13	4.257	2.5	L
95,48	3.759	2.5	R	98,88	3.893	17.5	L	103,63	4.080	7.5	L	108,31	4.264	0	—
95,66	3.766	5	R	99,06	3.900	15	L	103,78	4.086	5	L	108,46	4.270	2.5	R
95,83	3.773	7.5	R	99,21	3.906	12.5	L	103,96	4.093	2.5	L	108,61	4.276	5	R
96,01	3.780	10	R	99,36	3.912	10	L	104,11	4.099	0	—	108,79	4.283	7.5	R
96,19	3.787	12.5	R	99,52	3.918	7.5	L	104,27	4.105	2.5	R	108,94	4.289	10	R
96,34	3.793	15	R	99,70	3.925	5	L	104,44	4.112	5	R	109,09	4.295	12.5	R
96,52	3.800	17.5	R	99,85	3.931	2.5	L	104,60	4.118	7.5	R	109,25	4.301	15	R
96,67	3.806	20	R	100,03	3.938	0	—	104,75	4.124	10	R	109,40	4.307	17.5	R
96,85	3.813	22.5	R	100,18	3.944	2.5	R	104,90	4.130	12.5	R	109,55	4.313	20	R
97,00	3.819	25	R	100,33	3.950	5	R	105,08	4.137	15	R	109,70	4.319	22.5	R
97,16	3.825	27.5	R	100,51	3.957	7.5	R	105,23	4.143	17.5	R	109,86	4.325	25	R
97,31	3.831	30	R	100,66	3.963	10	R	105,38	4.149	20	R	110,01	4.331	27.5	R
97,46	3.837	32.5	R	100,81	3.969	12.5	R	105,54	4.155	22.5	R	110,13	4.336	30	R
97,61	3.843	35	R	100,97	3.975	15	R	105,69	4.161	25	R	110,29	4.342	32.5	R
97,76	3.849	37.5	R	101,14	3.982	17.5	R	105,82	4.166	27.5	R	110,41	4.347	35	R
97,89	3.854	40	R	101,30	3.988	20	R	105,97	4.172	30	R	110,54	4.352	37.5	R
97,99	3.858	42.5	R	101,45	3.994	22.5	R	106,10	4.177	32.5	R	110,67	4.357	40	R
—	—	—	—	101,57	3.999	25	R	106,25	4.183	35	R	110,79	4.362	42.5	R
—	—	—	—	101,73	4.005	27.5	R	106,38	4.188	37.5	R	110,90	4.366	45	R
—	—	—	—	104,39	4.110	30	R	106,43	4.190	40	R	111,00	4.370	47.5	R
—	—	—	—	102,01	4.016	32.5	R	106,53	4.194	42.5	R	—	—	—	—



■ **Balancing Table • SVU-92 Boring Head**



1. The balancing dial 01 is identified on the figure below. The dial resolution is 2 units of table values.

2. Read the position value of the dial 01 on the table. For example, to machine a 108mm diameter, the position is 01 = 32R.

3. By moving dial 01, adjust its position, observing its proper reference mark, according to the read value.

Hole Finishing

KRDE101023M						KRDE120023M								
KRCSCFPR061F 101–108mm			KRCSCFPR062F 107,5–114,5mm			KRCSCFPR063F 114–121mm			KRCSCFPR061F 120–127mm			KRCSCFPR062F 126,5–133,5mm		
diameter mm	in	balancing ring setting	diameter mm	in	balancing ring setting	diameter mm	in	balancing ring setting	diameter mm	in	balancing ring setting	diameter mm	in	balancing ring setting
100,99	3.976	36 L	107,49	4.232	34 L	114,00	4.488	30 L	119,99	4.724	40 L	126,49	4.980	36 L
101,19	3.984	34 L	107,62	4.237	32 L	114,22	4.497	28 L	120,19	4.732	38 L	126,72	4.989	34 L
101,40	3.992	32 L	107,80	4.244	30 L	114,40	4.504	26 L	120,35	4.738	36 L	126,90	4.996	32 L
101,57	3.999	30 L	108,00	4.252	28 L	114,60	4.512	24 L	120,52	4.745	34 L	127,08	5.003	30 L
101,78	4.007	28 L	108,20	4.260	26 L	114,81	4.520	22 L	120,70	4.752	32 L	127,25	5.010	28 L
101,98	4.015	26 L	108,41	4.268	24 L	115,01	4.528	20 L	120,88	4.759	30 L	127,43	5.017	26 L
102,18	4.023	24 L	108,61	4.276	22 L	115,24	4.537	18 L	121,06	4.766	28 L	127,61	5.024	24 L
102,39	4.031	22 L	108,81	4.284	20 L	115,44	4.545	16 L	121,23	4.773	26 L	127,81	5.032	22 L
102,59	4.039	20 L	109,02	4.292	18 L	115,67	4.554	14 L	121,41	4.780	24 L	127,99	5.039	20 L
102,79	4.047	18 L	109,25	4.301	16 L	115,87	4.562	12 L	121,62	4.788	22 L	128,19	5.047	18 L
103,02	4.056	16 L	109,45	4.309	14 L	116,10	4.571	10 L	121,79	4.795	20 L	128,40	5.055	16 L
103,23	4.064	14 L	109,68	4.318	12 L	116,31	4.579	8 L	122,00	4.803	18 L	128,57	5.062	14 L
103,45	4.073	12 L	109,88	4.326	10 L	116,54	4.588	6 L	122,20	4.811	16 L	128,78	5.070	12 L
103,66	4.081	10 L	110,11	4.335	8 L	116,76	4.597	4 L	122,38	4.818	14 L	128,98	5.078	10 L
103,89	4.090	8 L	110,34	4.344	6 L	116,97	4.605	2 L	122,58	4.826	12 L	129,18	5.086	8 L
104,11	4.099	6 L	110,57	4.353	4 L	117,20	4.614	0	122,78	4.834	10 L	129,39	5.094	6 L
104,32	4.107	4 L	110,77	4.361	2 L	117,42	4.623	2 R	122,99	4.842	8 L	129,59	5.102	4 L
104,55	4.116	2 L	111,00	4.370	0	117,65	4.632	4 R	123,19	4.850	6 L	129,79	5.110	2 L
104,78	4.125	0	111,23	4.379	2 R	117,86	4.640	6 R	123,39	4.858	4 L	130,00	5.118	0
105,00	4.134	2 R	111,46	4.388	4 R	118,08	4.649	8 R	123,60	4.866	2 L	130,20	5.126	2 R
105,23	4.143	4 R	111,66	4.396	6 R	118,31	4.658	10 R	123,80	4.874	0	130,40	5.134	4 R
105,44	4.151	6 R	111,89	4.405	8 R	118,52	4.666	12 R	124,00	4.882	2 R	130,61	5.142	6 R
105,66	4.160	8 R	112,12	4.414	10 R	118,75	4.675	14 R	124,21	4.890	4 R	130,81	5.150	8 R
105,89	4.169	10 R	107,19	4.220	12 R	118,95	4.683	16 R	124,41	4.898	6 R	131,01	5.158	10 R
106,10	4.177	12 R	112,55	4.431	14 R	119,18	4.692	18 R	124,61	4.906	8 R	131,22	5.166	12 R
106,32	4.186	14 R	112,75	4.439	16 R	119,38	4.700	20 R	124,82	4.914	10 R	131,42	5.174	14 R
106,53	4.194	16 R	112,98	4.448	18 R	119,58	4.708	22 R	125,02	4.922	12 R	131,62	5.182	16 R
106,76	4.203	18 R	113,18	4.456	20 R	119,79	4.716	24 R	125,22	4.930	14 R	131,80	5.189	18 R
106,96	4.211	20 R	113,39	4.464	22 R	119,99	4.724	26 R	125,43	4.938	16 R	132,00	5.197	20 R
107,16	4.219	22 R	113,59	4.472	24 R	120,19	4.732	28 R	125,63	4.946	18 R	132,18	5.204	22 R
107,37	4.227	24 R	113,79	4.480	26 R	120,37	4.739	30 R	125,81	4.953	20 R	132,38	5.212	24 R
107,57	4.235	26 R	114,00	4.488	28 R	120,57	4.747	32 R	126,01	4.961	22 R	132,56	5.219	26 R
107,77	4.243	28 R	114,20	4.496	30 R	120,75	4.754	34 R	126,19	4.968	24 R	132,74	5.226	28 R
107,98	4.251	30 R	114,38	4.503	32 R	120,93	4.761	36 R	126,37	4.975	26 R	132,92	5.233	30 R
108,00	4.252	32 R	114,50	4.508	34 R	121,01	4.764	38 R	126,57	4.983	28 R	133,10	5.240	32 R
—	—	—	—	—	—	—	—	—	126,75	4.990	30 R	133,27	5.247	34 R
—	—	—	—	—	—	—	—	—	126,92	4.997	32 R	133,45	5.254	36 R
—	—	—	—	—	—	—	—	—	127,00	5.000	34 R	133,50	5.256	38 R

(continued)

(Balancing Table • SVU-92 Boring Head continued)

KRDE120023M				KRDE139026M											
KRCSCFPR063F 133–140mm				KRCSCFPR061F 139–146mm				KRCSCFPR062F 145,5–152,5mm				KRCSCFPR063F 152–159mm			
diameter mm	in	balancing ring setting		diameter mm	in	balancing ring setting		diameter mm	in	balancing ring setting		diameter mm	in	balancing ring setting	
132,99	5.236	34	L	138,99	5.472	50	L	145,49	5.728	44	L	151,99	5.984	40	L
133,10	5.240	32	L	139,09	5.476	48	L	145,67	5.735	42	L	152,12	5.989	38	L
133,27	5.247	30	L	139,22	5.481	46	L	145,80	5.740	40	L	152,27	5.995	36	L
133,45	5.254	28	L	139,34	5.486	44	L	145,95	5.746	38	L	152,40	6.000	34	L
133,63	5.261	26	L	139,47	5.491	42	L	146,08	5.751	36	L	152,55	6.006	32	L
133,81	5.268	24	L	139,60	5.496	40	L	146,23	5.757	34	L	152,70	6.012	30	L
133,99	5.275	22	L	139,73	5.501	38	L	146,35	5.762	32	L	152,86	6.018	28	L
134,19	5.283	20	L	139,88	5.507	36	L	146,51	5.768	30	L	153,01	6.024	26	L
134,37	5.290	18	L	140,00	5.512	34	L	146,66	5.774	28	L	153,16	6.030	24	L
134,57	5.298	16	L	140,16	5.518	32	L	146,81	5.780	26	L	153,31	6.036	22	L
134,77	5.306	14	L	140,31	5.524	30	L	146,99	5.787	24	L	153,49	6.043	20	L
134,98	5.314	12	L	140,46	5.530	28	L	147,14	5.793	22	L	153,64	6.049	18	L
135,18	5.322	10	L	140,61	5.536	26	L	147,29	5.799	20	L	153,82	6.056	16	L
135,36	5.329	8	L	140,77	5.542	24	L	147,47	5.806	18	L	153,97	6.062	14	L
135,56	5.337	6	L	140,92	5.548	22	L	147,62	5.812	16	L	154,15	6.069	12	L
135,76	5.345	4	L	141,10	5.555	20	L	147,80	5.819	14	L	154,33	6.076	10	L
135,97	5.353	2	L	141,25	5.561	18	L	147,96	5.825	12	L	154,48	6.082	8	L
136,17	5.361	0	—	141,43	5.568	16	L	148,13	5.832	10	L	154,66	6.089	6	L
136,37	5.369	2	R	141,58	5.574	14	L	148,31	5.839	8	L	154,84	6.096	4	L
136,58	5.377	4	R	141,76	5.581	12	L	148,49	5.846	6	L	155,02	6.103	2	L
162,18	6.385	6	R	141,94	5.588	10	L	148,64	5.852	4	L	155,19	6.110	0	—
136,98	5.393	8	R	142,11	5.595	8	L	148,82	5.859	2	L	155,35	6.116	2	R
137,19	5.401	10	R	142,27	5.601	6	L	149,00	5.866	0	—	155,52	6.123	4	R
137,39	5.409	12	R	142,44	5.608	4	L	149,17	5.873	2	R	155,70	6.130	6	R
137,59	5.417	14	R	142,62	5.615	2	L	149,35	5.880	4	R	155,88	6.137	8	R
137,80	5.425	16	R	142,80	5.622	0	—	149,53	5.887	6	R	156,03	6.143	10	R
137,97	5.432	18	R	142,98	5.629	2	R	149,68	5.893	8	R	156,21	6.150	12	R
138,18	5.440	20	R	143,15	5.636	4	R	149,86	5.900	10	R	156,39	6.157	14	R
138,38	5.448	22	R	143,31	5.642	6	R	150,04	5.907	12	R	156,54	6.163	16	R
138,56	5.455	24	R	143,48	5.649	8	R	150,19	5.913	14	R	156,72	6.170	18	R
138,73	5.462	26	R	143,66	5.656	10	R	150,37	5.920	16	R	156,87	6.176	20	R
138,91	5.469	28	R	143,84	5.663	12	R	150,55	5.927	18	R	157,05	6.183	22	R
139,09	5.476	30	R	143,99	5.669	14	R	150,70	5.933	20	R	157,20	6.189	24	R
139,27	5.483	32	R	144,17	5.676	16	R	150,85	5.939	22	R	157,35	6.195	26	R
139,45	5.490	34	R	144,32	5.682	18	R	151,03	5.946	24	R	157,51	6.201	28	R
139,60	5.496	36	R	144,50	5.689	20	R	151,18	5.952	26	R	157,66	6.207	30	R
139,78	5.503	38	R	144,65	5.695	22	R	151,33	5.958	28	R	157,81	6.213	32	R
139,93	5.509	40	R	144,83	5.702	24	R	151,49	5.964	30	R	157,96	6.219	34	R
140,00	5.512	42	R	144,98	5.708	26	R	151,64	5.970	32	R	158,09	6.224	36	R
—	—	—	—	145,14	5.714	28	R	151,79	5.976	34	R	158,24	6.23	38	R
—	—	—	—	145,29	5.720	30	R	151,92	5.981	36	R	158,37	6.235	40	R
—	—	—	—	145,44	5.726	32	R	152,07	5.987	38	R	158,50	6.24	42	R
—	—	—	—	145,57	5.731	34	R	152,20	5.992	40	R	158,62	6.245	44	R
—	—	—	—	145,72	5.737	36	R	152,32	5.997	42	R	158,75	6.25	46	R
—	—	—	—	145,87	5.743	38	R	152,45	6.002	44	R	158,88	6.255	48	R
—	—	—	—	145,97	5.747	40	R	152,50	6.004	46	R	158,98	6.259	50	R
—	—	—	—	146,00	5.748	42	R	—	—	—	—	159,00	6.26	52	R



(continued)

(Balancing Table • SVU-92 Boring Head continued)

KRDE156026M

KRCSCFPR061F 156–163mm				KRCSCFPR062F 162,5–169,5mm				KRCSCFPR063F 169–176mm			
diameter		balancing		diameter		balancing		diameter		balancing	
mm	in	ring	setting	mm	in	ring	setting	mm	in	ring	setting
156,01	6.142	56	L	162,51	6.398	50	L	169,01	6.654	44	L
156,11	6.146	54	L	162,61	6.402	48	L	169,11	6.658	42	L
156,21	6.150	52	L	162,71	6.406	46	L	169,24	6.663	40	L
156,31	6.154	50	L	162,81	6.410	44	L	169,37	6.668	38	L
156,41	6.158	48	L	162,94	6.415	42	L	169,49	6.673	36	L
156,51	6.162	46	L	163,07	6.420	40	L	169,62	6.678	34	L
156,62	6.166	44	L	163,20	6.425	38	L	169,75	6.683	32	L
156,74	6.171	42	L	163,32	6.430	36	L	169,90	6.689	30	L
156,87	6.176	40	L	163,45	6.435	34	L	170,03	6.694	28	L
157,00	6.181	38	L	163,58	6.440	32	L	170,18	6.700	26	L
157,12	6.186	36	L	163,70	6.445	30	L	170,33	6.706	24	L
157,25	6.191	34	L	163,86	6.451	28	L	170,46	6.711	22	L
157,38	6.196	32	L	164,01	6.457	26	L	170,61	6.717	20	L
157,53	6.202	30	L	164,13	6.462	24	L	170,76	6.723	18	L
157,66	6.207	28	L	164,29	6.468	22	L	170,92	6.729	16	L
157,81	6.213	26	L	164,44	6.474	20	L	171,07	6.735	14	L
157,94	6.218	24	L	164,59	6.480	18	L	171,22	6.741	12	L
158,09	6.224	22	L	164,74	6.486	16	L	171,37	6.747	10	L
158,24	6.230	20	L	164,90	6.492	14	L	171,55	6.754	8	L
158,39	6.236	18	L	165,05	6.498	12	L	171,70	6.760	6	L
158,55	6.242	16	L	165,20	6.504	10	L	171,86	6.766	4	L
158,70	6.248	14	L	165,35	6.510	8	L	172,01	6.772	2	L
158,85	6.254	12	L	165,53	6.517	6	L	172,19	6.779	0	—
159,00	6.260	10	L	165,68	6.523	4	L	172,34	6.785	2	R
159,18	6.267	8	L	165,84	6.529	2	L	172,49	6.791	4	R
159,33	6.273	6	L	165,99	6.535	0	—	172,64	6.797	6	R
159,49	6.279	4	L	166,17	6.542	2	R	172,82	6.804	8	R
159,64	6.285	2	L	166,32	6.548	4	R	172,97	6.810	10	R
159,82	6.292	0	—	166,47	6.554	6	R	173,13	6.816	12	R
159,97	6.298	2	R	166,62	6.560	8	R	173,28	6.822	14	R
160,12	6.304	4	R	166,80	6.567	10	R	173,43	6.828	16	R
160,27	6.310	6	R	166,95	6.573	12	R	173,58	6.834	18	R
160,45	6.317	8	R	167,11	6.579	14	R	173,74	6.840	20	R
160,60	6.323	10	R	167,26	6.585	16	R	173,89	6.846	22	R
160,76	6.329	12	R	167,41	6.591	18	R	174,04	6.852	24	R
160,91	6.335	14	R	167,56	6.597	20	R	174,17	6.857	26	R
161,06	6.341	16	R	167,72	6.603	22	R	174,32	6.863	28	R
161,21	6.347	18	R	167,87	6.609	24	R	174,45	6.868	30	R
161,37	6.353	20	R	168,00	6.614	26	R	174,60	6.874	32	R
161,52	6.359	22	R	168,15	6.620	28	R	174,73	6.879	34	R
161,67	6.365	24	R	168,28	6.625	30	R	174,85	6.884	36	R
161,82	6.371	26	R	168,43	6.631	32	R	174,98	6.889	38	R
161,95	6.376	28	R	168,55	6.636	34	R	175,11	6.894	40	R
162,10	6.382	30	R	168,68	6.641	36	R	175,23	6.899	42	R
162,23	6.387	32	R	168,81	6.646	38	R	175,34	6.903	44	R
162,36	6.392	34	R	168,94	6.651	40	R	175,46	6.908	46	R
162,51	6.398	36	R	169,06	6.656	42	R	175,56	6.912	48	R
162,64	6.403	38	R	169,16	6.660	44	R	175,67	6.916	50	R
162,74	6.407	40	R	169,29	6.665	46	R	175,77	6.920	52	R
162,86	6.412	42	R	169,39	6.669	48	R	175,87	6.924	54	R
162,99	6.417	44	R	169,49	6.673	50	R	175,95	6.927	56	R
162,99	6.417	46	R	169,49	6.673	52	R	176,00	6.929	58	R

(continued)

Hole Finishing

(Balancing Table • SVU-92 Boring Head continued)

KRDE175026M

KRCSCFPR061F 175–182mm				KRCSCFPR062F 181,5–188,5mm				KRCSCFPR063F 188–195mm			
diameter mm	in	balancing ring setting		diameter mm	in	balancing ring setting		diameter mm	in	balancing ring setting	
175,01	6.890	64	L	181,51	7.146	56	L	188,0108	7.402	48	L
175,06	6.892	62	L	181,56	7.148	54	L	188,1124	7.406	46	L
175,13	6.895	60	L	181,64	7.151	52	L	188,214	7.410	44	L
175,21	6.898	58	L	181,74	7.155	50	L	188,3156	7.414	42	L
175,29	6.901	56	L	181,84	7.159	48	L	188,4426	7.419	40	L
175,36	6.904	54	L	181,94	7.163	46	L	188,5442	7.423	38	L
175,46	6.908	52	L	182,04	7.167	44	L	188,6712	7.428	36	L
175,56	6.912	50	L	182,14	7.171	42	L	188,7982	7.433	34	L
175,64	6.915	48	L	182,27	7.176	40	L	188,8998	7.437	32	L
175,74	6.919	46	L	182,37	7.180	38	L	189,0268	7.442	30	L
175,87	6.924	44	L	182,50	7.185	36	L	189,1792	7.448	28	L
175,97	6.928	42	L	182,63	7.190	34	L	189,3062	7.453	26	L
176,07	6.932	40	L	182,75	7.195	32	L	189,4332	7.458	24	L
176,20	6.937	38	L	182,88	7.200	30	L	189,5602	7.463	22	L
176,30	6.941	36	L	183,01	7.205	28	L	189,7126	7.469	20	L
176,43	6.946	34	L	183,13	7.210	26	L	189,8396	7.474	18	L
176,56	6.951	32	L	183,26	7.215	24	L	189,992	7.480	16	L
176,68	6.956	30	L	183,41	7.221	22	L	190,1444	7.486	14	L
176,81	6.961	28	L	183,54	7.226	20	L	190,2714	7.491	12	L
176,96	6.967	26	L	183,69	7.232	18	L	190,4238	7.497	10	L
177,09	6.972	24	L	183,82	7.237	16	L	114,3762	4.503	8	L
177,22	6.977	22	L	183,97	7.243	14	L	190,7286	7.509	6	L
177,37	6.983	20	L	184,12	7.249	12	L	190,8556	7.514	4	L
177,50	6.988	18	L	184,25	7.254	10	L	191,008	7.520	2	L
177,65	6.994	16	L	184,40	7.260	8	L	191,1604	7.526	0	—
177,80	7.000	14	L	184,56	7.266	6	L	191,3128	7.532	2	R
177,93	7.005	12	L	184,71	7.272	4	L	191,4652	7.538	4	R
178,08	7.011	10	L	184,86	7.278	2	L	191,6176	7.544	6	R
178,23	7.017	8	L	184,99	7.283	0	—	191,7446	7.549	8	R
178,38	7.023	6	L	185,14	7.289	2	R	191,897	7.555	10	R
178,54	7.029	4	L	185,29	7.295	4	R	192,0494	7.561	12	R
178,66	7.034	2	L	185,45	7.301	6	R	192,2018	7.567	14	R
178,82	7.040	0	—	185,60	7.307	8	R	192,3288	7.572	16	R
178,97	7.046	2	R	185,75	7.313	10	R	192,4812	7.578	18	R
179,12	7.052	4	R	185,88	7.318	12	R	192,6082	7.583	20	R
179,27	7.058	6	R	186,03	7.324	14	R	192,7606	7.589	22	R
179,43	7.064	8	R	186,18	7.330	16	R	192,8876	7.594	24	R
179,55	7.069	10	R	186,31	7.335	18	R	193,04	7.600	26	R
179,71	7.075	12	R	186,46	7.341	20	R	193,167	7.605	28	R
179,86	7.081	14	R	186,59	7.346	22	R	193,294	7.610	30	R
180,01	7.087	16	R	186,74	7.352	24	R	193,421	7.615	32	R
180,14	7.092	18	R	186,87	7.357	26	R	193,548	7.620	34	R
180,29	7.098	20	R	186,99	7.362	28	R	193,675	7.625	36	R
180,42	7.103	22	R	187,12	7.367	30	R	193,7766	7.629	38	R
180,57	7.109	24	R	187,25	7.372	32	R	193,9036	7.634	40	R
180,70	7.114	26	R	187,38	7.377	34	R	194,0052	7.638	42	R
180,82	7.119	28	R	187,50	7.382	36	R	194,1068	7.642	44	R
180,95	7.124	30	R	187,63	7.387	38	R	194,2338	7.647	46	R
181,08	7.129	32	R	187,73	7.391	40	R	194,3354	7.651	48	R
181,20	7.134	34	R	187,86	7.396	42	R	194,4116	7.654	50	R
181,33	7.139	36	R	187,96	7.400	44	R	194,5132	7.658	52	R
181,46	7.144	38	R	188,06	7.404	46	R	194,6148	7.662	54	R
181,56	7.148	40	R	188,16	7.408	48	R	194,691	7.665	56	R
181,69	7.153	42	R	188,26	7.412	50	R	194,7672	7.668	58	R
181,79	7.157	44	R	188,37	7.416	52	R	194,8434	7.671	60	R
181,89	7.161	46	R	188,44	7.419	54	R	194,9196	7.674	62	R
181,99	7.165	48	R	188,49	7.421	56	R	194,9958	7.677	64	R
181,99	7.165	50	R	—	—	—	—	194,9958	7.677	66	R



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(Balancing Table • SVU-92 Boring Head continued)

KRDE193026M

KRCSCFPR061F 193–200mm				KRCSCFPR062F 199,5–206,5mm				KRCSCFPR063F 206–213mm			
diameter		balancing		diameter		balancing		diameter		balancing	
mm	in	mm	in	mm	in	mm	in	mm	in	mm	in
192,99	7.598	64	L	199,49	7.854	54	L	205,994	8.11	46	L
193,07	7.601	62	L	199,62	7.859	52	L	206,1464	8.116	44	L
193,14	7.604	60	L	199,72	7.863	50	L	206,248	8.12	42	L
193,22	7.607	58	L	199,80	7.866	48	L	206,375	8.125	40	L
193,29	7.610	56	L	199,90	7.870	46	L	206,4766	8.129	38	L
193,37	7.613	54	L	200,03	7.875	44	L	206,6036	8.134	36	L
193,47	7.617	52	L	200,13	7.879	42	L	206,7306	8.139	34	L
193,57	7.621	50	L	200,23	7.883	40	L	206,8576	8.144	32	L
193,65	7.624	48	L	200,36	7.888	38	L	206,9846	8.149	30	L
193,75	7.628	46	L	200,48	7.893	36	L	207,1116	8.154	28	L
193,88	7.633	44	L	200,61	7.898	34	L	207,2386	8.159	26	L
193,98	7.637	42	L	200,71	7.902	32	L	207,391	8.165	24	L
194,08	7.641	40	L	200,86	7.908	30	L	207,518	8.17	22	L
194,21	7.646	38	L	200,99	7.913	28	L	207,6704	8.176	20	L
194,34	7.651	36	L	201,12	7.918	26	L	207,7974	8.181	18	L
194,46	7.656	34	L	201,24	7.923	24	L	207,9498	8.187	16	L
194,59	7.661	32	L	201,40	7.929	22	L	208,1022	8.193	14	L
194,72	7.666	30	L	201,52	7.934	20	L	208,2292	8.198	12	L
194,84	7.671	28	L	201,68	7.940	18	L	208,3816	8.204	10	L
194,97	7.676	26	L	201,80	7.945	16	L	208,534	8.21	8	L
195,10	7.681	24	L	201,96	7.951	14	L	208,6864	8.216	6	L
195,25	7.687	22	L	202,11	7.957	12	L	208,8388	8.222	4	L
195,38	7.692	20	L	202,26	7.963	10	L	208,9912	8.228	2	L
195,53	7.698	18	L	202,41	7.969	8	L	209,1182	8.233	0	—
195,68	7.704	16	L	202,54	7.974	6	L	209,2706	8.239	2	R
195,81	7.709	14	L	202,69	7.980	4	L	209,423	8.245	4	R
195,96	7.715	12	L	202,84	7.986	2	L	209,5754	8.251	6	R
196,11	7.721	10	L	203,00	7.992	0	—	209,7278	8.257	8	R
196,27	7.727	8	L	203,15	7.998	2	R	209,8802	8.263	10	R
196,42	7.733	6	L	203,30	8.004	4	R	210,0326	8.269	12	R
196,57	7.739	4	L	203,45	8.010	6	R	210,1596	8.274	14	R
196,70	7.744	2	L	203,61	8.016	8	R	210,312	8.28	16	R
196,85	7.750	0	—	203,76	8.022	10	R	210,4644	8.286	18	R
197,00	7.756	2	R	203,89	8.027	12	R	210,5914	8.291	20	R
197,15	7.762	4	R	204,04	8.033	14	R	210,7438	8.297	22	R
197,31	7.768	6	R	204,19	8.039	16	R	210,8708	8.302	24	R
197,46	7.774	8	R	204,32	8.044	18	R	210,9978	8.307	26	R
197,61	7.780	10	R	204,47	8.050	20	R	211,1502	8.313	28	R
197,76	7.786	12	R	204,60	8.055	22	R	211,2772	8.318	30	R
197,89	7.791	14	R	204,75	8.061	24	R	211,4042	8.323	32	R
198,04	7.797	16	R	204,88	8.066	26	R	211,5312	8.328	34	R
198,20	7.803	18	R	205,03	8.072	28	R	211,6582	8.333	36	R
198,32	7.808	20	R	205,16	8.077	30	R	211,7598	8.337	38	R
198,48	7.814	22	R	205,28	8.082	32	R	84,8868	3.342	40	R
198,60	7.819	24	R	205,41	8.087	34	R	211,9884	8.346	42	R
198,76	7.825	26	R	205,54	8.092	36	R	212,1154	8.351	44	R
198,88	7.830	28	R	205,64	8.096	38	R	212,217	8.355	46	R
199,01	7.835	30	R	205,77	8.101	40	R	212,3186	8.359	48	R
199,14	7.840	32	R	205,87	8.105	42	R	212,4202	8.363	50	R
199,26	7.845	34	R	205,99	8.110	44	R	212,4964	8.366	52	R
199,39	7.850	36	R	206,10	8.114	46	R	212,598	8.37	54	R
199,52	7.855	38	R	206,20	8.118	48	R	212,6742	8.373	56	R
199,62	7.859	40	R	206,30	8.122	50	R	212,7758	8.377	58	R
199,75	7.864	42	R	206,38	8.125	52	R	212,852	8.38	60	R
199,85	7.868	44	R	206,48	8.129	54	R	212,9028	8.382	62	R
199,95	7.872	46	R	206,50	8.130	56	R	212,979	8.385	64	R
200,00	7.874	48	R	—	—	—	—	213,0044	8.386	66	R

Hole Finishing



The **EDGE** to **PERFORM**

Multicron Fine-Boring Tooling

Multiple edges allow respective increase of feed rate to increase productivity and metal removal rate (MRR).

- Engineered solutions are available starting at diameter 3.07" (78mm) with two independent adjustable Romicon™ edges.
- Combination of semi-finishing and finishing cutting operations in one tool are also possible.
- Romicon edges can be set up independently and adjusted to compensate for insert wear with one central dial to enable CLB as well.

Experience the advantages at your Authorized Kennametal Distributor or at www.kennametal.com.

www.kennametal.com

 **KENNAMETAL®**



ModBORE™

One system from highly flexible roughing and fine-boring heads to large bridge tooling with optimum amount of tooling components.

Primary Application

This premium boring line enables rough to fine-boring operations using one system with a large diameter range from .384–86.8" (9,75–2.205mm). ModBORE can be used in most materials commonly found in the metalcutting environment by applying the latest technology in Kennametal Standard ISO Turning Inserts.

Features and Benefits

Complete System

- Twin blade heads for roughing to semi-finishing operations starting from diameter .925" (23,5mm).
- Fine-boring heads for finishing for diameters .384–86.8" (9,75–2.205mm).
- Bridge tooling for large diameters up to .86.8" (2.205mm) standard with both roughing and fine-finishing heads.
- Through-coolant capability in all series.

Resolution

- Fine adjustable roughing heads.
- .0004" (0,01mm) diameter adjustment respective .00008" (2 µm) with easy-to-read large vernier scale with fine-boring heads.

Product Variety

- KM™ shanks for adaptation to all spindles via respective adapters.
- HSK shanks for direct adaptation.
- Inch shanks as most economic variant for adaptation via respective adapters.

Customization

- Engineered solutions available.
- Anti-chatter devices available.
- Cartridges can be designed into standard boring heads for added versatility.





ModBORE™ Fine-Boring System

Based on KM™, HSK, and inch SSF couplings, match all spindle specifications direct or indirect via adapters. The ModBORE Fine-Boring System utilizes standard ISO/ANSI turning inserts for maximum performance and flexibility.

RBHT • Twin Cutters for Rough and Semi-Finish Boring

- Diameters .925–6.024" (23,5–153mm).
- KM, HSK, and inch straight shank back end versions available.
- Special preloaded serration and ground support face ensures very stable connection, minimizes cutting vibration, and maximizes position accuracy while enabling easy diameter adjustment.
- Large selection of blades sets:
 - Staggered — efficient machining of large depths of cut.
 - 70° — for challenging applications requiring stable corner radii and full utilization of inserts.
 - 90° — most precise machining results.
- Generous clearance and through coolant enables free chip flow and improves tool life.
- All insert holders allow positive standard turning inserts for lowest cutting forces. Starting with diameter 2.58" (65,5mm) additional insert holders for negative standard turning inserts enable even higher feed rates for maximum metal removal rates.



FBHO • Offset Boring Bar Heads for Fine Finish

- Diameters .384–3.46" (9,75–88,1mm).
- KM, HSK, and inch straight shank back end versions available.
- Use of a precision-ground micrometric screw enables fine adjustment of .00008" (2 μm) via vernier scale. The large, TiN-coated dial is easy to adjust and easy to read. The force- and form-fixed adjustment mechanism is almost free of any backlash and play.
- Standard steel and carbide boring bars can be adjusted in length by pushing them deep into the body for maximum stability.
- Through coolant directed to the cutting edge improves tool life, surface finish, and chip evacuation.



FBHM • Offset Boring Bar and Cartridge Heads for Fine Finish

- Diameters .384–12.59" (9,75–320mm).
- KM-TS, HSK, CV, DV, and BT steep taper back end versions available.
- Use of a precision-ground micrometric screw enables fine adjustment of .00008" (2 μ m) via vernier scale. The large, TiN-coated dial is easy to adjust and easy to read. The force- and form-fixed adjustment mechanism is almost free of any backlash and play.
- Standard steel and carbide boring bars adjust in length by pushing them deep into the body for maximum stability.
- Aluminum diameter extender with insert cartridges and counterweight are used for diameters starting at 3.38" (86mm) for maximum flexibility.
- Through coolant directed to the cutting edge improves tool life, surface finish, and chip evacuation.



FBHS • Cartridge Boring Heads for Fine Finish

- Diameters .925–6.024" (23,5–153mm).
- KM™, HSK, and inch straight shank back end versions available.
- Use of a precision-ground micrometric screw enables fine adjustment of .00008" (2 μ m) via vernier scale. The large, TiN-coated dial is easy to adjust and easy to read. The force- and form-fixed adjustment mechanism is almost free of any backlash and play.
- Large selection of insert holders:
 - 95° — for use of Wiper turning inserts.
 - 90° regular diameter — for most efficient machining of large depths of cut.
 - 90° oversized diameter — for enhanced use of boring head diameter capabilities.
- Generous clearance and through coolant directed to the cutting edge improves tool life, surface finish, and chip evacuation.



BT • Bridge Tools for Rough and Finish Boring

- Diameters 5.91–86.81" (150–2.205mm).
- Highly sophisticated ground serration between consoles/slides and heads as well as T-style bolt clamping provides highest cutting force transmission capabilities, sensitive adjustment, and avoids diameter changes when heads are clamped.
- Only 10 bridge consoles are needed for diameters up to 25.7" (655mm).
- KM, HSK, and various steep taper adapters with console corresponding ground serration are available as standard. Through coolant to the cutting edge improves tool life and surface finish.
- Diameters 25.5–86.81" (650–2.205mm) are covered with only three aluminum-based consoles and two sets of steel slides for mounting rough and finish boring heads for direct spindle of shell mill adapter clamping.
- 90° roughing head sets ensure precise height alignment and, by use of negative standard turning inserts, highest metal removal rates.
- New counterweight for better dynamic balancing supplements the fine-boring head with precision-ground micrometric screw enabling fine adjustment of .00008" (2 μ m) via vernier scale.



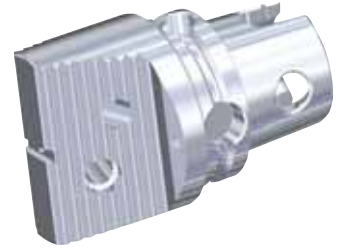
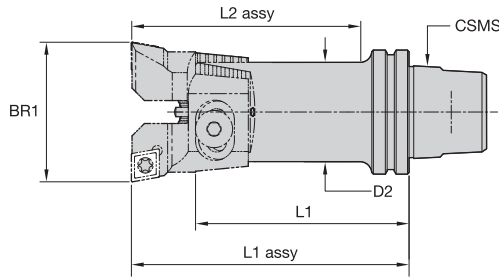
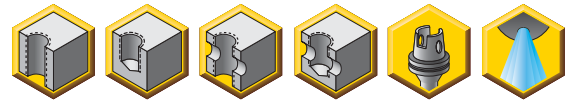
■ **FBHM Fine-Boring Kits**

range		order number	catalog number	content	
mm	in				
9,75–164,0	.383–6.456	4057100	KM50TSFBHMKIT164M	KM50TSFBHM1677 AFB09075SCFCR06 AFB13085SCFCR06 AFB17100SCFCR06 AFB21110SCFCR09 AFB24115SCFCR09	AFM29115 AFM47115 EBM8015086 AFM29SCFPR06 AFM47SCFPR09 886038045
9,75–164,0	.383–6.456	4057098	HSK63FBHMKIT164M	HSK63FBHM1696 AFB09075SCFCR06 AFB13085SCFCR06 AFB17100SCFCR06 AFB21110SCFCR09 AFB24115SCFCR09	AFM29115 AFM47115 EBM8015086 AFM29SCFPR06 AFM47SCFPR09 886038045
9,75–164,0	.383–6.456	4057099	DV40FBHMKIT164M	DV40FBHM1691 AFB09075SCFCR06 AFB13085SCFCR06 AFB17100SCFCR06 AFB21110SCFCR09 AFB21110SCFCR09	AFM29115 AFM47115 EBM8015086 AFM29SCFPR06 AFM47SCFPR09 886038045
9,75–164,0	.383–6.456	4057100	BT40FBHMKIT164M	BT40FBHM1691 AFB09075SCFCR06 AFB13085SCFCR06 AFB17100SCFCR06 AFB21110SCFCR09 AFB24115SCFCR09	AFM29115 AFM47115 EBM8015086 AFM29SCFPR06 AFM47SCFPR09 886038045
9,75–164,0	.383–6.456	4057101	CV40FBHMKIT645	CV40FBHM1691 AFB09075SCFCR06 AFB13085SCFCR06 AFB17100SCFCR06 AFB21110SCFCR09 AFB24115SCFCR09	AFM29115 AFM47115 EBM8015086 AFM29SCFPR06 AFM47SCFPR09 886038045

Hole Finishing



• Order blade sets separately; see page K189.



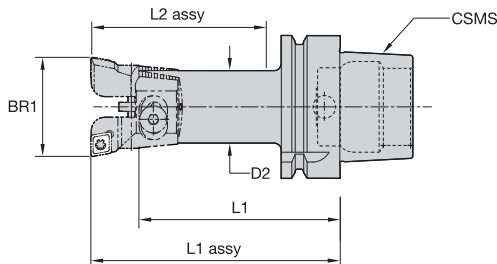
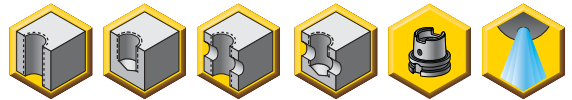
■ RBHT • KM™ Rough-Boring Twin Cutters

order number	catalog number	BR1 bore range		CSMS system size	D2		L1		L1 assy		L2 assy		blade screw	washer	pin
		mm	in		mm	in	mm	in	mm	in	mm	in			
3586519	KM32RBHT24	23,500-30,500	.9252-1.2008	KM32	20,0	.79	75,4	2.97	90,0	3.54	76,0	2.99	840.142.200	841.142.200	841.342.200
3586520	KM32RBHT30	29,500-40,000	1.1614-1.5748	KM32	25,0	.98	83,8	3.30	100,0	3.94	86,0	3.39	840.142.250	841.142.250	841.342.200
3586521	KM40RBHT40	39,500-50,500	1.5551-1.9882	KM40	32,0	1.26	68,8	2.71	90,0	3.54	74,0	2.91	840.142.320	841.142.320	841.342.200
3586522	KM50RBHT50	49,500-66,500	1.9488-2.6181	KM50	42,0	1.65	62,2	2.45	90,0	3.54	70,0	2.76	840.142.420	841.142.200	841.342.420
3586543	KM50RBHT66	65,500-87,500	2.5787-3.4449	KM50	55,0	2.17	63,0	2.48	100,0	3.94	100,0	3.94	840.142.550	841.142.550	841.342.420
3586544	KM50RBHT87	86,500-115,500	3.4055-4.5472	KM50	72,0	2.83	70,5	2.78	120,0	4.72	120,0	4.72	840.142.720	841.142.720	841.342.420
3586545	KM63UTRBHT87	86,500-115,500	3.4055-4.5472	KM63UT	72,0	2.83	70,5	2.78	120,0	4.72	120,0	4.72	840.142.720	841.142.720	841.342.420
3586546	KM63UTRBHT115	114,500-153,000	4.5079-6.0236	KM63UT	94,0	3.70	83,2	3.28	150,0	5.91	150,0	5.91	840.142.940	841.142.940	841.342.420



Hole Finishing

• Order blade sets separately; see page K189.

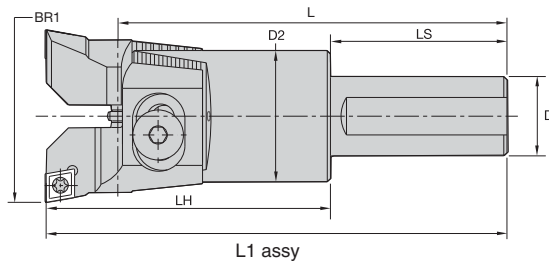
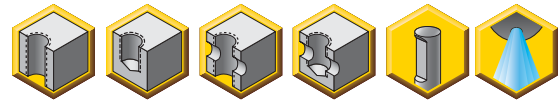


■ RBHT • HSK Rough-Boring Twin Cutters

order number	catalog number	BR1 bore range		CSMS system size	D2		L1		L1 assy		L2 assy		blade screw	washer	pin
		mm	in		mm	in	mm	in	mm	in	mm	in			
3586547	HSK63RBHT24	23,500-30,500	.9252-1.2008	HSK63A	20,0	.79	75,4	2.97	90,0	3.54	64,1	2.52	840.142.200	841.142.200	841.342.200
3586548	HSK63RBHT30	29,500-40,000	1.1614-1.5748	HSK63A	25,0	.98	88,8	3.50	105,0	4.13	79,1	3.11	840.142.250	841.142.250	841.342.200
3586549	HSK63RBHT40	39,500-50,500	1.5551-1.9882	HSK63A	32,0	1.26	92,2	3.63	110,0	4.33	84,1	3.31	840.142.320	841.142.320	841.342.200
3586550	HSK63RBHT50	49,500-66,500	1.9488-2.6181	HSK63A	42,0	1.65	92,2	3.63	120,0	4.72	94,1	3.70	840.142.420	841.142.420	841.342.200
3586551	HSK63RBHT66	65,500-87,500	2.5787-3.4449	HSK63A	55,0	2.17	95,5	3.76	125,0	4.92	125,0	4.92	840.142.550	841.142.720	841.342.420
3586563	HSK63RBHT87	86,500-115,500	3.4055-4.5472	HSK63A	72,0	2.83	95,5	3.76	145,0	5.71	145,0	5.71	840.142.720	841.142.720	841.342.420



• Order blade sets separately; see page K189.



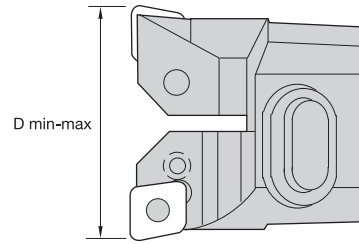
■ RBHT • Steel Straight Shank Rough-Boring Twin Cutters

Hole Finishing

order number	catalog number	BR1 bore range								blade screw	washer	pin
		mm	in	D	D2	L	LH	L1 assy	LS			
3586564	SF075RBHT24	23,500	.9252	.75	.79	5.33	1.09	5.91	—	840.142.200	841.142.200	841.342.200
3586565	SF100RBHT30	29,500	1.1614	1.00	.98	6.06	1.20	6.69	—	840.142.250	841.142.250	841.342.200
3586566	SF125RBHT40	39,500	1.5551	1.25	1.26	6.65	1.23	7.48	—	840.142.320	841.142.320	841.342.200
3586567	SF100RBHT50	49,500	1.9488	1.00	1.65	4.65	2.45	5.74	2.20	840.142.420	841.142.420	841.342.420
3586569	SF125RBHT66	65,500	2.5787	1.25	2.17	4.87	2.48	6.33	2.39	840.142.550	841.142.720	841.342.420
3586570	SF150RBHT87	86,500	3.4055	1.50	2.83	5.59	2.78	7.54	2.82	840.142.720	841.142.720	841.342.420
3586571	SF200RBHT115	114,500	4.5079	2.00	3.70	6.66	3.25	9.29	3.38	840.142.940	841.142.940	841.342.420

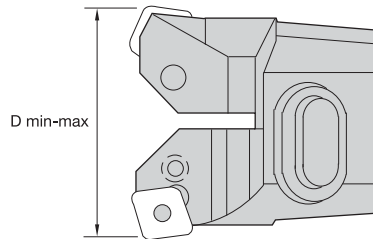
■ Reference Insert Blade Sets

BR1		90° lead blade sets		70° lead blade sets		90° lead simultaneous adjusting blade sets		90° lead split depth-of-cut blade	
mm	in								
23.500–30.500	.9252–1.2008	MB24RBHT06F	—	MB24RBHT06K	—	SYB24RBHT06F	—	SDB24RBHT06F	—
29.500–40.000	1.1614–1.5748	MB30RBHT06F	—	MB30RBHT06K	—	SYB30RBHT06F	—	SDB30RBHT06F	—
39.500–50.500	1.5551–1.9882	MB40RBHT09F	—	MB40RBHT09K	—	SYB40RBHT09F	—	SDB40RBHT09F	—
49.500–66.500	1.9488–2.6181	MB50RBHT09F	—	MB50RBHT09K	—	SYB50RBHT09F	—	SDB50RBHT09F	—
65.500–87.500	2.5787–3.4449	MB66RBHT12F	MB66RBHT12LF	MB66RBHT12K	MB66RBHT12LK	SYB66RBHT12F	SYB66RBHT12LF	SDB66RBHT12F	SDB66RBHT12LF
86.500–115.500	3.4055–4.5472	MB87RBHT12F	MB87RBHT16LF	MB87RBHT12K	MB87RBHT16LK	SYB87RBHT12F	SYB87RBHT16LF	SDB87RBHT12F	SDB87RBHT16LF
114.500–153.000	4.5079–6.0236	MB115RBHT12F	MB115RBHT16LF	—	MB115RBHT16LK	—	SYB115RBHT16LF	SDB115RBHT12F	SDB115RBHT16LF



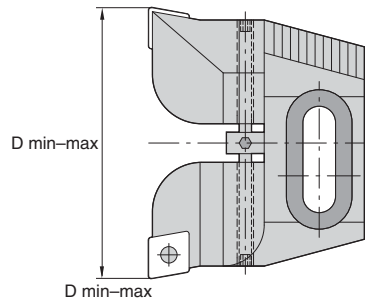
■ RBHT • 90° Blade Sets

order number	catalog number	D min		D max		gage insert	adjusting screw	insert screw	shim	shim pin	toggle lever	Torx wrench size	Torx size
		mm	in	mm	in								
3556346	MB24RBHT06F	23,50	.925	30,50	1.201	CC..0602../CC..215..	848.200.407	843.006.000	—	—	—	FT7	T7
3556347	MB30RBHT06F	29,50	1.161	40,10	1.579	CC..0602../CC..215..	848.250.409	843.006.000	—	—	—	FT7	T7
3556348	MB40RBHT09F	39,50	1.555	50,50	1.988	CC..09T3../CC..325..	848.320.413	843.009.000	—	—	—	FT15	T15
3556349	MB50RBHT09F	49,50	1.949	66,50	2.618	CC..09T3../CC..325..	848.420.614	843.009.000	—	—	—	FT15	T15
3556350	MB66RBHT12F	65,50	2.579	87,50	3.445	CC..1204../CC..43..	848.550.620	843.012.000	—	—	—	FT20	T20
3556352	MB66RBHT12LF	65,50	2.579	87,50	3.445	CN..1204../CN..43..	847.012.000	—	845.012.000	844.012.000	846.012.000	—	—
3556393	MB87RBHT12F	86,50	3.406	115,50	4.547	CC..1204../CC..43..	848.720.000	843.012.000	—	—	—	FT20	T20
3556394	MB87RBHT16LF	86,50	3.406	115,50	4.547	CN..1606../CN..54..	847.016.000	—	845.016.000	844.016.000	846.016.000	—	—
3556395	MB115RBHT12F	114,50	4.508	153,00	6.024	CC..1204../CC..43..	848.940.640	843.012.000	—	—	—	FT20	T20
3556396	MB115RBHT16LF	114,50	4.508	153,00	6.024	CN..1606../CN..54..	847.016.000	—	845.016.000	844.016.000	846.016.000	—	—

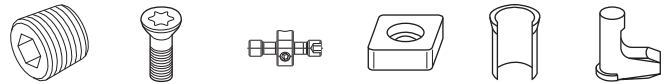


■ RBHT • 70° Blade Sets

order number	catalog number	D min		D max		gage insert	adjusting screw	insert screw	shim	shim pin	toggle lever	Torx wrench size	Torx size	hex size
		mm	in	mm	in									
3556397	MB24RBHT06K	23,50	.925	30,50	1.201	CC..0602../CC..215..	848.200.407	843.006.000	—	—	—	FT7	T7	—
3556398	MB30RBHT06K	29,50	1.161	40,10	1.579	CC..0602../CC..215..	848.250.409	843.006.000	—	—	—	FT7	T7	—
3556399	MB40RBHT09K	39,50	1.555	50,50	1.988	CC..09T3../CC..325..	848.320.413	843.009.000	—	—	—	FT15	T15	—
3556400	MB50RBHT09K	49,50	1.949	66,50	2.618	CC..09T3../CC..325..	848.420.614	843.009.000	—	—	—	FT15	T15	—
3556401	MB66RBHT12K	65,50	2.579	87,50	3.445	CC..1204../CC..43..	848.550.620	843.012.000	—	—	—	FT20	T20	—
3556402	MB66RBHT12LK	65,50	2.579	87,50	3.445	CN..1204../CN..43..	847.012.000	—	845.012.000	844.012.000	846.012.000	—	—	3mm
3556403	MB87RBHT12K	86,50	3.406	115,50	4.547	CC..1204../CC..43..	848.720.000	843.012.000	—	—	—	FT20	T20	—
3556404	MB87RBHT16LK	86,50	3.406	115,50	4.547	CN..1606../CN..54..	847.016.000	—	845.016.000	844.016.000	846.016.000	—	—	3mm
3556405	MB115RBHT16LK	114,50	4.508	153,00	6.024	CN..1606../CN..54..	847.016.000	—	845.016.000	844.016.000	846.016.000	—	—	3mm

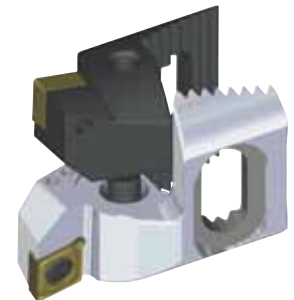
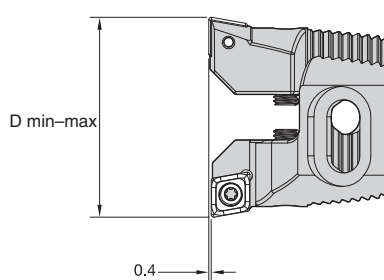
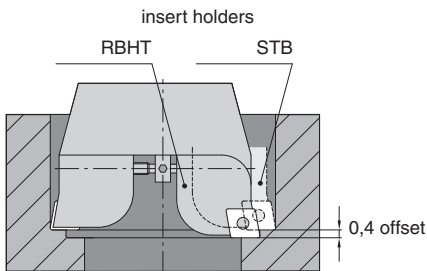


■ RBHT • 90° Simultaneous Adjusting Blade Sets



order number	catalog number	D min		D max		gage insert	adjusting screw	insert screw	simultaneous adj spindle	shim	shim pin	toggle lever
		mm	in	mm	in							
2652965	SYB24RBHT06F	23,50	.925	30,50	1.201	CC..0602../CC..215..	848.200.407	843.006.000	848.200.005	—	—	—
2652967	SYB30RBHT06F	29,50	1.161	40,10	1.579	CC..0602../CC..215..	848.250.409	843.006.000	848.250.005	—	—	—
2652968	SYB40RBHT09F	39,50	1.555	50,50	1.988	CC..09T3../CC..325..	848.320.413	843.009.000	848.320.005	—	—	—
2652969	SYB50RBHT09F	49,50	1.949	66,50	2.618	CC..09T3../CC..325..	848.420.614	843.009.000	848.420.005	—	—	—
2652971	SYB66RBHT12LF	65,50	2.579	87,50	3.445	CN..1204../CN..43..	—	848.550.620	848.550.005	845.012.000	844.012.000	846.012.000
2652970	SYB66RBHT12F	65,50	2.579	87,50	3.445	CC..1204../CC..43..	—	843.012.000	848.550.005	—	—	—
2652972	SYB87RBHT12F	86,50	3.406	115,50	4.547	CC..1204../CC..43..	—	843.012.000	848.720.005	—	—	—
2652983	SYB87RBHT16LF	86,50	3.406	115,50	4.547	CN..1606../CN..54..	847.016.000	—	848.720.005	845.016.000	844.016.000	846.016.000
2652984	SYB115RBHT16LF	114,50	4.508	153,00	6.024	CN..1606../CN..54..	847.016.000	—	848.720.005	845.016.000	844.016.000	846.016.000

Hole Finishing

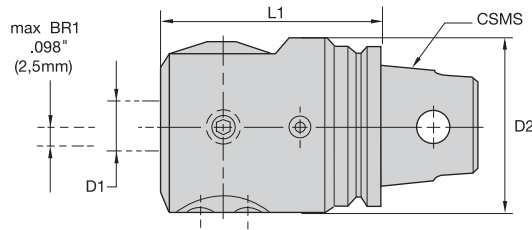


■ RBHT • 90° Split Depth of Cut Blade Sets



order number	catalog number	D min		D max		gage insert	adjusting screw	insert screw	shim	shim pin	toggle lever
		mm	in	mm	in						
4063996	SDB24RBHT06F	23,50	.925	30,50	1.201	CC..0602../CC..215..	848.200.407	843.006.000	—	—	—
4063997	SDB30RBHT06F	29,50	1.161	40,10	1.579	CC..0602../CC..215..	848.250.409	843.006.000	—	—	—
4063998	SDB40RBHT09F	39,50	1.555	50,50	1.988	CC..09T3../CC..325..	848.320.413	843.009.000	—	—	—
4063999	SDB50RBHT09F	49,50	1.949	66,50	2.618	CC..09T3../CC..325..	848.420.614	843.009.000	—	—	—
4064000	SDB66RBHT12F	65,50	2.579	87,50	3.445	CC..1204../CC..43..	848.550.620	843.012.000	—	—	—
4064001	SDB66RBHT12LF	65,50	2.579	87,50	3.445	CN..1204../CN..43..	847.012.000	—	845.012.000	844.012.000	846.012.000
4064002	SDB87RBHT12F	86,50	3.406	115,50	4.547	CC..1204../CC..43..	848.720.000	843.012.000	—	—	—
4064203	SDB87RBHT16LF	86,50	3.406	115,50	4.547	CN..1606../CN..54..	847.016.000	—	845.016.000	844.016.000	846.016.000
4064204	SDB115RBHT16LF	114,50	4.508	153,00	6.024	CN..1606../CN..54..	847.016.000	—	845.016.000	844.016.000	846.016.000
4064205	SDB115RBHT12F	114,50	4.508	153,00	6.024	CC..1204../CC..43..	848.940.640	843.012.000	—	—	—

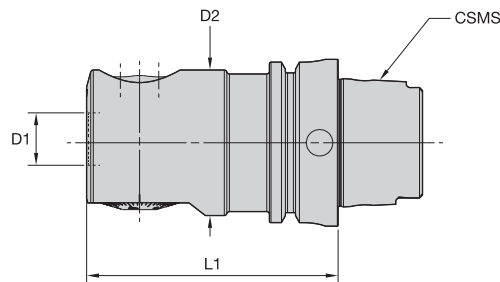
- Order boring bars separately for required diameter; see page K194.
- 0,01mm (.0004") diameter adjustment respective 2 µm (.00008") with vernier scale.



■ FBHO • KM™ Offset Boring Head

order number	catalog number	CSMS system size	D1		D2		L1		ModBORE FBHO parts package
			mm	in	mm	in	mm	in	
1131111	KM40FBHO1660	KM40	16	.63	55,0	2.17	60,0	2.36	PKG7001
1132036	KM50FBHO1670	KM50	16	.63	55,0	2.17	70,0	2.76	PKG7001

- Order boring bars separately for required diameter; see page K194.
- 0,01mm (.0004") diameter adjustment respective 2 µm (.00008") with vernier scale.

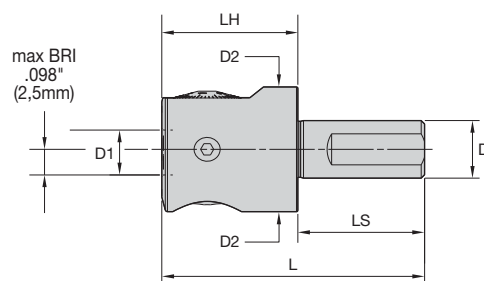


Hole Finishing

■ FBHO • HSK Boring Head

order number	catalog number	CSMS system size	D1		D2		L1		ModBORE FBHO parts package
			mm	in	mm	in	mm	in	
2651037	HSK63FBHO1695	HSK63A	16	.63	55	2.17	95,0	3.74	PKG7001

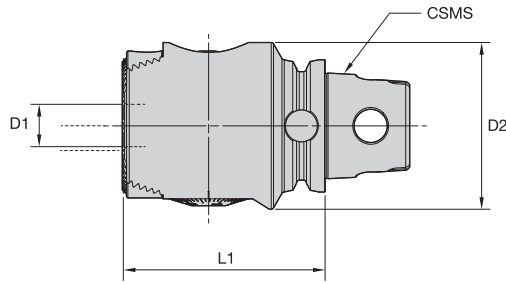
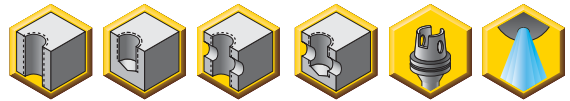
- Order boring bars separately for required diameter; see page K194.



■ FBHO • Straight Shank Boring Head

order number	catalog number	D1		D2	L	LH	LS	
		D	mm					
3077141	SF100FBHO1660	1.000	16	.63	2.17	4.56	2.36	2.20
3077140	SF150FBHO1660	1.500	16	.63	2.17	5.18	2.36	2.82

- Order boring bars, diameter extension bridge, and cartridges separately.
- 0,01mm (.0004") diameter adjustment respective 2 µm (.00008") with vernier scale.

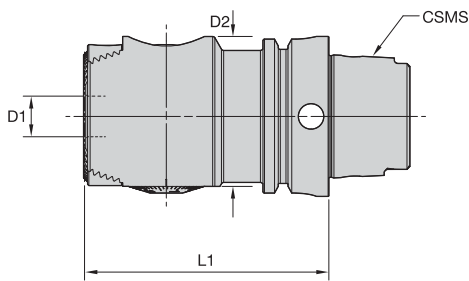
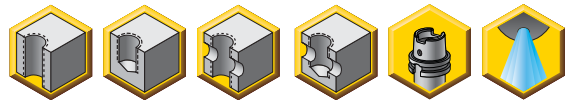


■ FBHM • KM™ Boring Head

order number	catalog number	BR1 bore range		CSMS system size	D1		D2		L1		ModBORE FBHS parts package	kg lbs
		mm	in		mm	in	mm	in				
4057060	KM50TSFBHM1677	9,750-164,000	.3838-6.4566	KM50TS	16,0	.63	63,0	2.48	76,6	3.02	PKG-8001	1,5 3.31

Hole Finishing

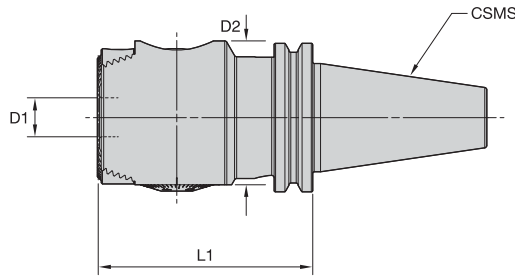
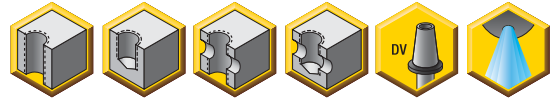
- Order boring bars, diameter extension bridge, and cartridges separately.
- 0,01mm (.0004") diameter adjustment respective 2 µm (.00008") with vernier scale.



■ FBHM • HSK Boring Head

order number	catalog number	BR1 bore range		CSMS system size	D1		D2		L1		ModBORE FBHS parts package	kg lbs
		mm	in		mm	in	mm	in				
4057057	HSK63FBHM1696	9,750-164,000	.3838-6.4566	HSK63A	16,0	.63	63,0	2.48	95,0	3.74	PKG-8001	2,0 4.30

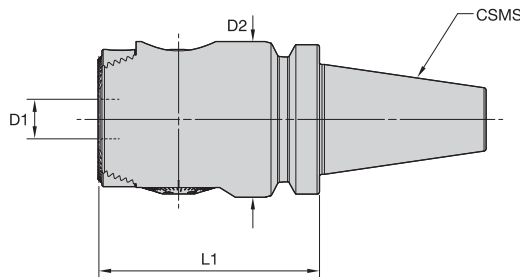
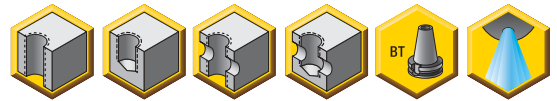
- Order boring bars, diameter extension bridge, and cartridges separately.
- 0,01mm (.0004") diameter adjustment respective 2 µm (.00008") with vernier scale.



■ FBHM • DV40 Boring Head

order number	catalog number	BR1 bore range		CSMS system size	D1		D2		L1		ModBORE FBHS parts package	kg	lbs
		mm	in		mm	in	mm	in					
4057058	DV40FBHM1691	9,750-154,000	.3838-6.0630	DV40	—	—	63,0	2.48	90,0	3.54	PKG-8001	2,1	4.64

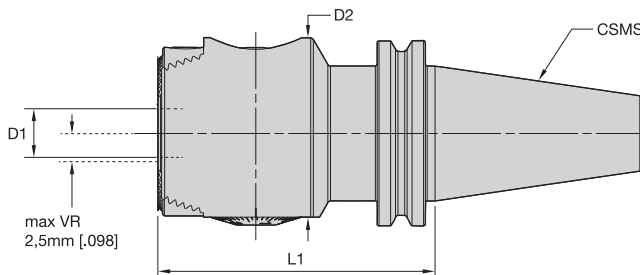
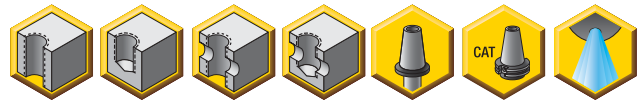
- Order boring bars, diameter extension bridge, and cartridges separately.
- 0,01mm (.0004") diameter adjustment respective 2 µm (.00008") with vernier scale.



■ FBHM • BT40 Boring Head

order number	catalog number	BR1 bore range		CSMS system size	D1		D2		L1		ModBORE FBHS parts package	kg	lbs
		mm	in		mm	in	mm	in					
4057059	BT40FBHM1691	9,750-164,000	.3838-6.4566	BT40	16,0	.63	63,0	2.48	90,0	3.54	PKG-8001	2,2	4.94

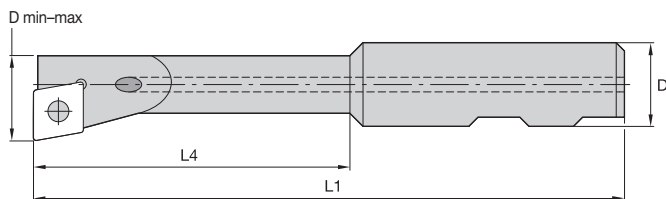
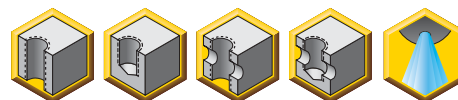
- Order boring bars, diameter extension bridge, and cartridges separately.
- 0,01mm (.0004") diameter adjustment respective 2 µm (.00008") with vernier scale.



■ FBHM • CV40 Boring Head

order number	catalog number	BR1 bore range		CSMS system size	D1		D2		L1		ModBORE FBHS parts package	kg	lbs
		mm	in		mm	in	mm	in					
4167881	CV40FBHM1691	9,750-164,000	.3838-6.4566	CV40	16,0	.63	63,0	2.48	91,2	3.59	PKG-8001	2,1	4.52

• Order inserts separately.



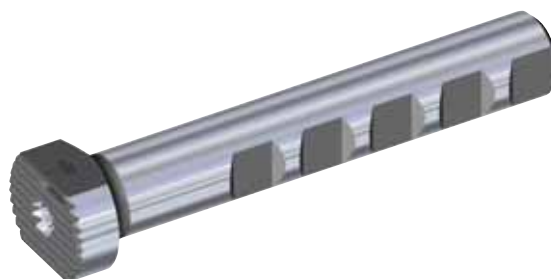
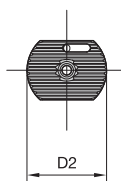
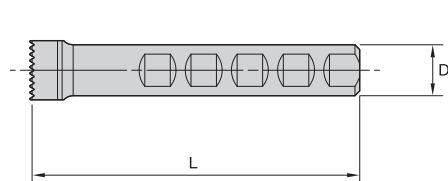
■ **FBHO/FBHM • Universal Boring Bars**

Hole Finishing

order number	catalog number	D min		D max		L1		L4		gage insert	insert screw	Torx size	
		mm	in	mm	in	D mm	D in	mm	in				
1125110	AFB09075SCFCR06	9,75	.384	14,75	.581	16	75,0	2,95	30,0	1,18	CC..0602../CC..215..	PKG2025	T7
1133883	AFB13085SCFCR06	13,75	.541	18,75	.738	16	85,0	3,35	40,0	1,57	CC..0602../CC..215..	PKG2025	T7
1133894	AFB17100SCFCR06	17,75	.699	22,75	.896	16	100,0	3,94	55,0	2,17	CC..0602../CC..215..	PKG2025	T7
1137835	AFB21110SCFCR09	21,75	.856	26,75	1.053	16	110,0	4,33	60,0	2,36	CC..09T3../CC..325..	PKG3242	T15
1128324	AFB24115SCFCR09	24,75	.974	29,75	1.171	16	115,0	4,53	65,0	2,56	CC..09T3../CC..325..	PKG3242	T15
1126838	AFB27115SCFCR09	27,75	1.093	32,75	1.289	16	115,0	4,53	70,0	2,76	CC..09T3../CC..325..	PKG3242	T15
1120731	AFB31115SCFCR09	31,75	1.250	36,75	1.447	16	115,0	4,53	70,0	2,76	CC..09T3../CC..325..	PKG3242	T15
1127271	AFB34115SCFCR09	34,75	1.368	39,75	1.565	16	115,0	4,53	70,0	2,76	CC..09T3../CC..325..	PKG3242	T15
2651038	AFB38115SCFPR09	38,75	1.526	44,10	1.736	16	115,0	4,53	85,0	3,47	CC..09T3../CC..325..	PKG3242	T15
2651039	AFB42115SCFPR09	42,75	1.683	48,10	1.894	16	115,0	4,53	85,0	3,47	CC..09T3../CC..325..	PKG3242	T15
2651040	AFB47115SCFPR09	47,75	1.880	53,10	2.091	16	115,0	4,53	85,0	3,35	CC..09T3../CC..325..	PKG3242	T15



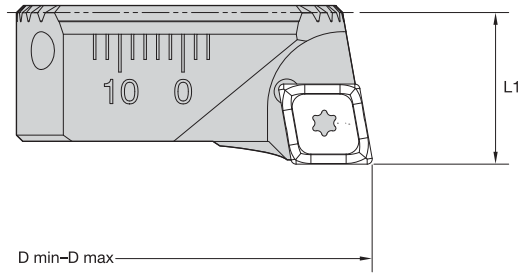
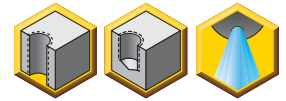
• Order AFM insert cartridge separately.



■ **FBHO/FBHM • AFM Boring Bars**

order number	catalog number	BR1 bore range		D		D2		L	
		mm	in	mm	in	mm	in	mm	in
4057061	AFM29115	29,8	1.17	16,0	.63	25,0	.98	103,000	4.0600
4057062	AFM47115	47,8	1.88	16,0	.63	44,0	1.73	101,580	4.0000

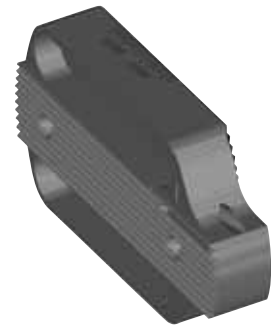
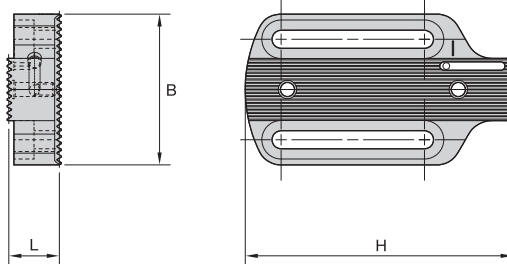
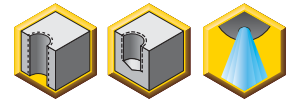
- For use with AFM boring bars.
- Order insert separately.



■ AFM Series • Insert Cartridges

order number	catalog number	D min		D max		L1		gage insert	ModBORE parts package	insert screw I.D. drive size
		mm	in	mm	in	mm	in			
4057093	AFM29SCFPR06	30	1.171	48	1.894	12	.472	CC..0602../CC..215..	PKG2025	T7
4057094	AFM47SCFPR09	48	1.880	88	3.469	14	.551	CC..09T3../CC..325..	PKG3242	T15

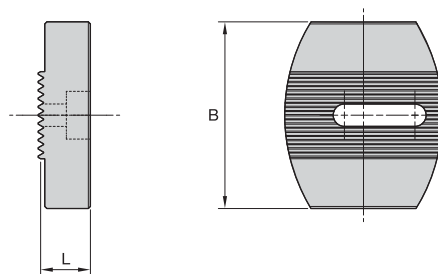
- For use with FBHM insert holders and FBHM counterweight.
- Order AFM47SCFPR09 insert cartridge separately to achieve diameter range.



■ FBHM • Extension Bridge

order number	catalog number	BR1 bore range		B		H		L	
		mm	in	mm	in	mm	in	mm	in
4057095	EBM8015086	86,000-164,000	3.3900-6.4600	45,0	1.77	80,0	3.15	15,0	.59

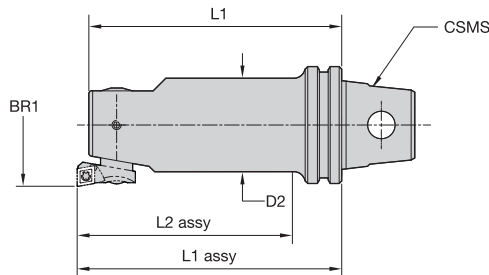
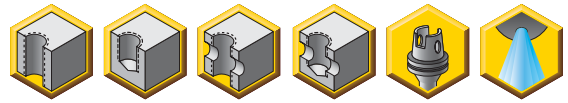
- For use with FBHM extension bridge.



■ FBHM • Counterweight

order number	catalog number	B		L	
		mm	in	mm	in
4057096	886038045	45	1.77	12	.47

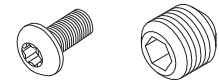
- 0,01mm (.0004") diameter adjustment respective 2 µm (.00008") with vernier scale.
- Internal coolant directed to indexable insert.
- Order insert cartridges separately for required bore range; see page K198.



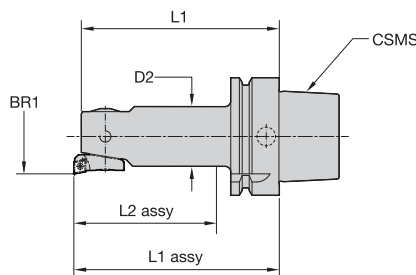
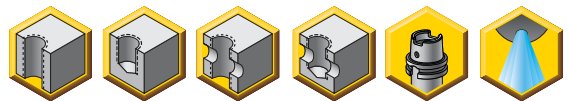
Hole Finishing

FBHS • KM™ Fine-Boring Single Cutters

order number	catalog number	BR1 bore range		CSMS system size	D2		L1		L1 assy		L2 assy		cartridge mounting screw	lock screw
		mm	in		mm	in	mm	in	mm	in	mm	in		
3586572	KM32FBHS24	23,900-37,100	.9409-1.4606	KM32	20,0	.79	86,0	3.39	90,0	3.54	76,1	2.99	880.252.200	881.252.200
3586573	KM32FBHS31	30,900-47,100	1.2165-1.8543	KM32	25,0	.98	96,0	3.78	100,0	3.94	86,1	3.39	880.252.250	881.252.250
3586574	KM40FBHS40	39,900-59,100	1.5709-2.3268	KM40	32,0	1.26	86,0	3.39	90,0	3.54	74,0	2.92	880.252.320	881.252.320
3586575	KM50FBHS51	50,900-81,100	2.0039-3.1929	KM50	42,0	1.65	86,0	3.39	90,0	3.54	70,0	2.76	880.252.420	881.252.420
3586576	KM50FBHS67	66,900-105,100	2.6339-4.1378	KM50	55,0	2.17	96,0	3.78	100,0	3.94	100,0	3.94	880.252.550	881.252.550
3586577	KM50FBHS87	86,900-154,100	3.4213-6.0669	KM50	72,0	2.84	116,0	4.57	120,0	4.72	120,0	4.72	880.252.550	881.252.720
3586578	KM63UTFBHS87	86,900-154,100	3.4213-6.0669	KM63UT	72,0	2.83	115,0	4.53	120,0	4.72	120,0	4.72	880.252.550	881.252.720
3586579	KM63UTFBHS116	115,900-191,100	4.5630-7.5236	KM63UT	96,0	3.70	145,0	5.71	150,0	5.91	150,0	5.91	880.252.550	881.252.940

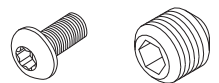


- 0,01mm (0.0004") diameter adjustment respective 2 µm (0.00008") with vernier scale.
- Internal coolant directed to indexable insert.
- Order insert cartridges separately for required bore range; see page K198.

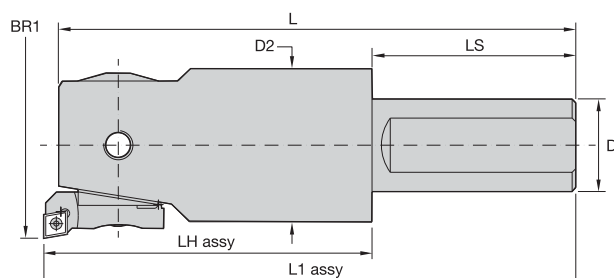
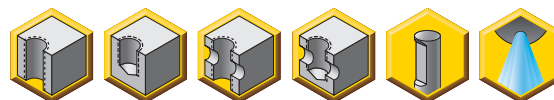


FBHS • HSK Fine-Boring Single Cutters

order number	catalog number	BR1 bore range		CSMS system size	D2		L1		L1 assy		L2 assy		cartridge mounting screw	lock screw
		mm	in		mm	in	mm	in	mm	in	mm	in		
3586580	HSK63FBHS24	23,900-37,100	.9409-1.4606	HSK63A	20,0	.79	86,0	3.39	90,0	3.54	61,1	2.40	880.252.200	881.252.200
3586581	HSK63FBHS31	30,900-47,100	1.2165-1.8543	HSK63A	25,0	.98	101,0	3.98	105,0	4.13	76,1	2.99	880.252.250	881.252.250
3586582	HSK63FBHS40	39,900-59,100	1.5709-2.3268	HSK63A	32,0	1.26	106,0	4.17	110,0	4.33	81,1	3.19	880.252.320	881.252.320
3586583	HSK63FBHS51	50,900-81,100	2.0039-3.1929	HSK63A	42,0	1.65	116,0	4.57	120,0	4.72	91,1	3.58	880.252.420	881.252.420
3586584	HSK63FBHS67	66,900-105,100	2.6339-4.1378	HSK63A	55,0	2.17	121,0	4.76	125,0	4.92	99,1	3.90	880.252.550	881.252.550
3586585	HSK63FBHS87	86,900-154,100	3.4213-6.0669	HSK63A	72,0	2.83	141,0	5.55	145,0	5.71	145,0	5.71	880.252.550	881.252.720



- 0,01mm (.0004") diameter adjustment respective 2 µm (.00008") with vernier scale.
- Internal coolant directed to indexable insert.
- Order insert cartridges separately for required bore range; see page K198.



■ FBHS • Straight Shank Fine-Boring Single Cutters

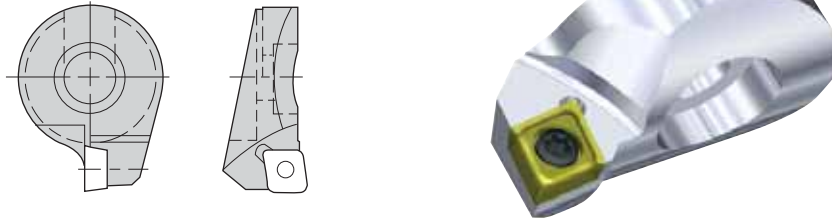
order number	catalog number	BR1 bore range									cartridge mounting screw	lock screw
		in	mm	D	D2	L	LH assy	L1 assy	LS			
3586586	SF075FBHS24	.9409-1.4606	23,900-37,100	.75	.79	5.75	1.65	5.91	—	880.252.200	881.252.200	
3586587	SF100FBHS31	1.2165-1.8543	30,900-47,100	1.00	.98	6.54	1.85	6.69	—	880.252.250	881.252.250	
3586588	SF125FBHS40	1.5709-2.3268	39,900-59,100	1.25	1.26	7.32	2.05	7.48	—	880.252.320	881.252.320	
3586589	SF100FBHS51	2.0039-3.1929	50,900-81,100	1.00	1.65	5.59	3.54	5.74	2.2008	880.252.420	881.252.420	
3586590	SF125FBHS67	2.6339-4.1378	66,900-105,100	1.25	2.17	6.17	3.94	6.33	2.3898	880.252.550	881.252.550	
3586591	SF150FBHS87	3.4213-6.0669	86,900-154,100	1.50	2.84	7.39	4.72	7.54	2.8189	880.252.550	881.252.720	
3586592	SF200FBHS116	4.5630-7.5236	115,900-191,100	2.00	3.01	9.13	5.91	9.29	3.3819	880.252.550	881.252.940	



■ Reference Insert Cartridges

BR1		insert cartridges			
in	mm	90° lead		95° lead	
.9409-1.2244	23,900-31,100	R24FBHS06	—	R24FBHS06LF	—
1.1772-1.4606	29,900-37,100	R30FBHS06	—	—	—
1.2165-1.5787	30,900-40,100	R31FBHS06	—	R31FBHS06LF	—
1.4921-1.8543	37,900-47,100	F38FBHS06	—	—	—
1.5709-2.0118	39,900-51,100	R40FBHS06	—	R40FBHS06LF	—
1.8858-2.3268	47,900-59,100	R48FBHS06	—	—	—
2.0039-2.6417	50,900-67,100	R51FBHS06	—	R51FBHS06LF	—
2.5551-3.1929	64,900-81,100	R65FBHS06	—	—	—
2.6339-3.4291	66,900-87,100	R67FBHS06	R67FBHS09	—	R67FBHS09LF
3.3425-4.1378	84,900-105,100	R85FBHS06	R85FBHS09	—	—
3.4213-4.5709	86,900-116,100	R67FBHS06	R67FBHS09	—	R67FBHS09LF
4.1299-5.2795	104,900-134,100	R85FBHS06	R85FBHS09	—	—
4.5630-6.0669	115,900-154,100	R67FBHS06	R67FBHS09	—	R67FBHS09LF
5.2717-6.7362	133,900-171,100	R85FBHS06	R85FBHS09	—	—
6.0591-7.5236	153,900-191,100	—	R125FBHS09	—	—

• Order inserts separately.



■ 90° Lead • Insert Holders for FBHS Fine-Boring Heads

Hole Finishing

order number	catalog number	gage insert	Torx size	insert screw
1137487	R24FBHS06	CC..0602../CC..215..	T7	843.006.000
2649548	R30FBHS06	CC..0602../CC..215..	T7	843.006.000
1133669	R31FBHS06	CC..0602../CC..215..	T7	843.006.000
2649549	R38FBHS06	CC..0602../CC..215..	T7	843.006.000
1135369	R40FBHS06	CC.0602../CC..215..	T7	843.006.000
2649550	R48FBHS06	CC..0602../CC..215..	T7	843.006.000
1137479	R51FBHS06	CC..0602../CC..215..	T7	843.006.000
2649551	R65FBHS06	CC..0602../CC..215..	T7	843.006.000
1834274	R67FBHS06	CC..0602../CC..215..	T7	843.006.000
1137505	R67FBHS09	CC..09T3../CC..325..	T15	843.009.000
2649552	R85FBHS06	CC..0602../CC..215..	T7	843.006.000
2649553	R85FBHS09	CC..09T3../CC..325..	T15	843.009.000
2649554	R125FBHS09	CC..09T3../CC..325..	T15	843.009.000



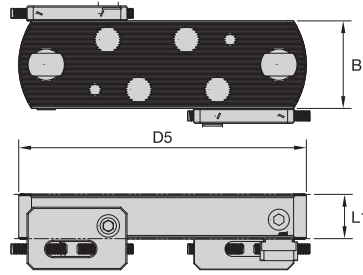
• Order inserts separately.

■ 95° Lead • Insert Holders for FBHS

order number	catalog number	gage insert	insert screw I.D. drive size	insert screw
2649555	R24FBHS06LF	CC..0602../CC..215..	T7	843.006.000
2649556	R31FBHS06LF	CC..0602../CC..215..	T7	843.006.000
2649557	R40FBHS06LF	CC..0602../CC..215..	T7	843.006.000
2649558	R51FBHS06LF	CC..0602../CC..215..	T7	843.006.000
2649559	R67FBHS09LF	CC..09T3../CC..325..	T15	843.009.000



- Match extension bridge series to adapter.

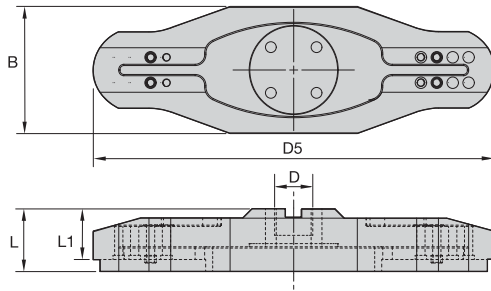


■ Small-Scale Extension Bridges

order number	catalog number	BR1 bore range		max RPM	extension bridge series	B		D5		L1		spare parts package	hex size	kg	lbs
		mm	in			mm	in	mm	in	mm	in				
1133280	EB13030150	150,000-205,000	5.9055-8.0709	1250	A	70,0	2.76	130,0	5.12	30,0	1.18	PKG156502	8mm	1,95	4.30
1125085	EB18030200	200,000-255,000	7.8740-10.0394	1000	A	70,0	2.76	180,0	7.09	30,0	1.18	PKG156502	8mm	2,77	6.10
1132857	EB23035250	250,000-305,000	9.8425-12.0079	850	B	70,0	2.76	230,0	9.06	35,0	1.38	PKG156502	8mm	4,00	8.80
1126830	EB28035300	300,000-355,000	11.8110-13.9764	700	B	70,0	2.76	280,0	11.02	35,0	1.38	PKG156502	8mm	5,14	11.30
1121703	EB33040350	350,000-405,000	13.7795-15.9449	600	B	70,0	2.76	330,0	12.99	40,0	1.57	PKG156502	8mm	6,86	15.10
1140602	EB38040400	400,000-455,000	15.7480-17.9134	530	C	70,0	2.76	380,0	14.96	40,0	1.57	PKG156502	8mm	7,95	17.50
1121036	EB43040450	450,000-505,000	17.7165-19.8819	480	C	70,0	2.76	430,0	16.93	40,0	1.57	PKG156502	8mm	9,23	20.30
1270619	EB48040500	500,000-550,000	19.6850-21.8504	440	C	70,0	2.76	480,0	18.90	40,0	1.57	PKG156502	8mm	10,23	22.50
1270620	EB53050550	550,000-605,000	21.6535-23.8189	400	C	70,0	2.76	530,0	20.87	50,0	1.97	PKG156502	8mm	13,91	30.60
1270621	EB58050600	600,000-655,000	23.6220-25.7874	370	C	70,0	2.76	580,0	22.84	50,0	1.97	PKG156502	8mm	15,32	33.70



- For use with shell mill adapters or direct connection to the machine spindle.
- Order bridge slides separately.



■ Large Scale Extension Bridge

Hole Finishing

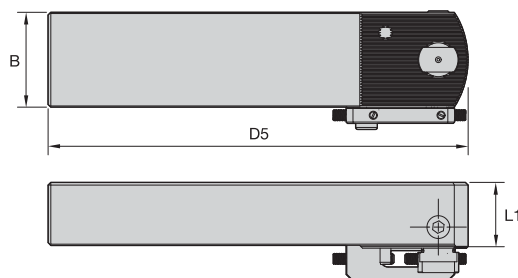
order number	catalog number	BR1 bore range		D		D5		B		L		L1		kg	lbs
		mm	in	mm	in	mm	in	mm	in	mm	in	mm	in		
4057204	EB630128650	650,000-1105,000	25.5900-43.5000	60,0	2.36	630,0	24.80	200,0	7.87	99,0	3.90	84,0	3.31	17,2	37.84
4057205	EB10801281100	1100,000-1655,000	43.3100-65.1600	60,0	2.36	1080,0	42.52	200,0	7.87	99,0	3.90	84,0	3.31	28,1	61.82
4057206	EB16301281650	1650,000-2205,000	64.9600-86.8100	60,0	2.36	1630,0	64.17	200,0	7.87	99,0	3.90	84,0	3.31	43,0	94.60

max RPMs		
BR1 bore range (mm)	BR1 bore range (in)	max RPM
650-705	25.59-27.76	300
700-755	27.56-29.72	285
750-805	29.53-31.69	270
800-855	31.50-33.66	255
850-905	33.46-35.63	240
900-955	35.43-37.60	225
950-1005	37.40-39.57	210
1000-1055	39.37-41.54	195
1050-1105	41.34-43.50	180
1100-1155	43.31-45.47	170

max RPMs		
BR1 bore range (mm)	BR1 bore range (in)	max RPM
1150-1205	45.28-47.44	163
1200-1255	47.24-49.41	156
1250-1305	49.21-51.38	149
1300-1355	51.18-53.35	142
1350-1405	53.15-55.31	135
1400-1455	55.12-57.28	128
1450-1505	57.09-59.25	121
1500-1555	59.06-61.22	114
1550-1605	61.02-63.19	107
1600-1655	62.99-65.16	100

max RPMs		
BR1 bore range (mm)	BR1 bore range (in)	max RPM
1650-1705	64.96-67.13	95
1700-1755	66.93-69.09	90
1750-1805	68.90-71.06	85
1800-1855	70.87-73.03	80
1850-1905	72.83-75.00	75
1900-1955	74.80-76.97	70
1950-2005	76.77-78.94	65
2000-2055	78.74-80.91	60
2050-2105	80.71-82.87	55
2100-2155	82.68-84.84	50
2150-2205	84.65-86.81	45

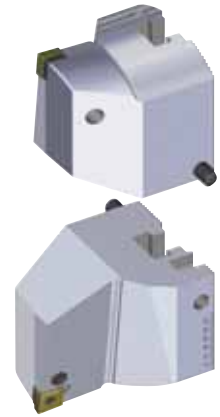
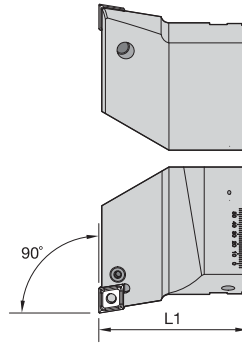
- For use with large-scale bridge extensions.
- Delivered as a set of two.



■ Bridge Slides

order number	catalog number	BR1 bore range		B		D5		L1		spare parts package	kg	lbs
		mm	in	mm	in	mm	in					
4057207	EBSLD1105	650,000-1105,000	25.5900-43.5000	70,0	2.76	310,0	12.20	48,0	1.89	PKG156502	7,0	15.40
4057208	EBSLD2205	1100,000-2205,000	43.3100-86.8100	70,0	2.76	360,0	14.17	48,0	1.89	PKG156502	7,9	17.38

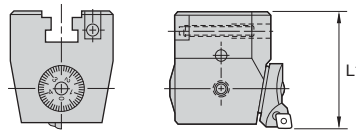
- Packaged as a matched set of two to enable twin cutting operations.



■ 90° Lead • Bridge Tool Rough-Boring Head

order number	catalog number	L1		gage insert	spare parts package	insert screw I.D. drive size	kg	lbs
		mm	in					
1624878	EBURF1975PKG	75,0	2.95	CN..1906../CN..64..	PKG7994	4mm	1,6	3.60

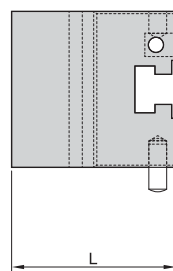
- Insert holder included.
- 0,01mm (.0004") diameter adjustment respective 2 µm (.00008") with vernier scale.
- Use with counterweight for balance.



■ 90° Lead • Bridge Tool Fine-Boring Head

order number	catalog number	L1		cartridge	spare parts package	wrench size adjusting screw	kg	lbs
		mm	in					
1135375	EBUFF0975	75,0	2.95	R67-FBHS-09	PKG0002	5mm	2,1	4.70

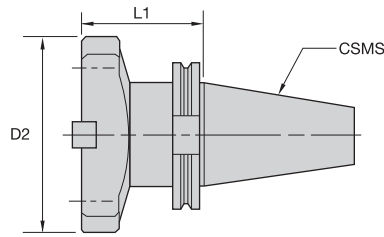
- Use to balance the extension bridge when using an EBUFF fine-boring head.



■ Bridge Tool Counterweight

order number	catalog number	L		kg	lbs
		mm	in		
4062443	EBUCW0074	74	2.913	2,1	4.63

- Extension bridge required.
- Order extension bridge separately; see page K199.
- Order coolant cartridge set separately; see page K203.
- Match adapter and extension bridge series.



■ CV Bridge Tool Adapters



order number	catalog number	CSMS system size	extension bridge series	D1		D1 max		D2		L1		spare parts package	socket-head cap screw
				mm	in	mm	in	mm	in	mm	in		
1122185	CV50BT13069	CV50	A,B,C	150	5.906	655	25.787	130,0	5.12	69,1	2.72	PKG1565	MS1085PKG

Hole Finishing



■ BT Bridge Tool Adapters



order number	catalog number	CSMS system size	extension bridge series	D1		D1 max		D2		L1		spare parts package	socket-head cap screw
				mm	in	mm	in	mm	in	mm	in		
1121711	BT50BT13088	BT50	A,B,C	150	5.906	655	25.787	130	5.12	88	3.46	PKG1565	MS1085PKG

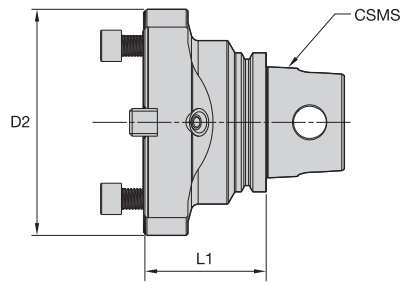


■ DV Bridge Tool Adapters



order number	catalog number	CSMS system size	extension bridge series	D1		D1 max		D2		L1		spare parts package	socket-head cap screw
				mm	in	mm	in	mm	in	mm	in		
1263825	DV40BT13069	DV50	A	150	5.906	255	10.039	130	5.12	69	2.72	PKG1565	MS1085PKG
1133581	DV50BT13069	DV50	A,B,C	150	5.906	655	25.787	130	5.12	69	2.72	PKG1565	MS1085PKG

- Extension bridge required.
- Order extension bridge separately; see page K199.
- Match adapter and extension bridge series.

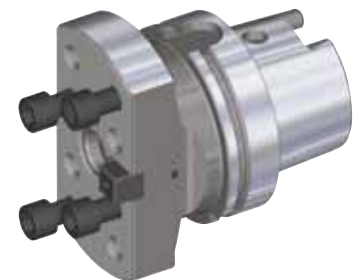
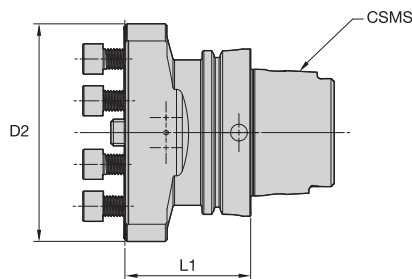


■ KM™ Bridge Tool Adapters

order number	catalog number	CSMS system size	extension bridge series	D1		D1 max		D2		L1		spare parts package	socket-head cap screw
				mm	in	mm	in	mm	in	mm	in		
1135802	KM63BT13065	KM63	A	150	5.906	305	12.008	130,0	5.12	65,0	2.56	PKG1565	MS1085PKG
1197315	KM80BT13070	KM80	B,A	150	5.906	405	15.945	130,0	5.12	70,0	2.76	PKG1565	MS1085PKG



- Extension bridge required.
- Order extension bridge separately; see page K199.
- Match adapter and extension bridge series.



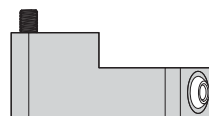
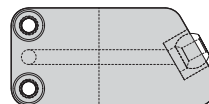
■ HSK Bridge Tool Adapters

order number	catalog number	CSMS system size	extension bridge series	D2		L1		spare parts package	socket-head cap screw
				mm	in	mm	in		
4062112	HSK100BT13075	HSK100A	A,B,C	130,0	5.12	75,0	2.95	PKG1565	MS1085PKG



Coolant Cartridge for Bridge Tool Adapter

- Use with bridge tool adapter to direct the coolant towards the insert.
- Delivered as a set of two with mounting screws.



■ Coolant Cartridge

order number
4062111

catalog number
920028015

■ ModBORE™ • Roughing • Inch

Hole Finishing

Material Group	Condition	Geometry			Cutting Speed SFM			Feed Rate IPR			
		-MP	-MN	-MF	min	Starting Value	max	-MP	-MN	-MF	
P	1		KCP05		590	1430	1620	—	.006 - .025	—	
			KCP10		590	1300	1180	.004 - .016	.006 - .025	.004 - .016	
			KC9110		590	1300	1180	—	.006 - .025	.004 - .016	
			KCP25		410	900	1180	.004 - .008	.006 - .012	.004 - .008	
	2			KC9125		510	920	1180	—	.006 - .012	.004 - .008
				KCP05		590	870	1310	—	.006 - .025	—
				KCP10		590	790	1540	.004 - .016	.006 - .025	.004 - .016
				KC9110		590	820	1120	—	.006 - .025	.004 - .016
	3			KCP25		410	640	920	.004 - .008	.006 - .012	.004 - .008
				KC9125		460	660	970	—	.006 - .012	.004 - .008
				KCP05		590	670	900	—	.006 - .025	—
				KCP10		520	620	1150	.004 - .016	.006 - .025	.004 - .016
	4			KC9110		510	620	770	—	.006 - .025	.004 - .016
				KCP25		440	510	740	.004 - .008	.006 - .012	.004 - .008
				KC9125		440	510	740	—	.006 - .012	.004 - .008
				KCP05		300	520	720	—	.006 - .025	—
	5			KCP10		300	480	770	.004 - .016	.006 - .025	.004 - .016
				KC9110		300	480	640	—	.006 - .025	.004 - .016
				KCP25		250	340	590	.004 - .008	.006 - .012	.004 - .008
				KC9125		250	360	570	—	.006 - .012	.004 - .008
	6			KCP05		490	790	1030	—	.006 - .025	—
				KCP10		490	710	980	.004 - .016	.006 - .025	.004 - .016
				KC9110		490	710	980	—	.006 - .025	.004 - .016
				KCP25		390	640	850	.004 - .008	.006 - .012	.004 - .008
7			KC9125		390	640	850	—	.006 - .012	.004 - .008	
			KCP05		460	660	980	—	.006 - .025	—	
			KCP10		360	590	890	.004 - .016	.006 - .025	.004 - .016	
			KC9110		390	590	740	—	.006 - .025	.004 - .016	
8			KCP25		340	490	740	.004 - .008	.006 - .012	.004 - .008	
			KC9125		340	490	740	—	.006 - .012	.004 - .008	

Material Group	Condition	Geometry			Cutting Speed SFM			Feed Rate IPR			
		-MP	-MF	—	min	Starting Value	max	-MP	-MF	—	
M	1		KCM15	—	330	590	790	.004 - .016	.003 - .012	—	
			KC5010	—	430	710	820	.004 - .016	—	—	
			KC9225	—	570	610	820	.004 - .016	.003 - .012	—	
	2			KCM25	—	300	490	660	.004 - .008	.003 - .006	—
				KC9240	—	300	390	440	.004 - .008	.003 - .006	—
				KCM15	—	360	540	820	.004 - .016	.003 - .012	—
	3			KC5010	—	410	660	820	.004 - .016	—	—
				KC9225	—	360	560	750	.004 - .016	.003 - .012	—
				KCM25	—	300	490	740	.004 - .008	.003 - .006	—
	4			KC9240	—	260	340	440	.004 - .008	.003 - .006	—
				KCM15	—	360	490	820	.004 - .016	.003 - .012	—
				KC5010	—	360	490	750	.004 - .016	—	—
5			KC9225	—	360	490	750	.004 - .016	.003 - .012	—	
			KCM25	—	300	390	660	.004 - .008	.003 - .006	—	
			KC9240	—	260	300	440	.004 - .008	.003 - .006	—	

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Material Group	Condition	Geometry			Cutting Speed SFM			Feed Rate IPR			
		-MP	-MW	—	min	Starting Value	max	-MP	-MW	—	
K	1	○	KCK20		—	720	980	1770	.004 - .016	.006 - .039	—
			KT315		—	520	900	1610	—	.006 - .039	—
		○	KCK20		—	720	900	1150	.004 - .016	.006 - .039	—
			KC9315		—	490	900	1150	—	.006 - .039	—
		○	KCK20		—	460	690	1120	.004 - .008	.006 - .018	—
			KC9325		—	230	690	1120	—	.006 - .018	—
	2	○	KCK20		—	720	900	1150	.004 - .016	.006 - .039	—
			KT315		—	590	900	1180	—	.006 - .039	—
		○	KCK20		—	720	900	1150	.004 - .016	.006 - .039	—
			KC9315		—	430	850	1120	—	.006 - .039	—
		○	KCK20		—	720	900	1150	.004 - .008	.006 - .018	—
			KC9315		—	430	710	1150	—	.006 - .039	—
3	○	KCK20		—	360	490	750	.004 - .016	.006 - .039	—	
		KT315		—	560	750	1180	—	.006 - .039	—	
	○	KCK20		—	360	490	750	.004 - .016	.006 - .039	—	
		KC9315		—	430	710	1150	—	.006 - .039	—	
	○	KCK20		—	360	490	750	.004 - .008	.006 - .018	—	
		KC9315		—	430	710	1150	—	.006 - .039	—	

Material Group	Condition	Geometry			Cutting Speed SFM			Feed Rate IPR			
		-HP	—	—	min	Starting Value	max	-HP	—	—	
N	1	○○	KC5410		—	660	1800	3280	.006 - .025	—	—
			KD1400		—	1480	2510	8200	—	.010 - .025	—
	2	○○	KC5410		—	660	1800	3280	.006 - .012	—	—
			KD1425		—	980	1710	2950	—	.010 - .025	—
	3	○○	KC5410		—	330	900	1640	.006 - .025	—	—
			K313		—	390	850	1610	.006 - .025	—	—
	5	○○	KC5410		—	330	900	1640	.006 - .012	—	—
			KC5410		—	330	660	1150	.006 - .025	—	—

Material Group	Condition	Geometry			Cutting Speed SFM			Feed Rate IPR			
		-MP	-FP	-UP	min	Starting Value	max	-MP	-FP	-UP	
S	1	○○	KCU10		—	100	180	380	.004 - .016	.002 - .010	—
			KC5010		—	100	180	380	.004 - .016	.002 - .010	.006 - .020
		○	KCU25		—	30	130	180	.004 - .008	.002 - .005	—
			KC9240	—	KC9240	30	130	200	.004 - .008	—	.006 - .011
	2	○○	KCU10		—	100	200	390	.004 - .016	.002 - .010	—
			KC5010		—	100	200	380	.004 - .016	.002 - .010	.006 - .020
		○	KCU25		—	30	100	180	.004 - .008	.002 - .005	—
			KC9240	—	KC9240	30	100	180	.004 - .008	—	.006 - .011
	3	○○	KCU10		—	100	230	380	.004 - .016	.002 - .010	—
			KC5010		—	100	230	380	.004 - .016	.002 - .010	.006 - .020
		○	KCU25		—	70	130	180	.004 - .008	.002 - .005	—
			KC9240	—	KC9240	70	130	200	.004 - .008	—	.006 - .011
	4	○○	KCU10		—	150	230	460	.004 - .016	.002 - .010	—
			KC5010		—	150	230	560	.004 - .016	.002 - .010	.006 - .020
		○	KCU25		—	70	180	300	.004 - .008	.002 - .005	—
			KC9240	—	KC9240	50	180	300	.004 - .008	—	.006 - .011



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Material Group	Condition	Geometry			Cutting Speed m/min			Feed Rate mm/r		
		-MP	-MN	-MF	min	Starting Value	max	-MP	-MN	-MF
P	1		KCP05		180	435	495	—	0,16 - 0,63	—
			KCP10		180	395	360	0,10 - 0,40	0,16 - 0,63	0,10 - 0,40
			KC9110		180	395	360	—	0,16 - 0,63	0,10 - 0,40
			KCP25		125	275	360	0,10 - 0,20	0,16 - 0,31	0,10 - 0,20
			KC9125		155	280	360	—	0,16 - 0,31	0,10 - 0,20
	2		KCP05		180	265	400	—	0,16 - 0,63	—
			KCP10		180	240	470	0,10 - 0,40	0,16 - 0,63	0,10 - 0,40
			KC9110		180	250	340	—	0,16 - 0,63	0,10 - 0,40
			KCP25		125	195	280	0,10 - 0,20	0,16 - 0,31	0,10 - 0,20
			KC9125		140	200	295	—	0,16 - 0,31	0,10 - 0,20
	3		KCP05		180	205	275	—	0,16 - 0,63	—
			KCP10		160	190	350	0,10 - 0,40	0,16 - 0,63	0,10 - 0,40
			KC9110		155	190	235	—	0,16 - 0,63	0,10 - 0,40
			KCP25		135	155	225	0,10 - 0,20	0,16 - 0,31	0,10 - 0,20
			KC9125		135	155	225	—	0,16 - 0,31	0,10 - 0,20
	4		KCP05		90	160	220	—	0,16 - 0,63	—
			KCP10		90	145	235	0,10 - 0,40	0,16 - 0,63	0,10 - 0,40
			KC9110		90	145	195	—	0,16 - 0,63	0,10 - 0,40
			KCP25		75	105	180	0,10 - 0,20	0,16 - 0,31	0,10 - 0,20
			KC9125		75	110	175	—	0,16 - 0,31	0,10 - 0,20
	5		KCP05		150	240	315	—	0,16 - 0,63	—
			KCP10		150	215	300	0,10 - 0,40	0,16 - 0,63	0,10 - 0,40
			KC9110		150	215	300	—	0,16 - 0,63	0,10 - 0,40
			KCP25		120	195	260	0,10 - 0,20	0,16 - 0,31	0,10 - 0,20
		KC9125		120	195	260	—	0,16 - 0,31	0,10 - 0,20	
6		KCP05		140	200	300	—	0,16 - 0,63	—	
		KCP10		110	180	270	0,10 - 0,40	0,16 - 0,63	0,10 - 0,40	
		KC9110		120	180	225	—	0,16 - 0,63	0,10 - 0,40	
		KCP25		105	150	225	0,10 - 0,20	0,16 - 0,31	0,10 - 0,20	
		KC9125		105	150	225	—	0,16 - 0,31	0,10 - 0,20	

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Material Group	Condition	Geometry			Cutting Speed m/min			Feed Rate mm/r		
		-MP	-MF	—	min	Starting Value	max	-MP	-MF	—
M	1		KCM15	—	100	180	240	0,10 - 0,40	0,08 - 0,30	—
			KC5010	—	130	215	250	0,10 - 0,40	—	—
			KC9225	—	175	185	250	0,10 - 0,40	0,08 - 0,30	—
			KCM25	—	90	150	200	0,10 - 0,20	0,08 - 0,15	—
			KC9240	—	90	120	135	0,10 - 0,20	0,08 - 0,15	—
	2		KCM15	—	110	165	250	0,10 - 0,40	0,08 - 0,30	—
			KC5010	—	125	200	250	0,10 - 0,40	—	—
			KC9225	—	110	170	230	0,10 - 0,40	0,08 - 0,30	—
			KCM25	—	90	150	225	0,10 - 0,20	0,08 - 0,15	—
			KC9240	—	80	105	135	0,10 - 0,20	0,08 - 0,15	—
	3		KCM15	—	110	150	250	0,10 - 0,40	0,08 - 0,30	—
			KC5010	—	110	150	230	0,10 - 0,40	—	—
			KC9225	—	110	150	230	0,10 - 0,40	0,08 - 0,30	—
			KCM25	—	90	120	200	0,10 - 0,20	0,08 - 0,15	—
			KC9240	—	80	90	135	0,10 - 0,20	0,08 - 0,15	—

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Material Group	Condition	Geometry			Cutting Speed m/min			Feed Rate mm/r		
		-MP	-MW	-	min	Starting Value	max	-MP	-MW	-
K	1	○	KCK20		220	300	540	0,10 - 0,40	0,16 - 1,00	-
			KT315		160	275	490	-	0,16 - 1,00	-
		○	KCK20		220	275	350	0,10 - 0,40	0,16 - 1,00	-
			KC9315		150	275	350	-	0,16 - 1,00	-
		○	KCK20		140	210	340	0,10 - 0,20	0,16 - 0,45	-
			KC9325		70	210	340	-	0,16 - 0,45	-
	2	○	KCK20		220	275	350	0,10 - 0,40	0,16 - 1,00	-
			KT315		180	275	360	-	0,16 - 1,00	-
		○	KCK20		220	275	350	0,10 - 0,40	0,16 - 1,00	-
			KC9315		130	260	340	-	0,16 - 1,00	-
		○	KCK20		220	275	350	0,10 - 0,20	0,16 - 0,45	-
			KCK20		110	150	230	0,10 - 0,40	0,16 - 1,00	-
3	○	KCK20		110	150	230	0,10 - 0,40	0,16 - 1,00	-	
		KT315		170	230	360	-	0,16 - 1,00	-	
	○	KCK20		110	150	230	0,10 - 0,40	0,16 - 1,00	-	
		KC9315		130	215	350	-	0,16 - 1,00	-	
	○	KCK20		110	150	230	0,10 - 0,20	0,16 - 0,45	-	
		KCK20		110	150	230	0,10 - 0,20	0,16 - 0,45	-	

Material Group	Condition	Geometry			Cutting Speed m/min			Feed Rate mm/r		
		-HP	-	-	min	Starting Value	max	-HP	-	-
N	1	○○	KC5410		200	550	1000	0,16 - 0,63	-	-
			KD1400		450	765	2500	-	0,25 - 0,63	-
	2	○○	KC5410		200	550	1000	0,16 - 0,31	-	-
			KD1425		300	520	900	-	0,25 - 0,63	-
	3	○○	KC5410		100	275	500	0,16 - 0,63	-	-
			K313		120	260	490	0,16 - 0,63	-	-
	5	○○	KC5410		100	275	500	0,16 - 0,31	-	-
			KC5410		100	200	350	0,16 - 0,63	-	-
	5	○○	KC5410		100	200	350	0,16 - 0,31	-	-
			KC5410		100	200	350	0,16 - 0,31	-	-

Material Group	Condition	Geometry			Cutting Speed m/min			Feed Rate mm/r			
		-MP	-FP	-UP	min	Starting Value	max	-MP	-FP	-UP	
S	1	○○	KCU10		30	55	115	0,10 - 0,40	0,06 - 0,25	-	
			KC5010		30	55	115	0,10 - 0,40	0,06 - 0,25	0,16 - 0,50	
		○	KCU25		10	40	55	0,10 - 0,20	0,06 - 0,12	-	
			KC9240		KC9240	10	40	60	0,10 - 0,20	-	0,16 - 0,27
		2	○○	KCU10		30	60	120	0,10 - 0,40	0,06 - 0,25	-
				KC5010		30	60	115	0,10 - 0,40	0,06 - 0,25	0,16 - 0,50
	○		KCU25		10	30	55	0,10 - 0,20	0,06 - 0,12	-	
	3	○○	KCU10		30	70	115	0,10 - 0,40	0,06 - 0,25	-	
			KC5010		30	70	115	0,10 - 0,40	0,06 - 0,25	0,16 - 0,50	
		○	KCU25		20	40	55	0,10 - 0,20	0,06 - 0,12	-	
			KC9240		KC9240	20	40	60	0,10 - 0,20	-	0,16 - 0,27
		4	○○	KCU10		45	70	140	0,10 - 0,40	0,06 - 0,25	-
				KC5010		45	70	170	0,10 - 0,40	0,06 - 0,25	0,16 - 0,50
	○		KCU25		20	55	90	0,10 - 0,20	0,06 - 0,12	-	
	4	○○	KCU25		20	55	90	0,10 - 0,20	0,06 - 0,12	-	
			KC9240		KC9240	15	55	90	0,10 - 0,20	-	0,16 - 0,27

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Material Group	Condition	Geometry				Cutting Speed SFM			Feed Rate IPR			
		-LF	-UF	-FP	-FW	min	Starting Value	max	-LF	-UF	-FP	-FW
P	1	KCP05				590	1430	1620	.002 - .010	.002 - .006	.002 - .010	—
				KTP10		590	1430	1620	—	—	.002 - .010	—
		KT315			KT315	590	1310	1620	.002 - .010	—	—	.003 - .012
	1	KCP10				590	1300	1530	.002 - .010	.002 - .006	.002 - .010	—
		KC9110				590	1300	1620	.002 - .010	.002 - .006	—	—
		KCP25				460	920	1180	.002 - .004	.002 - .003	.002 - .005	.003 - .006
	2	KCP05				590	870	1310	.002 - .010	.002 - .006	.002 - .010	—
				KTP10		590	870	1310	—	—	.002 - .010	—
		KT315			KT315	620	890	1280	.002 - .010	—	—	.003 - .012
	2	KCP10				590	790	1080	.002 - .010	.002 - .006	.002 - .010	—
		KC9110				590	790	1080	.002 - .010	.002 - .006	—	—
		KCP25				480	640	1050	.002 - .004	.002 - .003	.002 - .005	.003 - .006
	3	KCP05				590	670	900	.002 - .010	.002 - .006	.002 - .010	—
				KTP10		590	670	900	—	—	.002 - .010	—
		KT315			KT315	590	690	900	.002 - .010	—	—	.003 - .012
	3	KCP10				520	620	820	.002 - .010	.002 - .006	.002 - .010	—
		KC9110				510	620	790	.002 - .010	.002 - .006	—	—
		KCP25				440	510	740	.002 - .004	.002 - .003	.002 - .005	.003 - .006
	4	KCP05				300	520	720	.002 - .010	.002 - .006	.002 - .010	—
				KTP10		300	520	720	—	—	.002 - .010	—
		KT315			KT315	300	590	720	.002 - .010	—	—	.003 - .012
	4	KCP10				300	480	640	.002 - .010	.002 - .006	.002 - .010	—
		KC9110				300	480	640	.002 - .010	.002 - .006	—	—
		KCP25				250	340	590	.002 - .004	.002 - .003	.002 - .005	.003 - .006
5	KCP05				490	790	1030	.002 - .010	.002 - .006	.002 - .010	—	
			KTP10		490	790	1030	—	—	.002 - .010	—	
	KT315			KT315	490	820	1030	.002 - .010	—	—	.003 - .012	
5	KCP10				490	710	980	.002 - .010	.002 - .006	.002 - .010	—	
	KC9110				490	710	980	.002 - .010	.002 - .006	—	—	
	KCP25				390	640	840	.002 - .004	.002 - .003	.002 - .005	.003 - .006	
6	KCP05				460	660	980	.002 - .010	.002 - .006	.002 - .010	—	
			KTP10		460	660	980	—	—	.002 - .010	—	
	KT315			KT315	460	660	980	.002 - .010	—	—	.003 - .012	
6	KCP10				390	590	900	.002 - .010	.002 - .006	.002 - .010	—	
	KC9110				390	590	740	.002 - .010	.002 - .006	—	—	
	KCP25				340	490	740	.002 - .004	.002 - .003	.002 - .005	.003 - .006	
6	KCP05				460	660	980	.002 - .010	.002 - .006	.002 - .010	—	
			KTP10		460	660	980	—	—	.002 - .010	—	
	KT315			KT315	460	660	980	.002 - .010	—	—	.003 - .012	

Material Group	Condition	Geometry				Cutting Speed SFM			Feed Rate IPR			
		-LF	-UF	-FP	-FW	min	Starting Value	max	-LF	-UF	-FP	-FW
M	1			KTP10		460	750	1030	—	—	.002 - .010	—
		KT315			KT315	460	750	1030	.002 - .010	—	—	.003 - .012
		KC5010			KC5010	430	710	800	.002 - .010	—	—	.003 - .012
	2	KCM15		KCM15		340	590	790	.002 - .005	—	.002 - .005	—
		KC9225			KC9225	340	590	790	.002 - .005	—	—	.003 - .006
				KTP10		460	710	970	—	—	.002 - .010	—
	3	KT315			KT315	460	710	970	.002 - .010	—	—	.003 - .012
		KC5010			KC5010	430	660	800	.002 - .010	—	—	.003 - .012
		KCM15		KCM15		340	540	820	.002 - .005	—	.002 - .005	—
	3	KC9225			KC9225	330	520	750	.002 - .005	—	—	.003 - .006
				KTP10		460	660	980	—	—	.002 - .010	—
		KT315			KT315	460	660	980	.002 - .010	—	—	.003 - .012
3	KC5010			KC5010	430	610	750	.002 - .010	—	—	.003 - .012	
	KCM15		KCM15		380	490	840	.002 - .005	—	.002 - .005	—	
	KC9225			KC9225	360	490	750	.002 - .005	—	—	.003 - .006	

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Material Group	Condition	Geometry				Cutting Speed SFM			Feed Rate IPR			
		-LF	-UF	-FP	-FW	min	Starting Value	max	-LF	-UF	-FP	-FW
K	1	KCK20		KCK20		660	980	1770	.002 - .010	—	.002 - .010	.003 - .012
		KT315			KT315	540	900	1610	.002 - .010	—	—	.003 - .012
		KC9315				360	900	1480	.002 - .010	—	—	—
	2	KCK20		KCK20		490	790	1380	.002 - .010	—	.002 - .010	.003 - .012
		KT315			KT315	590	900	1180	.002 - .010	—	—	.003 - .012
		KC5010		KC5010		330	660	870	.002 - .010	.002 - .006	—	.003 - .012
		KC9315				480	850	1180	.002 - .010	—	—	—
		KC9320				460	790	1080	.002 - .005	—	—	—
		3	KCK20		KCK20		460	690	1150	.002 - .010	—	.002 - .010	.003 - .012
	KT315				KT315	590	750	1050	.002 - .010	—	—	.003 - .012
	KC5010		KC5010		390	490	740	.002 - .010	.002 - .006	—	.003 - .012	
	KC9315					480	710	900	.002 - .010	—	—	—
KC9320					460	690	850	.002 - .005	—	—	—	

Material Group	Condition	Geometry				Cutting Speed SFM			Feed Rate IPR			
		-LF	—	—	—	min	Starting Value	max	-LF	—	—	—
N	1	KC5410		—	—	660	1800	3280	.004 - .016	—	—	—
		KC5410		—	—	660	1800	3280	.004 - .008	—	—	—
	2	KD1400		—	—	1480	2510	9840	—	.002 - .006	—	—
		KD1425		—	—	1230	1900	3770	—	.002 - .010	—	—
	3	KC5410		—	—	410	900	1720	.004 - .016	—	—	—
		KD1425		—	—	820	1640	2870	—	.002 - .010	—	—
		KC5410		—	—	410	900	1720	.004 - .008	—	—	—
		KD1400		—	—	1230	1710	3280	—	.002 - .005	—	—
		KC5410		—	—	410	660	1230	.004 - .016	—	—	—
		KC5410		—	—	410	660	1230	.004 - .008	—	—	—

Material Group	Condition	Geometry				Cutting Speed SFM			Feed Rate IPR			
		-LF	-UF	-FP	-FW	min	Starting Value	max	-LF	-UF	-FP	-FW
S	1			KCU10		100	180	410	—	—	.002 - .010	—
		K313				30	100	200	.002 - .010	—	—	—
		KC5010		KC5010		100	180	390	.002 - .010	.002 - .006	—	.003 - .012
		KCU10		KCU10		100	180	410	—	—	.002 - .010	—
		KC5010		KC5010		100	180	390	.002 - .010	.002 - .006	—	.003 - .012
		KCU25		KCU25		30	130	160	—	—	.002 - .005	—
	2	KC5025		KC5025		30	130	160	.002 - .004	—	—	—
		KCU10		KCU10		100	110	410	—	—	.002 - .010	—
		K313		K313		30	110	200	.002 - .010	—	—	—
		KC5010		KC5010		100	200	390	.002 - .010	.002 - .006	—	.003 - .012
		KCU10		KCU10		100	110	410	—	—	.002 - .010	—
		KC5010		KC5010		100	200	390	.002 - .010	.002 - .006	—	.003 - .012
	3	KCU25		KCU25		30	100	160	—	—	.002 - .005	—
		KC5025		KC5025		30	100	160	.002 - .004	—	—	—
		KCU10		KCU10		100	230	410	—	—	.002 - .010	—
		K313		K313		30	130	200	.002 - .010	—	—	—
		KC5010		KC5010		100	230	390	.002 - .010	.002 - .006	—	.003 - .012
		KCU10		KCU10		100	110	410	—	—	.002 - .010	—
	4	KC5010		KC5010		100	230	390	.002 - .010	.002 - .006	—	.003 - .012
		KCU25		KCU25		80	130	200	—	—	.002 - .005	—
		KC5025		KC5025		80	130	200	.002 - .004	—	—	—
		KCU10		KCU10		150	230	460	—	—	.002 - .010	—
		K313		K313		50	150	210	.002 - .010	—	—	—
		KC5010		KC5010		150	230	460	.002 - .010	.002 - .006	—	.003 - .012



Hole Finishing

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Hole Finishing

Material Group	Condition	Geometry				Cutting Speed m/min			Feed Rate mm/r			
		-LF	-UF	-FP	-FW	min	Starting Value	max	-LF	-UF	-FP	-FW
P	1	KCP05				180	435	495	0,06 - 0,25	0,04 - 0,16	0,06 - 0,25	—
		KTP10				180	435	495	—	—	0,06 - 0,25	—
		KT315			KT315	180	400	495	0,06 - 0,25	—	—	0,08 - 0,30
	2	KCP10				180	395	465	0,06 - 0,25	0,04 - 0,16	0,06 - 0,25	—
		KC9110				180	395	495	0,06 - 0,25	0,04 - 0,16	—	—
		KCP25				140	280	360	0,06 - 0,10	0,04 - 0,08	0,06 - 0,12	0,08 - 0,16
	3	KCP05				180	265	400	0,06 - 0,25	0,04 - 0,16	0,06 - 0,25	—
		KTP10				180	265	400	—	—	0,06 - 0,25	—
		KT315			KT315	190	270	390	0,06 - 0,25	—	—	0,08 - 0,30
	4	KCP10				180	240	330	0,06 - 0,25	0,04 - 0,16	0,06 - 0,25	—
		KC9110				180	240	330	0,06 - 0,25	0,04 - 0,16	—	—
		KCP25				145	195	320	0,06 - 0,10	0,04 - 0,08	0,06 - 0,12	0,08 - 0,16
	5	KCP05				180	205	275	0,06 - 0,25	0,04 - 0,16	0,06 - 0,25	—
		KTP10				180	205	275	—	—	0,06 - 0,25	—
		KT315			KT315	180	210	275	0,06 - 0,25	—	—	0,08 - 0,30
	6	KCP10				160	190	250	0,06 - 0,25	0,04 - 0,16	0,06 - 0,25	—
		KC9110				155	190	240	0,06 - 0,25	0,04 - 0,16	—	—
		KCP25				135	155	225	0,06 - 0,10	0,04 - 0,08	0,06 - 0,12	0,08 - 0,16
	7	KCP05				90	160	220	0,06 - 0,25	0,04 - 0,16	0,06 - 0,25	—
		KTP10				90	160	220	—	—	0,06 - 0,25	—
		KT315			KT315	90	180	220	0,06 - 0,25	—	—	0,08 - 0,30
	8	KCP10				90	145	195	0,06 - 0,25	0,04 - 0,16	0,06 - 0,25	—
		KC9110				90	145	195	0,06 - 0,25	0,04 - 0,16	—	—
		KCP25				75	105	180	0,06 - 0,10	0,04 - 0,08	0,06 - 0,12	0,08 - 0,16
9	KCP05				150	240	315	0,06 - 0,25	0,04 - 0,16	0,06 - 0,25	—	
	KTP10				150	240	315	—	—	0,06 - 0,25	—	
	KT315			KT315	150	250	315	0,06 - 0,25	—	—	0,08 - 0,30	
10	KCP10				150	215	300	0,06 - 0,25	0,04 - 0,16	0,06 - 0,25	—	
	KC9110				150	215	300	0,06 - 0,25	0,04 - 0,16	—	—	
	KCP25				120	195	255	0,06 - 0,10	0,04 - 0,08	0,06 - 0,12	0,08 - 0,16	
11	KCP05				140	200	300	0,06 - 0,25	0,04 - 0,16	0,06 - 0,25	—	
	KTP10				140	200	300	—	—	0,06 - 0,25	—	
	KT315			KT315	140	200	300	0,06 - 0,25	—	—	0,08 - 0,30	
12	KCP10				120	180	275	0,06 - 0,25	0,04 - 0,16	0,06 - 0,25	—	
	KC9110				120	180	225	0,06 - 0,25	0,04 - 0,16	—	—	
	KCP25				105	150	225	0,06 - 0,10	0,04 - 0,08	0,06 - 0,12	0,08 - 0,16	
13	KCP05				140	200	300	0,06 - 0,25	0,04 - 0,16	0,06 - 0,25	—	
	KTP10				140	200	300	—	—	0,06 - 0,25	—	
	KT315			KT315	140	200	300	0,06 - 0,25	—	—	0,08 - 0,30	
14	KCP10				120	180	275	0,06 - 0,25	0,04 - 0,16	0,06 - 0,25	—	
	KC9110				120	180	225	0,06 - 0,25	0,04 - 0,16	—	—	
	KCP25				105	150	225	0,06 - 0,10	0,04 - 0,08	0,06 - 0,12	0,08 - 0,16	
15	KCP05				140	200	300	0,06 - 0,25	0,04 - 0,16	0,06 - 0,25	—	
	KTP10				140	200	300	—	—	0,06 - 0,25	—	
	KT315			KT315	140	200	300	0,06 - 0,25	—	—	0,08 - 0,30	
16	KCP10				120	180	275	0,06 - 0,25	0,04 - 0,16	0,06 - 0,25	—	
	KC9110				120	180	225	0,06 - 0,25	0,04 - 0,16	—	—	
	KCP25				105	150	225	0,06 - 0,10	0,04 - 0,08	0,06 - 0,12	0,08 - 0,16	
17	KCP05				140	200	300	0,06 - 0,25	0,04 - 0,16	0,06 - 0,25	—	
	KTP10				140	200	300	—	—	0,06 - 0,25	—	
	KT315			KT315	140	200	300	0,06 - 0,25	—	—	0,08 - 0,30	
18	KCP10				120	180	275	0,06 - 0,25	0,04 - 0,16	0,06 - 0,25	—	
	KC9110				120	180	225	0,06 - 0,25	0,04 - 0,16	—	—	
	KCP25				105	150	225	0,06 - 0,10	0,04 - 0,08	0,06 - 0,12	0,08 - 0,16	

Material Group	Condition	Geometry				Cutting Speed m/min			Feed Rate mm/r			
		-LF	-UF	-FP	-FW	min	Starting Value	max	-LF	-UF	-FP	-FW
M	1			KTP10		140	230	315	—	—	0,06 - 0,25	—
		KT315			KT315	140	230	315	0,06 - 0,25	—	—	0,08 - 0,30
		KC5010		KC5010		130	215	245	0,06 - 0,25	—	—	0,08 - 0,30
	2	KCM15		KCM15		105	180	240	0,06 - 0,12	—	0,06 - 0,12	—
		KC9225		KC9225		105	180	240	0,06 - 0,12	—	—	0,08 - 0,16
		KCP10				140	215	295	—	—	0,06 - 0,25	—
	3	KT315		KT315		140	215	295	0,06 - 0,25	—	—	0,08 - 0,30
		KC5010		KC5010		130	200	245	0,06 - 0,25	—	—	0,08 - 0,30
		KCM15		KCM15		105	165	250	0,06 - 0,12	—	0,06 - 0,12	—
	4	KC9225		KC9225		100	160	230	0,06 - 0,12	—	—	0,08 - 0,16
		KCP10				140	200	300	—	—	0,06 - 0,25	—
		KT315			KT315	140	200	300	0,06 - 0,25	—	—	0,08 - 0,30
	5	KC5010		KC5010		130	185	230	0,06 - 0,25	—	—	0,08 - 0,30
		KCM15		KCM15		115	150	255	0,06 - 0,12	—	0,06 - 0,12	—
		KC9225				110	150	230	0,06 - 0,12	—	—	0,08 - 0,16

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Material Group	Condition	Geometry				Cutting Speed m/min			Feed Rate mm/r			
		-LF	-UF	-FP	-FW	min	Starting Value	max	-LF	-UF	-FP	-FW
K	1	KCK20		KCK20		200	300	540	0,06 - 0,25	—	0,06 - 0,25	0,08 - 0,30
		KT315		KT315		165	275	490	0,06 - 0,25	—	—	0,08 - 0,30
		KC9315				110	275	450	0,06 - 0,25	—	—	—
		KC9320				100	240	400	0,06 - 0,12	—	—	—
	2	KCK20		KCK20		150	240	420	0,06 - 0,25	—	0,06 - 0,25	0,08 - 0,30
		KT315		KT315		180	275	360	0,06 - 0,25	—	—	0,08 - 0,30
		KC5010		KC5010		100	200	265	0,06 - 0,25	0,04 - 0,16	—	0,08 - 0,30
		KC9315				145	260	360	0,06 - 0,25	—	—	—
	3	KCK20		KCK20		140	210	350	0,06 - 0,25	—	0,06 - 0,25	0,08 - 0,30
		KT315		KT315		180	230	320	0,06 - 0,25	—	—	0,08 - 0,30
		KC5010		KC5010		120	150	225	0,06 - 0,25	0,04 - 0,16	—	0,08 - 0,30
		KC9315				145	215	275	0,06 - 0,25	—	—	—
		KC9320				140	210	260	0,06 - 0,12	—	—	

Material Group	Condition	Geometry				Cutting Speed m/min			Feed Rate mm/r			
		-LF	—	—	—	min	Starting Value	max	-LF	—	—	—
N	1	KC5410		—		200	550	1000	0,10 - 0,40	—	—	—
		KC5410		—		200	550	1000	0,10 - 0,20	—	—	—
	2	KD1400		—		450	765	3000	—	0,06 - 0,15	—	—
		KD1425		—		375	580	1150	—	0,06 - 0,25	—	—
	3	KD1400		—		400	650	1250	—	0,06 - 0,15	—	—
		KC5410		—		125	275	525	0,10 - 0,40	—	—	—
		KD1425		—		250	500	875	—	0,06 - 0,25	—	—
		KC5410		—		125	275	525	0,10 - 0,20	—	—	—
	5	KD1400		—		375	520	1000	—	0,06 - 0,12	—	—
		KC5410		—		125	200	375	0,10 - 0,40	—	—	—
			KC5410		—		125	200	375	0,10 - 0,20	—	—






Material Group	Condition	Geometry				Cutting Speed m/min			Feed Rate mm/r			
		-LF	-UF	-FP	-FW	min	Starting Value	max	-LF	-UF	-FP	-FW
S	1	KCU10				30	55	125	—	—	0,06 - 0,25	—
		K313				10	30	60	0,06 - 0,25	—	—	—
		KC5010		KC5010		30	55	120	0,06 - 0,25	0,04 - 0,16	—	0,08 - 0,30
		KCU10				30	55	125	—	—	0,06 - 0,25	—
		KC5010		KC5010		30	55	120	0,06 - 0,25	0,04 - 0,16	—	0,08 - 0,30
		KCU25				10	40	50	—	—	0,06 - 0,12	—
	2	KC5025				10	40	50	0,06 - 0,10	—	—	—
		KCU10				30	35	125	—	—	0,06 - 0,25	—
		K313				10	35	60	0,06 - 0,25	—	—	—
		KC5010		KC5010		30	60	120	0,06 - 0,25	0,04 - 0,16	—	0,08 - 0,30
		KCU10				30	35	125	—	—	0,06 - 0,25	—
		KC5010		KC5010		30	60	120	0,06 - 0,25	0,04 - 0,16	—	0,08 - 0,30
	3	KCU25				10	30	50	—	—	0,06 - 0,12	—
		KC5025				10	30	50	0,06 - 0,10	—	—	—
		KCU10				30	70	125	—	—	0,06 - 0,25	—
		K313				10	40	60	0,06 - 0,25	—	—	—
		KC5010		KC5010		30	70	120	0,06 - 0,25	0,04 - 0,16	—	0,08 - 0,30
		KCU10				30	35	125	—	—	0,06 - 0,25	—
	4	KC5010		KC5010		30	70	120	0,06 - 0,25	0,04 - 0,16	—	0,08 - 0,30
		KCU25				25	40	60	—	—	0,06 - 0,12	—
		KC5025				25	40	60	0,06 - 0,10	—	—	—
		KCU10				45	70	140	—	—	0,06 - 0,25	—
		K313				15	45	65	0,06 - 0,25	—	—	—
		KC5010		KC5010		45	70	140	0,06 - 0,25	0,04 - 0,16	—	0,08 - 0,30
5	KCU10				45	70	140	—	—	0,06 - 0,25	—	
	KC5010		KC5010		45	70	140	0,06 - 0,25	0,04 - 0,16	—	0,08 - 0,30	
	KCU25				25	55	90	—	—	0,06 - 0,12	—	
	KC5025				15	55	90	0,06 - 0,10	—	—	—	



Hole Finishing

Application Data • Maximum RPM

Hole Finishing

	Application Diameter				RPM max	
	D1		D1			
	min (mm)	max (mm)	min (in)	max (in)		
 <p>ModBORE™ RBHT</p>	24	31	0.9449	1.2205	12000	
	31	40	1.2205	1.5748	10000	
	40	51	1.5748	2.0079	8000	
	51	67	2.0079	2.6378	6500	
	67	87	2.6378	3.4252	5000	
	87	116	3.4252	4.5669	4000	
	116	153	4.5669	6.0236	3000	
 <p>ModBORE FBHS</p>	24	31	0.9449	1.2205	balanced	unbalanced
	31	40	1.2205	1.5748	12000	9000
	40	51	1.5748	2.0079	10000	7500
	51	67	2.0079	2.6378	8000	5250
	67	87	2.6378	3.4252	6500	4000
	87	116	3.4252	4.5669	5000	3000
	116	171	4.5669	6.7323	4000	2500
 <p>ModBORE FBHO</p>	3	20	0.1181	0.7874	boring bar out of center	
	20	48	0.7874	1.8898	max 0,5mm (.02")	0,5–2,5mm (.02–.1")
	48	88	1.8898	3.4646	16000	6000
					12000	4000
 <p>ModBORE FBHM</p>	3	20	0.1181	0.7874	boring bar out of center	
	20	48	0.7874	1.8898	max 0,5mm (.02")	0,5–2,5mm (.02–.1")
	48	88	1.8898	3.4646	16000	6000
	86	164	3.3858	6.4567	12000	4000
	164	320	6.4567	12.5984	8000	2000
	—	—	0.0000	0.0000	1000	—
	—	—	0.0000	0.0000	500	—
 <p>ModBORE Bridge Tools</p>	150	205	5.9055	8.0709	1250	
	200	255	7.8740	10.0394	1000	
	250	305	9.8425	12.0079	850	
	300	355	11.8110	13.9764	700	
	350	405	13.7795	15.9449	600	
	400	455	15.7480	17.9134	530	
	450	505	17.7165	19.8819	480	
	500	555	19.6850	21.8504	440	
	550	605	21.6535	23.8189	400	
600	655	23.6220	25.7874	380		

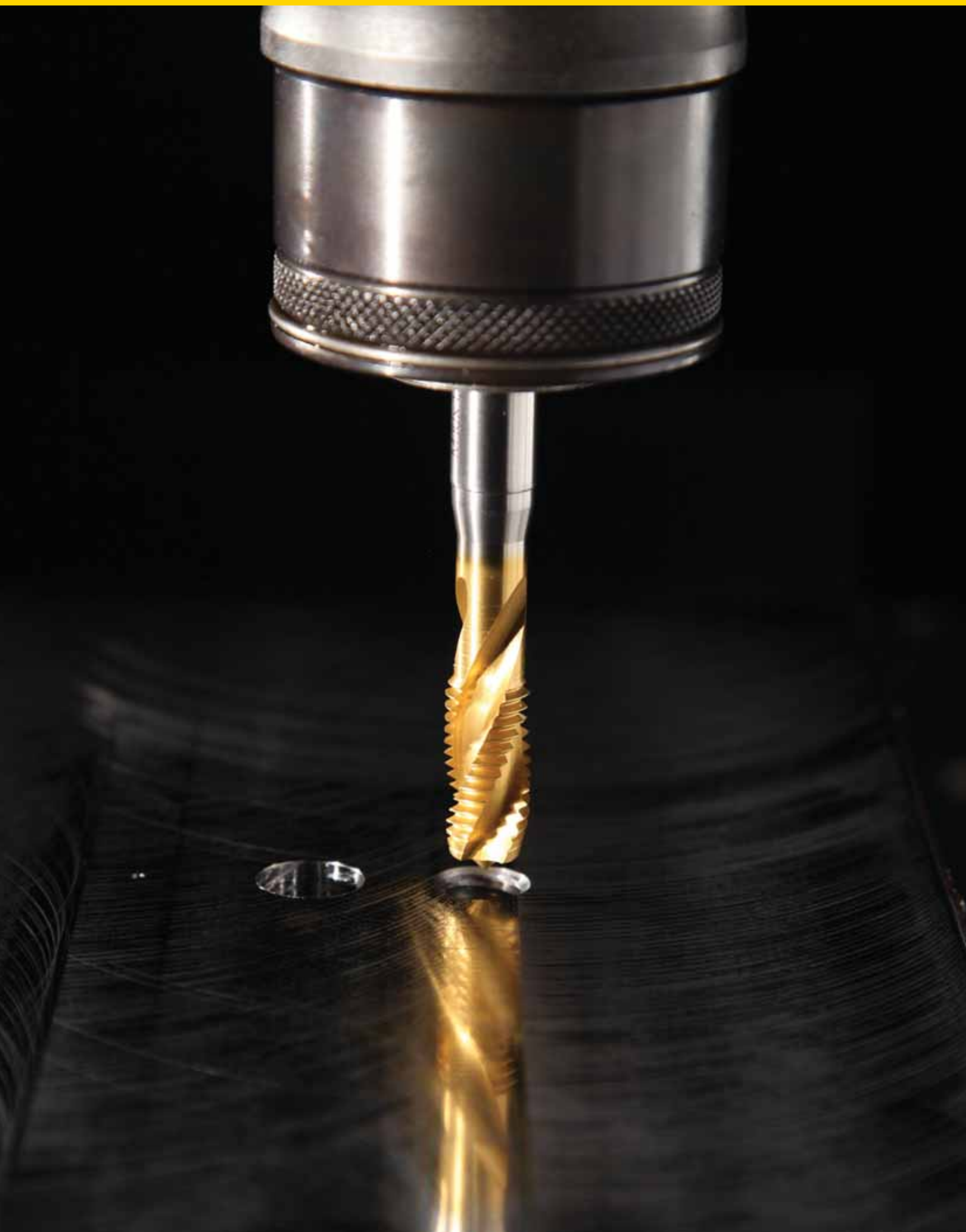
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Holemaking

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Beyond™ High-Performance Solid Carbide Taps

Beyond™ Primary Application

Solid carbide taps offer higher productivity and outstanding performance in a wider range of materials than formerly possible. Get more production from a single tool and superior accuracy of product thread that surpasses the competition. Kennametal High-Performance Solid Carbide Taps are available in various specifications with enhanced precision and design, which translates into longer tool life, excellent performance, and exceptional wear resistance.

- High performance to surpass competitive taps.
- More production from a single tool.
- Available in various specifications.

Features and Benefits

Advanced Technology

- Manufactured with micrograin carbide for exceptional wear life.
- Ideal for long production runs where fewer tool changes equate to greater productivity.
- Designed for outstanding tool life in steel, cast iron, aluminum, and hardened materials.
- Runs 4x faster and lasts 4x longer than conventional taps.
- Tap runout less than 10 microns (.0004").
- PVD nanolayer TiAlN/TiN coated carbide grade.

Customization

- Engineered solutions available upon request.
- Available in various specifications.

Application Information

- Maximum chip control and free cutting in through holes.
- For use on CNC machines with synchronous or rigid tapping control and precision toolholders.
- Straight-flute taps for sizes M4 and larger for ductile or cast iron.
- Can be factory reconditioned to original specifications and tolerances.



Optimized flute design
Better chip evacuation.

Carbide substrate
Higher heat resistance,
higher speed.

Chamfer design
Helps chip load,
lower torque.



Application-specific coatings
Extremely high wear resistance,
longer tool life.

Cylindrical h6 shank
Low runout, higher
quality threads.

To learn more, [scan here](#).
For instructions on how to scan, please see page xxix.



Beyond™ Series HP Solid Carbide Taps and Solid Carbide Forming Taps • Metric

● first choice
○ alternate choice

Beyond HP Solid Carbide Taps	series	grade	shank/dimension	P	M	K	N	S	H
	T320	KC7542	6535 HA	●	○				
	T321	KC7542	6535 HA	●	○				
	T331	KC7542	6535 HA	●	○				
	T340	KC7542	6535 HA			●			
	T351	KC7542	6535 HA			●			
	T410	KCU36	DIN 371, 374, 376						●
	T461	KC7512	6535 HA				●		
	T471	KC7512	6535 HA				●		

Beyond HP Solid Carbide Forming Taps

	T381	KC7542	6535 HA	●					
	T391	KC7542	6535 HA	●					
	T481	KC7512	6535 HA				●		
	T491	KC7512	6535 HA				●		

Beyond Series HP Solid Carbide Taps and Solid Carbide Forming Taps • Inch

● first choice
○ alternate choice

Beyond HP Solid Carbide Taps	series	grade	shank/dimension	P	M	K	N	S	H
	T320	KC7542	6535 HA	●	○				
	T331	KC7542	6535 HA	●	○				
	T340	KC7542	6535 HA			●			
	T351	KC7542	6535 HA			●			
	T461	KC7512	6535 HA				●		
	T471	KC7512	6535 HA				●		

Beyond HP Solid Carbide Forming Taps

	T381	KC7542	6535 HA	●					
	T391	KC7542	6535 HA	●					
	T481	KC7512	6535 HA				●		
	T491	KC7512	6535 HA				●		

*Through coolant 1/4" and larger.

size range (metric)	through hole	blind hole	chamfer form	helix angle	external coolant	internal coolant	page(s)	recommended cutting parameters
size min-max								
M6-M16							L10	L27
M6-M16							L11	L27
M6-M16							L12	L27
M4-M20							L14	L27
M4*-M16							L16	L27
M3-M16							L19	L27
M6-M16							L21	L27
M6-M16							L23	L27
M4*-M10							L17	L27
M4*-M10							L18	L27
M4*-M12							L25	L27
M4*-M12							L26	L27
size range (inch)	through hole	blind hole	chamfer form	helix angle	external coolant	internal coolant	page(s)	recommended cutting parameters
size min-max								
1/4"-5/8"							L10	L27
1/4"-5/8"							L12	L27
#6-3/4"							L13	L27
#6-3/4"							L15	L27
1/4"-5/8"							L20	L27
1/4"-5/8"							L22	L27
#6*-3/8"							L17	L27
#6*-3/8"							L18	L27
#6*-1/2"							L24	L27
#6*-1/2"							L26	L27



Carbide Tap Identification System



Metric

T320 **MF** **120** **X** **150** **R** **6HX**

Inch

T320 **NC** **06250** **-** **11** **R** **3BX**

Tap Design

Type of Thread

Nominal Diameter of Thread

Pitch

Cutting Direction

Tolerance Class

mm or inch (depending on type)

mm or TPI (depending on type)

- M** = Metric coarse-pitch thread (ISO form)
- MF** = Metric fine-pitch thread (ISO form)
- NC** = Unified coarse series thread
- NF** = Unified fine series thread

Style

- T320** = Steel, through holes, LHSF
- T321** = Steel, through holes, LHSF coolant
- T331** = Steel, blind holes, RHSF coolant
- T340** = Cast iron and cast aluminum, through holes, STFL
- T351** = Cast iron and cast aluminum, blind holes, STFL coolant
- T381** = Steel, through holes, forming FT, coolant
- T391** = Steel, blind holes, forming FT, coolant
- T410** = Hard materials up to 63 HRC
- T461** = Aluminum, through holes, STFL, coolant
- T471** = Aluminum, blind holes, STFL, coolant
- T481** = Aluminum, through holes, forming FT, coolant
- T491** = Aluminum, blind holes, forming FT, coolant

Taps



The **SPEED** to **EXCEED**

Solid Carbide Taps

The Kennametal Solid Carbide Taps deliver the accuracy you demand at up to four times the speed of HSS taps. Longer tool life, exceptional thread quality, and an array of sizes for ferrous and non-ferrous materials make our taps the most trusted and productive tools in the industry.

- Reduce your operating costs by up to 65%.
- Workpiece-specific grades: KC7542™ for steels and cast irons, KC7512™ for aluminum.
- Go 4x faster with 4x the service life of conventional HSS offerings.
- Wide array of styles and sizes for through or blind hole applications.

Tap into something great at your Authorized Kennametal Distributor or at www.kennametal.com.

www.kennametal.com

 **KENNAMETAL®**



Through Holes

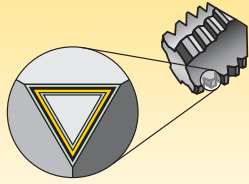


Blind Holes

Taps

		Cutting		Forming		Cutting		Forming	
		Internal Coolant	Flood	Internal Coolant	Flood	Internal Coolant	Flood	Internal Coolant	Flood
P	<32 HRC	T321_KC7542 T621_KP6525	T320_KC7542 T620_KP6525	T381_KC7542 T623_KSP21	T622_KSP21	T331_KC7542 T631_KP6525 T630_KP6505 T633_KP6525 T651_KP6525	T630_KP6525 T630_KP6505 T632_KP6525 T650_KP6525	T391_KC7542 T623_KSP21	T622_KSP21
	32-44 HRC	—	T600_KSP2	—	—	—	T602_KSP21 T604_KSH26	—	—
M		T621_KM6515	T620_KM6515	—	—	T631_KM6515	T630_KM6515	—	—
K		T641_KP6525	T340_KC7542 T640_KP6525	—	—	T351_KC7542 T641_KP6525 T643_KP6525	T640_KP6525 T642_KP6525	—	—
N	Wrought, Low Si	—	T670_KSN38	T481_KC7512 T623_KSN28	T622_KSN28	—	T680_KSN38	T491_KC7512 T623_KSN28	T622_KSN28
	Cast, Si<12%	T461_KC7512 T641_KP6525	T640_KP6525	T481_KC7512 T623_KSN28	T622_KSN28	T471_KC7512 T641_KP6525 T643_KP6525	T640_KP6525 T642_KP6525	T491_KC7512 T623_KSN28	T622_KSN28
S	Titanium Alloys	—	T614_KSN25	—	—	—	T616_KSN25	—	—
	Ni and Co Alloys	—	T610_KSSH22	—	—	—	T612_KSSH22	—	—
H	44-55 HRC	—	T606_KSSH22	—	—	—	T606_KSSH22	—	—
	55-63 HRC	—	T410_KCU36	—	—	—	T410_KCU36	—	—

Solid Carbide = **bold**
HSS-E-PM = regular



Coatings provide high-speed capability and are engineered for finishing to light roughing.

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous Materials
S	High-Temp Alloys
H	Hardened Materials

wear resistance ← → toughness

NEW!

NEW!

NEW!

NEW!

NEW!

NEW!

NEW!

NEW!

NEW!

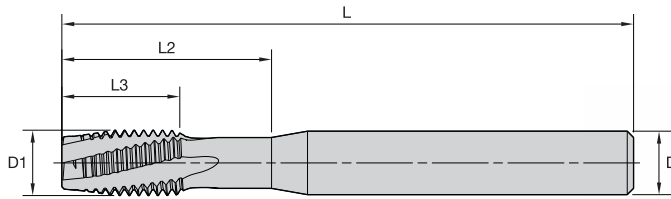
NEW!

NEW!

NEW!

Taps

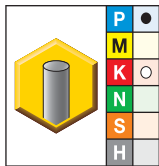
Grade	Coating	Grade Description	Material Hardness (HRC)												
			05	10	15	20	25	30	35	40	45				
KC7542		Coated carbide. PVD — multilayer coating with TiAlN and TiN over a high-strength carbide substrate specifically designed for tap application. Use in steel up to 32 HRC and cast iron at four times faster speeds than HSS-E-PM taps.	P												
			K												
KC7512		Coated carbide. PVD — two-layer coating over fine-grain carbide. Coating consists of low friction Cr/C over wear-resistant TiN. Cr/C resists galling of non-ferrous materials to the tap. Provides superior performance for tapping cast aluminum and other non-ferrous materials.	N												
KCU36		Coated carbide. PVD — two-layer coating with heat-resistant TiAlN base layer and low-friction MoS ₂ top layer over carbide substrate. Use in hardened steel 55–63 HRC.	H												
KP6525		Coated HSS-E-PM. PVD — heat- and wear-resistant high vanadium — cobalt powder metal HSS substrate coated with wear-resistant TiCN base layer and low-friction TiN top layer. Use in steel, cast iron, and cast aluminum with silicon.	K												
KSP21		Coated HSS-E-PM. PVD — powder metal HSS-E substrate with TiN coating. Use for tapping steel 32–44 HRC and for forming threads in steel 32 HRC.	P												
KSH26		Coated HSS-E-PM. PVD — powder metal HSS-E substrate coated with TiN base layer and low-friction MoS ₂ top layer. Use in deep blind steel holes 32–44 HRC.	P												
KM6515		Coated HSS-E-PM. PVD — heat- and wear-resistant high vanadium — cobalt powder metal HSS substrate. Coating consists of low-friction Cr/C over wear-resistant TiN base layer. Use for tapping stainless steel and non-ferrous materials.	M												
			N												
KSN28		Coated HSS-E-PM. PVD — powder metal HSS-E substrate with DLC coating. Use for form tapping aluminum. Not recommended for steel.	N												
KSN38		Coated HSS-E. PVD — Lower vanadium HSS-E substrate with DLC coating. Use for tapping non-ferrous materials with low cutting temperatures like wrought aluminum. Not recommended for steel.	N												
KSN25		Coated HSS-E-PM. PVD — powder metal HSS-E substrate with two-layer coating: TiN base layer and DLC top layer that resists galling of non-ferrous materials to the tap. Use for tapping titanium. Not recommended for steel.	S												
KSSH22		Coated HSS-E-PM. PVD — heat- and wear-resistant high vanadium — cobalt powder metal HSS substrate with high hardness TiCN coating. Use when tapping heat-treated steel 44–55 HRC and cobalt- or nickel-based heat-resistant alloys.	S												
			H												



beyond

KC7542 • TiAIN + TiN for steel.

■ T320 • Form D Plug Chamfer • Inch



- first choice
- alternate choice

KC7542	D1 size	L	L3	L2	D	number of flutes	class of fit
T320NC02500-20R3BX	1/4 - 20	2.76	.59	.91	.2500	3	3BX
T320NF02500-28R3BX	1/4 - 28	2.76	.59	.91	.2500	3	3BX
T320NC03125-18R3BX	5/16 - 18	3.15	.67	1.10	.3125	3	3BX
T320NF03125-24R3BX	5/16 - 24	3.15	.67	1.10	.3125	3	3BX
T320NC03750-16R3BX	3/8 - 16	3.54	.75	1.30	.3750	4	3BX
T320NF03750-24R3BX	3/8 - 24	3.54	.75	1.30	.3750	4	3BX
T320NC04375-14R3BX	7/16 - 14	3.94	.87	1.42	.4375	4	3BX
T320NC05000-13R3BX	1/2 - 13	3.94	.94	1.58	.5000	4	3BX
T320NF0500020R3BX	1/2 - 20	3.94	.94	1.58	.5000	4	3BX
T320NC05625-12R3BX	9/16 - 12	4.33	1.02	1.85	.5000	4	3BX
T320NC06250-11R3BX	5/8 - 11	4.33	1.10	2.09	.5625	5	3BX

Shank Tolerance

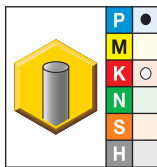
D	tolerance h6
.250-.375	+0, -.0004
.438-.625	+0, -.0004

Taps

beyond

KC7542 • TiAIN + TiN for steel.

■ T320 • Form D Plug Chamfer • Metric



- first choice
- alternate choice

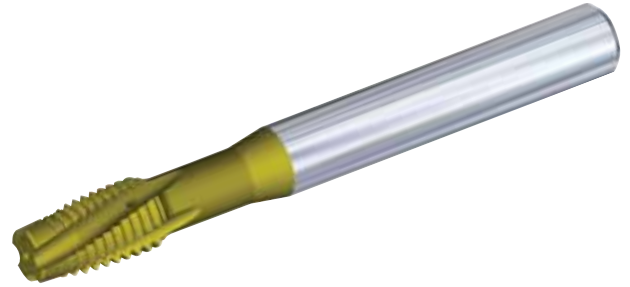
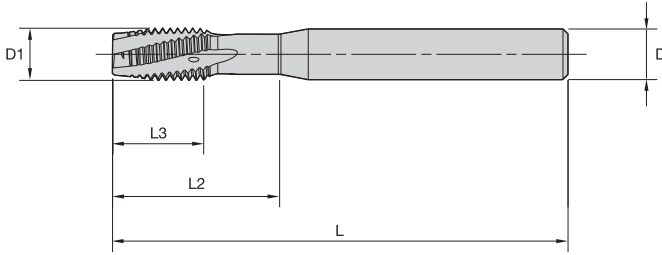


KC7542	D1 size	L	L3	L2	D	number of flutes	class of fit
T320M060X100R6HX	M6 x 1	70	12	23	6,0	3	6HX
T320M080X125R6HX	M8 x 1,25	80	15	28	8,0	3	6HX
T320M100X150R6HX	M10 x 1,5	90	18	33	10,0	4	6HX
T320MF120X150R6HX	M12 x 1,5	100	21	40	12,0	4	6HX
T320M120X175R6HX	M12 x 1,75	100	21	40	12,0	4	6HX
T320MF140X150R6HX	M14 x 1,5	110	24	47	12,0	4	6HX
T320M140X200R6HX	M14 x 2	110	24	47	12,0	4	6HX
T320M160X200R6HX	M16 x 2	110	24	53	14,0	4	6HX

NOTE: Proprietary technology.

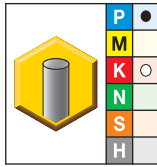
Shank Tolerance

D	tolerance h6
6	+0, -0,008
8-10	+0, -0,009
12-16	+0, -0,011



KC7542 • TiAlN + TiN for steel.

■ T321 • Form D Plug Chamfer • Through Coolant • Metric



● first choice
○ alternate choice

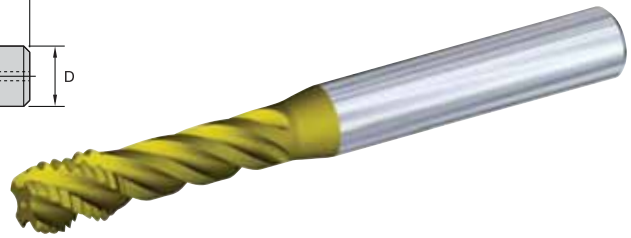
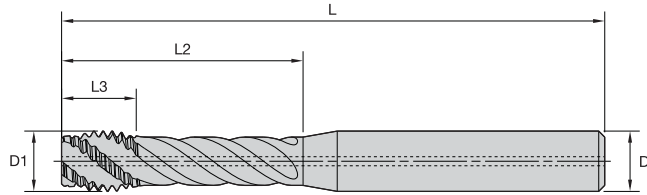
KC7542	D1 size	L	L3	L2	D	number of flutes	class of fit
T321M100X150R6HX	M10 x 1,5	90	18	33	10,0	4	6HX
T321MF120X150R6HX	M12 x 1,5	100	21	40	12,0	4	6HX
T321M120X175R6HX	M12 x 1,75	100	21	40	12,0	4	6HX
T321MF140X150R6HX	M14 x 1,5	110	24	47	12,0	4	6HX
T321M140X200R6HX	M14 x 2	110	24	47	12,0	4	6HX
T321M160X200R6HX	M16 x 2	110	24	53	14,0	4	6HX

NOTE: Proprietary technology.

Shank Tolerance

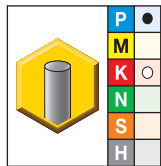
D	tolerance h6
6	+0, -0,008
8-10	+0, -0,009
12-16	+0, -0,011





KC7542 • TiAlN + TiN for steel.

■ T331 • Form C Semi-Bottoming Chamfer • Through Coolant • Inch



- first choice
- alternate choice

Taps

KC7542	D1 size	L	L3	L2	D	number of flutes	class of fit
T331NC2500-20R3BX	1/4 - 20	2.76	.39	.94	.2500	3	3BX
T331NF2500-28R3BX	1/4 - 28	2.76	.39	.94	.2500	3	3BX
T331NC3125-18R3BX	5/16 - 18	3.15	.47	1.26	.3125	3	3BX
T331NC3750-16R3BX	3/8 - 16	3.54	.51	1.57	.3750	4	3BX
T331NC4375-14R3BX	7/16 - 14	3.94	.59	1.73	.4375	4	3BX
T331NC5000-13R3BX	1/2 - 13	3.94	.63	1.89	.5000	4	3BX
T331NC5625-12R3BX	9/16 - 12	4.33	.67	2.20	.5000	4	3BX
T331NC6250-11R3BX	5/8 - 11	4.33	.75	2.52	.5625	4	3BX

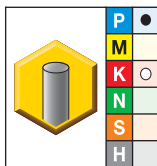
Shank Tolerance

D	tolerance h6
.250-.375	+0, -.0004
.438-.625	+0, -.0004



KC7542 • TiAlN + TiN for steel.

■ T331 • Form C Semi-Bottoming Chamfer • Through Coolant • Metric



- first choice
- alternate choice

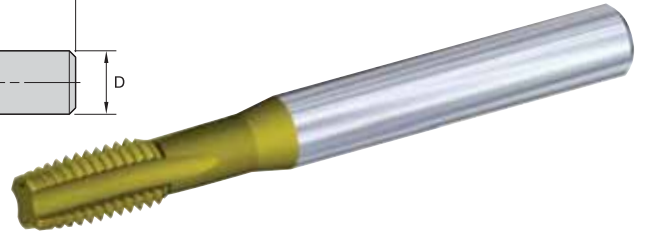
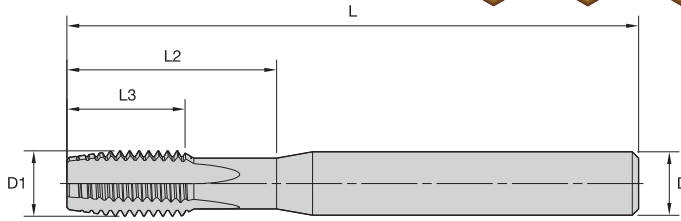
KC7542	D1 size	L	L3	L2	D	number of flutes	class of fit
T331M060X100R6HX	M6 x 1	70	8	24	6,0	3	6HX
T331M080X125R6HX	M8 x 1,25	80	10	32	8,0	3	6HX
T331MF100X100R6HX	M10 x 1	90	12	40	10,0	4	6HX
T331M100X150R6HX	M10 x 1,5	90	12	40	10,0	4	6HX
T331MF120X150R6HX	M12 x 1,5	100	14	48	12,0	4	6HX
T331M120X175R6HX	M12 x 1,75	100	14	48	12,0	4	6HX
T331MF140X150R6HX	M14 x 1,5	110	16	56	12,0	4	6HX
T331M140X200R6HX	M14 x 2	110	16	56	12,0	4	6HX
T331M160X200R6HX	M16 x 2	110	16	64	14,0	4	6HX

NOTE: Proprietary technology.

Shank Tolerance

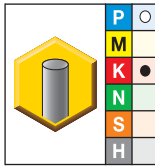
D	tolerance h6
6	+0, -0,008
8-10	+0, -0,009
12-16	+0, -0,011





KC7542 • TiAlN + TiN for cast iron.

■ T340 • Form D Plug Chamfer • Inch



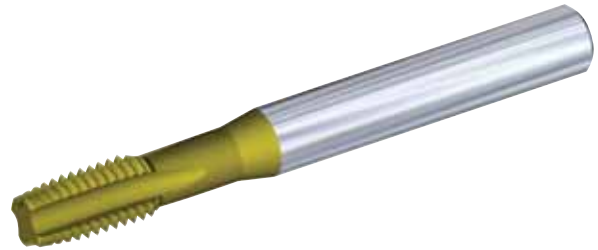
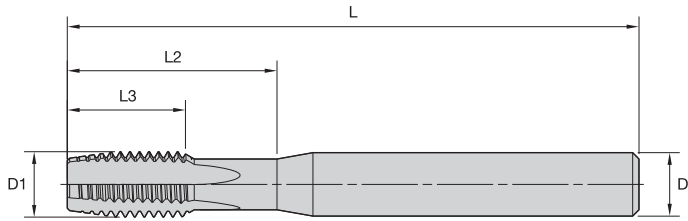
● first choice
○ alternate choice

KC7542	D1 size	L	L3	L2	D	number of flutes	class of fit
T340NC#6-32R3BX	6 - 32	2.36	.28	.55	.2500	3	3BX
T340NC#8-32R3BX	8 - 32	2.36	.28	.63	.2500	3	3BX
T340NC#10-24R3BX	10 - 24	2.36	.35	.79	.2500	3	3BX
T340NF#10-32R3BX	10 - 32	2.36	.35	.79	.2500	3	3BX
T340NC2500-20R3BX	1/4 - 20	2.76	.59	.91	.2500	4	3BX
T340NF2500-28R3BX	1/4 - 28	2.76	.59	.91	.2500	4	3BX
T340NC3125-18R3BX	5/16 - 18	3.15	.67	1.10	.3125	4	3BX
T340NC03750-16R3BX	3/8 - 16	3.54	.75	1.30	.3750	4	3BX
T340NF03750-24R3BX	3/8 - 24	3.54	.75	1.30	.3750	4	3BX
T340NC04375-14R3BX	7/16 - 14	3.94	.87	1.42	.4375	4	3BX
T340NC05000-13R3BX	1/2 - 13	3.94	.94	1.58	.5000	4	3BX
T340NF05000-20R3BX	1/2 - 20	3.94	.94	1.58	.5000	4	3BX
T340NF05625-18R3B	9/16 - 18	4.33	1.02	1.85	.5000	4	3BX
T340NC05625-12R3BX	9/16 - 12	4.33	1.02	1.85	.5000	4	3BX
T340NC06250-11R3BX	5/8 - 11	4.33	1.10	2.09	.5625	5	3BX
T340NC07500-10R3BX	3/4 - 10	4.92	1.22	2.48	.6250	5	3BX



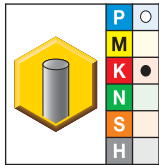
Shank Tolerance

D	tolerance h6
.250-.375	+0, -.0004
.438-.625	+0, -.0004



KC7542 • TiAlN + TiN for cast iron.

■ T340 • Form D Plug Chamfer • Metric



● first choice
○ alternate choice

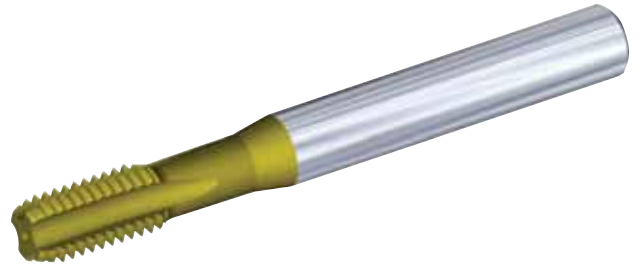
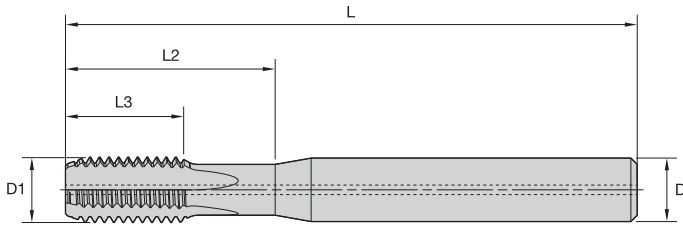
Taps

KC7542	D1 size	L	L3	L2	D	number of flutes	class of fit
T340M040X070R6HX	M4 x 0,7	60	6	16	6,0	3	6HX
T340M050X080R6HX	M5 x 0,8	60	7	20	6,0	3	6HX
T340M060X100R6HX	M6 x 1	70	12	23	6,0	4	6HX
T340M080X125R6HX	M8 x 1,25	80	15	28	8,0	4	6HX
T340M100X150R6HX	M10 x 1,5	90	18	33	10,0	4	6HX
T340MF100X100R6HX	M10 x 1	90	18	33	10,0	4	6HX
T340MF120X150R6HX	M12 x 1,5	100	21	40	12,0	4	6HX
T340M120X175R6HX	M12 x 1,75	100	21	40	12,0	4	6HX
T340M140X200R6HX	M14 x 2	110	24	47	12,0	4	6HX
T340MF140X150R6HX	M14 x 1,5	110	24	47	12,0	4	6HX
T340M160X200R6HX	M16 x 2	110	24	53	14,0	4	6HX
T340M180X250R6HX	M18 x 2,5	125	30	59	16,0	5	6HX
T340M200X250R6HX	M20 x 2,5	140	30	66	18,0	5	6HX

NOTE: Proprietary technology.

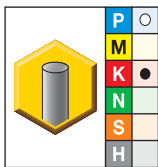
Shank Tolerance

D	tolerance h6
6	+0, -0,008
8-10	+0, -0,009
12-16	+0, -0,011



KC7542 • TiAlN + TiN for tapping cast iron.

■ T351 • Form E Bottoming Chamfer • Through Coolant 1/4" and Larger • Inch



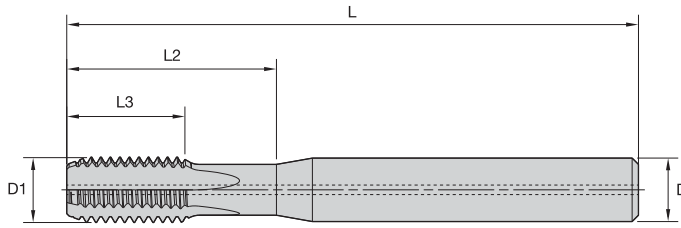
- first choice
- alternate choice

KC7542	D1 size	L	L3	L2	D	number of flutes	class of fit
T351NC#6-32R3BX	6 - 32	2.36	.28	.55	.2500	3	3BX
T351NC#8-32R3BX	8 - 32	2.36	.28	.63	.2500	3	3BX
T351NC#10-24R3BX	10 - 24	2.36	.35	.79	.2500	3	3BX
T351NF#10-32R3BX	10 - 32	2.36	.35	.79	.2500	3	3BX
T351NC2500-20R3BX	1/4 - 20	2.76	.59	.91	.2500	4	3BX
T351NF2500-28R3BX	1/4 - 28	2.76	.59	.91	.2500	4	3BX
T351NC3125-18R3BX	5/16 - 18	3.15	.67	1.10	.3125	4	3BX
T351NC3750-16R3BX	3/8 - 16	3.54	.75	1.30	.3750	4	3BX
T351NC4375-14R3BX	7/16 - 14	3.94	.87	1.42	.4375	4	3BX
T351NC5000-13R3BX	1/2 - 13	3.94	.94	1.57	.5000	4	3BX
T351NC5625-12R3BX	9/16 - 12	4.33	1.02	1.85	.5000	4	3BX
T351NC6250-11R3BX	5/8 - 11	4.33	1.10	2.09	.5625	5	3BX
T351NC7500-10R3BX	3/4 - 10	4.92	1.22	2.48	.6250	5	3BX



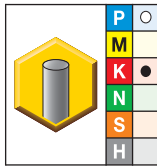
Shank Tolerance

D	tolerance h6
.250-.375	+0, -.0004
.438-.625	+0, -.0004



KC7542 • TiAlN + TiN for cast iron.

■ T351 • Form E Bottoming Chamfer • Through Coolant M6 and Larger • Metric



● first choice
○ alternate choice

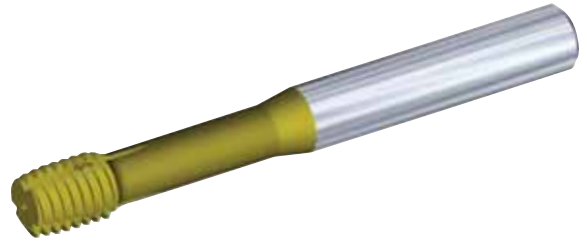
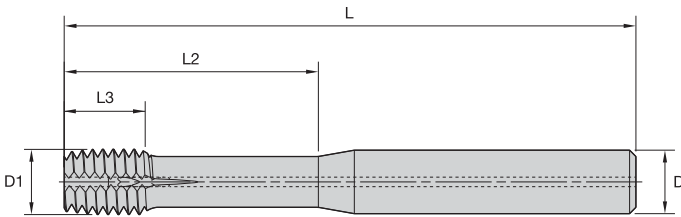
Taps

KC7542	D1 size	L	L3	L2	D	number of flutes	class of fit
T351M040X070R6HX	M4 x 0,7	60	6	16	6,0	3	6HX
T351M050X080R6HX	M5 x 0,8	60	7	20	6,0	3	6HX
T351M060X100R6HX	M6 x 1	70	12	23	6,0	4	6HX
T351M080X125R6HX	M8 x 1,25	80	15	28	8,0	4	6HX
T351MF100X100R6HX	M10 x 1	90	18	33	10,0	4	6HX
T351M100X150R6HX	M10 x 1,5	90	18	33	10,0	4	6HX
T351MF120X150R6HX	M12 x 1,5	100	21	40	12,0	4	6HX
T351M120X175R6HX	M12 x 1,75	100	21	40	12,0	4	6HX
T351MF140X150R6HX	M14 x 1,5	110	24	47	12,0	4	6HX
T351M140X200R6HX	M14 x 2	110	24	47	12,0	4	6HX
T351M160X200R6HX	M16 x 2	110	24	53	14,0	4	6HX
T351M200X250R6HX	M20 x 2,5	140	30	66	18,0	5	6HX

NOTE: Proprietary technology.

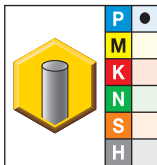
Shank Tolerance

D	tolerance h6
6	+0, -0,008
8-10	+0, -0,009
12-16	+0, -0,011



KC7542 • TiAIN + TiN for tapping steel.

■ T381 • Form D Plug Entry Taper • Through Coolant 1/4" and Larger • Inch



- first choice
- alternate choice

KC7542	D1 size	L	L3	L2	D	number of lube grooves	class of fit
T381NC#6-32R3BX	6 - 32	2.36	.28	.55	.2500	2	3BX
T381NC#8-32R3BX	8 - 32	2.36	.28	.63	.2500	2	3BX
T381NC#10-24R3BX	10 - 24	2.36	.35	.79	.2500	2	3BX
T381NF#10-32R3BX	10 - 32	2.36	.35	.79	.2500	2	3BX
T381NC2500-20R3BX	1/4 - 20	2.76	.39	.95	.2500	2	3BX
T381NF2500-28R3BX	1/4 - 28	2.76	.39	.95	.2500	2	3BX
T381NC3125-18R3BX	5/16 - 18	3.15	.47	1.26	.3125	2	3BX
T381NC3750-16R3BX	3/8 - 16	3.54	.51	1.58	.3750	3	3BX

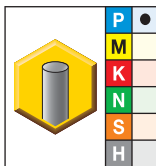
Shank Tolerance

D	tolerance h6
.250-.375	+0, -.0004
.438-.625	+0, -.0004



KC7542 • TiAIN + TiN for steel.

■ T381 • Form D Plug Entry Taper • Through Coolant M6 and Larger • Metric



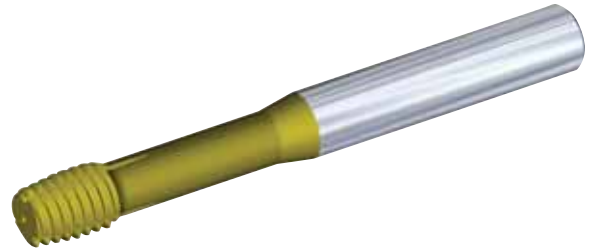
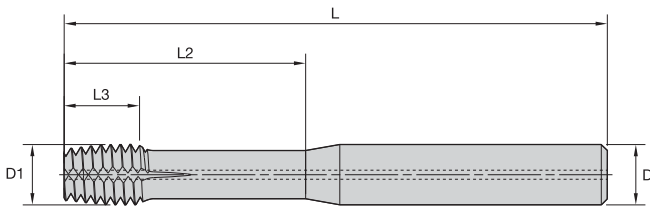
- first choice
- alternate choice

KC7542	D1 size	L	L3	L2	D	number of lube grooves	class of fit
T381M040X070R6HX	M4 x 0,7	60	6	16	6,0	2	6HX
T381M050X080R6HX	M5 x 0,8	60	7	20	6,0	2	6HX
T381M060X100R6HX	M6 x 1	70	8	24	6,0	2	6HX
T381M080X125R6HX	M8 x 1,25	80	10	32	8,0	2	6HX
T381M100X150R6HX	M10 x 1,5	90	12	40	10,0	3	6HX

NOTE: Proprietary technology.
Form taps require a larger drilled hole size prior to tapping than corresponding cutting taps.

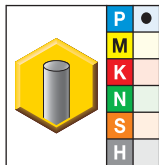
Shank Tolerance

D	tolerance h6
6	+0, -0,008
8-10	+0, -0,009
12-16	+0, -0,011



KC7542 • TiAIN + TiN for tapping steel.

■ T391 • Form E Bottoming Entry Taper • Through Coolant 1/4" and Larger • Inch



- first choice
- alternate choice

Taps

KC7542	D1 size	L	L3	L2	D	number of lube grooves	class of fit
T391NC#6-32R3BX	6 - 32	2.36	.28	.55	.2500	2	3BX
T391NC#8-32R3BX	8 - 32	2.36	.28	.63	.2500	2	3BX
T391NC#10-24R3BX	10 - 24	2.36	.35	.79	.2500	2	3BX
T391NF#10-32R3BX	10 - 32	2.36	.35	.79	.2500	2	3BX
T391NC2500-20R3BX	1/4 - 20	2.76	.39	.95	.2500	2	3BX
T391NF2500-28R3BX	1/4 - 28	2.76	.39	.95	.2500	2	3BX
T391NC3125-18R3BX	5/16 - 18	3.15	.47	1.26	.3125	2	3BX
T391NC3750-16R3BX	3/8 - 16	3.54	.51	1.58	.3750	3	3BX

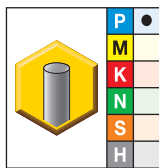
Shank Tolerance

D	tolerance h6
.250-.375	+0, -.0004
.438-.625	+0, -.0004



KC7542 • TiAIN + TiN for steel.

■ T391 • Form E Bottoming Entry Taper • Through Coolant M6 and Larger • Metric



- first choice
- alternate choice



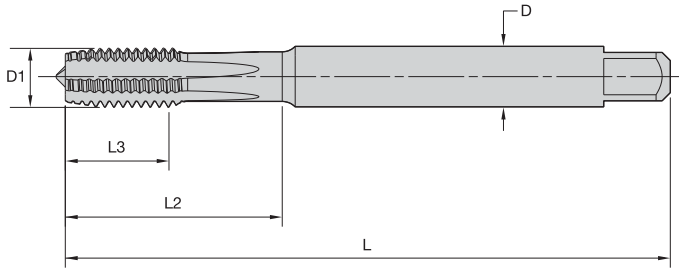
KC7542	D1 size	L	L3	L2	D	number of lube grooves	class of fit
T391M040X070R6HX	M4 x 0,7	60	6	16	6,0	2	6HX
T391M050X080R6HX	M5 x 0,8	60	7	20	6,0	2	6HX
T391M060X100R6HX	M6 x 1	70	8	24	6,0	2	6HX
T391M080X125R6HX	M8 x 1,25	80	10	32	8,0	2	6HX
T391M100X150R6HX	M10 x 1,5	90	12	40	10,0	3	6HX

NOTE: Proprietary technology.

Form taps require a larger drilled hole size prior to tapping than corresponding cutting taps.

Shank Tolerance

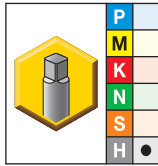
D	tolerance h6
6	+0, -0,008
8-10	+0, -0,009
12-16	+0, -0,011



beyond

KCU36 • TiAlN/MoS₂ for tapping steel 55–63 HRC.

■ T410 • DIN 371, 374, and 376 • Form C Semi-Bottoming Chamfer • Metric



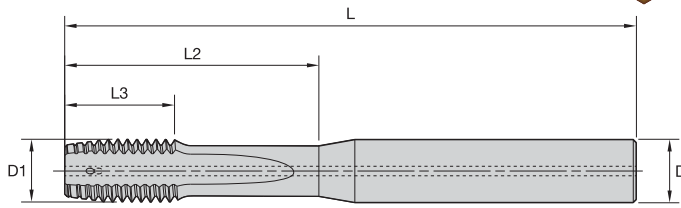
● first choice
○ alternate choice

KCU36	D1 size	L	L3	L2	D	number of flutes	dimension standard	class of fit
T410M030X050R6HX-D1	M3 x 0,5	63	6	18	4,5	4	DIN 371	6HX
T410M040X070R6HX-D1	M4 x 0,7	63	8	20	4,5	4	DIN 371	6HX
T410M050X080R6HX-D1	M5 x 0,8	70	10	26	6,0	4	DIN 371	6HX
T410M060X100R6HX-D1	M6 x 1	80	12	28	6,0	4	DIN 371	6HX
T410MF080X100R6HX-D4	M8 x 1	90	15	35	8,0	5	DIN 374	6HX
T410M080X125R6HX-D1	M8 x 1,25	90	15	35	8,0	5	DIN 371	6HX
T410MF100X100R6HX-D4	M10 x 1	100	18	38	10,0	5	DIN 374	6HX
T410M100X150R6HX-D1	M10 x 1,5	100	18	38	10,0	5	DIN 371	6HX
T410MF120X150R6HX-D4	M12 x 1,5	110	21	41	12,0	5	DIN 374	6HX
T410M120X175R6HX-D6	M12 x 1,75	110	21	41	12,0	5	DIN 376	6HX
T410MF140X150R6HX-D4	M14 x 1,5	110	24	44	14,0	5	DIN 374	6HX
T410M140X200R6HX-D6	M14 x 2	110	24	44	14,0	6	DIN 376	6HX
T410MF160X150R6HX-D4	M16 x 1,5	110	24	44	16,0	5	DIN 374	6HX

Shank Tolerance

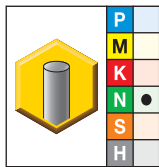
D	tolerance h9
1–3	+0, -0,025
3,5–6	+0, -0,030
7–10	+0, -0,036
11–18	+0, -0,043

Taps



KC7512 • TiN + CrC/C for aluminum.

■ T461 • Form D Plug Chamfer • Through Coolant 1/4" and Larger • Inch



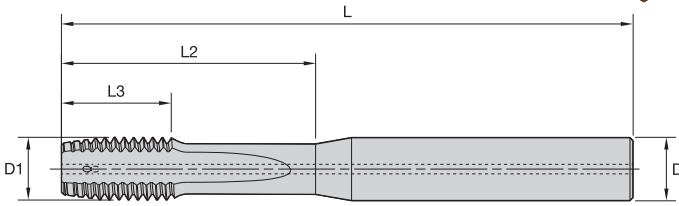
- first choice
- alternate choice

Taps

KC7512	D1 size	L	L3	L2	D	number of flutes	class of fit
T461NC2500-20R3BX	1/4 - 20	2.76	.59	.94	.2500	3	3BX
T461NF2500-28R3BX	1/4 - 28	2.76	.59	.94	.2500	3	3BX
T461NC3125-18R3BX	5/16 - 18	3.15	.67	1.26	.3125	3	3BX
T461NC3750-16R3BX	3/8 - 16	3.54	.75	1.57	.3750	3	3BX
T461NC4375-14R3BX	7/16 - 14	3.94	.87	1.73	.4375	3	3BX
T461NC5000-13R3BX	1/2 - 13	3.94	.94	1.89	.5000	3	3BX
T461NC5625-12R3BX	9/16 - 12	4.33	1.02	2.20	.5000	4	3BX
T461NC6250-11R3BX	5/8 - 11	4.33	1.10	2.52	.5625	4	3BX

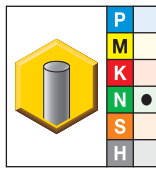
Shank Tolerance

D	tolerance h6
.250-.375	+0, -.0004
.438-.625	+0, -.0004



KC7512 • TiN + CrC/C for aluminum.

■ T461 • Form D Plug Chamfer • Through Coolant M6 and Larger • Metric



- first choice
- alternate choice

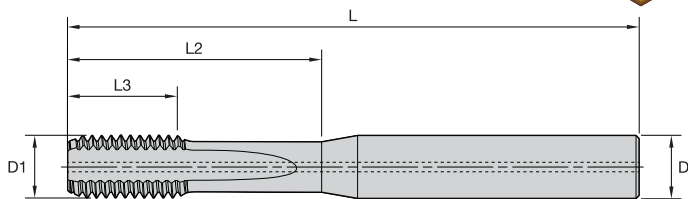
KC7512	D1 size	L	L3	L2	D	number of flutes	class of fit
T461M060X100R6HX	M6 x 1	70	12	24	6,0	3	6HX
T461M080X125R6HX	M8 x 1,25	80	15	32	8,0	3	6HX
T461MF100X100R6HX	M10 x 1	90	18	40	10,0	3	6HX
T461M100X150R6HX	M10 x 1,5	90	18	40	10,0	3	6HX
T461MF120X150R6HX	M12 x 1,5	100	21	48	12,0	3	6HX
T461M120X175R6HX	M12 x 1,75	100	21	48	12,0	3	6HX
T461MF140X150R6HX	M14 x 1,5	110	24	56	12,0	4	6HX
T461M140X200R6HX	M14 x 2	110	24	56	12,0	4	6HX
T461MF160X150R6HX	M16 x 1,5	110	24	64	14,0	4	6HX
T461M160X200R6HX	M16 x 2	110	24	64	14,0	4	6HX

NOTE: Proprietary technology.

Shank Tolerance

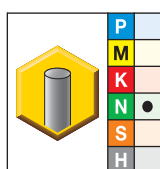
D	tolerance h6
6	+0, -0,008
8-10	+0, -0,009
12-16	+0, -0,011





KC7512 • TiN + CrC/C for aluminum.

■ T471 • Form E Bottoming Chamfer • Through Coolant • Inch



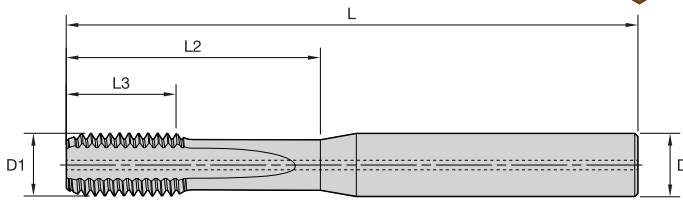
● first choice
○ alternate choice

Taps

KC7512	D1 size	L	L3	L2	D	number of flutes	class of fit
T471NC2500-20R3BX	1/4 - 20	2.76	.59	.94	.2500	3	3BX
T471NF2500-28R3BX	1/4 - 28	2.76	.59	.94	.2500	3	3BX
T471NC3125-18R3BX	5/16 - 18	3.15	.67	1.26	.3125	3	3BX
T471NC3750-16R3BX	3/8 - 16	3.54	.75	1.57	.3750	3	3BX
T471NC4375-14R3BX	7/16 - 14	3.94	.87	1.73	.4375	3	3BX
T471NC5000-13R3BX	1/2 - 13	3.94	.94	1.89	.5000	3	3BX
T471NC5625-12R3BX	9/16 - 12	4.33	1.02	2.20	.5000	4	3BX
T471NC6250-11R3BX	5/8 - 11	4.33	1.10	2.52	.5625	4	3BX

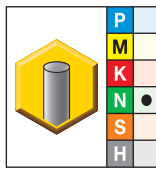
Shank Tolerance

D	tolerance h6
.250-.375	+0, -.0004
.438-.625	+0, -.0004



KC7512 • TiN + CrC/C for aluminum.

■ T471 • Form E Bottoming Chamfer • Through Coolant M6 and Larger • Metric



- first choice
- alternate choice

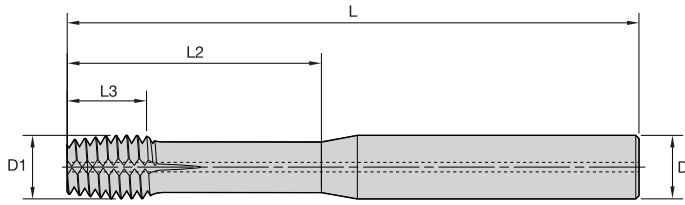
KC7512	D1 size	L	L3	L2	D	number of flutes	class of fit
T471M060X100R6HX	M6 x 1	70	12	24	6,0	3	6HX
T471M080X125R6HX	M8 x 1,25	80	15	32	8,0	3	6HX
T471MF100X100R6HX	M10 x 1	90	18	40	10,0	3	6HX
T471M100X150R6HX	M10 x 1,5	90	18	40	10,0	3	6HX
T471MF120X150R6HX	M12 x 1,5	100	21	48	12,0	3	6HX
T471M120X175R6HX	M12 x 1,75	100	21	48	12,0	3	6HX
T471MF140X150R6HX	M14 x 1,5	110	24	56	12,0	4	6HX
T471M140X200R6HX	M14 x 2	110	24	56	12,0	4	6HX
T471MF160X150R6HX	M16 x 1,5	110	24	64	14,0	4	6HX
T471M160X200R6HX	M16 x 2	110	24	64	14,0	4	6HX

NOTE: Proprietary technology.

Shank Tolerance

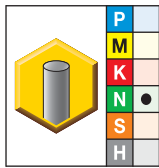
D	tolerance h6
6	+0, -0,008
8-10	+0, -0,009
12-16	+0, -0,011





KC7512 • TiN + CrC/C for aluminum.

■ T481 • Form D Plug Entry Taper • Through Coolant 1/4" and Larger • Inch



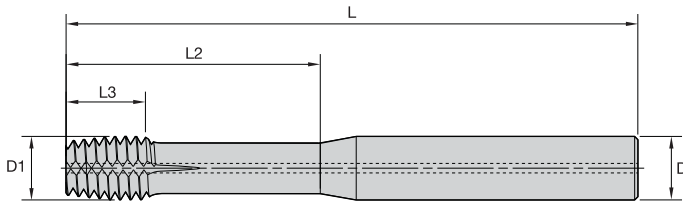
- first choice
- alternate choice

Taps

KC7512	D1 size	L	L3	L2	D	number of lube grooves	class of fit
T481NC#6-32R3BX	6 - 32	2.36	.28	.55	.2500	2	3BX
T481NC#8-32R3BX	8 - 32	2.36	.28	.63	.2500	2	3BX
T481NC#10-24R3BX	10 - 24	2.36	.35	.79	.2500	2	3BX
T481NF#10-32R3BX	10 - 32	2.36	.35	.79	.2500	2	3BX
T481NC2500-20R3BX	1/4 - 20	2.76	.39	.94	.2500	2	3BX
T481NF2500-28R3BX	1/4 - 28	2.76	.39	.94	.2500	2	3BX
T481NC3125-18R3BX	5/16 - 18	3.15	.47	1.26	.3125	2	3BX
T481NC3750-16R3BX	3/8 - 16	3.54	.51	1.57	.3750	3	3BX
T481NC4375-14R3BX	7/16 - 14	3.94	.59	1.73	.4375	3	3BX
T481NC5000-13R3BX	1/2 - 13	3.94	.63	1.89	.5000	3	3BX

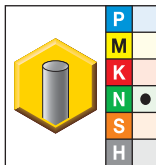
Shank Tolerance

D	tolerance h6
.250-375	+0, -.0004
.438-625	+0, -.0004



KC7512 • TiN + CrC/C for aluminum.

■ T481 • Form D Plug Entry Taper • Through Coolant M6 and Larger • Metric



- first choice
- alternate choice

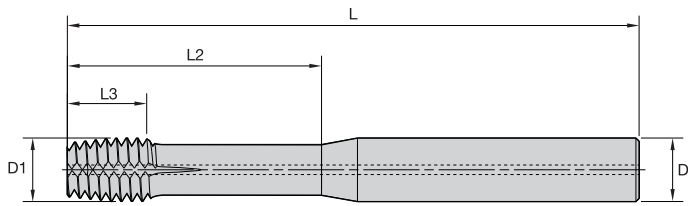
KC7512	D1 size	L	L3	L2	D	number of lube grooves	class of fit
T481M040X070R6HX	M4 x 0,7	60	6	16	6,0	2	6HX
T481M050X080R6HX	M5 x 0,8	60	7	20	6,0	2	6HX
T481M060X100R6HX	M6 x 1	70	8	24	6,0	2	6HX
T481M080X125R6HX	M8 x 1,25	80	10	32	8,0	2	6HX
T481MF100X100R6HX	M10 x 1	90	12	40	10,0	3	6HX
T481M100X150R6HX	M10 x 1,5	90	12	40	10,0	3	6HX
T481MF120X150R6HX	M12 x 1,5	100	14	48	12,0	3	6HX
T481M120X175R6HX	M12 x 1,75	100	14	48	12,0	3	6HX



NOTE: Proprietary technology.
Form taps require a larger drilled hole size prior to tapping than corresponding cutting taps.

Shank Tolerance

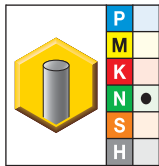
D	tolerance h6
6	+0, -0,008
8-10	+0, -0,009
12-16	+0, -0,011



beyond

KC7512 • TiN + CrC/C for aluminum.

■ T491 • Form E Bottoming Entry Taper • Through Coolant 1/4" and Larger • Inch



- first choice
- alternate choice

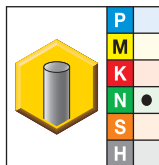
KC7512	D1 size	L	L3	L2	D	number of lube grooves	class of fit
T491NC#6-32R3BX	6 - 32	2.36	.28	.55	.2500	2	3BX
T491NC#8-32R3BX	8 - 32	2.36	.28	.63	.2500	2	3BX
T491NC#10-24R3BX	10 - 24	2.36	.35	.79	.2500	2	3BX
T491NF#10-32R3BX	10 - 32	2.36	.35	.79	.2500	2	3BX
T491NC2500-20R3BX	1/4 - 20	2.76	.39	.94	.2500	2	3BX
T491NF2500-28R3BX	1/4 - 28	2.76	.39	.94	.2500	2	3BX
T491NC3125-18R3BX	5/16 - 18	3.15	.47	1.26	.3125	2	3BX
T491NC3750-16R3BX	3/8 - 16	3.54	.51	1.57	.3750	3	3BX
T491NC4375-14R3BX	7/16 - 14	3.94	.59	1.73	.4375	3	3BX
T491NC5000-13R3BX	1/2 - 13	3.94	.63	1.89	.5000	3	3BX

Shank Tolerance

D	tolerance h6
.250-.375	+0, -.0004
.438-.625	+0, -.0004



■ T491 • Form E Bottoming Entry Taper • Through Coolant M6 and Larger • Metric



- first choice
- alternate choice

KC7512	D1 size	L	L3	L2	D	number of lube grooves	class of fit
T491M040X070R6HX	M4 x 0,7	60	6	16	6,0	2	6HX
T491M050X080R6HX	M5 x 0,8	60	7	20	6,0	2	6HX
T491M060X100R6H	M6 x 1	70	8	24	6,0	2	6HX
T491M080X125R6HX	M8 x 1,25	80	10	32	8,0	2	6HX
T491MF100X100R6H	M10 x 1	90	12	40	10,0	3	6HX
T491M100X150R6HX	M10 x 1,5	90	12	40	10,0	3	6HX
T491MF120X150R6HX	M12 x 1,5	100	14	48	12,0	3	6HX
T491M120X175R6HX	M12 x 1,75	100	14	48	12,0	3	6HX

NOTE: Proprietary technology.
Form taps require a larger drilled hole size prior to tapping than corresponding cutting taps.

Shank Tolerance

D	tolerance h6
6	+0, -.0,008
8-10	+0, -.0,009
12-16	+0, -.0,011

Metric

Material Group	 Through Holes					 Blind Holes					
	Tap Style	Grade	Range – m/min			Tap Style	Grade	Range – m/min			
			min	Starting Value	max			min	Starting Value	max	
P	1	T320, T381	KC7542	80	100	130	T331, T381	KC7542	50	70	90
	2	T320, T381	KC7542	70	90	120	T331, T381	KC7542	50	60	80
	3	T320, T381	KC7542	60	80	100	T331, T381	KC7542	50	60	80
K	1	T340	KC7542	80	105	140	T351	KC7542	50	70	90
	2	T340	KC7542	80	100	130	T351	KC7542	50	70	90
	3	T340	KC7542	70	90	120	T351	KC7542	50	60	80
N	1	T461, T481	KC7512	90	120	160	T471, T491	KC7512	60	80	100
	2	T461, T481	KC7512	80	100	130	T471, T491	KC7512	50	70	90
	4	T461, T481	KC7512	70	85	110	T471, T491	KC7512	50	60	80
H	3	T410	KCU36	1,2	1,5	2,0	T410	KCU36	0,8	1,1	1,4
	4	T410	KCU36	0,6	0,8	1,0	T410	KCU36	0,4	0,5	0,7

Inch

Material Group	 Through Holes					 Blind Holes					
	Tap Style	Grade	Range – SFM			Tap Style	Grade	Range – SFM			
			min	Starting Value	max			min	Starting Value	max	
P	1	T320, T381	KC7542	260	330	430	T331, T381	KC7542	160	230	300
	2	T320, T381	KC7542	230	300	390	T331, T381	KC7542	160	200	260
	3	T320, T381	KC7542	200	260	330	T331, T381	KC7542	160	200	260
K	1	T340	KC7542	260	340	460	T351	KC7542	160	230	300
	2	T340	KC7542	260	330	430	T351	KC7542	160	230	300
	3	T340	KC7542	230	300	390	T351	KC7542	160	200	260
N	1	T461, T481	KC7515	300	390	520	T471, T491	KC7512	200	260	330
	2	T461, T481	KC7515	260	330	430	T471, T491	KC7512	160	230	300
	4	T461, T481	KC7515	230	280	360	T471, T491	KC7512	160	200	260
H	3	T410	KCU36	4	5	6	T410	KCU36	3	3	4
	4	T410	KCU36	2	2	3	T410	KCU36	1	2	2

NOTE: Increase speed of T321 coolant taps by up to 25% of speeds listed for non-coolant T320 taps.

Steel







P

Solid Carbide Taps



typical thread sizes				required tap drill diameter				Solid Carbide Taps		
cutting taps		forming taps		mm	inch	fraction	wire	blind hole with coolant	through hole	through hole with coolant
metric	inch	metric	inch					T331_KC7542	T320_KC7542	T321_KC7542
—	—	—	6-32	3.175	.1250	1/8	—	—	—	—
M4,5 x 0,75	—	M4 x 0,70	—	3.700	.1457	—	—	—	—	—
—	—	—	8-32	3.797	.1495	—	25	—	—	—
—	—	—	10-24	4.366	.1719	11/64	—	—	—	—
—	12-24	—	10-32	4.496	.1770	—	16	—	—	—
—	—	M5 x 0,80	—	4.700	.1850	—	13	—	—	—
M6 x 1,00	—	—	—	5.000	.1969	—	—	T331M060X100R6HX	T320M060X100R6HX	—
—	1/4-20	—	12-28	5.106	.2010	—	7	T331NC2500-20R3BX	T320NC02500-20R3BX	—
—	1/4-28	—	—	5.410	.2130	—	3	T331NF2500-28R3BX	T320NF02500-28R3BX	—
—	—	M6 x 1,00	—	5.600	.2205	—	—	—	—	—
—	—	—	1/4-20	5.791	.2280	—	1	—	—	—
—	—	—	1/4-28	5.944	.2340	—	A	—	—	—
—	5/16-18	—	—	6.528	.2570	—	F	T331NC3125-18R3BX	T320NC03125-18R3BX	—
M8 x 1,25	—	—	—	6.700	.2638	—	—	T331M080X125R6HX	T320M080X125R6HX	—
—	5/16-24	—	—	6.909	.2720	—	I	—	T320NF03125-24R3BX	—
—	—	—	5/16-18	7.366	.2900	—	L	—	—	—
—	—	M8 x 1,25	—	7.400	.2913	—	—	—	—	—
—	3/8-16	—	—	7.938	.3125	5/16	—	T331NC3750-16R3BX	T320NC03750-16R3BX	—
—	3/8-24	—	—	8.433	.3320	—	Q	—	T320NF03750-24R3BX	—
M10 x 1,50	—	—	—	8.500	.3346	—	—	T331M100X150R6HX	T320M100X150R6HX	T321M100X150R6HX
M10 x 1,00	—	—	—	9.000	.3543	—	—	T331MF100X100R6HX	—	—
—	—	—	3/8-16	8.839	.3480	—	S	—	—	—
—	7/16-14	—	3/8-24	9.093	.3580	—	T	T331NC4375-14R3BX	T320NC04375-14R3BX	—
—	—	M10 x 1,50	—	9.400	.3701	—	—	—	—	—
M12 x 1,75	—	—	—	10.200	.4016	—	—	T331M120X175R6HX	T320M120X175R6HX	T321M120X175R6HX
M12 x 1,50	—	—	—	10.500	.4134	—	—	T331MF120X150R6HX	T320MF120X150R6HX	T321MF120X150R6HX
—	1/2-13	—	—	10.716	.4219	27/64	—	T331NC5000-13R3BX	T320NC05000-13R3BX	—
—	1/2-20	—	—	11.509	.4531	29/64	—	—	T320NF0500020R3BX	—
M14 x 2,00	—	—	—	12.000	.4724	—	—	T331M140X200R6HX	T320M140X200R6HX	T321M140X200R6HX
—	9/16-12	—	—	12.304	.4844	31/64	—	T331NC5625-12R3BX	T320NC05625-12R3BX	—
M14 x 1,50	—	—	—	12.500	.4921	—	—	T331MF140X150R6HX	T320MF140X150R6HX	T321MF140X150R6HX
—	5/8-11	—	9/16-12	13.495	.5313	17/32	—	T331NC6250-11R3BX	T320NC06250-11R3BX	—
M16 x 2,00	—	—	—	14.000	.5512	—	—	T331M160X200R6HX	T320M160X200R6HX	T321M160X200R6HX

Taps

Solid Carbide Taps		P Recommended SC Drill		All Materials Alternate Tap Drill	
					
forming blind hole with coolant T391_KC7542	forming through hole with coolant T381_KC7542	approximately 3 x D with coolant B224_HP KCPK15	approximately 5 x D with coolant B225_HP KCPK15	approximately 3 x D with coolant B976_KC7315	approximately 5 x D with coolant B977_KC7315
T391NC#6-32R3BX	T381NC#6-32R3BX	B224A03175HP	B225A03175HP	B976A03175	B977A03175
T391M040X070R6HX	T381M040X070R6HX	B224A03700HP	B225A03700HP	B976A03700	B977A03700
T391NC#8-32R3BX	T381NC#8-32R3BX	B224A03797HP	B225A03797HP	B976A03797	B977A03797
T391NC#10-24R3BX	T381NC#10-24R3BX	B224A04366HP	B225A04366HP	B976A04366	B977A04366
T391NF#10-32R3BX	T381NF#10-32R3BX	B224A04496HP	B225A04496HP	B976A04496	B977A04496
T391M050X080R6HX	T381M050X080R6HX	B224A04700HP	B225A04700HP	B976A04700	B977A04700
-	-	B224A05000HP	B225A05000HP	B976A05000	B977A05000
-	-	B224A05106HP	B225A05106HP	B976A05106	B977A05106
-	-	B224A05410HP	B225A05410HP	B976A05410	B977A05410
T391M060X100R6HX	T381M060X100R6HX	B224A05600HP	B225A05600HP	B976A05600	B977A05600
T391NC2500-20R3BX	T381NC2500-20R3BX	B224A05791HP	B225A05791HP	B976A05791	B977A05791
T391NF2500-28R3BX	T381NF2500-28R3BX	B224A05944HP	B225A05944HP	B976A05944	B977A05944
-	-	B224A06528HP	B225A06528HP	B976A06528	B977A06528
-	-	B224A06700HP	B225A06700HP	B976A06700	B977A06700
-	-	B224A06909HP	B225A06909HP	B976A06909	B977A06909
T391NC3125-18R3BX	T381NC3125-18R3BX	B224A07366HP	B225A07366HP	B976A07366	B977A07366
T391M080X125R6HX	T381M080X125R6HX	B224A07400HP	B225A07400HP	B976A07400	B977A07400
-	-	B224A07938HP	B225A07938HP	B976A07938	B977A07938
-	-	B224A08433HP	B225A08433HP	B976A08433	B977A08433
-	-	B224A08500HP	B225A08500HP	B976A08500	B977A08500
-	-	B224A09000HP	B225A09000HP	B976A09000	B977A09000
T391NC3750-16R3BX	T381NC3750-16R3BX	B224A08839HP	B225A08839HP	B976A08839	B977A08839
-	-	B224A09093HP	B225A09093HP	B976A09093	B977A09093
T391M100X150R6HX	T381M100X150R6HX	B224A09400HP	B225A09400HP	B976A09400	B977A09400
-	-	B224A10200HP	B225A10200HP	B976A10200	B977A10200
-	-	B224A10500HP	B225A10500HP	B976A10500	B977A10500
-	-	B224A10716HP	B225A10716HP	B976A10716	B977A10716
-	-	B224A11509HP	B225A11509HP	B976A11509	B977A11509
-	-	B224A12000HP	B225A12000HP	B976A12000	B977A12000
-	-	B224A12304HP	B225A12304HP	B976A12304	B977A12304
-	-	B224A12500HP	B225A12500HP	B976A12500	B977A12500
-	-	B224A13495HP	B225A13495HP	B976A13495	B977A13495
-	-	B224A14000HP	B225A14000HP	B976A14000	B977A14000



Cast Iron

typical thread sizes		required tap drill diameter			
cutting taps					
metric	inch	mm	inch	fraction	wire
—	6-32	2.705	.1065	—	36
M4 x 0,70	—	3.300	.1299	—	—
—	8-32 / 8-36	3.454	.1360	—	29
—	10-24	3.734	.1470	—	26
—	10-32	4.039	.1590	—	21
M5 x 0,80	—	4.200	.1654	—	—
M6 x 1,00	—	5.000	.1969	—	—
—	1/4-20	5.106	.2010	—	7
—	1/4-28	5.410	.2130	—	3
—	5/16-18	6.528	.2570	—	F
M8 x 1,25	—	6.700	.2638	—	—
—	3/8-16	7.938	.3125	5/16	—
—	3/8-24	8.433	.3320	—	Q
M10 x 1,50	—	8.500	.3346	—	—
M10 x 1,00	—	9.000	.3543	—	—
—	7/16-14	9.093	.3580	—	T
M12 x 1,75	—	10.200	.4016	—	—
M12 x 1,50	—	10.500	.4134	—	—
—	1/2-13	10.716	.4219	27/64	—
—	1/2-20	11.509	.4531	29/64	—
M14 x 2,00	—	12.000	.4724	—	—
—	9/16-12	12.304	.4844	31/64	—
M14 x 1,50	—	12.500	.4921	—	—
—	5/8-11	13.495	.5313	17/32	—
M16 x 2,00	—	14.000	.5512	—	—
M18 x 2,50	—	15.500	.6102	—	—
—	3/4-10	16.670	.6563	21/32	—
M20 x 2,50	—	17.500	.6890	—	—

Solid Carbide Taps	
blind hole with coolant T351_KC7542	through hole T340_KC7542
T351NC#6-32R3BX	—
T351M040X070R6HX	T340M040X070R6HX
T351NC#8-32R3BX	—
T351NC#10-24R3BX	—
T351NF#10-32R3BX	—
T351M050X080R6HX	T340M050X080R6HX
T351M060X100R6HX	T340M060X100R6HX
T351NC2500-20R3BX	T340NC2500-20R3BX
T351NF2500-28R3BX	T340NF2500-28R3BX
T351NC3125-18R3BX	T340NC3125-18R3BX
T351M080X125R6HX	T340M080X125R6HX
T351NC3750-16R3BX	T340NC03750-16R3BX
—	T340NF03750-24R3BX
T351M100X150R6HX	T340M100X150R6HX
T351MF100X100R6HX	T340MF100X100R6HX
T351NC4375-14R3BX	T340NC04375-14R3BX
T351M120X175R6HX	T340M120X175R6HX
T351MF120X150R6HX	T340MF120X150R6HX
T351NC5000-13R3BX	T340NC05000-13R3BX
—	T340NF05000-20R3BX
T351M140X200R6HX	T340M140X200R6HX
T351NC5625-12R3BX	T340NC05625-12R3BX
T351MF140X150R6HX	T340MF140X150R6HX
T351NC6250-11R3BX	T340NC06250-11R3BX
T351M160X200R6HX	T340M160X200R6HX
—	T340M180X250R6HX
T351NC7500-10R3BX	T340NC07500-10R3BX
T351M200X250R6HX	T340M200X250R6HX



K		All Materials	
Recommended SC Drill		Alternate Tap Drill	
approximately 3 x D with coolant B254_YPC KCK10	approximately 5 x D with coolant B254_YPC KCK10	approximately 3 x D with coolant B976_KC7315	approximately 5 x D with coolant B977_KC7315
B254Z02705YPC	B255Z02705YPC	B051A02705CPG	B051A02705CPG
B254A03300YPC	B255A03300YPC	B976A03300	B977A03300
B254A03454YPC	B255A03454YPC	B976A03454	B977A03454
B254A03734YPC	B255A03734YPC	B976A03734	B977A03734
B254A04039YPC	B255A04039YPC	B976A04039	B977A04039
B254A04200YPC	B255A04200YPC	B976A04200	B977A04200
B254A05000YPC	B255A05000YPC	B976A05000	B977A05000
B254A05106YPC	B255A05106YPC	B976A05106	B977A05106
B254A05410YPC	B255A05410YPC	B976A05410	B977A05410
B254A06528YPC	B255A06528YPC	B976A06528	B977A06528
B254A06700YPC	B255A06700YPC	B976A06700	B977A06700
B254A07938YPC	B255A07938YPC	B976A07938	B977A07938
B254A08433YPC	B255A08433YPC	B976A08433	B977A08433
B254A08500YPC	B255A08500YPC	B976A08500	B977A08500
B254A09000YPC	B255A09000YPC	B976A09000	B977A09000
B254A09093YPC	B255A09093YPC	B976A09093	B977A09093
B254A10200YPC	B255A10200YPC	B976A10200	B977A10200
B254A10500YPC	B255A10500YPC	B976A10500	B977A10500
B254A10716YPC	B255A10716YPC	B976A10716	B977A10716
B254A11509YPC	B255A11509YPC	B976A11509	B977A11509
B254A12000YPC	B255A12000YPC	B976A12000	B977A12000
B254A12304YPC	B255A12304YPC	B976A12304	B977A12304
B254A12500YPC	B255A12500YPC	B976A12500	B977A12500
B254A13495YPC	B255A13495YPC	B976A13495	B977A13495
B254A14000YPC	B255A14000YPC	B976A14000	B977A14000
B254A15500YPC	B255A15500YPC	B976A15500	B977A15500
B254A16670YPC	B255A16670YPC	B976A16670	B977A16670
B254A17500YPC	B255A17500YPC	B976A17500	B977A17500








Aluminum

typical thread sizes				required tap drill diameter			
cutting taps		forming taps		mm	inch	fraction	wire
metric	inch	metric	inch				
—	—	—	6-32	3.175	.1250	1/8	—
M4,5 x 0,75	—	M4 x 0,70	—	3.700	.1457	—	—
—	—	—	8-32	3.797	.1495	—	25
—	—	—	10-24	4.366	.1719	11/64	—
—	12-24	—	10-32	4.496	.1770	—	16
—	—	M5 x 0,80	—	4.700	.1850	—	13
M6 x 1,00	—	—	—	5.000	.1969	—	—
—	1/4-20	—	12-28	5.106	.2010	—	7
—	1/4-28	—	—	5.410	.2130	—	3
—	—	M6 x 1,00	—	5.600	.2205	—	—
—	—	—	1/4-20	5.791	.2280	—	1
—	—	—	1/4-28	5.944	.2340	—	A
—	5/16-18	—	—	6.528	.2570	—	F
M8 x 1,25	—	—	—	6.700	.2638	—	—
—	—	—	5/16-18	7.366	.2900	—	L
—	—	M8 x 1,25	—	7.400	.2913	—	—
—	3/8-16	—	—	7.938	.3125	5/16	—
M10 x 1,50	—	—	—	8.500	.3346	—	—
M10 x 1,00	—	—	—	9.000	.3543	—	—
—	—	—	3/8-16	8.839	.3480	—	S
—	7/16-14	—	3/8-24	9.093	.3580	—	T
—	—	M10 x 1,50	—	9.400	.3701	—	—
—	—	M10 x 1,00	—	9.500	.3740	—	—
—	7/16-20	—	—	9.921	.3906	25/64	—
M12 x 1,75	—	—	—	10.200	.4016	—	—
—	—	—	7/16-14	10.262	.4040	—	Y
M12 x 1,50	—	—	—	10.500	.4134	—	—
—	1/2-13	—	—	10.716	.4219	27/64	—
—	—	M12 x 1,75	—	11.300	.4449	—	—
—	—	M12 x 1,50	—	11.300	.4449	—	—
—	—	—	1/2-13	11.908	.4688	15/32	—
M14 x 2,00	—	—	—	12.000	.4724	—	—
—	9/16-12	—	—	12.304	.4844	31/64	—
M14 x 1,50	—	—	—	12.500	.4921	—	—
—	5/8-11	—	9/16-12	13.495	.5313	17/32	—
M16 x 2,00	—	—	—	14.000	.5512	—	—
M16 x 1,50	—	—	—	14.500	.5709	—	—

N Solid Carbide Taps		
blind hole with coolant T471_KC7512	through hole with coolant T461_KC7512	forming blind hole with coolant T491_KC7512
—	—	T491NC#6—32R3B
—	—	T491M040X070R6H
—	—	T491NC#8—32R3B
—	—	T491NC#10—24R3B
—	—	T491NF#10—32R3B
—	—	T491M050X080R6H
T471M060X100R6H	T461M060X100R6H	—
T471NC2500—20R3B	T461NC2500—20R3B	—
T471NF2500—28R3B	T461NF2500—28R3B	—
—	—	T491M060X100R6H
—	—	T491NC2500—20R3B
—	—	T491NF2500—28R3B
T471NC3125—18R3B	T461NC3125—18R3B	—
T471M080X125R6H	T461M080X125R6H	—
—	—	T491NC3125—18R3B
—	—	T491M080X125R6H
T471NC3750—16R3B	T461NC3750—16R3B	—
T471M100X150R6H	T461M100X150R6H	—
T471MF100X100R6H	T461MF100X100R6H	—
—	—	T491NC3750—16R3B
T471NC4375—14R3B	T461NC4375—14R3B	—
—	—	T491M100X150R6H
—	—	T491MF100X100R6H
—	—	—
T471M120X175R6H	T461M120X175R6H	—
—	—	T491NC4375—14R3B
T471MF120X150R6H	T461MF120X150R6H	—
T471NC5000—13R3B	T461NC5000—13R3B	—
—	—	T491M120X175R6H
—	—	T491MF120X150R6H
—	—	T491NC5000—13R3B
T471M140X200R6H	T461M140X200R6H	—
T471NC5625—12R3B	T461NC5625—12R3B	—
T471MF140X150R6H	T461MF140X150R6H	—
T471NC6250—11R3B	T461NC6250—11R3B	—
T471M160X200R6H	T461M160X200R6H	—
T471MF160X150R6H	T461MF160X150R6H	—



Taps

Solid Carbide Taps	N		All Materials	
	Recommended SC Drill		Alternate Tap Drill	
 forming through hole with coolant T481_KC7512	 approximately 3 x D with coolant B284_(HP) K715	 approximately 5 x D with coolant B411 KF1	 approximately 3 x D with coolant B976_KC7315	 approximately 5 x D with coolant B977_KC7315
T481NC#6—32R3B	—	—	B976A03175	B977A03175
T481M040X070R6H	—	—	B976A03700	B977A03700
T481NC#8—32R3B	—	—	B976A03797	B977A03797
T481NC#10—24R3B	—	—	B976A04366	B977A04366
T481NF#10—32R3B	—	—	B976A04496	B977A04496
T481M050X080R6H	—	—	B976A04700	B977A04700
—	B284A05000	B411A05000	B976A05000	B977A05000
—	—	—	B976A05106	B977A05106
—	—	—	B976A05410	B977A05410
T481M060X100R6H	—	B411A05600	B976A05600	B977A05600
T481NC2500—20R3B	—	—	B976A05791	B977A05791
T481NF2500—28R3B	—	—	B976A05944	B977A05944
—	—	—	B976A06528	B977A06528
—	—	—	B976A06700	B977A06700
T481NC3125—18R3B	—	—	B976A07366	B977A07366
T481M080X125R6H	—	B411A07400	B976A07400	B977A07400
—	—	—	B976A07938	B977A07938
—	—	B411A08500	B976A08500	B977A08500
—	—	B411A09000	B976A09000	B977A09000
T481NC3750—16R3B	—	—	B976A08839	B977A08839
—	—	—	B976A09093	B977A09093
T481M100X150R6H	—	—	B976A09400	B977A09400
T481MF100X100R6H	—	B411A09500	B976A09500	B977A09500
—	K284A03906	—	B976A09921	B977A09921
—	—	B411A10200	B976A10200	B977A10200
T481NC4375—14R3B	—	—	B976A10262	B977A10262
—	—	B411A10500	B976A10500	B977A10500
—	—	—	B976A10716	B977A10716
T481M120X175R6H	—	—	B976A11300	B977A11300
T481MF120X150R6H	—	—	B976A11300	B977A11300
T481NC5000—13R3B	K284A04688	—	B976A11908	B977A11908
—	—	B411A12000	B976A12000	B977A12000
—	—	—	B976A12304	B977A12304
—	—	B411A12500	B976A12500	B977A12500
—	—	—	B976A13495	B977A13495
—	—	B411A14000	B976A14000	B977A14000
—	—	B411A14500	B976A14500	B977A14500





High-Performance HSS-E-PM Taps



Primary Application

The High-Performance High-Speed Steel (HSS-E-PM) Taps are manufactured to both ANSI and DIN standards from powder metal, offering high productivity and reliable thread quality and are engineered for greater wear and heat resistance. HSS-E-PM tools can be used on conventional non-rigid and CNC-synchronous tapping machines for tapping through and blind holes in a variety of materials and is particularly efficient in tapping soft steel and aluminum.

The precision h6 shank enables usage in either conventional square drive tap holders or in precision round toolholders.

Features and Benefits

Improved Performance, Wide Range of Choices

- Higher strength and wider range of applications versus carbide taps.
- Higher tapping speed capability and longer life than conventional HSS-E taps.
- Can be used on either conventional or synchronous tapping machines.
- Forming taps for soft steel and aluminum.
- Selection of taps for all materials:
 - Steel
 - Stainless steel
 - Iron
 - Aluminum, cast and wrought
 - Aerospace
 - Hard steel

Customization

- Customized taps are available with short lead times from semi-finished blanks.



Beyond™ High-Performance HSS-E-PM Taps • ANSI Inch and Metric

Beyond High-Performance HSS-E-PM				● first choice ○ alternate choice					
	series	grade	shank/dimension	P	M	K	N	S	H
	T620	KP6525	ANSI 302A	●			○		
	T620	KM6515	ANSI 302A		●		○	○	
	T620	KP6525	ANSI 302A	●			○		
	T620	KM6515	ANSI 302A		●		○	○	
	T630	KP6525	ANSI 302A	●			○		
	T630	KM6515	ANSI 302A		●		○	○	
	T630	KP6505	ANSI 302A	●	○				
	T640	KP6525	ANSI 302A			●			
	T640	KP6525	ANSI 302A			●			

Taps

size range (inch and metric)	through hole	blind hole	chamfer form	helix angle	external coolant	page(s)	recommended cutting parameters
#2-3/4"						L50	L77
#2-3/4"						L50	L77
M3-M12						L51	L77
M3-M12						L51	L77
#2-1"						L56	L77
#2-1"						L56	L77
#4-3/4"						L57	L77
#10-3/4"						L57	L77
M3-M16						L57	L77



Beyond™ High-Performance HSS-E-PM Taps • DIN Metric

● first choice
○ alternate choice

Beyond High-Performance HSS-E-PM

	series	grade	shank/dimension	P	M	K	N	S	H
	T600	KSP21	DIN 371, 374, 376	●	○			○	
	T602	KSP21	DIN 371, 374, 376	●				○	
	T604	KSH26	DIN 371, 374, 376	●					
	T606	KSSH22	DIN 371, 374, 376						●
	T610	KSSH22	DIN 371, 374, 376					●	
	T612	KSSH22	DIN 371, 374, 376					●	
	T614	KSN25	DIN 371, 376				○	●	
	T616	KSN25	DIN 371				○	●	
	T620	KP6525	DIN 371, 374, 376, XL	●				○	
	T620	KM6515	DIN 371, 374, 376		●		○	○	
	T621	KP6525	DIN 371, 376	●				○	
	T621	KM6515	DIN 371, 376		●		○	○	
	T622	KSP21	DIN 371, 374, 376	●					
	T622	KSN28	DIN 371, 374, 376					●	
	T623	KSP21	DIN 371, 374, 376	●					
	T623	KSN28	DIN 371, 374, 376					●	
	T630	KP6525	DIN 371, 374, 376, XL	●				○	
	T630	KM6515	DIN 371, 374, 376		●		○	○	
	T630	KP6505	DIN 371, 376	●					
	T631	KP6525	DIN 371, 376, XL	●				○	
	T631	KM6515	DIN 371, 376		●		○	○	
	T632	KP6525	DIN 371, 374, 376	●				○	
	T633	KP6525	DIN 371, 374, 376	●					
	T640	KP6525	DIN 371, 376			●	●		
	T641	KP6525	DIN 371, 376			●	●		
	T642	KP6525	DIN 371, 374, 376			●	●		
	T643	KP6525	DIN 371, 374, 376			●	●		
	T650	KP6525	DIN 376, XL	●	○				
	T651	KP6525	DIN 376, XL	●	○				
	T670	KSN38	DIN 371, 376					●	
	T680	KSN38	DIN 371, 376					●	

Taps

size range (metric)	through hole	blind hole	chamfer form	helix angle	external coolant	internal coolant	page(s)	recommended cutting parameters
size min-max								
M3-M20							L42	L76
M3-M20							L43	L76
M3-M20							L44	L76
M6-M16							L45	L76
M3-M20							L46	L76
M3-M20							L47	L76
M3-M12							L48	L76
M3-M12							L49	L76
M3-M42							L52, L71	L76
M3-M20							L52	L76
M5-M14							L53	L76
M5-M14							L53	L76
M3-M16							L54	L76
M3-M16							L54	L76
M5-M16							L55	L76
M5-M16							L55	L76
M3-M42							L58, L72	L76
M3-M24							L58	L76
M3-M16							L58	L76
M5-M42							L59, L73	L76
M5-M16							L59	L76
M5-M16							L60	L76
M5-M16							L61	L76
M4-M22							L64	L76
M4-M20							L65	L76
M5-M16							L66	L76
M5-M16							L67	L76
M24-M42							L74	L76
M24-M42							L75	L76
M3-M16							L68	L76
M3-M20							L69	L76



HSS Taps Identification System



T620MF120X150R6HX-D4
T620NC06250-11R3BX-A

Metric

T620 **MF** **120** **X** **150** **R** **6HX** **-D4**

Inch

T620 **NC** **06250** **-** **11** **R** **3BX** **-A**

Tap Design

Type of Thread

Nominal Diameter of Thread

-

Pitch

Cutting Direction

Tolerance Class

Taps Dimension

mm or inch (depending on type)

mm or TPI (depending on type)

M = Metric coarse-pitch thread (ISO form)

MF = Metric fine-pitch thread (ISO form)

NC = Unified coarse series thread

NF = Unified fine series thread

A = ANSI

D1 = DIN 371

D4 = DIN 374

D6 = DIN 376

D74 = DIN 3174

J = JIS

XL = DIN extra length

Style

T620 = Steel and stainless steel, through holes, LH spiral flute, solid

T621 = Steel and stainless steel, through holes, LH spiral flute, coolant

T630 = Steel and stainless steel, blind holes, RH spiral flute, solid

T631 = Steel and stainless steel, blind holes, RH spiral flute, coolant

T640 = Cast iron, through and blind holes, straight flute, solid

T641 = Cast iron, through and blind holes, straight flute, coolant

NOTE: Other taps styles, see pages L38–L39.

Taps



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Kennametal Global Engineered Solutions. Coordinated global resources with world-class manufacturing, process development, and implementation capabilities.

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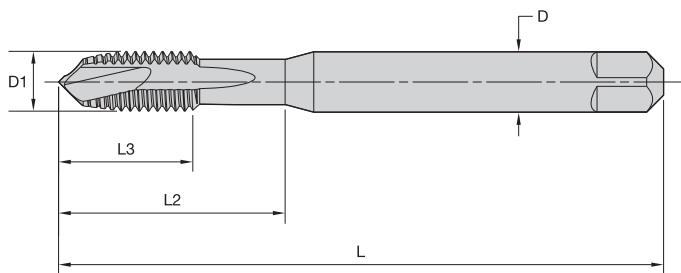
Regardless of where you're located, Kennametal is everywhere you are.

- With Kennametal's team, you receive globally coordinated manufacturing, process development, implementation, and optimization support and key alliances with machine tool builders and other leading technology manufacturers that ensure a complete solution.

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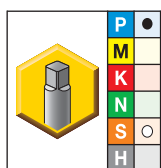
www.kennametal.com





KSP21 • TiN for tapping steel 32–44 HRC.

■ T600 • DIN 371, 374, and 376 • Form B Plug Chamfer • Metric



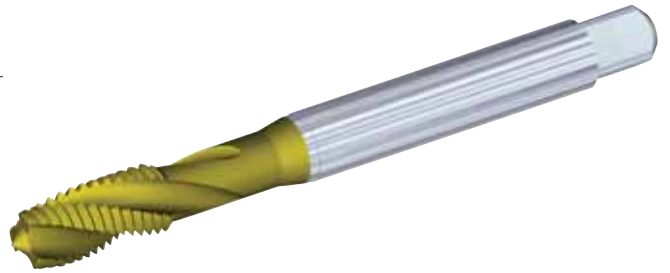
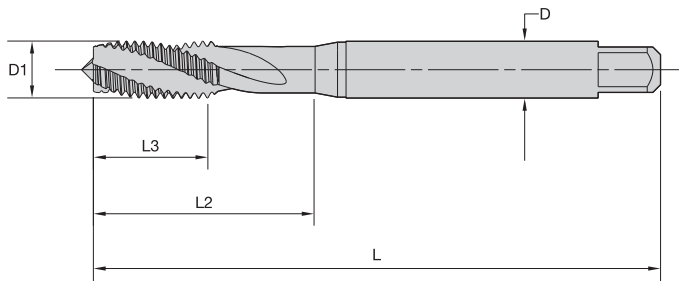
● first choice
○ alternate choice

Taps

KSP21	D1 size	L	L3	L2	D	number of flutes	dimension standard	class of fit
T600M030X050R6HX-D1	M3 x 0,5	56	11	18	3,5	2	DIN 371	6HX
T600M040X070R6HX-D1	M4 x 0,7	63	13	21	4,5	2	DIN 371	6HX
T600M050X080R6HX-D1	M5 x 0,8	70	15	25	6,0	2	DIN 371	6HX
T600M060X100R6HX-D1	M6 x 1	80	17	30	6,0	3	DIN 371	6HX
T600MF080X100R6HX-D4	M8 x 1	90	17	—	6,0	3	DIN 374	6HX
T600M080X125R6HX-D1	M8 x 1,25	90	20	35	8,0	3	DIN 371	6HX
T600MF100X100R6HX-D4	M10 x 1	90	18	—	7,0	3	DIN 374	6HX
T600MF100X125R6HX-D4	M10 x 1,25	100	22	—	7,0	3	DIN 374	6HX
T600M100X150R6HX-D1	M10 x 1,5	100	22	39	10,0	3	DIN 371	6HX
T600MF120X125R6HX-D4	M12 x 1,25	100	22	—	9,0	3	DIN 374	6HX
T600MF120X150R6HX-D4	M12 x 1,5	100	22	—	9,0	3	DIN 374	6HX
T600M120X175R6HX-D6	M12 x 1,75	110	24	—	9,0	3	DIN 376	6HX
T600MF140X150R6HX-D4	M14 x 1,5	100	22	—	11,0	3	DIN 374	6HX
T600M140X200R6HX-D6	M14 x 2	110	26	—	11,0	3	DIN 376	6HX
T600MF160X150R6HX-D4	M16 x 1,5	100	22	—	12,0	4	DIN 374	6HX
T600M160X200R6HX-D6	M16 x 2	110	27	—	12,0	4	DIN 376	6HX
T600M180X250R6HX-D6	M18 x 2	125	30	—	14,0	4	DIN 376	6HX
T600M200X250R6HX-D6	M20 x 2,5	140	32	—	16,0	4	DIN 376	6HX

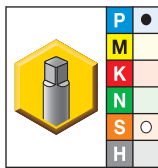
Shank Tolerance

D	tolerance h9
1–3	+0, -0,025
3,5–6	+0, -0,030
7–10	+0, -0,036
11–18	+0, -0,043



KSP21 • TiN for tapping steel 32–44 HRC (2 x D).

■ T602 • DIN 371, 374, and 376 • Form C Semi-Bottoming Chamfer • Metric



● first choice
○ alternate choice

KSP21	D1 size	L	L3	L2	D	number of flutes	dimension standard	class of fit
T602M030X050R6H-D1	M3 x 0,5	56	11	18	3,5	3	DIN 371	6H
T602M040X070R6H-D1	M4 x 0,7	63	13	21	4,5	3	DIN 371	6H
T602M050X080R6H-D1	M5 x 0,8	70	15	25	6,0	3	DIN 371	6H
T602M060X100R6H-D1	M6 x 1	80	17	30	6,0	3	DIN 371	6H
T602MF080X100R6H-D4	M8 x 1	90	17	—	6,0	3	DIN 374	6H
T602M080X125R6H-D1	M8 x 1,25	90	20	35	8,0	3	DIN 371	6H
T602MF100X100R6H-D4	M10 x 1	90	18	—	7,0	3	DIN 374	6H
T602MF100X125R6H-D4	M10 x 1,25	100	22	—	7,0	3	DIN 374	6H
T602M100X150R6H-D1	M10 x 1,5	100	22	39	10,0	3	DIN 371	6H
T602MF120X125R6H-D4	M12 x 1,25	100	22	—	9,0	3	DIN 374	6H
T602MF120X150R6H-D4	M12 x 1,5	100	22	—	9,0	3	DIN 374	6H
T602M120X175R6H-D6	M12 x 1,75	110	24	44	12,0	3	DIN 376	6H
T602MF140X150R6H-D4	M14 x 1,5	100	22	—	11,0	3	DIN 374	6H
T602M140X200R6H-D6	M14 x 2	110	26	52	11,0	3	DIN 376	6H
T602MF160X150R6H-D4	M16 x 1,5	100	22	—	12,0	3	DIN 374	6H
T602M160X200R6H-D6	M16 x 2	110	27	—	12,0	3	DIN 376	6H
T602M180X250R6H-D6	M18 x 2	125	30	—	14,0	4	DIN 376	6H
T602M200X250R6H-D6	M20 x 2,5	140	32	—	16,0	4	DIN 376	6H

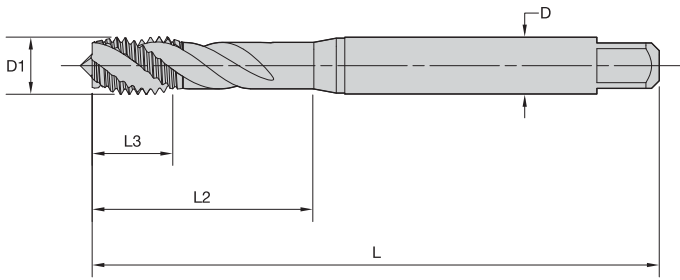
Shank Tolerance

D	tolerance h9
1–3	+0, -0,025
3,5–6	+0, -0,030
7–10	+0, -0,036
11–18	+0, -0,043



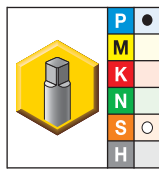
High-Performance Taps

Spiral-Flute HSS-E-PM Taps • Blind Holes (3 x D)



KSH26 • TiAlN/MoS₂ for tapping steel 32–44 HRC (3 x D).

■ T604 • DIN 371, 374, and 376 • Form C Semi-Bottoming Chamfer • Metric



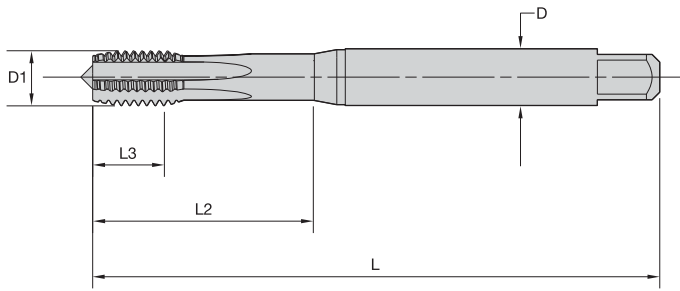
- first choice
- alternate choice

Taps

KSH26	D1 size	L	L3	L2	D	number of flutes	dimension standard	class of fit
T604M030X050R6H-D1	M3 x 0,5	56	6	18	3,5	3	DIN 371	6H
T604M040X070R6H-D1	M4 x 0,7	63	7	21	4,5	3	DIN 371	6H
T604M050X080R6H-D1	M5 x 0,8	70	8	25	6,0	3	DIN 371	6H
T604M060X100R6H-D1	M6 x 1	80	10	30	6,0	3	DIN 371	6H
T604MF080X100R6H-D4	M8 x 1	90	10	—	6,0	3	DIN 374	6H
T604M080X125R6H-D1	M8 x 1,25	90	14	35	8,0	3	DIN 371	6H
T604MF100X100R6H-D4	M10 x 1	90	10	—	7,0	3	DIN 374	6H
T604MF100X125R6H-D4	M10 x 1,25	100	16	—	7,0	3	DIN 374	6H
T604M100X150R6H-D1	M10 x 1,5	100	16	39	10,0	3	DIN 371	6H
T604MF120X125R6H-D4	M12 x 1,25	100	15	—	9,0	4	DIN 374	6H
T604MF120X150R6H-D4	M12 x 1,5	100	15	—	9,0	4	DIN 374	6H
T604M120X175R6H-D6	M12 x 1,75	110	18	—	9,0	4	DIN 376	6H
T604MF140X150R6H-D4	M14 x 1,5	100	15	—	11,0	4	DIN 374	6H
T604M140X200R6H-D6	M14 x 2	110	20	—	11,0	4	DIN 376	6H
T604MF160X150R6H-D4	M16 x 1,5	100	15	—	12,0	4	DIN 374	6H
T604M160X200R6H-D6	M16 x 2	110	22	—	12,0	4	DIN 376	6H
T604M180X250R6H-D6	M18 x 2	125	25	—	14,0	4	DIN 376	6H
T604M200X250R6H-D6	M20 x 2,5	140	25	—	16,0	4	DIN 376	6H

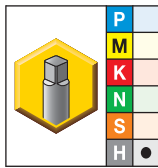
Shank Tolerance

D	tolerance h9
1–3	+0, -0,025
3,5–6	+0, -0,030
7–10	+0, -0,036
11–18	+0, -0,043



KSSH22 • TiCN for tapping steel 44–55 HRC.

■ T606 • DIN 371, 374, and 376 • Form C Semi-Bottoming Chamfer • Metric



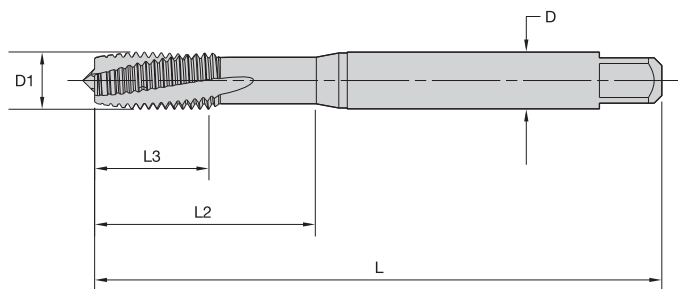
- first choice
- alternate choice

KSSH22	D1 size	L	L3	L2	D	number of flutes	dimension standard	class of fit
T606M060X100R6HX-D1	M6 x 1	80	10	30	6,0	4	DIN 371	6HX
T606MF080X100R6HX-D4	M8 x 1	90	10	35	8,0	5	DIN 374	6HX
T606M080X125R6HX-D1	M8 x 1,25	90	14	35	8,0	5	DIN 371	6HX
T606MF100X100R6HX-D4	M10 x 1	90	10	35	10,0	5	DIN 374	6HX
T606M100X150R6HX-D1	M10 x 1,5	100	16	39	10,0	5	DIN 371	6HX
T606MF120X150R6HX-D4	M12 x 1,5	100	15	—	9,0	5	DIN 374	6HX
T606M120X175R6HX-D6	M12 x 1,75	110	18	—	9,0	5	DIN 376	6HX
T606MF140X150R6HX-D4	M14 x 1,5	100	15	—	11,0	6	DIN 374	6HX
T606MF160X150R6HX-D4	M16 x 1,5	100	15	—	12,0	6	DIN 374	6HX
T606M160X200R6HX-D6	M16 x 2	110	22	—	12,0	6	DIN 376	6HX

Shank Tolerance

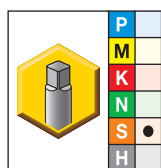
D	tolerance h9
1–3	+0, -0,025
3,5–6	+0, -0,030
7–10	+0, -0,036
11–18	+0, -0,043

Taps



KSSH22 • TiCN for tapping cobalt and nickel alloys.

■ T610 • DIN 371 and 376 • Form D Plug Chamfer • Metric



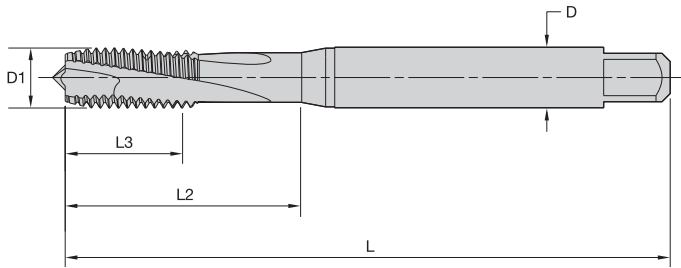
- first choice
- alternate choice

Taps

KSSH22	D1 size	L	L3	L2	D	number of flutes	dimension standard	class of fit
T610M030X050R6HX-D1	M3 x 0,5	56	11	18	3,5	2	DIN 371	6HX
T610M040X070R6HX-D1	M4 x 0,7	63	13	21	4,5	3	DIN 371	6HX
T610M050X080R6HX-D1	M5 x 0,8	70	15	25	6,0	3	DIN 371	6HX
T610M060X100R6HX-D1	M6 x 1	80	17	30	6,0	3	DIN 371	6HX
T610M080X125R6HX-D1	M8 x 1,25	90	20	35	8,0	3	DIN 371	6HX
T610M100X150R6HX-D1	M10 x 1,5	100	22	39	10,0	3	DIN 371	6HX
T610M120X175R6HX-D6	M12 x 1,75	110	24	—	9,0	3	DIN 376	6HX
T610M140X200R6HX-D6	M14 x 2	110	26	—	11,0	3	DIN 376	6HX
T610M160X200R6HX-D6	M16 x 2	110	27	—	12,0	3	DIN 376	6HX
T610M200X250R6HX-D6	M20 x 2,5	140	32	—	16,0	3	DIN 376	6HX

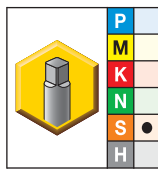
Shank Tolerance

D	tolerance h9
1-3	+0, -0,025
3,5-6	+0, -0,030
7-10	+0, -0,036
11-18	+0, -0,043



KSSH22 • TiCN for tapping cobalt and nickel alloys.

■ T612 • DIN 371 and 376 • Form C Semi-Bottoming Chamfer • Metric

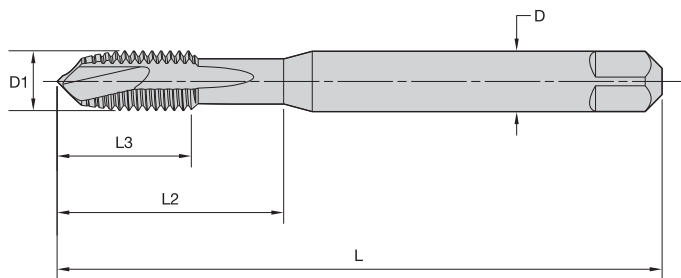


- first choice
- alternate choice

KSSH22	D1 size	L	L3	L2	D	number of flutes	dimension standard	class of fit
T612M030X050R6HX-D1	M3 x 0,5	56	11	18	3,5	2	DIN 371	6HX
T612M040X070R6HX-D1	M4 x 0,7	63	13	21	4,5	3	DIN 371	6HX
T612M050X080R6HX-D1	M5 x 0,8	70	15	25	6,0	3	DIN 371	6HX
T612M060X100R6HX-D1	M6 x 1	80	17	30	6,0	3	DIN 371	6HX
T612M080X125R6HX-D1	M8 x 1,25	90	20	35	8,0	3	DIN 371	6HX
T612M120X175R6HX-D6	M12 x 1,75	110	24	—	9,0	3	DIN 376	6HX
T612M100X150R6HX-D1	M10 x 1,5	100	22	39	10,0	3	DIN 371	6HX
T612M140X200R6HX-D6	M14 x 2	110	26	—	11,0	3	DIN 376	6HX
T612M160X200R6HX-D6	M16 x 2	110	27	—	12,0	3	DIN 376	6HX
T612M200X250R6HX-D6	M20 x 2,5	140	32	—	16,0	3	DIN 376	6HX

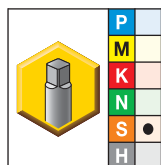
Shank Tolerance

D	tolerance h9
1-3	+0, -0,025
3,5-6	+0, -0,030
7-10	+0, -0,036
11-18	+0, -0,043



KSN25 • TiN/DLC for tapping titanium and titanium alloys.

■ T614 • DIN 371 and 376 • Form D Plug Chamfer • Metric

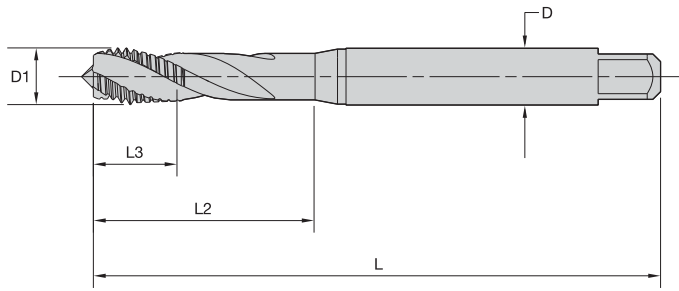


- first choice
- alternate choice

KSN25	D1 size	L	L3	L2	D	number of flutes	dimension standard	class of fit
T614M030X050R6HX-D1	M3 x 0,5	56	11	18	3,5	3	DIN 371	6HX
T614M040X070R6HX-D1	M4 x 0,7	63	13	21	4,5	3	DIN 371	6HX
T614M050X080R6HX-D1	M5 x 0,8	70	15	25	6,0	3	DIN 371	6HX
T614M060X100R6HX-D1	M6 x 1	80	17	30	6,0	3	DIN 371	6HX
T614M080X125R6HX-D1	M8 x 1,25	90	20	35	8,0	3	DIN 371	6HX
T614M100X150R6HX-D1	M10 x 1,5	100	22	39	10,0	3	DIN 371	6HX
T614M120X175R6HX-D6	M12 x 1,75	110	24	—	9,0	3	DIN 376	6HX

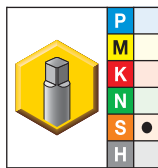
Shank Tolerance

D	tolerance h9
1-3	+0, -0,025
3,5-6	+0, -0,030
7-10	+0, -0,036
11-18	+0, -0,043



KSN25 • TiN/DLC for tapping titanium and titanium alloys.

■ **T616 • DIN 371 • Form C Semi-Bottoming Chamfer • Metric**



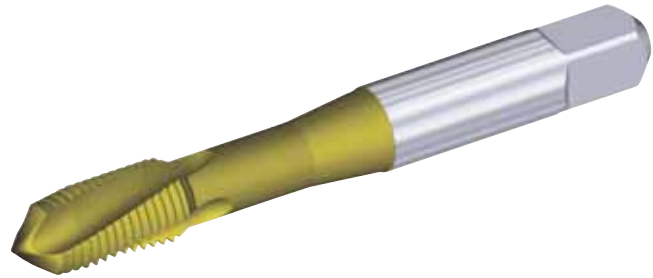
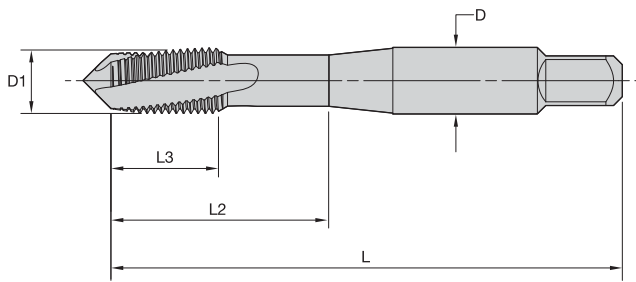
- first choice
- alternate choice

KSN25	D1 size	L	L3	L2	D	number of flutes	dimension standard	class of fit
T616M030X050R6HX-D1	M3 x 0,5	56	6	18	3,5	3	DIN 371	6HX
T616M040X070R6HX-D1	M4 x 0,7	63	7	21	4,5	3	DIN 371	6HX
T616M050X080R6HX-D1	M5 x 0,8	70	8	25	6,0	3	DIN 371	6HX
T616M060X100R6HX-D1	M6 x 1	80	10	30	6,0	3	DIN 371	6HX
T616M080X125R6HX-D1	M8 x 1,25	90	14	35	8,0	3	DIN 371	6HX
T616M100X150R6HX-D1	M10 x 1,5	100	16	39	10,0	3	DIN 371	6HX
T616M120X175R6HX-D1	M12 x 1,75	110	18	44	12,0	3	DIN 371	6HX

Shank Tolerance

D	tolerance h9
1-3	+0, -0,025
3,5-6	+0, -0,030
7-10	+0, -0,036
11-18	+0, -0,043

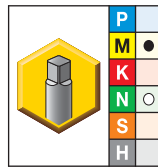
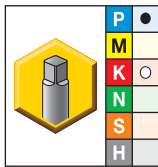




KM6515 • TiN+CrC/C for tapping stainless steel.

KP6525 • TiCN+TiN for tapping steel.

■ T620 • Machine Screw and Fractional • Form D Plug Chamfer



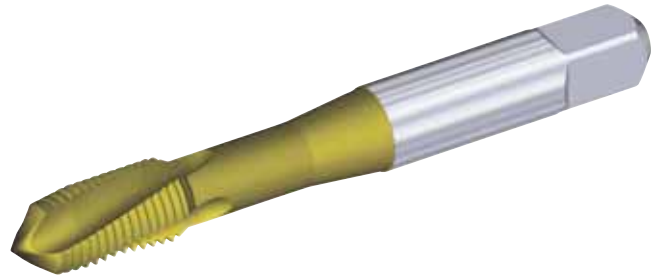
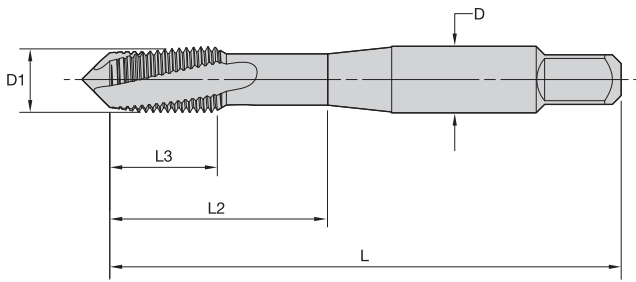
● first choice
○ alternate choice

Taps

	KP6525	KM6515	D1 size	L	L3	L2	D	number of flutes	class of fit
	T620NC#02-56R3BX-A	T620NC#02-56R3BX-A	2 - 56	1.75	.44	.49	.141	2	3BX
	T620NC#02-56R2BX-A	T620NC#02-56R2BX-A	2 - 56	1.75	.44	.49	.141	2	2BX
	T620NC#04-40R2BX-A	T620NC#04-40R2BX-A	4 - 40	1.88	.56	.68	.141	2	2BX
	T620NC#04-40R3BX-A	T620NC#04-40R3BX-A	4 - 40	1.88	.56	.68	.141	2	3BX
	T620NC#05-40R3BX-A	T620NC#05-40R3BX-A	5 - 40	1.94	.63	.75	.141	2	3BX
	T620NC#06-32R3BX-A	T620NC#06-32R3BX-A	6 - 32	1.99	.36	.71	.141	2	3BX
	T620NC#06-32R2BX-A	T620NC#06-32R2BX-A	6 - 32	1.99	.36	.71	.141	2	2BX
	T620NC#08-32R2BX-A	T620NC#08-32R2BX-A	8 - 32	2.12	.31	.76	.168	2	2BX
	T620NC#08-32R3BX-A	T620NC#08-32R3BX-A	8 - 32	2.12	.31	.76	.168	2	3BX
	T620NF#08-36R3BX-A	T620NF#08-36R3BX-A	8 - 36	2.12	.31	.76	.168	2	3BX
	T620NC#10-24R3BX-A	T620NC#10-24R3BX-A	10 - 24	2.37	.47	.91	.194	3	3BX
	T620NF#10-32R3BX-A	T620NF#10-32R3BX-A	10 - 32	2.36	.47	.91	.194	3	3BX
	T620NF#10-32R2BX-A	T620NF#10-32R2BX-A	10 - 32	2.36	.47	.91	.194	3	2BX
	T620NC#12-24R3BX-A	T620NC#12-24R3BX-A	12 - 24	2.37	.42	.96	.220	3	3BX
	T620NC02500-20R3BX-A	T620NC02500-20R3BX-A	1/4 - 20	2.50	.44	1.01	.255	3	3BX
	T620NC02500-20R2BX-A	T620NC02500-20R2BX-A	1/4 - 20	2.50	.44	1.01	.255	3	2BX
	T620NF02500-28R3BX-A	T620NF02500-28R3BX-A	1/4 - 28	2.49	.43	1.00	.255	3	3BX
	T620NF02500-28R2BX-A	T620NF02500-28R2BX-A	1/4 - 28	2.49	.43	1.00	.255	3	2BX
	T620NC03125-18R2BX-A	T620NC03125-18R2BX-A	5/16 - 18	2.72	.49	1.13	.318	3	2BX
	T620NC03125-18R3BX-A	T620NC03125-18R3BX-A	5/16 - 18	2.72	.49	1.13	.318	3	3BX
	T620NF03125-24R3BX-A	T620NF03125-24R3BX-A	5/16 - 24	2.71	.48	1.13	.318	3	3BX
	T620NC04375-14R3BX-A	T620NC04375-14R3BX-A	7/16 - 14	3.16	.71	1.49	.323	3	3BX
	T620NF04375-20R3BX-A	T620NF04375-20R3BX-A	7/16 - 20	3.16	.71	1.49	.323	3	3BX
	T620NC05000-13R3BX-A	T620NC05000-13R3BX-A	1/2 - 13	3.38	.77	1.74	.367	3	3BX
	T620NF05000-20R3BX-A	T620NF05000-20R3BX-A	1/2 - 20	3.38	.77	1.74	.367	3	3BX
	T620NC03750-16R2BX-A	T620NC03750-16R2BX-A	3/8 - 16	2.94	.60	1.27	.381	3	2BX
	T620NC03750-16R3BX-A	T620NC03750-16R3BX-A	3/8 - 16	2.94	.60	1.27	.381	3	3BX
	T620NF03750-24R3BX-A	T620NF03750-24R3BX-A	3/8 - 24	2.92	.58	1.25	.381	3	3BX
	T620NC06250-11R3BX-A	T620NC06250-11R3BX-A	5/8 - 11	3.81	.91	1.89	.480	4	3BX
	T620NC07500-10R3BX-A	T620NC07500-10R3BX-A	3/4 - 10	4.25	1.00	2.08	.590	4	3BX

Shank Tolerance

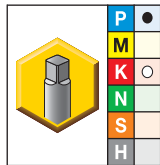
D fractional	tolerance h6
.250-375	+0, -.0004
.438-625	+0, -.0004



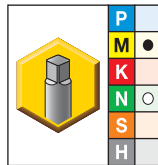
KM6515 • TiN+CrC/C for tapping stainless steel.

KP6525 • TiCN+TiN for tapping steel.

■ T620 • Form D Plug Chamfer • Metric ANSI



KP6525



KM6515

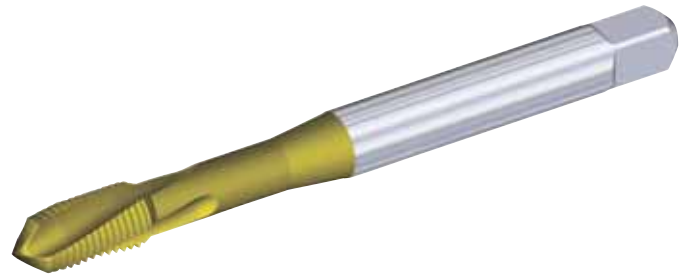
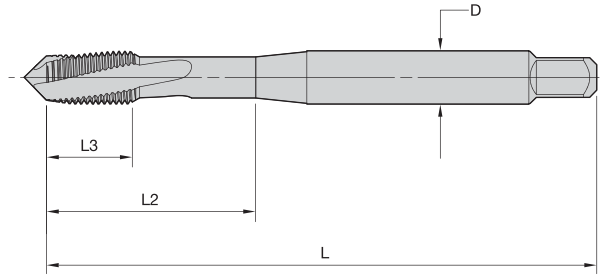
- first choice
- alternate choice

		D1 size	L	L3	L2	D	number of flutes	class of fit
T620M030X050R6HX-A	T620M030X050R6HX-A	M3 x 0,5	1.94	.63	.75	.141	2	6HX
T620M040X070R6HX-A	T620M040X070R6HX-A	M4 x 0,7	2.12	.32	.76	.168	2	6HX
T620M050X080R6HX-A	T620M050X080R6HX-A	M5 x 0,8	2.37	.47	.91	.194	2	6HX
T620M060X100R6HX-A	T620M060X100R6HX-A	M6 x 1	2.50	.46	1.01	.255	3	6HX
T620M080X125R6HX-A	T620M080X125R6HX-A	M8 x 1,25	2.71	.48	1.13	.318	3	6HX
T620M100X150R6HX-A	T620M100X150R6HX-A	M10 x 1,5	2.92	.53	1.26	.381	3	6HX
T620M120X175R6HX-A	T620M120X175R6HX-A	M12 x 1,75	3.38	.77	1.74	.367	3	6HX

Shank Tolerance

D fractional	tolerance h6
.250-.375	+0, -.0004
.438-.625	+0, -.0004

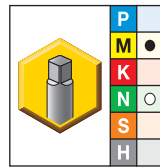
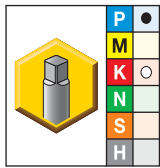




KM6515 • TiN + CrC/C for stainless steel.

KP6525 • TiCN+ TiN for steel.

■ T620 • DIN 371, 374, and 376 • Form D Plug Chamfer • Metric



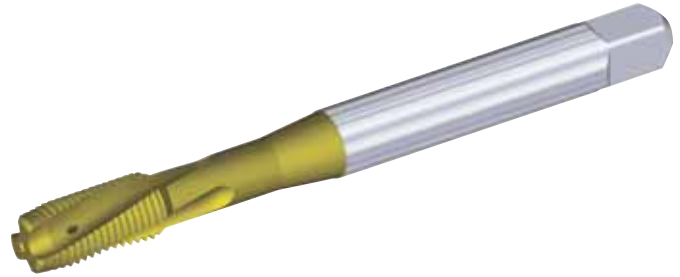
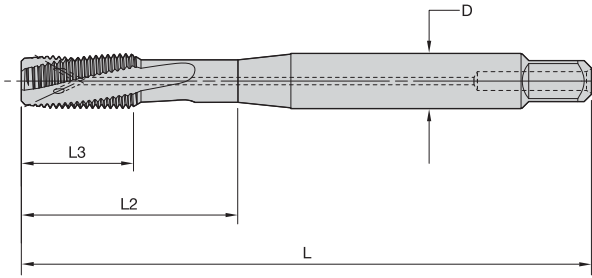
● first choice
○ alternate choice

Taps

		KP6525	KM6515	D1 size	L	L3	L2	D	number of flutes	dimension standard	class of fit
	T620M030X050R6HX-D1		T620M030X050R6HX-D1	M3 x 0,5	56	8	18	3,5	3	DIN 371	6HX
	T620M040X070R6HX-D1		T620M040X070R6HX-D1	M4 x 0,7	63	10	21	4,5	3	DIN 371	6HX
	T620M050X080R6HX-D1		T620M050X080R6HX-D1	M5 x 0,8	70	10	25	6,0	3	DIN 371	6HX
	T620M060X100R6HX-D1		T620M060X100R6HX-D1	M6 x 1	80	10	30	6,0	3	DIN 371	6HX
	T620MF080X100R6HX-D4		T620MF080X100R6HX-D4	M8 x 1	90	13	35	6,0	3	DIN 374	6HX
	T620M080X125R6HX-D1		T620M080X125R6HX-D1	M8 x 1,25	90	13	35	8,0	3	DIN 371	6HX
	T620MF100X100R6HX-D4		T620MF100X100R6HX-D4	M10 x 1	90	10	35	7,0	3	DIN 374	6HX
	T620MF100X125R6HX-D4		—	M10 x 1,25	100	15	39	7,0	3	DIN 374	6HX
	T620M100X150R6HX-D1		T620M100X150R6HX-D1	M10 x 1,5	100	15	39	10,0	3	DIN 371	6HX
	T620MF120X150R6HX-D4		T620MF120X150R6HX-D4	M12 x 1,5	100	15	39	9,0	3	DIN 374	6HX
	T620M120X175R6HX-D6		T620M120X175R6HX-D6	M12 x 1,75	110	18	44	9,0	3	DIN 376	6HX
	T620MF140X150R6HX-D4		T620MF140X150R6HX-D4	M14 x 1,5	100	15	47	11,0	4	DIN 374	6HX
	T620M140X200R6HX-D6		T620M140X200R6HX-D6	M14 x 2	110	20	52	11,0	4	DIN 376	6HX
	T620MF160X150R6HX-D4		T620MF160X150R6HX-D4	M16 x 1,5	100	15	46	12,0	4	DIN 374	6HX
	T620M160X200R6HX-D6		T620M160X200R6HX-D6	M16 x 2	110	20	51	12,0	4	DIN 376	6HX
	T620MF180X150R6HX-D4		T620MF180X150R6HX-D4	M18 x 1,5	110	15	50	14,0	4	DIN 374	6HX
	T620M200X250R6HX-D6		T620M200X250R6HX-D6	M20 x 2,5	140	25	64	16,0	4	DIN 376	6HX

Shank Tolerance

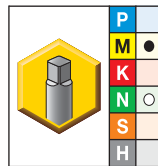
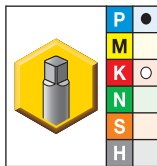
D	tolerance h6
6	+0, -0,008
8-10	+0, -0,009
12-16	+0, -0,011



KM6515 • TiN + CrC/C for stainless steel.

KP6525 • TiCN+ TiN for steel.

■ T621 • DIN 371, 374, and 376 • Form D Plug Chamfer • Through Coolant • Metric

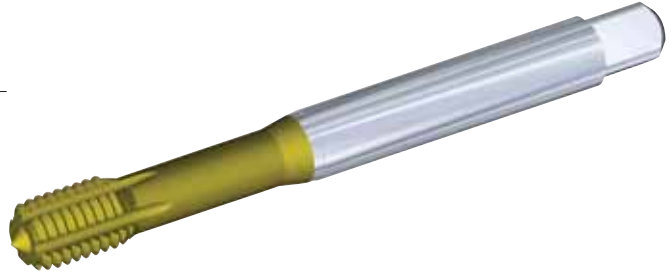
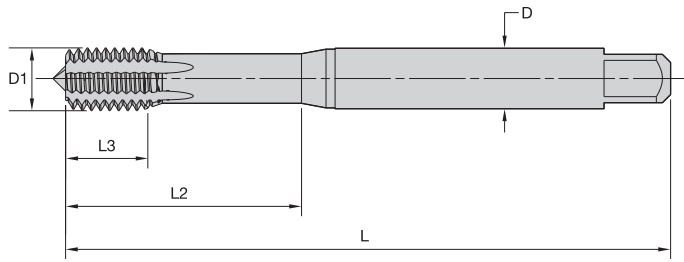


● first choice
○ alternate choice

		D1 size	L	L3	L2	D	number of flutes	dimension standard	class of fit
KP6525	T621M050X080R6HX-D1	M5 x 0,8	70	10	25	6,0	2	DIN 371	6HX
	T621M060X100R6HX-D1	M6 x 1	80	10	30	6,0	3	DIN 371	6HX
KM6515	T621M050X080R6HX-D1	M5 x 0,8	70	10	25	6,0	2	DIN 371	6HX
	T621M060X100R6HX-D1	M6 x 1	80	10	30	6,0	3	DIN 371	6HX
KP6525	T621MF080X100R6HX-D4	M8 x 1	90	13	35	6,0	3	DIN 374	6HX
	T621M080X125R6HX-D1	M8 x 1,25	90	13	35	8,0	3	DIN 371	6HX
KM6515	T621MF080X100R6HX-D4	M8 x 1	90	13	35	6,0	3	DIN 374	6HX
	T621M080X125R6HX-D1	M8 x 1,25	90	13	35	8,0	3	DIN 371	6HX
KP6525	T621MF100X100R6HX-D4	M10 x 1	90	10	35	7,0	3	DIN 374	6HX
	T621MF100X125R6HX-D4	M10 x 1,25	100	15	39	7,0	3	DIN 374	6HX
KM6515	T621MF100X100R6HX-D4	M10 x 1	90	10	35	7,0	3	DIN 374	6HX
	T621MF100X125R6HX-D4	M10 x 1,25	100	15	39	7,0	3	DIN 374	6HX
KP6525	T621M100X150R6HX-D1	M10 x 1,5	100	15	39	10,0	3	DIN 371	6HX
	T621MF120X125R6HX-D4	—	M12 x 1,25	100	15	39	9,0	3	DIN 374	6HX
KM6515	T621M100X150R6HX-D1	M10 x 1,5	100	15	39	10,0	3	DIN 371	6HX
	—	—	M12 x 1,25	100	15	39	9,0	3	DIN 374	6HX
KP6525	T621MF140X125R6HX-D4	M14 x 1,25	100	15	47	11,0	4	DIN 374	6HX
	T621MF120X150R6HX-D4	—	M12 x 1,5	100	15	39	9,0	3	DIN 374	6HX
KM6515	T621MF140X125R6HX-D4	M14 x 1,25	100	15	47	11,0	4	DIN 374	6HX
	T621MF120X150R6HX-D4	—	M12 x 1,5	100	15	39	9,0	3	DIN 374	6HX
KP6525	T621M120X175R6HX-D6	M12 x 1,75	110	18	44	9,0	3	DIN 376	6HX
	T621MF140X150R6HX-D4	M14 x 1,5	100	15	47	11,0	4	DIN 374	6HX
KM6515	T621M120X175R6HX-D6	M12 x 1,75	110	18	44	9,0	3	DIN 376	6HX
	T621MF140X150R6HX-D4	M14 x 1,5	100	15	47	11,0	4	DIN 374	6HX
KP6525	T621M140X200R6HX-D6	M14 x 2	110	20	52	11,0	4	DIN 376	6HX
	T621MF160X150R6HX-D4	M16 x 1,5	100	15	46	12,0	4	DIN 374	6HX
KM6515	T621M140X200R6HX-D6	M14 x 2	110	20	52	11,0	4	DIN 376	6HX
	T621MF160X150R6HX-D4	M16 x 1,5	100	15	46	12,0	4	DIN 374	6HX
KP6525	T621M160X200R6HX-D6	M16 x 2	110	20	51	12,0	4	DIN 376	6HX
	T621MF180X150R6HX-D4	M18 x 1,5	110	15	50	14,0	4	DIN 374	6HX
KM6515	T621M160X200R6HX-D6	M16 x 2	110	20	51	12,0	4	DIN 376	6HX
	T621MF180X150R6HX-D4	M18 x 1,5	110	15	50	14,0	4	DIN 374	6HX
KP6525	T621M180X250R6HX-D6	M18 x 2,5	125	25	58	14,0	4	DIN 376	6HX
	—	—	—	—	—	—	—	—	—
KM6515	T621M180X250R6HX-D6	M18 x 2,5	125	25	58	14,0	4	DIN 376	6HX
	—	—	—	—	—	—	—	—	—

Shank Tolerance

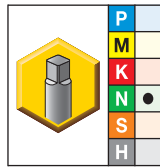
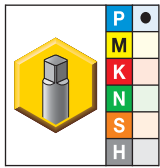
D	tolerance h6
6	+0, -0,008
8-10	+0, -0,009
12-16	+0, -0,011



KSP21 • TiN for tapping steel.

KSN28 • DLC for tapping aluminum.

■ T622 • DIN 2174 • Form C Semi-Bottoming Entry Taper • Metric



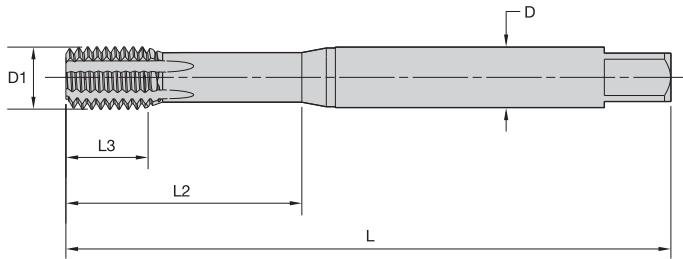
● first choice
○ alternate choice

Taps

		KSP21	KSN28	D1 size	L	L3	L2	D	number of lube grooves	dimension standard	class of fit
		T622M030X050R6HX-D74	T622M030X050R6HX-D74	M3 x 0,5	56	6	18	3,5	4	DIN 2174	6HX
		T622M040X070R6HX-D74	T622M040X070R6HX-D74	M5 x 0,7	63	7	21	4,5	4	DIN 2174	6HX
		T622M050X080R6HX-D74	T622M050X080R6HX-D74	M5 x 0,8	70	8	25	6,0	4	DIN 2174	6HX
		T622M060X100R6HX-D74	T622M060X100R6HX-D74	M6 x 1	80	10	30	6,0	5	DIN 2174	6HX
		T622MF080X100R6HX-D74	T622MF080X100R6HX-D74	M8 x 1	90	10	35	8,0	5	DIN 2174	6HX
		T622M080X125R6HX-D74	T622M080X125R6HX-D74	M8 x 1,25	90	14	35	8,0	5	DIN 2174	6HX
		T622MF100X100R6HX-D74	T622MF100X100R6HX-D74	M10 x 1	90	10	35	10,0	5	DIN 2174	6HX
		T622MF100X125R6HX-D74	T622MF100X125R6HX-D74	M10 x 1,25	100	16	69	10,0	5	DIN 2174	6HX
		T622M100X150R6HX-D74	T622M100X150R6HX-D74	M10 x 1,5	100	16	39	10,0	5	DIN 2174	6HX
		T622MF120X125R6HX-D74	T622MF120X125R6HX-D74	M12 x 1,25	100	15	27	9,0	6	DIN 2174	6HX
		T622MF120X150R6HX-D74	T622MF120X150R6HX-D74	M12 x 1,5	100	15	27	9,0	6	DIN 2174	6HX
		T622M120X175R6HX-D74	T622M120X175R6HX-D74	M12 x 1,75	110	—	—	9,0	6	DIN 2174	6HX
		T622MF140X150R6HX-D74	T622MF140X150R6HX-D74	M14 x 1,5	100	—	—	11,0	6	DIN 2174	6HX
		T622MF160X150R6HX-D74	T622MF160X150R6HX-D74	M16 x 1,5	100	—	—	12,0	6	DIN 2174	6HX
		T622M160X200R6HX-D74	T622M160X200R6HX-D74	M16 x 2	110	—	—	12,0	6	DIN 2174	6HX

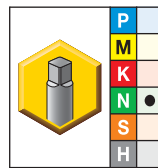
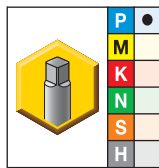
Shank Tolerance

D	tolerance h9
1-3	+0, -0,025
3,5-6	+0, -0,030
7-10	+0, -0,036
11-18	+0, -0,043



KSP21 • TiN for tapping steel.
KSP28 • DLC for tapping aluminum.

■ T623 • DIN 2174 • Form C Semi-Bottoming Entry Taper • Through Coolant • Metric

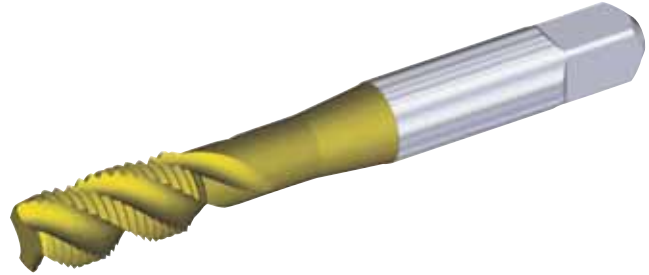
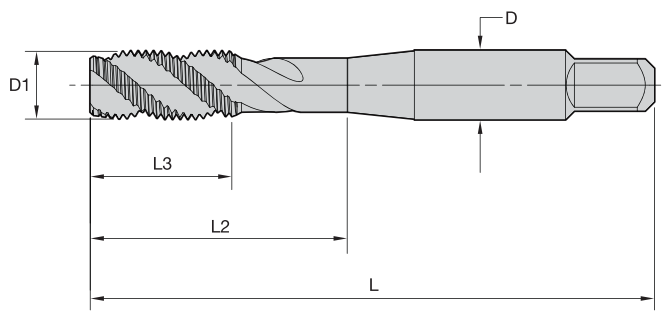


● first choice
○ alternate choice

		D1 size	L	L3	L2	D	number of lube grooves	dimension standard	class of fit
KSP21	KSN28								
T623M050X080R6HX-D74	T623M050X080R6HX-D74	M5 x 0,8	70	8	25	6,0	4	DIN 2174	6HX
T623M060X100R6HX-D74	T623M060X100R6HX-D74	M6 x 1	80	10	30	6,0	5	DIN 2174	6HX
T623MF080X100R6HX-D74	T623MF080X100R6HX-D74	M8 x 1	90	10	35	8,0	5	DIN 2174	6HX
T623M080X125R6HX-D74	T623M080X125R6HX-D74	M8 x 1,25	90	14	35	8,0	5	DIN 2174	6HX
T623MF100X100R6HX-D74	T623MF100X100R6HX-D74	M10 x 1	90	10	35	10,0	5	DIN 2174	6HX
T623M100X150R6HX-D74	T623M100X150R6HX-D1	M10 x 1,5	100	16	39	10,0	5	DIN 2174	6HX
T623MF120X150R6HX-D74	T623MF120X150R6HX-D74	M12 x 1,5	100	15	27	9,0	6	DIN 2174	6HX
T623M120X175R6HX-D74	T623M120X175R6HX-D74	M12 x 1,75	110	18	30	9,0	6	DIN 2174	6HX
T623MF140X150R6HX-D74	T623MF140X150R6HX-D74	M14 x 1,5	100	15	—	11,0	6	DIN 2174	6HX
T623MF160X150R6HX-D74	T623MF160X150R6HX-D74	M16 x 1,5	100	15	—	12,0	6	DIN 2174	6HX
T623M160X200R6HX-D74	T623M160X200R6HX-D74	M16 x 2	110	22	—	12,0	6	DIN 2174	6HX

Shank Tolerance

D	tolerance h9
1-3	+0, -0,025
3,5-6	+0, -0,030
7-10	+0, -0,036
11-18	+0, -0,043

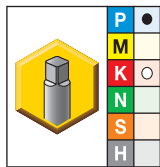


KM6515 • TiN+CrC/C for tapping stainless steel.

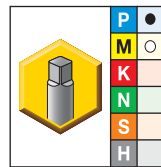
KP6525 • TiCN+TiN for tapping steel.

KP6505 • Oxide for tapping steel.

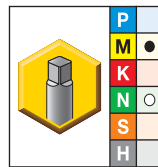
■ T630 • Machine Screw and Fractional • Form C Semi-Bottoming Chamfer



KP6525



KP6505



KM6515

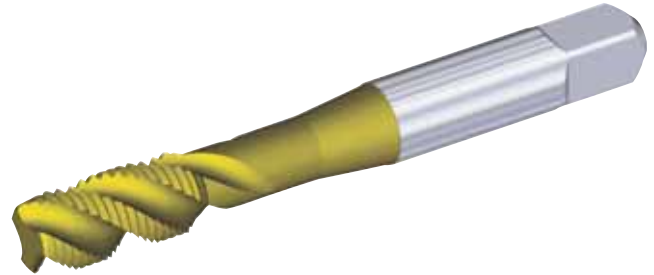
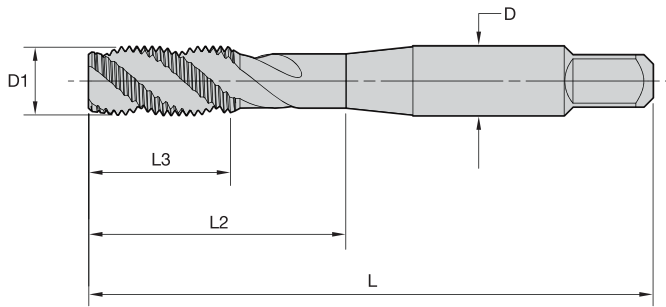
● first choice
○ alternate choice

Taps

			D1 size	L	L3	L2	D	number of flutes	class of fit
T630NC#02-56R3BX-A	—	T630NC#02-56R3BX-A	2 - 56	1.75	.44	.49	.141	2	3BX
T630NC#04-40R3BX-A	T630NC#04-40R3BX-A	T630NC#04-40R3BX-A	4 - 40	1.88	.56	.68	.141	2	3BX
T630NC#04-40R2BX-A	—	T630NC#04-40R2BX-A	4 - 40	1.88	.56	.68	.141	2	2BX
T630NC#06-32R3BX-A	T630NC#06-32R3BX-A	T630NC#06-32R3BX-A	6 - 32	1.99	.36	.71	.141	3	3BX
T630NC#06-32R2BX-A	—	T630NC#06-32R2BX-A	6 - 32	1.99	.36	.71	.141	3	2BX
T630NC#08-32R3BX-A	T630NC#08-32R3BX-A	T630NC#08-32R3BX-A	8 - 32	2.12	.31	.76	.168	3	3BX
T630NF#10-32R2BX-A	—	T630NF#10-32R2BX-A	10 - 32	2.36	.47	.91	.194	3	2BX
T630NF#10-32R3BX-A	T630NF#10-32R3BX-A	T630NF#10-32R3BX-A	10 - 32	2.36	.47	.91	.194	3	3BX
T630NC#10-24R3BX-A	T630NC#10-24R3BX-A	T630NC#10-24R3BX-A	10 - 24	2.37	.47	.91	.194	3	3BX
T630NF02500-28R2BX-A	T630NF02500-28R2BX-A	T630NF02500-28R2BX-A	1/4 - 28	2.49	.43	1.00	.255	3	2BX
T630NF02500-28R3BX-A	T630NF02500-28R3BX-A	T630NF02500-28R3BX-A	1/4 - 28	2.49	.43	1.00	.255	3	3BX
T630NC02500-20R2BX-A	T630NC02500-20R2BX-A	T630NC02500-20R2BX-A	1/4 - 20	2.50	.44	1.01	.255	3	2BX
T630NC02500-20R3BX-A	T630NC02500-20R3BX-A	T630NC02500-20R3BX-A	1/4 - 20	2.50	.44	1.01	.255	3	3BX
T630NF03125-24R3BX-A	T630NF03125-24R3BX-A	T630NF03125-24R3BX-A	5/16 - 24	2.71	.48	1.13	.318	3	3BX
T630NF03125-24R2BX-A	—	T630NF03125-24R2BX-A	5/16 - 24	2.71	.48	1.13	.318	3	2BX
T630NC03125-18R2BX-A	T630NC03125-18R2BX-A	T630NC03125-18R2BX-A	5/16 - 18	2.72	.49	1.13	.318	3	2BX
T630NC03125-18R3BX-A	T630NC03125-18R3BX-A	T630NC03125-18R3BX-A	5/16 - 18	2.72	.49	1.13	.318	3	3BX
T630NF03750-24R3BX-A	—	T630NF03750-24R3BX-A	3/8 - 24	2.92	.59	1.25	.381	3	3BX
T630NC03750-16R2BX-A	T630NC03750-16R2BX-A	T630NC03750-16R2BX-A	3/8 - 16	2.94	.60	1.27	.381	3	2BX
T630NC03750-16R3BX-A	T630NC03750-16R3BX-A	T630NC03750-16R3BX-A	3/8 - 16	2.94	.60	1.27	.381	3	3BX
T630NC04375-14R3BX-A	T630NC04375-14R3BX-A	T630NC04375-14R3BX-A	7/16 - 14	3.16	.71	1.49	.323	5	3BX
T630NF04375-20R3BX-A	T630NF04375-20R3BX-A	T630NF04375-20R3BX-A	7/16 - 20	3.16	.71	1.49	.323	5	3BX
T630NC05000-13R3BX-A	T630NC05000-13R3BX-A	T630NC05000-13R3BX-A	1/2 - 13	3.38	.77	1.74	.367	5	3BX
T630NC05000-13R2BX-A	T630NC05000-13R2BX-A	T630NC05000-13R2BX-A	1/2 - 13	3.38	.77	1.74	.367	4	2BX
T630NF05000-20R3BX-A	T630NF05000-20R3BX-A	T630NF05000-20R3BX-A	1/2 - 20	3.38	.77	1.74	.367	5	3BX
T630NC06250-11R3BX-A	T630NC06250-11R3BX-A	T630NC06250-11R3BX-A	5/8 - 11	3.81	.91	1.89	.480	5	3BX
T630NC06250-11R2BX-A	—	T630NC06250-11R2BX-A	5/8 - 11	3.81	.91	1.89	.480	4	2BX
T630NC07500-10R3BX-A	T630NC07500-10R3BX-A	T630NC07500-10R3BX-A	3/4 - 10	4.25	1.00	2.08	.590	5	3BX
T630NC07500-10R2BX-A	—	T630NC07500-10R2BX-A	3/4 - 10	4.25	1.00	2.08	.590	4	2BX
T630NC10000-08R3BX-A	—	T630NC10000-08R3BX-A	1 - 8	5.13	1.25	2.58	.800	5	3BX

Shank Tolerance

D fractional	tolerance h6
.250-375	+0, -.0004
.438-625	+0, -.0004

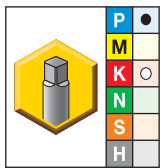


KM6515 • TiN+CrC/C for tapping stainless steel.

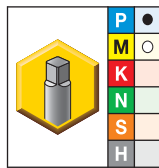
KP6525 • TiCN+TiN for tapping steel.

KP6505 • Oxide for tapping steel.

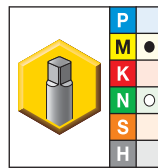
■ T630 • Form C Semi-Bottoming Chamfer • Metric ANSI



KP6525



KP6505



KM6515

● first choice
○ alternate choice

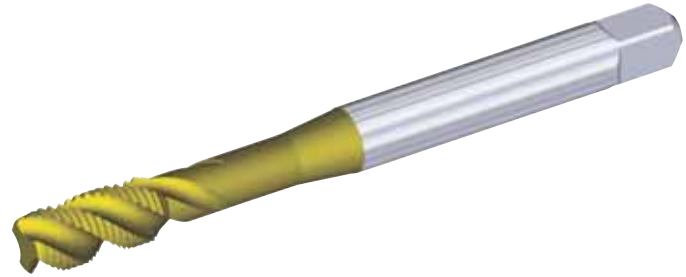
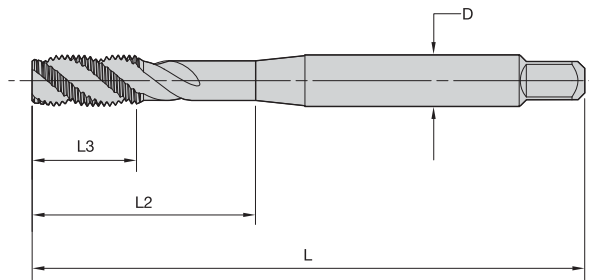
			D1 size	L	L3	L2	D	number of flutes	class of fit
T630M030X050R6HX-A	T630M030X050R6HX-A	T630M030X050R6HX-A	M3 x 0,5	1.94	.58	.75	.141	2	6HX
T630M040X070R6HX-A	T630M040X070R6HX-A	T630M040X070R6HX-A	M4 x 0,7	2.11	.31	.76	.168	3	6HX
T630M050X080R6HX-A	T630M050X080R6HX-A	T630M050X080R6HX-A	M5 x 0,8	2.37	.46	.91	.194	3	6HX
T630M060X100R6HX-A	T630M060X100R6HX-A	T630M060X100R6HX-A	M6 x 1	2.49	.45	1.00	.255	3	6HX
T630M080X125R6HX-A	T630M080X125R6HX-A	T630M080X125R6HX-A	M8 x 1,25	2.70	.47	1.12	.318	3	6HX
T630M100X150R6HX-A	T630M100X150R6HX-A	T630M100X150R6HX-A	M10 x 1,5	2.92	.52	1.25	.381	3	6HX
T630M120X175R6HX-A	T630M120X175R6HX-A	T630M120X175R6HX-A	M12 x 1,75	3.38	.77	1.74	.367	5	6HX
T630M140X200R6HX-A	T630M140X200R6HX-A	T630M140X200R6HX-A	M14 x 2	3.59	.83	1.74	.429	5	6HX
T630M160X200R6HX-A	T630M160X200R6HX-A	T630M160X200R6HX-A	M16 x 2	3.81	.91	1.89	.480	5	6HX

Shank Tolerance

D fractional	tolerance h6
.250–.375	+0, -.0004
.438–.625	+0, -.0004



Taps

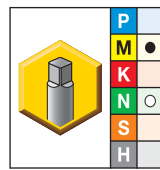
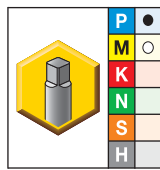
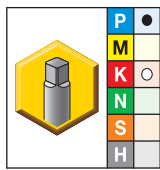


KM6515 • TiN + CrC/C for stainless steel.

KP6525 • TiCN+ TiN for steel.

KP6505 • Steam oxide for steel.

■ T630 • DIN 371, 374, and 376 • Form C Semi-Bottoming Chamfer • Metric



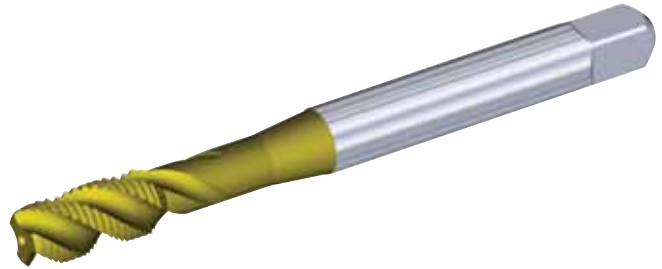
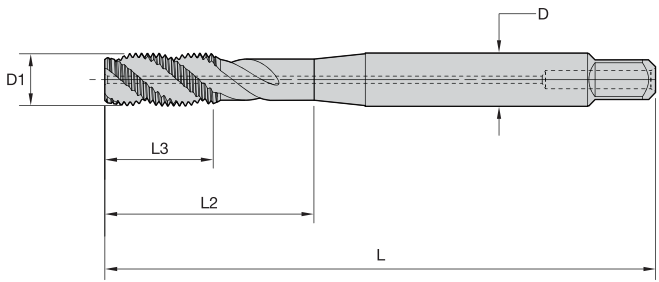
● first choice
○ alternate choice

Taps

			D1 size	L	L3	L2	D	number of flutes	dimension standard	class of fit
KP6525	KP6505	KM6515								
T630M030X050R6HX-D1	T630M030X050R6HX-D1	T630M030X050R6HX-D1	M3 x 0,5	56	8	18	3,5	3	DIN 371	6HX
T630M040X070R6HX-D1	T630M040X070R6HX-D1	T630M040X070R6HX-D1	M4 x 0,7	63	10	21	4,5	3	DIN 371	6HX
T630M050X080R6HX-D1	T630M050X080R6HX-D1	T630M050X080R6HX-D1	M5 x 0,8	70	10	25	6,0	3	DIN 371	6HX
T630M060X100R6HX-D1	T630M060X100R6HX-D1	T630M060X100R6HX-D1	M6 x 1	80	10	30	6,0	3	DIN 371	6HX
T630MF080X100R6HX-D4	—	T630MF080X100R6HX-D4	M8 x 1	90	13	35	6,0	3	DIN 374	6HX
T630M080X125R6HX-D1	T630M080X125R6HX-D1	T630M080X125R6HX-D1	M8 x 1,25	90	13	35	8,0	3	DIN 371	6HX
T630MF100X100R6HX-D4	—	T630MF100X100R6HX-D4	M10 x 1	90	10	35	7,0	3	DIN 374	6HX
T630MF100X125R6HX-D4	—	T630MF100X125R6HX-D4	M10 x 1,25	100	15	39	7,0	3	DIN 374	6HX
T630M100X150R6HX-D1	T630M100X150R6HX-D1	T630M100X150R6HX-D1	M10 x 1,5	100	15	39	10,0	3	DIN 371	6HX
T630MF120X150R6HX-D4	—	T630MF120X150R6HX-D4	M12 x 1,5	100	15	39	9,0	3	DIN 374	6HX
T630M120X175R6HX-D6	T630M120X175R6HX-D6	T630M120X175R6HX-D6	M12 x 1,75	110	18	44	9,0	3	DIN 376	6HX
T630MF140X150R6HX-D4	—	T630MF140X150R6HX-D4	M14 x 1,5	100	15	47	11,0	4	DIN 374	6HX
T630M140X200R6HX-D6	T630M140X200R6HX-D6	T630M140X200R6HX-D6	M14 x 2	110	20	52	11,0	4	DIN 376	6HX
T630MF160X150R6HX-D4	—	T630MF160X150R6HX-D4	M16 x 1,5	100	15	46	12,0	4	DIN 374	6HX
T630M160X200R6HX-D6	T630M160X200R6HX-D6	T630M160X200R6HX-D6	M16 x 2	110	20	51	12,0	4	DIN 376	6HX
T630MF180X150R6HX-D4	—	T630MF180X150R6HX-D4	M18 x 1,5	110	15	50	14,0	4	DIN 374	6HX
T630M180X250R6HX-D6	T630M180X250R6HX-D6	T630M180X250R6HX-D6	M18 x 2,5	125	25	58	14,0	4	DIN 376	6HX
—	T630M200X250R6HX-D6	—	M20 x 2,5	140	25	64	16,0	4	DIN 376	6HX

Shank Tolerance

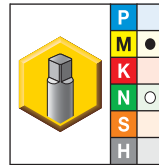
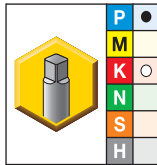
D	tolerance h6
6	+0, -0,008
8-10	+0, -0,009
12-16	+0, -0,011



KM6515 • TiN + CrC/C for stainless steel.

KP6525 • TiCN+ TiN for steel.

■ T631 • DIN 371, 374, and 376 • Form C Semi-Bottoming Chamfer • Through Coolant • Metric



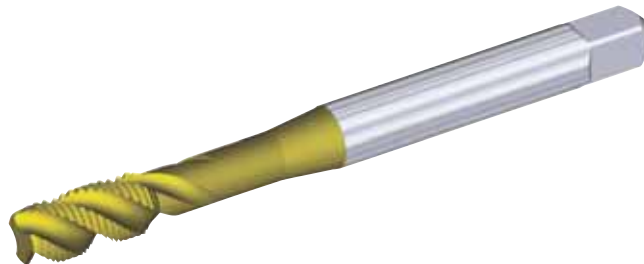
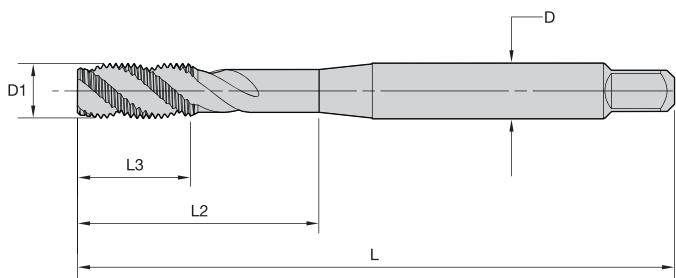
● first choice
○ alternate choice

		D1 size	L	L3	L2	D	number of flutes	dimension standard	class of fit
KP6525	KM6515								
T631M050X080R6HX-D1	T631M050X080R6HX-D1	M5 x 0,8	70	10	25	6,0	3	DIN 371	6HX
T631M060X100R6HX-D1	T631M060X100R6HX-D1	M6 x 1	80	10	30	6,0	3	DIN 371	6HX
T631MF080X100R6HX-D4	T631MF080X100R6HX-D4	M8 x 1	90	13	35	6,0	3	DIN 374	6HX
T631M080X125R6HX-D1	T631M080X125R6HX-D1	M8 x 1,25	90	13	35	8,0	3	DIN 371	6HX
T631MF100X100R6HX-D4	T631MF100X100R6HX-D4	M10 x 1	90	10	35	7,0	3	DIN 374	6HX
T631MF100X125R6HX-D4	T631MF100X125R6HX-D4	M10 x 1,25	100	15	39	7,0	3	DIN 374	6HX
T631M100X150R6HX-D1	T631M100X150R6HX-D1	M10 x 1,5	100	15	39	10,0	3	DIN 371	6HX
T631MF120X125R6HX-D4	T631MF120X125R6HX-D4	M12 x 1,25	100	15	39	9,0	4	DIN 374	6HX
T631MF140X125R6HX-D4	T631MF140X125R6HX-D4	M14 x 1,25	100	15	47	11,0	4	DIN 374	6HX
T631MF120X150R6HX-D4	T631MF120X150R6HX-D4	M12 x 1,5	100	15	39	9,0	4	DIN 374	6HX
T631M120X175R6HX-D6	T631M120X175R6HX-D6	M12 x 1,75	110	18	44	9,0	4	DIN 376	6HX
T631MF140X150R6HX-D4	T631MF140X150R6HX-D4	M14 x 1,5	100	15	47	11,0	4	DIN 374	6HX
T631M140X200R6HX-D6	T631M140X200R6HX-D6	M14 x 2	110	20	52	11,0	4	DIN 376	6HX
T631MF160X150R6HX-D4	T631MF160X150R6HX-D4	M16 x 1,5	100	15	46	12,0	4	DIN 374	6HX
T631M160X200R6HX-D6	T631M160X200R6HX-D6	M16 x 2	110	20	51	12,0	4	DIN 376	6HX
T631MF180X150R6HX-D4	T631MF180X150R6HX-D4	M18 x 1,5	110	15	50	14,0	4	DIN 374	6HX
T631M180X250R6HX-D6	T631M180X250R6HX-D6	M18 x 2,5	125	25	58	13,0	4	DIN 376	6HX

Shank Tolerance

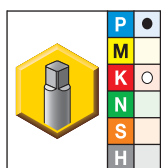
D	tolerance h6
6	+0, -0,008
8-10	+0, -0,009
12-16	+0, -0,011





KP6525 • TiCN+TiN for tapping steel.

■ T632 • DIN 371, 374, and 376 • Form E Bottoming Chamfer • Metric



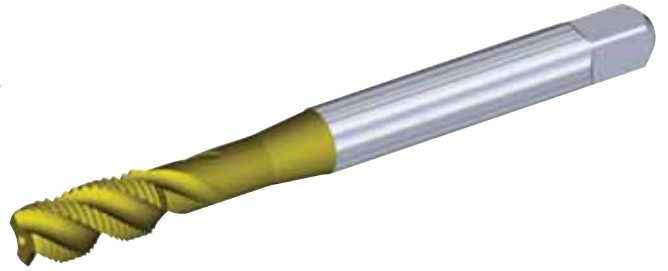
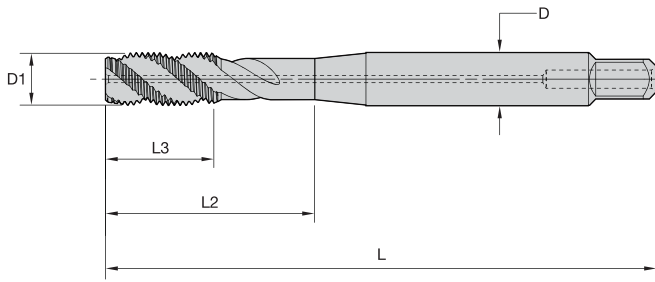
● first choice
○ alternate choice

Taps

KP6525	D1 size	L	L3	L2	D	number of flutes	dimension standard	class of fit
T632M050X080R6HX-D1	M5 x 0,8	70	10	25	6,0	3	DIN 371	6HX
T632M060X100R6HX-D1	M6 x 1	80	10	30	6,0	3	DIN 371	6HX
T632M080X125R6HX-D1	M8 x 1,25	90	13	35	8,0	3	DIN 371	6HX
T632M100X150R6HX-D1	M10 x 1,5	100	15	39	10,0	3	DIN 371	6HX
T632MF120X150R6HX-D4	M12 x 1,5	100	15	39	9,0	4	DIN 374	6HX
T632M120X175R6HX-D6	M12 x 1,75	110	18	44	9,0	4	DIN 376	6HX
T632MF140X150R6HX-D4	M14 x 1,5	100	15	47	11,0	4	DIN 374	6HX
T632M140X200R6HX-D6	M14 x 2	110	20	52	11,0	4	DIN 376	6HX
T632MF160X150R6HX-D4	M16 x 1,5	100	15	46	12,0	4	DIN 374	6HX

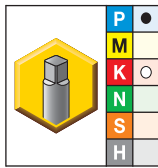
Shank Tolerance

D	tolerance h6
6	+0, -0,008
8-10	+0, -0,009
12-16	+0, -0,011



KP6525 • TiCN+TiN for tapping steel.

T633 • DIN 371, 374, and 376 • Form E Bottoming Chamfer • Through Coolant • Metric



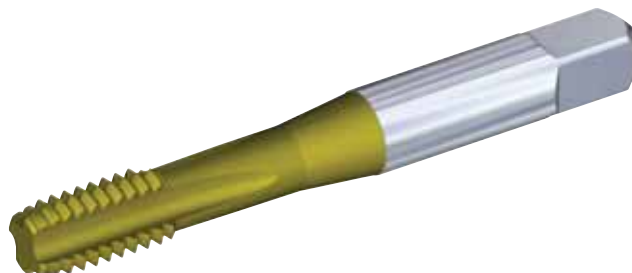
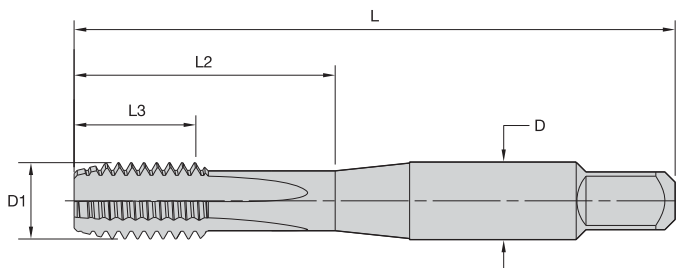
● first choice
○ alternate choice

KP6525	D1 size	L	L3	L2	D	number of flutes	dimension standard	class of fit
T633M050X080R6HX-D1	M5 x 0,8	70	10	25	6,0	3	DIN 371	6HX
T633M060X100R6HX-D1	M6 x 1	80	10	30	6,0	3	DIN 371	6HX
T633M080X125R6HX-D1	M8 x 1,25	90	13	35	8,0	3	DIN 371	6HX
T633M100X150R6HX-D1	M10 x 1,5	100	15	39	10,0	3	DIN 371	6HX
T633MF120X150R6HX-D4	M12 x 1,5	100	15	39	9,0	4	DIN 374	6HX
T633M120X175R6HX-D6	M12 x 1,75	110	18	44	9,0	4	DIN 376	6HX
T633MF140X150R6HX-D4	M14 x 1,5	100	15	47	11,0	4	DIN 374	6HX
T633M140X200R6HX-D6	M14 x 2	110	20	52	11,0	4	DIN 376	6HX
T633MF160X150R6HX-D4	M16 x 1,5	100	15	46	12,0	4	DIN 374	6HX

Shank Tolerance

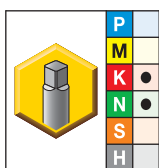
D	tolerance h6
6	+0, -0,008
8-10	+0, -0,009
12-16	+0, -0,011





For through and blind holes.
TiCN+TiN for tapping.

T640 • Machine Screw and Fractional • Form C Semi-Bottoming Chamfer



- first choice
- alternate choice

Taps

	D1 size	L	L3	L2	D	number of flutes	class of fit
KP6525							
T640NF#10-32R3BX-A	10 - 32	2.36	.47	.91	.194	3	3BX
T640NC#10-24R3BX-A	10 - 24	2.37	.47	.91	.194	3	3BX
T640NF02500-28R3BX-A	1/4 - 28	2.49	.43	1.00	.255	4	3BX
T640NF02500-28R2BX-A	1/4 - 28	2.49	.43	1.00	.255	4	2BX
T640NC02500-20R3BX-A	1/4 - 20	2.50	.44	1.01	.255	4	3BX
T640NC02500-20R2BX-A	1/4 - 20	2.50	.44	1.01	.255	4	2BX
T640NF03125-24R3BX-A	5/16 - 24	2.71	.48	1.13	.318	4	3BX
T640NC03125-18R2BX-A	5/16 - 18	2.72	.49	1.13	.318	4	2BX
T640NC03125-18R3BX-A	5/16 - 18	2.72	.49	1.13	.318	4	3BX
T640NF03750-24R3BX-A	3/8 - 24	2.92	.58	1.25	.381	4	3BX
T640NC03750-16R2BX-A	3/8 - 16	2.94	.60	1.27	.381	4	2BX
T640NC03750-16R3BX-A	3/8 - 16	2.94	.60	1.27	.381	4	3BX
T640NC04375-14R3BX-A	7/16 - 14	3.16	.71	1.49	.323	4	3BX
T640NF04375-20R3BX-A	7/16 - 20	3.16	.71	1.49	.323	4	3BX
T640NF05000-20R3BX-A	1/2 - 20	3.38	.77	1.74	.367	4	3BX
T640NC05000-13R3BX-A	1/2 - 13	3.38	.77	1.74	.367	4	3BX
T640NC06250-11R3BX-A	5/8 - 11	3.81	.91	1.89	.480	4	3BX
T640NC07500-10R3BX-A	3/4 - 10	4.25	1.00	2.08	.590	4	3BX

Shank Tolerance

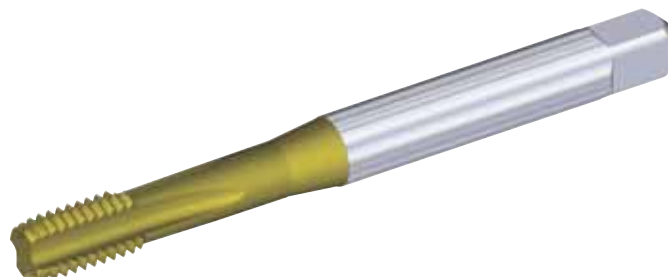
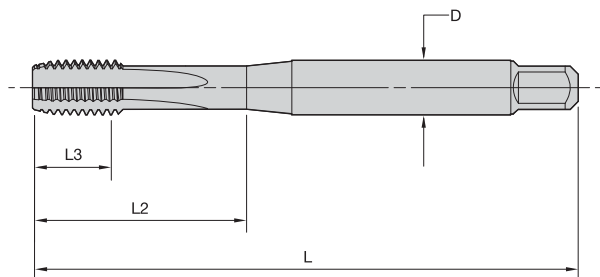
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.438-.625	+0, -.0004

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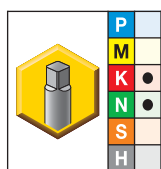
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KP6525 • TiCN+ TiN for cast iron and cast aluminum.

■ T640 • DIN 371 and 376 • Form C Semi-Bottoming Chamfer • Metric



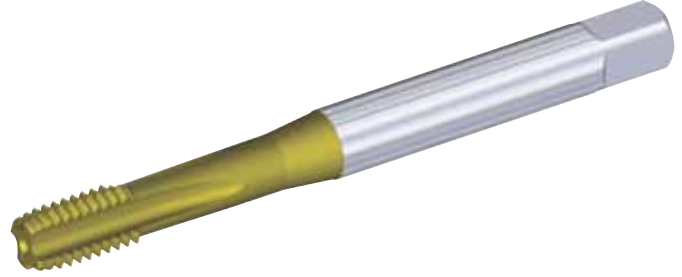
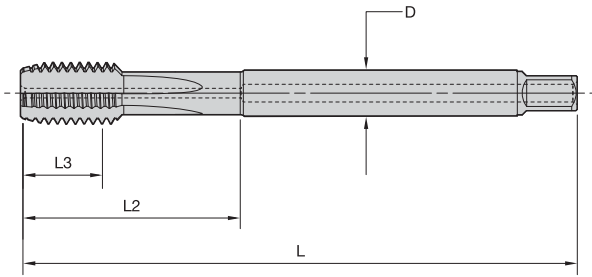
- first choice
- alternate choice

Taps

KP6525	D1 size	L	L3	L2	D	number of flutes	dimension standard	class of fit
T640M040X070R6HX-D1	M4 x 0,7	63	10	21	4,5	3	DIN 371	6HX
T640M050X080R6HX-D1	M5 x 0,8	70	10	25	6,0	3	DIN 371	6HX
T640M060X100R6HX-D1	M6 x 1	80	10	30	6,0	4	DIN 371	6HX
T640M080X125R6HX-D1	M8 x 1,25	90	13	35	8,0	4	DIN 371	6HX
T640M100X150R6HX-D1	M10 x 1,5	100	15	39	10,0	4	DIN 371	6HX
T640M120X175R6HX-D6	M12 x 1,75	110	18	44	9,0	4	DIN 376	6HX
T640M140X200R6HX-D6	M14 x 2	110	20	52	11,0	4	DIN 376	6HX
T640M160X200R6HX-D6	M16 x 2	110	20	51	12,0	4	DIN 376	6HX
T640M180X250R6HX-D6	M18 x 2,5	125	25	58	14,0	4	DIN 376	6HX
T640M200X250R6HX-D6	M20 x 2,5	140	25	64	16,0	4	DIN 376	6HX
T640M220X250R6HX-D6	M22 x 2,5	140	25	64	16,0	4	DIN 376	6HX

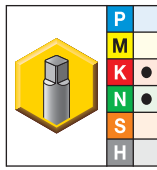
Shank Tolerance

D	tolerance h6
6	+0, -0,008
8-10	+0, -0,009
12-16	+0, -0,011



KP6525 • TiCN+ TiN for cast iron and cast aluminum.

■ T641 • DIN 371 and 376 • Form C Semi-Bottoming Chamfer • Through Coolant • Metric



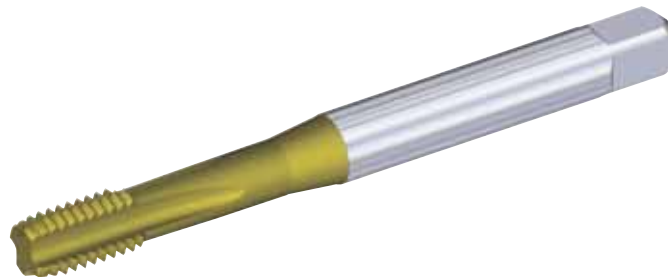
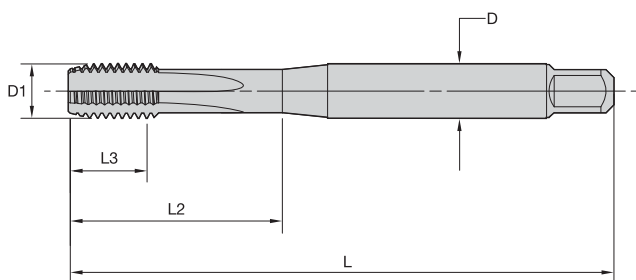
- first choice
- alternate choice

KP6525	D1 size	L	L3	L2	D	number of flutes	dimension standard	class of fit
T641M050X080R6HX-D1	M5 x 0,8	70	10	25	6,0	3	DIN 371	6HX
T641M060X100R6HX-D1	M6 x 1	80	10	30	6,0	4	DIN 371	6HX
T641M080X125R6HX-D1	M8 x 1,25	90	13	35	8,0	4	DIN 371	6HX
T641M100X150R6HX-D1	M10 x 1,5	100	15	39	10,0	4	DIN 371	6HX
T641M120X175R6HX-D6	M12 x 1,75	110	18	44	9,0	4	DIN 376	6HX
T641M140X200R6HX-D6	M14 x 2	110	20	52	11,0	4	DIN 376	6HX
T641M160X200R6HX-D6	M16 x 2	110	20	51	12,0	4	DIN 376	6HX
T641M180X250R6HX-D6	M18 x 2,5	125	25	58	14,0	4	DIN 376	6HX
T641M200X250R6HX-D6	M20 x 2,5	140	25	64	16,0	4	DIN 376	6HX

Shank Tolerance

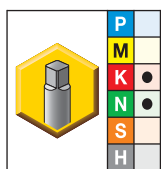
D	tolerance h6
6	+0, -0,008
8-10	+0, -0,009
12-16	+0, -0,011





KP6525 • TiCN+TiN for cast iron and cast silicon aluminum.

■ T642 • DIN 371, 374, and 376 • Form E Bottoming Chamfer • Metric



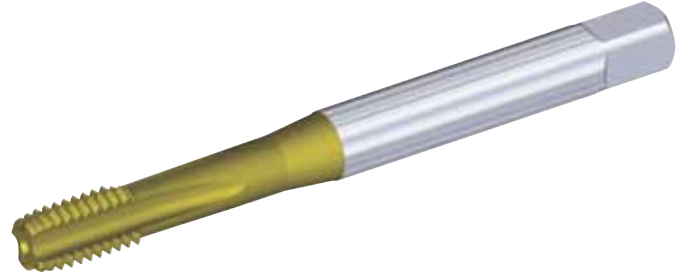
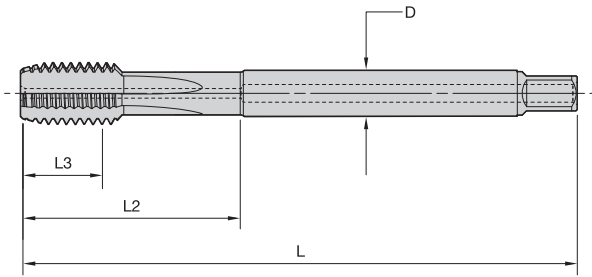
- first choice
- alternate choice

Taps

KP6525	D1 size	L	L3	L2	D	number of flutes	dimension standard	class of fit
T642M050X080R6HX-D1	M5 x 0,8	70	10	25	6,0	3	DIN 371	6HX
T642M060X100R6HX-D1	M6 x 1	80	10	30	6,0	4	DIN 371	6HX
T642M080X125R6HX-D1	M8 x 1,25	90	13	35	8,0	4	DIN 371	6HX
T642M100X150R6HX-D1	M10 x 1,5	100	15	39	10,0	4	DIN 371	6HX
T642MF120X150R6HX-D4	M12 x 1,5	100	15	39	9,0	4	DIN 374	6HX
T642M120X175R6HX-D6	M12 x 1,75	110	18	44	9,0	4	DIN 376	6HX
T642MF140X150R6HX-D4	M14 x 1,5	100	15	47	11,0	4	DIN 374	6HX
T642M140X200R6HX-D6	M14 x 2	110	20	52	11,0	4	DIN 376	6HX
T642MF160X150R6HX-D4	M16 x 1,5	100	15	46	12,0	4	DIN 374	6HX

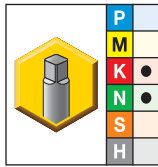
Shank Tolerance

D	tolerance h6
6	+0, -0,008
8-10	+0, -0,009
12-16	+0, -0,011



KP6525 • TiCN+TiN for tapping cast iron and cast silicon aluminum.

■ T643 • DIN 371, 374, and 376 • Form E Bottoming Chamfer • Through Coolant • Metric



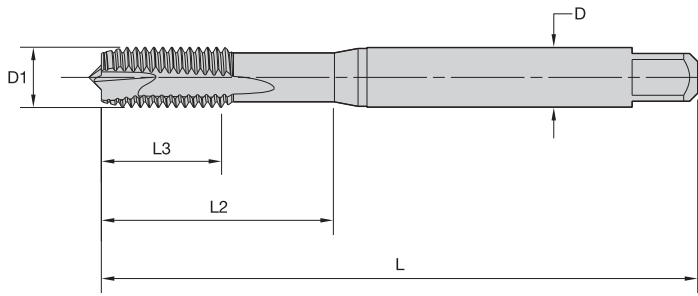
- first choice
- alternate choice

KP6525	D1 size	L	L3	L2	D	number of flutes	dimension standard	class of fit
T643M050X080R6HX-D1	M5 x 0,8	70	10	25	6,0	3	DIN 371	6HX
T643M060X100R6HX-D1	M6 x 1	80	10	30	6,0	4	DIN 371	6HX
T643M080X125R6HX-D1	M8 x 1,25	90	13	35	8,0	4	DIN 371	6HX
T643M100X150R6HX-D1	M10 x 1,5	100	15	39	10,0	4	DIN 371	6HX
T643MF120X150R6HX-D4	M12 x 1,5	100	15	39	9,0	4	DIN 374	6HX
T643M120X175R6HX-D6	M12 x 1,75	110	18	44	9,0	4	DIN 376	6HX
T643MF140X150R6HX-D4	M14 x 1,5	100	15	47	11,0	4	DIN 374	6HX
T643M140X200R6HX-D6	M14 x 2	110	20	52	11,0	4	DIN 376	6HX
T643MF160X150R6HX-D4	M16 x 1,5	100	15	46	12,0	4	DIN 374	6HX

Shank Tolerance

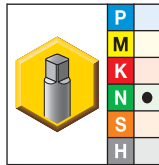
D	tolerance h6
6	+0, -0,008
8-10	+0, -0,009
12-16	+0, -0,011





KSN38 • DLC for tapping aluminum.

T670 • DIN 371 and 376 • Form B Plug Chamfer • Metric



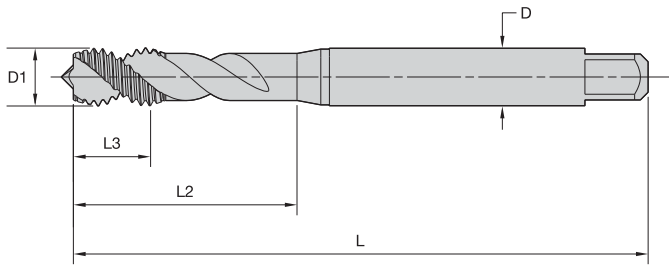
- first choice
- alternate choice

Taps

	D1 size	L	L3	L2	D	number of flutes	dimension standard	class of fit
KSN38								
T670M030X050R6H-D1	M3 x 0,5	56	11	18	3,5	2	DIN 371	6H
T670M040X070R6H-D1	M4 x 0,7	63	13	21	4,5	2	DIN 371	6H
T670M050X080R6H-D1	M5 x 0,8	70	15	25	6,0	2	DIN 371	6H
T670M060X100R6H-D1	M6 x 1	80	17	30	6,0	2	DIN 371	6H
T670M080X125R6H-D1	M8 x 1,25	90	20	35	8,0	2	DIN 371	6H
T670M100X150R6H-D1	M10 x 1,5	100	22	39	10,0	2	DIN 371	6H
T670M120X175R6H-D6	M12 x 1,75	110	24	—	9,0	3	DIN 376	6H
T670M160X200R6H-D6	M16 x 2	110	27	—	12,0	3	DIN 376	6H

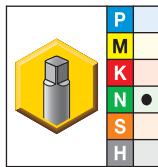
Shank Tolerance

D	tolerance h9
1-3	+0, -0,025
3,5-6	+0, -0,030
7-10	+0, -0,036
11-18	+0, -0,043



KSN38 • DLC for tapping aluminum.

■ T680 • DIN 371 and 376 • Form C Semi-Bottoming Chamfer • Metric



● first choice
○ alternate choice

KSN38	D1 size	L	L3	L2	D	number of flutes	dimension standard	class of fit
T680M030X050R6H-D1	M3 x 0,5	56	6	18	3,5	2	DIN 371	6H
T680M040X070R6H-D1	M4 x 0,7	63	7	21	4,5	2	DIN 371	6H
T680M050X080R6H-D1	M5 x 0,8	70	8	25	6,0	2	DIN 371	6H
T680M060X100R6H-D1	M6 x 1	80	10	30	6,0	2	DIN 371	6H
T680M080X125R6H-D1	M8 x 1,25	90	14	35	8,0	2	DIN 371	6H
T680M100X150R6H-D1	M10 x 1,5	100	16	39	10,0	2	DIN 371	6H
T680M120X175R6H-D6	M12 x 1,75	110	18	—	9,0	3	DIN 376	6H
T680M160X200R6H-D6	M16 x 2	110	22	—	12,0	3	DIN 376	6H
T680M200X250R6H-D6	M20 x 2,5	140	25	—	16,0	3	DIN 376	6H

Shank Tolerance

D	tolerance h9
1-3	+0, -0,025
3,5-6	+0, -0,030
7-10	+0, -0,036
11-18	+0, -0,043



Wind Energy Taps



Primary Application

The new high-performance, large-sized HSS-E-PM Wind Taps were developed for manufacturers of some of the most important wind turbine components to increase productivity because of increased demand and can be used in conventional non-rigid and CNC-synchronous tapping machines. These Wind Taps are manufactured to DIN 376 dimensions and an extra-long version is available to reach the longer overhang that is common on these big components.

The precision h6 shanks enable use in either conventional tap holders with square drive or in precision round holders.

Features and Benefits

T620 LH Spiral Flute

- For through hole tapping.
- Push chips ahead, enabling free tapping on long chipping material.
- Form D plug chamfer.
- DIN 376 and extra-long versions available.

T630 RH Spiral Flute

- For blind hole tapping.
- Preferred for vertical tapping application.
- Form D plug chamfer.
- Internal coolant available as standard; see T631.
- DIN 376 and extra-long versions available.

T650 RH Spiral Flute

- For blind hole tapping.
- Preferred for horizontal tapping application.
- Form D plug chamfer.
- Internal coolant available as standard; see T651.
- DIN 376 and extra-long versions available.

T650 HSS-E-PM • Proven Solution

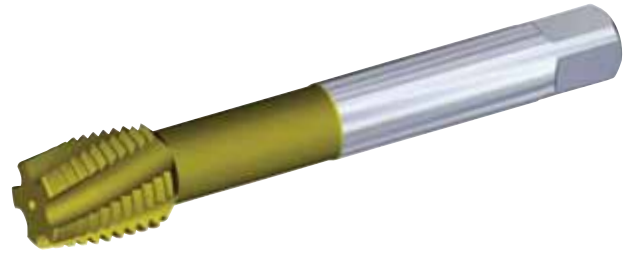
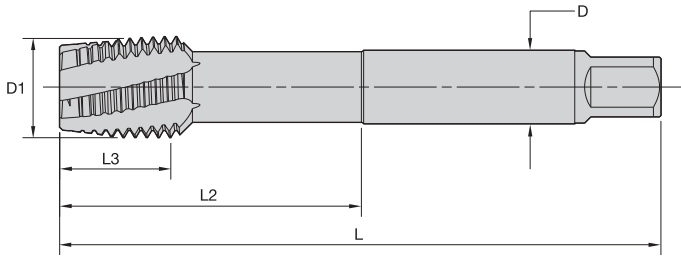
Case study:

- Manufacturer of large diameter bearing for wind turbines.

Conditions:

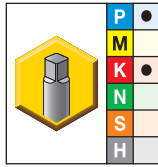
- Thread size: M24 x 2.5 6H
- Workpiece: bearing ring
- Material: low-carbon steel 1010 (C10)
- Thread depth: 35mm blind
- Tap drill size: 17,5mm
- Machine: CNC
- Coolant: water soluble





KP6525 • TiCN+TiN for tapping steel and cast iron.

T620 • DIN 376 • Form D Plug Chamfer • Larger Sizes • Metric

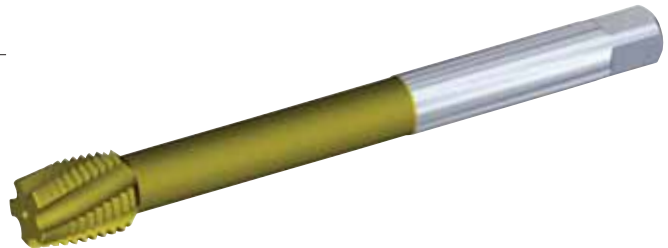
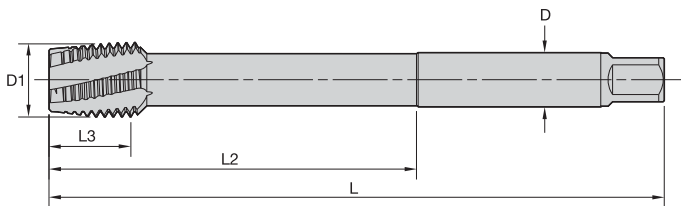


● first choice
○ alternate choice

KP6525	D1 size	L	L3	L2	D	number of flutes	class of fit
T620M240X300R6HX-D6	M24 x 3	160	30	77	18,0	5	6HX
T620M300X350R6HX-D6	M30 x 3,5	180	35	91	22,0	5	6HX
T620M330X350R6HX-D6	M33 x 3,5	180	35	100	25,0	5	6HX
T620M360X400R6HX-D6	M36 x 4	200	40	110	28,0	6	6HX
T620M420X450R6HX-D6	M42 x 4,5	200	45	120	32,0	6	6HX

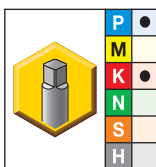
Shank Tolerance

D	tolerance h6
12-18	+0, -0,011
20-30	+0, -0,013
32-36	+0, -0,016



KP6525 • TiCN+TiN for tapping steel and cast iron.

T620 • Extra Long • Form D Plug Chamfer • Larger Sizes • Metric

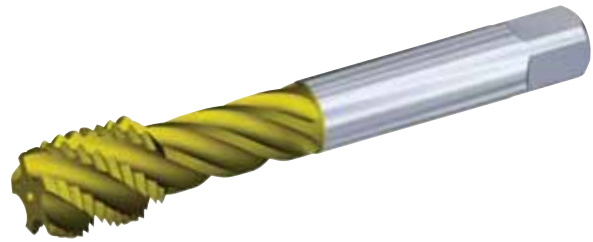
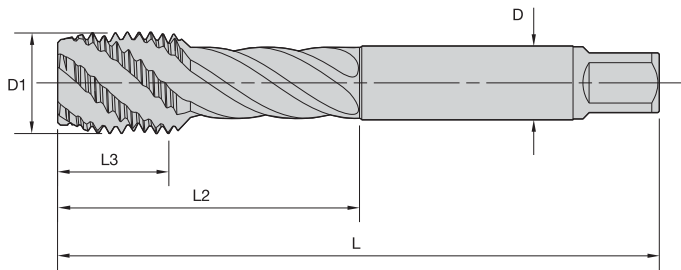


● first choice
○ alternate choice

KP6525	D1 size	L	L3	L2	D	number of flutes	class of fit
T620M240X300R6H-XL	M24 x 3	200	30	120	18,0	5	6HX
T620M300X350R6H-XL	M30 x 3,5	250	35	150	22,0	5	6HX
T620M330X350R6H-XL	M33 x 3,5	250	35	150	25,0	5	6HX
T620M360X400R6H-XL	M36 x 4	250	40	150	28,0	6	6HX
T620M420X450R6H-XL	M42 x 4,5	300	45	180	32,0	6	6HX

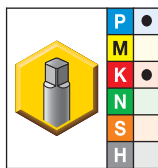
Shank Tolerance

D	tolerance h6
12-18	+0, -0,011
20-30	+0, -0,013
32-36	+0, -0,016



KP6525 • TiCN+TiN for tapping steel and cast iron.

■ **T630 • DIN 376 • Form C Semi-Bottoming Chamfer • Larger Sizes • Metric**



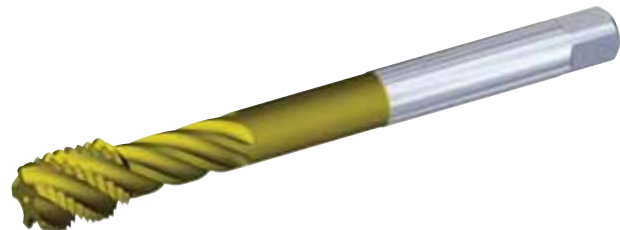
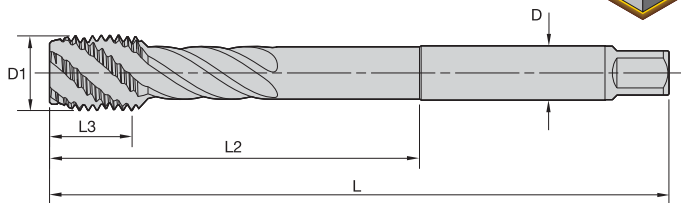
● first choice
○ alternate choice

KP6525	D1 size	L	L3	L2	D	number of flutes	class of fit
T630M240X300R6HX-D6	M24 x 3	160	30	77	18,0	5	6HX
T630M300X350R6HX-D6	M30 x 3,5	180	35	91	22,0	5	6HX
T630M330X350R6HX-D6	M33 x 3,5	180	35	100	25,0	5	6HX
T630M360X400R6HX-D6	M36 x 4	200	40	110	28,0	5	6HX
T630M420X450R6HX-D6	M42 x 4,5	200	45	120	32,0	5	6HX

Shank Tolerance

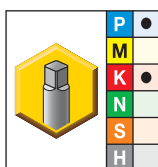
D	tolerance h6
12-18	+0, -0,011
20-30	+0, -0,013
32-36	+0, -0,016

Taps



KP6525 • TiCN+TiN for tapping steel and cast iron.

■ **T630 • Extra Long • Form C Semi-Bottoming Chamfer • Larger Sizes • Metric**

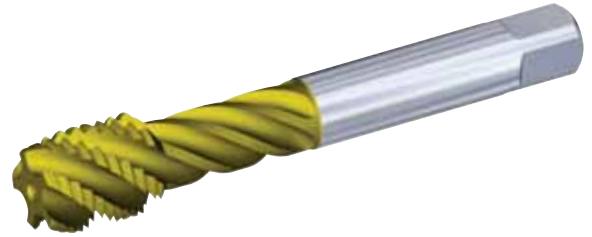
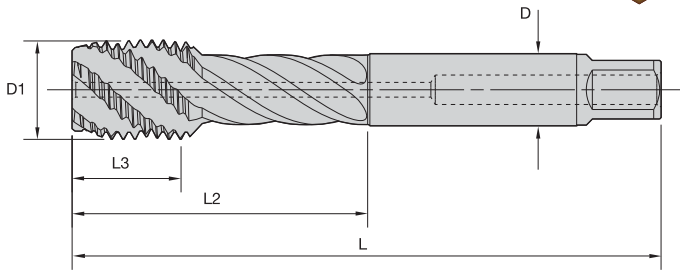


● first choice
○ alternate choice

KP6525	D1 size	L	L3	L2	D	number of flutes	class of fit
T630M240X300R6HX-XL	M24 x 3	200	30	120	18,0	5	6HX
T630M300X350R6HX-XL	M30 x 3,5	250	35	150	22,0	5	6HX
T630M330X350R6HX-XL	M33 x 3,5	250	35	150	25,0	5	6HX
T630M360X400R6HX-XL	M36 x 4	250	40	150	28,0	5	6HX
T630M420X450R6HX-XL	M42 x 4,5	300	45	180	32,0	5	6HX

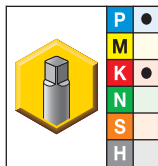
Shank Tolerance

D	tolerance h6
12-18	+0, -0,011
20-30	+0, -0,013
32-36	+0, -0,016



KP6525 • TiCN+TiN for tapping steel and cast iron.

■ **T631 • DIN 376 • Form C Semi-Bottoming Chamfer • Through Coolant • Larger Sizes • Metric**

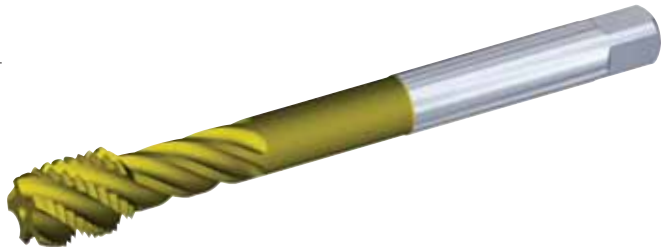
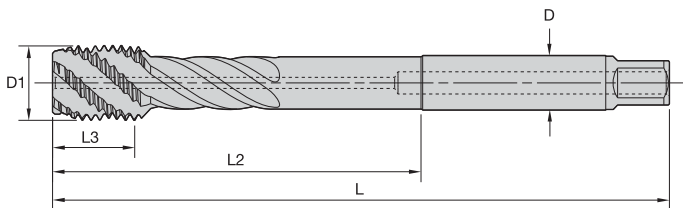


- first choice
- alternate choice

KP6525	D1 size	L	L3	L2	D	number of flutes	class of fit
T631M240X300R6HX-D6	M24 x 3	160	30	77	18,0	5	6HX
T631M300X350R6HX-D6	M30 x 3,5	180	35	91	22,0	5	6HX
T631M330X350R6HX-D6	M33 x 3,5	180	35	100	25,0	5	6HX
T631M360X400R6HX-D6	M36 x 4	200	40	110	28,0	5	6HX
T631M420X450R6HX-D6	M42 x 4,5	200	45	120	32,0	5	6HX

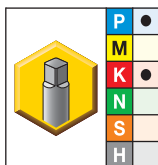
Shank Tolerance

D	tolerance h6
12-18	+0, -0,011
20-30	+0, -0,013
32-36	+0, -0,016



KP6525 • TiCN+TiN for tapping steel and cast iron.

■ **T631 • Extra Long • Form C Semi-Bottoming Chamfer • Through Coolant • Larger Sizes • Metric**

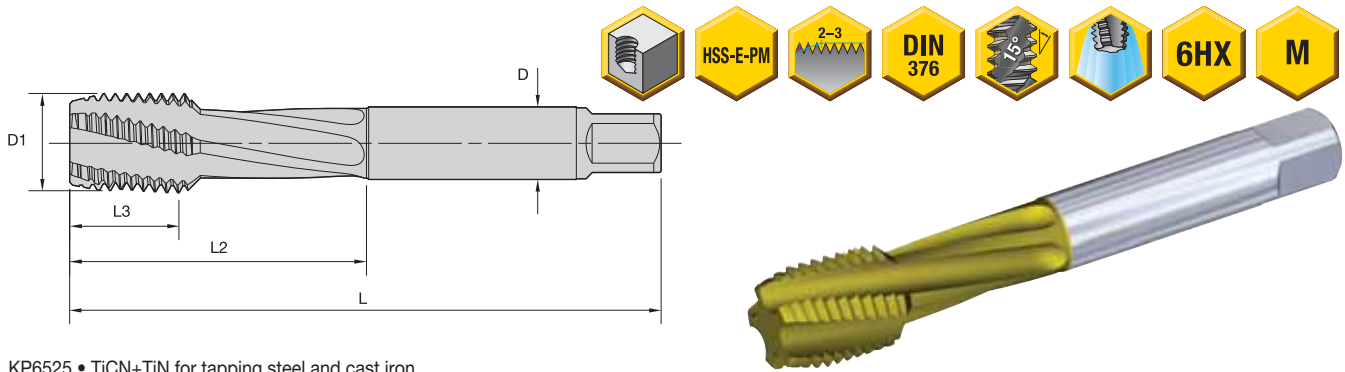


- first choice
- alternate choice

KP6525	D1 size	L	L3	L2	D	number of flutes	class of fit
T631M240X300R6HX-XL	M24 x 3	200	30	120	18,0	5	6HX
T631M300X350R6HX-XL	M30 x 3,5	250	35	150	22,0	5	6HX
T631M330X350R6HX-XL	M33 x 3,5	250	35	150	25,0	5	6HX
T631M360X400R6HX-XL	M36 x 4	250	40	150	28,0	5	6HX
T631M420X450R6HX-XL	M42 x 4,5	300	45	180	32,0	5	6HX

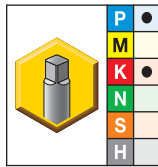
Shank Tolerance

D	tolerance h6
12-18	+0, -0,011
20-30	+0, -0,013
32-36	+0, -0,016



KP6525 • TiCN+TiN for tapping steel and cast iron.

■ **T650 • DIN 376 • Form C Semi-Bottoming Chamfer • Larger Sizes • Metric**



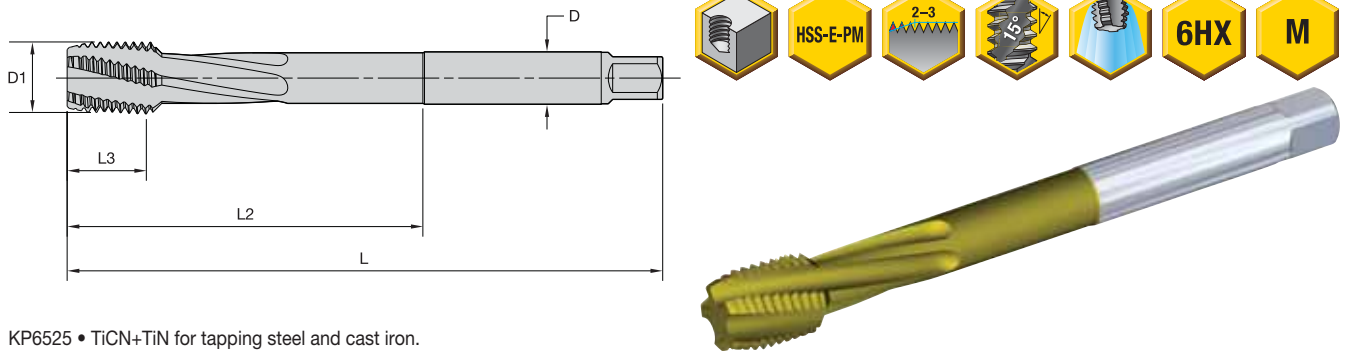
- first choice
- alternate choice

KP6525		D1 size	L	L3	L2	D	number of flutes	class of fit
T650M240X300R6HX-D6		M24 x 3	160	30	77	18,0	4	6HX
T650M300X350R6HX-D6		M30 x 3,5	180	35	91	22,0	5	6HX
T650M330X350R6HX-D6		M33 x 3,5	180	35	100	25,0	5	6HX
T650M360X400R6HX-D6		M36 x 4	200	40	110	28,0	5	6HX
T650M420X450R6HX-D6		M42 x 4,5	200	45	120	32,0	6	6HX

Shank Tolerance

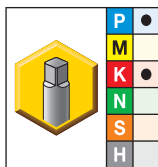
D	tolerance h6
12-18	+0, -0,011
20-30	+0, -0,013
32-36	+0, -0,016

Taps



KP6525 • TiCN+TiN for tapping steel and cast iron.

■ **T650 • Extra Long • Form C Semi-Bottoming Chamfer • Larger Sizes • Metric**

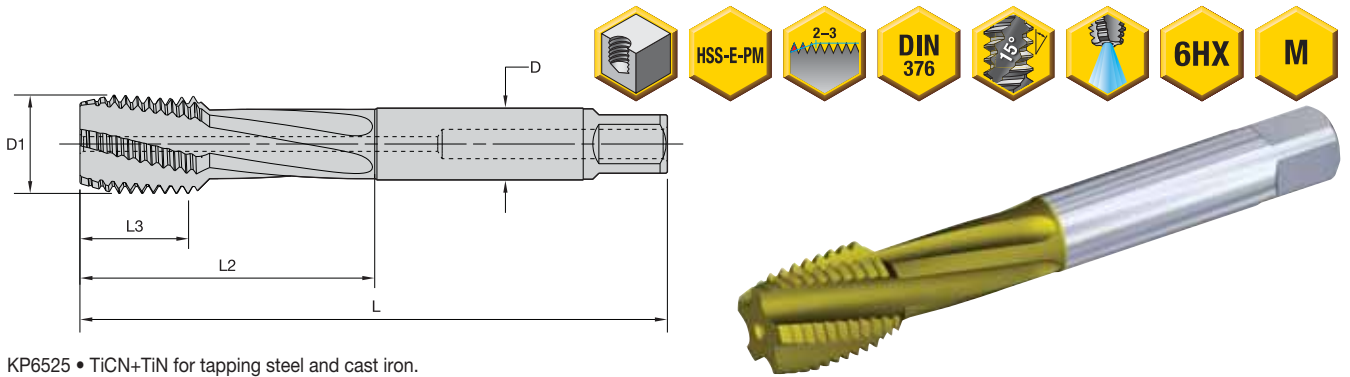


- first choice
- alternate choice

KP6525		D1 size	L	L3	L2	D	number of flutes	class of fit
T650M240X300R6HX-XL		M24 x 3	200	30	120	18,0	4	6HX
T650M300X350R6HX-XL		M30 x 3,5	250	35	150	22,0	5	6HX
T650M330X350R6HX-XL		M33 x 3,5	250	35	150	25,0	5	6HX
T650M360X400R6HX-XL		M36 x 4	250	40	150	28,0	5	6HX
T650M420X450R6HX-XL		M42 x 4,5	300	45	180	32,0	6	6HX

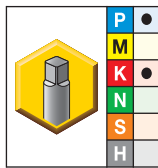
Shank Tolerance

D	tolerance h6
12-18	+0, -0,011
20-30	+0, -0,013
32-36	+0, -0,016



KP6525 • TiCN+TiN for tapping steel and cast iron.

■ T651 • DIN 376 • Form C Semi-Bottoming Chamfer • Through Hole • Larger Sizes • Metric

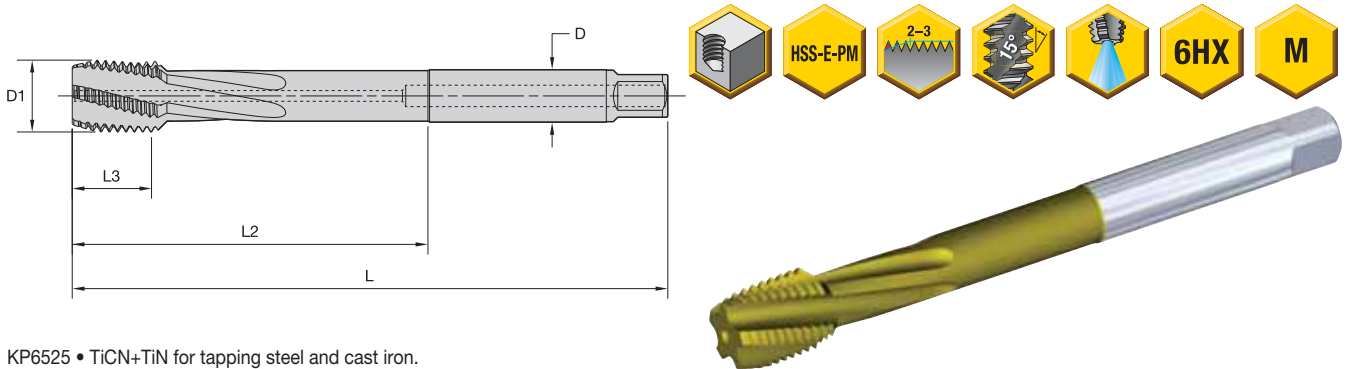


- first choice
- alternate choice

KP6525	D1 size	L	L3	L2	D	number of flutes	class of fit
T651M240X300R6HX-D6	M24 x 3	160	30	77	18,0	4	6HX
T651M300X350R6HX-D6	M30 x 3,5	180	35	91	22,0	5	6HX
T651M330X350R6HX-D6	M33 x 3,5	180	35	100	25,0	5	6HX
T651M360X400R6HX-D6	M36 x 4	200	40	110	28,0	5	6HX
T651M420X450R6HX-D6	M42 x 4,5	200	45	120	32,0	6	6HX

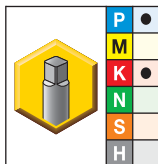
Shank Tolerance

D	tolerance h6
12-18	+0, -0,011
20-30	+0, -0,013
32-36	+0, -0,016



KP6525 • TiCN+TiN for tapping steel and cast iron.

■ T651 • Extra Long • Form C Semi-Bottoming Chamfer • Through Coolant • Larger Sizes • Metric



- first choice
- alternate choice

KP6525	D1 size	L	L3	L2	D	number of flutes	class of fit
T651M240X300R6HX-XL	M24 x 3	200	30	120	18,0	4	6HX
T651M300X350R6HX-XL	M30 x 3,5	250	35	150	22,0	5	6HX
T651M330X350R6HX-XL	M33 x 3,5	250	35	150	25,0	5	6HX
T651M360X400R6HX-XL	M36 x 4	250	40	150	28,0	5	6HX
T651M420X450R6HX-XL	M42 x 4,5	300	45	180	32,0	6	6HX

Shank Tolerance

D	tolerance h6
12-18	+0, -0,011
20-30	+0, -0,013
32-36	+0, -0,016

Material Group	 Through Holes					 Blind Holes					
	Tap Style	Grade	Range – m/min			Tap Style	Grade	Range – m/min			
			min	Starting Value	max			min	Starting Value	max	
P	1	T620	KP6525	20	30	45	T630,T632,T650	KP6525	14	21	32
		T622	KSP21	18	30	50	T622	KSP21	13	21	35
	2	T620	KP6525	17	25	38	T630,T632,T650	KP6525	12	18	26
		T622	KSP21	15	25	42	T622	KSP21	10	18	29
	3	T620	KP6525	12	15	20	T630,T632,T650	KP6525	8	11	14
	4	T600	KSP21	5	6	8	T602, T604	KSP21	3	4	5
5	T620	KP6525	12	15	20	T630,T632,T650	KP6525	8	11	14	
6	T600	KSP21	6	8	10	T602, T604	KSP21	4	6	7	
M	1	T620	KM6515	12	15	20	T630,T632,T650	KM6515	8	11	14
	2	T620	KM6515	9	12	16	T630,T632,T650	KM6515	6	8	11
	3	T620	KM6515	8	10	13	T630,T632,T650	KM6515	5	7	9
K	1	T640	KP6525	35	45	59	T640, T642	KP6525	24	32	41
	2	T640	KP6525	31	40	52	T640, T642	KP6525	22	28	36
	3	T640	KP6525	23	30	39	T640, T642	KP6525	16	21	27
N	1	T670	KSN38	42	55	72	T680	KSN38	30	39	50
		T622	KSN28	37	55	83	T622	KSN28	26	39	58
	2	T640	KP6525	38	50	65	T640, T642	KP6525	27	35	46
		T622	KSN28	33	50	75	T622	KSN28	23	35	53
4	T640	KP6525	4	6	9	T640, T642	KP6525	3	4	5	
S	1	T620	KP6525	8	12	18	T630, T632	KP6525	6	8	11
	2	T610	KSSH22	3	5	8	T612	KSSH22	3	4	5
	3	T610	KSSH22	3	4	6	T612	KSSH22	2	3	4
	4	T614	KSN25	3	4	6	T616	KSN25	2	3	4
H	1	T606	KSSH22	1,3	2,0	3,0	T606	KSSH22	1,1	1,4	1,8
	2	T606	KSSH22	1,0	1,5	2,3	T606	KSSH22	0,8	1,1	1,4

NOTE: Increase speed by up to 25% when using coolant taps (T621,T623,T631,T633,T641,T643,T651).
Use grade KP6505™ in steels. Use 50% of the recommended speed listed for grade KP6525™.

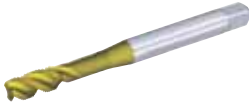
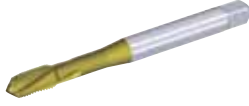

Taps

Material Group	Through Holes					Blind Holes					
	Tap Style	Grade	Range – SFM			Tap Style	Grade	Range – SFM			
			min	Starting Value	max			min	Starting Value	max	
P	1	T620	KP6525	70	100	150	T630,T632,T650	KP6525	50	70	100
		T622	KSP21	60	100	160	T622	KSP21	40	70	120
	2	T620	KP6525	50	80	120	T630,T632,T650	KP6525	40	60	90
		T622	KSP21	50	80	140	T622	KSP21	30	60	100
	3	T620	KP6525	40	50	60	T630,T632,T650	KP6525	30	30	40
	4	T600	KSP21	15	20	26	T602, T604	KSP21	11	14	18
5	T620	KP6525	40	50	60	T630,T632,T650	KP6525	30	30	40	
6	T600	KSP21	20	30	30	T602, T604	KSP21	10	20	20	
M	1	T620	KM6515	40	50	60	T630,T632,T650	KM6515	30	30	40
	2	T620	KM6515	30	40	50	T630,T632,T650	KM6515	20	30	40
	3	T620	KM6515	30	30	40	T630,T632,T650	KM6515	20	20	30
K	1	T640	KP6525	110	150	190	T640, T642	KP6525	80	100	130
	2	T640	KP6525	100	130	170	T640, T642	KP6525	70	90	120
	3	T640	KP6525	80	100	130	T640, T642	KP6525	50	70	90
N	1	T670	KSN38	140	180	230	T680	KSN38	100	130	160
		T622	KSN28	120	180	270	T622	KSN28	80	130	190
	2	T640	KP6525	130	160	210	T640, T642	KP6525	90	110	150
		T622	KSN28	110	160	250	T622	KSN28	80	110	170
4	T640	KP6525	13	20	30	T640, T642	KP6525	11	14	18	
S	1	T620	KP6525	30	40	60	T630, T632	KP6525	21	28	36
	2	T610	KSSH22	11	16	25	T612	KSSH22	9	11	15
	3	T610	KSSH22	9	13	20	T612	KSSH22	7	9	12
	4	T614	KSN25	9	13	20	T616	KSN25	7	9	12
H	1	T606	KSSH22	4	7	10	T606	KSSH22	4	5	6
	2	T606	KSSH22	3	5	7	T606	KSSH22	3	3	4






NOTE: Increase speed by up to 25% when using coolant taps (T621,T623,T631,T633,T641,T643,T651).
Use grade KP6505™ in steels. Use 50% of the recommended speed listed for grade KP6525™.



Steel • >32 HRC

typical thread sizes		required tap drill diameter				P		
						HSS-E-PM Taps – Tapping Steel >32 HRC		
cutting taps metric	inch	mm	inch	fraction	wire			
						blind hole T630_KP6525	through hole T620_KP6525	blind hole with coolant T631_KP6525
M3 x 0,50	—	2,500	.0984	—	—	T630M030X050R6HX-D1	T620M030X050R6HX-D1	—
—	5-40	2,578	.1015	—	38	T630NC#05-40R3BX-A	T620NC#05-40R3BX-A	—
—	6-32	2,705	.1065	—	36	T630NC#06-32R2BX-A	T620NC#06-32R2BX-A	—
M4 x 0,70	—	3,300	.1299	—	—	T630M040X070R6HX-D1	T620M040X070R6HX-D1	—
—	8-32	3,454	.1360	—	29	T630NC#08-32R2BX-A	T620NC#08-32R2BX-A	—
—	8-36	3,454	.1360	—	29	T630NF#08-36R3BX-A	T620NF#08-36R3BX-A	—
—	10-24	3,734	.1470	—	26	T630NC#10-24R3BX-A	T620NC#10-24R3BX-A	—
—	10-32	4,039	.1590	—	21	T630NF#10-32R2BX-A	T620NF#10-32R2BX-A	—
M5 x 0,80	—	4,200	.1654	—	—	T630M050X080R6HX-D1	T620M050X080R6HX-D1	T631M050X080R6HX-D1
—	12-24	4,496	.1770	—	16	T630NC#12-24R3BX-A	T620NC#12-24R3BX-A	—
M6 x 1,00	—	5,000	.1969	—	—	T630M060X100R6HX-D1	T620M060X100R6HX-D1	T631M060X100R6HX-D1
—	1/4-20	5,106	.2010	—	7	T630NC02500-20R2BX-A	T620NC02500-20R2BX-A	—
—	1/4-28	5,410	.2130	—	3	T630NF02500-28R2BX-A	T620NF02500-28R2BX-A	—
—	5/16-18	6,528	.2570	—	F	T630NC03125-18R2BX-A	T620NC03125-18R2BX-A	—
M8 x 1,25	—	6,700	.2638	—	—	T630M080X125R6HX-D1	T620M080X125R6HX-D1	T631M080X125R6HX-D1
M8 x 1,00	—	7,000	.2756	—	—	T630MF080X100R6HX D4	T620MF080X100R6HX D4	T631MF080X100R6HX D4
—	3/8-16	7,938	.3125	5/16	—	T630NC03750-16R3BX-A	T620NC03750-16R3BX-A	—
—	3/8-24	8,433	.3320	—	Q	T630NF03750-24R3BX-A	T620NF03750-24R3BX-A	—
M10 x 1,50	—	8,500	.3346	—	—	T630M100X150R6HX-D1	T620M100X150R6HX-D1	T631M100X150R6HX-D1
M10 x 1,25	—	8,700	.3425	—	—	T630MF100X125R6HX D4	—	T631MF100X125R6HX D4
M10 x 1,00	—	9,000	.3543	—	—	T630MF100X100R6HX D4	T620MF100X100R6HX D4	T631MF100X100R6HX D4
—	7/16-14	9,093	.3580	—	T	T630NC04375-14R3BX-A	T620NC04375-14R3BX-A	—
—	7/16-20	9,921	.3906	25/64	—	T630NF04375-20R3BX-A	T620NF04375-20R3BX-A	—
M12 x 1,75	—	10,200	.4016	—	—	T630M120X175R6HX-D6	T620M120X175R6HX-D6	T631M120X175R6HX-D6
M12 x 1,50	—	10,500	.4134	—	—	T630MF120X150R6HX-D4	T620MF120X150R6HX-D4	T631MF120X150R6HX-D4
—	1/2-13	10,716	.4219	27/64	—	T630NC05000-13R3BX-A	T620NC05000-13R3BX-A	—
M12 x 1,25	—	10,800	.4252	—	—	—	—	T631MF120X125R6HX-D4
—	1/2-20	11,509	.4531	29/64	—	T630NF05000-20R3BX-A	T620NF05000-20R3BX-A	—
M14 x 2,00	—	12,000	.4724	—	—	T630M140X200R6HX-D6	T620M140X200R6HX-D6	T631M140X200R6HX-D6
M14 x 1,50	—	12,500	.4921	—	—	T630MF140X150R6HX-D4	T620MF140X150R6HX-D4	T631MF140X150R6HX-D4
M16 x 2,00	—	14,000	.5512	—	—	T630M160X200R6HX-D6	T620M160X200R6HX-D6	T631M160X200R6HX-D6
M16 x 1,50	—	14,500	.5709	—	—	T630MF160X150R6HX-D4	T620MF160X150R6HX-D4	T631MF160X150R6HX-D4
M18 x 2,50	—	15,500	.6102	—	—	T630M180X250R6HX-D6	—	T631M180X250R6HX-D6
M18 x 1,50	—	16,500	.6496	—	—	T630MF180X150R6HX-D4	T620MF180X150R6HX-D4	T631MF180X150R6HX-D4
—	3/4-10	16,670	.6563	21/32	—	T630NC07500-10R3BX-A	T620NC07500-10R3BX-A	—
M20 x 2,50	—	17,500	.6890	—	—	T630M200X250R6HX-D6	T620M200X250R6HX-D6	T631M200X250R6HX-D6

Taps

HSS-E-PM Taps – Tapping Steel >32 HRC  through hole with coolant T621_KP6525	P Recommended SC Drill		All Materials Alternate Tap Drill	
	 approximately 3 x D with coolant B224_HP KCPK15	 approximately 5 x D with coolant B225_HP KCPK15	 approximately 3 x D with coolant B976_KC7315	 approximately 5 x D with coolant B977_KC7315
–	–	–	B976Z02500	–
–	–	–	B976Z02578	–
–	–	–	B976Z02705	–
–	B224A03300HP	B225A03300HP	B976A03300	B977A03300
–	–	–	B976A03454	B977A03454
–	–	–	B976A03454	B977A03454
–	–	–	B976A03734	B977A03734
–	–	–	B976A04039	B977A04039
T621M050X080R6HX-D1	B224A04200HP	B225A04200HP	B976A04200	B977A04200
–	B224A04496HP	B225A04496HP	B976A04496	B977A04496
T621M060X100R6HX-D1	B224A05000HP	B225A05000HP	B976A05000	B977A05000
–	B224A05106HP	B225A05106HP	B976A05106	B977A05106
–	B224A05410HP	B225A05410HP	B976A05410	B977A05410
–	B224A06528HP	B225A06528HP	B976A06528	B977A06528
T621M080X125R6HX-D1	B224A06700HP	B225A06700HP	B976A06700	B977A06700
T621MF080X100R6HX-D4	B224A07000HP	B225A07000HP	B976A07000	B977A07000
–	B224A07938HP	B225A07938HP	B976A07938	B977A07938
–	B224A08433HP	B225A08433HP	B976A08433	B977A08433
T621M100X150R6HX-D1	B224A08500HP	B225A08500HP	B976A08500	B977A08500
T621MF100X125R6HX-D4	B224A08700HP	B225A08700HP	B976A08700	B977A08700
T621MF100X100R6HX-D4	B224A09000HP	B225A09000HP	B976A09000	B977A09000
–	B224A09093HP	B225A09093HP	B976A09093	B977A09093
–	B224A09921HP	B225A09921HP	B976A09921	B977A09921
T621M120X175R6HX-D6	B224A10200HP	B225A10200HP	B976A10200	B977A10200
T621MF120X150R6HX-D4	B224A10500HP	B225A10500HP	B976A10500	B977A10500
–	B224A10716HP	B225A10716HP	B976A10716	B977A10716
T621MF120X125R6HX-D4	B224A10800HP	B225A10800HP	B976A10800	B977A10800
–	B224A11509HP	B225A11509HP	B976A11509	B977A11509
T621M140X200R6HX-D6	B224A12000HP	B225A12000HP	B976A12000	B977A12000
T621MF140X150R6HX-D4	B224A12500HP	B225A12500HP	B976A12500	B977A12500
T621M160X200R6HX-D6	B224A14000HP	B225A14000HP	B976A14000	B977A14000
T621MF160X150R6HX-D4	B224A14500HP	B225A14500HP	B976A14500	B977A14500
T621M180X250R6HX-D6	B224A15500HP	B225A15500HP	B976A15500	B977A15500
T621MF180X150R6HX-D4	B224A16500HP	B225A16500HP	B976A16500	B977A16500
–	–	B225A16670HP	B976A16670	B977A16670
–	B224A17500HP	B225A17500HP	B976A17500	B977A17500







Steel • 32–44 HRC

typical thread sizes		required tap drill diameter				P HSS-E-PM Taps — Tapping Steel 32–44 HRC		
						blind hole T602_KSP21	blind hole (3 x D) T604_KSH26	through hole T600_KSP21
cutting taps		mm	inch	fraction	wire			
metric								
M3 x 0,50	2,500	.0984	—	—	T602M030X050R6HX-D1	T604M030X050R6HX-D1	T600M030X050R6HX-D1	
M4 x 0,70	3,300	.1299	—	—	T602M040X070R6HX-D1	T604M040X070R6HX-D1	T600M040X070R6HX-D1	
M5 x 0,80	4,200	.1654	—	—	T602M050X080R6HX-D1	T604M050X080R6HX-D1	T600M050X080R6HX-D1	
M6 x 1,00	5,000	.1969	—	—	T602M060X100R6HX-D1	T604M060X100R6HX-D1	T600M060X100R6HX-D1	
M8 x 1,25	6,700	.2638	—	—	T602M080X125R6HX-D1	T604M080X125R6HX-D1	T600M080X125R6HX-D1	
M8 x 1,00	7,000	.2756	—	—	T602MF080X100R6HX D4	T604MF080X100R6HX D4	T600MF080X100R6HX D4	
M10 x 1,50	8,500	.3346	—	—	T602M100X150R6HX-D1	T604M100X150R6HX-D1	T600M100X150R6HX-D1	
M10 x 1,25	8,700	.3425	—	—	T602MF100X125R6HX D4	T604MF100X125R6HX D4	T600MF100X125R6HX D4	
M10 x 1,00	9,000	.3543	—	—	T602MF100X100R6HX D4	T604MF100X100R6HX D4	T600MF100X100R6HX D4	
M12 x 1,75	10,200	.4016	—	—	T602M120X175R6H-D6	T604M120X175R6H-D6	T600M120X175R6HX-D6	
M12 x 1,50	10,500	.4134	—	—	T602MF120X150R6H-D4	T604MF120X150R6H-D4	T600MF120X150R6HX-D4	
M12 x 1,25	10,800	.4252	—	—	T602MF120X125R6H D4	T604MF120X125R6H D4	T600MF120X125R6HX D4	
M14 x 2,00	12,000	.4724	—	—	T602M140X200R6H-D6	T604M140X200R6H-D6	T600M140X200R6HX-D6	
M14 x 1,50	12,500	.4921	—	—	T602MF140X150R6H-D4	T604MF140X150R6H-D4	T600MF140X150R6HX-D4	
M16 x 2,00	14,000	.5512	—	—	T602M160X200R6H-D6	T604M160X200R6H-D6	T600M160X200R6HX-D6	
M16 x 1,50	14,500	.5709	—	—	T602MF160X150R6H-D4	T604MF160X150R6H-D4	T600MF160X150R6HX-D4	
M18 x 2,50	15,500	.6102	—	—	T602M180X250R6H-D6	—	—	
M18 x 1,50	16,500	.6496	—	—	T602MF180X150R6H-D4	T604MF180X150R6H-D4	T600MF180X150R6HX-D4	
M20 x 2,50	17,500	.6890	—	—	T602M200X250R6H-D6	T604M200X250R6H-D6	T600M200X250R6HX-D6	





Taps

Steel • Forming Taps

typical thread sizes		required tap drill diameter				P HSS-E-PM Taps — Forming Steel >32 HRC	
						blind and through hole T622_KSP21	blind and through hole with coolant T623_KSP21
forming taps		mm	inch	fraction	wire		
metric							
M3 x 0,50	2,800	.1102	—	—	T622M030X050R6HX-D74	—	
M4 x 0,70	3,700	.1457	—	—	T622M040X070R6HX-D74	—	
M5 x 0,80	4,700	.1850	—	13	T622M050X080R6HX-D74	T623M050X080R6HX-D74	
M6 x 1,00	5,600	.2205	—	—	T622M060X100R6HX-D74	T623M060X100R6HX-D74	
M8 x 1,25	7,400	.2913	—	—	T622M080X125R6HX-D74	T623M080X125R6HX-D74	
M8 x 1,00	7,600	.2992	—	—	T622MF080X100R6HX-D74	T623MF080X100R6HX-D74	
M10 x 1,50	9,400	.3701	—	—	T622M100X150R6HX-D74	T623M100X150R6HX-D74	
M10 x 1,00	9,500	.3740	—	—	T622MF100X100R6HX-D74	T623MF100X100R6HX-D74	
M12 x 1,75	11,300	.4449	—	—	T622M120X175R6HX-D74	T623M120X175R6HX-D74	
M12 x 1,50	11,300	.4449	—	—	T622MF120X150R6HX-D74	T623MF120X150R6HX-D74	
M12 x 1,25	11,500	.4528	—	—	T622MF120X125R6HX-D74	T623MF120X125R6HX-D74	
M14 x 1,50	13,400	.5276	—	—	T622MF140X150R6HX-D74	T623MF140X150R6HX-D74	
M16 x 2,00	15,200	.5984	—	—	T622M160X200R6HX-D74	T623M160X200R6HX-D74	
M16 x 1,50	15,400	.6063	—	—	T622MF160X150R6HX-D74	T623MF160X150R6HX-D74	

P Recommended SC Drill		All Materials Alternate Tap Drill	
			
approximately 3 x D with coolant B224_HP KCPK15	approximately 5 x D with coolant B225_HP KCPK15	approximately 3 x D with coolant B976_KC7315	approximately 5 x D with coolant B977_KC7315
—	—	B976Z02500	—
B224A03300HP	B225A03300HP	B976A03300	B977A03300
B224A04200HP	B225A04200HP	B976A04200	B977A04200
B224A05000HP	B225A05000HP	B976A05000	B977A05000
B224A06700HP	B225A06700HP	B976A06700	B977A06700
B224A07000HP	B225A07000HP	B976A07000	B977A07000
B224A08500HP	B225A08500HP	B976A08500	B977A08500
B224A08700HP	B225A08700HP	B976A08700	B977A08700
B224A09000HP	B225A09000HP	B976A09000	B977A09000
B224A10200HP	B225A10200HP	B976A10200	B977A10200
B224A10500HP	B225A10500HP	B976A10500	B977A10500
B224A10800HP	B225A10800HP	B976A10800	B977A10800
B224A12000HP	B225A12000HP	B976A12000	B977A12000
B224A12500HP	B225A12500HP	B976A12500	B977A12500
B224A14000HP	B225A14000HP	B976A14000	B977A14000
B224A14500HP	B225A14500HP	B976A14500	B977A14500
B224A15500HP	B225A15500HP	B976A15500	B977A15500
B224A16500HP	B225A16500HP	B976A16500	B977A16500
B224A17500HP	B225A17500HP	B976A17500	B977A17500








P Recommended SC Drill		All Materials Alternate Tap Drill	
			
approximately 3 x D with coolant B224_HP KCPK15	approximately 5 x D with coolant B225_HP KCPK15	approximately 3 x D with coolant B976_KC7315	approximately 5 x D with coolant B977_KC7315
—	—	B976Z02800	—
B224A03700HP	B225A03700HP	B976A03700	B977A03700
B224A04700HP	B225A04700HP	B976A04700	B977A04700
B224A05600HP	B225A05600HP	B976A05600	B977A05600
B224A07400HP	B225A07400HP	B976A07400	B977A07400
—	B225A07600HP	—	B977A07600
B224A09400HP	B225A09400HP	B976A09400	B977A09400
B224A09500HP	B225A09500HP	B976A09500	B977A09500
—	B225A11300HP	B976A11300	B977A11300
—	B225A11300HP	B976A11300	B977A11300
B224A11500HP	B225A11500HP	B976A11500	B977A11500
—	B225A13400HP	—	—
—	B225A15200HP	—	—
—	B225A15400HP	—	—

Stainless Steel

typical thread sizes		required tap drill diameter				M HSS-E-PM Taps		
cutting taps		mm	inch	fraction	wire	blind hole	through hole	blind hole
metric	inch					T630_KM6515	T620_KM6515	T631_KM6515
—	2-56	1.778	0.07	—	50	T630NC#02-56R3BX-A	T620NC#02-56R3BX-A	—
—	4-40	2.261	0.089	—	43	T630NC#04-40R2BX-A	T620NC#04-40R2BX-A	—
M3 x 0,50	—	2.500	.0984	—	—	T630M030X050R6HX-D1	T620M030X050R6HX-D1	—
—	5-40	2.578	.1015	—	38	T630NC#05-40R2BX-A	T620NC#05-40R2BX-A	—
—	6-32	2.705	.1065	—	36	T630NC#06-32R2BX-A	T620NC#06-32R2BX-A	—
M4 x 0,70	—	3.300	.1299	—	—	T630M040X070R6HX-D1	T620M040X070R6HX-D1	—
—	8-32	3.454	.1360	—	29	T630NC#08-32R2BX-A	T620NC#08-32R2BX-A	—
—	8-36	3.454	.1360	—	29	T630NF#08-36R3BX-A	T620NF#08-36R3BX-A	—
—	10-24	3.734	.1470	—	26	T630NC#10-24R3BX-A	T620NC#10-24R3BX-A	—
—	10-32	4.039	.1590	—	21	T630NF#10-32R2BX-A	T620NF#10-32R2BX-A	—
M5 x 0,80	—	4.200	.1654	—	—	T630M050X080R6HX-D1	T620M050X080R6HX-D1	T631M050X080R6HX-D1
—	12-24	4.496	.1770	—	16	T630NC#12-24R3BX-A	T620NC#12-24R3BX-A	—
M6 x 1,00	—	5.000	.1969	—	—	T630M060X100R6HX-D1	T620M060X100R6HX-D1	T631M060X100R6HX-D1
—	1/4-20	5.106	.2010	—	7	T630NC02500-20R2BX-A	T620NC02500-20R2BX-A	—
—	1/4-28	5.410	.2130	—	3	T630NF02500-28R2BX-A	T620NF02500-28R2BX-A	—
—	5/16-18	6.528	.2570	—	F	T630NC03125-18R2BX-A	T620NC03125-18R2BX-A	—
M8 x 1,25	—	6.700	.2638	—	—	T630M080X125R6HX-D1	T620M080X125R6HX-D1	T631M080X125R6HX-D1
—	5/16-24	6.909	.2720	—	I	—	T620NF03125-24R3BX-A	—
M8 x 1,00	—	7.000	.2756	—	—	T630MF080X100R6HX D4	T620MF080X100R6HX D4	T631MF080X100R6HX D4
—	3/8-16	7.938	.3125	5/16	—	T630NC03750-16R3BX-A	T620NC03750-16R3BX-A	—
—	3/8-24	8.433	.3320	—	Q	T630NF03750-24R3BX-A	T620NF03750-24R3BX-A	—
M10 x 1,50	—	8.500	.3346	—	—	T630M100X150R6HX-D1	T620M100X150R6HX-D1	T631M100X150R6HX-D1
M10 x 1,25	—	8.700	.3425	—	—	T630MF100X125R6HX D4	—	T631MF100X125R6HX D4
M10 x 1,00	—	9.000	.3543	—	—	T630MF100X100R6HX D4	T620MF100X100R6HX D4	T631MF100X100R6HX D4
—	7/16-14	9.093	.3580	—	T	T630NC04375-14R3BX-A	T620NC04375-14R3BX-A	—
—	7/16-20	9.921	.3906	25/64	—	T630NF04375-20R3BX-A	T620NF04375-20R3BX-A	—
M12 x 1,75	—	10.200	.4016	—	—	T630M120X175R6HX-D6	T620M120X175R6HX-D6	T631M120X175R6HX-D6
M12 x 1,50	—	10.500	.4134	—	—	T630MF120X150R6HX-D4	T620MF120X150R6HX-D4	T631MF120X150R6HX-D4
—	1/2-13	10.716	.4219	27/64	—	T630NC05000-13R3BX-A	T620NC05000-13R3BX-A	—
M12 x 1,25	—	10.800	.4252	—	—	—	—	T631MF120X125R6HX-D4
—	1/2-20	11.509	.4531	29/64	—	T630NF05000-20R3BX-A	T620NF05000-20R3BX-A	—
M14 x 2,00	—	12.000	.4724	—	—	T630M140X200R6HX-D6	T620M140X200R6HX-D6	T631M140X200R6HX-D6
M14 x 1,50	—	12.500	.4921	—	—	T630MF140X150R6HX-D4	T620MF140X150R6HX-D4	T631MF140X150R6HX-D4
M14 x 1,25	—	12.800	.5039	—	—	—	—	T631MF140X125R6HX-D4
—	5/8-11	13.495	.5313	17/32	—	T630NC06250-10R3BX-A	T620NC06250-10R3BX-A	—
M16 x 2,00	—	14.000	.5512	—	—	T630M160X200R6HX-D6	T620M160X200R6HX-D6	T631M160X200R6HX-D6
M16 x 1,50	—	14.500	.5709	—	—	T630MF160X150R6HX-D4	T620MF160X150R6HX-D4	T631MF160X150R6HX-D4
M18 x 2,50	—	15.500	.6102	—	—	T630M180X250R6HX-D6	—	T631M180X250R6HX-D6
M18 x 1,50	—	16.500	.6496	—	—	T630MF180X150R6HX-D4	T620MF180X150R6HX-D4	T631MF180X150R6HX-D4
—	3/4-10	16.670	.6563	21/32	—	T630NC07500-10R3BX-A	T620NC07500-10R3BX-A	—
M20 x 2,50	—	17.500	.6890	—	—	T630M200X250R6HX-D6	T620M200X250R6HX-D6	—



Taps

HSS-E-PM Taps	M		All Materials	
	Recommended Drill		Alternative Tap Drill	
 through hole with coolant T621_KM6515	 approximately 3 x D with coolant B210_HP KCM15	 approximately 5 x D with coolant B211_HP KCM15	 approximately 3 x D with coolant B976_KC7315	 approximately 5 x D with coolant B977_KC7315
—	—	—	—	—
—	—	—	B976Z02500	—
—	—	—	B976Z02578	—
—	—	—	B976Z02705	—
—	B210A03300HP	B211A03300HP	B976A03300	B977A03300
—	—	B211A03454HP	B976A03454	B977A03454
—	—	B211A03454HP	B976A03454	B977A03454
—	—	—	B976A03734	B977A03734
—	—	—	B976A04039	B977A04039
T621M050X080R6HX-D1	B210A04200HP	B211A04200HP	B976A04200	B977A04200
—	—	—	B976A04496	B977A04496
T621M060X100R6HX-D1	B210A05000HP	B211A05000HP	B976A05000	B977A05000
—	B210A05106HP	—	B976A05106	B977A05106
—	B210A05410HP	—	B976A05410	B977A05410
—	B210A06528HP	—	B976A06528	B977A06528
T621M080X125R6HX-D1	B210A06700HP	B211A06700HP	B976A06700	B977A06700
—	—	—	B976A06909	B977A06909
T621MF080X100R6HX-D4	B210A07000HP	B211A07000HP	B976A07000	B977A07000
—	B210A07938HP	—	B976A07938	B977A07938
—	B210A08433HP	—	B976A08433	B977A08433
T621M100X150R6HX-D1	B210A08500HP	B211A08500HP	B976A08500	B977A08500
T621MF100X125R6HX-D4	B210A08700HP	B211A08700HP	B976A08700	B977A08700
T621MF100X100R6HX-D4	B210A09000HP	B211A09000HP	B976A09000	B977A09000
—	B210A09093HP	—	B976A09093	B977A09093
—	B210A09921HP	—	B976A09921	B977A09921
T621M120X175R6HX-D6	B210A10200HP	B211A10200HP	B976A10200	B977A10200
T621MF120X150R6HX-D4	B210A10500HP	B211A10500HP	B976A10500	B977A10500
—	B210A10716HP	—	B976A10716	B977A10716
T621MF120X125R6HX-D4	B210A10800HP	B211A10800HP	B976A10800	B977A10800
—	B210A11509HP	—	B976A11509	B977A11509
T621M140X200R6HX-D6	B210A12000HP	B211A12000HP	B976A12000	B977A12000
T621MF140X150R6HX-D4	B210A12500HP	B211A12500HP	B976A12500	B977A12500
—	B210A12800HP	B211A12800HP	B976A12800	B977A12800
—	B210A13495HP	—	B976A13495	B977A13495
T621M160X200R6HX-D6	B210A14000HP	B211A14000HP	B976A14000	B977A14000
T621MF160X150R6HX-D4	B210A14500HP	B211A14500HP	B976A14500	B977A14500
T621M180X250R6HX-D6	B210A15500HP	B211A15500HP	B976A15500	B977A15500
T621MF180X150R6HX-D4	B210A16500HP	B211A16500HP	B976A16500	B977A16500
—	B210A16670HP	B211A16670HP	B976A16670	B977A16670
—	B210A17500HP	B211A17500HP	B976A17500	B977A17500





Cast and Ductile Iron

typical thread sizes		required tap drill diameter			
cutting taps		mm	inch	fraction	wire
metric	inch				
M4 x 0,7	—	3,3	.1299	—	—
—	10-24	3,734	.1470	—	26
—	10-32	4,039	.1590	—	21
M5 x 0,8	—	4,2	.1654	—	—
M6 x 1,0	—	5,0	.1969	—	—
—	—	5,991	.2280	—	1
—	—	5,944	.2340	—	A
—	5/16-18	6,528	.2570	—	F
M8 x 1,25	—	6,7	.2638	—	—
—	5/16-24	6,909	.2720	—	I
—	3/8-16	7,938	.3125	5/16	—
—	3/8-24	8,433	.3320	—	Q
M10 x 1,5	—	8,5	.3346	—	—
—	7/16-14	9,093	.3580	—	T
—	7/16-20	9,921	.3906	25/64	—
M12 x 1,75	—	10,2	.4016	—	—
—	1/2-13	10,716	.4219	27/64	—
—	1/2-20	11,509	.4531	29/64	—
M14 x 2,0	—	12,0	.4724	—	—
—	5/8-11	13,495	.5313	17/32	—
M16 x 2,0	—	14,0	.5512	—	—
M18 x 2,5	—	15,5	.6102	—	—
—	3/4-10	16,67	.6563	21/32	—
M20 x 2,5	—	17,5	.6890	—	—
M22 x 2,5	—	19,5	.7677	—	—

K HSS-E-PM Taps	
blind and through hole T640 KP6525	blind and through hole with coolant T641 KP6525
T640M040X070R6HX-D1	—
T640NC#10-24R3B-A	—
T640NF#10-32R3B-A	—
T640M050X080R6HX-D1	T641M050X080R6HX-D1
T640M060X100R6HX-D1	T641M060X100R6HX-D1
T640NC02500-20R3B-A	—
T640NF02500-28R3B-A	—
T640NC03125-18R3B-A	—
T640M080X125R6HX-D1	T641M080X125R6HX-D1
T640NF03125-24R3B-A	—
T640NC03750-16R3B-A	—
T640NF03750-24R3B-A	—
T640M100X150R6HX-D1	T641M100X150R6HX-D1
T640NC04375-14R3B-A	—
T640NF04375-20R3B-A	—
T640M120X175R6HX-D6	T641M120X175R6HX-D6
T640NC05000-13R3B-A	—
T640NF05000-20R3B-A	—
T640M140X200R6HX-D6	T641M140X200R6HX-D6
T640NC06250-11R3B-A	—
T640M160X200R6HX-D6	T641M160X200R6HX-D6
T640M180X250R6HX-D6	T641M180X250R6HX-D6
T640NC07500-10R3B-A	—
T640M200X250R6HX-D6	T641M200X250R6HX-D6
T640M220X250R6HX-D6	—

Taps

K		All Materials	
Recommended Drill		Alternate Tap Drill	
			
3 x D with coolant B254_YPC KCK10	5 x D with coolant B255_YPC KCK10	3 x D with coolant B976 KC7315	5 x D with coolant B977 KC7315
B254A03300YPC	B255A03300YPC	B976A03300	B977A03300
B254A03734YPC	B255A03734YPC	B976A03734	B977A03734
B254A04039YPC	B255A04039YPC	B976A04039	B977A04039
B254A04200YPC	B255A04200YPC	B976A04200	B977A04200
B254A05000YPC	B255A05000YPC	B976A05000	B977A05000
B254A05791YPC	B255A05791YPC	B976A05791	B977A05791
B254A05944YPC	B255A05944YPC	B976A05944	B977A05944
B254A06528YPC	B255A06528YPC	B976A06528	B977A06528
B254A06700YPC	B255A06700YPC	B976A06700	B977A06700
B254A06909YPC	B255A06909YPC	B976A06909	B977A06909
B254A07938YPC	B255A07940YPC	B976A07938	B977A07938
B254A08433YPC	B255A08433YPC	B976A08433	B977A08433
B254A08500YPC	B255A08500YPC	B976A08500	B977A08500
B254A09093YPC	B255A09093YPC	B976A09093	B977A09093
B254A09921YPC	B255A09920YPC	B976A09921	B977A09921
B254A10200YPC	B255A10200YPC	B976A10200	B977A10200
B254A10716YPC	B255A10716YPC	B976A10716	B977A10716
B254A11509YPC	B255A11509YPC	B976A11509	B977A11509
B254A12000YPC	B255A12000YPC	B976A12000	B977A12000
B254A13495YPC	B255A13495YPC	B976A13495	B977A13495
B254A14000YPC	B255A14000YPC	B976A14000	B977A14000
B254A15500YPC	B255A15500YPC	B976A15500	B977A15500
B254A16670YPC	B255A16670YPC	B976A16670	B977A16670
B254A17500YPC	B255A17500YPC	B976A17500	B977A17500
B254A19500YPC	B255A19500YPC	B976A19500	B977A19500



Aluminum

typical thread sizes		required tap drill diameter				N			
						HSS-E Taps – Tapping Aluminum (Wrought, low Si)		HSS-E-PM Taps – Tapping Cast Aluminum (Si <12%)	
cutting taps						through hole T680_KSN38		blind hole T670_KSN38	blind and through hole T640_KP6525
metric	inch	mm	inch	fraction	wire				
M3 x 0,50	—	2,500	.0984	—	—	T680M030X050R6H-D1	T670M030X050R6H-D1	—	
M4 x 0,70	—	3,300	.1299	—	—	T680M040X070R6H-D1	T670M040X070R6H-D1	T640M040X070R6HX-D1	
—	10-24	3,734	.1470	—	26	—	—	T640NC#10-24R3B-A	
—	10-32	4,039	.1590	—	21	—	—	T640NF#10-32R3B-A	
M5 x 0,80	—	4,200	.1654	—	—	T680M050X080R6H-D1	T670M050X080R6H-D1	T640M050X080R6HX-D1	
M6 x 1,00	—	5,000	.1969	—	—	T680M060X100R6H-D1	T670M060X100R6H-D1	T640M060X100R6HX-D1	
—	—	5,791	.2280	—	1	—	—	T640NC02500-20R3B-A	
—	—	5,944	.2340	—	A	—	—	T640NF02500-28R3B-A	
—	5/16-18	6,528	.2570	—	F	—	—	T640NC03125-18R3B-A	
M8 x 1,25	—	6,700	.2638	—	—	T680M080X125R6H-D1	T670M080X125R6H-D1	T640M080X125R6HX-D1	
—	5/16-24	6,909	.2720	—	I	—	—	T640NF03125-24R3B-A	
—	3/8-16	7,938	.3125	5/16	—	—	—	T640NC03750-16R3B-A	
—	3/8-24	8,433	.3320	—	Q	—	—	T640NF03750-24R3B-A	
M10 x 1,50	—	8,500	.3346	—	—	T680M100X150R6H-D1	T670M100X150R6H-D1	T640M100X150R6HX-D1	
—	7/16-14	9,093	.3580	—	T	—	—	T640NC04375-14R3B-A	
—	7/16-20	9,921	.3906	25/64	—	—	—	T640NF04375-20R3B-A	
M12 x 1,75	—	10,200	.4016	—	—	T680M120X175R6H-D6	T670M120X175R6H-D6	T640M120X175R6HX-D6	
—	1/2-13	10,716	.4219	27/64	—	—	—	T640NC05000-13R3B-A	
—	1/2-20	11,509	.4531	29/64	—	—	—	T640NF05000-20R3B-A	
M14 x 2,00	—	12,000	.4724	—	—	—	—	T640M140X200R6HX-D6	
—	5/8-111	13,495	.5313	17/32	—	—	—	T640NC06250-11R3B-A	
M16 x 2,00	—	14,000	.5512	—	—	T680M160X200R6H-D6	T670M160X200R6H-D6	T640M160X200R6HX-D6	
M18 x 2,50	—	15,500	.6102	—	—	—	—	T640M180X250R6HX-D6	
—	3/4-10	16,670	.6563	21/32	—	—	—	T640NC07500-10R3B-A	
M20 x 2,50	—	17,500	.6890	—	—	T680M200X250R6H-D6	—	T640M200X250R6HX-D6	
M22 x 2,50	—	19,500	.7677	—	—	—	—	T640M220X250R6HX-D6	

Taps

Aluminum • Forming Taps

typical thread sizes		required tap drill diameter		N	
				HSS-E-PM Taps – Forming Aluminum (Wrought, low Si)	
forming taps				blind and through hole T622_KSN38	blind and through hole with coolant T623_KSN38
metric	inch	mm	inch		
M3 x 0,50	—	2,800	.1102	T622M030X050R6HX-D74	—
—	—	3,734	.1470	T622M040X070R6HX-D74	—
—	—	5,000	.1969	T622M050X080R6HX-D74	T623M050X080R6HX-D74
—	1/4-20	5,791	.2280	T622M060X100R6HX-D74	T623M060X100R6HX-D74
—	5/16-24	7,493	.2950	T622M080X125R6HX-D74	T623M080X125R6HX-D74
—	—	7,938	.3125	T622MF080X100R6HX-D74	T623MF080X100R6HX-D74
M10 x 1,25	—	9,500	.3740	T622M100X150R6HX-D74	T623M100X150R6HX-D74
—	—	9,921	.3906	T622MF100X100R6HX-D74	T623MF100X100R6HX-D74
M12 x 1,50	—	11,300	.4449	T622M120X175R6HX-D74	T623M120X175R6HX-D74
M12 x 1,25	—	11,500	.4528	T622MF120X150R6HX-D74	T623MF120X150R6HX-D74
—	—	11,509	.4531	T622MF120X125R6HX-D74	T623MF120X125R6HX-D74
M14 x 1,25	—	13,400	.5276	T622MF140X150R6HX-D74	T623MF140X150R6HX-D74
—	5/8-18	15,250	.6004	T622M160X200R6HX-D74	T623M160X200R6HX-D74
—	—	15,500	.6102	T622MF160X150R6HX-D74	T623MF160X150R6HX-D74

HSS-E-PM Taps – Tapping Cast Aluminum (Si <12%)	N Recommended SC Drill		All Materials Alternate Tap Drill	
	 approximately 3 x D with coolant T641 KP6525	 approximately 3 x D with coolant B284_(HP) K715	 approximately 5 x D with coolant B411 KF1	 approximately 5 x D with coolant B976_KC7315
–	–	–	B976Z02500	–
–	–	B411A03300	B976A03300	B977A03300
–	–	–	B976A03734	B977A03734
–	–	–	B976A04039	B977A04039
T641M050X080R6HX-D1	B284A04200	B411A04200	B976A04200	B977A04200
T641M060X100R6HX-D1	B284A05000	B411A05000	B976A05000	B977A05000
–	–	–	B976A05791	B977A05791
–	–	–	B976A05944	B977A05944
–	–	–	B976A06528	B977A06528
T641M080X125R6HX-D1	–	–	B976A06700	B977A06700
–	–	–	B976A06909	B977A06909
–	–	–	B976A07938	B977A07938
–	–	–	B976A08433	B977A08433
T641M100X150R6HX-D1	–	B411A08500	B976A08500	B977A08500
–	–	–	B976A09093	B977A09093
–	K284A03906	–	B976A09921	B977A09921
T641M120X175R6HX-D6	–	B411A10200	B976A10200	B977A10200
–	–	–	B976A10716	B977A10716
–	K284A04531	–	B976A11509	B977A11509
T641M140X200R6HX-D6	–	B411A12000	B976A12000	B977A12000
–	–	–	B976A13495	B977A13495
T641M160X200R6HX-D6	–	B411A14000	B976A14000	B977A14000
T641M180X250R6HX-D6	–	B411A15500	B976A15500	B977A15500
–	–	–	B976A16670	B977A16670
T641M200X250R6HX-D6	–	B411A17500	B976A17500	B977A17500
–	–	B411A19500	B976A19500	B977A19500



	N Recommended SC Drill		All Materials Alternate Tap Drill	
	 approximately 3 x D with coolant B284_(HP) K715	 approximately 5 x D with coolant B411 KF1	 approximately 3 x D with coolant B976_KC7315	 approximately 5 x D with coolant B977_KC7315
–	–	–	B976Z02800	–
–	–	–	B976A03734	B977A03734
B284A05000	–	B411A05000	B976A05000	B977A05000
–	–	–	B976A05791	B977A05791
–	–	–	–	–
–	–	–	B976A07938	B977A07938
–	–	B411A09500	B976A09500	B977A09500
–	–	K284A03906	B976A09921	B977A09921
–	–	–	B976A11300	B977A11300
–	–	B411A11500	B976A11500	B977A11500
K284A04531	–	–	B976A11509	B977A11509
–	–	–	–	–
–	–	–	–	–
–	–	B411A15500	B976A15500	B977A15500





High-Temperature Alloys





			S		
			HSS-E-PM Taps – Tapping Titanium Alloys		HSS-E-PM Taps – Tapping Nickel and Cobalt Alloys
typical thread sizes	required tap drill diameter				
	cutting taps metric	mm	inch	blind hole T616_KSN25	through hole T614_KSN25	blind hole T612_KSSH22
M3 x 0,50	2,500	.0984	T616M030X050R6HX-D1	T614M030X050R6HX-D1	T616M030X050R6HX-D1
M4 x 0,70	3,300	.1299	T616M040X070R6H-D1	T614M040X070R6H-D1	T616M040X070R6H-D1
M5 x 0,80	4,200	.1654	T616M050X080R6H-D1	T614M050X080R6H-D1	T616M050X080R6H-D1
M6 x 1,00	5,000	.1969	T616M060X100R6H-D1	T614M060X100R6H-D1	T616M060X100R6H-D1
M8 x 1,25	6,700	.2638	T616M080X125R6H-D1	T614M080X125R6H-D1	T616M080X125R6H-D1
M10 x 1,50	8,500	.3346	T616M100X150R6H-D1	T614M100X150R6H-D1	T616M100X150R6H-D1
M12 x 1,75	10,200	.4016	T616M120X175R6H-D6	T614M120X175R6H-D6	T616M120X175R6H-D6
M14 x 2,00	12,000	.4724	–	–	T612M140X200R6HX-D6
M16 x 2,00	14,000	.5512	–	–	T612M160X200R6HX-D6
M20 x 2,50	17,500	.6890	–	–	T612M200X250R6HX-D6

Taps

Hard Materials

			H		
			HSS-E-PM Taps – Tapping Hard Materials 44–55 HRC	Carbide Taps – Tapping Hard Materials 55–63 HRC	
typical thread sizes	required tap drill diameter				
	cutting taps metric	mm	inch	blind and through hole T606_KSSH22	blind and through hole T410_KCU36
M5 x 0,80	4,200	.1654	–	T410M050X080R6HX-D1	
M6 x 1,00	5,000	.1969	T606M060X100R6HX-D1	T410M060X100R6HX-D1	
M8 x 1,25	6,700	.2638	T606M080X125R6HX-D1	T410M080X125R6HX-D1	
M8 x 1,00	7,000	.2756	T606MF080X100R6HX-D4	T410MF080X100R6HX-D4	
M10 x 1,50	8,500	.3346	T606M100X150R6HX-D1	T410M100X150R6HX-D1	
M10 x 1,00	9,000	.3543	T606MF100X100R6HX-D4	T410MF100X100R6HX-D4	
M12 x 1,75	10,200	.4016	T606M120X175R6HX-D6	T410M120X175R6HX-D6	
M12 x 1,50	10,500	.4134	T606MF120X150R6HX-D4	T410MF120X150R6HX-D4	
M14 x 2,00	12,000	.4724	–	T410M140X200R6HX-D6	
M14 x 1,50	12,500	.4921	T606MF140X150R6HX-D4	T410MF140X150R6HX-D4	
M16 x 2,00	14,000	.5512	T606M160X200R6HX-D6	T612M160X200R6HX-D6	
M16 x 1,50	14,500	.5709	T606MF160X150R6HX-D4	T410MF160X150R6HX-D4	

HSS-E-PM Taps – Tapping Nickel and Cobalt Alloys	S Recommended SC Drill		All Materials Alternate Tap Drill	
	 approximately 3 x D with coolant B291_YPL KC7315	 approximately 5 x D with coolant B292_YPL KC7315	 approximately 3 x D with coolant B976_KC7315	 approximately 5 x D with coolant B977_KC7315
through hole T610_KSSH22				
T610M030X050R6HX-D1	–	–	B976Z02500	–
T610M040X070R6H-D1	B291A03300YPL	B292A03300YPL	B976A03300	B977A03300
T610M050X080R6H-D1	–	B292A04200YPL	B976A04200	B977A04200
T610M060X100R6H-D1	B291A05000YPL	B292A05000YPL	B976A05000	B977A05000
T610M080X125R6H-D1	–	–	B976A06700	B977A06700
T610M100X150R6H-D1	B291A08500YPL	B292A08500YPL	B976A08500	B977A08500
T610M120X175R6H-D6	B291A10200YPL	B292A10200YPL	B976A10200	B977A10200
T610M140X200R6HX-D6	B291A12000YPL	B292A12000YPL	B976A12000	B977A12000
T610M160X200R6HX-D6	B291A14000YPL	B292A14000YPL	B976A14000	B977A14000
T610M200X250R6HX-D6	B291A17500YPL	B292A17500YPL	B976A17500	B977A17500

	H Recommended SC Drill		All Materials Alternative Tap Drill	
	 approximately 3 x D with coolant B291_YPL KC7315	 approximately 5 x D with coolant B292_YPL KC7315	 approximately 3 x D with coolant B976_KC7315	 approximately 5 x D with coolant B977_KC7315
	–	B292A04200YPL	B976A04200	B977A04200
	B291A05000YPL	B292A05000YPL	B976A05000	B977A05000
	–	–	B976A06700	B977A06700
	B291A07000YPL	B292A07000YPL	B976A07000	B977A07000
	B291A08500YPL	B292A08500YPL	B976A08500	B977A08500
	B291A09000YPL	B292A09000YPL	B976A09000	B977A09000
	B291A10200YPL	B292A10200YPL	B976A10200	B977A10200
	B291A10500YPL	B292A10500YPL	B976A10500	B977A10500
	B291A12000YPL	B292A12000YPL	B976A12000	B977A12000
	B291A12500YPL	B292A12500YPL	B976A12500	B977A12500
	B291A14000YPL	B292A14000YPL	B976A14000	B977A14000
	B291A14500YPL	B292A14500YPL	B976A14500	B977A14500



Steel • Wind Energy

			P HSS-E-PM Taps — Tapping Steel >32 HRC		
typical thread sizes	required tap drill diameter		blind hole T630_KP6525	blind hole T650_KP6525	through hole T620_KP6525
	cutting taps metric	mm				inch
M24 x 3,00	21,000	.8268	T630M240X300R6HX-D6	T650M240X300R6HX-D6	T620M240X300R6HX-D6
M30 x 3,50	26,500	1.0433	T630M300X350R6HX-D6	T650M300X350R6HX-D6	T620M300X350R6HX-D6
M33 x 3,50	29,500	1.1614	T630M330X350R6HX-D6	T650M330X350R6HX-D6	T620M330X350R6HX-D6
M36 x 4,00	32,000	1.2598	T630M360X400R6HX-D6	T650M360X400R6HX-D6	T620M360X400R6HX-D6
M42 x 4,50	37,500	1.4764	T630M420X450R6HX-D6	T650M420X450R6HX-D6	T620M420X450R6HX-D6

Steel • Wind Energy • Extra Long

			P HSS-E-PM Taps — Tapping Steel >32 HRC		
typical thread sizes	required tap drill diameter		blind hole T630_KP6525	blind hole T650_KP6525	through hole T620_KP6525
	cutting taps metric	mm				inch
M24 x 3,00	21,000	.8268	T630M240X300R6HX-XL	T650M240X300R6HX-XL	T620M240X300R6HX-XL
M30 x 3,50	26,500	1.0433	T630M300X350R6HX-XL	T650M300X350R6HX-XL	T620M300X350R6HX-XL
M33 x 3,50	29,500	1.1614	T630M330X350R6HX-XL	T650M330X350R6HX-XL	T620M330X350R6HX-XL
M36 x 4,00	32,000	1.2598	T630M360X400R6HX-XL	T650M360X400R6HX-XL	T620M360X400R6HX-XL
M42 x 4,50	37,500	1.4764	T630M420X450R6HX-XL	T650M420X450R6HX-XL	T620M420X450R6HX-XL

Cast Iron • Wind Energy

			K HSS-E-PM Taps — Cast Iron		
typical thread sizes	required tap drill diameter		blind hole T630_KP6525	blind hole T650_KP6525	through hole T620_KP6525
	cutting taps metric	mm				inch
M24 x 3,00	21,000	.8268	T630M240X300R6HX-D6	T650M240X300R6HX-D6	T620M240X300R6HX-D6
M30 x 3,50	26,500	1.0433	T630M300X350R6HX-D6	T650M300X350R6HX-D6	T620M300X350R6HX-D6
M33 x 3,50	29,500	1.1614	T630M330X350R6HX-D6	T650M330X350R6HX-D6	T620M330X350R6HX-D6
M36 x 4,00	32,000	1.2598	T630M360X400R6HX-D6	T650M360X400R6HX-D6	T620M360X400R6HX-D6
M42 x 4,50	37,500	1.4764	T630M420X450R6HX-D6	T650M420X450R6HX-D6	T620M420X450R6HX-D6

Cast Iron • Wind Energy • Extra Long

			K HSS-E-PM Taps — Cast Iron		
typical thread sizes	required tap drill diameter		blind hole T630_KP6525	blind hole T650_KP6525	through hole T620_KP6525
	cutting taps metric	mm				inch
M24 x 3,00	21,000	.8268	T630M240X300R6HX-XL	T650M240X300R6HX-XL	T620M240X300R6HX-XL
M30 x 3,50	26,500	1.0433	T630M300X350R6HX-XL	T650M300X350R6HX-XL	T620M300X350R6HX-XL
M33 x 3,50	29,500	1.1614	T630M330X350R6HX-XL	T650M330X350R6HX-XL	T620M330X350R6HX-XL
M36 x 4,00	32,000	1.2598	T630M360X400R6HX-XL	T650M360X400R6HX-XL	T620M360X400R6HX-XL
M42 x 4,50	37,500	1.4764	T630M420X450R6HX-XL	T650M420X450R6HX-XL	T620M420X450R6HX-XL

P HSS-E-PM Taps – Tapping Steel >32 HRC		P Recommended Modular Drill	
blind hole with coolant T631_KP6525	blind hole with coolant T651_KP6525	KSEM PLUS™ insert KCP15	KSEM PLUS™ tool body 3 x D
T631M240X300R6HX-D6	T651M240X300R6HX-D6	KTIP2100HPM	KSEM PLUS
T631M300X350R6HX-D6	T651M300X350R6HX-D6	KTIP2650HPM	KSEM PLUS
T631M330X350R6HX-D6	T651M330X350R6HX-D6	KSEM PLUS	KSEM PLUS
T631M360X400R6HX-D6	T651M360X400R6HX-D6	KSEM PLUS	KSEM PLUS
T631M420X450R6HX-D6	T651M420X450R6HX-D6	KSEM PLUS	KSEM PLUS

P HSS-E-PM Taps – Tapping Steel >32 HRC		P Recommended Modular Drill	
blind hole with coolant T631_KP6525	blind hole with coolant T651_KP6525	KSEM PLUS™ insert KCP15	KSEM PLUS™ tool body 3 x D
T631M240X300R6HX-XL	T651M240X300R6HX-XL	KTIP2100HPM	KSEM PLUS
T631M300X350R6HX-XL	T651M300X350R6HX-XL	KTIP2650HPM	KSEM PLUS
T631M330X350R6HX-XL	T651M330X350R6HX-XL	KSEM PLUS	KSEM PLUS
T631M360X400R6HX-XL	T651M360X400R6HX-XL	KSEM PLUS	KSEM PLUS
T631M420X450R6HX-XL	T651M420X450R6HX-XL	KSEM PLUS	KSEM PLUS



K HSS-E-PM Taps – Cast Iron		K Recommended Modular Drill	
blind hole with coolant T631_KP6525	blind hole with coolant T651_KP6525	KSEM PLUS™ insert KC7140	KSEM PLUS™ tool body 3 x D
T631M240X300R6HX-D6	T651M240X300R6HX-D6	KTIP2100HPM	KSEM PLUS
T631M300X350R6HX-D6	T651M300X350R6HX-D6	KTIP2650HPM	KSEM PLUS
T631M330X350R6HX-D6	T651M330X350R6HX-D6	KSEM PLUS	KSEM PLUS
T631M360X400R6HX-D6	T651M360X400R6HX-D6	KSEM PLUS	KSEM PLUS
T631M420X450R6HX-D6	T651M420X450R6HX-D6	KSEM PLUS	KSEM PLUS

K HSS-E-PM Taps – Cast Iron		K Recommended Modular Drill	
blind hole with coolant T631_KP6525	blind hole with coolant T651_KP6525	KSEM PLUS™ insert KC7140	KSEM PLUS™ tool body 3 x D
T631M240X300R6HX-XL	T651M240X300R6HX-XL	KTIP2100HPM	KSEM PLUS
T631M300X350R6HX-XL	T651M300X350R6HX-XL	KTIP2650HPM	KSEM PLUS
T631M330X350R6HX-XL	T651M330X350R6HX-XL	KSEM PLUS	KSEM PLUS
T631M360X400R6HX-XL	T651M360X400R6HX-XL	KSEM PLUS	KSEM PLUS
T631M420X450R6HX-XL	T651M420X450R6HX-XL	KSEM PLUS	KSEM PLUS



High-Performance K Series Taps

Our family of K Series taps are specially designed to thread a broad assortment of materials for unrivaled high-performance tapping. The K Series taps are designed and manufactured to successfully thread high- and low-volume applications in aluminum, stainless steel, nickel alloys, titanium alloys, mold steels, irons, brass, bronze, and plastics. The formulation of premium steel tap base material is unique for every application. The combination of a special geometry, tap surface treatment, and premium steel gives these taps the highest level of performance.

Features and Benefits

Unmatched Performance

- Enhanced tool geometry.
- Less tapping torque.
- Better chip removal.

Premium Steels

- Special HSS-E compositions containing chromium, tungsten, molybdenum, vanadium, and cobalt, depending on the application.
- Improved tap performance resulting in improved product finish and pitch diameter size.
- Excellent heat and abrasion resistance.
- Maintains the same quality from the first hole to the very last.



Broad Offering of Diameter Limits

- Pitch diameters from H2–H7 and metric pitch diameters from D3–D7 are stocked as standards in many styles, at no premium in price.
- Rigid setups enable higher pitch diameter limits.
- Offers many size options to produce the class of thread desired.

K Series HP HSS-E Taps • ANSI Inch and Metric

● first choice
○ alternate choice

K Series High-Performance HSS-E Taps	series	coating	tap dimension						
				P	M	K	N	S	H
	K-SS SPPT	TiCN, TiN, oxide, uncoated	ANSI 302A	●	○	○	○		
	K-SS SPPT	TiCN, TiN, oxide, uncoated	ANSI 302A	●	○	○	○		
	K-SS SPPT 6"	oxide	extend 6"	●	○	○			
	K-SS SPFL	TiCN, TiN, oxide, uncoated	ANSI 302A	●	○	○	○		
	K-SS SPFL	oxide	ANSI 302A	●	○	○			
	K-SS SPFL	TiCN, TiN, oxide, uncoated	ANSI 302A	●	○	○	○		
	K-SS SPFL	oxide	ANSI 302A	●	○	○			
	K-SS SPFL 6"	oxide	extend 6"	●	○	○			
	K-SS PIPE	TiN, oxide, uncoated	ANSI 311	●	○	○	●		
	K-AL SPPT	nitride	ANSI-DIN length				●		
	K-AL SPPT	nitride	ANSI-DIN length				●		
	K-ALS 25° SPFL	nitride	ANSI-DIN length				●		
	K-ALS 25° SPFL	nitride	ANSI-DIN length				●		
	K-AL 45° SPFL	nitride	ANSI-DIN length				●		
	K-AL 45° SPFL	nitride	ANSI-DIN length				●		
	K-NI SPPT	TiCN, oxide nitride, uncoated	ANSI 302A	○	○	○		●	
	K-NI SPPT	TiCN, oxide nitride	ANSI 302A	○	○	○		●	
	K-NI SPFL	TiCN, oxide nitride	ANSI 302A	○	○	○		●	
	K-NI SPFL	oxide nitride	ANSI 302A	○	○	○		●	
	K-NI SPFL	TiCN, oxide nitride	ANSI 302A	○	○	○		●	
	K-TI LHSF	nitride	ANSI 302A				○	●	
	K-TI LHSF	nitride	ANSI 302A				○	●	

Taps

size range (inch and metric)	through hole	blind hole	chamfer form	helix angle	coolant	page(s)	recommended cutting parameters
#2-2 4 1/2"						L98	L135
M3-M18						L100	L134
#2-1/2"						L101	L135
#2-2 4 1/2"						L102	L135
#4-3/4"						L104	L135
M3-M18						L106	L134
M3-M18						L107	L134
#2-1/2"						L108	L135
1/16"-1 - 11 1/2"						L109	L135
#2-1/2"						L110	L135
M3-M12						L111	L134
#2-1/2"						L112	L135
M3-M12						L112	L134
#2-1/2"						L113	L135
M3-M12						L114	L134
#2-3/4"						L115	L135
M2,5-M12						L117	L134
#2-3/4"						L118	L135
#4-3/4"						L120	L135
M2,5-M12						L121	L134
#2-1/2"						L122	L135
M2,5-M12						L123	L134



(continued)

(continued)

K Series HP HSS-E Taps • ANSI Inch and Metric

K Series High-Performance HSS-E Taps	series	coating	tap dimension	● first choice ○ alternate choice						
				P	M	K	N	S	H	
	K-TI SPFL	nitride	ANSI 302A				○	●		
	K-TI SPFL	nitride	ANSI 302A				○	●		
	K-TI SPFL	nitride	ANSI 302A				○	●		
	K-MS	uncoated	ANSI 302A	○		○				
	K-MS PIPE	uncoated	ANSI 311	○		○	○			

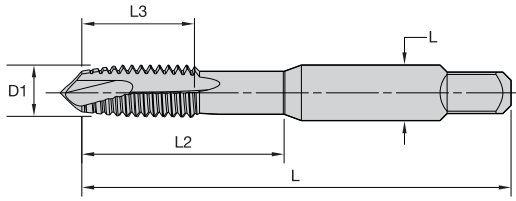
K Series High-Performance HSS-E Forming Taps

	K-TLD	TiCN	ANSI-DIN length	●	○		○			
	K-TLD	TiCN	ANSI-DIN length	●	○		○			
	K-TL	TiCN	ANSI-DIN length	●	○		○			
	K-TL	TiCN	ANSI-DIN length	●	○		○			
	K-TL	TiCN	ANSI-DIN length	●	○		○			
	K-TL	TiCN	ANSI-DIN length	●	○		○			

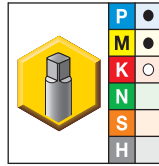
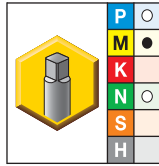
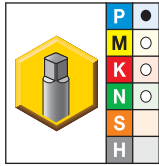


size range (inch and metric)	through hole	blind hole	chamfer form	helix angle	coolant	page(s)	recommended cutting parameters
#2-1/2"						L124	L135
#4-1/2"						L125	L135
M2,5-M12						L126	L134
#4-3/4"						L127	L135
1/8-3/4						L128	L135
#2-1/4"						L129	L135
M3-M6						L129	L134
#2-1/2"						L130	L135
M3-M12						L131	L134
#2-1/2"						L132	L135
M3-M12						L133	L134





■ K-Stainless • Machine Screw and Fractional • Plug Chamfer



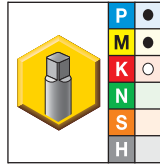
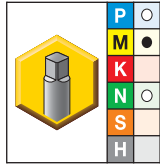
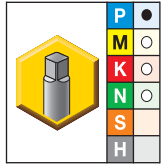
● first choice
○ alternate choice

Taps

	TiCN	TiN	oxide	D1 size	L	L3	L2	D	number of flutes	pitch diameter limit
	—	—	40510200001	2 - 56	1.75	.26	.44	.141	2	H2
	—	—	40510200002	2 - 56	1.75	.26	.44	.141	2	H3
	—	—	40510200003	2 - 56	1.75	.26	.44	.141	2	H4
	—	—	40510200004	3 - 48	1.81	.30	.50	.141	2	H2
40512201041	40510200729	40510200005	4 - 40	1.88	.34	.56	.141	2	H2	
—	—	40510200006	4 - 40	1.88	.34	.56	.141	2	H3	
—	—	40510200007	4 - 40	1.88	.34	.56	.141	2	H4	
—	—	40510200008	4 - 40	1.88	.34	.56	.141	2	H5	
—	—	40510200009	4 - 40	1.88	.34	.56	.141	2	H6	
—	—	40510200010	4 - 48	1.88	.34	.56	.141	2	H2	
—	—	40510200011	4 - 48	1.88	.34	.56	.141	2	H4	
—	—	40510200012	5 - 40	1.94	.37	.63	.141	3	H2	
—	—	40510200013	6 - 32	2.00	.41	.69	.141	3	H2	
40512201046	40510200731	40510200014	6 - 32	2.00	.41	.69	.141	3	H3	
—	—	40510200015	6 - 32	2.00	.41	.69	.141	3	H4	
—	—	40510200016	6 - 32	2.00	.41	.69	.141	3	H5	
—	—	40510200017	6 - 32	2.00	.41	.69	.141	3	H6	
—	—	40510200018	6 - 32	2.00	.41	.69	.141	3	H7	
—	—	40510200019	6 - 40	2.00	.41	.69	.141	3	H2	
—	—	40510200020	6 - 40	2.00	.41	.69	.141	3	H3	
—	—	40510200021	8 - 32	2.13	.45	.75	.168	3	H2	
40512201048	40510200732	40510200022	8 - 32	2.13	.45	.75	.168	3	H3	
—	—	40510200023	8 - 32	2.13	.45	.75	.168	3	H4	
—	—	40510200024	8 - 32	2.13	.45	.75	.168	3	H5	
—	—	40510200025	8 - 32	2.13	.45	.75	.168	3	H6	
—	—	40510200026	8 - 32	2.13	.45	.75	.168	3	H7	
—	—	40510200027	8 - 36	2.13	.45	.75	.168	3	H2	
40512201034	40510200733	40510200028	10 - 24	2.38	.53	.88	.194	3	H3	
—	—	40510200030	10 - 24	2.38	.53	.88	.194	3	H5	
—	—	40510200032	10 - 24	2.38	.53	.88	.194	3	H7	
—	—	40510200033	10 - 32	2.38	.53	.88	.194	3	H2	
40512201035	40510200756	40510200034	10 - 32	2.38	.53	.88	.194	3	H3	
—	—	40510200035	10 - 32	2.38	.53	.88	.194	3	H4	
—	—	40510200036	10 - 32	2.38	.53	.88	.194	3	H5	
—	—	40510200037	10 - 32	2.38	.53	.88	.194	3	H6	
—	—	40510200038	10 - 32	2.38	.53	.88	.194	3	H7	
—	—	40510200039	12 - 24	2.38	.57	.94	.220	3	H3	
—	—	40510200040	12 - 28	2.38	.57	.94	.220	3	H3	
—	—	40510200041	1/4 - 20	2.50	.59	1.00	.255	3	H2	
40512201032	40510200757	40510200042	1/4 - 20	2.50	.59	1.00	.255	3	H3	
—	—	40510200043	1/4 - 20	2.50	.59	1.00	.255	3	H5	
—	—	40510200044	1/4 - 20	2.50	.59	1.00	.255	3	H7	

(continued)

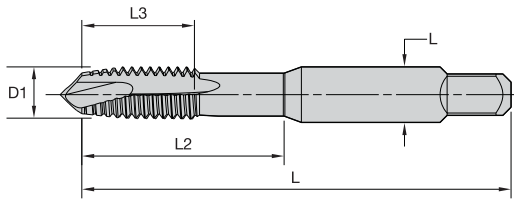
(K-Stainless • Machine Screw and Fractional • Plug Chamfer continued)



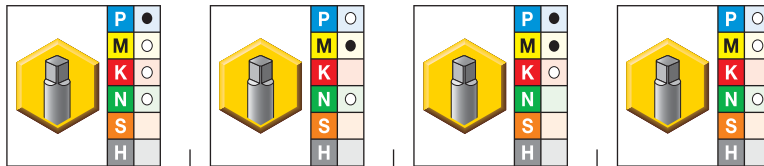
TiCN	TiN	oxide	D1 size	L	L3	L2	D	number of flutes	pitch diameter limit
—	—	40510200045	1/4 - 28	2.50	.59	1.00	.255	3	H2
40512201033	40510200758	40510200046	1/4 - 28	2.50	.59	1.00	.255	3	H3
—	—	40510200047	1/4 - 28	2.50	.59	1.00	.255	3	H4
—	—	40510200048	1/4 - 28	2.50	.59	1.00	.255	3	H5
—	—	40510200049	1/4 - 28	2.50	.59	1.00	.255	3	H6
—	—	40510200050	1/4 - 28	2.50	.59	1.00	.255	3	H7
40512201042	40510200759	40510200051	5/16 - 18	2.72	.67	1.13	.318	3	H3
—	—	40512201026	5/16 - 18	2.72	.67	1.13	.318	3	H5
—	—	40510200053	5/16 - 18	2.72	.67	1.13	.318	3	H7
40512201043	40510200760	40510200054	5/16 - 24	2.72	.67	1.13	.318	3	H3
—	—	40510200055	5/16 - 24	2.72	.67	1.13	.318	3	H4
—	—	40510200056	5/16 - 24	2.72	.67	1.13	.318	3	H5
—	—	40510200057	5/16 - 24	2.72	.67	1.13	.318	3	H6
—	—	40510200058	5/16 - 24	2.72	.67	1.13	.318	3	H7
40512201039	40510200761	40510200059	3/8 - 16	2.94	.75	1.25	.381	3	H3
—	—	40510200060	3/8 - 16	2.94	.75	1.25	.381	3	H5
—	—	40510200061	3/8 - 16	2.94	.75	1.25	.381	3	H7
40512201040	40510200762	40512201025	3/8 - 24	2.94	.75	1.25	.381	3	H3
—	—	40510200063	3/8 - 24	2.94	.75	1.25	.381	3	H4
—	—	40510200064	3/8 - 24	2.94	.75	1.25	.381	3	H5
—	—	40510200065	3/8 - 24	2.94	.75	1.25	.381	3	H6
—	—	40510200066	3/8 - 24	2.94	.75	1.25	.381	3	H7
—	40510200763	40510200067	7/16 - 14	3.16	.89	—	.323	3	H3
—	—	40510200068	7/16 - 14	3.16	.89	—	.323	3	H5
—	40510200764	40510200070	7/16 - 20	3.16	.89	—	.323	3	H3
—	—	40510200071	7/16 - 20	3.16	.89	—	.323	3	H5
—	—	40510200072	7/16 - 20	3.16	.89	—	.323	3	H6
—	—	40510200073	7/16 - 20	3.16	.89	—	.323	3	H7
40512201030	40510200765	40510200074	1/2 - 13	3.38	.98	—	.367	3	H3
—	—	40510200075	1/2 - 13	3.38	.98	—	.367	3	H5
—	—	40510200076	1/2 - 13	3.38	.98	—	.367	3	H7
40512201031	40510200766	40510200077	1/2 - 20	3.38	.98	—	.367	3	H3
—	—	40510200078	1/2 - 20	3.38	.98	—	.367	3	H5
—	—	40510200079	1/2 - 20	3.38	.98	—	.367	3	H6
—	—	40512201023	1/2 - 20	3.38	.98	—	.367	3	H7
40512201049	40510200767	40510200081	9/16 - 12	3.59	.98	—	.429	3	H3
—	40510200768	40510200082	9/16 - 18	3.59	.98	—	.429	3	H3
40512201044	40510200769	40510200083	5/8 - 11	3.81	1.08	—	.480	3	H3
—	—	40510200084	5/8 - 11	3.81	1.08	—	.480	3	H5
—	—	40510200085	5/8 - 11	3.81	1.08	—	.480	3	H7
40512201045	40510200770	40510200086	5/8 - 18	3.81	1.08	—	.480	3	H3
—	—	40510200087	5/8 - 18	3.81	1.08	—	.480	3	H5
—	—	40512201027	5/8 - 18	3.81	1.08	—	.480	3	H6
40512201037	40510200771	40510200090	3/4 - 10	4.25	1.20	—	.590	3	H3
40512201038	40510200772	40512201024	3/4 - 16	4.25	1.20	—	.590	3	H3
40512201047	40512201029	40510200092	7/8 - 9	4.69	1.34	—	.697	3	H4
—	40510200774	40510200093	7/8 - 14	4.69	1.34	—	.697	3	H4
40512201036	40512201028	40510200094	1 - 8	5.13	1.50	—	.800	3	H4
—	—	40510200095	1 - 12	5.13	1.50	—	.800	3	H4
—	—	40510200983	1 1/8 - 7	5.44	2.56	—	.896	4	H6
—	—	40510200984	1 1/8 - 12	5.44	2.56	—	.896	4	H5
—	—	40510200985	1 1/4 - 7	5.75	2.56	—	1.021	4	H6



NOTE: K-SS taps for 3B class of fit are suitable for UNJ aerospace internal threading applications.
Refer to table on pages L291–L292 for the recommended pitch diameter limit for 2B or 3B class of fit.



K-Stainless • Plug Chamfer • Metric ANSI

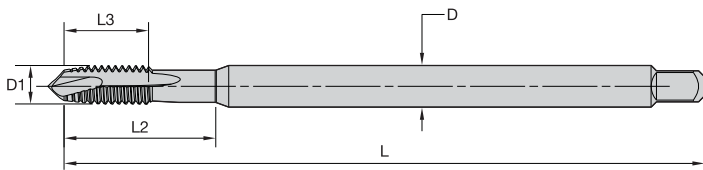
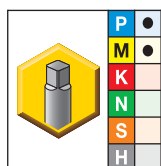


● first choice
○ alternate choice

Taps

	TiCN	TiN	oxide	uncoated	D1 size	L	L3	L2	D	number of flutes	pitch diameter limit
	40512201109	40512201101	40510200238	—	M3 x 0,5	1.94	.31	.63	.141	3	D3
	—	—	40510200239	—	M3,5 x 0,6	2.00	.38	.69	.141	3	D4
	40512201110	40512201102	40510200240	—	M4 x 0,7	2.13	.38	.75	.168	3	D4
	40512201111	40512201103	40510200241	—	M5 x 0,8	2.38	.50	.88	.194	3	D4
	40512201112	40512201104	40510200242	40512201095	M6 x 1	2.50	.63	1.00	.255	3	D5
	—	—	40510200243	—	M7 x 1	2.72	.69	1.13	.318	3	D5
	—	—	40510200244	—	M8 x 1	2.72	.69	1.13	.318	3	D5
	40512201113	40512201105	40510200245	40512201096	M8 x 1,25	2.72	.69	1.13	.318	3	D5
	—	—	40510200246	—	M10 x 1,25	2.94	.75	1.25	.381	3	D5
	40512201106	40512201097	40510200247	40512201093	M10 x 1,5	2.94	.75	1.25	.381	3	D6
	—	—	40510200248	—	M12 x 1,25	3.38	.94	—	.367	3	D5
	40512201107	40512201098	40510200249	—	M12 x 1,75	3.38	.94	—	.367	3	D6
	—	—	40510200250	—	M14 x 1,5	3.59	1.00	—	.429	3	D6
	—	—	40510200251	—	M14 x 2	3.59	1.00	—	.429	3	D7
	—	40512201099	40510200252	—	M16 x 1,5	3.81	1.09	—	.480	3	D6
	40512201108	40512201100	40510200253	40512201094	M16 x 2	3.81	1.09	—	.480	3	D7
	—	—	40510200255	—	M18 x 2,5	4.03	1.09	—	.542	3	D7

NOTE: Metric taps for 6H class of fit are suitable for MJ aerospace internal threading applications.
Metric taps are manufactured to USCT1 specifications and dimensions.
Metric tap blank dimensions are equivalent to inch taps.
Refer to table on page L292 for the recommended pitch diameter limit for 6H class of fit.

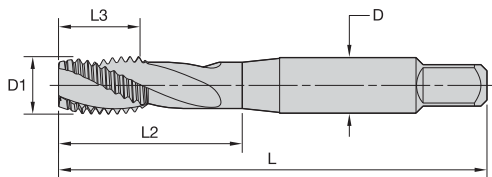

■ K-Stainless 6" • Machine Screw and Fractional • Plug Chamfer


- first choice
- alternate choice

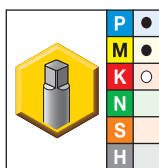
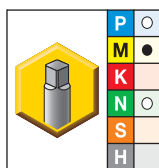
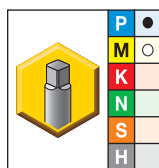
oxide	D1 size	L	L3	L2	D	number of flutes	pitch diameter limit
40510200801	2 - 56	6.00	.44	—	.141	2	H2
40510200803	3 - 48	6.00	.50	—	.141	2	H2
40510200804	4 - 40	6.00	.31	.56	.141	2	H2
40510200806	6 - 32	6.00	.38	.69	.141	3	H3
40510200807	8 - 32	6.00	.38	.75	.168	3	H3
40510200810	10 - 24	6.00	.50	.88	.194	3	H3
40510200812	10 - 32	6.00	.50	.88	.194	3	H3
40510200813	1/4 - 20	6.00	.63	1.00	.255	3	H3
40510200815	1/4 - 28	6.00	.63	1.00	.255	3	H3
40510200816	5/16 - 18	6.00	.69	1.13	.318	3	H3
40510200817	5/16 - 24	6.00	.69	1.13	.318	3	H3
40510200818	3/8 - 16	6.00	.75	1.25	.381	3	H3
40510200734	3/8 - 24	6.00	.75	1.25	.381	3	H3
40510200735	7/16 - 14	6.00	.88	—	.323	3	H3
40510200736	7/16 - 20	6.00	.88	—	.323	3	H3
40510200737	1/2 - 13	6.00	.94	—	.367	3	H3
40510200738	1/2 - 20	6.00	.94	—	.367	3	H3

NOTE: K-SS taps for 3B class of fit are suitable for UNJ aerospace internal threading applications.
 Refer to table on pages L291–L292 for the recommended pitch diameter limit for 2B or 3B class of fit.





■ K-Stainless Spiral Flute • Machine Screw and Fractional • Chamfer 2 1/2–3 1/2 Pitches



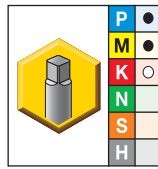
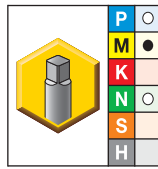
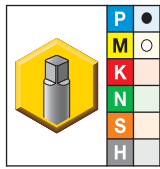
● first choice
○ alternate choice

Taps

	TICN	TiN	oxide	D1 size	L	L3	L2	D	number of flutes	pitch diameter limit
	—	—	40510200096	2 - 56	1.75	.44	—	.141	2	H2
	—	—	40510200097	3 - 48	1.81	.50	—	.141	2	H2
	40512201069	40510200776	40510200098	4 - 40	1.88	.24	.56	.141	2	H2
	—	—	40510200100	4 - 40	1.88	.24	.56	.141	2	H3
	—	—	40510200102	4 - 40	1.88	.24	.56	.141	2	H4
	—	—	40510200103	4 - 40	1.88	.24	.56	.141	2	H5
	—	—	40510200106	4 - 48	1.88	.24	.56	.141	2	H2
	—	40510200777	40510200108	5 - 40	1.94	.24	.63	.141	3	H2
	—	—	40510200110	6 - 32	2.00	.28	.69	.141	3	H2
	40512201074	40510200778	40510200112	6 - 32	2.00	.28	.69	.141	3	H3
	—	—	40510200114	6 - 32	2.00	.28	.69	.141	3	H4
	—	—	40510200115	6 - 32	2.00	.28	.69	.141	3	H5
	—	—	40510200117	6 - 32	2.00	.28	.69	.141	3	H7
	—	—	40510200118	6 - 40	2.00	.28	.69	.141	3	H2
	—	—	40510200121	6 - 40	2.00	.28	.69	.141	3	H3
	—	—	40510200123	8 - 32	2.13	.28	.75	.168	3	H2
	40512201078	40510200779	40510200125	8 - 32	2.13	.28	.75	.168	3	H3
	—	—	40510200127	8 - 32	2.13	.28	.75	.168	3	H4
	—	—	40510200128	8 - 32	2.13	.28	.75	.168	3	H5
	—	—	40512201054	8 - 32	2.13	.28	.75	.168	3	H6
	—	—	40510200131	8 - 32	2.13	.28	.75	.168	3	H7
	—	—	40510200132	10 - 24	2.38	.35	.88	.194	3	H2
	40512201062	40510200780	40510200133	10 - 24	2.38	.35	.88	.194	3	H3
	—	—	40510200135	10 - 24	2.38	.35	.88	.194	3	H4
	—	—	40510200136	10 - 24	2.38	.35	.88	.194	3	H5
	—	—	40510200138	10 - 24	2.38	.35	.88	.194	3	H7
	—	—	40510200139	10 - 32	2.38	.28	.88	.194	3	H2
	40512201063	40510200781	40510200140	10 - 32	2.38	.28	.88	.194	3	H3
	—	—	40510200142	10 - 32	2.38	.28	.88	.194	3	H4
	—	—	40510200143	10 - 32	2.38	.28	.88	.194	3	H5
	—	—	40510200145	10 - 32	2.38	.28	.88	.194	3	H6
	—	—	40510200146	10 - 32	2.38	.28	.88	.194	3	H7
	—	—	40510200147	12 - 24	2.38	.35	.94	.220	3	H3
	—	—	40510200149	1/4 - 20	2.50	.43	1.00	.255	3	H2
	40512201060	40510200782	40510200150	1/4 - 20	2.50	.43	1.00	.255	3	H3
	—	—	40510200152	1/4 - 20	2.50	.43	1.00	.255	3	H5
	—	—	40510200154	1/4 - 20	2.50	.43	1.00	.255	3	H7
	—	—	40510200155	1/4 - 28	2.50	.35	1.00	.255	3	H2
	40512201061	40510200783	40510200156	1/4 - 28	2.50	.35	1.00	.255	3	H3
	—	—	40510200158	1/4 - 28	2.50	.35	1.00	.255	3	H4

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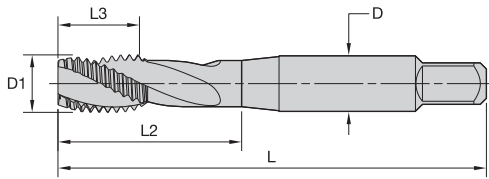
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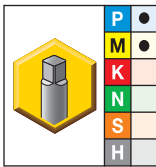
TiCN	TiN	oxide	D1 size	L	L3	L2	D	number of flutes	pitch diameter limit
-	-	40510200159	1/4 - 28	2.50	.35	1.00	.255	3	H5
-	-	40510200161	1/4 - 28	2.50	.35	1.00	.255	3	H6
-	-	40510200162	1/4 - 28	2.50	.35	1.00	.255	3	H7
40512201070 -	40510200784	40510200163	5/16 - 18	2.72	.47	1.13	.318	3	H3
-	-	40510200165	5/16 - 18	2.72	.47	1.13	.318	3	H5
-	-	40510200167	5/16 - 18	2.72	.47	1.13	.318	3	H7
40512201071	40510200785	40510200168	5/16 - 24	2.72	.39	1.13	.318	3	H3
-	-	40510200170	5/16 - 24	2.72	.39	1.13	.318	3	H4
-	-	40510200171	5/16 - 24	2.72	.39	1.13	.318	3	H5
-	-	40510200174	5/16 - 24	2.72	.39	1.13	.318	3	H7
40512201067	40510200786	40510200175	3/8 - 16	2.94	.55	1.25	.381	3	H3
-	-	40510200177	3/8 - 16	2.94	.55	1.25	.381	3	H5
-	-	40510200179	3/8 - 16	2.94	.55	1.25	.381	3	H7
40512201068	40510200787	40510200181	3/8 - 24	2.94	.39	1.25	.381	3	H3
-	-	40510200183	3/8 - 24	2.94	.39	1.25	.381	3	H4
40512201075	40510200788		7/16 - 14	3.16	.59	-	.323	3	H3
-	-	40510200191	7/16 - 14	3.16	.59	-	.323	3	H5
-	-	40510200193	7/16 - 14	3.16	.59	-	.323	3	H7
40512201076	40510200789	40510200194	7/16 - 20	3.16	.47	-	.323	3	H3
-	-	40510200196	7/16 - 20	3.16	.47	-	.323	3	H5
-	-	40510200198	7/16 - 20	3.16	.47	-	.323	3	H6
-	-	40510200199	7/16 - 20	3.16	.47	-	.323	3	H7
40512201058	40510200790	40510200200	1/2 - 13	3.38	.63	-	.367	3	H3
-	-	40510200202	1/2 - 13	3.38	.63	-	.367	3	H5
-	-	40510200204	1/2 - 13	3.38	.63	-	.367	3	H7
40512201059	40510200791	40510200205	1/2 - 20	3.38	.47	-	.367	3	H3
-	-	40510200207	1/2 - 20	3.38	.47	-	.367	3	H5
-	-	40510200209	1/2 - 20	3.38	.47	-	.367	3	H6
-	-	40510200210	1/2 - 20	3.38	.47	-	.367	3	H7
-	40510200792	40510200211	9/16 - 12	3.59	.71	-	.429	3	H3
-	-	40510200213	9/16 - 12	3.59	.71	-	.429	3	H5
40512201079	40510200793	40510200214	9/16 - 18	3.59	.51	-	.429	3	H3
-	-	40512201055	9/16 - 18	3.59	.51	-	.429	3	H5
40512201072	40510200794	40510200217	5/8 - 11	3.81	.75	-	.480	3	H3
-	-	40510200219	5/8 - 11	3.81	.75	-	.480	3	H5
-	-	40510200221	5/8 - 11	3.81	.75	-	.480	3	H7
40512201073	40510200795	40510200222	5/8 - 18	3.81	.51	-	.480	3	H3
-	-	40510200224	5/8 - 18	3.81	.51	-	.480	3	H5
-	-	40510200226	5/8 - 18	3.81	.51	-	.480	3	H6
-	-	40510200227	5/8 - 18	3.81	.51	-	.480	3	H7
40512201065	40510200796	40510200228	3/4 - 10	4.25	.83	-	.590	4	H3
-	-	40510200230	3/4 - 10	4.25	.83	-	.590	4	H5
40512201066	40510200797	40510200231	3/4 - 16	4.25	.59	-	.590	4	H3
-	-	40510200233	3/4 - 16	4.25	.59	-	.590	4	H5
-	40510200799	40510200235	7/8 - 14	4.69	.71	-	.697	4	H4
40512201077	40510200798	40510200234	7/8 - 9	4.69	.83	-	.697	4	H4
-	-	40510200237	1 - 12	5.13	.71	-	.800	4	H4
-	-	40512201050	1 - 12	5.13	.71	-	.800	4	H4
40512201064	40510200800	40510200236	1 - 8	5.13	.98	-	.800	4	H4



NOTE: K-SS taps for 3B class of fit are suitable for UNJ aerospace internal threading applications.
Refer to table on pages L291-L292 for the recommended pitch diameter limit for 2B or 3B class of fit.



■ K-Stainless Spiral Flute • Machine Screw and Fractional • Full-Bottoming Chamfer



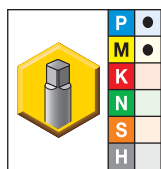
● first choice
○ alternate choice

Taps

oxide	D1 size	L	L3	L2	D	number of flutes	pitch diameter limit
40510200099	4 - 40	1.88	.24	.56	.141	2	H2
40510200101	4 - 40	1.88	.24	.56	.141	2	H3
40510200104	4 - 40	1.88	.24	.56	.141	2	H5
40510200107	4 - 48	1.88	.24	—	.141	2	H2
40510200109	5 - 40	1.94	.24	.63	.141	3	H2
40510200111	6 - 32	2.00	.28	.69	.141	3	H2
40510200113	6 - 32	2.00	.28	.69	.141	3	H3
40510200116	6 - 32	2.00	.28	.69	.141	3	H5
40510200119	6 - 40	2.00	.28	.69	.141	3	H2
40510200122	6 - 40	2.00	.28	.69	.141	3	H3
40510200124	8 - 32	2.13	.28	.75	.168	3	H2
40510200126	8 - 32	2.13	.28	.75	.168	3	H3
40510200129	8 - 32	2.13	.28	.75	.168	3	H5
40510200134	10 - 24	2.38	.35	.88	.194	3	H3
40510200137	10 - 24	2.38	.35	.88	.194	3	H5
40510200141	10 - 32	2.38	.28	.88	.194	3	H3
40510200144	10 - 32	2.38	.28	.88	.194	3	H5
D0510200151	1/4 - 20	2.50	.43	1.00	.255	3	H3
40510200153	1/4 - 20	2.50	.43	1.00	.255	3	H5
40510200157	1/4 - 28	2.50	.35	1.00	.255	3	H3
40510200160	1/4 - 28	2.50	.35	1.00	.255	3	H5
40510200164	5/16 - 18	2.72	.47	1.13	.318	3	H3

(continued)

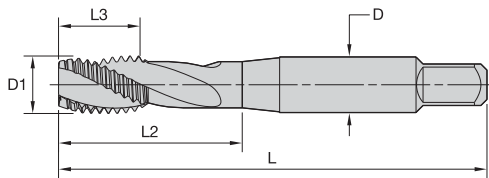
(K-Stainless Spiral Flute • Machine Screw and Fractional • Full-Bottoming Chamfer continued)



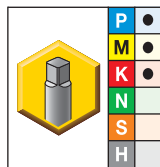
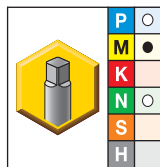
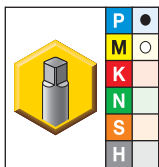
oxide	D1 size	L	L3	L2	D	number of flutes	pitch diameter limit
40510200166	5/16 - 18	2.72	.47	1.13	.318	3	H5
40510200169	5/16 - 24	2.72	.39	1.13	.318	3	H3
40510200172	5/16 - 24	2.72	.39	1.13	.318	3	H5
40510200176	3/8 - 16	2.94	.55	1.25	.381	3	H3
40510200178	3/8 - 16	2.94	.55	1.25	.381	3	H5
40510200180	3/8 - 16	2.94	.55	1.25	.381	3	H7
40510200182	3/8 - 24	2.94	.39	1.25	.381	3	H3
40510200184	3/8 - 24	2.94	.39	1.25	.381	3	H4
40510200186	3/8 - 24	2.94	.39	1.25	.381	3	H5
40510200190	7/16 - 14	3.16	.59	—	.323	3	H3
40510200192	7/16 - 14	3.16	.59	—	.323	3	H5
40510200195	7/16 - 20	3.16	.47	—	.323	3	H3
40510200197	7/16 - 20	3.16	.47	—	.323	3	H5
40510200201	1/2 - 13	3.38	.63	—	.367	3	H3
40510200203	1/2 - 13	3.38	.63	—	.367	3	H5
40510200206	1/2 - 20	3.38	.47	—	.367	3	H3
40510200212	9/16 - 12	3.59	.71	—	.429	3	H3
40510200215	9/16 - 18	3.59	.51	—	.429	3	H3
40510200218	5/8 - 11	3.81	.75	—	.480	3	H3
40510200220	5/8 - 11	3.81	.75	—	.480	3	H5
40510200223	5/8 - 18	3.81	.51	—	.480	3	H3
40512201053	5/8 - 18	3.81	.51	—	.480	3	H5
40510200225	5/8 - 18	3.81	.51	—	.480	3	H5
40510200229	3/4 - 10	4.25	.83	—	.590	4	H3
40510200232	3/4 - 16	4.25	.59	—	.590	4	H3

NOTE: K-Stainless taps for 3B class of fit are suitable for UNJ aerospace internal threading applications.
Refer to table on pages L291–L292 for the recommended pitch diameter limit for 2B or 3B class of fit.





■ K-Stainless Spiral Flute • Chamfer 2 1/2-3 1/2 Pitches • Metric ANSI

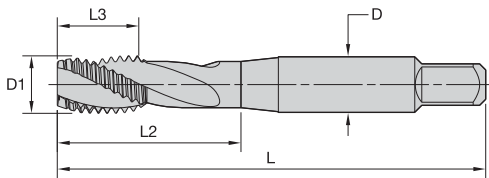


● first choice
○ alternate choice

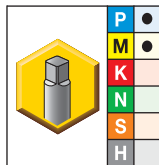
Taps

	TiCN	TiN	oxide	D1 size	L	L3	L2	D	number of flutes	pitch diameter limit
	40512201123	—	40510200256	M3 x 0,5	1.94	.31	.56	.141	3	D3
	—	—	40510200258	M3,5 x 0,6	2.00	.38	.63	.141	3	D4
	40512201124	—	40510200260	M4 x 0,7	2.13	.38	.75	.168	3	D4
	40512201125	40512201118	40510200262	M5 x 0,8	2.38	.50	.88	.194	3	D4
	40512201126	40512201119	40510200264	M6 x 1	2.50	.63	1.00	.255	3	D5
	—	—	40510200266	M7 x 1	2.72	.69	1.13	.318	3	D5
	—	—	40510200268	M8 x 1	2.72	.69	1.13	.318	3	D5
	40512201127	40512201120	40510200270	M8 x 1,25	2.72	.69	1.13	.318	3	D5
	—	—	40510200272	M10 x 1,25	2.94	.75	1.25	.381	3	D5
	40512201121	40512201116	40510200274	M10 x 1,5	2.94	.75	1.25	.381	3	D6
	—	—	40510200276	M12 x 1,25	3.38	.94	—	.367	3	D5
	40512201122	40512201117	40510200278	M12 x 1,75	3.38	.94	—	.367	3	D6
	—	—	40510200280	M14 x 1,5	3.59	1.00	—	.429	3	D6
	—	—	40510200282	M14 x 2	3.59	1.00	—	.429	3	D7
	—	—	40510200284	M16 x 1,5	3.81	1.09	—	.480	3	D6
	—	—	40510200286	M16 x 2	3.81	1.09	—	.480	3	D7
	—	—	40510200290	M18 x 2,5	4.03	.79	—	.542	3	D7

NOTE: Metric taps for 6H class of fit are suitable for MJ aerospace internal threading applications.
Metric taps are manufactured to USCTI specifications and dimensions.
Metric tap blank dimensions are equivalent to inch taps.
Refer to table on page L292 for the recommended pitch diameter limit for 6H class of fit.



■ K-Stainless Spiral Flute • Full-Bottoming Chamfer • Metric ANSI

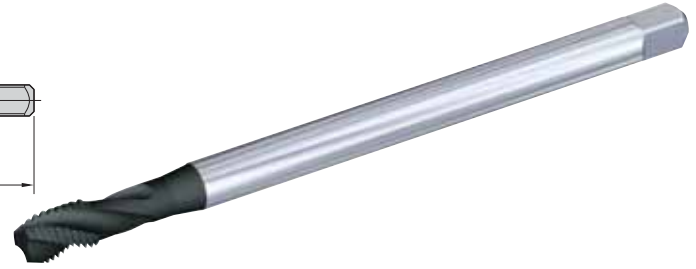
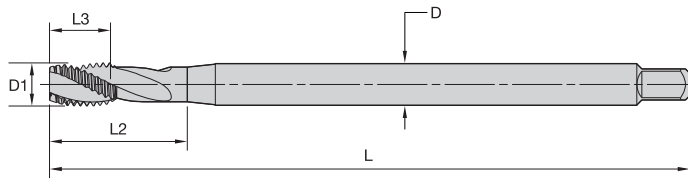


- first choice
- alternate choice

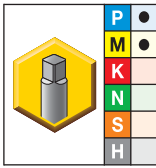
oxide	D1 size	L	L3	L2	D	number of flutes	pitch diameter limit
40510200257	M3 x 0,5	1.94	.31	.56	.141	3	D3
40510200259	M3,5 x 0,6	2.00	.38	.63	.141	3	D4
40510200261	M4 x 0,7	2.13	.38	.75	.168	3	D4
40510200263	M5 x 0,8	2.38	.50	.88	.194	3	D4
40510200265	M6 x 1	2.50	.63	1.00	.255	3	D5
40510200267	M7 x 1	2.72	.69	1.13	.318	3	D5
40510200269	M8 x 1	2.72	.69	1.13	.318	3	D5
40510200271	M8 x 1,25	2.72	.69	1.13	.318	3	D5
40510200273	M10 x 1,25	2.94	.75	1.25	.381	3	D5
40510200275	M10 x 1,5	2.94	.75	1.25	.381	3	D6
40510200277	M12 x 1,25	3.38	.94	—	.367	3	D5
40510200279	M12 x 1,75	3.38	.94	—	.367	3	D6
40510200281	M14 x 1,5	3.59	1.00	—	.429	3	D6
40510200283	M14 x 2	3.59	1.00	—	.429	3	D7
40510200285	M16 x 1,5	3.81	1.09	—	.480	3	D6
40510200287	M16 x 2	3.81	1.09	—	.480	3	D7
40510200289	M18 x 1,5	4.03	1.09	—	.542	3	D6

NOTE: Metric taps for 6H class of fit are suitable for MJ aerospace internal threading applications.
 Metric taps are manufactured to USCTI specifications and dimensions.
 Metric tap blank dimensions are equivalent to inch taps.
 Refer to table on page L292 for the recommended pitch diameter limit for 6H class of fit.





■ K-Stainless Spiral Flute 6" • Machine Screw and Fractional • Modified Bottoming Chamfer



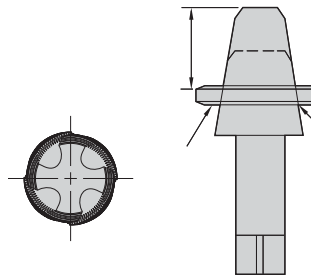
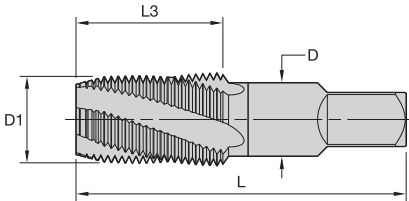
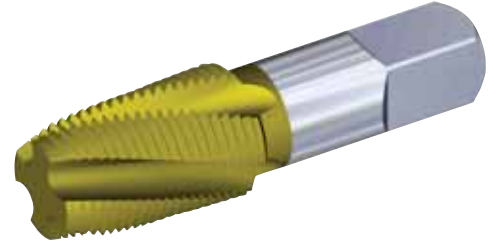
● first choice
○ alternate choice

Taps

oxide	D1 size	L	L3	L2	D	number of flutes	pitch diameter limit
40510200739	2 - 56	6.00	.44	—	.141	2	H2
40510200740	3 - 48	6.00	.50	—	.141	2	H2
40510200741	4 - 40	6.00	.24	.56	.141	2	H2
40510200742	6 - 32	6.00	.28	.69	.141	3	H3
40510200743	8 - 32	6.00	.28	.75	.168	3	H3
40510200744	10 - 24	6.00	.35	.88	.194	3	H3
40510200745	10 - 32	6.00	.28	.88	.194	3	H3
40510200746	1/4 - 20	6.00	.43	1.00	.255	3	H3
40510200747	1/4 - 28	6.00	.35	1.00	.255	3	H3
40510200748	5/16 - 18	6.00	.47	1.13	.318	3	H3
40510200749	5/16 - 24	6.00	.39	1.13	.318	3	H3
40510200750	3/8 - 16	6.00	.55	1.25	.381	3	H3
40510200751	3/8 - 24	6.00	.39	1.25	.381	3	H3
40510200752	7/16 - 14	6.00	.59	—	.323	3	H3
40510200753	7/16 - 20	6.00	.47	—	.323	3	H3
40510200754	1/2 - 13	6.00	.63	—	.367	3	H3
40510200755	1/2 - 20	6.00	.47	—	.367	3	H3

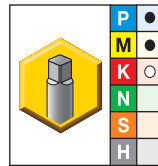
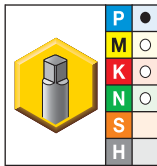
NOTE: K-SS taps for 3B class of fit are suitable for UNJ aerospace internal threading applications. Refer to table on pages L291–L292 for the recommended pitch diameter limit for 2B or 3B class of fit.

- Ground thread pipe taps are standard in American Standard Pipe Thread (NPT) and American Standard Dryseal Pipe Thread (NPTF).
- NPT threads require the use of a sealer such as Teflon® tape or pipe compound.
- NPTF dryseal threads give a pressure-tight joint without the use of sealer.
- Standard projection.
- Unique, slow, spiral-tap geometry for improved thread finish when tapping stainless steels.



*Standard Projection
L1 Ring Gage
Basic Size

■ K-SS Spiral-Flute Pipe • Standard Chamfer



- first choice
- alternate choice

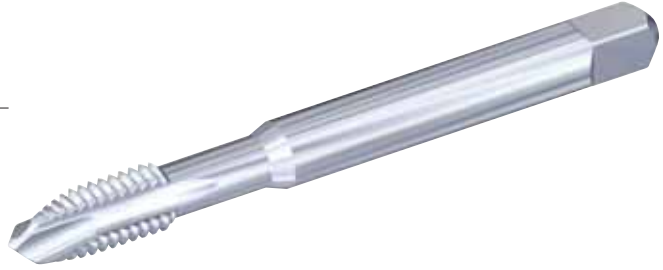
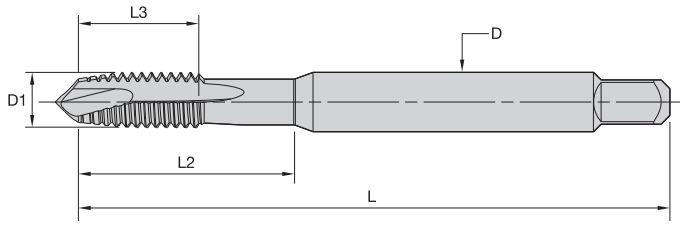
TiN	oxide	D1 size	L	L3	D	number of flutes	thread type
40512201080	40510200838	1/16 - 27	2.13	.69	.313	4	NPT
—	40510200855	1/16 - 27	2.13	.69	.313	4	NPTF
40512201086	40510200840	1/8 - 27	2.13	.75	.313	4	NPT
40512201088	40510200859	1/8 - 27	2.13	.75	.313	4	NPTF
40512201085	40510200839	1/8 - 27	2.13	.75	.438	4	NPT
40512201087	40510200856	1/8 - 27	2.13	.75	.438	4	NPTF
40512201083	40510200841	1/4 - 18	2.44	1.06	.563	4	NPT
40512201084	40510200860	1/4 - 18	2.44	1.06	.563	4	NPTF
40512201091	40510200842	3/8 - 18	2.56	1.06	.703	4	NPT
40512201092	40510200861	3/8 - 18	2.56	1.06	.703	4	NPTF
40512201081	40510200844	1/2 - 14	3.13	1.38	.688	4	NPT
40512201082	40510200862	1/2 - 14	3.13	1.38	.688	4	NPTF
40512201090	40510200846	3/4 - 14	3.25	1.38	.906	4	NPT
—	40510200863	3/4 - 14	3.25	1.38	.906	4	NPTF
40512201089	40510200848	1 - 11 1/2	3.75	1.75	1.125	4	NPT
—	40510200864	1 - 11 1/2	3.75	1.75	1.125	4	NPTF

* Pipe tap projection is the distance the small end of the tap projects through an American National Standard L1 Pipe Thread Ring Gage.

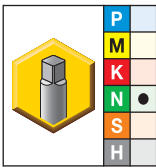
NOTE: Large shank available on D1=1/8–27.

For gage measurement projection, see technical page L287.





■ K-AL • Machine Screw and Fractional • Plug Chamfer • DIN Length

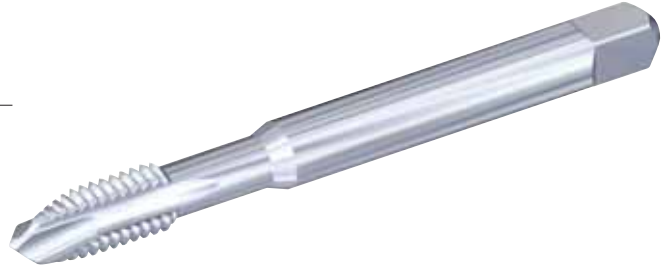
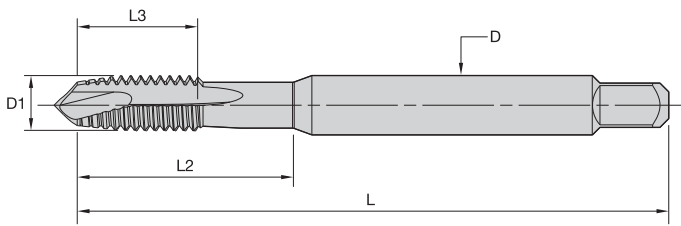


● first choice
○ alternate choice

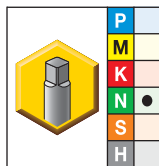
Taps

nitride	D1 size	L	L3	L2	D	number of flutes	pitch diameter limit
40510286200	2 - 56	1.77	.28	.47	.141	2	H2
40510286201	4 - 40	2.21	.43	.71	.141	2	H2
40510286202	5 - 40	2.21	.43	.71	.141	3	H2
40510286203	6 - 32	2.21	.51	.79	.141	3	H3
40510286204	8 - 32	2.48	.51	.83	.168	3	H3
40510286205	10 - 24	2.76	.63	.98	.194	3	H3
40510286206	10 - 32	2.76	.63	.98	.194	3	H3
40510286207	1/4 - 20	3.15	.75	1.18	.255	3	H3
40510286208	1/4 - 20	3.15	.75	1.18	.255	3	H5
40510286209	1/4 - 28	3.15	.75	1.18	.255	3	H3
40510286211	1/4 - 28	3.15	.75	1.18	.255	3	H4
40510286212	5/16 - 18	3.54	.87	1.38	.318	3	H3
40510286213	5/16 - 18	3.54	.87	1.38	.318	3	H5
40510286214	5/16 - 24	3.54	.87	1.38	.318	3	H3
40510286215	5/16 - 24	3.54	.87	1.38	.318	3	H4
40510286216	3/8 - 16	3.94	.95	1.54	.381	3	H3
40510286217	3/8 - 16	3.94	.95	1.54	.381	3	H5
40510286218	3/8 - 24	3.54	.79	1.54	.381	3	H3
40510286219	3/8 - 24	3.54	.79	1.54	.381	3	H4
40510286222	7/16 - 14	3.94	.95	1.65	.323	3	H3
40510286221	7/16 - 14	3.94	.95	1.65	.323	3	H5
40510286220	7/16 - 20	3.94	.95	1.65	.323	3	H3
40510286223	7/16 - 20	3.94	.95	1.65	.323	3	H5
40510286224	1/2 - 13	4.33	1.14	1.77	.367	3	H3
40510286225	1/2 - 13	4.33	1.14	1.77	.367	3	H5
40510286226	1/2 - 20	3.94	.87	1.77	.367	3	H3
40510286227	1/2 - 20	3.94	.87	1.77	.367	3	H5

NOTE: K-AL taps for 3B class of fit are suitable for UNJ aerospace internal threading applications.
Refer to table on pages L291–L292 for the recommended pitch diameter limit for 2B or 3B class of fit.



■ K-AL • Plug Chamfer • DIN Length • ANSI Shank • Metric

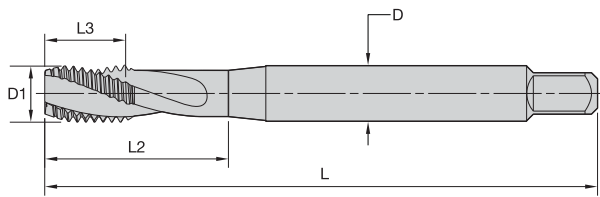


● first choice
○ alternate choice

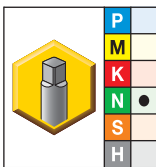
nitride	D1 size	L	L3	L2	D	number of flutes	pitch diameter limit
40510286228	M3 x 0,5	2.21	.43	.71	.141	3	D3
40510286229	M3,5 x 0,6	2.21	.51	.79	.141	3	D4
40510286230	M4 x 0,7	2.48	.51	.83	.168	3	D4
40510286231	M5 x 0,8	2.76	.63	.98	.194	3	D4
40510286232	M6 x 1	3.15	.75	1.18	.255	3	D5
40510286233	M7 x 1	3.15	.75	1.18	.318	3	D5
40510286234	M8 x 1	3.54	.87	1.38	.318	3	D5
40510286235	M8 x 1,25	3.54	.87	1.38	.318	3	D5
40510286236	M10 x 1,25	3.94	.95	1.54	.381	3	D5
40510286237	M10 x 1,5	3.94	.95	1.54	.381	3	D6
40510286238	M12 x 1,25	3.94	.87	1.77	.367	3	D5
40510286239	M12 x 1,5	3.94	.87	1.77	.367	3	D5
40510286240	M12 x 1,75	4.33	1.14	1.77	.367	3	D6

NOTE: Metric taps for 6H class of fit are suitable for MJ aerospace internal threading applications. Refer to table on page L292 for the recommended pitch diameter limit for 6H class of fit.





■ K-ALS • Machine Screw and Fractional • Semi-Bottoming Chamfer • DIN Length • ANSI Shank



- first choice
- alternate choice

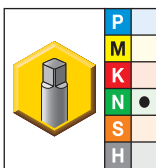
Taps

nitride	D1 size	L	L3	L2	D	number of flutes	pitch diameter limit
40512201006	2 - 56	1.77	.28	.47	.141	3	H2
40512201008	4 - 40	2.21	.43	.71	.141	3	H2
40512201011	6 - 32	2.25	.51	.79	.141	3	H3
40512201013	8 - 32	2.48	.51	.83	.168	3	H3
40512201004	10 - 24	2.76	.63	.98	.194	3	H3
40512201005	10 - 32	2.76	.63	.98	.194	3	H3
40512201003	1/4 - 20	3.15	.75	1.18	.255	3	H3
40512201009	5/16 - 18	3.54	.87	1.38	.318	3	H3
40512201010	5/16 - 24	3.54	.87	1.38	.318	3	H3
40512201007	3/8 - 16	3.54	.95	1.54	.381	3	H3
40512201012	7/16 - 20	3.94	.95	1.65	.323	3	H3
40512201001	1/2 - 13	4.33	1.14	1.77	.367	3	H5
40512201002	1/2 - 20	3.94	.87	1.77	.367	3	H3

NOTE: K-ALS taps for 3B class of fit are suitable for UNJ aerospace internal threading applications.
Refer to table on pages L291-L292 for the recommended pitch diameter limit for 2B or 3B class of fit.



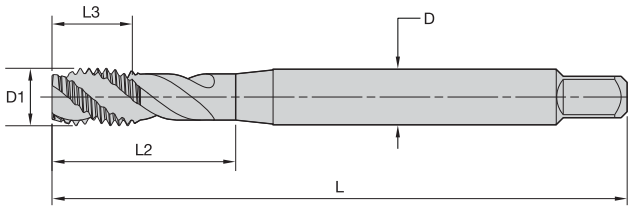
■ K-ALS • Semi-Bottoming Chamfer • DIN Length • ANSI Shank • Metric Sizes



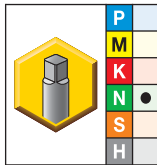
- first choice
- alternate choice

nitride	D1 size	L	L3	L2	D	number of flutes	pitch diameter limit
40512201018	M3 x 0,5	2.21	.43	.71	.141	3	D3
40512201019	M4 x 0,7	2.48	.51	.83	.168	3	D4
40512201020	M5 x 0,8	2.76	.63	.98	.194	3	D4
40512201021	M6 x 1	3.15	.75	1.18	.255	3	D5
40512201022	M8 x 1,25	3.54	.87	1.38	.318	3	D5
40512201016	M10 x 1,5	3.94	.95	1.54	.381	3	D6
40512201017	M12 x 1,5	3.94	.87	1.50	.367	3	D5

NOTE: Metric taps for 6H class of fit are suitable for MJ aerospace internal threading applications.
Metric taps are manufactured to USCTI specifications and dimensions.
Refer to table on page L292 for the recommended pitch diameter limit for 6H class of fit.



■ K-AL Spiral Flute • Machine Screw and Fractional • Semi-Bottoming Chamfer • DIN Length • ANSI Shank

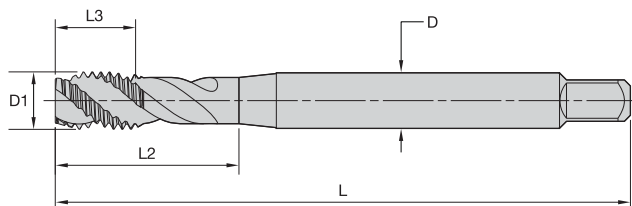


- first choice
- alternate choice

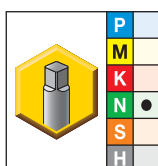
nitride	D1 size	L	L3	L2	D	number of flutes	pitch diameter limit
40510286500	2 - 56	1.77	.28	.47	.141	2	H2
40510286501	4 - 40	2.21	.43	.71	.141	2	H2
40510286502	5 - 40	2.21	.43	.71	.141	3	H2
40510286503	6 - 32	2.21	.51	.79	.141	3	H3
40510286504	8 - 32	2.48	.51	.83	.168	3	H3
40510286505	10 - 24	2.76	.63	.98	.194	3	H3
40510286506	10 - 32	2.76	.63	.98	.194	3	H3
40510286507	1/4 - 20	3.15	.75	1.18	.255	3	H3
40510286508	1/4 - 20	3.15	.75	1.18	.255	3	H5
40510286509	1/4 - 28	3.15	.75	1.18	.255	3	H3
40510286511	1/4 - 28	3.15	.75	1.18	.255	3	H4
40512201014	5/16 - 18	3.54	.87	1.38	.318	3	H3
40510286513	5/16 - 18	3.54	.87	1.38	.318	3	H5
40510286514	5/16 - 24	3.54	.87	1.38	.318	3	H3
40510286515	5/16 - 24	3.54	.87	1.38	.318	3	H4
40510286516	3/8 - 16	3.94	.95	1.54	.381	3	H3
40510286517	3/8 - 16	3.94	.95	1.54	.381	3	H5
40510286518	3/8 - 24	3.54	.79	1.54	.381	3	H3
40510286519	3/8 - 24	3.54	.79	1.54	.381	3	H4
40510286520	7/16 - 14	3.94	.95	1.65	.323	3	H3
40510286521	7/16 - 14	3.94	.95	1.65	.323	3	H5
40510286522	7/16 - 20	3.94	.95	1.65	.323	3	H3
40510286523	7/16 - 20	3.94	.95	1.65	.323	3	H5
40510286524	1/2 - 13	4.33	1.14	1.77	.367	3	H3
40510286525	1/2 - 13	4.33	1.14	1.77	.367	3	H5
40510286526	1/2 - 20	3.94	.87	1.77	.367	3	H3
40510286527	1/2 - 20	3.94	.87	1.77	.367	3	H5

NOTE: K-AL taps for 3B class of fit are suitable for UNJ aerospace internal threading applications.
Refer to table on pages L291-L292 for the recommended pitch diameter limit for 2B or 3B class of fit.





■ K-AL Spiral-Flute • Semi-Bottoming Chamfer • DIN Length • ANSI Shank • Metric Sizes

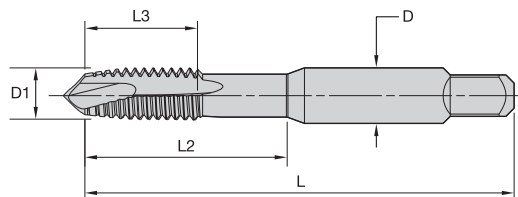


- first choice
- alternate choice

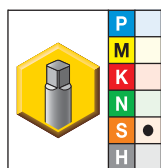
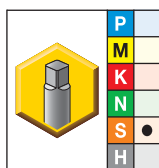
Taps

nitride	D1 size	L	L3	L2	D	number of flutes	pitch diameter limit
40512201015	M3 x 0,5	2.21	.43	.79	.141	3	D3
40510286529	M3,5 x 0,6	2.21	.51	.83	.141	3	D4
40510286530	M4 x 0,7	2.48	.51	.83	.168	3	D4
40510286531	M5 x 0,8	2.76	.63	.98	.194	3	D4
40510286532	M6 x 1	3.15	.75	1.18	.255	3	D5
40510286533	M7 x 1	3.15	.75	1.18	.318	3	D5
40510286534	M8 x 1	3.54	.87	1.38	.318	3	D5
40510286535	M8 x 1,25	3.54	.87	1.38	.318	3	D5
40510286536	M10 x 1,25	3.94	.95	1.54	.381	3	D5
40510286537	M10 x 1,5	3.94	.95	1.54	.381	3	D6
40510286538	M12 x 1,25	3.94	.87	1.50	.367	3	D5
40510286539	M12 x 1,5	3.94	.87	1.50	.367	3	D5
40510286540	M12 x 1,75	4.33	1.14	2.05	.367	3	D6

NOTE: Metric taps for 6H class of fit are suitable for MJ aerospace internal threading applications. Refer to table on page L292 for the recommended pitch diameter limit for 6H class of fit.



■ K-NI • Machine Screw and Fractional • Plug Chamfer

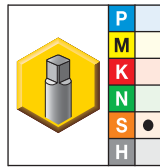
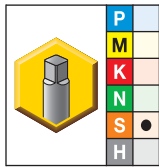


- first choice
- alternate choice

TICN	oxide/nitride	D1 size	L	L3	L2	D	number of flutes	pitch diameter limit
—	40510200291	2 - 56	1.75	.26	—	.141	2	H2
40512201211	40510200292	4 - 40	1.88	.34	.56	.141	2	H2
—	40510200293	4 - 40	1.88	.34	.56	.141	2	H3
—	40510200295	4 - 48	1.88	.34	.56	.141	2	H2
—	40510200296	5 - 40	1.94	.37	.62	.141	3	H2
40512201214	40510200298	6 - 32	2.00	.41	.69	.141	3	H3
—	40510200299	6 - 32	2.00	.41	.69	.141	3	H5
—	40510200301	6 - 40	2.00	.41	.69	.141	3	H2
40512201217	40510200303	8 - 32	2.13	.45	.75	.168	3	H3
—	40512201202	8 - 32	2.13	.45	.75	.168	3	H4
—	40510200305	8 - 32	2.13	.45	.75	.168	3	H5
—	40510200306	8 - 32	2.13	.45	.75	.168	3	H6
40512201207	40510200308	10 - 24	2.38	.53	.88	.194	3	H3
—	40510200309	10 - 24	2.38	.53	.88	.194	3	H4
—	40510200310	10 - 24	2.38	.53	.88	.194	3	H5
—	40512201200	10 - 32	2.38	.53	.88	.194	3	H2
40512201208	40510200313	10 - 32	2.38	.53	.88	.194	3	H3
—	40510200314	10 - 32	2.38	.53	.88	.194	3	H4
—	40510200315	10 - 32	2.38	.53	.88	.194	3	H5
—	40510200316	10 - 32	2.38	.53	.88	.194	3	H6
40512201205	40510200318	1/4 - 20	2.50	.59	1.00	.255	3	H3
—	40510200319	1/4 - 20	2.50	.59	1.00	.255	3	H5
40512201206	40510200321	1/4 - 28	2.50	.59	1.00	.255	3	H3
—	40510200322	1/4 - 28	2.50	.59	1.00	.255	3	H4
—	40510200323	1/4 - 28	2.50	.59	1.00	.255	3	H5
—	40510200324	1/4 - 28	2.50	.59	1.00	.255	3	H6
—	40512201199	1/4 - 28	2.50	.59	1.00	.255	3	H7
40512201212	40510200326	5/16 - 18	2.72	.67	1.13	.318	3	H3

(continued)

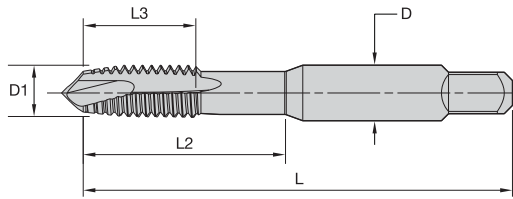
(K-NI • Machine Screw and Fractional • Plug Chamfer continued)



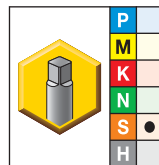
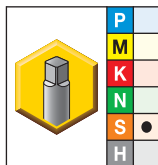
TiCN	oxide/nitride	D1 size	L	L3	L2	D	number of flutes	pitch diameter limit
—	40510200327	5/16 - 18	2.72	.67	1.13	.318	3	H5
—	40510200328	5/16 - 18	2.72	.67	1.13	.318	3	H7
40512201213	40510200329	5/16 - 24	2.72	.67	1.13	.318	3	H3
—	40510200330	5/16 - 24	2.72	.67	1.13	.318	3	H4
—	40510200331	5/16 - 24	2.72	.67	1.13	.318	3	H5
—	40512201201	5/16 - 24	2.72	.67	1.13	.318	3	H6
—	40510200333	5/16 - 24	2.72	.67	1.13	.318	3	H7
40512201209	40510200334	3/8 - 16	2.94	.75	1.25	.381	3	H3
—	40510200335	3/8 - 16	2.94	.75	1.25	.381	3	H5
—	40510200336	3/8 - 16	2.94	.75	1.25	.381	3	H7
40512201210	40510200337	3/8 - 24	2.94	.75	1.25	.381	3	H3
—	40510200338	3/8 - 24	2.94	.75	1.25	.381	3	H4
—	40510200339	3/8 - 24	2.94	.75	1.25	.381	3	H5
—	40510200340	3/8 - 24	2.94	.75	1.25	.381	3	H6
—	40510200341	3/8 - 24	2.94	.75	1.25	.381	3	H7
40512201215	40510200342	7/16 - 14	3.16	.87	—	.323	3	H3
40512201216	40510200344	7/16 - 20	3.16	.87	—	.323	3	H3
—	40510200345	7/16 - 20	3.16	.87	—	.323	3	H5
40512201203	40510200346	1/2 - 13	3.38	.96	—	.367	3	H3
—	40510200347	1/2 - 13	3.38	.96	—	.367	3	H5
—	40510200348	1/2 - 13	3.38	.96	—	.367	3	H7
40512201204	40510200349	1/2 - 20	3.38	.96	—	.367	3	H3
—	40510200350	1/2 - 20	3.38	.96	—	.367	3	H5
—	40510200351	1/2 - 20	3.38	.96	—	.367	3	H7
—	40510200352	5/8 - 11	3.81	1.08	—	.480	3	H3
—	40510200353	5/8 - 18	3.81	1.08	—	.480	3	H3
—	40510200354	3/4 - 10	4.25	1.20	—	.590	3	H3
—	40510200355	3/4 - 16	4.25	1.20	—	.590	3	H3

NOTE: K-NI taps for 3B class of fit are suitable for UNJ aerospace internal threading applications.
Refer to table on pages L291–L292 for the recommended pitch diameter limit for 2B or 3B class of fit.

Taps



■ K-NI • Plug Chamfer • Metric ANSI

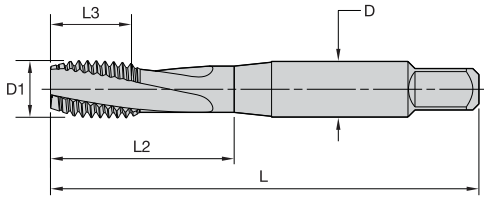


- first choice
- alternate choice

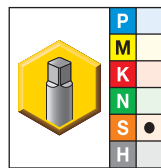
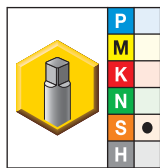
TiCN	oxide/nitride	D1 size	L	L3	L2	D	number of flutes	pitch diameter limit
—	40512201244	M2,5 x 0,45	1.81	.30	.50	.141	3	D3
40512201253	40512201245	M3 x 0,5	1.94	.37	.63	.141	3	D3
—	40510201036	M3,5 x 0,6	2.00	.41	.69	.141	3	D4
40512201254	40512201246	M4 x 0,7	2.13	.45	.75	.168	3	D4
40512201255	40512201247	M5 x 0,8	2.38	.53	.88	.194	3	D4
40512201256	40512201248	M6 x 1	2.50	.59	1.00	.255	3	D5
—	40510201040	M7 x 1	2.72	.67	1.13	.318	3	D5
—	40512201249	M8 x 1	2.72	.67	1.13	.318	3	D5
40512201257	40512201250	M8 x 1,25	2.72	.67	1.13	.318	3	D5
—	40510201043	M10 x 1,25	2.94	.75	1.25	.381	3	D5
40512201251	—	M10 x 1,5	2.94	.75	1.25	.381	3	D6
—	40510201044	M10 x 1,5	2.94	.75	1.25	.381	3	D6
—	40510201045	M12 x 1,25	3.38	.98	—	.367	3	D5
40512201252	40510201046	M12 x 1,75	3.38	.98	—	.367	3	D6

NOTE: Metric taps for 6H class of fit are suitable for MJ aerospace internal threading applications.
 Metric taps are manufactured to USCTI specifications and dimensions.
 Metric tap blank dimensions are equivalent to inch taps.
 Refer to table on page L292 for the recommended pitch diameter limit for 6H class of fit.





■ K-NI Spiral Flute • Machine Screw and Fractional • 3-4 Pitches Chamfer



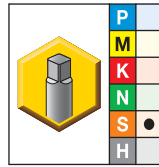
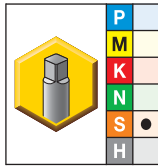
● first choice
○ alternate choice

Taps

	TiCN	oxide/nitride	D1 size	L	L3	L2	D	number of flutes	pitch diameter limit
	—	40510200356	2 - 56	1.75	.44	—	.141	3	H2
	—	40510200357	3 - 48	1.81	.50	—	.141	3	H2
	40512201236	40510200358	4 - 40	1.88	.31	.56	.141	3	H2
	—	40510200361	4 - 40	1.88	.31	.56	.141	3	H3
	—	40510200364	4 - 40	1.88	.31	.56	.141	3	H5
	—	40510200366	4 - 48	1.88	.31	.56	.141	3	H2
	40512201237	40510200368	5 - 40	1.94	.31	.63	.141	3	H2
	—	40510200370	6 - 32	2.00	.38	.69	.141	3	H2
	40512201240	40510200372	6 - 32	2.00	.38	.69	.141	3	H3
	—	40510200374	6 - 32	2.00	.38	.69	.141	3	H5
	—	40510200376	6 - 32	2.00	.38	.69	.141	3	H7
	—	40510200377	6 - 40	2.00	.38	.69	.141	3	H2
	—	40512201226	8 - 32	2.13	.38	.75	.168	3	H2
	40512201243	40510200381	8 - 32	2.13	.38	.75	.168	3	H3
	—	40510200383	8 - 32	2.13	.38	.75	.168	3	H4
	—	40510200384	8 - 32	2.13	.38	.75	.168	3	H5
	—	40512201227	8 - 32	2.13	.38	.75	.168	3	H6
	40512201232	40512201219	10 - 24	2.38	.50	.88	.194	3	H3
	—	40510200390	10 - 24	2.38	.50	.88	.194	3	H4
	—	40510200391	10 - 24	2.38	.50	.88	.194	3	H5
	—	40510200393	10 - 24	2.38	.50	.88	.194	3	H7
	—	40512201220	10 - 32	2.38	.50	.88	.194	3	H2
	40512201233	40510200395	10 - 32	2.38	.50	.88	.194	3	H3
	—	40510200398	10 - 32	2.38	.50	.88	.194	3	H5
	—	40510200401	10 - 32	2.38	.50	.88	.194	3	H7
	40512201230	40510200402	1/4 - 20	2.50	.63	1.00	.255	3	H3
	—	40510200404	1/4 - 20	2.50	.63	1.00	.255	3	H5
	40512201231	40510200407	1/4 - 28	2.50	.63	1.00	.255	3	H3
	—	40510200409	1/4 - 28	2.50	.63	1.00	.255	3	H4
	—	40510200413	1/4 - 28	2.50	.63	1.00	.255	3	H6
	—	40510200414	1/4 - 28	2.50	.63	1.00	.255	3	H7
	40512201238	40510200415	5/16 - 18	2.72	.69	1.13	.318	3	H3

(continued)

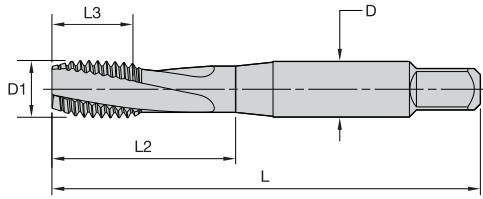
(K-NI Spiral Flute • Machine Screw and Fractional • 3-4 Pitches Chamfer continued)



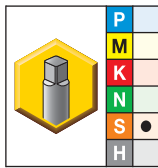
TICN	oxide/nitride	D1 size	L	L3	L2	D	number of flutes	pitch diameter limit
—	40510200417	5/16 - 18	2.72	.69	1.13	.318	3	H5
—	40510200419	5/16 - 18	2.72	.69	1.13	.318	3	H7
40512201239	40510200420	5/16 - 24	2.72	.69	1.13	.318	3	H3
—	40510200422	5/16 - 24	2.72	.69	1.13	.318	3	H4
—	40510200424	5/16 - 24	2.72	.69	1.13	.318	3	H5
—	40510200426	5/16 - 24	2.72	.69	1.13	.318	3	H6
—	40510200427	5/16 - 24	2.72	.69	1.13	.318	3	H7
40512201234	40510200428	3/8 - 16	2.94	.75	1.25	.381	3	H3
—	40510200430	3/8 - 16	2.94	.75	1.25	.381	3	H5
—	40510200432	3/8 - 16	2.94	.75	1.25	.381	3	H7
40512201235	40510200433	3/8 - 24	2.94	.75	1.25	.381	3	H3
—	40510200435	3/8 - 24	2.94	.75	1.25	.381	3	H4
—	40510200437	3/8 - 24	2.94	.75	1.25	.381	3	H5
—	40510200439	3/8 - 24	2.94	.75	1.25	.381	3	H6
—	40510200440	3/8 - 24	2.94	.75	1.25	.381	3	H7
40512201241	40510200441	7/16 - 14	3.16	.88	—	.323	3	H3
—	40512201225	7/16 - 14	3.16	.88	—	.323	3	H5
40512201242	40510200445	7/16 - 20	3.16	.88	—	.323	3	H3
—	40510200447	7/16 - 20	3.16	.88	—	.323	3	H5
40512201228	40510200449	1/2 - 13	3.38	.94	—	.367	3	H3
—	40510200451	1/2 - 13	3.38	.94	—	.367	3	H5
—	40510200453	1/2 - 13	3.38	.94	—	.367	3	H7
40512201229	40510200454	1/2 - 20	3.38	.94	—	.367	3	H3
—	40510200456	1/2 - 20	3.38	.94	—	.367	3	H5
—	40510200458	1/2 - 20	3.38	.94	—	.367	3	H7
—	40510200459	5/8 - 11	3.81	1.09	—	.480	4	H3
—	40510200461	5/8 - 18	3.81	1.09	—	.480	4	H3
—	40510200463	3/4 - 10	4.25	1.22	—	.590	4	H3
—	40512201221	3/4 - 10	4.25	1.22	—	.590	4	H5
—	40510200465	3/4 - 16	4.25	1.22	—	.590	4	H3
—	40512201222	3/4 - 16	4.25	1.22	—	.590	4	H5



NOTE: K-NI taps for 3B class of fit are suitable for UNJ aerospace internal threading applications.
Refer to table on pages L291–L292 for the recommended pitch diameter limit for 2B or 3B class of fit.



■ K-NI Spiral Flute • Machine Screw and Fractional • Full-Bottoming Chamfer

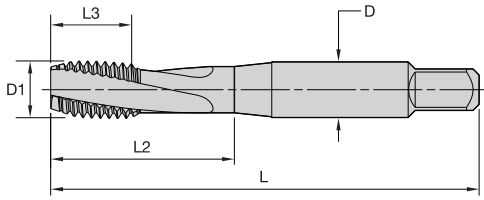


- first choice
- alternate choice

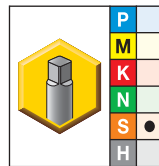
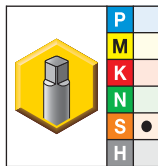
Taps

oxide/nitride	D1 size	L	L3	L2	D	number of flutes	pitch diameter limit
40510200359	4 - 40	1.88	.31	.56	.141	3	H2
40510200362	4 - 40	1.88	.31	.56	.141	3	H3
40510200365	4 - 40	1.88	.31	.56	.141	3	H5
40510200367	4 - 48	1.88	.31	.56	.141	3	H2
40510200369	5 - 40	1.94	.31	.63	.141	3	H2
40510200373	6 - 32	2.00	.38	.69	.141	3	H3
40510200375	6 - 32	2.00	.38	.69	.141	3	H5
40510200378	6 - 40	2.00	.28	.69	.141	3	H2
40510200380	8 - 32	2.13	.38	.75	.168	3	H2
40510200382	8 - 32	2.13	.38	.75	.168	3	H3
40510200389	10 - 24	2.38	.50	.88	.194	3	H3
40510200396	10 - 32	2.38	.50	.88	.194	3	H3
40510200405	1/4 - 20	2.50	.63	1.00	.255	3	H5
40510200403	1/4 - 20	2.50	.63	1.00	.255	3	H3
40510200408	1/4 - 28	2.50	.63	1.00	.255	3	H3
40512201218	1/4 - 28	2.50	.63	1.00	.255	3	H4
40510200416	5/16 - 18	2.72	.69	1.13	.318	3	H3
40510200421	5/16 - 24	2.72	.69	1.13	.318	3	H3
40510200423	5/16 - 24	2.72	.69	1.13	.318	3	H4
40510200429	3/8 - 16	2.94	.75	1.25	.381	3	H3
40510200431	3/8 - 16	2.94	.75	1.25	.381	3	H5
40510200434	3/8 - 24	2.94	.75	1.25	.381	3	H3
40510200438	3/8 - 24	2.94	.75	1.25	.381	3	H5
40510200442	7/16 - 14	3.16	.88	—	.323	3	H3
40510200444	7/16 - 14	3.16	.88	—	.323	3	H5
40510200446	7/16 - 20	3.16	.88	—	.323	3	H3
40510200448	7/16 - 20	3.16	.88	—	.323	3	H5
40510200450	1/2 - 13	3.38	.94	—	.367	3	H3
40510200452	1/2 - 13	3.38	.94	—	.367	3	H5
40510200455	1/2 - 20	3.38	.94	—	.367	3	H3
40510200457	1/2 - 20	3.38	.94	—	.367	3	H5
40510200460	5/8 - 11	3.81	1.09	—	.480	4	H3
40512201223	5/8 - 11	3.81	1.09	—	.480	4	H5
40512201224	5/8 - 11	3.81	1.09	—	.480	4	H7
40510200462	5/8 - 18	3.81	1.09	—	.480	4	H3
40510200464	3/4 - 10	4.25	1.22	—	.590	4	H3

NOTE: K-NI taps for 3B class of fit are suitable for UNJ aerospace internal threading applications.
Refer to table on pages L291-L292 for the recommended pitch diameter limit for 2B or 3B class of fit.



■ K-NI Spiral Flute • 3-4 Pitches Chamfer • Metric ANSI

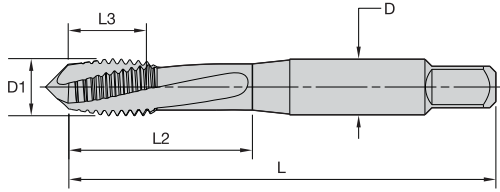


● first choice
○ alternate choice

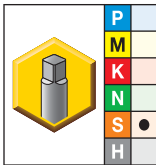
TiCN	oxide/nitride	D1 size	L	L3	L2	D	number of flutes	pitch diameter limit
—	40512201260	M2,5 x 0,45	1.81	.50	—	.141	3	D3
40512201268	40510201061	M3 x 0,5	1.94	.31	.63	.141	3	D3
—	40510201062	M3,5 x 0,6	2.00	.28	.63	.141	3	D4
—	40512201261	M4 x 0,7	2.13	.38	.75	.168	3	D4
40512201269	40512201262	M5 x 0,8	2.38	.50	.88	.194	3	D4
40512201270	40512201263	M6 x 1	2.50	.63	1.00	.255	3	D5
—	40510201066	M7 x 1	2.72	.43	1.13	.318	3	D5
—	40512201264	M8 x 1	2.72	.69	1.13	.318	3	D5
40512201271	40512201265	M8 x 1,25	2.72	.69	1.13	.318	3	D5
—	40512201258	M10 x 1,25	2.94	.75	1.25	.381	3	D5
—	40510201070	M10 x 1,5	2.94	.75	1.25	.381	3	D6
40512201266	—	M10 x 1,5	2.94	.75	1.25	.381	3	D6
—	40510201071	M12 x 1,25	3.38	.55	—	.367	3	D5
40512201267	40512201259	M12 x 1,75	3.38	.94	—	.367	3	D6

NOTE: Metric taps for 6H class of fit are suitable for MJ aerospace internal threading applications.
Metric taps are manufactured to USCTI specifications and dimensions.
Metric tap blank dimensions are equivalent to inch taps.
Refer to table on page L292 for the recommended pitch diameter limit for 6H class of fit.





■ K-TI • Machine Screw and Fractional • Plug Chamfer

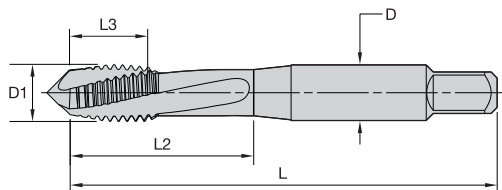


- first choice
- alternate choice

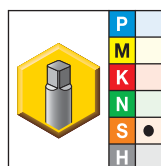
Taps

nitride	D1 size	L	L3	L2	D	number of flutes	pitch diameter limit
40512201272	2 - 56	1.75	.26	.44	.141	2	H2
40510200581	4 - 40	1.88	.34	.56	.141	3	H2
40510200582	5 - 40	1.94	.37	.63	.141	3	H2
40510200583	6 - 32	2.00	.41	.69	.141	3	H3
40510200584	6 - 32	2.00	.41	.69	.141	3	H5
40510200585	8 - 32	2.13	.45	.75	.168	3	H3
40510200586	8 - 32	2.13	.45	.75	.168	3	H5
40510200587	10 - 24	2.38	.53	.88	.194	3	H3
40510200588	10 - 24	2.38	.53	.88	.194	3	H5
40510200589	10 - 32	2.38	.53	.88	.194	3	H3
40510200590	10 - 32	2.38	.53	.88	.194	3	H5
40510200591	1/4 - 20	2.50	.59	1.00	.255	3	H3
40510200592	1/4 - 20	2.50	.59	1.00	.255	3	H5
40510200593	1/4 - 28	2.50	.59	1.00	.255	3	H3
40510200594	1/4 - 28	2.50	.59	1.00	.255	3	H5
40510200595	5/16 - 18	2.72	.67	1.13	.318	3	H3
40510200596	5/16 - 18	2.72	.67	1.13	.318	3	H5
40510200598	5/16 - 24	2.72	.67	1.13	.318	3	H5
40510200599	3/8 - 16	2.94	.75	1.25	.381	3	H3
40510200600	3/8 - 16	2.94	.75	1.25	.381	3	H5
40510200601	3/8 - 24	2.94	.75	1.25	.381	3	H3
40510200602	3/8 - 24	2.94	.75	1.25	.381	3	H5
40510200603	7/16 - 14	3.16	.87	—	.323	3	H3
40510200604	7/16 - 14	3.16	.87	—	.323	3	H5
40510200605	7/16 - 20	3.16	.87	—	.323	3	H3
40510200607	1/2 - 13	3.38	.98	—	.367	3	H3
40510200609	1/2 - 20	3.38	.98	—	.367	3	H3

NOTE: K-TI taps for 3B class of fit are suitable for UNJ aerospace internal threading applications.
Refer to table on pages L291–L292 for the recommended pitch diameter limit for 2B or 3B class of fit.



■ K-TI • Plug Chamfer • Metric ANSI

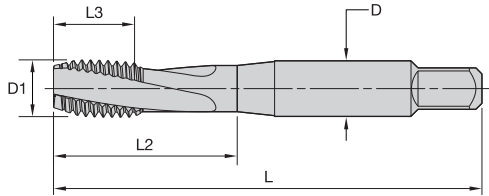


- first choice
- alternate choice

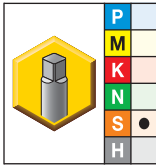
nitride	D1 size	L	L3	L2	D	number of flutes	pitch diameter limit
40512201278	M2,5 x 0,45	1.81	.30	.50	.141	3	D3
40512201280	M3 x 0,5	1.94	.37	.63	.141	3	D3
40512201279	M3,5 x 0,6	2.00	.41	.69	.141	3	D4
40512201281	M4 x 0,7	2.13	.45	.75	.168	3	D4
40512201282	M5 x 0,8	2.38	.53	.88	.194	3	D4
40512201283	M6 x 1	2.50	.59	1.00	.255	3	D5
40512201284	M7 x 1	2.72	.67	1.13	.318	3	D5
40510201028	M8 x 1	2.72	.67	1.13	.318	3	D5
40512201285	M8 x 1,25	2.72	.67	1.13	.318	3	D5
40510201030	M10 x 1,25	2.94	.75	1.25	.381	3	D5
40512201277	M10 x 1,5	2.94	.75	1.25	.381	3	D6
40510201032	M12 x 1,25	3.38	.98	—	.367	3	D5
40510201033	M12 x 1,75	3.38	.98	—	.367	3	D6

NOTE: Metric taps for 6H class of fit are suitable for MJ aerospace internal threading applications.
 Metric taps are manufactured to USCTI specifications and dimensions.
 Metric tap blank dimensions are equivalent to inch taps.
 Refer to table on page L292 for the recommended pitch diameter limit for 6H class of fit.





■ K-TI Spiral-Flute • Machine Screw and Fractional • 3-4 Pitches Chamfer

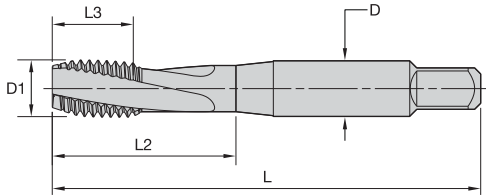


- first choice
- alternate choice

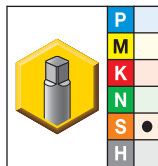
Taps

nitride	D1 size	L	L3	L2	D	number of flutes	pitch diameter limit
40512201275	2 - 56	1.75	.16	.44	.141	3	H2
40510200611	4 - 40	1.88	.24	.56	.141	3	H2
40512201276	4 - 40	1.88	.24	.56	.141	3	H4
40510200614	5 - 40	1.94	.24	.63	.141	3	H3
40510200615	6 - 32	2.00	.28	.69	.141	3	H3
40510200617	6 - 32	2.00	.28	.69	.141	3	H5
40510200618	8 - 32	2.13	.28	.75	.168	3	H3
40510200620	8 - 32	2.13	.28	.75	.168	3	H5
40510200621	10 - 24	2.38	.35	.88	.194	3	H3
40510200623	10 - 32	2.38	.28	.88	.194	3	H3
40510200625	10 - 32	2.38	.28	.88	.194	3	H5
40510200626	1/4 - 20	2.50	.43	1.00	.255	3	H3
40510200628	1/4 - 20	2.50	.43	1.00	.255	3	H5
40510200630	1/4 - 28	2.50	.35	1.00	.255	3	H3
40512201274	1/4 - 28	2.50	.35	1.00	.255	3	H5
40510200634	5/16 - 18	2.72	.47	1.13	.318	3	H3
40510200636	5/16 - 18	2.72	.47	1.13	.318	3	H5
40510200638	5/16 - 24	2.72	.39	1.13	.318	3	H3
40510200640	5/16 - 24	2.72	.39	1.13	.318	3	H5
40510200641	3/8 - 16	2.94	.55	1.25	.381	3	H3
40510200643	3/8 - 16	2.94	.55	1.25	.381	3	H5
40510200645	3/8 - 24	2.94	.39	1.25	.381	3	H3
40510200647	3/8 - 24	2.94	.39	1.25	.381	3	H5
40510200648	7/16 - 14	3.16	.59	—	.323	3	H3
40510200650	7/16 - 20	3.16	.47	—	.323	3	H3
40510200653	1/2 - 13	3.38	.63	—	.367	3	H3
40512201273	1/2 - 20	3.38	.47	—	.367	3	H3
40510200658	1/2 - 20	3.38	.47	—	.367	3	H5

NOTE: K-TI taps for 3B class of fit are suitable for UNJ aerospace internal threading applications.
Refer to table on pages L291-L292 for the recommended pitch diameter limit for 2B or 3B class of fit.



■ K-TI Spiral-Flute • Machine Screw and Fractional • Full Bottoming Chamfer

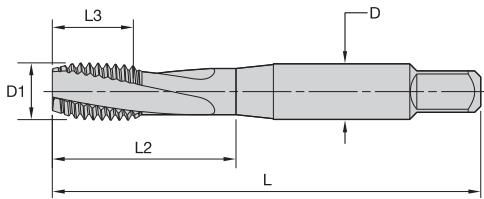


- first choice
- alternate choice

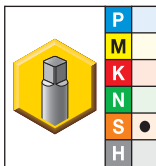
nitride	D1 size	L	L3	L2	D	number of flutes	pitch diameter limit
40510200612	4 - 40	1.88	.24	.56	.141	3	H4
40510200616	6 - 32	2.00	.28	.69	.141	3	H3
40510200619	8 - 32	2.13	.28	.75	.168	3	H3
40510200622	10 - 24	2.38	.35	.88	.194	3	H3
40510200624	10 - 32	2.38	.28	.88	.194	3	H3
40510200627	1/4 - 20	2.50	.43	1.00	.255	3	H3
40510200631	1/4 - 28	2.50	.35	1.00	.255	3	H3
40510200635	5/16 - 18	2.72	.47	1.13	.318	3	H3
40510200637	5/16 - 18	2.72	.47	1.13	.318	3	H5
40510200639	5/16 - 24	2.72	.39	1.13	.318	3	H3
40510200642	3/8 - 16	2.94	.55	1.25	.381	3	H3
40510200644	3/8 - 16	2.94	.55	1.25	.381	3	H5
40510200646	3/8 - 24	2.94	.39	1.25	.381	3	H3
40510200649	7/16 - 14	3.16	.59	—	.323	3	H3
40510200651	7/16 - 20	3.16	.47	—	.323	3	H3
40510200654	1/2 - 13	3.38	.63	—	.367	3	H3
40510200657	1/2 - 20	3.38	.47	—	.367	3	H3

NOTE: K-TI taps for 3B class of fit are suitable for UNJ aerospace internal threading applications. Refer to table on pages L291–L292 for the recommended pitch diameter limit for 2B or 3B class of fit.





■ K-TI Spiral-Flute • 3-4 Pitches Chamfer • Metric ANSI

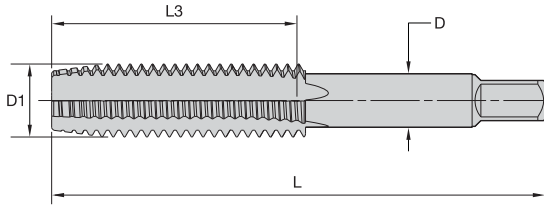


- first choice
- alternate choice

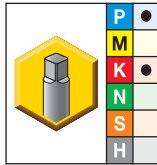
Taps

nitride	D1 size	L	L3	L2	D	number of flutes	pitch diameter limit
40512201287	M2,5 x 0,45	1.81	.30	.50	.141	3	D3
40512201288	M3 x 0,5	1.94	.20	.63	.141	3	D3
40510201049	M3,5 x 0,6	2.00	.28	.75	.141	3	D4
40512201289	M4 x 0,7	2.13	.28	.75	.168	3	D4
40512201290	M5 x 0,8	2.38	.35	.88	.194	3	D4
40512201291	M6 x 1	2.50	.43	1.00	.255	3	D5
40512201292	M7 x 1	2.72	.43	1.13	.318	3	D5
40510201054	M8 x 1	2.72	.47	1.13	.318	3	D5
40512201293	M8 x 1,25	2.72	.47	1.13	.318	3	D5
40510201056	M10 x 1,25	2.94	.47	1.25	.381	3	D5
40512201286	M10 x 1,5	2.94	.51	1.25	.381	3	D6
40510201058	M12 x 1,25	3.38	.55	—	.367	3	D5
40510201059	M12 x 1,75	3.38	.59	—	.367	3	D6

NOTE: Metric taps for 6H class of fit are suitable for MJ aerospace internal threading applications.
 Metric taps are manufactured to USCTI specifications and dimensions.
 Metric tap blank dimensions are equivalent to inch taps.
 Refer to table on page L292 for the recommended pitch diameter limit for 6H class of fit.



■ K-MS • Machine Screw and Fractional • Plug Chamfer

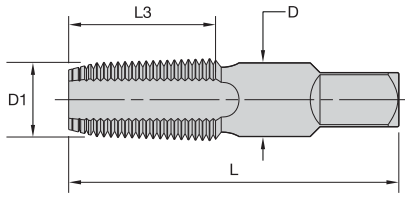


● first choice
○ alternate choice

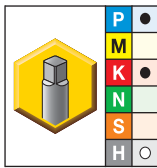
uncoated	D1 size	L	L3	D	number of flutes	pitch diameter limit
40510200802	4 - 40	1.88	.56	.141	3	H2
40510200805	5 - 40	1.94	.63	.141	3	H2
40510200808	6 - 32	2.00	.69	.141	3	H3
40510200809	8 - 32	2.13	.75	.168	3	H3
40510200811	10 - 24	2.38	.88	.194	3	H3
40510200814	10 - 32	2.38	.88	.194	3	H3
40510200819	1/4 - 20	2.50	1.00	.255	3	H3
40510200820	1/4 - 28	2.50	1.00	.255	3	H3
40510200821	5/16 - 18	2.72	1.13	.318	4	H3
40510200822	5/16 - 24	2.72	1.13	.318	4	H3
40510200823	3/8 - 16	2.94	1.25	.381	4	H3
40510200824	3/8 - 24	2.94	1.25	.381	4	H3
40510200825	7/16 - 14	3.16	1.44	.323	4	H3
40510200827	1/2 - 13	3.38	1.66	.367	4	H3
40510200828	1/2 - 20	3.38	1.66	.367	4	H3
40510200829	5/8 - 11	3.81	1.81	.480	4	H3
40510200830	5/8 - 18	3.81	1.81	.480	4	H3
40510200831	3/4 - 10	4.25	2.00	.590	4	H3
40510200832	3/4 - 16	4.25	2.00	.590	4	H3

NOTE: Refer to table on pages L291–L292 for the recommended pitch diameter limit for 2B or 3B class of fit.





■ K-MS Pipe • NPT Pipe • Chamfer 2 1/2–3 1/2 Pitches

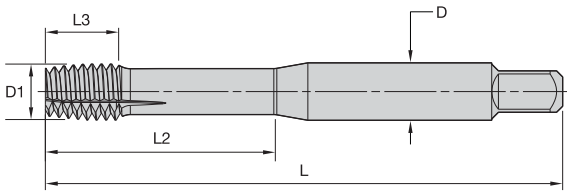


- first choice
- alternate choice

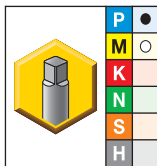
Taps

uncoated	D1 size	L	L3	L2	D	number of flutes
40510200833	1/8 - 27	2.13	.75	.75	.313	4
40510200834	1/4 - 18	2.44	1.06	1.06	.563	4
40510200835	3/8 - 18	2.56	1.06	1.06	.703	4
40510200836	1/2 - 14	3.13	1.38	1.38	.367	4
40510200837	3/4 - 14	3.25	1.38	1.38	.906	5

NOTE: Pipe tap projection is the distance the small end of the tap projects through an American National Standard L1 Pipe Thread Ring Gage. For gage measurement projection, see technical page L287.



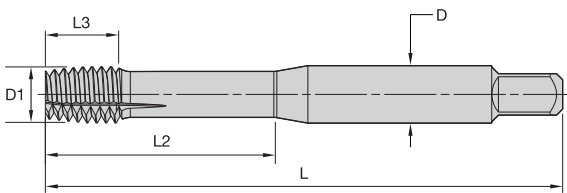
■ K-TLD • Machine Screw and Fractional • Plug Entry Taper • DIN Length • Minimum Quantity Lubrication (MQL)



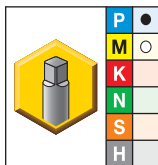
● first choice
○ alternate choice

TiCN	D1 size	L	L3	L2	D	number of lube grooves	pitch diameter limit
40512201194	2 - 56	1.77	.35	.35	.141	—	H3
40512201195	4 - 40	2.21	.43	.71	.141	—	H5
40512201196	8 - 32	2.48	.51	.83	.168	—	H5
40512201192	10 - 24	2.76	.63	.98	.194	—	H6
40512201193	10 - 32	2.76	.63	.98	.194	—	H6
40512201191	1/4 - 20	3.15	.75	1.18	.255	—	H6

NOTE: K-TLD form taps can be run 1.5–2x faster than the tapping speeds recommended for thread cutting taps. Form taps require a larger drilled hole size prior to tapping than corresponding cutting taps. Refer to table on pages L291–L292 for the recommended pitch diameter limit for 2B or 3B class of fit.



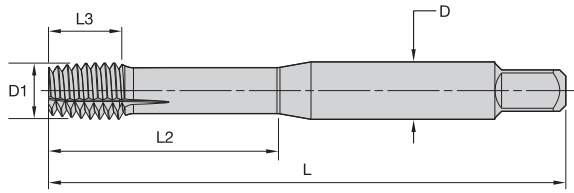
■ K-TLD • Plug Entry Taper • Minimum Quantity Lubrication (MQL) • DIN Length • ANSI Shank • Metric Sizes



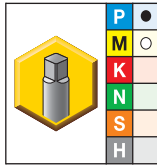
● first choice
○ alternate choice

TiCN	D1 size	L	L3	L2	D	number of lube grooves	pitch diameter limit
40512201197	M3 x 0,5	2.21	.43	.71	.141	—	D5
40512201198	M6 x 1	3.15	.75	1.18	.255	—	D8

NOTE: K-TLD form taps can be run 1.5–2x faster than the tapping speeds recommended for thread cutting taps. Metric tap shank dimensions are equivalent to inch taps. Form taps require a larger drilled hole size prior to tapping than corresponding cutting taps. Refer to table on page L292 for the recommended pitch diameter limit for 6H class of fit.



■ K-TL • Machine Screw and Fractional • Bottom Entry Taper • DIN Length

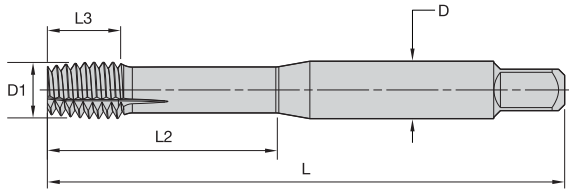


● first choice
○ alternate choice

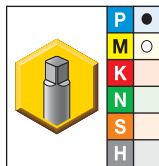
Taps

TiCN	D1 size	L	L3	L2	D	number of lube grooves	pitch diameter limit
40512201160	2 - 56	1.77	.35	—	.141	—	H3
40512201164	3 - 48	1.97	.28	.49	.141	—	H3
40512201165	4 - 40	2.21	.43	.71	.141	—	H3
40512201166	4 - 40	2.21	.43	.71	.141	—	H5
40512201170	6 - 32	2.21	.51	.79	.141	2	H3
40512201171	6 - 32	2.21	.51	.79	.141	2	H5
40512201172	8 - 32	2.48	.51	.83	.168	2	H3
40512201173	8 - 32	2.48	.51	.83	.168	2	H5
40512201155	10 - 24	2.76	.63	.98	.194	2	H4
40512201157	10 - 24	2.76	.63	.98	.194	2	H6
40512201158	10 - 32	2.76	.63	.98	.194	2	H4
40512201159	10 - 32	2.76	.63	.98	.194	2	H6
40512201151	1/4 - 20	3.15	.75	1.18	.255	2	H4
40512201152	1/4 - 20	3.15	.75	1.18	.255	2	H6
40512201153	1/4 - 28	3.15	.75	1.18	.255	2	H4
40512201154	1/4 - 28	3.15	.75	1.18	.255	2	H6
40512201167	5/16 - 18	3.54	.87	1.38	.318	3	H5
40512201168	5/16 - 18	3.54	.87	1.38	.318	3	H7
40512201169	5/16 - 24	3.54	.87	1.38	.318	3	H7
40512201161	3/8 - 16	3.94	.95	1.54	.381	3	H5
40512201162	3/8 - 16	3.94	.95	1.54	.381	3	H7
40512201163	3/8 - 24	3.94	.79	1.54	.381	3	H5
40512201149	1/2 - 13	4.33	1.14	—	.367	4	H5
40512201150	1/2 - 13	4.33	1.14	—	.367	4	H7

NOTE: K-TL form taps can be run 1.5-2x faster than the tapping speeds recommended for thread cutting taps. Form taps require a larger drilled hole size prior to tapping than corresponding cutting taps. Made to DIN tap lengths, ANSI shank dimensions. Refer to table on pages L291-L292 for the recommended pitch diameter limit for 2B or 3B class of fit.



■ K-TL • Bottom Entry Taper • DIN Length • ANSI Shank • Metric Sizes

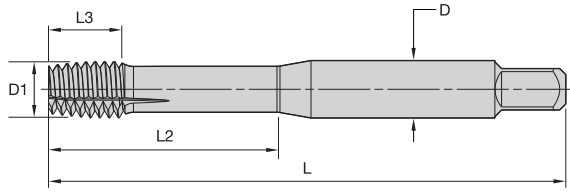


● first choice
○ alternate choice

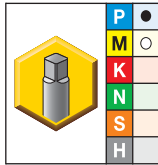
TiCN	D1 size	L	L3	L2	D	number of lube grooves	pitch diameter limit
40512201186	M3 x 0,5	2.21	.43	.71	.141	2	D5
40512201185	M3,5 x 0,6	2.21	.51	.79	.141	2	D6
40512201187	M4 x 0,7	2.48	.51	.83	.168	2	D6
40512201188	M5 x 0,8	2.76	.63	.98	.194	2	D7
40512201189	M6 x 1	3.15	.75	1.18	.255	2	D8
40512201190	M8 x 1,25	3.54	.87	1.38	.318	3	D9
40512201183	M10 x 1,5	3.94	.95	1.54	.381	4	D10
40512201184	M12 x 1,75	4.33	1.14	—	.367	4	D11

NOTE: K-TL form taps can be run 1.5-2x faster than the tapping speeds recommended for thread cutting taps.
Metric tap shank dimensions are equivalent to inch taps.
Made to DIN tap lengths, ANSI shank dimensions.
Form taps require a larger drilled hole size prior to tapping than corresponding cutting taps.
Refer to table on page L292 for the recommended pitch diameter limit for 6H class of fit.





■ K-TL • Machine Screw and Fractional • Plug Entry Taper • DIN Length

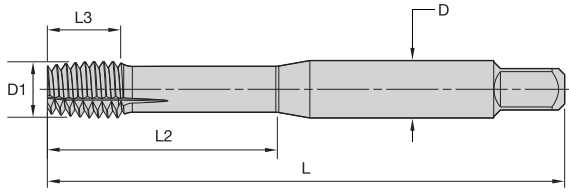


● first choice
○ alternate choice

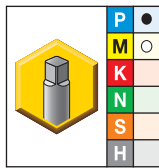
Taps

TiCN	D1 size	L	L3	L2	D	number of lube grooves	pitch diameter limit
40512201160	2 - 56	1.77	.35	—	.141	—	H3
40512201164	3 - 48	1.97	.28	.49	.141	—	H3
40512201165	4 - 40	2.21	.43	.71	.141	—	H3
40512201166	4 - 40	2.21	.43	.71	.141	—	H5
40512201170	6 - 32	2.21	.51	.79	.141	2	H3
40512201171	6 - 32	2.21	.51	.79	.141	2	H5
40512201172	8 - 32	2.48	.51	.83	.168	2	H3
40512201173	8 - 32	2.48	.51	.83	.168	2	H5
40512201155	10 - 24	2.76	.63	.98	.194	2	H4
40512201157	10 - 24	2.76	.63	.98	.194	2	H6
40512201158	10 - 32	2.76	.63	.98	.194	2	H4
40512201159	10 - 32	2.76	.63	.98	.194	2	H6
40512201151	1/4 - 20	3.15	.75	1.18	.255	2	H4
40512201152	1/4 - 20	3.15	.75	1.18	.255	2	H6
40512201153	1/4 - 28	3.15	.75	1.18	.255	2	H4
40512201154	1/4 - 28	3.15	.75	1.18	.255	2	H6
40512201167	5/16 - 18	3.54	.87	1.38	.318	3	H5
40512201168	5/16 - 18	3.54	.87	1.38	.318	3	H7
40512201169	5/16 - 24	3.54	.87	1.38	.318	3	H7
40512201161	3/8 - 16	3.94	.95	1.54	.381	3	H5
40512201162	3/8 - 16	3.94	.95	1.54	.381	3	H7
40512201163	3/8 - 24	3.94	.79	1.54	.381	3	H5
40512201149	1/2 - 13	4.33	1.14	—	.367	4	H5
40512201150	1/2 - 13	4.33	1.14	—	.367	4	H7

NOTE: K-TL form taps can be run 1.5–2x faster than the tapping speeds recommended for thread cutting taps. Form taps require a larger drilled hole size prior to tapping than corresponding cutting taps. Made to DIN tap lengths, ANSI shank dimensions. Refer to table on pages L291–L292 for the recommended pitch diameter limit for 2B or 3B class of fit.



■ K-TL • Plug Entry Taper • DIN Length • ANSI Shank • Metric Sizes





- first choice
- alternate choice

TiCN	D1 size	L	L3	L2	D	number of lube grooves	pitch diameter limit
40512201179	M3 x 0,5	2.21	.43	.71	.141	2	D5
40512201180	M4 x 0,7	2.48	.51	.83	.168	2	D6
40512201181	M6 x 1	3.15	.75	1.18	.255	2	D8
40512201182	M8 x 1,25	3.54	.87	1.38	.318	3	D9
40512201174	M10 x 1,25	3.94	.95	1.54	.381	4	D9
40512201175	M10 x 1,5	3.94	.95	1.54	.381	4	D10
40512201176	M12 x 1,25	3.94	.87	—	.367	4	D9
40512201177	M12 x 1,5	3.94	.87	—	.367	4	D9
40512201178	M12 x 1,75	4.33	1.14	—	.367	4	D11

NOTE: K-TL form taps can be run 1.5–2x faster than the tapping speeds recommended for thread cutting taps.
 Metric tap shank dimensions are equivalent to inch taps.
 Form taps require a larger drilled hole size prior to tapping than corresponding cutting taps.
 Refer to table on page L292 for the recommended pitch diameter limit for 6H class of fit.





■ Metric

Material Group	 Through Holes				 Blind Holes				
	Tap Style	Range – m/min			Tap Style	Range – m/min			
		min	Starting Value	max		min	Starting Value	max	
P	1	K-SS Spiral Point	15	18	23	K-SS Spiral Flute	7	9	11
		K-TLD Forming	15	18	27	K-TLD Forming	7	9	14
	2	K-SS Spiral Point	11	14	17	K-SS Spiral Flute	5	7	9
		K-TLD Forming	11	14	21	K-TLD Forming	5	7	10
	3	K-SS Spiral Point	7	9	11	K-SS Spiral Flute	4	5	6
	4	K-MS Hand	3	4	5	K-MS Hand	1	2	2
M	5	K-SS Spiral Point	6	8	10	K-SS Spiral Flute	3	4	5
	6	K-NI Spiral Point	4	5	7	K-NI Spiral Flute	2	3	3
	1	K-SS Spiral Point	7	9	11	K-SS Spiral Flute	4	5	6
K	2	K-SS Spiral Point	6	8	10	K-SS Spiral Flute	3	4	5
	3	K-SS Spiral Point	5	6	8	K-SS Spiral Flute	2	3	4
	1	K-NI Spiral Point	24	30	38	K-NI Spiral Flute	12	15	19
N	2	K-SS Spiral Point	21	26	32	K-SS Spiral Flute	10	13	16
	3	K-NI Spiral Point	18	23	29	K-NI Spiral Flute	9	11	14
	1	K-AL Spiral Point	29	37	46	K-AL Spiral Flute	15	18	23
		K-TLD Forming	29	37	55	K-TLD Forming	15	18	27
	2	K-AL Spiral Point	24	30	38	K-ALS Spiral Flute	12	15	19
S		K-TLD Forming	24	30	46	K-TLD Forming	12	15	23
	4	K-AL Spiral Point	5	6	8	K-AL Spiral Flute	2	3	4
	1	K-SS Spiral Point	6	8	10	K-SS Spiral Flute	3	4	5
	2	K-NI Spiral Point	2	3	4	K-NI Spiral Flute	1	2	2
S	3	K-NI Spiral Point	2	2	3	K-NI Spiral Flute	1	1	2
	4	K-TI LH Spiral Flute	2	2	3	K-TI RH Spiral Flute	1	1	2

NOTE: Increase speed by up to 50% when using coated taps (TiN, TiCN, TiN+Cr/C).

Taps

■ Inch

Material Group	 Through Holes				 Blind Holes				
	Tap Style	Range – SFM			Tap Style	Range – SFM			
		min	Starting Value	max		min	Starting Value	max	
P	1	K-SS Spiral Point	48	60	75	K-SS Spiral Flute	24	30	38
		K-TLD Forming	48	60	90	K-TLD Forming	24	30	45
	2	K-SS Spiral Point	36	45	56	K-SS Spiral Flute	18	23	28
		K-TLD Forming	36	45	68	K-TLD Forming	18	23	34
	3	K-SS Spiral Point	24	30	38	K-SS Spiral Flute	12	15	19
	4	K-MS Hand	10	12	15	K-MS Hand	5	6	8
M	5	K-SS Spiral Point	20	25	31	K-SS Spiral Flute	10	13	16
	6	K-NI Spiral Point	14	18	23	K-NI Spiral Flute	7	9	11
	1	K-SS Spiral Point	24	30	38	K-SS Spiral Flute	12	15	19
K	2	K-SS Spiral Point	20	25	31	K-SS Spiral Flute	10	13	16
	3	K-SS Spiral Point	16	20	25	K-SS Spiral Flute	8	10	13
	1	K-NI Spiral Point	80	100	125	K-NI Spiral Flute	40	50	63
N	2	K-SS Spiral Point	68	85	106	K-SS Spiral Flute	34	43	53
	3	K-NI Spiral Point	60	75	94	K-NI Spiral Flute	30	38	47
	1	K-AL Spiral Point	96	120	150	K-AL Spiral Flute	48	60	75
		K-TLD Forming	96	120	180	K-TLD Forming	48	60	90
S	2	K-AL Spiral Point	80	100	125	K-ALS Spiral Flute	40	50	63
		K-TLD Forming	80	100	150	K-TLD Forming	40	50	75
	4	K-AL Spiral Point	16	20	25	K-AL Spiral Flute	8	10	13
	1	K-SS Spiral Point	20	25	31	K-SS Spiral Flute	10	13	16
S	2	K-NI Spiral Point	8	10	13	K-NI Spiral Flute	4	5	6
	3	K-NI Spiral Point	6	8	10	K-NI Spiral Flute	3	4	5
	4	K-TI LH Spiral Flute	6	8	10	K-TI RH Spiral Flute	3	4	5

NOTE: Increase speed by up to 50% when using coated taps (TiN, TiCN, TiN+Cr/C).



General-Purpose Taps

Production Taps

Kennametal offers an extensive line of thread-cutting and thread-forming taps for any industrial application, manufactured using the highest quality materials and workmanship since 1872.

Alternate Coatings

Kennametal's in-house tool coating capabilities lead the industry! Choose from a wide range of sizes, tap limits, chamfers, and styles for through and blind holes.

New Additions to the General Purpose Line

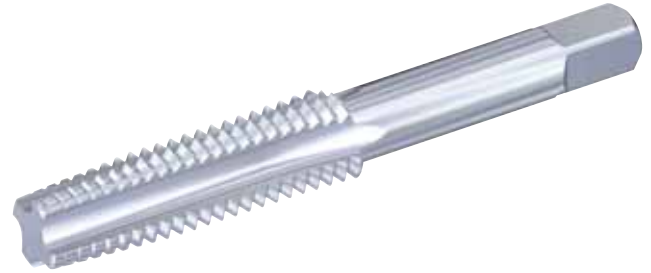
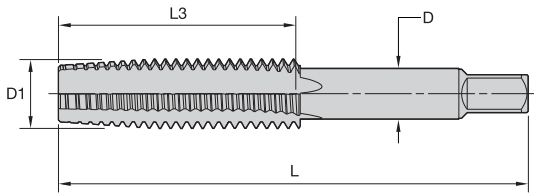
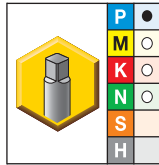
New T920 Series Spiral-Point Taps

- The new T920 series spiral point taps have an optimized flute design for lower tapping torque and improved neck design for more efficient coolant flow.
- Higher quality thread and tool life.
- Enhanced performance with tool life at least 35% better than current Spiral Point taps.
- Uncoated, TiCN, and TiN+CrC/C coatings available for tapping a broad range of materials.

New KHSST Forming Taps

- The next generation of forming taps.
- Made from vanadium high-speed steel for extending wear life and better part finish.
- New tap lobe design improves thread forming in ductile steels and non-ferrous materials for better tool life.
- Necked design with short thread length for tapping at reduced torque levels.
- Plug and bottoming chamfers for form tapping without troublesome chips that clog and break taps.
- Performance-enhancing surface treatment available as stock standards with alternate coatings available as stocks modifications.



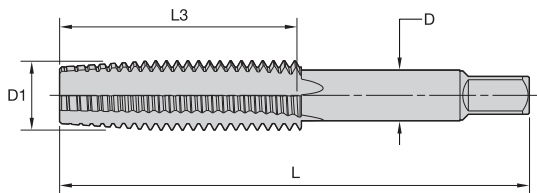

■ KHSST Hand • Machine Screw Sizes • Taper Chamfer Tap


● first choice
○ alternate choice

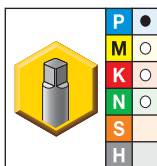
uncoated	D1 size	L	L3	D	number of flutes	pitch diameter limit
KHSST28370	0 - 80	1.63	.31	.141	2	H1
KHSST28378	2 - 56	1.75	.44	.141	3	H2
KHSST28382	3 - 48	1.81	.50	.141	3	H2
KHSST08086	4 - 40	1.88	.56	.141	3	H2
KHSST28386	5 - 40	1.94	.63	.141	3	H2
KHSST28391	6 - 32	2.00	.69	.141	3	H3
KHSST28393	6 - 40	2.00	.69	.141	3	H2
KHSST08184	8 - 32	2.13	.75	.168	4	H2
KHSST08191	8 - 32	2.13	.75	.168	4	H3
KHSST08233	10 - 24	2.38	.88	.194	4	H3
KHSST08267	10 - 32	2.38	.88	.194	4	H3
KHSST28415	12 - 24	2.38	.94	.220	4	H3

NOTE: Hand taps for 3B class of fit are suitable for UNJ aerospace internal threading applications.
Refer to table on pages L291–L292 for the recommended pitch diameter limit for 2B or 3B class of fit.





■ KHSST Hand • Fractional Sizes • Taper Chamfer Tap

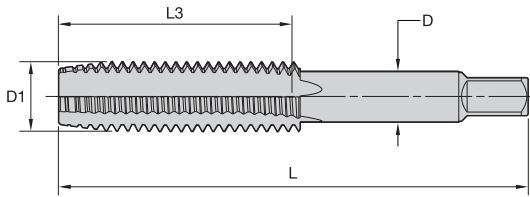
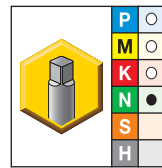
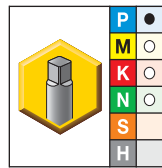
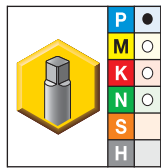


● first choice
○ alternate choice

Taps

uncoated	D1 size	L	L3	D	number of flutes	pitch diameter limit
KHSST08319	1/4 - 20	2.50	1.00	.255	4	H3
KHSST08352	1/4 - 28	2.50	1.00	.255	4	H3
KHSST28316	5/16 - 18	2.72	1.13	.318	4	H3
KHSST28321	5/16 - 24	2.72	1.13	.318	4	H3
KHSST08433	3/8 - 16	2.94	1.25	.381	4	H3
KHSST08458	3/8 - 24	2.94	1.25	.381	4	H3
KHSST08476	7/16 - 14	3.16	1.44	.323	4	H3
KHSST28328	7/16 - 20	3.16	1.44	.323	4	H3
KHSST08507	1/2 - 13	3.38	1.66	.367	4	H3
KHSST08529	1/2 - 20	3.38	1.66	.367	4	H3
KHSST28335	9/16 - 12	3.59	1.66	.429	4	H3
KHSST28337	9/16 - 18	3.59	1.66	.429	4	H3
KHSST08560	5/8 - 11	3.81	1.81	.480	4	H3
KHSST28324	5/8 - 18	3.81	1.81	.480	4	H3
KHSST08594	3/4 - 10	4.25	2.00	.590	4	H3
KHSST28303	3/4 - 16	4.25	2.00	.590	4	H3
KHSST08615	7/8 - 9	4.69	2.22	.697	4	H4
KHSST28332	7/8 - 14	4.69	2.22	.697	4	H4
KHSST28285	1 - 8	5.13	2.50	.800	4	H4
KHSST28280	1 - 12	5.13	2.50	.800	4	H4
KHSST28284	1 - 14	5.13	2.50	.800	4	H4
KHSST28034	1 1/8 - 7	5.44	2.56	.896	4	H4
KHSST28030	1 1/8 - 12	5.44	2.56	.896	4	H4
KHSST28022	1 1/4 - 7	5.75	2.56	1.021	4	H4
KHSST28017	1 1/4 - 12	5.75	2.56	1.021	6	H4
KHSST28044	1 3/8 - 6	6.06	3.00	1.108	4	H4
KHSST28041	1 3/8 - 12	6.06	3.00	1.108	6	H4
KHSST28010	1 1/2 - 6	6.38	3.00	1.233	4	H4
KHSST28005	1 1/2 - 12	6.38	3.00	1.233	6	H4

NOTE: Hand taps for 3B class of fit are suitable for UNJ aerospace internal threading applications.
Refer to table on pages L291–L292 for the recommended pitch diameter limit for 2B or 3B class of fit.


■ KHSST Hand • Machine Screw Sizes • Plug Chamfer Tap


● first choice
○ alternate choice

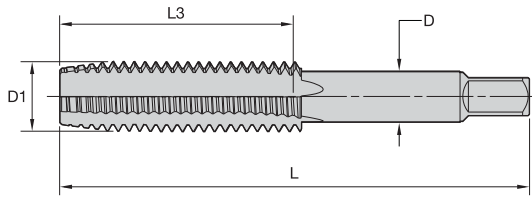
	TiCN	TiN	uncoated	D1 size	L	L3	D	number of flutes	pitch diameter limit
	—	KHSST09000	KHSST08003	0 - 80	1.63	.31	.141	2	H2
	—	—	KHSST08015	1 - 64	1.69	.38	.141	2	H2
	—	KHSST28129	KHSST08039	2 - 56	1.75	.44	.141	3	H2
	—	KHSST28426	—	2 - 56	1.75	.44	.141	2	H2
	—	KHSST28134	—	3 - 48	1.81	.50	.141	2	H2
	—	KHSST28427	KHSST08082	4 - 40	1.88	.56	.141	2	H2
	KHSST28433	KHSST09004	KHSST08087	4 - 40	1.88	.56	.141	3	H2
	—	—	KHSST08112	5 - 40	1.94	.63	.141	2	H2
	—	—	KHSST08116	5 - 40	1.94	.63	.141	3	H2
	KHSST09582	KHSST09008	KHSST08148	6 - 32	2.00	.69	.141	3	H2
	KHSST28440	—	—	6 - 32	2.00	.69	.141	3	H3
	—	KHSST28428	—	6 - 32	2.00	.69	.141	2	H3
	—	KHSST28136	—	8 - 32	2.13	.75	.168	3	H3
	—	KHSST09010	—	8 - 32	2.13	.75	.168	4	H2
	—	—	KHSST08192	8 - 32	2.13	.75	.168	4	H3
	—	—	KHSST08218	8 - 36	2.13	.75	.168	4	H2
	—	—	KHSST08238	10 - 24	2.38	.88	.194	2	H3
	—	KHSST09012	KHSST08234	10 - 24	2.38	.88	.194	4	H3
	—	KHSST09014	KHSST08268	10 - 32	2.38	.88	.194	4	H3
	—	KHSST28425	—	10 - 32	2.38	.88	.194	2	H3
	—	KHSST28424	—	10 - 32	2.38	.88	.194	3	H2
	—	KHSST28132	—	12 - 24	2.38	.94	.220	4	H3

NOTE: Hand taps for 3B class of fit are suitable for UNJ aerospace internal threading applications.
Refer to table on pages L291–L292 for the recommended pitch diameter limit for 2B or 3B class of fit.

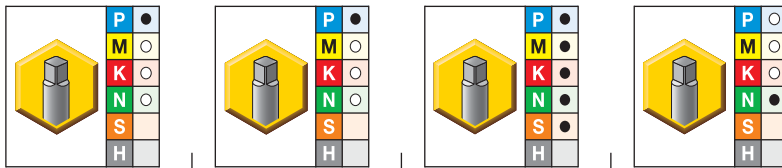


General-Purpose Taps

Hand Taps • Through Holes in General Machining Applications



KHSST Hand • Fractional Sizes • Plug Chamfer Tap



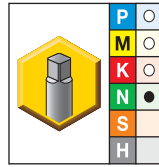
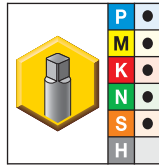
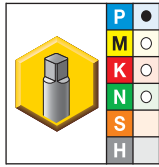
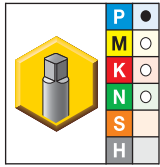
● first choice
○ alternate choice

Taps

	TiCN	TiN	oxide	uncoated	D1 size	L	L3	D	number of flutes	pitch diameter limit
	—	—	—	KHSST08316	1/4 - 20	2.50	1.00	.255	4	H2
	—	KHSST28358	—	KHSST08324	1/4 - 20	2.50	1.00	.255	2	H3
	—	KHSST28355	—	KHSST28296	1/4 - 20	2.50	1.00	.255	3	H3
	KHSST28364	KHSST09018	KHSST28343	KHSST08320	1/4 - 20	2.50	1.00	.255	4	H3
	—	—	—	KHSST28298	1/4 - 20	2.50	1.00	.255	4	H5
	—	—	—	KHSST08355	1/4 - 28	2.50	1.00	.255	3	H3
	—	—	—	KHSST08353	1/4 - 28	2.50	1.00	.255	4	H3
	—	KHSST28356	—	KHSST28318	5/16 - 18	2.72	1.13	.318	2	H3
	—	KHSST28127	—	KHSST28314	5/16 - 18	2.72	1.13	.318	3	H3
	—	KHSST09022	—	KHSST08380	5/16 - 18	2.72	1.13	.318	4	H3
	—	—	—	KHSST08411	5/16 - 24	2.72	1.13	.318	3	H3
	—	—	KHSST28349	KHSST08409	5/16 - 24	2.72	1.13	.318	4	H3
	—	KHSST28359	—	KHSST28309	3/8 - 16	2.94	1.25	.381	3	H3
	—	KHSST09026	KHSST28348	KHSST08434	3/8 - 16	2.94	1.25	.381	4	H3
	—	—	—	KHSST08461	3/8 - 24	2.94	1.25	.381	3	H3
	—	KHSST09028	—	KHSST08459	3/8 - 24	2.94	1.25	.381	4	H3
	—	KHSST09030	—	KHSST08477	7/16 - 14	3.16	1.44	.323	4	H3
	—	KHSST28123	—	KHSST08493	7/16 - 20	3.16	1.44	.323	4	H3
	—	KHSST28357	—	KHSST08510	1/2 - 13	3.38	1.66	.367	3	H3
	KHSST28361	KHSST28116	KHSST28341	KHSST08508	1/2 - 13	3.38	1.66	.367	4	H3
	—	—	—	KHSST28291	1/2 - 20	3.38	1.66	.367	3	H3
	—	—	—	KHSST08530	1/2 - 20	3.38	1.66	.367	4	H3
	—	—	—	KHSST28293	1/2 - 20	3.38	1.66	.367	4	H5
	—	—	—	KHSST08545	9/16 - 12	3.59	1.66	.429	4	H3
	—	—	—	KHSST08553	9/16 - 18	3.59	1.66	.429	4	H3
	KHSST28366	KHSST28120	KHSST28351	KHSST08561	5/8 - 11	3.81	1.81	.480	4	H3
	—	—	—	KHSST28323	5/8 - 11	3.81	1.81	.480	4	H5
	—	KHSST28121	—	KHSST08574	5/8 - 18	3.81	1.81	.480	4	H3
	—	—	—	KHSST28242	5/8 - 18	3.81	1.81	.480	4	H5
	—	—	—	KHSST28103	11/16 - 16	4.03	1.06	.542	4	H3
	KHSST28365	KHSST09042	KHSST28345	KHSST08595	3/4 - 10	4.25	2.00	.590	4	H3
	—	—	—	KHSST28302	3/4 - 10	4.25	2.00	.590	4	H5
	—	KHSST28118	KHSST28346	KHSST08608	3/4 - 16	4.25	2.00	.590	4	H3
	—	—	—	KHSST28305	3/4 - 16	4.25	2.00	.590	4	H5

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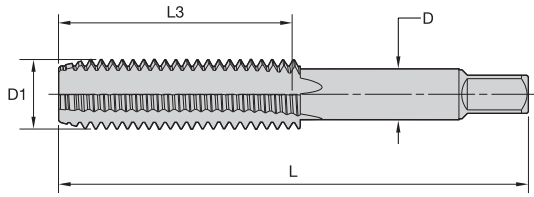
(KHSST Hand • Fractional Sizes • Plug Chamfer continued)



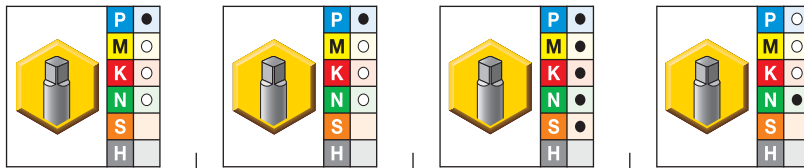
	TiCN	TiN	oxide	uncoated	D1 size	L	L3	D	number of flutes	pitch diameter limit
	—	KHSST28125	KHSST28352	KHSST08616	7/8 - 9	4.69	2.22	.697	4	H4
	—	KHSST09048	—	KHSST28330	7/8 - 14	4.69	2.22	.697	4	H4
	—	KHSST28115	KHSST28339	KHSST08630	1 - 8	5.13	2.50	.800	4	H4
	—	—	—	KHSST28286	1 - 8	5.13	2.50	.800	4	H6
	—	—	—	KHSST28279	1 - 12	5.13	2.50	.800	4	H4
	—	—	—	KHSST28281	1 - 14	5.13	2.50	.800	4	H2
	—	—	—	KHSST28283	1 - 14	5.13	2.50	.800	4	H4
	—	—	—	KHSST28033	1 1/8 - 7	5.44	2.56	.896	4	H4
	—	—	—	KHSST28029	1 1/8 - 12	5.44	2.56	.896	4	H4
	—	—	—	KHSST28021	1 1/4 - 7	5.75	2.56	1.021	4	H4
	—	—	—	KHSST28016	1 1/4 - 12	5.75	2.56	1.021	6	H4
	—	—	—	KHSST28043	1 3/8 - 6	6.06	3.00	1.108	4	H4
	—	—	—	KHSST28040	1 3/8 - 12	6.06	3.00	1.108	6	H4
	—	—	—	KHSST28009	1 1/2 - 6	6.38	3.00	1.233	4	H4
	—	—	—	KHSST28004	1 1/2 - 12	6.38	3.00	1.233	6	H4

NOTE: Hand taps for 3B class of fit are suitable for UNJ aerospace internal threading applications.
 Refer to table on pages L291–L292 for the recommended pitch diameter limit for 2B or 3B class of fit.





KHSST Hand • Machine Screw Sizes • Bottoming Chamfer Tap

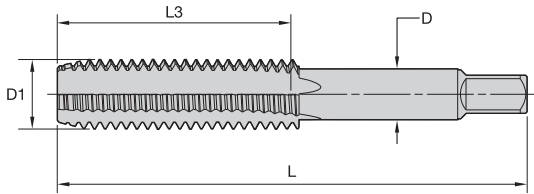


● first choice
○ alternate choice

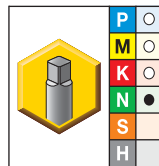
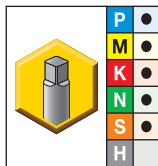
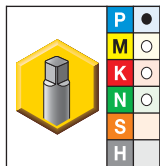
Taps

	TiCN	TiN	oxide	uncoated	D1 size	L	L3	D	number of flutes	pitch diameter limit
	—	—	—	KHSST28368	0 - 80	1.63	.31	.141	2	H1
	KHSST28430	KHSST28128	—	KHSST28371	0 - 80	1.63	.31	.141	2	H2
	—	—	—	KHSST28373	1 - 72	1.69	.38	.141	2	H1
	—	—	—	KHSST28374	2 - 56	1.75	.44	.141	2	H2
	KHSST28431	KHSST09003	—	KHSST28375	2 - 56	1.75	.44	.141	3	H2
	—	—	—	KHSST28379	3 - 48	1.81	.50	.141	3	H2
	KHSST28432	KHSST28130	KHSST28420	KHSST08083	4 - 40	1.88	.56	.141	2	H2
	—	—	—	KHSST08088	4 - 40	1.88	.56	.141	3	H2
	—	—	—	KHSST28384	4 - 48	1.88	.56	.141	3	H2
	—	—	—	KHSST08117	5 - 40	1.94	.63	.141	3	H2
	—	KHSST28135	—	KHSST28388	6 - 32	2.00	.69	.141	2	H3
	—	KHSST09009	—	KHSST08149	6 - 32	2.00	.69	.141	3	H2
	—	—	—	KHSST08152	6 - 32	2.00	.69	.141	3	H3
	—	—	—	KHSST08173	6 - 40	2.00	.69	.141	3	H2
	—	—	—	KHSST28394	8 - 32	2.13	.75	.168	2	H2
	—	—	—	KHSST08197	8 - 32	2.13	.75	.168	2	H3
	—	KHSST28429	—	KHSST28399	8 - 32	2.13	.75	.168	3	H3
	—	KHSST09011	—	KHSST28395	8 - 32	2.13	.75	.168	4	H2
	KHSST28441	—	KHSST28423	KHSST08193	8 - 32	2.13	.75	.168	4	H3
	—	—	—	KHSST28403	8 - 36	2.13	.75	.168	4	H2
	—	—	—	KHSST08239	10 - 24	2.38	.88	.194	2	H3
	—	—	—	KHSST28406	10 - 24	2.38	.88	.194	3	H3
	—	KHSST09013	—	KHSST08235	10 - 24	2.38	.88	.194	4	H3
	—	—	—	KHSST08273	10 - 32	2.38	.88	.194	2	H3
	—	KHSST28133	—	—	10 - 32	2.38	.88	.194	3	H2
	—	—	—	KHSST28412	10 - 32	2.38	.88	.194	3	H3
	—	—	—	KHSST08262	10 - 32	2.38	.88	.194	4	H2
	KHSST28436	KHSST09015	KHSST28419	KHSST08269	10 - 32	2.38	.88	.194	4	H3
	—	KHSST28131	—	KHSST08295	12 - 24	2.38	.94	.220	4	H3
	—	—	—	KHSST28416	12 - 28	2.38	.94	.220	4	H3

NOTE: Hand taps for 3B class of fit are suitable for UNJ aerospace internal threading applications.
Refer to table on pages L291–L292 for the recommended pitch diameter limit for 2B or 3B class of fit.



■ KHSST Hand • Fractional Sizes • Bottoming Chamfer Tap



● first choice
○ alternate choice

	TiN	oxide	uncoated	D1 size	L	L3	D	number of flutes	pitch diameter limit
	—	—	KHSST08317	1/4 - 20	2.50	1.00	.255	4	H2
KHSST28353	—	—	KHSST28294	1/4 - 20	2.50	1.00	.255	2	H3
KHSST28354	—	—	KHSST28295	1/4 - 20	2.50	1.00	.255	3	H3
KHSST09019	—	KHSST28342	KHSST08321	1/4 - 20	2.50	1.00	.255	4	H3
—	—	—	KHSST08327	1/4 - 20	2.50	1.00	.255	4	H5
—	—	—	KHSST08356	1/4 - 28	2.50	1.00	.255	3	H3
KHSST09021	—	—	KHSST08354	1/4 - 28	2.50	1.00	.255	4	H3
—	—	—	KHSST08392	5/16 - 18	2.72	1.13	.318	2	H3
—	—	—	KHSST28313	5/16 - 18	2.72	1.13	.318	3	H3
KHSST28119	—	—	KHSST08381	5/16 - 18	2.72	1.13	.318	4	H3
—	—	—	KHSST28317	5/16 - 18	2.72	1.13	.318	4	H5
KHSST09025	—	—	KHSST28319	5/16 - 24	2.72	1.13	.318	4	H3
KHSST28126	—	—	KHSST28308	3/8 - 16	2.94	1.25	.381	3	H3
KHSST09027	—	KHSST28347	KHSST08435	3/8 - 16	2.94	1.25	.381	4	H3
—	—	—	KHSST28311	3/8 - 16	2.94	1.25	.381	4	H5
KHSST09029	—	—	KHSST08460	3/8 - 24	2.94	1.25	.381	4	H3
—	—	—	KHSST08478	7/16 - 14	3.16	1.44	.323	4	H3
KHSST28122	—	—	KHSST08494	7/16 - 20	3.16	1.44	.323	4	H3
—	—	—	KHSST28290	1/2 - 13	3.38	1.66	.367	3	H3
KHSST09035	—	KHSST28340	KHSST28287	1/2 - 13	3.38	1.66	.367	4	H3
—	—	—	KHSST28289	1/2 - 13	3.38	1.66	.367	4	H5
—	—	—	KHSST08531	1/2 - 20	3.38	1.66	.367	4	H3
—	—	—	KHSST08546	9/16 - 12	3.59	1.66	.429	4	H3
—	—	—	KHSST08554	9/16 - 18	3.59	1.66	.429	4	H3
KHSST09039	—	KHSST28350	KHSST08562	5/8 - 11	3.81	1.81	.480	4	H3
—	—	—	KHSST28235	5/8 - 11	3.81	1.81	.480	4	H5
KHSST09041	—	—	KHSST08575	5/8 - 18	3.81	1.81	.480	4	H3
—	—	—	KHSST28241	5/8 - 18	3.81	1.81	.480	4	H5
—	—	—	KHSST28102	11/16 - 16	4.03	1.06	.542	4	H3
KHSST09043	—	KHSST28344	KHSST08596	3/4 - 10	4.25	2.00	.590	4	H3

NOTE: Hand taps for 3B class of fit are suitable for UNJ aerospace internal threading applications.
Refer to table on pages L291–L292 for the recommended pitch diameter limit for 2B or 3B class of fit.

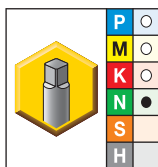
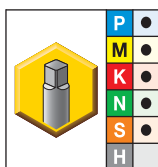
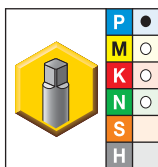
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General-Purpose Taps

Hand Taps • Blind Holes in General Machining Applications



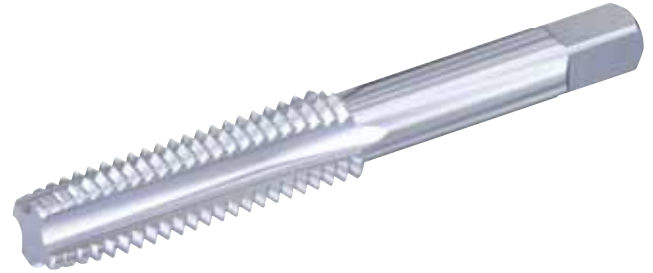
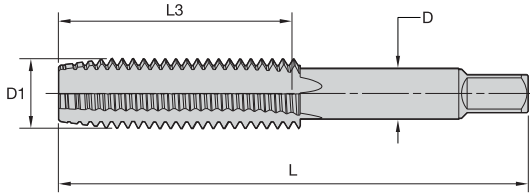
(KHSST Hand • Fractional Sizes • Bottoming Chamfer continued)



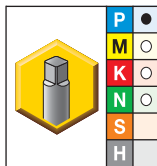
	TiN	oxide	uncoated	D1 size	L	L3	D	number of flutes	pitch diameter limit
	—	—	KHSST28301	3/4 - 10	4.25	2.00	.590	4	H5
	KHSST28117	—	KHSST08609	3/4 - 16	4.25	2.00	.590	4	H3
	—	—	KHSST28304	3/4 - 16	4.25	2.00	.590	4	H5
	KHSST09047	—	KHSST08617	7/8 - 9	4.69	2.22	.697	4	H4
	KHSST28124	—	KHSST28329	7/8 - 14	4.69	2.22	.697	4	H4
	KHSST28114	KHSST28338	KHSST08631	1 - 8	5.13	2.50	.800	4	H4
	—	—	KHSST28278	1 - 12	5.13	2.50	.800	4	H4
	—	—	KHSST28282	1 - 14	5.13	2.50	.800	4	H4
	—	—	KHSST28032	1 1/8 - 7	5.44	2.56	.896	4	H4
	—	—	KHSST28028	1 1/8 - 12	5.44	2.56	.896	4	H4
	—	—	KHSST28020	1 1/4 - 7	5.75	2.56	1.021	4	H4
	—	—	KHSST28015	1 1/4 - 12	5.75	2.56	1.021	6	H4
	—	—	KHSST28042	1 3/8 - 6	6.06	3.00	1.108	4	H4
	—	—	KHSST28039	1 3/8 - 12	6.06	3.00	1.108	6	H4
	—	—	KHSST28008	1 1/2 - 6	6.38	3.00	1.233	4	H4
	—	—	KHSST28003	1 1/2 - 12	6.38	3.00	1.233	6	H4

Taps

NOTE: Hand taps for 3B class of fit are suitable for UNJ aerospace internal threading applications.
Refer to table on pages L291–L292 for the recommended pitch diameter limit for 2B or 3B class of fit.



■ KHSST Hand • Machine Screw and Fractional Sizes • Sets of One Each Taper, Plug, and Bottoming Chamfer

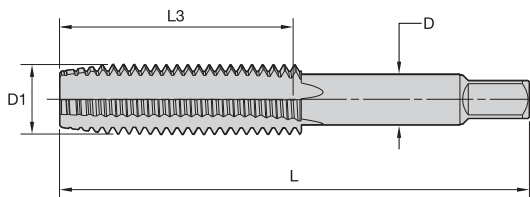


● first choice
○ alternate choice

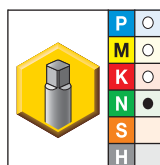
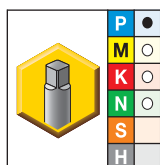
uncoated	D1 size	L	L3	D	number of flutes	pitch diameter limit
KHSST28369	0 - 80	1.63	.31	.141	2	H1
KHSST28377	2 - 56	1.75	.44	.141	3	H2
KHSST28381	3 - 48	1.81	.50	.141	3	H2
KHSST28383	4 - 40	1.88	.56	.141	3	H2
KHSST28385	5 - 40	1.94	.63	.141	3	H2
KHSST28387	6 - 32	2.00	.69	.141	3	H2
KHSST28390	6 - 32	2.00	.69	.141	3	H3
KHSST28392	6 - 40	2.00	.69	.141	3	H2
KHSST28398	8 - 32	2.13	.75	.168	4	H2
KHSST28402	8 - 32	2.13	.75	.168	4	H3
KHSST28404	8 - 36	2.13	.75	.168	4	H2
KHSST28408	10 - 24	2.38	.88	.194	4	H3
KHSST28409	10 - 32	2.38	.88	.194	4	H3
KHSST28414	12 - 24	2.38	.94	.220	4	H3
KHSST28418	12 - 28	2.38	.94	.220	4	H3
KHSST28297	1/4 - 20	2.50	1.00	.255	4	H3
KHSST28299	1/4 - 28	2.50	1.00	.255	4	H3
KHSST28315	5/16 - 18	2.72	1.13	.318	4	H3
KHSST28320	5/16 - 24	2.72	1.13	.318	4	H3
KHSST28310	3/8 - 16	2.94	1.25	.381	4	H3
KHSST28312	3/8 - 24	2.94	1.25	.381	4	H3
KHSST28326	7/16 - 14	3.16	1.44	.323	4	H3
KHSST28327	7/16 - 20	3.16	1.44	.323	4	H3
KHSST28288	1/2 - 13	3.38	1.66	.367	4	H3
KHSST28292	1/2 - 20	3.38	1.66	.367	4	H3
KHSST28334	9/16 - 12	3.59	1.66	.429	4	H3
KHSST28336	9/16 - 18	3.59	1.66	.429	4	H3
KHSST28322	5/8 - 11	3.81	1.81	.480	4	H3
KHSST28325	5/8 - 18	3.81	1.81	.480	4	H3
KHSST28300	3/4 - 10	4.25	2.00	.590	4	H3
KHSST28306	3/4 - 16	4.25	2.00	.590	4	H3
KHSST28333	7/8 - 9	4.69	2.22	.697	4	H4
KHSST28331	7/8 - 14	4.69	2.22	.697	4	H4

NOTE: Hand taps for 3B class of fit are suitable for UNJ aerospace internal threading applications.
Tap sets: one of each taper, plug, and bottoming chamfers.
Refer to table on pages L291-L292 for the recommended pitch diameter limit for 2B or 3B class of fit.





■ KHSST Hand • Plug Chamfer Tap • Metric ANSI

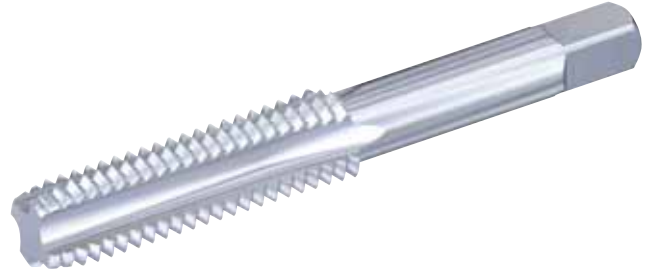
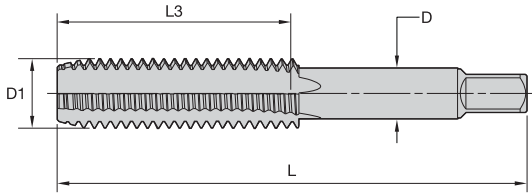


● first choice
○ alternate choice

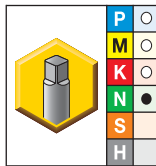
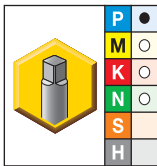
Taps

	TiN	uncoated	D1 size	L	L3	D	number of flutes	pitch diameter limit
—	—	KHSST28682	M1,6 x 0,35	1.63	.31	.141	2	D3
—	—	KHSST27709	M2 x 0,4	1.75	.44	.141	3	D3
—	—	KHSST27721	M3 x 0,5	1.94	.63	.141	3	D3
—	—	KHSST27729	M4 x 0,7	2.13	.75	.168	4	D4
—	—	KHSST27733	M4,5 x 0,75	2.38	.88	.194	4	D4
KHSST09052	—	KHSST27737	M5 x 0,8	2.38	.88	.194	4	D4
KHSST09054	—	KHSST27741	M6 x 1	2.50	1.00	.255	4	D5
KHSST09056	—	KHSST27749	M8 x 1,25	2.72	1.13	.318	4	D5
KHSST09058	—	KHSST27757	M10 x 1,5	2.94	1.25	.381	4	D6
—	—	KHSST27765	M12 x 1,75	3.38	1.66	.367	4	D6
—	—	KHSST27773	M14 x 2	3.59	1.66	.429	4	D7
—	—	KHSST27785	M16 x 1,5	3.81	1.81	.480	4	D7
—	—	KHSST27781	M16 x 2	3.81	1.81	.480	4	D7
—	—	KHSST27793	M18 x 2,5	4.03	1.06	.542	4	D7
—	—	KHSST27800	M20 x 1,5	4.47	2.00	.652	4	D6
—	—	KHSST27796	M20 x 2,5	4.47	2.00	.652	4	D7
—	—	KHSST27809	M24 x 3	4.91	2.22	.760	4	D8
—	—	KHSST28695	M30 x 3,5	5.44	2.56	1.021	4	D9
—	—	KHSST28698	M36 x 4	6.06	3.00	1.233	4	D9

NOTE: Metric taps for 6H class of fit are suitable for MJ aerospace internal threading applications.
Metric taps are manufactured to USCTI specifications and dimensions.
Metric tap blank dimensions are equivalent to inch taps.
Refer to table on page L292 for the recommended pitch diameter limit for 6H class of fit.



■ KHSST HAND • Bottoming Chamfer Tap • Metric ANSI



● first choice
○ alternate choice

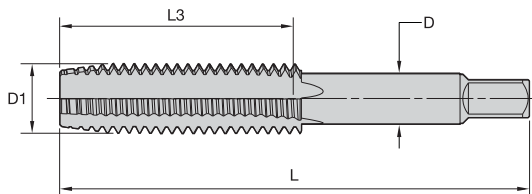
TiN	uncoated	D1 size	L	L3	D	Z	pitch diameter limit
—	KHSST27710	M2 x 0,4	1.75	.44	.141	3	D3
—	KHSST27722	M3 x 0,5	1.94	.63	.141	3	D3
—	KHSST27730	M4 x 0,7	2.13	.75	.168	4	D4
—	KHSST27738	M5 x 0,8	2.38	.88	.194	4	D4
KHSST28154	KHSST27742	M6 x 1	2.50	1.00	.255	4	D5
KHSST09057	KHSST27750	M8 x 1,25	2.72	1.13	.318	4	D5
KHSST09059	KHSST27758	M10 x 1,5	2.94	1.25	.381	4	D6
KHSST09061	KHSST27766	M12 x 1,75	3.38	1.66	.367	4	D6
KHSST28153	—	M12 x 1,75	3.38	1.66	.367	4	D6
—	KHSST28455	M14 x 2	3.59	1.66	.429	4	D7
—	KHSST28458	M16 x 2	3.81	1.81	.480	4	D7
—	KHSST28462	M20 x 2,5	4.47	2.00	.652	4	D7
—	KHSST28465	M24 x 3	4.91	2.22	.760	4	D8
—	KHSST28694	M30 x 3,5	5.44	2.56	1.021	4	D9
—	KHSST28697	M36 x 4	6.06	3.00	1.233	4	D9

NOTE: Metric taps for 6H class of fit are suitable for MJ aerospace internal threading applications.
Metric taps are manufactured to USCTI specifications and dimensions.
Metric tap blank dimensions are equivalent to inch taps.
Refer to table on page L292 for the recommended pitch diameter limit for 6H class of fit.

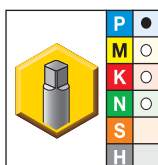


General-Purpose Taps

Hand Taps • Through or Blind Holes in General Machining Applications



■ KHSST Hand • Sets of One of Each Taper, Plug, Bottoming Chamfer Taps • Metric ANSI

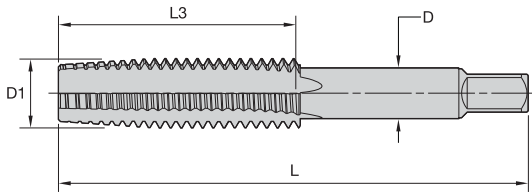
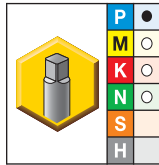


● first choice
○ alternate choice

Taps

uncoated	D1 size	L	L3	D	number of flutes	pitch diameter limit
KHSST28468	M3 x 0,5	1.94	.63	.141	3	D3
KHSST28470	M4 x 0,7	2.13	.75	.168	4	D4
KHSST28472	M5 x 0,8	2.38	.88	.194	4	D4
KHSST28473	M6 x 1	2.50	1.00	.255	4	D5
KHSST28475	M8 x 1,25	2.72	1.13	.318	4	D5
KHSST28452	M10 x 1,5	2.94	1.25	.381	4	D6
KHSST28454	M12 x 1,75	3.38	1.66	.367	4	D6
KHSST28457	M14 x 2	3.59	1.66	.429	4	D7
KHSST28460	M16 x 2	3.81	1.81	.480	4	D7
KHSST28464	M20 x 2,5	4.47	2.00	.652	4	D7

NOTE: Metric taps for 6H class of fit are suitable for MJ aerospace internal threading applications.
Metric taps are manufactured to USCTI specifications and dimensions.
Metric tap blank dimensions are equivalent to inch taps.
Refer to table on page L292 for the recommended pitch diameter limit for 6H class of fit.

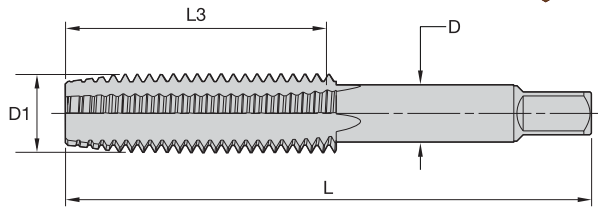

KHSST Hand • Taper Chamfer Tap • Metric ANSI


- first choice
- alternate choice

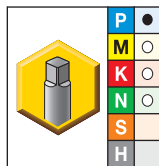
uncoated	D1 size	L	L3	D	number of flutes	pitch diameter limit
KHSST28466	M2 x 0,4	1.75	.44	.141	3	D3
KHSST28467	M3 x 0,5	1.94	.63	.141	3	D3
KHSST28469	M4 x 0,7	2.13	.75	.168	4	D4
KHSST28471	M5 x 0,8	2.38	.88	.194	4	D4
KHSST28474	M8 x 1,25	2.72	1.13	.318	4	D5
KHSST28451	M10 x 1,5	2.94	1.25	.381	4	D6
KHSST28453	M12 x 1,75	3.38	1.66	.367	4	D6
KHSST28456	M14 x 2	3.59	1.66	.429	4	D7
KHSST28459	M16 x 2	3.81	1.81	.480	4	D7
KHSST28461	M18 x 2,5	4.03	1.06	.542	4	D7
KHSST28463	M20 x 2,5	4.47	2.00	.652	4	D7
KHSST28691	M24 x 3	4.91	2.22	.760	4	D8
KHSST28696	M30 x 3,5	5.44	2.56	1.021	4	D9
KHSST28699	M36 x 4	6.06	3.00	1.233	4	D9



NOTE: Metric taps for 6H class of fit are suitable for MJ aerospace internal threading applications.
 Metric taps are manufactured to USCTI specifications and dimensions.
 Metric tap blank dimensions are equivalent to inch taps.
 Refer to table on page L292 for the recommended pitch diameter limit for 6H class of fit.



KHSST Left Hand • Fractional Sizes • Plug Chamfer Taps

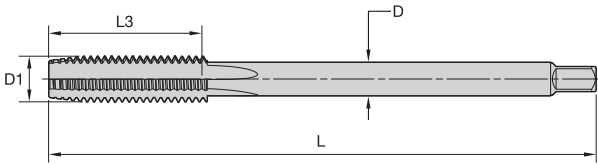


● first choice
○ alternate choice

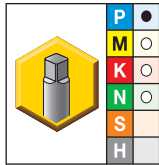
Taps

plug chamfer 3-5 pitch	D1 size	L	L3	D	number of flutes	pitch diameter limit
KHSST28086	1/4 - 28	2.50	1.00	.255	4	H3
KHSST28207	3/8 - 24	2.94	1.25	.381	4	H3
KHSST28675	7/16 - 20	3.16	1.44	.323	4	H3
KHSST28053	1/2 - 13	3.38	1.66	.367	4	H3
KHSST28064	1/2 - 20	3.38	1.66	.367	4	H3
KHSST28233	5/8 - 11	3.81	1.81	.480	4	H3
KHSST28239	5/8 - 18	3.81	1.81	.480	4	H3
KHSST28167	3/4 - 10	4.25	2.00	.590	4	H3
KHSST28184	3/4 - 16	4.25	2.00	.590	4	H3

NOTE: Refer to table on pages L291-L292 for the recommended pitch diameter limit for 2B or 3B class of fit.



■ KHSST Extended-Length Hand Taps • Machine Screw and Fractional • Plug Chamfer Tap

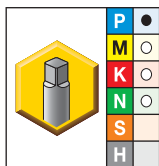


● first choice
○ alternate choice

uncoated	D1 size	L	L3	D	number of flutes	pitch diameter limit
KHSST28781	6 - 32	6.00	.69	.141	3	H3
KHSST28791	8 - 32	6.00	.75	.168	4	H3
KHSST28742	10 - 24	6.00	.88	.194	4	H3
KHSST28752	10 - 32	6.00	.88	.194	4	H3
KHSST28078	1/4 - 20	6.00	1.00	.255	4	H3
KHSST28085	1/4 - 28	6.00	1.00	.255	4	H3
KHSST28218	5/16 - 18	6.00	.67	.318	4	H3
KHSST28195	3/8 - 16	6.00	1.25	.381	4	H3



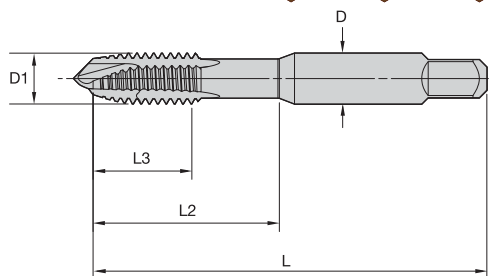
■ KHSST Extended-Length Hand Taps • Machine Screw and Fractional • Bottoming Chamfer Tap



● first choice
○ alternate choice

uncoated	D1 size	L	L3	D	number of flutes	pitch diameter limit
KHSST28751	10 - 32	6.00	.88	.194	4	H3
KHSST28077	1/4 - 20	6.00	1.00	.255	4	H3
KHSST28217	5/16 - 18	6.00	.67	.318	4	H3
KHSST28226	5/16 - 24	6.00	.59	.318	4	H3
KHSST28194	3/8 - 16	6.00	1.25	.381	4	H3

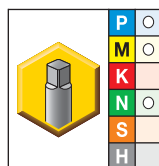
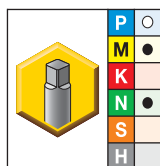
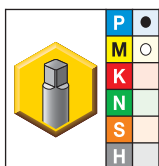
NOTE: Refer to table on pages L291-L292 for the recommended pitch diameter limit for 2B or 3B class of fit.



NEW!

KSU52 TiCN for steel.
KSU54 TiN+CrC/C for stainless steel.
KSU50 uncoated for aluminum.

■ Spiral Point • Machine Screw and Fractional • Spiral-Point Plug Chamfer Tap

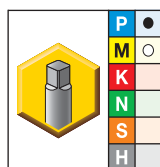


● first choice
○ alternate choice

Taps

	KSU52	KSU54	KSU50	D1 size	L	L3	L2	D	number of flutes	pitch diameter limit
T922NC#4-40RH2-A	T922NC#4-40RH2-A	T922NC#4-40RH2-A	T922NC#4-40RH2-A	4 - 40	1.88	.56	.69	.141	2	H2
T922NC#5-40RH2-A	T922NC#5-40RH2-A	T922NC#5-40RH2-A	T922NC#5-40RH2-A	5 - 40	1.94	.63	.75	.141	2	H2
T922NC#6-32RH2-A	T922NC#6-32RH2-A	T922NC#6-32RH2-A	T922NC#6-32RH2-A	6 - 32	2.00	.39	.88	.141	2	H2
T922NC#6-32RH3-A	T922NC#6-32RH3-A	T922NC#6-32RH3-A	T922NC#6-32RH3-A	6 - 32	2.00	.39	.88	.141	2	H3
T922NC#8-32RH2-A	T922NC#8-32RH2-A	T922NC#8-32RH2-A	T922NC#8-32RH2-A	8 - 32	2.13	.39	.92	.168	2	H2
T922NC#8-32RH3-A	T922NC#8-32RH3-A	T922NC#8-32RH3-A	T922NC#8-32RH3-A	8 - 32	2.13	.39	.92	.168	2	H3
T922NC#10-24RH2-A	T922NC#10-24RH2-A	T922NC#10-24RH2-A	T922NC#10-24RH2-A	10 - 24	2.38	.51	1.07	.194	2	H2
T922NC#10-24RH3-A	T922NC#10-24RH3-A	T922NC#10-24RH3-A	T922NC#10-24RH3-A	10 - 24	2.38	.51	1.07	.194	2	H3
T922NF#10-32RH2-A	T922NF#10-32RH2-A	T922NF#10-32RH2-A	T922NF#10-32RH2-A	10 - 32	2.37	.51	1.04	.194	2	H2
T922NF#10-32RH3-A	T922NF#10-32RH3-A	T922NF#10-32RH3-A	T922NF#10-32RH3-A	10 - 32	2.37	.51	1.04	.194	2	H3
T922NC#12-24RH3-A	T922NC#12-24RH3-A	T922NC#12-24RH3-A	T922NC#12-24RH3-A	12 - 24	2.38	.51	1.05	.220	2	H3
T922NC02500-20RH3-A	T922NC02500-20RH3-A	T922NC02500-20RH3-A	T922NC02500-20RH3-A	1/4 - 20	2.50	.61	1.16	.255	2	H3
T922NC02500-20RH5-A	T922NC02500-20RH5-A	T922NC02500-20RH5-A	T922NC02500-20RH5-A	1/4 - 20	2.50	.61	1.16	.255	2	H5
T922NF02500-28RH2-A	T922NF02500-28RH2-A	T922NF02500-28RH2-A	T922NF02500-28RH2-A	1/4 - 28	2.49	.61	1.15	.255	2	H2
T922NF02500-28RH3-A	T922NF02500-28RH3-A	T922NF02500-28RH3-A	T922NF02500-28RH3-A	1/4 - 28	2.49	.61	1.15	.255	2	H3
T922NC03125-18RH3-A	T922NC03125-18RH3-A	T922NC03125-18RH3-A	T922NC03125-18RH3-A	5/16 - 18	2.72	.68	1.32	.318	2	H3
T922NC03125-18RH5-A	T922NC03125-18RH5-A	T922NC03125-18RH5-A	T922NC03125-18RH5-A	5/16 - 18	2.72	.68	1.32	.318	2	H5
T922NF03125-24RH3-A	T922NF03125-24RH3-A	T922NF03125-24RH3-A	T922NF03125-24RH3-A	5/16 - 24	2.71	.67	1.31	.318	2	H3

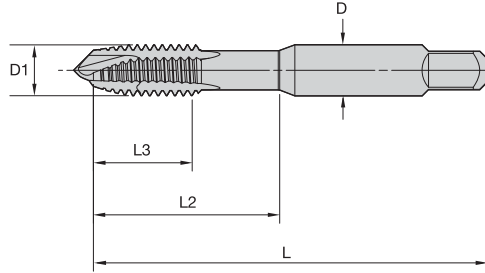
■ Spiral Point • Machine Screw and Fractional • Spiral-Point Plug Chamfer Tap • DIN Length



● first choice
○ alternate choice

	D1 size	L	L3	L2	D	number of flutes	pitch diameter limit
KSU52							
T922NC#4-40RH2-AD	4 - 40	2.09	.31	.71	.141	2	H2
T922NC#6-32RH3-AD	6 - 32	2.21	.38	.79	.141	2	H3
T923NC#8-32RH3-AD	8 - 32	2.48	.38	.83	.168	3	H3
T923NC#10-24RH3-AD	10 - 24	2.76	.50	.98	.194	3	H3
T923NF#10-32RH3-AD	10 - 32	2.76	.50	.98	.194	3	H3
T923NC02500-20RH3-AD	1/4 - 20	3.15	.63	1.18	.255	3	H3
T923NF02500-28RH3-AD	1/4 - 28	3.15	.63	1.18	.255	3	H3
T923NC03125-18RH3-AD	5/16 - 18	3.54	.69	1.38	.318	3	H3
T923NC03750-16RH3-AD	3/8 - 16	3.94	.75	1.54	.381	3	H3
T923NC05000-13RH3-AD	1/2 - 13	4.33	.94	1.14	.367	3	H3

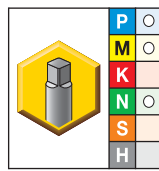
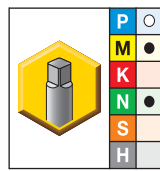
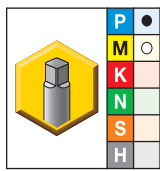
NOTE: Refer to table on pages L291-L292 for the recommended pitch diameter limit for 2B or 3B class of fit.



NEW!

KSU52 TiCN for steel.
KSU54 TiN+CrC/C for stainless steel.
KSU50 uncoated for aluminum.

■ Spiral Point • Plug Chamfer Tap • Metric ANSI

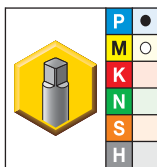


● first choice
○ alternate choice

KSU52		KSU54		KSU50		D1 size	L	L3	L2	D	number of flutes	pitch diameter limit
T922M030X050RD3-A	T922M030X050RD3-A	T922M030X050RD3-A	T922M030X050RD3-A	T922M030X050RD3-A	T922M030X050RD3-A	M3 x 0,5	1.94	.63	.75	.140	2	D3
T922M035X060RD4-A	T922M035X060RD4-A	T922M035X060RD4-A	T922M035X060RD4-A	T922M035X060RD4-A	T922M035X060RD4-A	M3,5 x 0,6	2.00	.38	.88	.141	2	D4
T922M040X070RD4-A	T922M040X070RD4-A	T922M040X070RD4-A	T922M040X070RD4-A	T922M040X070RD4-A	T922M040X070RD4-A	M4 x 0,7	2.13	.39	.92	.168	2	D4
T922M050X080RD4-A	T922M050X080RD4-A	T922M050X080RD4-A	T922M050X080RD4-A	T922M050X080RD4-A	T922M050X080RD4-A	M5 x 0,8	2.38	.51	1.07	.194	2	D4
T922M060X100RD5-A	T922M060X100RD5-A	T922M060X100RD5-A	T922M060X100RD5-A	T922M060X100RD5-A	T922M060X100RD5-A	M6 x 1	2.50	.61	1.16	.255	2	D5
T922M063X100RD5-A	T922M063X100RD5-A	T922M063X100RD5-A	T922M063X100RD5-A	T922M063X100RD5-A	T922M063X100RD5-A	M6.3 x 1	2.49	.61	1.15	.255	2	D5
T923M060X100RD5-A	T923M060X100RD5-A	T923M060X100RD5-A	T923M060X100RD5-A	T923M060X100RD5-A	T923M060X100RD5-A	M6 x 1	2.50	.61	1.16	.255	3	D5
T922M080X125RD5-A	T922M080X125RD5-A	T922M080X125RD5-A	T922M080X125RD5-A	T922M080X125RD5-A	T922M080X125RD5-A	M8 x 1,25	2.72	.67	1.31	.318	2	D5
T923M080X125RD5-A	T923M080X125RD5-A	T923M080X125RD5-A	T923M080X125RD5-A	T923M080X125RD5-A	T923M080X125RD5-A	M8 x 1,25	2.72	.67	1.32	.318	3	D5
T923M100X150RD6-A	T923M100X150RD6-A	T923M100X150RD6-A	T923M100X150RD6-A	T923M100X150RD6-A	T923M100X150RD6-A	M10 x 1,5	2.93	.76	1.41	.381	3	D6
T923M120X175RD6-A	T923M120X175RD6-A	T923M120X175RD6-A	T923M120X175RD6-A	T923M120X175RD6-A	T923M120X175RD6-A	M12 x 1,75	3.38	.97	1.61	.367	3	D6
T923M140X200RD7-A	T923M140X200RD7-A	T923M140X200RD7-A	T923M140X200RD7-A	T923M140X200RD7-A	T923M140X200RD7-A	M14 x 2	3.59	1.00	1.61	.429	3	D7
T923M160X200RD7-A	T923M160X200RD7-A	T923M160X200RD7-A	T923M160X200RD7-A	T923M160X200RD7-A	T923M160X200RD7-A	M16 x 2	3.81	1.12	1.74	.480	3	D7



■ Spiral Point • Plug Chamfer Tap • DIN Length • Metric ANSI



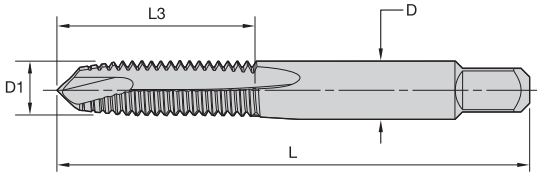
● first choice
○ alternate choice

KSU52	D1 size	L	L3	L2	D	number of flutes	pitch diameter limit
T922M030X050RD3-AD	M3 x 0,5	2.21	.38	.71	.141	2	D3
T923M040X070RD4-AD	M4 x 0,7	2.48	.38	.83	.168	3	D4
T923M050X080RD4-AD	M5 x 0,8	2.76	.50	.98	.194	3	D4
T923M060X100RD5-AD	M6 x 1	3.15	.63	1.18	.255	3	D5
T923M080X125RD5-AD	M8 x 1,25	3.54	.69	1.38	.318	3	D5
T923M100X150RD6-AD	M10 x 1,5	3.94	.75	1.54	.381	3	D6
T923M120X175RD6-AD	M12 x 1,75	4.33	.94	1.14	.367	3	D6

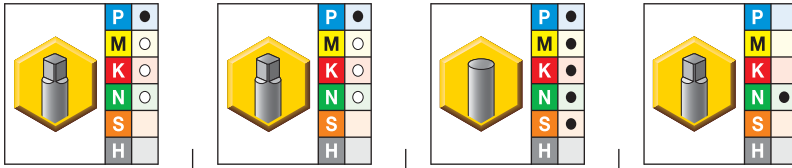
NOTE: Refer to table on page L292 for the recommended pitch diameter limit for 6H class of fit.

General-Purpose Taps

Spiral-Point Taps • Through Holes in General Machining Applications



■ KHSST Spiral Point • Machine Screw and Fractional Sizes • Plug Chamfer Tap

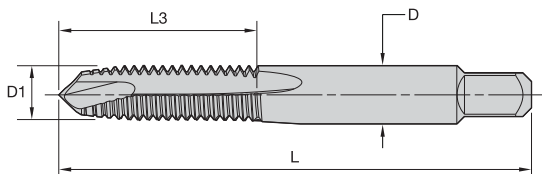


● first choice
○ alternate choice

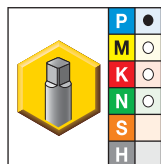
Taps

	TiCN	TiN	oxide	uncoated	D1 size	L	L3	D	number of flutes	pitch diameter limit
	KHSST28732	KHSST28733	—	KHSST28731	0 - 80	1.63	.31	.141	2	H2
	—	—	—	KHSST28757	1 - 72	1.69	.38	.141	2	H2
	—	KHSST09101	KHSST28252	KHSST08043	2 - 56	1.75	.44	.141	2	H2
	—	—	—	KHSST08061	3 - 48	1.81	.50	.141	2	H2
	KHSST28274	KHSST09103	KHSST28253	KHSST08090	4 - 40	1.88	.56	.141	2	H2
	—	—	—	KHSST08104	4 - 48	1.88	.56	.141	2	H2
	—	KHSST09104	—	KHSST08119	5 - 40	1.94	.63	.141	2	H2
	—	KHSST09105	KHSST28254	KHSST08156	6 - 32	2.00	.69	.141	2	H2
	KHSST28276	KHSST09106	KHSST28255	KHSST08157	6 - 32	2.00	.69	.141	2	H3
	—	—	—	KHSST08175	6 - 40	2.00	.69	.141	2	H2
	—	KHSST09108	KHSST28256	KHSST08203	8 - 32	2.13	.75	.168	2	H2
	KHSST28277	KHSST09109	KHSST28257	KHSST08205	8 - 32	2.13	.75	.168	2	H3
	—	—	—	KHSST28244	8 - 36	2.13	.75	.168	2	H2
	—	—	—	KHSST08243	10 - 24	2.38	.88	.194	2	H2
	KHSST09608	KHSST28113	KHSST28262	KHSST08245	10 - 24	2.38	.88	.194	2	H3
	—	KHSST09111	KHSST28263	KHSST08280	10 - 32	2.38	.88	.194	2	H2
	KHSST09609	KHSST09112	KHSST28264	KHSST08282	10 - 32	2.38	.88	.194	2	H3
	—	—	—	KHSST28248	10 - 32	2.38	.88	.194	2	H7
	—	KHSST09113	—	KHSST08296	12 - 24	2.38	.94	.220	2	H3
	—	KHSST09114	—	KHSST08331	1/4 - 20	2.50	1.00	.255	2	H2
	—	KHSST09115	KHSST28260	KHSST08332	1/4 - 20	2.50	1.00	.255	2	H3
	—	KHSST28111	—	KHSST08336	1/4 - 20	2.50	1.00	.255	2	H5
	KHSST09611	KHSST09116	—	KHSST08334	1/4 - 20	2.50	1.00	.255	3	H3
	—	KHSST28112	KHSST28261	KHSST08364	1/4 - 28	2.50	1.00	.255	2	H3
	—	KHSST09119	KHSST28267	KHSST08391	5/16 - 18	2.72	1.13	.318	2	H3
	KHSST28275	—	—	KHSST08393	5/16 - 18	2.72	1.13	.318	3	H3
	—	KHSST09120	KHSST28268	KHSST08419	5/16 - 24	2.72	1.13	.318	2	H3
	KHSST09615	KHSST09121	KHSST28266	KHSST08443	3/8 - 16	2.94	1.25	.381	3	H3
	—	—	—	KHSST08444	3/8 - 16	2.94	1.25	.381	3	H5
	—	KHSST09122	—	KHSST08467	3/8 - 24	2.94	1.25	.381	3	H3
	—	KHSST09123	KHSST28270	KHSST08484	7/16 - 14	3.16	1.44	.323	3	H3
	—	KHSST09124	KHSST28271	KHSST08498	7/16 - 20	3.16	1.44	.323	3	H3
	KHSST28272	KHSST09125	KHSST28258	KHSST08516	1/2 - 13	3.38	1.66	.367	3	H3
	—	—	—	KHSST28245	1/2 - 13	3.38	1.66	.367	3	H5
	—	KHSST09126	KHSST28259	KHSST08537	1/2 - 20	3.38	1.66	.367	3	H3
	—	—	—	KHSST08549	9/16 - 18	3.59	1.66	.429	3	H3
	KHSST28273	KHSST09127	KHSST28269	KHSST08566	5/8 - 11	3.81	1.81	.480	3	H3
	—	—	—	KHSST08578	5/8 - 18	3.81	1.81	.480	3	H3
	—	KHSST09128	KHSST28265	KHSST08599	3/4 - 10	4.25	2.00	.590	3	H3
	—	—	—	KHSST28249	3/4 - 10	4.25	2.00	.590	3	H5

NOTE: Spiral-point taps for 3B class of fit are suitable for UNJ aerospace internal threading applications. Refer to table on pages L291-L292 for the recommended pitch diameter limit for 2B or 3B class of fit.



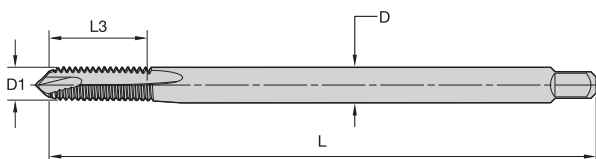
■ KHSST Oversized Spiral Point • Fractional Sizes • Plug Chamfer Taps



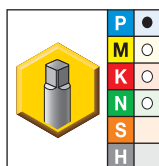
● first choice
○ alternate choice

uncoated	D1 size	L	L3	D	number of flutes	pitch diameter limit
KHSST28247	1/4 - 20	2.50	1.00	.255	2	H11
KHSST28251	5/16 - 18	2.72	1.13	.318	2	H11
KHSST28246	1/2 - 13	3.38	1.66	.367	3	H11
KHSST28250	3/8 - 16	2.94	1.25	.381	3	H11

NOTE: Refer to table on pages L291-L292 for the recommended pitch diameter limit for 2B or 3B class of fit.



■ KHSST Spiral Point 6" • Fractional Sizes • Plug Chamfer Taps



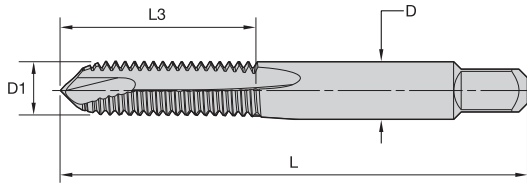
● first choice
○ alternate choice

uncoated	D1 size	L	L3	D	number of flutes
KHSST28776	6 - 32	6.00	.69	.141	2
KHSST28784	8 - 32	6.00	.75	.168	2
KHSST28737	10 - 24	6.00	.88	.194	2
KHSST28744	10 - 32	6.00	.88	.194	2
KHSST28072	1/4 - 20	6.00	1.00	.255	2
KHSST28080	1/4 - 28	6.00	1.00	.255	2
KHSST28209	5/16 - 18	6.00	1.13	.318	2
KHSST28220	5/16 - 24	6.00	1.13	.318	2
KHSST28192	3/8 - 16	6.00	1.25	.381	3
KHSST28204	3/8 - 24	6.00	1.25	.381	3

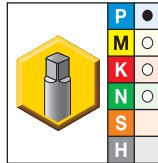
NOTE: Spiral-point taps for 3B class of fit are suitable for UNJ aerospace internal threading applications. Refer to table on pages L291-L292 for the recommended pitch diameter limit for 2B or 3B class of fit.

General-Purpose Taps

Heavy-Duty Spiral-Point Taps • Through Holes • Spiral-Point Taps • Blind Holes



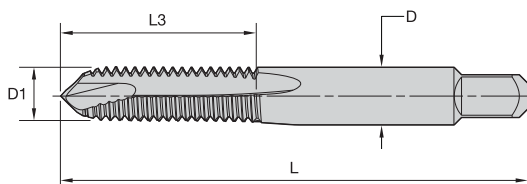
■ KHSST Heavy-Duty Spiral Point • Machine Screw and Fractional • Plug Chamfer Taps



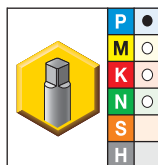
● first choice
○ alternate choice

oxide/nitride	D1 size	L	L3	D	number of flutes
KHSST28526	6 - 32	2.00	.69	.141	3
KHSST28527	8 - 32	2.13	.75	.168	3
KHSST28531	10 - 24	2.38	.88	.194	3
KHSST28532	10 - 32	2.38	.88	.194	3
KHSST28529	1/4 - 20	2.50	1.00	.255	3
KHSST28530	1/4 - 28	2.50	1.00	.255	3
KHSST28534	5/16 - 18	2.72	1.13	.318	3
KHSST28533	3/8 - 16	2.94	1.25	.381	3
KHSST28205	3/8 - 24	2.94	1.25	.381	3
KHSST28528	1/2 - 13	3.38	1.66	.367	3
KHSST28228	5/8 - 11	3.81	1.81	.480	3
KHSST28162	3/4 - 10	4.25	2.00	.590	3

NOTE: Spiral-point taps for 3B class of fit are suitable for UNJ aerospace internal threading applications. Refer to table on pages L291-L292 for the recommended pitch diameter limit for 2B or 3B class of fit.



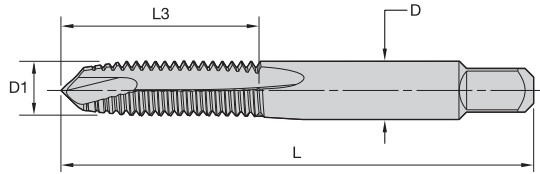
■ KHSST Spiral Point • Machine Screw and Fractional • Bottoming-Chamfer Taps



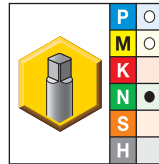
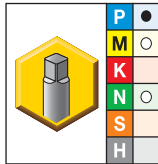
● first choice
○ alternate choice

uncoated	D1 size	L	L3	D	number of flutes	pitch diameter limit
KHSST28730	0 - 80	1.63	.31	.141	2	H2
KHSST08091	4 - 40	1.88	.56	.141	2	H2
KHSST08159	6 - 32	2.00	.69	.141	2	H2
KHSST08160	6 - 32	2.00	.69	.141	2	H3
KHSST08246	10 - 24	2.38	.88	.194	2	H3
KHSST28743	10 - 32	2.38	.88	.194	2	H2
KHSST08333	1/4 - 20	2.50	1.00	.255	2	H3
KHSST28219	5/16 - 24	2.72	1.13	.318	2	H3
KHSST08044	2 - 56	1.75	.44	.141	3	H2

NOTE: Refer to table on pages L291-L292 for the recommended pitch diameter limit for 2B or 3B class of fit.



■ Spiral Point • Plug Chamfer Taps • Metric ANSI

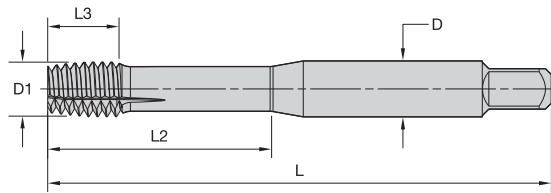


● first choice
○ alternate choice

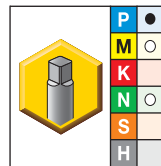
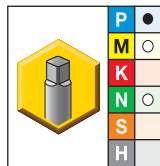
		D1 size	L	L3	D	number of flutes	pitch diameter limit
TiN	uncoated						
—	KHSST28681	M1,6 x 0,35	1.63	.31	.141	2	D3
—	KHSST27711	M2 x 0,4	1.75	.44	.141	2	D3
—	KHSST27719	M2,5 x 0,45	1.81	.50	.141	2	D3
KHSST09129	KHSST27723	M3 x 0,5	1.94	.63	.141	2	D3
KHSST09130	KHSST27731	M4 x 0,7	2.13	.75	.168	2	D4
KHSST09131	KHSST27739	M5 x 0,8	2.38	.88	.194	2	D4
KHSST09132	KHSST27743	M6 x 1	2.50	1.00	.255	2	D5
KHSST09133	KHSST27751	M8 x 1,25	2.72	1.13	.318	2	D5
KHSST28152	KHSST27759	M10 x 1,5	2.94	1.25	.381	3	D6
KHSST09135	KHSST27767	M12 x 1,75	3.38	1.66	.367	3	D6
—	KHSST28447	M14 x 2	3.59	1.66	.429	3	D7
—	KHSST27787	M16 x 2	3.81	1.81	.480	3	D6
—	KHSST28448	M16 x 2	3.81	1.81	.480	3	D7
—	KHSST27798	M20 x 2,5	4.47	2.00	.652	4	D7

NOTE: Metric taps for 6H class of fit are suitable for MJ aerospace internal threading applications.
Metric taps are manufactured to USCTI specifications and dimensions.
Metric tap blank dimensions are equivalent to inch taps.
Refer to table on page L292 for the recommended pitch diameter limit for 6H class of fit.





■ KHSST Forming Taps • Machine Screw and Fractional • Plug Entry Taper Tap

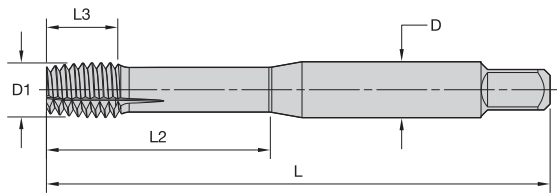
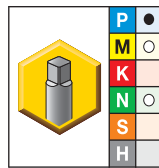
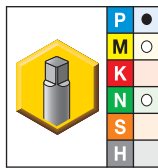


- first choice
- alternate choice

Taps

	TiCN	TiN	D1 size	L	L3	L2	D	number of lube grooves	pitch diameter limit
	KHSST28578	KHSST28579	6 - 32	2.00	.38	.69	.141	4	H3
	KHSST28580	KHSST28581	6 - 32	2.00	.38	.69	.141	4	H5
	KHSST28582	KHSST28583	6 - 40	2.00	.38	.69	.141	4	H3
	KHSST28584	KHSST28585	6 - 40	2.00	.38	.69	.141	4	H5
	KHSST28586	KHSST28587	8 - 32	2.13	.38	.75	.168	4	H3
	KHSST28588	KHSST28589	8 - 32	2.13	.38	.75	.168	4	H5
	KHSST28552	KHSST28553	10 - 24	2.38	.50	.88	.194	4	H4
	KHSST28554	KHSST28555	10 - 24	2.38	.50	.88	.194	4	H6
	KHSST28556	KHSST28557	10 - 32	2.38	.50	.88	.194	4	H4
	KHSST28558	KHSST28559	10 - 32	2.38	.50	.88	.194	4	H6
	KHSST28560	KHSST28561	12 - 24	2.38	.50	.94	.220	4	H4
	KHSST28562	KHSST28563	12 - 24	2.38	.50	.94	.220	4	H6
	KHSST28544	KHSST28545	1/4 - 20	2.50	.63	1.00	.255	4	H4
	KHSST28546	KHSST28547	1/4 - 20	2.50	.63	1.00	.255	4	H6
	KHSST28548	KHSST28549	1/4 - 28	2.50	.63	1.00	.255	4	H4
	KHSST28550	KHSST28551	1/4 - 28	2.50	.63	1.00	.255	4	H6
	KHSST28570	KHSST28571	5/16 - 18	2.72	.69	1.13	.318	4	H5
	KHSST28572	KHSST28573	5/16 - 18	2.72	.69	1.13	.318	4	H7
	KHSST28574	KHSST28575	5/16 - 24	2.72	.69	1.13	.318	4	H5
	KHSST28576	KHSST28577	5/16 - 24	2.72	.69	1.13	.318	4	H7
	KHSST28564	KHSST28565	3/8 - 16	2.94	.75	1.25	.381	4	H5
	KHSST28566	KHSST28567	3/8 - 16	2.94	.75	1.25	.381	4	H7
	KHSST28568	KHSST28569	3/8 - 24	2.94	.75	1.55	.381	4	H5
	KHSST28538	KHSST28539	1/2 - 13	3.38	.94	—	.367	4	H5
	KHSST28540	KHSST28541	1/2 - 13	3.38	.94	—	.367	4	H7
	KHSST28542	KHSST28543	1/2 - 20	3.38	.94	—	.367	4	H5

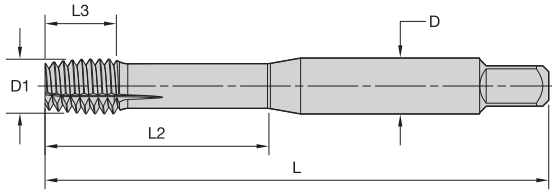
NOTE: Form taps require a larger drilled hole size prior to tapping than corresponding cutting taps.
Refer to table on pages L291–L292 for the recommended pitch diameter limit for 2B or 3B class of fit.


NEW!
Forming Taps • Machine Screw and Fractional • Bottom Entry Taper Tap

 ● first choice
 ○ alternate choice

TiCN	TiN	D1 size	L	L3	L2	D	number of lube grooves	pitch diameter limit
KHSST28630	KHSST28631	6 - 32	2.00	.38	.69	.141	4	H3
KHSST28632	KHSST28633	6 - 32	2.00	.38	.69	.141	4	H5
KHSST28634	KHSST28635	6 - 40	2.00	.38	.69	.141	4	H3
KHSST28636	KHSST28637	6 - 40	2.00	.38	.69	.141	4	H5
KHSST28638	KHSST28639	8 - 32	2.13	.38	.75	.168	4	H3
KHSST28640	KHSST28641	8 - 32	2.13	.38	.75	.168	4	H5
KHSST28642	KHSST28643	8 - 36	2.13	.38	.75	.168	4	H3
KHSST28644	KHSST28645	8 - 36	2.13	.38	.75	.168	4	H5
KHSST28604	KHSST28605	10 - 24	2.38	.50	.88	.194	4	H4
KHSST28606	KHSST28607	10 - 24	2.38	.50	.88	.194	4	H6
KHSST28608	KHSST28609	10 - 32	2.38	.50	.88	.194	4	H4
KHSST28610	KHSST28611	10 - 32	2.38	.50	.88	.194	4	H6
KHSST28612	KHSST28613	12 - 24	2.38	.50	.94	.220	4	H4
KHSST28596	KHSST28597	1/4 - 20	2.50	.63	1.00	.255	4	H4
KHSST28598	KHSST28599	1/4 - 20	2.50	.63	1.00	.255	4	H6
KHSST28600	KHSST28601	1/4 - 28	2.50	.63	1.00	.255	4	H4
KHSST28602	KHSST28603	1/4 - 28	2.50	.63	1.00	.255	4	H6
KHSST28622	KHSST28623	5/16 - 18	2.72	.69	1.13	.318	4	H5
KHSST28624	KHSST28625	5/16 - 18	2.72	.69	1.13	.318	4	H7
KHSST28626	KHSST28627	5/16 - 24	2.72	.69	1.13	.318	4	H5
KHSST28628	KHSST28629	5/16 - 24	2.72	.69	1.13	.318	4	H7
KHSST28614	KHSST28615	3/8 - 16	2.94	.75	1.25	.381	4	H5
KHSST28616	KHSST28617	3/8 - 16	2.94	.75	1.25	.381	4	H7
KHSST28618	KHSST28619	3/8 - 24	2.94	.75	1.25	.381	4	H5
KHSST28620	KHSST28621	3/8 - 24	2.94	.75	1.25	.381	4	H7
KHSST28590	KHSST28591	1/2 - 13	3.38	.94	—	.367	4	H5
KHSST28592	KHSST28593	1/2 - 13	3.38	.94	—	.367	4	H7
KHSST28594	KHSST28595	1/2 - 20	3.38	.94	—	.367	4	H5

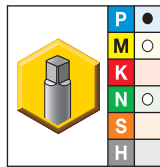
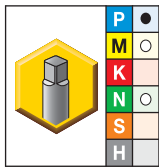
NOTE: Form taps require a larger drilled hole size prior to tapping than corresponding cutting taps.
 Refer to table on pages L291–L292 for the recommended pitch diameter limit for 2B or 3B class of fit.





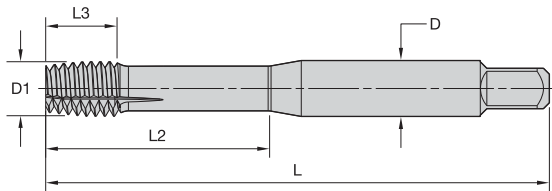
NEW!

■ KHSST Forming Taps • Plug Entry Taper Tap • Metric ANSI

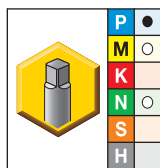
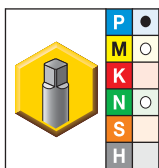


- first choice
- alternate choice

		TiCN	TiN	D1 size	L	L3	L2	D	number of lube grooves	pitch diameter limit
Taps		<input checked="" type="radio"/>	<input type="radio"/>	M4 x 0,7	2.13	.38	.75	.168	4	D6
		<input type="radio"/>	<input checked="" type="radio"/>	M5 x 0,8	2.38	.50	.88	.194	4	D7
		<input checked="" type="radio"/>	<input type="radio"/>	M6 x 1	2.50	.63	1.00	.255	4	D8
		<input type="radio"/>	<input checked="" type="radio"/>	M8 x 1,25	2.72	.69	1.13	.318	4	D9
		<input checked="" type="radio"/>	<input type="radio"/>	M10 x 1,5	2.94	.75	1.25	.381	4	D10
		<input type="radio"/>	<input checked="" type="radio"/>	M12 x 1,75	3.38	.94	—	.367	4	D11



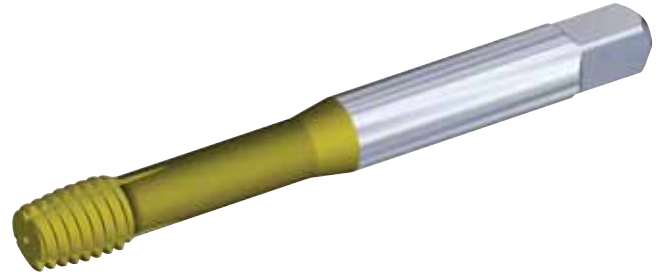
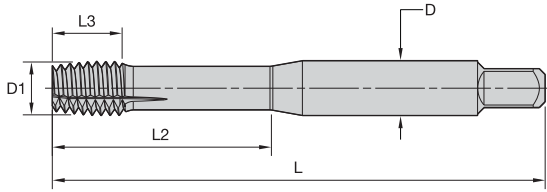
■ KHSST Forming Taps • Bottom Entry Taper Tap • Metric ANSI



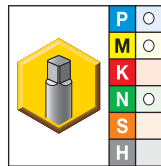
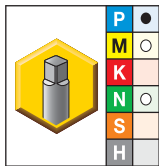
- first choice
- alternate choice

		TiCN	TiN	D1 size	L	L3	L2	D	number of lube grooves	pitch diameter limit
Taps		<input checked="" type="radio"/>	<input type="radio"/>	M4 x 0,7	2.13	.38	.75	.168	4	D6
		<input type="radio"/>	<input checked="" type="radio"/>	M5 x 0,8	2.38	.50	.88	.194	4	D7
		<input checked="" type="radio"/>	<input type="radio"/>	M6 x 1	2.50	.63	1.00	.255	4	D8
		<input type="radio"/>	<input checked="" type="radio"/>	M8 x 1,25	2.72	.69	1.13	.318	4	D9
		<input checked="" type="radio"/>	<input type="radio"/>	M10 x 1,5	2.94	.75	1.25	.381	4	D10
		<input type="radio"/>	<input checked="" type="radio"/>	M12 x 1,75	3.38	.94	—	.367	4	D11

NOTE: Metric taps are manufactured to USCTI specifications and dimensions.
 Metric tap blank dimensions are equivalent to inch taps.
 Form taps require a larger drilled hole size prior to tapping than corresponding cutting taps.
 Refer to table on page L292 for the recommended pitch diameter limit for 6H class of fit.



■ KHSST Forming Tap • Machine Screw and Fractional • Plug Entry Taper Tap

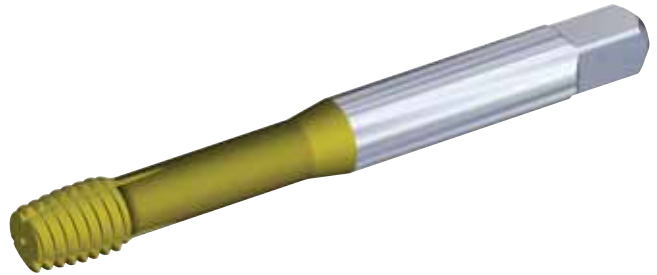
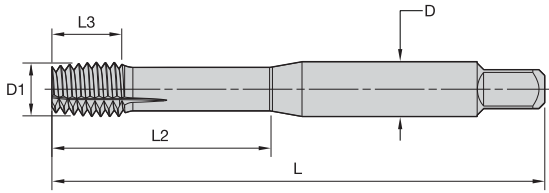


- first choice
- alternate choice

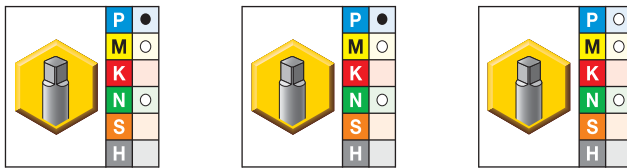
TiN	uncoated	D1 size	L	L3	L2	D	number of lube grooves	pitch diameter limit
KHSST28769	KHSST28768	4 - 40	1.88	.31	.56	.141	—	H3
—	KHSST28771	4 - 40	1.88	.31	.56	.141	—	H5
—	KHSST28773	5 - 40	1.94	.31	.63	.141	4	H3
KHSST09301	KHSST28482	6 - 32	2.00	.38	.69	.141	4	H3
KHSST09302	KHSST10034	6 - 32	2.00	.38	.69	.141	4	H5
KHSST09303	KHSST28483	8 - 32	2.13	.38	.75	.168	4	H3
KHSST28161	KHSST10043	8 - 32	2.13	.38	.75	.168	4	H5
KHSST09305	KHSST28485	10 - 24	2.38	.50	.88	.194	4	H4
—	KHSST28486	10 - 24	2.38	.50	.88	.194	4	H6
KHSST09306	KHSST28487	10 - 32	2.38	.50	.88	.194	4	H4
—	KHSST10058	10 - 32	2.38	.50	.88	.194	4	H6
—	KHSST28755	12 - 24	2.38	.50	.94	.220	4	H4
—	KHSST28756	12 - 24	2.38	.50	.94	.220	4	H6
KHSST09307	KHSST28484	1/4 - 20	2.50	.63	1.00	.255	4	H4
—	KHSST10072	1/4 - 20	2.50	.63	1.00	.255	4	H6
KHSST28090	KHSST28089	1/4 - 28	2.50	.63	1.00	.255	4	H4
KHSST09309	—	5/16 - 18	2.70	.69	1.13	.318	4	H5
—	KHSST28489	5/16 - 18	2.72	.69	1.13	.318	4	H5
—	KHSST10084	5/16 - 18	2.72	.69	1.13	.318	4	H7
—	KHSST28227	5/16 - 24	2.72	.69	1.13	.318	4	H5
KHSST09310	KHSST28488	3/8 - 16	2.94	.75	1.25	.381	4	H5
—	KHSST10096	3/8 - 16	2.94	.75	1.25	.381	4	H7
—	KHSST28208	3/8 - 24	2.94	.75	—	.323	4	H8
—	KHSST28056	1/2 - 13	3.38	.94	—	.367	4	H5
—	KHSST10116	1/2 - 13	3.38	.94	—	.367	4	H8
—	KHSST28066	1/2 - 20	3.38	.94	—	.367	4	H5
—	KHSST28237	5/8 - 11	3.81	1.09	—	.480	4	H7
—	KHSST28171	3/4 - 10	4.25	1.22	—	.590	4	H7
—	KHSST28186	3/4 - 16	4.25	1.22	—	.590	4	H7

NOTE: Form taps require a larger drilled hole size prior to tapping than corresponding cutting taps.
Refer to table on pages L291–L292 for the recommended pitch diameter limit for 2B or 3B class of fit.





■ KHSST Form • Machine Screw and Fractional • Bottoming Chamfer Tap



● first choice
○ alternate choice

Taps

	TiCN	TiN	uncoated	D1 size	L	L3	L2	D	number of lube grooves	pitch diameter limit
	KHSST28508	KHSST28735	KHSST28734	0 - 80	1.63	.31	—	.141	—	H2
	—	—	KHSST28736	0 - 80	1.63	.31	—	.141	—	H3
	KHSST09624	—	—	2 - 56	1.75	.44	—	.141	—	H2
	KHSST28510	KHSST28759	KHSST28758	2 - 56	1.75	.44	—	.141	—	H2
	—	—	KHSST28760	2 - 56	1.75	.44	—	.141	—	H3
	KHSST28512	KHSST28767	KHSST28766	4 - 40	1.88	.31	.56	.141	—	H3
	—	—	KHSST28770	4 - 40	1.88	.31	.56	.141	—	H5
	—	—	KHSST28772	5 - 40	1.94	.31	.63	.141	4	H3
	KHSST28504	KHSST09316	KHSST28490	6 - 32	2.00	.38	.69	.141	4	H3
	KHSST28505	KHSST09317	KHSST28491	6 - 32	2.00	.38	.69	.141	4	H5
	KHSST28506	KHSST09318	KHSST28492	8 - 32	2.13	.38	.75	.168	4	H3
	KHSST28507	KHSST09319	KHSST28493	8 - 32	2.13	.38	.75	.168	4	H5
	KHSST28502	KHSST09320	KHSST28496	10 - 24	2.38	.50	.88	.194	4	H4
	—	—	KHSST10053	10 - 24	2.38	.50	.88	.194	4	H6
	KHSST28503	KHSST09321	KHSST28497	10 - 32	2.38	.50	.88	.194	4	H4
	—	—	KHSST28498	10 - 32	2.38	.50	.88	.194	4	H6
	KHSST28509	KHSST09322	KHSST28494	1/4 - 20	2.50	.63	1.00	.255	4	H4
	—	—	KHSST28495	1/4 - 20	2.50	.63	1.00	.255	4	H6
	KHSST28088	—	KHSST28087	1/4 - 28	2.50	.63	1.00	.255	4	H4
	—	—	KHSST10079	1/4 - 28	2.50	.63	1.00	.255	4	H6
	—	—	—	5/16 - 18	2.72	.69	1.13	.318	4	H5
	KHSST28513	KHSST09324	KHSST28500	5/16 - 18	2.72	.69	1.13	.318	4	H5
	—	—	KHSST28501	5/16 - 18	2.72	.69	1.13	.318	4	H7
	KHSST28511	KHSST09325	KHSST28499	3/8 - 16	2.94	.75	1.25	.381	4	H5
	—	—	KHSST10097	3/8 - 16	2.94	.75	1.25	.381	4	H7
	—	—	KHSST28055	1/2 - 13	3.38	.94	—	.367	4	H5
	—	—	KHSST10117	1/2 - 13	3.38	.94	—	.367	4	H8
	—	—	KHSST28065	1/2 - 20	3.38	.94	—	.367	4	H5
	—	—	KHSST28236	5/8 - 11	3.81	1.09	—	.480	4	H7
	—	—	KHSST28243	5/8 - 18	3.81	1.09	—	.480	4	H7
	—	—	KHSST28170	3/4 - 10	4.25	1.22	—	.590	4	H7

NOTE: Form taps require a larger drilled hole size prior to tapping than corresponding cutting taps.
Refer to table on pages L291–L292 for the recommended pitch diameter limit for 2B or 3B class of fit.



Quick Ship Services

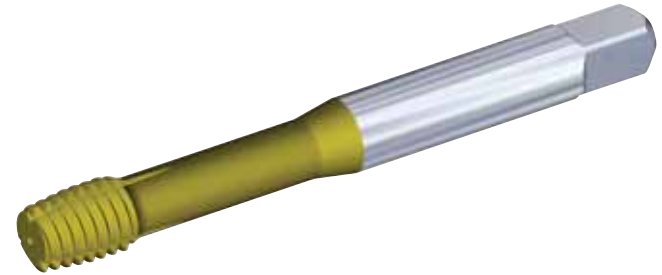
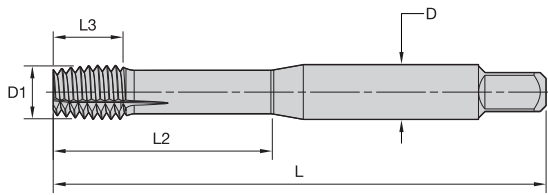
Rely on the Kennametal Quick Ship Services to deliver the special taps you need, when and where you need them. Within minutes, we can quote, process, and release your order to the factory.

- Non-standard tap sizes, pitches, PDs, coatings, etc.
- Special taps can be used for tapping steel, cast iron, aluminum or brass.
- Custom ordered taps can be designed to thread INCONEL®, titanium, and high-temp alloys.
- Always accurate thread pitch diameters and gage fits.

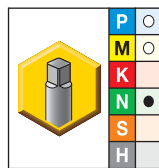
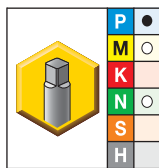
Let our Kennametal Quick Ship Services spark your production. Contact your Authorized Kennametal Distributor or at www.kennametal.com.

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 **KENNAMETAL®**



■ KHSST Form • Plug Entry Taper Tap • Metric ANSI



● first choice
○ alternate choice

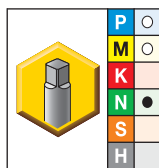
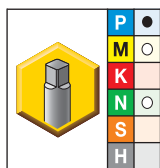
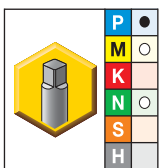
	TiN	uncoated	D1 size	L	L3	L2	D	number of lube grooves	pitch diameter limit
	KHSST28706	KHSST28705	M3 x 0,5	1.94	.31	.63	.141	4	D5
	KHSST09327	KHSST28515	M4 x 0,7	2.13	.38	.75	.168	4	D6
	KHSST28715	—	M5 x 0,8	2.38	.50	.88	.194	4	D7
	KHSST09329	KHSST28516	M6 x 1	2.50	.63	1.00	.255	4	D8
	KHSST09330	KHSST28517	M8 x 1,25	2.72	.69	1.13	.318	4	D9
	KHSST09331	KHSST28514	M10 x 1,5	2.94	.75	1.25	.381	4	D10
	KHSST09332	—	M12 x 1,75	3.38	1.66	—	.367	4	D11

NOTE: Metric taps are manufactured to USCTI specifications and dimensions.
Metric tap blank dimensions are equivalent to inch taps.
Form taps require a larger drilled hole size prior to tapping than corresponding cutting taps.
Refer to table on page L292 for the recommended pitch diameter limit for 6H class of fit.

Taps



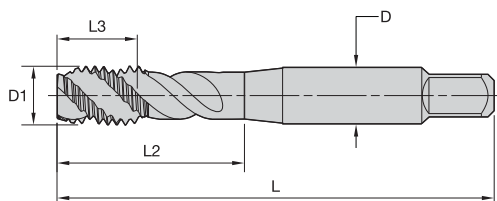
■ KHSST Forming Tap • Bottom Entry Taper Tap • Metric ANSI



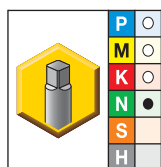
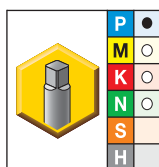
● first choice
○ alternate choice

	TiCN	TiN	uncoated	D1 size	L	L3	L2	D	number of lube grooves	pitch diameter limit
	KHSST28522	KHSST28704	KHSST28703	M3 x 0,5	1.94	.31	.63	.141	4	D5
	KHSST28523	KHSST09334	KHSST28519	M4 x 0,7	2.13	.38	.75	.168	4	D6
	KHSST09640	KHSST28714	KHSST28718	M5 x 0,8	2.38	.50	.88	.194	4	D7
	KHSST28524	KHSST09336	KHSST28520	M6 x 1	2.50	.63	1.00	.255	4	D8
	KHSST28525	KHSST09337	KHSST28521	M8 x 1,25	2.72	.69	1.13	.318	4	D9
	KHSST09643	KHSST09338	KHSST28518	M10 x 1,5	2.94	.75	1.25	.381	4	D10
	KHSST09644	KHSST28689	—	M12 x 1,75	3.38	.94	—	.367	4	D11

NOTE: Metric taps are manufactured to USCTI specifications and dimensions.
Metric tap blank dimensions are equivalent to inch taps.
Form taps require a larger drilled hole size prior to tapping than corresponding cutting taps.
Refer to table on page L292 for the recommended pitch diameter limit for 6H class of fit.



■ KHSST Spiral Flute • Machine Screw and Fractional • Plug Chamfer Tap

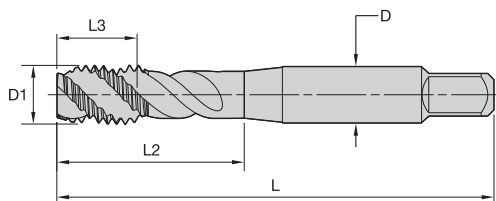


● first choice
○ alternate choice

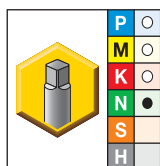
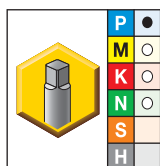
TiN	uncoated	D1 size	L	L3	L2	D	number of flutes	pitch diameter limit
KHSST28763	KHSST28765	4 - 40	1.88	.56	—	.141	2	H2
KHSST28775	KHSST28778	6 - 32	2.00	.38	.69	.141	2	H3
KHSST28788	KHSST28790	8 - 32	2.13	.38	.75	.168	3	H3
—	KHSST28741	10 - 24	2.38	.50	.88	.194	3	H3
KHSST28748	KHSST28750	10 - 32	2.38	.50	.88	.194	3	H3
KHSST28138	KHSST28076	1/4 - 20	2.50	.63	1.00	.255	3	H3
—	KHSST28084	1/4 - 28	2.50	.63	1.00	.255	3	H3
KHSST28214	KHSST28216	5/16 - 18	2.72	.69	1.12	.318	3	H3
KHSST28224	—	5/16 - 24	2.72	.69	1.12	.318	3	H3
KHSST28190	KHSST28193	3/8 - 16	2.94	.75	1.25	.381	3	H3
—	KHSST28206	3/8 - 24	2.94	.75	1.25	.381	3	H3
—	KHSST28673	7/16 - 14	3.16	.88	—	.323	3	H3
KHSST28050	KHSST28052	1/2 - 13	3.38	.94	—	.367	3	H3
—	KHSST28234	5/8 - 11	3.81	1.09	—	.480	4	H3
—	KHSST28168	3/4 - 10	4.25	1.22	—	.590	4	H3

NOTE: Refer to table on pages L291–L292 for the recommended pitch diameter limit for 2B or 3B class of fit.





■ KHSST Spiral Flute • Machine Screw and Fractional • Bottoming Chamfer Tap

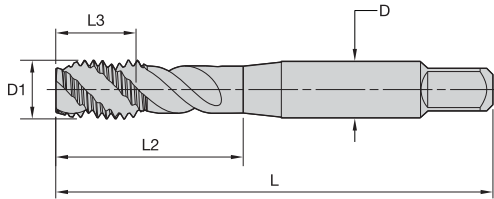


● first choice
○ alternate choice

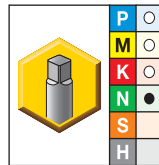
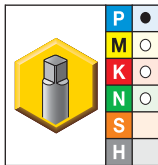
Taps

	TIN	uncoated	D1 size	L	L3	L2	D	number of flutes	pitch diameter limit
	KHSST28761	KHSST28762	4 - 40	1.88	.56	—	.141	2	H2
	KHSST28779	KHSST28774	6 - 32	2.00	.38	.69	.141	2	H3
	KHSST28785	KHSST28787	8 - 32	2.13	.38	.75	.168	3	H3
	KHSST28738	KHSST28740	10 - 24	2.38	.50	.88	.194	3	H3
	KHSST28745	KHSST28747	10 - 32	2.38	.50	.88	.194	3	H3
	KHSST28137	KHSST28074	1/4 - 20	2.50	.63	1.00	.255	3	H3
	KHSST28081	KHSST28083	1/4 - 28	2.50	.63	1.00	.255	3	H3
	KHSST28211	KHSST28213	5/16 - 18	2.72	.69	1.12	.318	3	H3
	KHSST28221	KHSST28223	5/16 - 24	2.72	.69	1.12	.318	3	H3
	KHSST28187	KHSST28189	3/8 - 16	2.94	.75	1.25	.381	3	H3
	KHSST28201	KHSST28203	3/8 - 24	2.94	.75	1.25	.381	3	H3
	KHSST28670	KHSST28672	7/16 - 14	3.16	.88	—	.323	3	H3
	—	KHSST28674	7/16 - 20	3.16	.88	—	.323	3	H3
	KHSST28047	KHSST28049	1/2 - 13	3.38	.94	—	.367	3	H3
	—	KHSST28062	1/2 - 20	3.38	.94	—	.367	3	H3
	—	KHSST28231	5/8 - 11	3.81	1.09	—	.480	4	H3
	—	KHSST28165	3/4 - 10	4.25	1.22	—	.590	4	H3

NOTE: Refer to table on pages L291–L292 for the recommended pitch diameter limit for 2B or 3B class of fit.



■ KHSST Spiral Flute • Plug Chamfer Tap • Metric ANSI

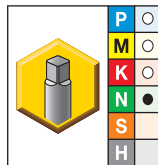
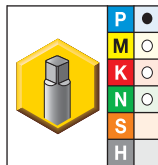
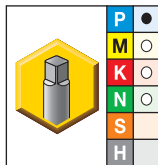


● first choice
○ alternate choice

TiN	uncoated	D1 size	L	L3	L2	D	number of flutes	pitch diameter limit
KHSST28701	KHSST28693	M3 x 0,5	1.94	.31	—	.141	2	D3
KHSST28711	KHSST28708	M4 x 0,7	2.13	.38	.75	.168	3	D4
—	KHSST28717	M5 x 0,8	2.38	.50	.88	.194	3	D4
KHSST28725	KHSST28722	M6 x 1	2.50	.63	1.00	.255	3	D5
KHSST28729	KHSST28727	M8 x 1,25	2.72	.69	1.12	.318	3	D5
KHSST28686	KHSST28684	M10 x 1,5	2.94	.75	1.25	.381	3	D6
KHSST28690	KHSST28688	M12 x 1,75	3.38	.94	—	.367	3	D6



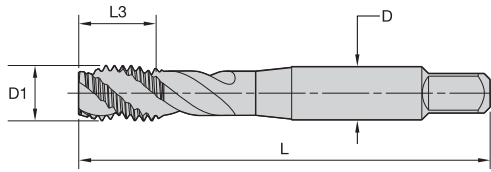
■ KHSST Spiral Flute • Bottoming Chamfer Tap • Metric ANSI



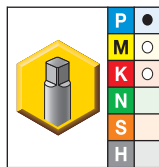
● first choice
○ alternate choice

TiCN	TiN	uncoated	D1 size	L	L3	L2	D	number of flutes	pitch diameter limit
KHSST28478	KHSST28700	KHSST28692	M3 x 0,5	1.94	.31	—	.141	2	D3
KHSST28709	KHSST28710	KHSST28707	M4 x 0,7	2.13	.38	.75	.168	3	D4
KHSST28479	KHSST28719	KHSST28716	M5 x 0,8	2.38	.50	.88	.194	3	D4
KHSST28723	KHSST28724	KHSST28721	M6 x 1	2.50	.38	.75	.255	3	D5
KHSST28480	KHSST28728	KHSST28726	M8 x 1,25	2.72	.69	1.12	.318	3	D5
KHSST28476	KHSST28685	KHSST28683	M10 x 1,5	2.94	.75	1.25	.381	3	D6
KHSST28477	—	KHSST28687	M12 x 1,75	3.38	.94	—	.367	3	D6

NOTE: Metric D limits are suitable for ISO 6H tolerance class.
Metric taps are manufactured to USCTI specifications and dimensions.
Metric tap blank dimensions are equivalent to inch taps.
Refer to table on page L292 for the recommended pitch diameter limit for 6H class of fit.



■ KHSST Heavy-Duty Spiral Flute • Machine Screw and Fractional • Plug Chamfer Tap



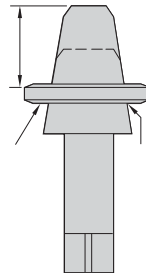
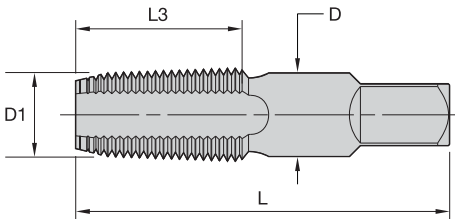
● first choice
○ alternate choice

Taps

oxide	D1 size	L	L3	D	number of flutes	pitch diameter limit
KHSST28780	6 - 32	2.00	.38	.141	3	H3
KHSST28782	6 - 32	2.00	.38	.141	3	H3
KHSST28789	8 - 32	2.13	.38	.168	3	H3
KHSST28786	8 - 32	2.13	.38	.168	3	H3
KHSST28739	10 - 24	2.38	.50	.194	3	H3
KHSST28746	10 - 32	2.38	.50	.194	3	H3
KHSST28075	1/4 - 20	2.50	.63	.255	3	H3
KHSST28073	1/4 - 20	2.50	.63	.255	3	H3
KHSST28082	1/4 - 28	2.50	.63	.255	3	H3
KHSST28212	5/16 - 18	2.72	.69	.318	3	H3
KHSST28215	5/16 - 18	2.72	.69	.318	3	H3
KHSST28225	5/16 - 24	2.72	.69	.318	3	H3
KHSST28222	5/16 - 24	2.72	.69	.318	3	H3
KHSST28191	3/8 - 16	2.94	.75	.381	3	H3
KHSST28188	3/8 - 16	2.94	.75	.381	3	H3
KHSST28202	3/8 - 24	2.94	.75	.381	3	H3
KHSST28671	7/16 - 14	3.16	.88	.323	3	H3
KHSST28048	1/2 - 13	3.38	.94	.367	3	H3
KHSST28051	1/2 - 13	3.38	.94	.367	3	H3
KHSST28232	5/8 - 11	3.81	1.09	.480	4	H3
KHSST28229	5/8 - 11	3.81	1.09	.480	4	H3
KHSST28163	3/4 - 10	4.25	1.22	.590	4	H3
KHSST28166	3/4 - 10	4.25	1.22	.590	4	H3

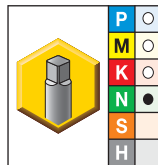
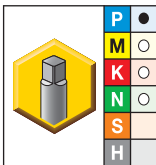
NOTE: KHSST taps for 3B class of fit are suitable for UNJ aerospace internal threading applications. Refer to table on pages L291-L292 for the recommended pitch diameter limit for 2B or 3B class of fit.

- Manufactured from select high-speed steel.
- Ground thread pipe taps are standard in American Standard Pipe Form (NPT) and American Standard Dryseal Thread Form (NPTF).
- NPT threads require the use of a sealer, such as Teflon® tape or pipe compound.
- NPTF dryseal threads give a pressure-tight joint without the use of sealer.
- The nominal size of a pipe tap is that of the pipe fitting to be tapped, not the actual size of the tap; thread taper is 3/4" per foot.
- Alternate tap coatings are available as stock modifications.



*Standard Projection
Shortest Projection
L1 Ring Gage
Basic Size

■ KHSST Taper Pipe Tap • Chamfer 2 1/2–3 1/2 Pitches



- first choice
- alternate choice

		D1 size	L	L3	D	number of flutes	thread type
TiN	uncoated						
KHSST09137	KHSST28443	1/16 - 27	2.13	.69	.313	4	NPT/ANPT
KHSST09140	KHSST08703	1/8 - 27	2.13	.75	.313	4	NPT/ANPT
KHSST28141	KHSST08705	1/8 - 27	2.13	.75	.313	4	NPTF
KHSST28139	KHSST08704	1/8 - 27	2.13	.75	.438	4	NPT/ANPT
KHSST28140	—	1/8 - 27	2.13	.75	.438	4	NPTF
KHSST09143	KHSST08709	1/4 - 18	2.44	1.06	.563	4	NPT/ANPT
—	KHSST28445	1/4 - 18	2.44	1.06	.563	4	NPTF
KHSST28142	KHSST28446	3/8 - 18	2.56	1.06	.700	4	NPT/ANPT
—	KHSST08712	3/8 - 18	2.56	1.06	.700	4	NPTF
KHSST09147	KHSST08715	1/2 - 14	3.13	1.66	.687	4	NPT/ANPT
KHSST28060	KHSST28444	1/2 - 14	3.13	1.66	.687	4	NPTF
KHSST28178	KHSST28177	3/4 - 14	3.25	1.38	.906	5	NPT/ANPT
KHSST28182	KHSST28181	3/4 - 14	3.25	1.38	.906	5	NPTF
KHSST09151	KHSST28106	1 - 11 1/2	3.75	1.75	1.125	5	NPT/ANPT
—	KHSST28107	1 - 11 1/2	3.75	1.75	1.125	5	NPTF
—	KHSST08724	1 1/4 - 11 1/2	4.00	1.75	1.313	5	NPT/ANPT
—	KHSST28002	1 1/2 - 11 1/2	4.25	3.00	1.500	7	NPT/ANPT
—	KHSST28109	2 - 11 1/2	4.25	1.75	1.875	7	NPT/ANPT
—	KHSST28110	2 - 11 1/2	4.25	1.75	1.875	7	NPTF

* Pipe tap projection is the distance the small end of the tap projects through an American National Standard Pipe Tap Thread Ring Gage.
NOTE: ANPT Taps marked NPT may be used for NPT and ANPT applications.

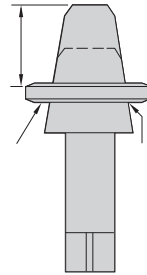
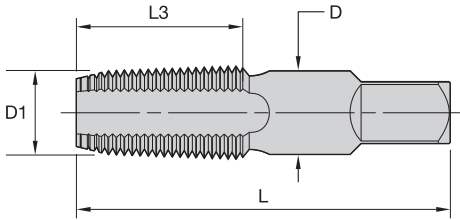


General-Purpose Taps

NPT/ANPT and NPTF Production Taper Pipe Taps with Interrupted Threads



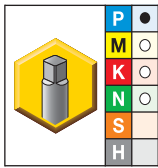
- Manufactured from select high-speed steel.
- Interrupted threads to reduce drag while taper pipe threading.
- Use where chip disposal is a concern.
- Odd number of flutes standard.
- NPT threads require the use of a sealer, such as Teflon® tape or pipe compound.
- NPTF dryseal threads give a pressure-tight joint without the use of sealer.



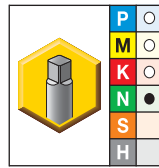
*Standard Projection
Shortest Projection
L1 Ring Gage
Basic Size

Taps

■ KHSST Taper Pipe Interrupted Threads • Standard Pipe Chamfer Tap • Chamfer 2 1/2–3 1/2 Pitches



oxide



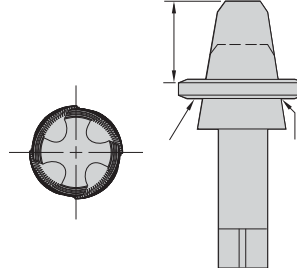
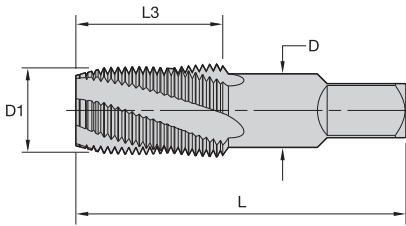
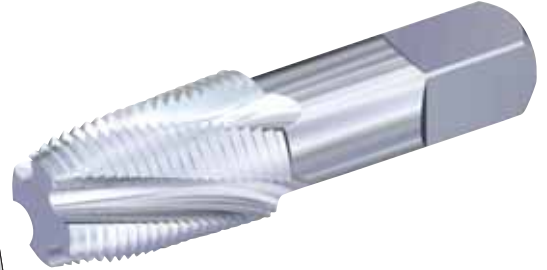
uncoated

- first choice
- alternate choice

		D1 size	L	L3	D	number of flutes	thread type
KHSST28096	KHSST28097	1/8 - 27	2.13	.75	.313	5	NPT/ANPT
—	KHSST28100	1/8 - 27	2.13	.75	.313	5	NPTF
—	KHSST28098	1/8 - 27	2.13	.75	.438	5	NPT/ANPT
—	KHSST28101	1/8 - 27	2.13	.75	.438	5	NPTF
KHSST28070	KHSST28071	1/4 - 18	2.44	1.06	.563	5	NPT/ANPT
KHSST28059	KHSST08772	1/2 - 14	3.13	1.66	.688	5	NPT/ANPT
—	KHSST28061	1/2 - 14	3.13	1.66	.688	5	NPTF
—	KHSST08769	3/8 - 18	2.56	1.06	.700	5	NPT
KHSST28199	KHSST28200	3/8 - 18	2.56	1.06	.700	5	NPT/ANPT
KHSST28175	KHSST28176	3/4 - 14	3.25	1.38	.906	5	NPT/ANPT
—	KHSST28179	3/4 - 14	3.25	1.38	.906	5	NPTF
—	KHSST28108	1 - 11 1/2	3.75	1.75	1.125	5	NPT/ANPT
—	KHSST08781	1 1/4 - 11 1/2	4.00	1.75	1.313	5	NPT/ANPT
—	KHSST28001	1 1/2 - 11 1/2	4.25	3.00	1.500	7	NPT/ANPT

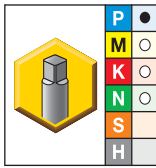
* Pipe tap projection is the distance the small end of the tap projects through an American National Standard Pipe Tap Thread Ring Gage.
NOTE: NPT taps may be used for ANPT applications.

- Manufactured from select tap high-speed steel.
- Ground threads standard in American Standard Pipe Form (NPT) and American Standard Dryseal Pipe Form (NPTF).
- NPT threads require the use of a sealer, such as Teflon® tape or pipe compound.
- NPTF dryseal threads give a pressure-tight joint without the use of sealer.
- Uncoated taps standard; coatings available as a stock modification.
- Spiral flutes lift chips out of the tapped hole reducing stop lines.
- Most effective in materials that produce long, stringy chips.



*Standard Projection
Shortest Projection
L1 Ring Gage
Basic Size

■ KHSST Spiral-Flute Taper Pipe • Standard Pipe Chamfer 2 1/2–3 1/2 Pitches



- first choice
- alternate choice

uncoated	D1 size	L	L3	D	number of flutes	thread type
KHSST28095	1/8 - 27	2.13	.75	.438	4	NPT/ANPT
KHSST28099	1/8 - 27	2.13	.75	.438	4	NPTF
KHSST28069	1/4 - 18	2.44	1.06	.563	4	NPT/ANPT
KHSST08859	1/2 - 14	3.13	1.66	.688	4	NPT/ANPT
KHSST28198	3/8 - 18	2.56	1.06	.700	4	NPT/ANPT
KHSST08861	3/4 - 14	3.25	1.38	.906	5	NPT
KHSST28180	3/4 - 14	3.25	1.38	.906	5	NPTF

* Pipe tap projection is the distance the small end of the tap projects through an American National Standard Pipe Tap Thread Ring Gage.
NOTE: NPT taps may be used for ANPT applications.



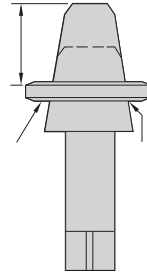
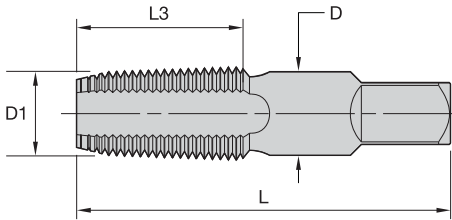
Taps

General-Purpose Taps

NPT/ANPT and NPTF High-Hook Production Taper Pipe Taps



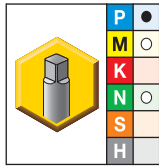
- Manufactured from select high-speed steel.
- Ground thread pipe taps are standard in American Standard Pipe Form (NPT) and American Standard Dryseal Pipe Thread Form (NPTF).
- NPT threads require the use of a sealer, such as Teflon® tape or pipe compound.
- NPTF dryseal threads give a pressure-tight joint without the use of sealer.
- Uncoated taps standard; coatings available as specials.
- Hook designed for use in ductile materials that produce long, continuous chips.



*Standard Projection
Shortest Projection
L1 Ring Gage
Basic Size

Taps

KHSST High-Hook Taper Pipe • Standard Pipe Chamfer 2 1/2-3 1/2 Pitches



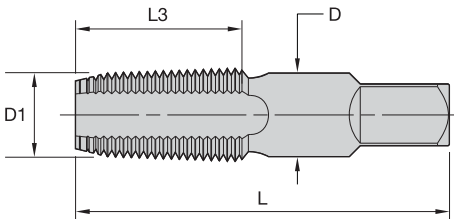
- first choice
- alternate choice

uncoated	D1 size	L	L3	D	number of flutes	thread type
KHSST28536	1/4 - 18	2.44	1.06	.563	4	NPT/ANPT
KHSST28535	1/2 - 14	3.13	1.66	.688	4	NPT/ANPT
KHSST28537	3/8 - 18	2.56	1.06	.700	4	NPT/ANPT
KHSST28174	3/4 - 14	3.25	1.38	.906	5	NPT/ANPT
KHSST28105	1 - 11 1/2	3.75	1.75	1.125	5	NPT/ANPT

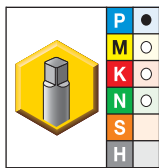
* Pipe tap projection is the distance the small end of the tap projects through an American National Standard Pipe Tap Thread Ring Gage.
NOTE: NPT taps may be used for ANPT applications.



- Manufactured from select tap high-speed steel.
- Ground thread pipe taps are standard in American National Standard Straight Pipe (NPS) thread form and American National Standard Dryseal Straight Pipe (NPSF) thread form.
- NPS threads are suitable for tapping holes or couplings for low pressure work when used with a sealer; also suitable for NPSC and NPSM work.
- NPSF dryseal taps are intended for low pressure work such as fuel and oil lines where a sealer is not used.
- Dryseal threads give a low-pressure, pressure-tight joint without the use of sealer.



■ **KHSST Straight Pipe • Modified Bottoming Chamfer Tap**



- first choice
- alternate choice

uncoated	D1 size	L	L3	D	number of flutes	thread series
KHSST28091	1/8 - 27	2.13	.75	.313	4	NPS
KHSST28093	1/8 - 27	2.13	.75	.313	4	NPSF
KHSST28094	1/8 - 27	2.13	.75	.438	4	NPSF
KHSST28092	1/8 - 27	2.13	.75	.438	4	NPS
KHSST28067	1/4 - 18	2.44	1.06	.563	4	NPS
KHSST28068	1/4 - 18	2.44	1.06	.563	4	NPSF
KHSST28058	1/2 - 14	3.13	1.66	.688	4	NPSF
KHSST28057	1/2 - 14	3.13	1.66	.688	4	NPS
KHSST28196	3/8 - 18	2.56	1.06	.700	4	NPS
KHSST28197	3/8 - 18	2.56	1.06	.700	4	NPSF
KHSST28173	3/4 - 14	3.25	1.38	.906	5	NPSF
KHSST28172	3/4 - 14	3.25	1.38	.906	5	NPS
KHSST28104	1 - 11 1/2	3.75	1.75	1.125	5	NPS





High-Performance Solid Carbide Thread Mills

Primary Application

Our solid thread mills are designed to deliver high-quality internal threading on 3-axis CNC machines. Because these mills are made of carbide, they are capable of easily cutting most difficult materials up to 63 HRC. Thread mills make interrupted cuts and short chips.

The combination of these design elements offers a range of benefits to improve overall thread quality and tool production. Short, easily evacuated chips generate less heat and friction, so there is a lower risk of damage to threading. Also, the superior carbide grades make threading easier and machining times shorter.

Features and Benefits

System Requirements

- 3-axis CNC machine.
- Good clamping for tool and workpiece.
- Internal coolant supply.

Features

- Interrupted cuts.
- Short chips.
- Optimized carbide grades.
- Drill, thread, countersink.

Advantages





- Versatile.
- Better surface quality.
- No chip problems.
- No need to reverse the spindle.
- More production safety.





Through and Blind Holes (2 x D)

Taps

					
		Thread Mill	Thread Mill and Chamfer	Drill, Thread Mill, and Chamfer	Mill, Thread Mill, and Chamfer
P	<35 HRC	TM711	TM721	—	TM741_RHSF
	35–43 HRC	—	TM721	—	TM741_RHSF
M		TM711	TM721	—	TM741_RHSF
K		TM711	TM721	TM731	TM741_RHSF
N	Wrought	TM711	TM721	—	TM731
	Cast	TM711	TM721	TM731	TM741_RHSF
S		TM711	TM721	—	TM741_LHSF
H	44–63 HRC	—	—	—	TM741_RHSF TM741_LHSF



High-Performance Solid Carbide Thread Mills

Our solid thread mills are designed to deliver high-quality internal threading on 3-axis CNC machines. Because these mills are made of carbide, they are capable of easily cutting most difficult materials up to 63 HRC. Thread mills make interrupted cuts and short chips. The combination of these design elements offers a range of benefits to improve overall thread quality and tool production. Short, easily evacuated chips generate less heat and friction, so there is a lower risk of damage to threading. Also, the superior carbide grades make threading easier and machining times shorter.

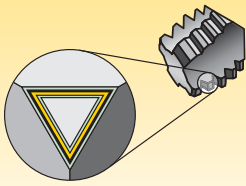
Features:

- 3-axis CNC machine.
- Good clamping for tool and workpiece.
- Internal coolant supply.
- Interrupted cuts.
- Short chips.
- Optimized carbide grades.
- Drill, thread, countersink.
- Versatile.
- Better surface quality.
- No chip problems.
- No need to reverse the spindle.
- More production safety.

Visit www.kennametal.com or contact your local Authorized Kennametal Distributor.

www.kennametal.com





Coatings provide high-speed capability and are engineered for finishing to light roughing.

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous Materials
S	High-Temp Alloys
H	Hardened Materials

wear resistance ← → toughness

NEW!
Grade

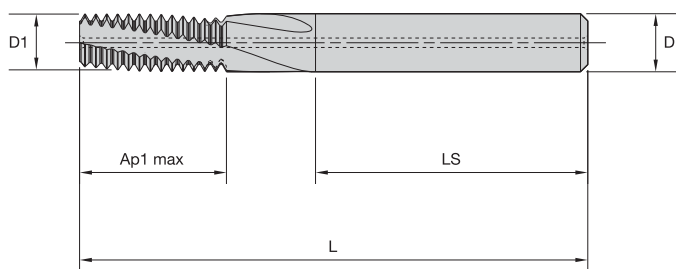
Coating	Grade Description		05	10	15	20	25	30	35	40	45	
KCU32	Coated carbide. PVD — Fine-grain carbide substrate with high hardness TiCN coating. Universal grade for thread milling most materials.	P										
		M										
		K										
		N										
		S										
KCU33	Coated carbide. PVD — Carbide substrate with heat-resistant TiAlN coating. Universal grade for thread milling most materials.	P										
		M										
		K										
		N										
		S										
KCU36	Coated carbide. PVD — two-layer coating with heat-resistant TiAlN base layer and low-friction MoS ₂ top layer over carbide substrate. Use for thread milling most materials including high hardness materials.	P										
		M										
		K										
		N										
		S										
		H										

Solid Thread Mills Identification System

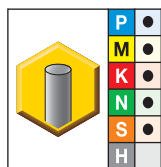


Metric							
TM721	MF	120	X	150	R	2D	HA
Inch							
TM721	NC	06250	-	11	R	2D	HA
Tap Design	Type of Thread	Nominal Diameter of Thread		Pitch	Cutting Dimension	Depth of Cut	Shank
		mm or inch (depending on type)		mm or TPI (depending on type)			
<p>M = Metric coarse-pitch thread (ISO form)</p> <p>MF = Metric fine-pitch thread (ISO form)</p> <p>NC = Unified coarse series thread</p> <p>NF = Unified fine series thread</p>						<p>DIN 6535</p> <p>HA = Plain Shank</p> <p>HB = Weldon® Shank</p> <p>HE = Whistle Notch™ Shank</p>	
Style							
TM711 = Solid Thread Mill; through coolant							
TM721 = Solid Thread Mill and Chamfer; through coolant							
TM731 = Solid Thread Mill, Chamfer, and Drill; through coolant							
TM741 = Solid Thread Mill, Chamfer, and Mill; through coolant							





■ **TM711 • Through Coolant • Metric and Metric Fine**



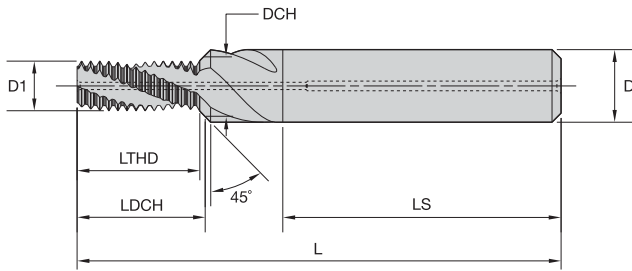
● first choice
○ alternate choice

Taps

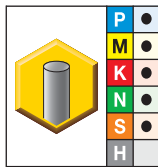
Material	SKU	D1 size	D1	Ap1 max	L	LS	D	cutting edges
P	TM711M030X050R2DHA	M3 x 0.5	2,4	6,2	42	28	4,0	3
	TM711MF040X050R2DHA	M4 x 0.5	3,4	8,2	55	36	6,0	3
M	TM711M040X070R2DHA	M4 x 0.7	3,2	8,7	55	36	6,0	3
	TM711MF050X050R2DHA	M5 x 0.5	4,3	10,2	55	36	6,0	3
K	TM711M050X080R2DHA	M5 x 0.8	4,0	10,8	55	36	6,0	3
	TM711MF060X075R2DHA	M6 x 0.75	5,0	12,4	55	36	6,0	3
N	TM711M060X100R2DHA	M6 x 1	4,8	12,5	55	36	6,0	3
	TM711MF080X075R2DHA	M8 x 0.75	5,9	16,8	63	36	6,0	3
S	TM711M080X100R2DHA	M8 x 1	5,9	16,4	63	36	6,0	3
	TM711M080X125R2DHA	M8 x 1.25	5,9	16,8	63	36	6,0	3
H	TM711MF100X100R2DHA	M10 x 1	7,9	20,5	70	36	8,0	3
	TM711M100X150R2DHA	M10 x 1.5	7,9	20,2	70	36	8,0	3
P	TM711MF120X100R2DHA	M12 x 1	9,9	24,5	80	40	10,0	4
	TM711MF120X150R2DHA	M12 x 1.5	9,9	24,7	80	40	10,0	4
M	TM711M120X175R2DHA	M12 x 1.75	9,9	25,3	80	40	10,0	4
	TM711MF140X150R2DHA	M14 x 1.5	9,9	29,2	80	40	10,0	4
K	TM711M140X200R2DHA	M14 x 2	11,6	29,0	90	45	12,0	4
	TM711MF160X150R2DHA	M16 x 1.5	11,9	32,2	90	45	12,0	4
N	TM711M160X200R2DHA	M16 x 2	11,9	32,9	90	45	12,0	4
	TM711MF180X150R2DHA	M18 x 1.5	13,9	36,7	90	45	14,0	4
S	TM711M180X250R2DHA	M18 x 2.5	13,9	38,7	90	45	14,0	4
	TM711MF200X150R2DHA	M20 x 1.5	13,9	41,2	90	45	14,0	4
H	TM711M200X250R2DHA	M20 x 2.5	13,9	41,2	90	45	14,0	4

Shank Tolerance

D	tolerance h6
6	+0, -0,008
8-10	+0, -0,009
12-18	+0, -0,011
20-30	+0, -0,013



■ TM721 • UNC • Through Coolant • Inch



- first choice
- alternate choice

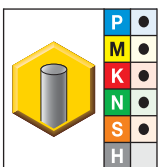
SKU	D1 size	D1	DCH	LTHD	LDCH	L	LS	D	cutting edges
TM721NC2500-20R2DHA	1/4 - 20	4,7	6,7	13,36	14,23	62	36	8,0	3
TM721NC3125-18R2DHA	5/16 - 18	6,2	8,3	16,26	17,19	74	40	10,0	3
TM721NC3750-16R2DHA	3/8 - 16	7,7	9,8	19,89	20,85	80	45	12,0	3
TM721NC4375-14R2DHA	7/16 - 14	9,0	11,4	22,72	23,79	80	45	12,0	3
TM721NC0500-13R2DHA	1/2 - 13	10,4	13,0	26,43	27,60	90	45	14,0	4
TM721NC5625-12R2DHA	9/16 - 12	11,8	14,6	30,75	31,99	100	48	16,0	4
TM721NC0625-11R2DHA	5/8 - 11	13,1	16,2	33,54	34,89	102	48	18,0	4

Shank Tolerance

D	tolerance h6
6	+0, -0,008
8-10	+0, -0,009
12-18	+0, -0,011
20-30	+0, -0,013

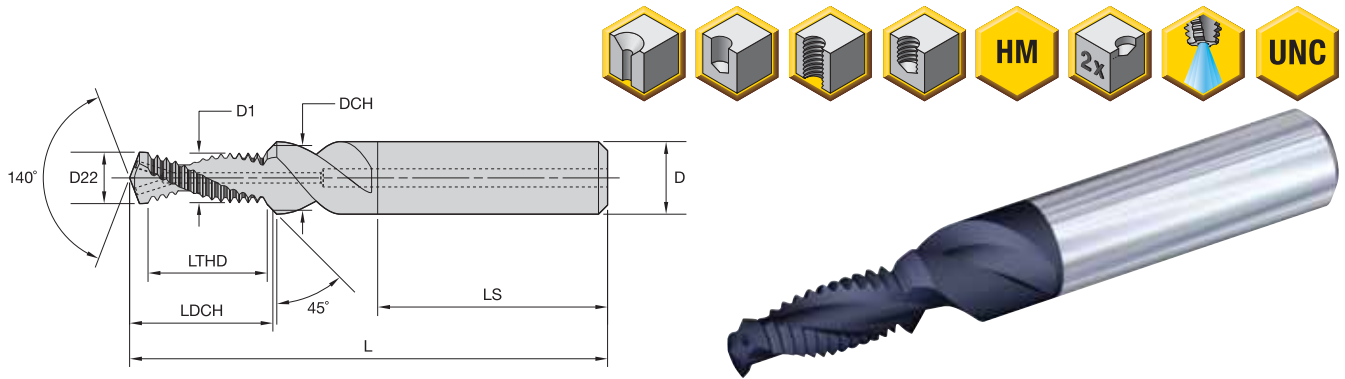


■ TM721 • Through Coolant • Metric and Metric Fine

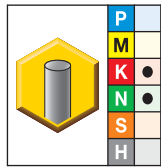


- first choice
- alternate choice

SKU	D1 size	D1	DCH	LTHD	LDCH	L	LS	D	cutting edges
TM721M050X080R2DHA	M5 x 0.8	4,0	5,3	10,82	11,40	55	36	6,0	3
TM721MF060X075R2DHA	M6 x 0.75	5,0	6,3	12,40	12,97	62	36	8,0	3
TM721M060X100R2DHA	M6 x 1	4,8	6,3	12,52	13,19	62	36	8,0	3
TM721MF080X100R2DHA	M8 x 1	6,7	8,3	16,53	17,23	74	40	10,0	3
TM721M080X125R2DHA	M8 x 1.25	6,5	8,3	16,91	17,71	74	40	10,0	3
TM721MF100X100R2DHA	M10 x 1	8,7	10,3	20,55	21,23	80	45	12,0	3
TM721MF100X125R2DHA	M10 x 1.25	8,4	10,3	20,67	21,50	80	45	12,0	3
TM721M100X150R2DHA	M10 x 1.5	8,2	10,3	20,29	21,22	80	45	12,0	3
TM721MF120X100R2DHA	M12 x 1	10,6	12,3	24,56	25,27	90	45	14,0	4
TM721MF120X125R2DHA	M12 x 1.25	10,4	12,3	24,43	25,24	90	45	14,0	4
TM721MF120X150R2DHA	M12 x 1.5	10,1	12,3	24,80	25,76	90	45	14,0	4
TM721M120X175R2DHA	M12 x 1.75	9,9	12,3	25,42	26,48	90	45	14,0	4
TM721MF140X150R2DHA	M14 x 1.5	12,1	14,3	29,31	30,25	100	48	16,0	4
TM721M140X200R2DHA	M14 x 2	11,6	14,3	29,05	30,24	100	48	16,0	4
TM721MF160X150R2DHA	M16 x 1.5	14,0	16,3	32,31	33,30	102	48	18,0	4
TM721M160X200R2DHA	M16 x 2	13,6	16,3	33,05	34,24	102	48	18,0	4



■ **TM731 • UNC • Through Coolant • Inch**



- first choice
- alternate choice

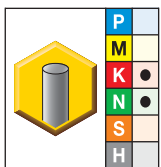
Material	D1 size	D22	D1	DCH	LTHD	LDCH	L	LS	D	cutting edges
● KCU32										
○ TM731NC2500-20R2DHA	1/4 - 20	5,2	4,9	6,7	12,80	15,87	62	36	8,0	2
○ TM731NC3125-18R2DHA	5/16 - 18	6,6	6,3	8,3	15,63	19,19	74	40	10,0	2
○ TM731NC3750-16R2DHA	3/8 - 16	8,0	7,7	9,8	19,16	23,25	79	45	12,0	2
○ TM731NC4375-14R2DHA	7/16 - 14	9,4	9,0	11,4	21,89	26,58	79	45	12,0	2
○ TM731NC0500-13R2DHA	1/2 - 13	10,8	10,4	13,0	25,52	30,71	89	45	14,0	2
○ TM731NC5625-12R2DHA	9/16 - 12	12,3	11,8	14,6	27,66	33,37	102	48	16,0	2
○ TM731NC0625-11R2DHA	5/8 - 11	13,5	13,1	16,2	30,14	36,40	102	48	18,0	2

Shank Tolerance

D	tolerance h6
6	+0, -0,008
8-10	+0, -0,009
12-18	+0, -0,011
20-30	+0, -0,013

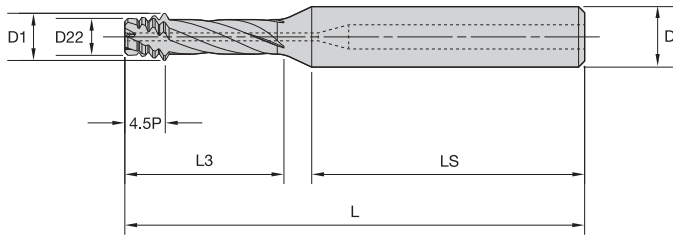


■ **TM731 • Through Coolant • Metric and Metric Fine**

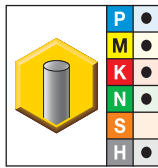


- first choice
- alternate choice

Material	D1 size	D22	D1	DCH	LTHD	LDCH	L	LS	D	cutting edges
● KCU32										
○ TM731M040X070R2DHA	M4 x 0.7	3,3	3,2	4,3	7,74	9,59	49	36	6,0	2
○ TM731M050X080R2DHA	M5 x 0.8	4,2	4,0	5,3	9,65	11,82	55	36	6,0	2
○ TM731MF060X075R2DHA	M6 x 0.75	5,3	5,1	6,3	12,07	14,37	62	36	8,0	2
○ TM731M060X100R2DHA	M6 x 1	5,0	4,8	6,3	12,06	14,69	62	36	8,0	2
○ TM731MF080X100R2DHA	M8 x 1	7,0	6,8	8,3	16,09	19,10	74	40	10,0	2
○ TM731M080X125R2DHA	M8 x 1.25	6,8	6,5	8,3	15,08	18,42	74	40	10,0	2
○ TM731MF100X100R2DHA	M10 x 1	9,0	8,7	10,3	20,11	23,52	79	45	12,0	2
○ TM731MF100X125R2DHA	M10 x 1.25	8,8	8,4	10,3	20,11	23,87	79	45	12,0	2
○ TM731M100X150R2DHA	M10 x 1.5	8,5	8,2	10,3	19,59	23,65	79	45	12,0	2
○ TM731MF120X125R2DHA	M12 x 1.25	10,8	10,4	12,3	23,88	28,00	89	45	14,0	2
○ TM731MF120X150R2DHA	M12 x 1.5	10,5	10,2	12,3	24,12	28,57	89	45	14,0	2
○ TM731M120X175R2DHA	M12 x 1.75	10,3	9,9	12,3	22,86	27,63	89	45	14,0	2
○ TM731MF140X150R2DHA	M14 x 1.5	12,5	12,1	14,3	27,14	31,98	102	48	16,0	2
○ TM731M140X200R2DHA	M14 x 2	12,0	11,6	14,3	28,12	33,62	102	48	16,0	2
○ TM731MF160X150R2DHA	M16 x 1.5	14,5	14,1	16,3	31,65	36,87	102	48	18,0	2
○ TM731M160X200R2DHA	M16 x 2	14,0	13,6	16,3	32,13	38,00	102	48	18,0	2



■ **TM741 • UNC and UNF • Through Coolant • Right Hand • Inch**



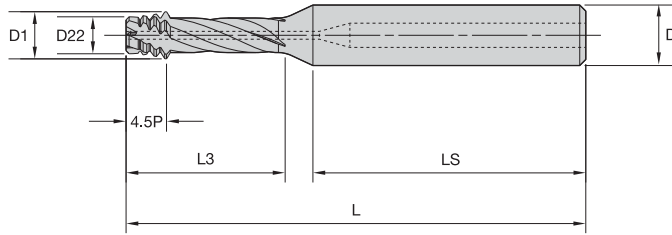
- first choice
- alternate choice

KCU36	D1 size	D1	D22	L3	L	LS	D	cutting edges
TM741NC2500-20R2DHA	1/4 - 20	4,64	3,34	17,0	60	36	8,0	3
TM741NF2500-28R2DHA	1/4 - 28	4,66	3,62	17,0	60	36	8,0	3
TM741NC3125-18R2DHA	5/16 - 18	5,64	4,12	21,9	76	40	10,0	4
TM741NF3125-24R2DHA	5/16 - 24	5,64	4,48	21,9	76	40	10,0	4
TM741NC3750-16R2DHA	3/8 - 16	7,16	5,42	26,3	76	40	10,0	4
TM741NF3750-24R2DHA	3/8 - 24	7,14	6,00	26,3	76	40	10,0	4
TM741NF4375-20R2DHA	7/16 - 20	8,45	7,06	33,0	86	45	12,0	4
TM741NC4375-14R2DHA	7/16 - 24	8,47	6,49	31,0	86	45	12,0	4
TM741NC0500-13R2DHA	1/2 - 13	10,08	7,95	33,4	86	45	12,0	4
TM741NF0500-20R2DHA	1/2 - 20	8,45	7,06	33,0	86	45	12,0	4
TM741NC5625-12R2DHA	9/16 - 12	11,28	8,98	41,0	98	48	16,0	4
TM741NF5625-18R2DHA	9/16 - 18	11,27	9,72	41,0	98	48	16,0	4
TM741NC0625-11R2DHA	5/8 - 11	12,89	10,40	42,0	98	48	16,0	4
TM741NF0625-18R2DHA	5/8 - 18	12,38	10,83	42,0	98	48	16,0	4
TM741NC0750-11R2DHA	3/4 - 10	15,50	12,77	51,3	111	50	20,0	5
TM741NC0750-16R2DHA	3/4 - 16	15,38	13,65	51,3	111	50	20,0	5

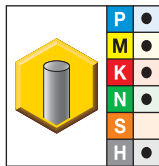


Shank Tolerance

D	tolerance h6
6	+0, -0,008
8-10	+0, -0,009
12-18	+0, -0,011
20-30	+0, -0,013



n TM741 • Through Coolant • Right Hand • Metric and Metric Fine



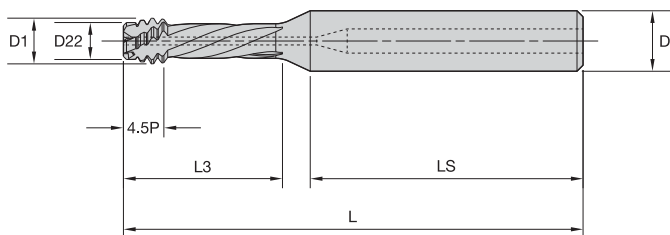
● first choice
○ alternate choice

Taps

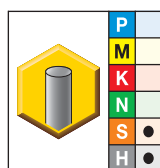
Material	Grade	D1 size	D1	D22	L3	L	LS	D	cutting edges
KCU36	TM741M060X100R2DHA	M6 x 1	4,51	3,41	16,5	60	36	8,0	3
	TM741M070X100R2DHA	M7 x 1	4,51	3,41	16,5	60	36	8,0	3
	TM741MF080X100R2DHA	M8 x 1	6,23	5,13	21,9	71	40	10,0	4
	TM741M080X125R2DHA	M8 x 1.25	6,23	4,91	21,9	71	40	10,0	4
	TM741MF090X100R2DHA	M9 x 1	6,23	5,13	21,9	71	40	10,0	4
	TM741M090X125R2DHA	M9 x 1.25	6,23	4,91	21,9	71	40	10,0	4
	TM741MF100X100R2DHA	M10 x 1	6,23	5,13	21,9	71	40	10,0	4
	TM741MF100X125R2DHA	M10 x 1.25	6,23	4,91	21,9	71	40	10,0	4
	TM741M100X150R2DHA	M10 x 1.5	7,75	6,11	26,3	76	40	10,0	4
	TM741M110X150R2DHA	M11 x 1.5	7,75	6,11	26,3	76	40	10,0	4
	TM741MF120X100R2DHA	M12 x 1	9,15	8,06	30,0	86	45	12,0	4
	TM741MF120X150R2DHA	M12 x 1.5	9,15	8,06	30,0	86	45	12,0	4
	TM741M120X175R2DHA	M12 x 1.75	9,16	7,21	32,4	86	45	12,0	4
	TM741MF140X100R2DHA	M14 x 1	9,15	8,06	30,0	86	45	12,0	4
	TM741MF140X150R2DHA	M14 x 1.5	10,83	9,15	37,4	98	48	16,0	4
	TM741M140X200R2DHA	M14 x 2	11,08	8,91	41,0	98	48	16,0	4
	TM741MF160X150R2DHA	M16 x 1.5	10,83	9,15	37,4	98	48	16,0	4
	TM741M160X200R2DHA	M16 x 2	11,08	8,91	41,0	98	48	16,0	4
	TM741MF180X150R2DHA	M18 x 1.5	14,83	13,15	47,0	111	50	20,0	4
	TM741M180X250R2DHA	M18 x 2.5	14,38	11,71	51,3	111	50	20,0	5
	TM741MF200X150R2DHA	M20 x 1.5	14,83	13,15	47,0	98	48	16,0	4
	TM741M200X250R2DHA	M20 x 2.5	14,38	11,71	51,3	111	50	20,0	5
	TM741MF220X150R2DHA	M22 x 1.5	18,23	16,55	56,0	111	50	20,0	5
	TM741MF240X150R2DHA	M24 x 1.5	18,23	16,55	56,0	111	50	20,0	5
	TM741M070X100L2DHA	M7 x 1	4,51	3,41	16,5	60	36	8,0	3
	TM741M060X100L2DHA	M6 x 1	4,51	3,41	16,5	60	36	8,0	3
	TM741M090X125L2DHA	M9 x 1.25	6,23	4,91	21,9	71	40	10,0	4
	TM741M080X125L2DHA	M8 x 1.25	6,23	4,91	21,9	71	40	10,0	4
	TM741M110X150L2DHA	M11 x 1.5	7,75	6,11	26,3	76	40	10,0	4
	TM741M100X150L2DHA	M10 x 1.5	7,75	6,11	26,3	76	40	10,0	4
	TM741MF120X150L2DHA	M12 x 1.5	9,17	7,21	32,4	86	45	12,0	4

Shank Tolerance

D	tolerance h6
6	+0, -0,008
8-10	+0, -0,009
12-18	+0, -0,011
20-30	+0, -0,013



TM741 • Through Coolant • Left Hand • Metric and Metric Fine





- first choice
- alternate choice

KCU36	D1 size	D1	D22	L3	L	LS	D	cutting edges
TM741M060X100L2DHA	M6 x 1	4,51	3,41	16,5	60	36	8,0	3
TM741M070X100L2DHA	M7 x 1	4,51	3,41	16,5	60	36	8,0	3
TM741M080X125L2DHA	M8 x 1.25	6,23	4,91	21,9	71	40	10,0	4
TM741M090X125L2DHA	M9 x 1.25	6,23	4,91	21,9	71	40	10,0	4
TM741M100X150L2DHA	M10 x 1.5	7,75	6,11	26,3	76	40	10,0	4
TM741M110X150L2DHA	M11 x 1.5	7,75	6,11	26,3	76	40	10,0	4
TM741MF120X150L2DHA	M12 x 1.5	9,17	7,21	32,4	86	45	12,0	4






Shank Tolerance

D	tolerance h6
6	+0, -0,008
8-10	+0, -0,009
12-18	+0, -0,011
20-30	+0, -0,013

		 Thread Mill TM711						 Thread Mill and Chamfer TM721					
Material Group		Cutting Speed – vc Range – m/min			Feed/Tooth by Diameter			Cutting Speed – vc Range – m/min			Feed/Tooth by Diameter		
		min	Starting Value	max		<10mm	>10mm	min	Starting Value	max		<10mm	>10mm
P	1	90	115	150	mm/r	0,05	0,08	140	185	240	mm/r	0,06	0,10
	2	90	115	150	mm/r	0,05	0,08	140	185	240	mm/r	0,06	0,10
	3	40	50	70	mm/r	0,02	0,03	70	90	120	mm/r	0,03	0,04
	4	–	–	–	–	–	–	70	90	120	mm/r	0,03	0,04
	5	60	80	100	mm/r	0,04	0,06	70	90	120	mm/r	0,05	0,08
	6	–	–	–	–	–	–	–	–	–	–	–	–
M	1	60	80	100	mm/r	0,04	0,06	70	90	120	mm/r	0,05	0,08
	2	60	80	100	mm/r	0,04	0,06	70	90	120	mm/r	0,05	0,08
	3	–	–	–	–	–	–	–	–	–	–	–	–
K	1	120	150	200	mm/r	0,06	0,10	130	170	220	mm/r	0,06	0,11
	2	120	150	200	mm/r	0,06	0,10	130	170	220	mm/r	0,06	0,11
	3	90	115	150	mm/r	0,05	0,07	110	140	180	mm/r	0,05	0,07
N	1	250	275	300	mm/r	0,07	0,09	270	300	330	mm/r	0,08	0,16
	2	200	225	250	mm/r	0,05	0,06	270	300	330	mm/r	0,08	0,16
	3	170	190	210	mm/r	0,04	0,05	160	175	190	mm/r	0,08	0,16
	4	250	275	300	mm/r	0,07	0,09	270	300	330	mm/r	0,08	0,16
	5	270	300	330	mm/r	0,12	0,13	250	275	300	mm/r	0,11	0,20
	6	170	190	210	mm/r	0,05	0,06	90	100	110	mm/r	0,11	0,20
S	1	60	80	100	mm/r	0,04	0,06	70	90	120	mm/r	0,05	0,08
	2	50	65	80	mm/r	0,03	0,04	50	60	80	mm/r	0,03	0,05
	3	50	65	80	mm/r	0,03	0,04	50	60	80	mm/r	0,03	0,05
	4	50	65	80	mm/r	0,03	0,04	50	60	80	mm/r	0,03	0,05




		 Thread Mill TM711						 Thread Mill and Chamfer TM721					
Material Group		Cutting Speed – vc Range – SFM			Feed/Tooth by Diameter			Cutting Speed – vc Range – SFM			Feed/Tooth by Diameter		
		min	Starting Value	max		<0.375"	>0.375"	min	Starting Value	max		<0.375"	>0.375"
P	1	300	380	490	IPR	0.002	0.003	460	610	790	IPR	0.002	0.004
	2	300	380	490	IPR	0.002	0.003	460	610	790	IPR	0.002	0.004
	3	130	160	230	IPR	0.001	0.001	230	300	390	IPR	0.001	0.001
	4	–	–	–	–	–	–	230	300	390	IPR	0.001	0.001
	5	200	260	330	IPR	0.002	0.002	230	300	390	IPR	0.002	0.003
	6	–	–	–	–	–	–	–	–	–	–	–	–
M	1	200	260	330	IPR	0.002	0.002	230	300	390	IPR	0.002	0.003
	2	200	260	330	IPR	0.002	0.002	230	300	390	IPR	0.002	0.003
	3	–	–	–	–	–	–	–	–	–	–	–	–
K	1	390	490	660	IPR	0.002	0.004	430	560	720	IPR	0.002	0.004
	2	390	490	660	IPR	0.002	0.004	430	560	720	IPR	0.002	0.004
	3	300	380	490	IPR	0.002	0.003	360	460	590	IPR	0.002	0.003
N	1	820	900	980	IPR	0.003	0.004	890	980	1080	IPR	0.003	0.006
	2	660	740	820	IPR	0.002	0.002	890	980	1080	IPR	0.003	0.006
	3	560	620	690	IPR	0.002	0.002	520	570	620	IPR	0.003	0.006
	4	820	900	980	IPR	0.003	0.004	890	980	1080	IPR	0.003	0.006
	5	890	980	1080	IPR	0.005	0.005	820	900	980	IPR	0.004	0.008
	6	560	620	690	IPR	0.002	0.002	300	330	360	IPR	0.004	0.008
S	1	200	260	330	IPR	0.002	0.002	230	300	390	IPR	0.002	0.003
	2	160	210	260	IPR	0.001	0.002	160	200	260	IPR	0.001	0.002
	3	160	210	260	IPR	0.001	0.002	160	200	260	IPR	0.001	0.002
	4	160	210	260	IPR	0.001	0.002	160	200	260	IPR	0.001	0.002



Drill, Chamfer, and Thread Mill TM731

Material Group	Cutting Speed – vc Range – m/min			Drilling Recommended Feed by Diameter				Milling Feed/Tooth by Diameter				
	min	Starting Value	max		<6mm	6–10mm	10–16mm		<6mm	6–10mm	10–16mm	
												mm/r
K	1	130	175	230	mm/r	0,10	0,16	0,30	mm/r	0,05	0,07	0,10
	2	270	300	330	mm/r	0,15	0,25	0,34	mm/r	0,06	0,08	0,12
N	3	140	150	170	mm/r	0,15	0,25	0,34	mm/r	0,06	0,08	0,12
	4	270	300	330	mm/r	0,15	0,25	0,34	mm/r	0,06	0,08	0,12
	5	110	120	130	mm/r	0,12	0,20	0,32	mm/r	0,06	0,08	0,12



Drill, Chamfer, and Thread Mill TM731

Material Group	Cutting Speed – vc Range – SFM			Drilling Recommended Feed by Diameter				Milling Feed/Tooth by Diameter				
	min	Starting Value	max		<0.250"	0.250–0.375"	0.375–0.625"		<0.250"	0.250–0.375"	0.375–0.625"	
												IPR
K	1	430	570	750	IPR	0.004	0.006	0.012	IPR	0.002	0.003	0.004
	2	890	980	1080	IPR	0.006	0.010	0.013	IPR	0.002	0.003	0.005
N	3	460	490	560	IPR	0.006	0.010	0.013	IPR	0.002	0.003	0.005
	4	890	980	1080	IPR	0.006	0.010	0.013	IPR	0.002	0.003	0.005
	5	360	390	430	IPR	0.005	0.008	0.013	IPR	0.002	0.003	0.005



Carbide Recycling

Help preserve and protect our planet!

It's easy for your company to be environmentally conscious with the Kennametal Carbide Recycling Program.

By sending us your used carbide tools, you help preserve and protect the environment and ensure that these products are recycled responsibly. Kennametal accepts any coated or non-coated carbide items, including inserts, drills, reamers, and taps.



By using the Kennametal Carbide Recycling Program, you will receive:

- A partner who cares about a sustainable environment.
- Easy-to-use web portal to value your used carbide.
- Access to our popular Green Box™ options for carbide collection.
- Systematic and efficient disposal of carbide materials.
- Improved profitability.

Program is not currently available in all geographical areas.
For more information, please visit www.kennametal.com/carbiderecycling.



Mill, Chamfer, and Thread Mill TM741

Material Group	TM Style	Grade	Cutting Speed – vc Range – m/min			Feed/Tooth by Diameter			
			min	Starting Value	max		<10mm	>10mm	
P	1	TM741 R	KCU36	170	225	290	mm/r	0,05	0,08
	2	TM741 R	KCU36	170	225	290	mm/r	0,05	0,08
	3	TM741 R	KCU36	120	150	200	mm/r	0,03	0,05
	4	TM741 R	KCU36	100	125	160	mm/r	0,03	0,05
	5	TM741 R	KCU36	120	150	200	mm/r	0,03	0,04
	6	TM741 R	KCU36	60	80	100	mm/r	0,03	0,04
M	1	TM741 R	KCU36	120	150	200	mm/r	0,03	0,04
	2	TM741 R	KCU36	120	150	200	mm/r	0,03	0,04
	3	TM741 R	KCU36	120	150	200	mm/r	0,03	0,04
K	1	TM741 R	KCU36	190	250	330	mm/r	0,06	0,10
	2	TM741 R	KCU36	190	250	330	mm/r	0,06	0,10
	3	TM741 R	KCU36	140	185	240	mm/r	0,04	0,07
N	1	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—
	3	TM741 R	KCU36	180	230	300	mm/r	0,06	0,07
	4	TM741 R	KCU36	210	275	360	mm/r	0,06	0,07
	5	—	—	—	—	—	—	—	—
	6	TM741 R	KCU36	210	275	360	mm/r	0,06	0,07
S	1	TM741 L	KCU36	120	150	200	mm/r	0,025	0,045
	2	TM741 L	KCU36	50	60	80	mm/r	0,015	0,025
	3	TM741 L	KCU36	50	60	80	mm/r	0,015	0,025
	4	TM741 L	KCU36	70	90	120	mm/r	0,025	0,035
H	1	TM741	KCU36	80	100	130	mm/r	0,030	0,050
	2	TM741	KCU36	80	100	130	mm/r	0,030	0,050
	3	TM741	KCU36	50	65	80	mm/r	0,020	0,030
	4	TM741	KCU36	50	65	80	mm/r	0,020	0,030



Mill, Chamfer, and Thread Mill TM741

Material Group	TM Style	Grade	Cutting Speed – vc Range – SFM			Feed/Tooth By Diameter			
			min	Starting Value	max		<0.375"	>0.375"	
P	1	TM741 R	KCU36	560	740	950	IPR	0.002	0.003
	2	TM741 R	KCU36	560	740	950	IPR	0.002	0.003
	3	TM741 R	KCU36	390	490	660	IPR	0.001	0.002
	4	TM741 R	KCU36	330	410	520	IPR	0.001	0.002
	5	TM741 R	KCU36	390	490	660	IPR	0.001	0.002
	6	TM741 R	KCU36	200	260	330	IPR	0.001	0.002
M	1	TM741 R	KCU36	390	490	660	IPR	0.001	0.002
	2	TM741 R	KCU36	390	490	660	IPR	0.001	0.002
	3	TM741 R	KCU36	390	490	660	IPR	0.001	0.002
K	1	TM741 R	KCU36	620	820	1080	IPR	0.002	0.004
	2	TM741 R	KCU36	620	820	1080	IPR	0.002	0.004
	3	TM741 R	KCU36	460	610	790	IPR	0.002	0.003
N	1	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—
	3	TM741 R	KCU36	590	750	980	IPR	0.002	0.003
	4	TM741 R	KCU36	690	900	1180	IPR	0.002	0.003
	5	—	—	—	—	—	—	—	—
	6	TM741 R	KCU36	690	900	1180	IPR	0.002	0.003
S	1	TM741 L	KCU36	390	490	660	IPR	0.001	0.002
	2	TM741 L	KCU36	160	200	260	IPR	0.001	0.001
	3	TM741 L	KCU36	160	200	260	IPR	0.001	0.001
	4	TM741 L	KCU36	230	300	390	IPR	0.001	0.001
H	1	TM741	KCU36	260	330	430	IPR	0.001	0.002
	2	TM741	KCU36	260	330	430	IPR	0.001	0.002
	3	TM741	KCU36	160	210	260	IPR	0.001	0.001
	4	TM741	KCU36	160	210	260	IPR	0.001	0.001

NOTE: For thread depths over 2 x D up to 3 x D, reduce speed and feed by 25%.

Milling Methods

Climb Milling

Properties:

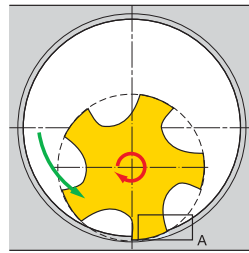
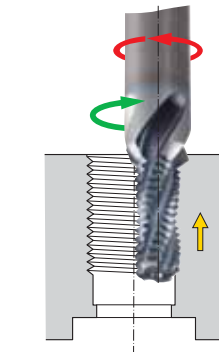
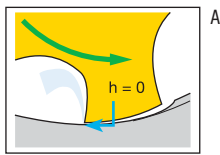
Tool rotation direction clockwise

Tool moves counter-clockwise

Pitch "upwards"

Right-hand thread

Climb milling is always when the cutting edge goes out of the material with a chip thickness $h = 0$



Conventional Milling

Properties:

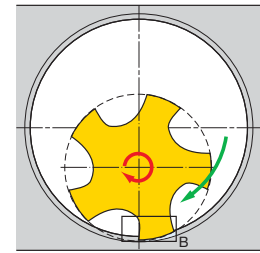
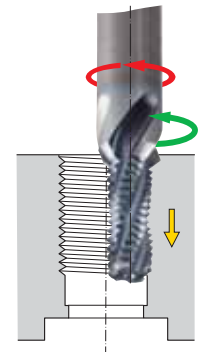
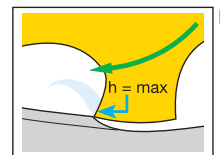
Tool rotation direction clockwise

Tool moves clockwise

Pitch "downwards"

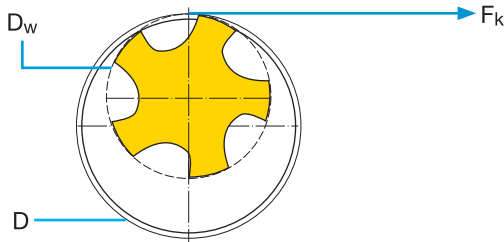
Right-hand thread

Conventional milling is always when the cutting edge goes out of the material with a chip thickness $h = \max$



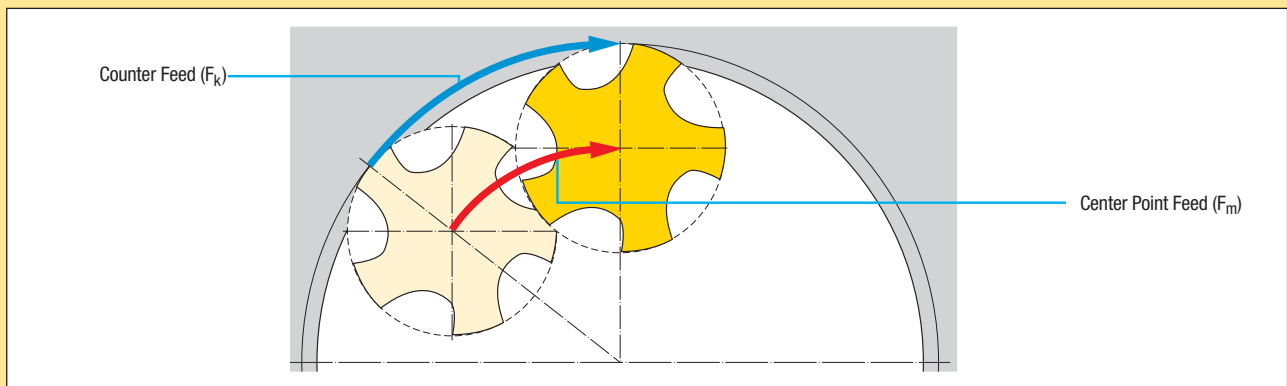
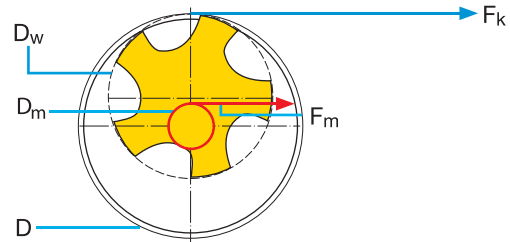
Counter Feed F_k

$$F_k = n \cdot f_z \cdot Z \text{ [mm/min]}$$



Center Point Feed F_m

$$F_m = \frac{F_k \cdot (D - D_w)}{D} \text{ [mm/min]}$$



D_w = Tool diameter [mm]

n = RPM [min^{-1}]

f_z = Feed per tooth [mm]

Z = Number of teeth on tool (radial)

D = Nominal diameter of thread = Diameter of external contour [mm]

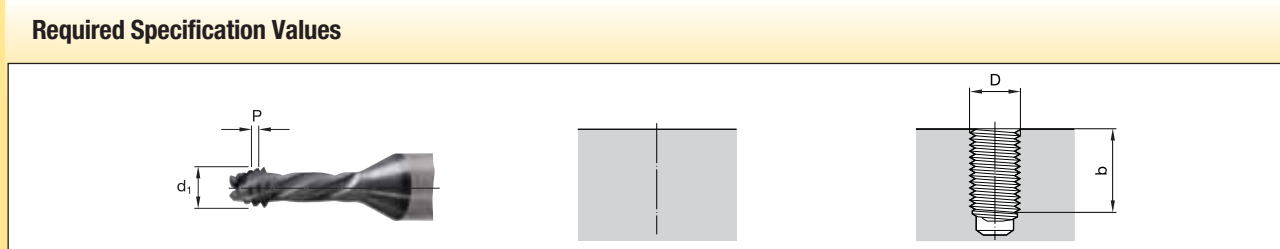
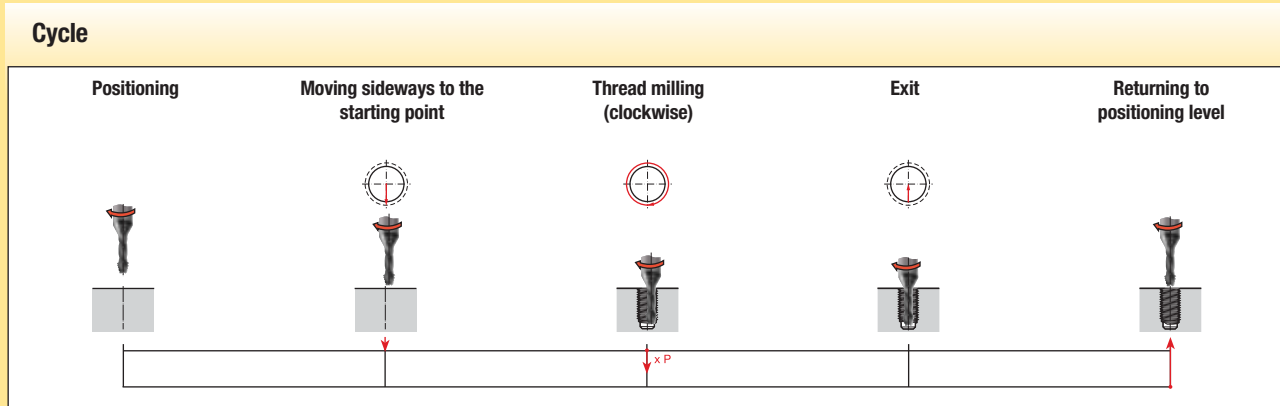
D_m = Diameter of the center point ($D - D_w$) [mm]

Taps

Drill Thread Mill TM741 • Right Hand

Preparation None

Process Principle Milling thread and core hole, countersinking (conventional milling)



Taps

Example

<p>Size — M10-6H Thread diameter D .....10mm Pitch P.....1,5mm Core hole diameter D₁.....8,5mm</p> <p>Material — Hard steel, 50 HRC Grade — KCU36</p>	<p>Tool — TM741 Right Hand Catalog number .....TM741M100X150R2DHA Number of teeth Z .....4 Tool diameter d₁ .....7,75mm* Tool radius compensation k¹ .....0,08mm** Tool radius to be programmed² .....3,795mm*** Thread depth b.....20mm Cutting speed v_c .....100 m/min Feed (milling) f_z.....0,04 mm/tooth Number of turns⁵.....17</p>	$N = \frac{v_c \cdot 1000}{d_1 \cdot \pi} \quad S = 4109$
		$v_f = f_z \cdot Z \cdot n \quad F = 657 \text{ (contour)}$
		$N = \frac{v_f \text{ contour} \cdot (D - d_1)}{D} \quad F = 148 \text{ (center point)}$

* (measured on the cutting part) **0.01 x D; adjust to application *** (1/2 d₁ - k)

Program to DIN 66025 (conventional milling, on the contour, incremental)

Positioning the tool	N 10	G 54	G 90	G 00	X...	Y...	Z 1.500	S 4109	T01 ²	M03 ⁶
Incremental programming	N 20	G 91								
Moving sideways to the starting point	N 30	G 42	G 01	X 0	Y-5	F 657 (contour)	[F 148] ⁴			
Thread milling	N 40	G 02		X 0	Y 0	Z-1.500	I 0	J 5.000		
Repeat thread milling	...									
Exit	N 50	G 40	G 01	X 0	Y 5					
Retracting tool to positioning level	N 70	G 90	G 00	Z 2						

Cutting time t_p 51.6 seconds

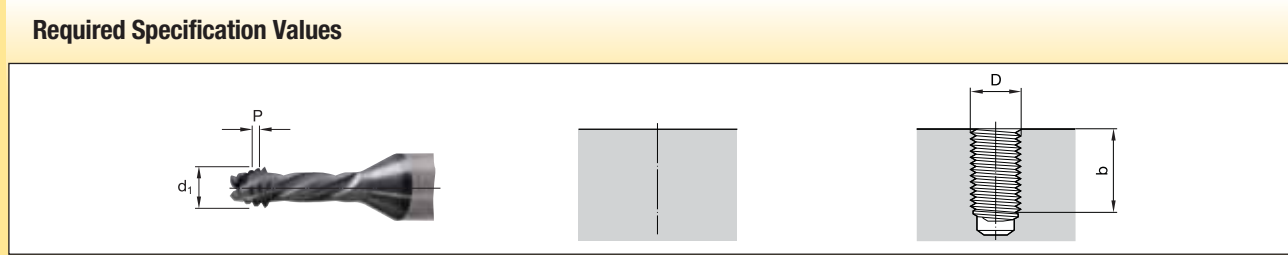
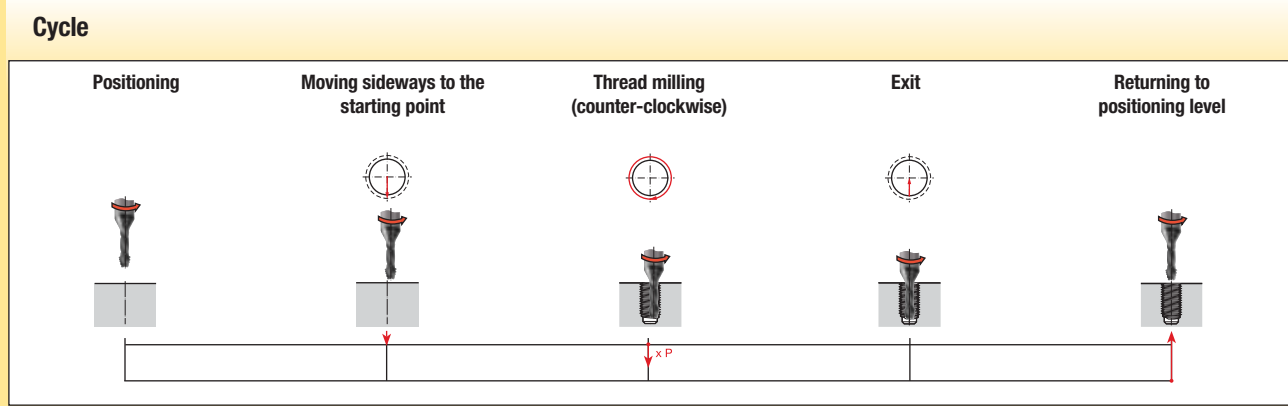
NOTES:

- ¹ The cutter radius measured over the tooth crests of the threaded part must be reduced by the amount of the cutter radius compensation. This is necessary to achieve a depth of cut to the middle of the 6H/ISO2 nut tolerance. Please note, however, that this also depends on the radial deflection of the tool (tensile strength of the material, projecting length of the tool).
- ² The cutter radius to be programmed is normally included in the tool memory.
- ³ The thread depth b must be divisible by the thread pitch P.
- ⁴ The feed values in brackets must be used for controllers, which do not calculate the center point feed themselves.
- ⁵ **Set N40 must be repeated with the number of threads.** Repetitions N = thread depth b/pitch P (rounded up to the nearest integer).

Drill Thread Mill TM741 • Left Hand

Preparation None

Process Principle Milling thread and core hole, countersinking (climb milling)



Example

<p>Size — M10-6H Thread diameter D .....10mm Pitch P .....1,5mm Core hole diameter D₁ .....8,5mm</p> <p>Material — TiAl6V4 titanium Grade — KCU36</p>	<p>Tool — TM741 Left Hand Catalog number .....TM741M100X150L2DHA Number of teeth Z .....4 Tool diameter d₁ .....7,75mm* Tool radius compensation k¹ .....0,08mm** Tool radius to be programmed² .....3,795mm*** Drilling/countersink depth l_E .....20mm Cutting speed v_c .....100 m/min Feed (milling) f_z .....0,03 mm/tooth Number of turns⁵ .....17</p>	$N = \frac{v_c \cdot 1000}{d_1 \cdot \pi} \quad S = 4109$
		$v_f = f_z \cdot Z \cdot n \quad F = 493 \text{ (contour)}$
		$v_f = \frac{v_f \text{ contour} \cdot (D - d_1)}{D} \quad F = 111 \text{ (center point)}$

* (measured on the cutting part) ** (0.01 x D) *** (1/2 d₁ - k)

Program to DIN 66025 (climb milling, on the contour, incremental)

Positioning the tool	N 10	G 54	G 90	G 00	X...	Y...	Z 1.500	S 4109	T01 ²	M04
Incremental programming	N 20	G 91								
Moving sideways to the starting point	N 30	G 42	G 01	X 0	Y -5	F 493 (contour)	[F 111] ⁴			
Thread milling	N 40	G 02		X 0	Y 0	Z -1.500	I 0	J 5.000		
Repeat thread milling	... ⁵									
Exit	N 50	G 40	G 01	X 0	Y 5					
Retracting tool to positioning level	N 70	G 90	G 00	Z 2						

Cutting time t_H 68.8 seconds

NOTES:

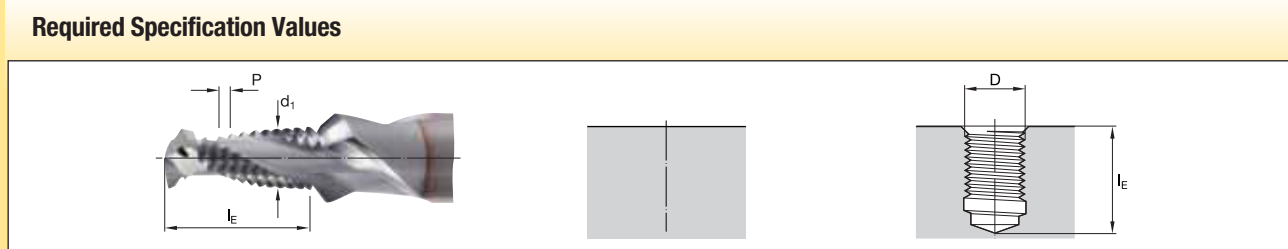
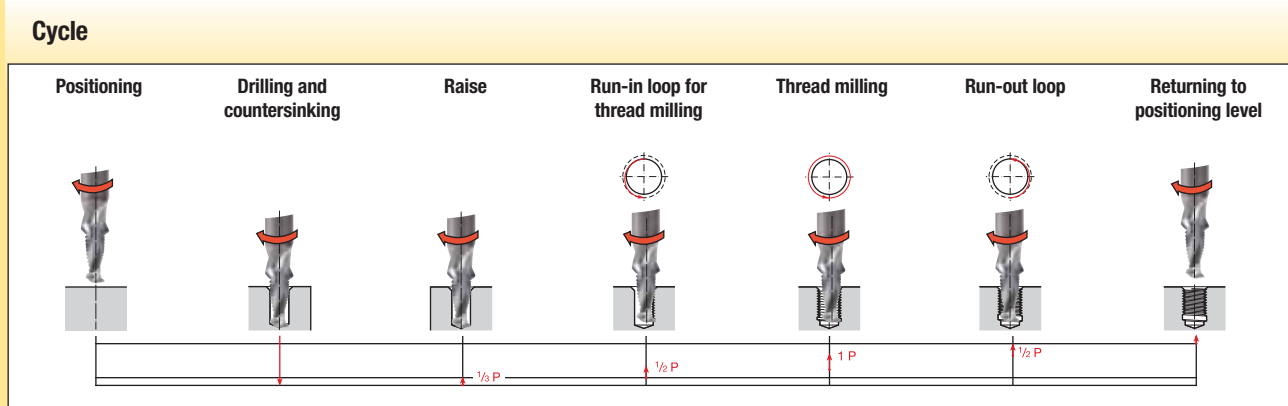
- ¹ The cutter radius measured over the tooth crests of the threaded part must be reduced by the amount of the cutter radius compensation. This is necessary to achieve a depth of cut to the middle of the 6H/ISO2 nut tolerance. Please note, however, that this also depends on the radial deflection of the tool (tensile strength of the material, projecting length of the tool).
- ² The cutter radius to be programmed is normally included in the tool memory.
- ³ The thread depth b must be divisible by the thread pitch P.
- ⁴ The feed values in brackets must be used for controllers, which do not calculate the center point feed themselves.
- ⁵ **Set N40 must be repeated with the number of threads.** Repetitions N = thread depth b/pitch P (rounded up to the nearest integer).



Drill Thread Mill TM731

Preparation	None
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Process Principle	Drilling, countersinking, thread milling (climb milling)
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Taps

Example

<p>Size — M10-6H Thread diameter D10mm Pitch P1,5mm Core hole diameter D₁8,5mm</p> <p>Material — Gray cast iron Grade — KCU32</p> <p><small>*(measured on the cutting part) ***(0.01 x D)</small></p>	<p>Tool — TM731 Catalog numberTM731M100X150R2DHA Number of teeth Z2 Tool diameter d₁8,2mm* Tool radius compensation k¹0,1mm** Tool radius to be programmed²4mm*** Drilling/countersink depth l_E19,11mm Cutting speed v_c250 m/min Feed (drilling, countersinking) f_b0,25 mm/U Feed (milling) f_z0,1 mm/tooth</p> <p><small>*(1/2 d₁ - k)</small></p>	$N = \frac{v_c \cdot 1000}{d_1 \cdot \pi} \quad S = 9709$ $v_b = f_b \cdot n \quad F = 2427 \text{ (drilling, countersinking)}$ $v_f = f_z \cdot Z \cdot n \quad F = 1942 \text{ (contour)}$ $v_f = \frac{v_f \text{ contour} \cdot (D - d_1)}{D} \quad F = 350 \text{ (center point)}$
--	--	---

Program to DIN 66025 (climb milling, on the contour, incremental)

Positioning the tool	N 10	G 54	G 90	G 00	X...	Y...	Z 2	S 9709	T01 ²	M03
Drilling and countersinking	N 20	G 91	G 01	Z-21.110	F 2427	(drill, countersink)				
Raise	N 30	G 01	Z 0.500							
Moving sideways to the starting point	N 40	G 41	Y-4.250	F 971	(milling, 1/2 contour)		[F 175] ³ (1/2 center point)			
Run-in loop in arc	N 50	G 03	X 0	Y 9.250	Z 0.750	I 0	J 4.625			
Thread milling	N 60	G 03	X 0	Y 0	Z 1.500	I 0	J -5.000	F 1942	[F 350] ³ (center point)	
Run-out loop in arc	N 70	G 03	X 0	Y -9.250	Z 0.750	I 0	J -4.625			
Exit	N 80	G 00	G 40	X 0	Y 4.250					
Retracting tool to positioning level	N 90	G 90	Z 2							

Cutting time t_h	2.3 seconds
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NOTES:

¹ The cutter radius measured over the tooth crests of the threaded part must be reduced by the amount of the cutter radius compensation. This is necessary to achieve a depth of cut to the middle of the 6H/ISO2 nut tolerance. Please note, however, that this also depends on the radial deflection of the tool (tensile strength of the material, projecting length of the tool).

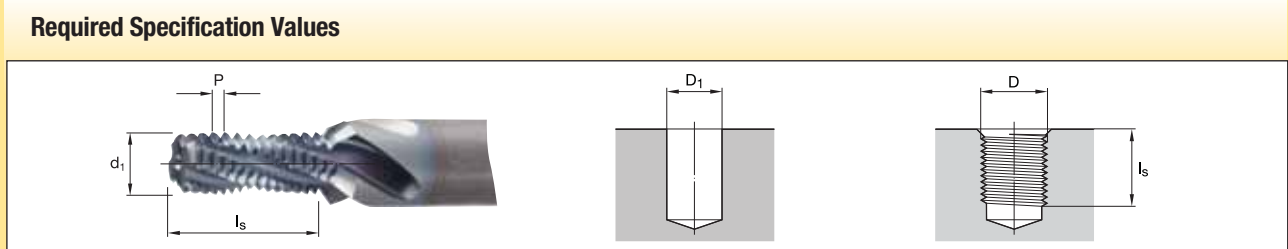
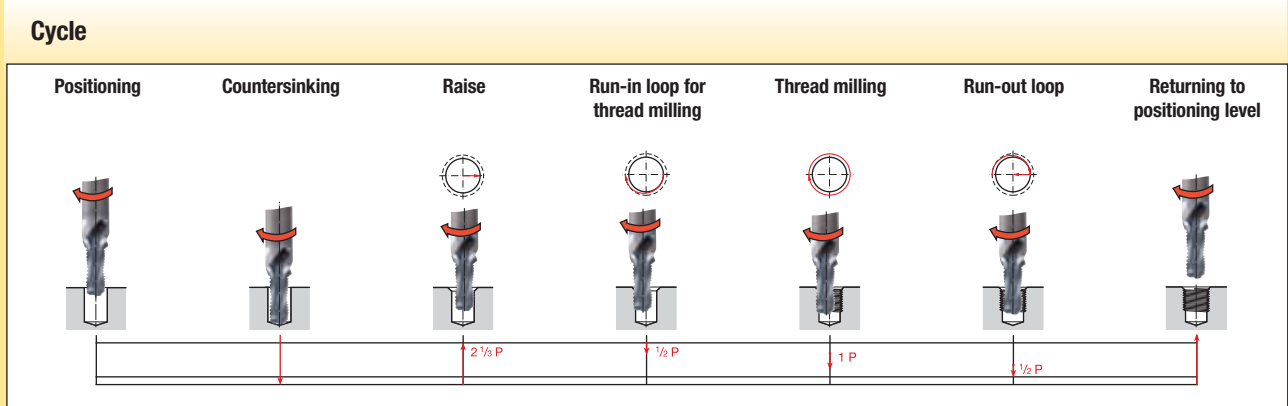
² The tool radius to be programmed is normally included in the tool memory.

³ The feed values in brackets must be used for controllers, which do not calculate the center point feed themselves.

Thread Mill TM721

Preparation Drilling of thread hole

Process Principle Countersinking, thread milling (conventional milling)



Example

<p>Size — M10-6H Thread diameter D10mm Pitch P1,5mm Core hole diameter D₁8,5mm</p> <p>Material — Cast aluminum Grade — KCU32</p>	<p>Tool — TM721 Catalog numberTM721M100X150R2DHA Number of teeth Z3 Tool diameter d₁8,2mm* Tool radius compensation k¹0,1mm** Tool radius to be programmed²4mm*** Countersink depth l_s21,2mm Cutting speed v_c250 m/min Feed (countersinking) f_s0,3 mm/U Feed (milling) f_z0,09 mm/tooth</p>	$N = \frac{v_c \cdot 1000}{d_1 \cdot \pi} \quad S = 9709$ $v_s = f_s \cdot n \quad F = 2913 \text{ (countersinking)}$ $v_f = f_z \cdot Z \cdot n \quad F = 2622 \text{ (contour)}$ $v_f = \frac{v_f \text{ contour} \cdot (D - d_1)}{D} \quad F = 472 \text{ (center point)}$
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* (measured on the cutting part) ** (0.01 x D) *** (1/2 d₁ - k)

Program to DIN 66025 (conventional milling, on the contour, incremental)

Positioning the tool	N 10	G 54	G 90	G 00	X...	Y...	Z 2	S 9709	T01 ²	M03
Advancing tool to full thread depth	N 20	G 91	Z-21.200							
Countersinking	N 30	G 01	Z-2	F 2913	(countersink)					
Raise	N 40	G 00	Z 3.450							
Moving sideways to the starting point	N 50	G 42	G01	X 4.250	F 1311	(milling, 1/2 contour) [F 236] ³ (milling, 1/2 center point)				
Run-in loop in arc	N 60	G 02	X-9.25	Y 0.000	Z-0.750	I-4.625	J 0			
Thread milling	N 70	G 02	X 0	Y 0	Z-1.500	I 5	J 0.000	F2622	[F 472] ³ (center point)	
Run-out loop in arc	N 80	G 02	X 9.25	Y 0.000	Z-0.750	I 4.625	J 0			
Exit	N 90	G 40	G 01	X-4.25						
Retracting tool to positioning level	N 100	G 90	G 00	Z 2						

Cutting time t_h 1.4 seconds

NOTES:
¹ The cutter radius measured over the tooth crests of the threaded part must be reduced by the amount of the cutter radius compensation. This is necessary to achieve a depth of cut to the middle of the 6H/ISO2 nut tolerance. Please note, however, that this also depends on the radial deflection of the tool (tensile strength of the material, projecting length of the tool).
² The cutter radius to be programmed is normally included in the tool memory.
³ The feed values in brackets must be used for controllers, which do not calculate the center point feed themselves.





Quick Ship

How to Order Special Taps; Delivery Matrix	L198
Surface Treatments, Additional Features and Options, Coating Recommendation Chart	L199
Common Specials	L200–L218
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Spiral-Point Taps	L209–L210
Spiral-Flute Taps	L211
Hand Taps, Metric Sizes	L212–L217
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Hand Taps	L219–L237
Spiral-Point Taps	L238–L249
Spiral-Flute Taps	L250–L252
Forming Taps	L253–L254
K-SS Spiral-Point Taps	L255–L257
K-SS Spiral-Flute Taps	L258–L261
K-NI Spiral-Point Taps	L262–L263
K-NI Spiral-Flute Taps	L264–L265
K-TI Left-Hand Spiral-Flute Taps	L266–L267
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Taper Pipe Taps • Interrupted Threads	L271
British Whitworth Taper Pipe Taps	L272
British Whitworth Taper Pipe Taps • Interrupted Threads	L273
Straight-Pipe Taps	L274
British Whitworth Straight-Pipe Taps	L275
Taper Pipe Taps • 6"	L276
Taper Pipe Taps • 6" • Interrupted Threads	L277
British Whitworth Taper Pipe Taps • 6"	L278
British Whitworth Taper Pipe Taps • 6" • Interrupted Thread	L279



Quick Ship

Rely on the Kennametal Quick Ship Services to deliver the special taps you need, when and where you need them. Within minutes, we can quote, process, and release your order to the factory.

Features and Benefits

- Non-standard tap sizes, pitches, PDs, coatings, etc.
- Special taps can be used for tapping steel, cast iron, aluminum or brass.
- Custom ordered taps can be designed to thread INCONEL[®], titanium, and high-temp alloys.
- Always accurate thread pitch diameters and gage fits.
- Select products available for shipping within 24 hours.





How to Order Special Taps

Kennametal leads the industry in quoting technology. Experienced quotation specialists and product engineers use in-house designed software to generate a quote from a customer inquiry and design cutting tools with the requested features, modifications, options, and surface treatments. We are tool coating specialists.

Use the following outline when selecting a tap:

1. Determine the tap that will fulfill your cutting tool needs. For assistance, consult the Tap Selection Manual.
2. Consult the new Kennametal Innovations Master catalog, and check the Quick Ship section.
3. The Quick Ship section is organized in two sections: Common Special Taps and Special Taps from Blanks. Common Specials are manufactured from in-stock blanks and should be considered first. These items can be ordered by simply referencing a catalog number. For those items not listed in Common Specials, consult the Special Taps from Blanks section for availability.
4. If the style, size, and/or quantity is not listed, consult customer service for a factory quote. Kennametal is fully equipped and ready to design your tool to your unique specifications.

Please use the following guidelines when placing an order:

1. Tap style and required quantity.
2. Catalog number, if available.
3. Size and pitch (nominal diameter and threads per inch or mm pitch).
4. Number of flutes (if spiral flute state right or left hand and helix angle desired).
5. Chamfer (taper, plug, modified bottoming, or bottoming).
6. Surface treatments.
7. Right or left hand (we will assume right hand).
8. Additional features or options.

NOTE: If you do not specify the pitch, number of flutes, and/or chamfer, standard specifications will be applied and shipped uncoated.

Any additional information, such as material to be tapped, type of hole, and any general dimensions, such as overall length and shank diameter, will ensure a correct tap for your application.

Taps

Delivery Matrix

Common Special Taps and Special Taps from Blanks

sizes	max quantity	lead time
up to 13/16", M20	72 pcs.	24 hours
7/8–1", M22–M25	24 pcs.	24 hours
1 1/16–2", M27–M48	12 pcs.	24 hours
2 1/8–2 1/2", M56	6 pcs.	24 hours
larger than 2 1/2"	2 pcs.	24 hours
Rp (BSPP), Rc (BSPT), G (BSPF)	47 pcs.	72 hours

NOTE: For orders greater than specified maximum quantity, consult customer service.

Surface Treatments

(Add to lead time designated for special taps)

treatment	lead time	price
TiN — Titanium Nitride	24 hours	consult customer service
Steam Oxide	24 hours	N/C
Nitride	24 hours	N/C
Steam Oxide/Nitride	48 hours	N/C
TiCN — Titanium Carbonitride	1 week	consult customer service
TiAlN — Titanium Aluminum Nitride	2 weeks	consult customer service
CrN — Chromium Nitride	2 weeks	consult customer service
TiN+CrC/C — Titanium Nitride + Chromium Nitride	2 weeks	consult customer service

Additional Features and Options

(Add to lead time designated for special taps)

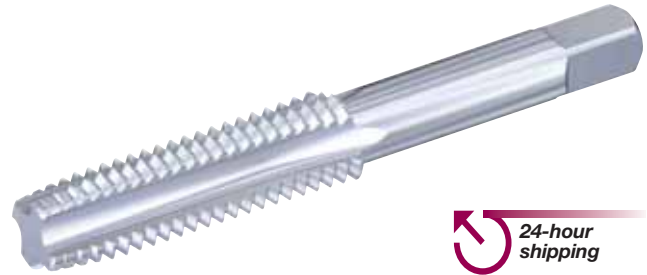
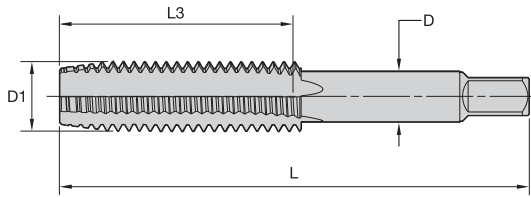
feature/option	lead time
controlled root (minor diameter $\pm .001$ ")	no additional time
double lead (except form taps)	24 hours
triple lead	24 hours
interrupted threads, taper or straight flute, odd number	24 hours
external centers removed	no additional time
special marking	no additional time
special K-series Taps	5 days
STI Taps	24 hours



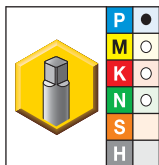
- first choice
- alternate choice

Coating Recommendation Chart

material	oxide	nitride	TiN	TiCN	TiAlN	CrN	TiN+CrCC
P	○		○	●	○		○
M	○		○	○	○	○	●
K	○	○	○	●	○		
N		●	○	○			●
S		○	○	○	●	○	
H							
speed (SFM) increase	0%	0%	50%	50%	100%	0%	50%



■ KHSST Hand • Machine Screw and Fractional Sizes • Taper Chamfer



- first choice
- alternate choice

Taps

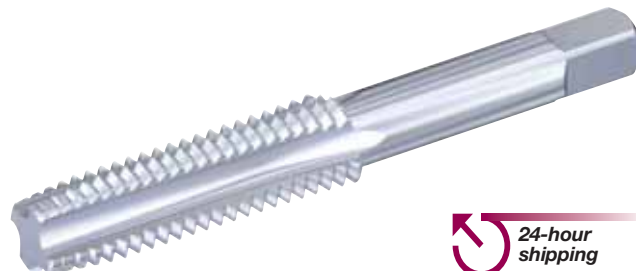
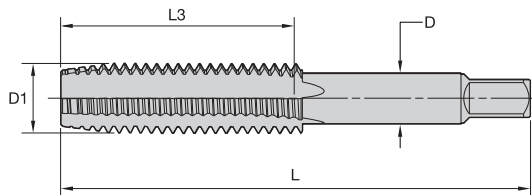
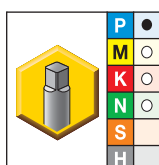
uncoated	D1 size	L	L3	D	number of flutes	pitch diameter limit
K27612	#12 - 28	2.38	0.94	0.220	4	H11
K26076	#12 - 32	2.38	0.94	0.220	4	H3
K26080	#12 - 36	2.38	0.94	0.220	4	H2
K27616	1/4 - 20	2.50	1.00	0.255	4	H11
K26097	1/4 - 24	2.50	1.00	0.255	4	H3
K26116	1/4 - 32	2.50	1.00	0.255	4	H3
K26134	1/4 - 40	2.50	1.00	0.255	4	H2
K28382	1/4 - 48	2.50	1.00	0.255	4	H3
K27627	5/8 - 11	3.81	1.81	0.480	4	H11
K27628	5/8 - 11	3.81	1.81	0.480	4	H11
K27631	11/16 - 24	4.03	1.81	0.542	4	H3
K14503	7/8 - 9	4.69	2.22	0.697	4	H4
K27639	7/8 - 14	4.69	2.22	0.697	4	H11
K14548	1 - 8	5.13	2.50	0.800	4	H4
K14561	1 - 12	5.13	2.50	0.800	4	H4
K14572	1 - 14	5.13	2.50	0.800	4	H4
K26535	1 1/16 - 12	5.13	2.50	0.896	4	H4

Ships in 24 Hours

NOTE: UNC and UNF taps may be used in UNJC and UNJF applications respectively. Refer to table on pages L291–L292 for the recommended pitch diameter limit for 2B or 3B class of fit. Quantities above max will be delivered as regular special order.

Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	23
24	47
48	72


■ KHSST Hand • Machine Screw and Fractional Sizes • Plug Chamfer


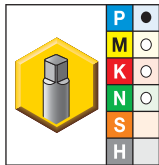
● first choice
○ alternate choice

uncoated	D1 size	L	L3	D	number of flutes	pitch diameter limit
K26002	#2 - 56	1.75	0.38	0.141	4	H4
K26008	#4 - 32	1.94	0.56	0.141	4	H2
K26017	#4 - 40	1.94	0.56	0.141	4	H3
K26043	#6 - 32	2.00	0.69	0.141	2	H11
K26039	#6 - 32	2.00	0.69	0.141	2	H7
K26031	#6 - 32	2.00	0.69	0.141	2	H3
K26035	#6 - 32	2.00	0.69	0.141	2	H5
K27301	#6 - 48	2.00	0.69	0.141	4	H2
K27305	#8 - 24	2.13	0.75	0.168	4	H3
K27318	#8 - 32	2.13	0.75	0.168	4	H11
K27312	#8 - 32	2.13	0.75	0.168	4	H5
K27308	#8 - 32	2.13	0.75	0.168	4	H3
K27322	#8 - 40	2.13	0.75	0.168	4	H2
K27337	#10 - 24	2.38	0.94	0.190	4	H11
K27334	#10 - 24	2.38	0.94	0.190	4	H7
K27330	#10 - 24	2.38	0.94	0.190	4	H5
K27326	#10 - 24	2.38	0.94	0.190	4	H3
K27341	#10 - 28	2.38	0.94	0.190	4	H3
K26045	#10 - 30	2.38	0.88	0.190	4	H3
K26057	#10 - 32	2.38	0.88	0.190	4	H11
K26054	#10 - 32	2.38	0.88	0.190	4	H7
K26050	#10 - 32	2.38	0.88	0.190	4	H5
K26061	#10 - 36	2.38	0.88	0.190	4	H2
K26064	#10 - 40	2.38	0.88	0.190	4	H2
K27609	#12 - 24	2.38	0.94	0.220	4	H11
K27613	#12 - 28	2.38	0.94	0.220	4	H11
K26077	#12 - 32	2.38	0.94	0.220	4	H3
K26081	#12 - 36	2.38	0.94	0.220	4	H2
K26084	#14 - 20	2.50	0.94	0.255	4	H3
K26087	#14 - 24	2.50	0.94	0.255	4	H3
K26093	1/4 - 20	2.50	1.00	0.255	4	H7
K26098	1/4 - 24	2.50	1.00	0.255	4	H3
K26102	1/4 - 27	2.50	1.00	0.255	4	H3
K26115	1/4 - 28	2.50	1.00	0.255	4	H11
K26110	1/4 - 28	2.50	1.00	0.255	4	H7
K26106	1/4 - 28	2.50	1.00	0.255	4	H5
K26113	1/4 - 28	2.50	1.00	0.255	4	H11
K26124	1/4 - 32	2.50	1.00	0.255	4	H5
K26117	1/4 - 32	2.50	1.00	0.255	4	H3
K26127	1/4 - 36	2.50	1.00	0.255	4	H2



(continued)

(KHSST Hand • Machine Screw and Fractional Sizes • Plug Chamfer continued)

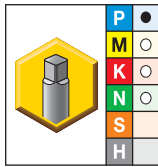


Taps

uncoated	D1 size	L	L3	D	number of flutes	pitch diameter limit
K26131	1/4 - 36	2.50	1.00	0.255	4	H3
K26138	1/4 - 40	2.50	1.00	0.255	4	H3
K26135	1/4 - 40	2.50	1.00	0.255	4	H2
K26142	5/16 - 18	2.72	1.13	0.318	4	H7
K26147	5/16 - 20	2.72	1.13	0.318	4	H3
K26157	5/16 - 24	2.72	1.13	0.318	4	H11
K26151	5/16 - 24	2.72	1.13	0.318	4	H5
K26155	5/16 - 24	2.72	1.13	0.318	4	H6
K26161	5/16 - 27	2.72	1.13	0.318	4	H3
K26164	5/16 - 28	2.72	1.13	0.318	4	H3
K26171	5/16 - 32	2.72	1.13	0.318	4	H5
K26167	5/16 - 32	2.72	1.13	0.318	4	H3
K26174	5/16 - 40	2.72	1.13	0.318	4	H2
K26179	3/8 - 16	2.94	1.25	0.381	4	H7
K26184	3/8 - 18	2.94	1.25	0.381	4	H3
K26187	3/8 - 20	2.94	1.25	0.381	4	H3
K26200	3/8 - 24	2.94	1.25	0.381	4	H11
K26197	3/8 - 24	2.94	1.25	0.381	4	H7
K26193	3/8 - 24	2.94	1.25	0.381	4	H5
K26205	3/8 - 27	2.94	1.25	0.381	4	H3
K26208	3/8 - 28	2.94	1.25	0.381	4	H3
K26211	3/8 - 32	2.94	1.25	0.381	4	H3
K26215	3/8 - 32	2.94	1.25	0.381	4	H5
K26220	3/8 - 40	2.94	1.25	0.381	4	H3
K26218	3/8 - 40	2.94	1.25	0.381	4	H2
K26223	7/16 - 14	3.16	1.44	0.323	4	H11
K26230	7/16 - 18	3.16	1.44	0.323	4	H3
K26235	7/16 - 20	3.16	1.44	0.323	4	H11
K26233	7/16 - 20	3.16	1.44	0.323	4	H6
K26242	7/16 - 24	3.16	1.44	0.323	4	H5
K26239	7/16 - 24	3.16	1.44	0.323	4	H3
K26245	7/16 - 27	3.16	1.44	0.323	4	H3
K26251	7/16 - 28	3.16	1.44	0.323	4	H5
K26248	7/16 - 28	3.16	1.44	0.323	4	H3
K26254	7/16 - 32	3.16	1.44	0.323	4	H3
K26257	1/2 - 12	3.38	1.66	0.367	4	H3
K26263	1/2 - 13	3.38	1.66	0.367	4	H7
K26265	1/2 - 13	3.38	1.66	0.367	4	H11
K26269	1/2 - 14	3.38	1.66	0.367	4	H3
K26272	1/2 - 16	3.38	1.66	0.367	4	H3
K26275	1/2 - 18	3.38	1.66	0.367	4	H3
K26281	1/2 - 20	3.38	1.66	0.367	4	H11
K26279	1/2 - 20	3.38	1.66	0.367	4	H7
K26285	1/2 - 24	3.38	1.66	0.367	4	H3
K26288	1/2 - 27	3.38	1.66	0.367	4	H3
K26295	1/2 - 28	3.38	1.66	0.367	4	H5
K26291	1/2 - 28	3.38	1.66	0.367	4	H3
K26298	1/2 - 32	3.38	1.66	0.367	2	H3
K26301	1/2 - 40	3.38	1.66	0.367	4	H2
K26304	9/16 - 16	3.59	1.66	0.542	4	H3

(continued)

(KHSST Hand • Machine Screw and Fractional Sizes • Plug Chamfer continued)

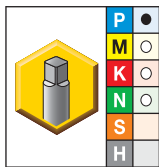


uncoated	D1 size	L	L3	D	number of flutes	pitch diameter limit
K26310	9/16 - 18	3.59	1.66	0.542	4	H11
K26314	9/16 - 20	3.59	1.66	0.542	4	H3
K26317	9/16 - 24	3.59	1.66	0.542	4	H3
K26320	9/16 - 24	3.59	1.66	0.542	4	H5
K26323	9/16 - 27	3.59	1.66	0.542	2	H3
K26326	5/8 - 10	3.81	1.81	0.480	4	H3
K26331	5/8 - 11	3.81	1.81	0.480	4	H11
K26335	5/8 - 12	3.81	1.81	0.480	4	H3
K26349	5/8 - 18	3.81	1.81	0.480	4	H11
K26347	5/8 - 18	3.81	1.81	0.480	4	H7
K26352	5/8 - 20	3.81	1.81	0.480	4	H3
K26358	5/8 - 24	3.81	1.81	0.480	4	H5
K26355	5/8 - 24	3.81	1.81	0.480	4	H3
K26364	5/8 - 28	3.81	1.81	0.480	2	H3
K26370	11/16 - 18	4.03	1.81	0.542	4	H3
K26373	11/16 - 20	4.03	1.81	0.542	2	H3
K26376	11/16 - 24	4.03	1.81	0.542	4	H3
K27632	11/16 - 24	4.03	1.81	0.542	4	H3
K26382	11/16 - 28	4.03	1.81	0.542	2	H3
K26389	3/4 - 10	4.25	2.00	0.590	4	H11
K26387	3/4 - 10	4.25	2.00	0.590	4	H11
K26393	3/4 - 12	4.25	2.00	0.590	4	H4
K26408	3/4 - 16	4.25	2.00	0.590	4	H11
K26406	3/4 - 16	4.25	2.00	0.590	4	H8
K26403	3/4 - 16	4.25	2.00	0.590	4	H7
K26411	3/4 - 18	4.25	2.00	0.590	4	H3
K26417	3/4 - 20	4.25	2.00	0.590	4	H5
K26414	3/4 - 20	4.25	2.00	0.590	4	H3
K26420	3/4 - 24	4.25	2.00	0.590	4	H3
K26423	3/4 - 27	4.25	2.00	0.590	4	H3
K26425	13/16 - 10	4.47	2.00	0.652	4	H4
K26428	13/16 - 12	4.47	2.00	0.652	4	H4
K26431	13/16 - 16	4.47	2.00	0.652	4	H3
K26434	13/16 - 18	4.47	2.00	0.652	4	H3
K26440	13/16 - 20	4.47	2.00	0.652	2	H5
K26437	13/16 - 20	4.47	2.00	0.652	2	H3
K26443	13/16 - 24	4.47	2.00	0.652	4	H3
K26448	7/8 - 9	4.69	2.22	0.697	4	H11
K14504	7/8 - 9	4.69	2.22	0.697	4	H4
K26451	7/8 - 10	4.69	2.22	0.697	4	H4
K26463	7/8 - 14	4.69	2.22	0.697	4	H11
K26458	7/8 - 14	4.69	2.22	0.697	4	H5
K26461	7/8 - 14	4.69	2.22	0.697	4	H6
K26466	7/8 - 16	4.69	2.22	0.697	4	H3
K26469	7/8 - 18	4.69	2.22	0.697	4	H3
K26472	7/8 - 20	4.69	2.22	0.697	2	H3
K26475	7/8 - 20	4.69	2.22	0.697	2	H5
K26478	7/8 - 24	4.69	2.22	0.697	4	H3
K26481	15/16 - 12	4.91	2.22	0.760	4	H4
K26487	15/16 - 16	4.91	2.22	0.760	3	H3



(continued)

(KHSST Hand • Machine Screw and Fractional Sizes • Plug Chamfer continued)



uncoated	D1 size	L	L3	D	number of flutes	pitch diameter limit
K26490	15/16 - 18	4.91	2.22	0.760	3	H3
K26493	15/16 - 20	4.91	2.22	0.760	2	H3
K26496	15/16 - 20	4.91	2.22	0.760	2	H5
K26506	1 - 8	5.13	2.50	0.800	4	H11
K14549	1 - 8	5.13	2.50	0.800	4	H4
K26510	1 - 10	5.13	2.50	0.800	4	H4
K26516	1 - 12	5.13	2.50	0.800	4	H11
K26513	1 - 12	5.13	2.50	0.800	4	H6
K14562	1 - 12	5.13	2.50	0.800	4	H4
K26519	1 - 14	5.13	2.50	0.800	4	H6
K14573	1 - 14	5.13	2.50	0.800	4	H4
K26521	1 - 14	5.13	2.50	0.800	4	H11
K26524	1 - 16	5.13	2.50	0.800	3	H3
K26527	1 - 18	5.13	2.50	0.800	3	H3
K26533	1 - 20	5.13	2.50	0.800	2	H5
K26530	1 - 20	5.13	2.50	0.800	2	H3
K26539	1 1/16 - 12	5.13	2.50	0.896	4	H5
K26536	1 1/16 - 12	5.13	2.50	0.896	4	H4
K26563	1 1/8 - 8	5.44	2.56	0.896	4	H5
K26629	1 1/4 - 8	5.75	2.56	1.021	4	H5
K28638	1 1/2 - 8	6.38	3.00	1.233	4	H5
K26776	1 3/4 - 12	5.00	2.00	1.430	4	H6

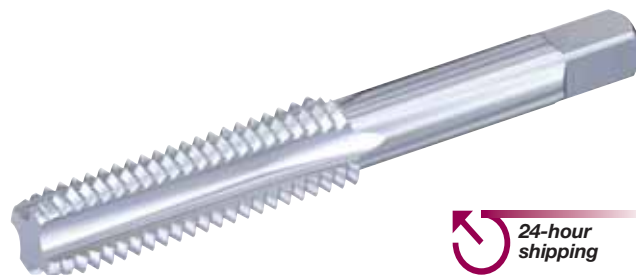
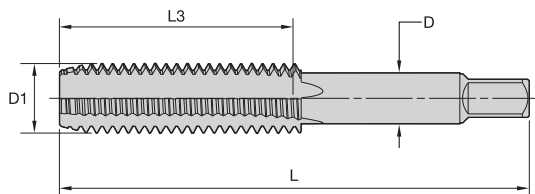
Taps

Ships in 24 Hours

NOTE: UNC and UNF taps may be used in UNJC and UNJF applications respectively.
 Refer to table on pages L291–L292 for the recommended pitch diameter limit for 2B or 3B class of fit.
 Quantities above max will be delivered as regular special order.

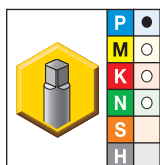
Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	23
24	47
48	72



24-hour shipping

■ KHSST Hand • Machine Screw and Fractional Sizes • Bottoming Chamfer



● first choice
○ alternate choice

uncoated	D1 size	L	L3	D	number of flutes	pitch diameter limit
K26003	#2 - 56	1.75	0.38	0.141	2	H4
K26009	#4 - 32	1.94	0.56	0.141	3	H2
K26018	#4 - 40	1.94	0.56	0.141	3	H3
K26044	#6 - 32	2.00	0.69	0.141	3	H11
K26036	#6 - 32	2.00	0.69	0.141	3	H5
K26032	#6 - 32	2.00	0.69	0.141	3	H3
K26040	#6 - 32	2.00	0.69	0.141	3	H7
K27302	#6 - 48	2.00	0.69	0.141	3	H2
K27306	#8 - 24	2.13	0.75	0.168	4	H3
K27319	#8 - 32	2.13	0.75	0.168	4	H11
K27316	#8 - 32	2.13	0.75	0.168	4	H7
K27313	#8 - 32	2.13	0.75	0.168	4	H5
K27309	#8 - 32	2.13	0.75	0.168	4	H3
K27323	#8 - 40	2.13	0.75	0.168	4	H2
K27338	#10 - 24	2.38	0.94	0.190	4	H11
K27331	#10 - 24	2.38	0.94	0.190	4	H5
K27327	#10 - 24	2.38	0.94	0.190	4	H3
K27335	#10 - 24	2.38	0.94	0.190	4	H7
K27342	#10 - 28	2.38	0.94	0.190	4	H3
K26046	#10 - 30	2.38	0.88	0.190	4	H3
K26058	#10 - 32	2.38	0.88	0.190	4	H11
K26055	#10 - 32	2.38	0.88	0.190	4	H7
K26051	#10 - 32	2.38	0.88	0.190	4	H5
K26062	#10 - 36	2.38	0.88	0.190	4	H2
K26065	#10 - 40	2.38	0.88	0.190	4	H2
K26069	0.210 - 36	2.50	0.94	0.220	4	H3
K27610	#12 - 24	2.38	0.94	0.220	4	H11
K27614	#12 - 28	2.38	0.94	0.220	4	H11
K26078	#12 - 32	2.38	0.94	0.220	4	H3
K26082	#12 - 36	2.38	0.94	0.220	4	H2
K26085	#14 - 14	2.50	0.94	0.255	4	H3
K26088	#14 - 24	2.50	0.94	0.255	4	H3
K26096	1/4 - 20	2.50	1.00	0.255	4	H11
K26094	1/4 - 20	2.50	1.00	0.255	4	H7
K26099	1/4 - 24	2.50	1.00	0.255	4	H3
K26103	1/4 - 27	2.50	1.00	0.255	4	H3
K26114	1/4 - 28	2.50	1.00	0.255	4	H11
K26111	1/4 - 28	2.50	1.00	0.255	4	H7
K26107	1/4 - 28	2.50	1.00	0.255	4	H5
K26125	1/4 - 32	2.50	1.00	0.255	4	H5



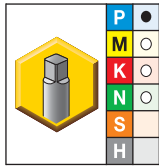
(continued)

Common Special

Hand Taps • Blind Holes in General Machining Applications



(KHSST Hand • Machine Screw and Fractional Sizes • Bottoming Chamfer continued)



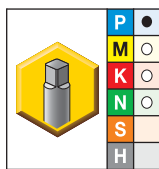
Taps

uncoated	D1 size	L	L3	D	number of flutes	pitch diameter limit
K26118	1/4 - 32	2.50	1.00	0.255	4	H3
K26128	1/4 - 36	2.50	1.00	0.255	4	H2
K26132	1/4 - 36	2.50	1.00	0.255	4	H3
K26139	1/4 - 40	2.50	1.00	0.255	4	H3
K26136	1/4 - 40	2.50	1.00	0.255	4	H2
K28383	1/4 - 48	2.50	1.00	0.255	4	H3
K26145	5/16 - 18	2.72	1.13	0.318	4	H11
K26143	5/16 - 18	2.72	1.13	0.318	4	H7
K26148	5/16 - 20	2.72	1.13	0.318	4	H3
K26158	5/16 - 24	2.72	1.13	0.318	4	H11
K26156	5/16 - 24	2.72	1.13	0.318	4	H6
K26152	5/16 - 24	2.72	1.13	0.318	4	H5
K26162	5/16 - 27	2.72	1.13	0.318	4	H3
K26165	5/16 - 28	2.72	1.13	0.318	4	H3
K26172	5/16 - 32	2.72	1.13	0.318	4	H5
K26168	5/16 - 32	2.72	1.13	0.318	4	H3
K26175	5/16 - 40	2.72	1.13	0.318	4	H2
K26182	3/8 - 16	2.94	1.25	0.381	4	H11
K26180	3/8 - 16	2.94	1.25	0.381	4	H7
K26185	3/8 - 18	2.94	1.25	0.381	4	H3
K26188	3/8 - 20	2.94	1.25	0.381	4	H3
K26201	3/8 - 24	2.94	1.25	0.381	4	H11
K26198	3/8 - 24	2.94	1.25	0.381	4	H7
K26194	3/8 - 24	2.94	1.25	0.381	4	H5
K26206	3/8 - 27	2.94	1.25	0.381	4	H3
K26209	3/8 - 28	2.94	1.25	0.381	4	H3
K26216	3/8 - 32	2.94	1.25	0.381	4	H5
K26212	3/8 - 32	2.94	1.25	0.381	4	H3
K26221	3/8 - 40	2.94	1.25	0.381	4	H3
K26219	3/8 - 40	2.94	1.25	0.381	4	H2
K26224	7/16 - 14	3.16	1.44	0.323	4	H11
K26231	7/16 - 18	3.16	1.44	0.323	4	H3
K26236	7/16 - 20	3.16	1.44	0.323	4	H11
K26234	7/16 - 20	3.16	1.44	0.323	4	H6
K26243	7/16 - 24	3.16	1.44	0.323	4	H5
K26240	7/16 - 24	3.16	1.44	0.323	4	H3
K26246	7/16 - 27	3.16	1.44	0.323	4	H3
K26252	7/16 - 28	3.16	1.44	0.323	4	H5
K26249	7/16 - 28	3.16	1.44	0.323	4	H3
K26255	7/16 - 32	3.16	1.44	0.323	4	H3
K26258	1/2 - 12	3.38	1.66	0.367	4	H3
K26266	1/2 - 13	3.38	1.66	0.367	4	H11
K26264	1/2 - 13	3.38	1.66	0.367	4	H7
K26270	1/2 - 14	3.38	1.66	0.367	4	H3
K26273	1/2 - 16	3.38	1.66	0.367	4	H3
K26276	1/2 - 18	3.38	1.66	0.367	4	H3
K26282	1/2 - 20	3.38	1.66	0.367	4	H11
K26280	1/2 - 20	3.38	1.66	0.367	4	H7
K26278	1/2 - 20	3.38	1.66	0.367	4	H5
K26286	1/2 - 24	3.38	1.66	0.367	4	H3
K26289	1/2 - 27	3.38	1.66	0.367	4	H3
K26296	1/2 - 28	3.38	1.66	0.367	4	H5

(continued)



(KHSST Hand • Machine Screw and Fractional Sizes • Bottoming Chamfer continued)

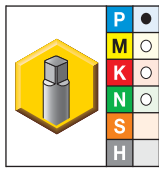


uncoated	D1 size	L	L3	D	number of flutes	pitch diameter limit
K26292	1/2 - 28	3.38	1.66	0.367	4	H3
K26299	1/2 - 32	3.38	1.66	0.367	6	H3
K26302	1/2 - 40	3.38	1.66	0.367	6	H2
K26305	9/16 - 16	3.59	1.66	0.429	4	H3
K26311	9/16 - 18	3.59	1.66	0.429	4	H11
K26307	9/16 - 18	3.59	1.66	0.429	4	H5
K26315	9/16 - 20	3.59	1.66	0.429	4	H3
K26318	9/16 - 24	3.59	1.66	0.429	4	H3
K26321	9/16 - 24	3.59	1.66	0.429	4	H5
K26324	9/16 - 27	3.59	1.66	0.429	6	H3
K26327	5/8 - 10	3.81	1.81	0.480	4	H3
K26332	5/8 - 11	3.81	1.81	0.480	4	H11
K26336	5/8 - 12	3.81	1.81	0.480	4	H3
K26350	5/8 - 18	3.81	1.81	0.480	4	H11
K26348	5/8 - 18	3.81	1.81	0.480	4	H7
K26353	5/8 - 20	3.81	1.81	0.480	4	H3
K26359	5/8 - 24	3.81	1.81	0.480	6	H5
K26356	5/8 - 24	3.81	1.81	0.480	6	H3
K26365	5/8 - 28	3.81	1.81	0.480	6	H3
K26371	11/16 - 18	4.03	1.81	0.542	4	H3
K26374	11/16 - 20	4.03	1.81	0.542	6	H3
K27633	11/16 - 24	4.03	1.81	0.542	4	H3
K26377	11/16 - 24	4.03	1.81	0.542	6	H3
K26383	11/16 - 28	4.03	1.81	0.542	6	H3
K26390	3/4 - 10	4.25	2.00	0.590	4	H11
K26388	3/4 - 10	4.25	2.00	0.590	4	H11
K26394	3/4 - 12	4.25	2.00	0.590	4	H4
K26409	3/4 - 16	4.25	2.00	0.590	4	H11
K26407	3/4 - 16	4.25	2.00	0.590	4	H8
K26404	3/4 - 16	4.25	2.00	0.590	4	H7
K26412	3/4 - 18	4.25	2.00	0.590	4	H3
K26418	3/4 - 20	4.25	2.00	0.590	6	H5
K26415	3/4 - 20	4.25	2.00	0.590	6	H3
K26421	3/4 - 24	4.25	2.00	0.590	6	H3
K26424	3/4 - 27	4.25	2.00	0.590	6	H3
K26426	13/16 - 10	4.47	2.00	0.652	4	H4
K26429	13/16 - 12	4.47	2.00	0.652	4	H4
K26432	13/16 - 16	4.47	2.00	0.652	4	H3
K26435	13/16 - 18	4.47	2.00	0.652	4	H3
K26441	13/16 - 20	4.47	2.00	0.652	6	H5
K26438	13/16 - 20	4.47	2.00	0.652	6	H3
K26444	13/16 - 24	4.47	2.00	0.652	6	H3
K26449	7/8 - 9	4.69	2.22	0.697	4	H11
K14505	7/8 - 9	4.69	2.22	0.697	4	H4
K26452	7/8 - 10	4.69	2.22	0.697	4	H4
K26464	7/8 - 14	4.69	2.22	0.697	4	H11
K26462	7/8 - 14	4.69	2.22	0.697	4	H6
K26459	7/8 - 14	4.69	2.22	0.697	4	H5
K26467	7/8 - 16	4.69	2.22	0.697	4	H3
K26470	7/8 - 18	4.69	2.22	0.697	4	H3
K26476	7/8 - 20	4.69	2.22	0.697	6	H5
K26473	7/8 - 20	4.69	2.22	0.697	6	H3



(continued)

(KHSST Hand • Machine Screw and Fractional Sizes • Bottoming Chamfer continued)



Taps

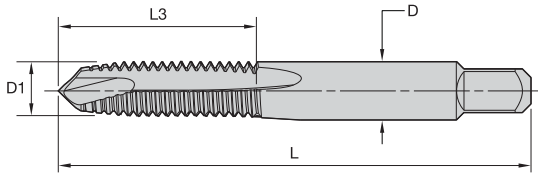
uncoated	D1 size	L	L3	D	number of flutes	pitch diameter limit
K26479	7/8 - 24	4.69	2.22	0.697	6	H3
K26482	15/16 - 12	4.91	2.22	0.760	4	H4
K26488	15/16 - 16	4.91	2.22	0.760	6	H3
K26491	15/16 - 18	4.91	2.22	0.760	6	H3
K26497	15/16 - 20	4.91	2.22	0.760	6	H5
K26494	15/16 - 20	4.91	2.22	0.760	6	H3
K26507	1 - 8	5.13	2.50	0.800	4	H11
K14550	1 - 8	5.13	2.50	0.800	4	H4
K26511	1 - 10	5.13	2.50	0.800	4	H4
K26517	1 - 12	5.13	2.50	0.800	4	H11
K26514	1 - 12	5.13	2.50	0.800	4	H6
K14563	1 - 12	5.13	2.50	0.800	4	H4
K26522	1 - 14	5.13	2.50	0.800	4	H11
K26520	1 - 14	5.13	2.50	0.800	4	H6
K14574	1 - 14	5.13	2.50	0.800	4	H4
K26525	1 - 16	5.13	2.50	0.800	6	H3
K26528	1 - 18	5.13	2.50	0.800	6	H3
K26534	1 - 20	5.13	2.50	0.800	6	H5
K26531	1 - 20	5.13	2.50	0.800	6	H3
K26540	1 1/16 - 12	5.13	2.50	0.896	4	H5
K26537	1 1/16 - 12	5.13	2.50	0.896	4	H4
K26564	1 1/8 - 8	5.44	2.56	0.896	4	H5
K26630	1 1/4 - 8	5.75	2.56	1.021	4	H5
K28639	1 1/2 - 8	6.38	3.00	1.233	4	H5
K26777	1 3/4 - 12	5.00	2.00	1.430	6	H6

Ships in 24 Hours

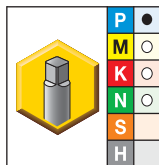
NOTE: UNC and UNF taps may be used in UNJC and UNJF applications respectively.
Refer to table on pages L291–L292 for the recommended pitch diameter limit for 2B or 3B class of fit.
Quantities above max will be delivered as regular special order.

Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	23
24	47
48	72



■ KHSST Spiral Point • Machine Screw and Fractional Sizes • Plug Chamfer



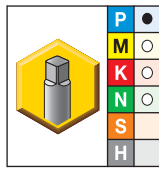
● first choice
○ alternate choice

uncoated	D1 size	L	L3	D	number of flutes	pitch diameter limit
K26005	#2 - 56	1.75	0.38	0.141	2	H5
K26004	#2 - 56	1.75	0.38	0.141	2	H4
K26000	#2 - 56	1.75	0.38	0.141	2	H3
K26020	#4 - 40	1.94	0.56	0.141	2	H7
K26019	#4 - 40	1.94	0.56	0.141	2	H3
K26029	#5 - 40	1.94	0.63	0.141	2	H5
K27295	#6 - 32	2.00	0.69	0.141	2	H11
K26037	#6 - 32	2.00	0.69	0.141	2	H5
K27299	#6 - 40	2.00	0.69	0.141	2	H3
K27303	#6 - 48	2.00	0.69	0.141	2	H2
K27320	#8 - 32	2.13	0.75	0.168	2	H11
K27314	#8 - 32	2.13	0.75	0.168	2	H5
K27339	#10 - 24	2.38	0.94	0.194	2	H11
K27332	#10 - 24	2.38	0.94	0.194	2	H5
K27328	#10 - 24	2.38	0.94	0.194	2	H3
K26059	#10 - 32	2.38	0.94	0.194	2	H11
K26052	#10 - 32	2.38	0.94	0.194	2	H5
K26048	#10 - 32	2.38	0.94	0.194	2	H4
K26047	#10 - 32	2.38	0.94	0.194	2	H3
K26066	#10 - 40	2.38	0.94	0.194	2	H2
K26095	1/4 - 20	2.50	1.00	0.255	2	H7
K26091	1/4 - 20	2.50	1.00	0.255	2	H3
K26112	1/4 - 28	2.50	1.00	0.255	2	H7
K26108	1/4 - 28	2.50	1.00	0.255	2	H5
K26104	1/4 - 28	2.50	1.00	0.255	2	H3
K26122	1/4 - 32	2.50	1.00	0.255	2	H3
K26140	5/16 - 18	2.72	1.13	0.318	2	H3
K26159	5/16 - 24	2.72	1.13	0.318	2	H11
K26153	5/16 - 24	2.72	1.13	0.318	2	H5
K26149	5/16 - 24	2.72	1.13	0.318	2	H3
K26169	5/16 - 32	2.72	1.13	0.318	2	H3
K26177	3/8 - 16	2.94	1.25	0.381	2	H3
K26176	3/8 - 16	2.94	1.25	0.381	3	H3
K26202	3/8 - 24	2.94	1.25	0.381	3	H11
K26195	3/8 - 24	2.94	1.25	0.381	3	H5
K26225	7/16 - 14	3.16	1.44	0.323	3	H11
K26262	1/2 - 13	3.38	1.66	0.429	3	H3
K26283	1/2 - 20	3.38	1.66	0.429	3	H11
K26277	1/2 - 20	3.38	1.66	0.429	3	H3
K28490	9/16 - 12	3.59	1.66	0.542	3	H3



(continued)

(KHSST Spiral Point • Machine Screw and Fractional Sizes • Plug Chamfer continued)



uncoated	D1 size	L	L3	D	number of flutes	pitch diameter limit
K26306	9/16 - 18	3.59	1.66	0.542	3	H3
K26345	5/8 - 18	3.81	1.81	0.480	3	H5
K27630	5/8 - 24	3.81	1.81	0.480	3	H3
K26391	3/4 - 10	4.25	2.00	0.590	3	H11
K26398	3/4 - 16	4.25	2.00	0.590	3	H5
K26397	3/4 - 16	4.25	2.00	0.590	3	H3
K26447	7/8 - 9	4.69	2.22	0.697	3	H4
K26456	7/8 - 14	4.69	2.22	0.697	3	H4
K26505	1 - 8	5.13	2.50	0.800	3	H4
K26508	1 - 8	5.13	2.50	0.800	3	H11

Ships in 24 Hours

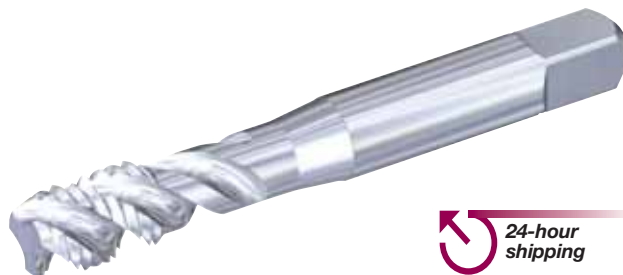
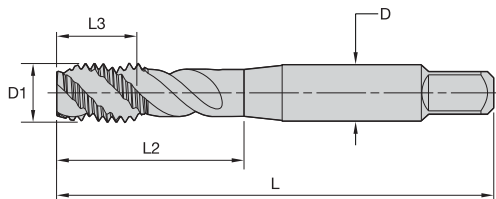
NOTE: UNC and UNF taps may be used in UNJC and UNJF applications respectively.
 Refer to table on pages L291–L292 for the recommended pitch diameter limit for 2B or 3B class of fit.
 Quantities above max will be delivered as regular special order.



Taps

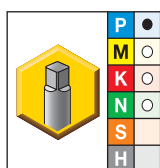
Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	23
24	47
48	72



24-hour shipping

■ KHSST Spiral Flute • Machine Screw and Fractional Sizes • Plug Chamfer



● first choice
○ alternate choice

uncoated	D1 size	L	L3	D	number of flutes	pitch diameter limit
K26010	#4 - 40	1.94	0.56	0.141	2	H3
K26089	1/4 - 20	2.50	0.63	0.255	3	H5
K26189	3/8 - 24	2.94	0.73	0.381	3	H5
K26342	5/8 - 18	3.81	1.81	0.480	4	H3
K26340	5/8 - 18	3.81	1.81	0.480	4	H3
K26328	5/8 - 11	3.81	1.81	0.480	4	H3
K26395	3/4 - 16	4.25	2.00	0.590	4	H3
K26384	3/4 - 10	4.25	2.00	0.590	4	H3
K26445	7/8 - 9	4.69	2.22	0.697	4	H4
K26501	1 - 8	5.13	2.50	0.800	4	H4

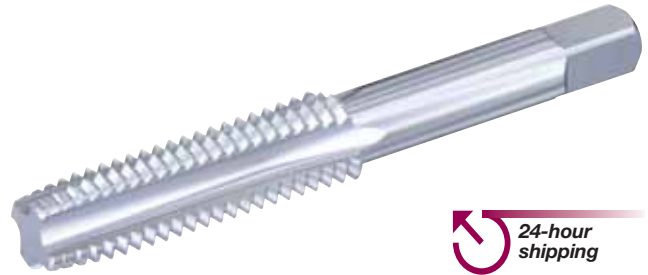
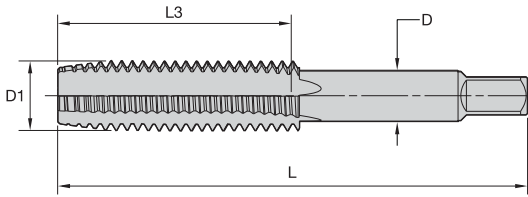


Ships in 24 Hours

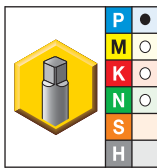
NOTE: UNC and UNF taps may be used in UNJC and UNJF applications respectively.
Refer to table on pages L291-L292 for the recommended pitch diameter limit for 2B or 3B class of fit.
Quantities above max will be delivered as regular special order.

Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	23
24	47
48	72



■ KHSST Hand • Metric Sizes ANSI • Taper Chamfer



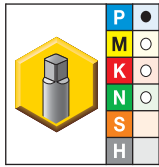
● first choice
○ alternate choice

Taps

uncoated	D1 size	L	L3	D	number of flutes	pitch diameter limit
K26877	M1,8 x 0,35	1.69	0.38	0.141	2	D3
K26881	M2,2 x 0,45	1.75	0.44	0.141	3	D3
K26887	M2,5 x 0,45	1.81	0.44	0.141	3	D1
K26885	M2,5 x 0,45	1.81	0.44	0.141	3	D3
K26891	M3 x 0,50	1.94	0.63	0.141	3	D1
K26897	M3,5 x 0,6	2.00	0.69	0.141	3	D1
K26895	M3,5 x 0,6	2.00	0.69	0.141	3	D4
K26904	M3,5 x 0,6	2.00	0.69	0.141	3	D11
K26908	M4 x 0,7	2.13	0.75	0.168	4	D2
K26915	M4 x 0,7	2.13	0.75	0.168	4	D11
K26928	M4,5 x 0,75	2.38	0.88	0.194	4	D11
K26921	M4,5 x 0,75	2.38	0.88	0.194	4	D2
K26919	M4,5 x 0,75	2.38	0.88	0.194	4	D4
K26943	M5 x 0,50	2.38	0.94	0.194	4	D3
K26932	M5 x 0,8	2.38	0.94	0.194	4	D11
K26939	M5 x 0,8	2.38	0.94	0.194	4	D11
K26947	M6 x 1	2.50	1.00	0.255	4	D3
K26954	M6 x 1	2.50	1.00	0.255	4	D11
K26958	M6 x 0,75	2.50	1.00	0.255	4	D3
K26962	M6 x 0,5	2.50	1.00	0.255	4	D3
K26965	M7 x 1	2.72	1.13	0.318	4	D3
K26972	M7 x 1	2.72	1.13	0.318	4	D11
K26991	M8 x 1	2.72	1.13	0.318	4	D3
K26987	M8 x 1	2.72	1.13	0.318	4	D5
K26998	M8 x 1	2.72	1.13	0.318	4	D11
K26976	M8 x 1,25	2.72	1.13	0.318	4	D3
K26983	M8 x 1,25	2.72	1.13	0.318	4	D11
K27002	M8 x 0,75	2.72	1.13	0.318	4	D5
K27034	M10 x 1	2.94	1.25	0.381	4	D5
K27031	M10 x 1	2.94	1.25	0.381	4	D3
K27020	M10 x 1,25	2.94	1.25	0.381	4	D3
K27016	M10 x 1,25	2.94	1.25	0.381	4	D5
K27027	M10 x 1,25	2.94	1.25	0.381	4	D11
K27005	M10 x 1,5	2.94	1.25	0.381	4	D3
K27012	M10 x 1,5	2.94	1.25	0.381	4	D11
K27045	M11 x 1	3.16	1.44	0.323	4	D5
K27041	M11 x 1,5	3.16	1.44	0.323	4	D6
K27076	M12 x 1	3.38	1.66	0.367	4	D5
K27073	M12 x 1,25	3.38	1.66	0.367	4	D11
K27066	M12 x 1,25	3.38	1.66	0.367	4	D3

(continued)

(KHSST Hand • Metric Sizes ANSI • Taper Chamfer continued)



uncoated	D1 size	L	L3	D	number of flutes	pitch diameter limit
K27062	M12 x 1,25	3.38	1.66	0.367	4	D5
K27059	M12 x 1,5	3.38	1.66	0.367	4	D6
K27048	M12 x 1,75	3.38	1.66	0.367	4	D3
K27055	M12 x 1,75	3.38	1.66	0.367	4	D11
K27101	M14 x 1	3.59	1.66	0.429	4	D5
K27098	M14 x 1,25	3.59	1.66	0.429	4	D4
K27087	M14 x 1,5	3.59	1.66	0.429	4	D6
K27091	M14 x 1,5	3.59	1.66	0.429	4	D3
K27080	M14 x 2	3.59	1.66	0.429	4	D3
K27104	M15 x 1	3.81	1.81	0.480	4	D5
K27122	M16 x 1,5	3.81	1.81	0.480	4	D3
K27118	M16 x 1,5	3.81	1.81	0.480	4	D6
K27107	M16 x 2	3.81	1.81	0.480	4	D4
K27114	M16 x 2	3.81	1.81	0.480	4	D11
K27147	M18 x 1	4.03	1.81	0.542	4	D5
K27141	M18 x 1,5	4.03	1.81	0.542	4	D3
K27138	M18 x 1,5	4.03	1.81	0.542	4	D4
K27135	M18 x 1,5	4.03	1.81	0.542	4	D6
K27129	M18 x 2,5	4.03	1.81	0.542	4	D4
K27162	M20 x 1,5	4.47	2.00	0.652	4	D3
K27159	M20 x 1,5	4.47	2.00	0.652	4	D6
K27168	M20 x 1,5	4.47	2.00	0.652	4	D11
K27150	M20 x 2,5	4.47	2.00	0.652	4	D4
K27189	M22 x 1,5	4.69	2.22	0.697	4	D11
K27174	M22 x 2,5	4.69	2.22	0.697	4	D4
K27180	M22 x 2,5	4.69	2.22	0.697	4	D6
K27183	M22 x 2,5	4.69	2.22	0.697	4	D3
K27189	M22 x 2,5	4.69	2.22	0.697	4	D11
K27192	M24 x 3	4.91	2.22	0.76	4	D4
K27201	M24 x 2	4.91	2.22	0.76	4	D7
K27204	M24 x 2	4.91	2.22	0.76	4	D4
K27210	M24 x 1,5	4.91	2.22	0.76	4	D6
K27243	M24 x 1,25	5.44	2.56	1.021	6	D6

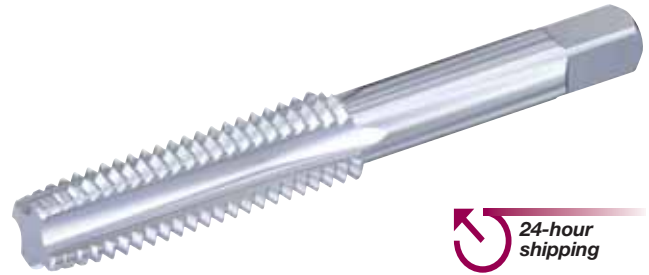
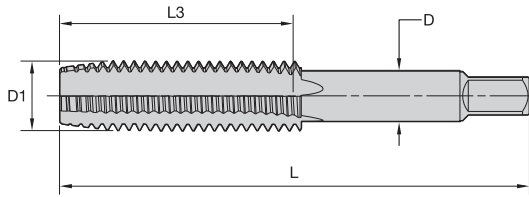


Ships in 24 Hours

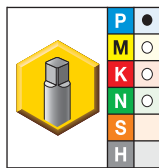
NOTE: M and MF taps may be used in MJ and MJF applications respectively.
Refer to table on page L292 for the recommended pitch diameter limit for class of fit.
Quantities above max will be delivered as regular special order.

Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	23
24	47
48	72



■ KHSST Hand • Metric Sizes ANSI • Plug Chamfer



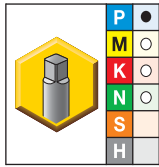
● first choice
○ alternate choice

Taps

uncoated	D1 size	L	L3	D	number of flutes	pitch diameter limit
K26878	M1,8 x 0,35	1.69	0.38	0.141	2	D3
K26882	M2,2 x 0,45	1.75	0.44	0.141	3	D3
K26888	M2,2 x 0,45	1.75	0.44	0.141	3	D1
K26892	M3 x 0,5	1.94	0.63	0.141	3	D1
K26898	M3,5 x 0,6	2.00	0.69	0.141	3	D1
K26905	M3,5 x 0,6	2.00	0.69	0.141	3	D11
K26909	M4 x 0,7	2.13	0.75	0.168	4	D2
K26916	M4 x 0,7	2.13	0.75	0.168	4	D11
K26922	M4,5 x 0,75	2.38	0.88	0.194	4	D2
K26929	M4,5 x 0,75	2.38	0.88	0.194	4	D11
K26944	M5 x 0,5	2.38	0.94	0.194	4	D3
K26940	M5 x 0,8	2.38	0.94	0.194	4	D11
K26933	M5 x 0,8	2.38	0.94	0.194	4	D2
K26955	M6 x 1	2.50	1.00	0.255	4	D11
K26948	M6 x 1	2.50	1.00	0.255	4	D3
K26963	M6 x 0,5	2.50	1.00	0.255	4	D3
K26959	M6 x 0,75	2.50	1.00	0.255	4	D3
K26973	M7 x 1	2.72	1.13	0.318	4	D11
K26966	M7 x 1	2.72	1.13	0.318	4	D3
K26992	M8 x 1	2.72	1.13	0.318	4	D3
K26988	M8 x 1	2.72	1.13	0.318	4	D5
K26999	M8 x 1	2.72	1.13	0.318	4	D11
K27003	M8 x 0,75	2.72	1.13	0.318	4	D5
K26984	M8 x 1,25	2.72	1.13	0.318	4	D11
K26977	M8 x 1,25	2.72	1.13	0.318	4	D3
K27035	M10 x 1	2.94	1.25	0.381	4	D5
K27032	M10 x 1	2.94	1.25	0.381	4	D3
K27028	M10 x 1,25	2.94	1.25	0.381	4	D11
K27021	M10 x 1,25	2.94	1.25	0.381	4	D3
K27017	M10 x 1,25	2.94	1.25	0.381	4	D5
K27013	M10 x 1,5	2.94	1.25	0.381	4	D11
K27006	M10 x 1,5	2.94	1.25	0.381	4	D3
K27046	M11 x 1	3.16	1.44	0.323	4	D5
K27042	M11 x 1,5	3.16	1.44	0.323	4	D6
K27077	M12 x 1	3.38	1.66	0.367	4	D5
K27074	M12 x 1,25	3.38	1.66	0.367	4	D11
K27067	M12 x 1,25	3.38	1.66	0.367	4	D3
K27063	M12 x 1,25	3.38	1.66	0.367	4	D5
K27060	M12 x 1,5	3.38	1.66	0.367	4	D6
K27056	M12 x 1,75	3.38	1.66	0.367	4	D11

(continued)

(KHSST Hand • Metric Sizes ANSI • Plug Chamfer continued)



uncoated	D1 size	L	L3	D	number of flutes	pitch diameter limit
K27049	M12 x 1,75	3.38	1.66	0.367	4	D3
K27102	M14 x 1	3.59	1.66	0.429	4	D5
K27081	M14 x 2	3.59	1.66	0.429	4	D3
K27099	M14 x 1,25	3.59	1.66	0.429	4	D4
K27088	M14 x 1,5	3.59	1.66	0.429	4	D6
K27092	M14 x 1,5	3.59	1.66	0.429	4	D3
K27105	M15 x 1	3.81	1.81	0.480	4	D5
K27115	M16 x 2	3.81	1.81	0.480	4	D11
K27108	M16 x 2	3.81	1.81	0.480	4	D4
K27123	M16 x 1,5	3.81	1.81	0.480	4	D3
K27119	M16 x 1,5	3.81	1.81	0.480	4	D6
K27148	M18 x 1	4.03	1.81	0.542	4	D5
K27139	M18 x 1,5	4.03	1.81	0.542	4	D4
K27136	M18 x 1,5	4.03	1.81	0.542	4	D6
K27142	M18 x 1,5	4.03	1.81	0.542	4	D3
K27130	M18 x 2,5	4.03	1.81	0.542	4	D4
K27169	M20 x 1,5	4.47	2.00	0.652	4	D11
K27163	M20 x 1,5	4.47	2.00	0.652	4	D3
K27160	M20 x 1,5	4.47	2.00	0.652	4	D6
K27151	M20 x 2,5	4.47	2.00	0.652	4	D4
K27184	M22 x 1,5	4.69	2.22	0.697	4	D3
K27181	M22 x 1,5	4.69	2.22	0.697	4	D6
K27190	M22 x 1,5	4.69	2.22	0.697	4	D11
K27175	M22 x 2,5	4.69	2.22	0.697	4	D4
K27172	M22 x 2,5	4.69	2.22	0.697	4	D7
K27205	M24 x 2	4.91	2.22	0.760	4	D4
K27202	M24 x 2	4.91	2.22	0.760	4	D7
K27193	M24 x 3	4.91	2.22	0.760	4	D4
K27211	M24 x 1,5	4.91	2.22	0.760	4	D6
K27244	M30 x 1,5	5.44	2.56	1.021	6	D6

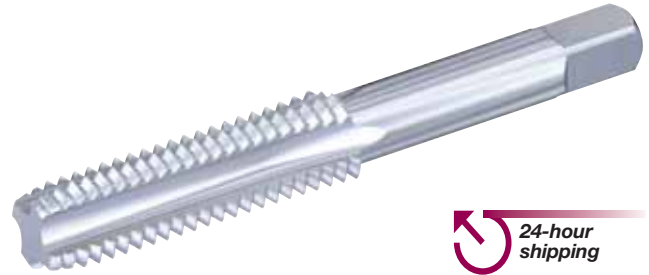
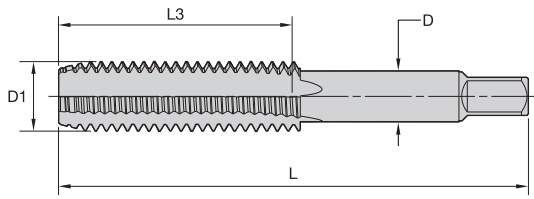


Ships in 24 Hours

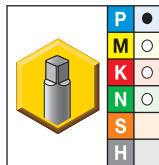
NOTE: M and MF taps may be used in MJ and MJF applications respectively.
Refer to table on page L292 for the recommended pitch diameter limit for class of fit.
Quantities above max will be delivered as regular special order.

Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	23
24	47
48	72



■ **KHSST Hand • Metric Sizes ANSI • Bottoming Chamfer**



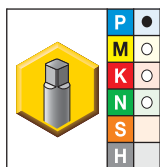
- first choice
- alternate choice

Taps

uncoated	D1 size	L	L3	D	number of flutes	pitch diameter limit
K26879	M1,8 x 0,35	1.69	0.38	0.141	2	D3
K26883	M2,2 x 0,45	1.75	0.44	0.141	3	D3
K26889	M2,2 x 0,45	1.81	0.44	0.141	3	D1
K26886	M2,2 x 0,45	1.81	0.44	0.141	3	D3
K26893	M3 x 0,5	1.94	0.63	0.141	3	D11
K26899	M3,5 x 0,6	2.00	0.69	0.141	3	D1
K26896	M3,5 x 0,6	2.00	0.69	0.141	3	D4
K26906	M3,5 x 0,6	2.00	0.69	0.141	3	D11
K26917	M4 x 0,6	2.13	0.75	0.168	4	D11
K26910	M4 x 0,6	2.13	0.75	0.168	4	D2
K26920	M4,5 x 0,6	2.38	0.88	0.194	4	D4
K26923	M4,5 x 0,6	2.38	0.88	0.194	4	D2
K26930	M4,5 x 0,6	2.38	0.88	0.194	4	D11
K26945	M5 x 0,5	2.38	0.94	0.194	4	D3
K26934	M5 x 0,6	2.38	0.94	0.194	4	D2
K26941	M5 x 0,6	2.38	0.94	0.194	4	D11
K26960	M6 x 0,75	2.50	1.00	0.255	4	D3
K26964	M6 x 0,5	2.50	1.00	0.255	4	D3
K26956	M6 x 1	2.50	1.00	0.255	4	D11
K26949	M6 x 1	2.50	1.00	0.255	4	D3
K26967	M7 x 1	2.72	1.13	0.318	4	D3
K26974	M7 x 1	2.72	1.13	0.318	4	D11
K27004	M8 x 0,75	2.72	1.13	0.318	4	D5
K26993	M8 x 1	2.72	1.13	0.318	4	D3
K26989	M8 x 1	2.72	1.13	0.318	4	D5
K27000	M8 x 1	2.72	1.13	0.318	4	D11
K26985	M8 x 1,25	2.72	1.13	0.318	4	D11
K26978	M8 x 1,25	2.72	1.13	0.318	4	D3
K27033	M10 x 1	2.94	1.25	0.381	4	D3
K27036	M10 x 1	2.94	1.25	0.381	4	D5
K27029	M10 x 1,25	2.94	1.25	0.381	4	D11
K27022	M10 x 1,25	2.94	1.25	0.381	4	D3
K27018	M10 x 1,25	2.94	1.25	0.381	4	D5
K27014	M10 x 1,5	2.94	1.25	0.381	4	D11
K27007	M10 x 1,5	2.94	1.25	0.381	4	D3
K27047	M11 x 1	3.16	1.44	0.323	4	D5
K27043	M11 x 1,5	3.16	1.44	0.323	4	D6
K27078	M12 x 1	3.38	1.66	0.367	4	D5
K27068	M12 x 1,25	3.38	1.66	0.367	4	D3
K27064	M12 x 1,25	3.38	1.66	0.367	4	D5

(continued)

(KHSST Hand • Metric Sizes ANSI • Bottoming Chamfer continued)



uncoated	D1 size	L	L3	D	number of flutes	pitch diameter limit
K27075	M12 x 1,25	3.38	1.66	0.367	4	D11
K27061	M12 x 1,5	3.38	1.66	0.367	4	D6
K27057	M12 x 1,75	3.38	1.66	0.367	4	D11
K27050	M12 x 1,75	3.38	1.66	0.367	4	D3
K27103	M14 x 1	3.59	1.66	0.429	4	D5
K27100	M14 x 1,25	3.59	1.66	0.429	4	D4
K27089	M14 x 1,5	3.59	1.66	0.429	4	D6
K27093	M14 x 1,5	3.59	1.66	0.429	4	D3
K27082	M14 x 2	3.59	1.66	0.429	4	D3
K27106	M15 x 1	3.81	1.81	0.48	4	D5
K27124	M16 x 1,5	3.81	1.81	0.48	4	D3
K27120	M16 x 1,5	3.81	1.81	0.48	4	D6
K27109	M16 x 2	3.81	1.81	0.48	4	D4
K27116	M16 x 2	3.81	1.81	0.48	4	D11
K27149	M18 x 1	4.03	1.81	0.542	4	D5
K27140	M18 x 1,5	4.03	1.81	0.542	4	D4
K27137	M18 x 1,5	4.03	1.81	0.542	4	D6
K27143	M18 x 1,5	4.03	1.81	0.542	4	D3
K27131	M18 x 2,5	4.03	1.81	0.542	4	D4
K27164	M20 x 1,5	4.47	2.00	0.652	4	D3
K27161	M20 x 1,5	4.47	2.00	0.652	4	D6
K27170	M20 x 1,5	4.47	2.00	0.652	4	D11
K27152	M20 x 2,5	4.47	2.00	0.652	4	D4
K27185	M22 x 1,5	4.69	2.22	0.697	4	D3
K27182	M22 x 1,5	4.69	2.22	0.697	4	D6
K27191	M22 x 1,5	4.69	2.22	0.697	4	D11
K27176	M22 x 2,5	4.69	2.22	0.697	4	D4
K27173	M22 x 2,5	4.69	2.22	0.697	4	D7
K27212	M24 x 1,5	4.91	2.22	0.76	4	D6
K27206	M24 x 2	4.91	2.22	0.76	4	D4
K27203	M24 x 2	4.91	2.22	0.76	4	D7
K27194	M24 x 3	4.91	2.22	0.76	4	D4
K27245	M30 x 1,5	5.44	2.56	1.021	6	D6

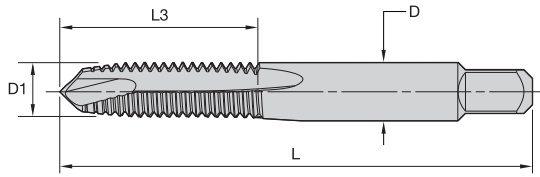


Ships in 24 Hours

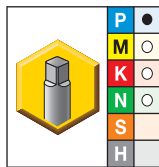
NOTE: M and MF taps may be used in MJ and MJF applications respectively.
Refer to table on page L292 for the recommended pitch diameter limit for class of fit.
Quantities above max will be delivered as regular special order.

Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	23
24	47
48	72



■ **KHSST Spiral Point • Metric Sizes ANSI • Plug Chamfer**



● first choice
○ alternate choice

Taps

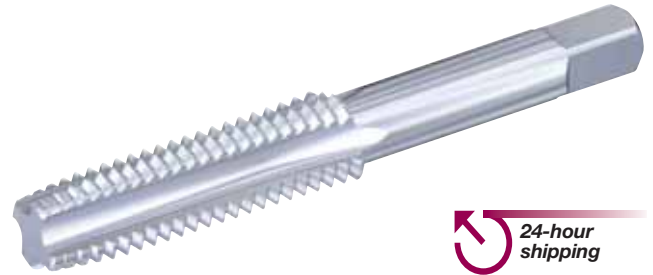
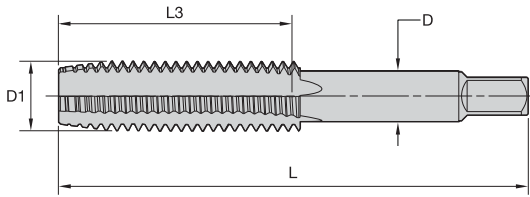
uncoated	D1 size	L	L3	D	number of flutes	pitch diameter limit
K26880	M1,8 x 0,35	1.69	0.38	0.141	2	D3
K26884	M2,2 x 0,45	1.75	0.44	0.141	2	D3
K26890	M2,2 x 0,45	1.81	0.44	0.141	2	D1
K26918	M4 x 0,70	2.13	0.75	0.168	2	D11
K26946	M5 x 0,50	2.38	0.94	0.194	2	D3
K26942	M5 x 0,80	2.38	0.94	0.194	2	D11
K26957	M6 x 1	2.50	1.00	0.255	2	D11
K26961	M6 x 0,75	2.50	1.00	0.255	2	D3
K26990	M8 x 1	2.72	1.13	0.318	2	D5
K26986	M8 x 1,25	2.72	1.13	0.318	2	D11
K27040	M10 x 1	2.94	1.25	0.381	3	D5
K27023	M10 x 1,25	2.94	1.25	0.381	3	D3
K27019	M10 x 1,25	2.94	1.25	0.381	3	D5
K27015	M10 x 1,5	2.94	1.25	0.381	3	D11
K27044	M11 x 1,5	3.16	1.44	0.323	3	D6
K27079	M12 x 1	3.38	1.66	0.367	3	D5
K27065	M12 x 1,25	3.38	1.66	0.367	3	D5
K27058	M12 x 1,75	3.38	1.66	0.367	3	D11
K27090	M14 x 1,5	3.59	1.66	0.429	3	D6
K27121	M16 x 1,5	3.81	1.81	0.48	3	D6

Ships in 24 Hours

NOTE: M and MF taps may be used in MJ and MJF applications respectively.
Refer to table on page L292 for the recommended pitch diameter limit for class of fit.
Quantities above max will be delivered as regular special order.

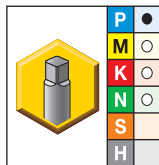
Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	23
24	47
48	72



24-hour shipping

■ KHSST Hand • Machine Screw and Fractional Sizes • Taper, Plug, or Bottoming Chamfer



● first choice
○ alternate choice

uncoated	D1 size	L	L3	D	number of flutes	H limit max	TPI max
K64250	#0	1.63	0.31	0.141	2	3	100
K64251	#1	1.69	0.38	0.141	2	4	100
K64252	#2	1.75	0.44	0.141	2	4	100
K64264	#2	1.75	0.44	0.141	3	4	100
K64253	#3	1.81	0.50	0.141	2	5	100
K64265	#3	1.81	0.50	0.141	3	5	100
K64254	#4	1.88	0.56	0.141	2	5	100
K64266	#4	1.75	0.56	0.141	3	5	100
K64255	#5	1.94	0.63	0.141	2	5	100
K64267	#5	1.81	0.63	0.141	3	5	100
K64256	#6	2.00	0.69	0.141	2	7	100
K64268	#6	2.00	0.69	0.141	3	7	100
K64836	#6	2.00	0.69	0.141	4	7	100
K64257	#8	2.13	0.75	0.168	2	7	100
K64269	#8	2.13	0.75	0.168	3	7	100
K64278	#8	2.13	0.75	0.168	4	7	100
K64258	#10	2.38	0.88	0.194	2	7	100
K64270	#10	2.38	0.88	0.194	3	7	100
K64279	#10	2.38	0.88	0.194	4	7	100
K64260	#12	2.38	0.94	0.220	2	7	100
K65692	#12	2.38	0.94	0.220	3	7	100
K64281	#12	2.38	0.94	0.220	4	7	100
K64261	1/4	2.50	1.00	0.255	2	7	80
K64272	1/4	2.50	1.00	0.255	3	7	80
K64282	1/4	2.50	1.00	0.255	4	7	80
K64262	5/16	2.72	1.13	0.318	2	7	80
K64273	5/16	2.72	1.13	0.318	3	7	80
K64283	5/16	2.72	1.13	0.318	4	7	80
K64263	3/8	2.94	1.25	0.381	2	7	80
K64274	3/8	2.94	1.25	0.381	3	7	80
K64284	3/8	2.94	1.25	0.381	4	7	80
K64276	7/16	3.16	1.44	0.323	3	15	80
K64286	7/16	3.16	1.44	0.323	4	15	80
K64277	1/2	3.38	1.66	0.367	3	15	80



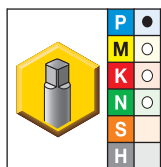
(continued)

Special Taps from Blanks

Hand Taps • Through and Blind Holes in General Machining Applications



(KHSST Hand • Machine Screw and Fractional Sizes • Taper, Plug, or Bottoming Chamfer continued)



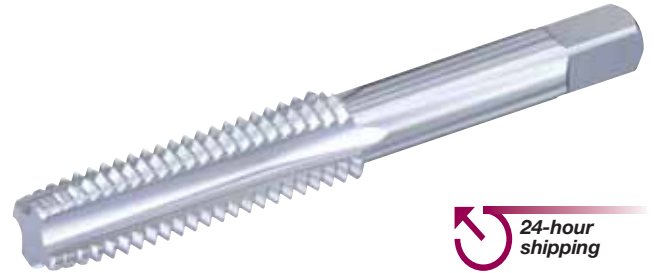
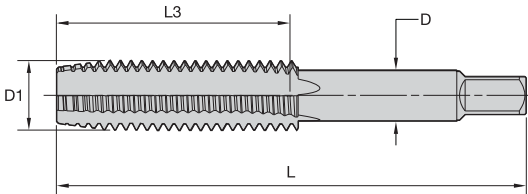
uncoated	D1 size	L	L3	D	number of flutes	H limit max	TPI max
K64287	1/2	3.38	1.66	0.367	4	15	80
K65693	1/2	3.38	1.66	0.367	6	15	80
K65100	9/16	3.59	1.66	0.429	3	15	64
K64288	9/16	3.59	1.66	0.429	4	15	64
K65694	9/16	3.59	1.66	0.429	6	15	64
K65101	5/8	3.81	1.81	0.480	3	15	64
K64289	5/8	3.81	1.81	0.480	4	15	64
K65695	5/8	3.81	1.81	0.480	6	15	64
K64290	11/16	4.03	1.81	0.542	4	15	64
K65696	11/16	4.03	1.81	0.542	6	15	64
K65103	3/4	4.25	2.00	0.590	3	15	64
K64291	3/4	4.25	2.00	0.590	4	15	64
K65697	3/4	4.25	2.00	0.590	6	15	64
K64292	13/16	4.47	2.00	0.652	4	15	64
K65698	13/16	4.47	2.00	0.652	6	15	64
K64293	7/8	4.69	2.22	0.697	4	15	64
K65699	7/8	4.69	2.22	0.697	6	15	64
K64294	15/16	4.91	2.22	0.760	4	15	64
K65700	15/16	4.91	2.22	0.760	6	15	64
K64295	1	3.75	2.50	0.800	4	15	64
K65701	1	5.13	2.50	0.800	6	15	64

Ships in 24 Hours

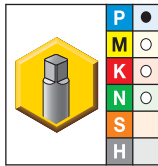
NOTE: Consult customer service for price and delivery of taps with more threads per inch or finer pitch. Quantities above max will be delivered as regular special order.

Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	23
24	47
48	72



■ KHSST Oversized Hand • Machine Screw and Fractional Sizes • Taper, Plug, or Bottoming Chamfer



- first choice
- alternate choice

uncoated	D1 size	L	L3	D	number of flutes	H limit max	TPI max
K65730	#4	1.88	0.56	0.141	2	11	100
K65731	#5	1.94	0.63	0.141	2	11	100
K65732	#6	2.00	0.69	0.141	2	13	100
K65735	#6	2.00	0.69	0.141	3	13	100
K65733	#8	2.13	0.75	0.168	2	13	100
K65736	#8	2.13	0.75	0.168	3	13	100
K64811	#8	2.13	0.75	0.168	4	13	100
K65734	#10	2.38	0.88	0.194	2	13	100
K65737	#10	2.38	0.88	0.194	3	13	100
K64812	#10	2.38	0.88	0.194	4	13	100
K65738	#12	2.38	0.94	0.220	3	13	100
K65752	#12	2.38	0.94	0.220	4	13	100
K65739	1/4	2.50	1.00	0.255	3	13	80
K64813	1/4	2.50	1.00	0.255	4	13	80
K65740	5/16	2.72	1.13	0.318	3	13	80
K64814	5/16	2.72	1.13	0.318	4	13	80
K65741	3/8	2.94	1.25	0.381	3	13	80
K64815	3/8	2.94	1.25	0.381	4	13	80

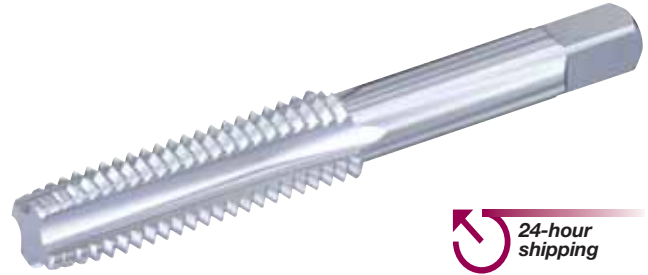
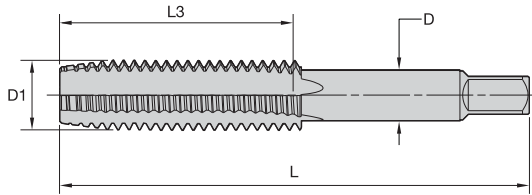


Ships in 24 Hours

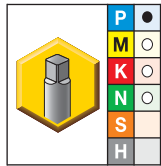
NOTE: Consult customer service for price and delivery of taps with more threads per inch or finer pitch. Quantities above max will be delivered as regular special order.

Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	23
24	48



■ KHSST Hand • Large Fractional Sizes • Long Series • Taper, Plug or Bottoming Chamfer Tap



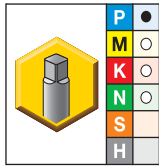
● first choice
○ alternate choice

Taps

uncoated	D1 size	L	L3	D	number of flutes	H limit max	TPI max
K64296	1 1/16	5.13	2.50	0.896	4	21	13
K65702	1 1/16	5.13	2.50	0.896	6	21	13
K64298	1 1/8	5.44	2.56	0.896	4	21	13
K65703	1 1/8	5.44	2.56	0.896	6	21	13
K64300	1 3/16	5.44	2.56	1.021	4	21	13
K64306	1 3/16	5.44	2.56	1.021	6	21	13
K64301	1 1/4	5.75	2.56	1.021	4	21	13
K64308	1 1/4	5.75	2.56	1.021	6	21	13
K64302	1 5/16	5.75	2.56	1.108	4	21	13
K64310	1 5/16	5.75	2.56	1.108	6	21	13
K64303	1 3/8	6.06	3.00	1.108	4	21	13
K64312	1 3/8	6.06	3.00	1.108	6	21	13
K64304	1 7/16	6.06	3.00	1.233	4	21	13
K65704	1 7/16	6.06	3.00	1.233	6	21	13
K64305	1 1/2	6.38	3.00	1.233	4	21	13
K64316	1 1/2	6.38	3.00	1.233	6	21	13
K64318	1 5/8	6.69	3.19	1.305	6	21	9
K64319	1 3/4	7.00	3.19	1.430	6	21	9
K64320	1 7/8	7.31	3.56	1.519	6	21	9
K65107	1 7/8	7.31	3.56	1.519	8	21	9
K64321	2	7.63	3.56	1.644	6	21	9
K65109	2	7.63	3.56	1.644	8	21	9
K64322	2 1/8	8.00	3.56	1.769	6	21	9
K64323	2 1/4	8.25	3.56	1.894	6	21	9

(continued)

(KHSST Hand • Large Fractional Sizes • Long Series • Taper, Plug or Bottoming Chamfer Tap continued)



uncoated	D1 size	L	L3	D	number of flutes	H limit max	TPI max
K65113	2 1/4	8.25	3.56	1.894	8	21	9
K64324	2 3/8	8.50	4.00	2.019	6	21	9
K64325	2 1/2	8.75	4.00	2.100	6	21	9
K65117	2 1/2	8.75	4.00	2.100	8	21	9
K64326	2 5/8	8.75	4.00	2.225	6	21	9
K65119	2 5/8	8.75	4.00	2.225	8	21	9
K64327	2 3/4	9.25	4.00	2.350	6	21	9
K65121	2 3/4	9.25	4.00	2.350	10	21	9

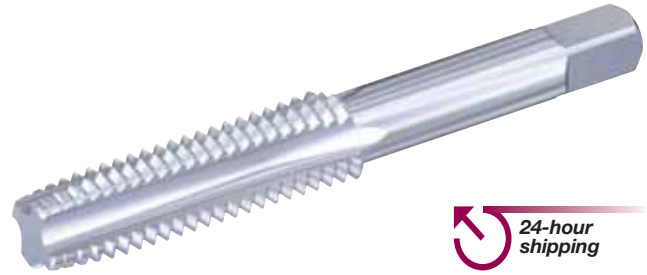
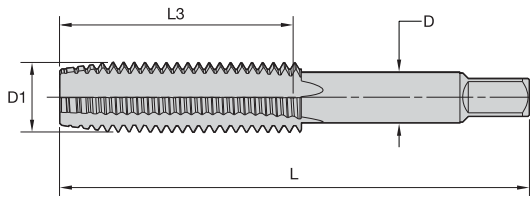
Ships in 24 Hours

NOTE: Consult customer service for price and delivery of taps with more threads per inch or finer pitch. Quantities above max will be delivered as regular special order.

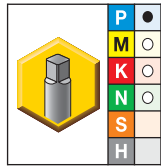
Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	24





■ KHSST Hand • Large Fractional Sizes • Short Series • Plug or Bottoming Chamfer



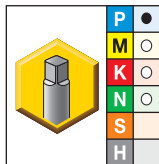
● first choice
○ alternate choice

Taps

uncoated	D1 size	L	L3	D	number of flutes	H limit max	TPI	
							min	max
K64297	1 1/6	4.00	1.50	0.896	6	21	14	55
K64835	1 1/8	4.00	1.50	0.896	4	21	14	55
K64299	1 1/8	4.00	1.50	0.896	6	21	14	55
K64307	1 3/16	4.00	1.50	1.021	6	21	14	55
K64309	1 1/4	4.00	1.50	1.021	6	21	14	55
K64311	1 5/16	4.00	1.50	1.108	6	21	14	55
K64313	1 3/8	4.00	1.50	1.108	6	21	14	55
K64315	1 7/16	4.00	1.50	1.233	6	21	14	55
K64317	1 1/2	4.00	1.50	1.233	6	21	14	55
K65104	1 9/16	5.00	2.00	1.305	6	21	10	55
K64334	1 5/8	5.00	2.00	1.305	6	21	10	55
K65105	1 11/16	5.00	2.00	1.430	6	21	10	55
K64335	1 3/4	5.00	2.00	1.430	6	21	10	55
K65106	1 13/16	5.00	2.00	1.519	6	21	10	55
K64336	1 7/8	5.00	2.00	1.519	6	21	10	55
K65108	1 7/8	5.00	2.00	1.519	8	21	10	55
K64337	2	5.00	2.00	1.644	6	21	10	55
K64841	2	5.00	2.00	1.644	8	21	10	55
K64338	2 1/8	5.25	2.00	1.769	6	21	10	47
K65112	2 1/8	5.25	2.00	1.769	8	21	10	47
K64339	2 1/4	5.25	2.00	1.894	6	21	10	47
K65114	2 1/4	5.25	2.00	1.849	8	21	10	47

(continued)

(KHSST Hand • Large Fractional Sizes • Short Series • Plug or Bottoming Chamfer continued)



uncoated	D1 size	L	L3	D	number of flutes	H limit max	TPI	
							min	max
K64340	2 3/8	5.25	2.00	2.019	6	21	10	47
K65116	2 3/8	5.25	2.00	2.019	8	21	10	47
K64341	2 1/2	5.25	2.00	2.100	6	21	10	47
K65118	2 1/2	5.25	2.00	2.100	8	21	10	47
K63942	2 5/8	5.50	2.00	2.100	6	21	10	47
K65120	2 5/8	5.50	2.00	2.100	8	21	10	47
K64342	2 3/4	5.50	2.00	2.100	6	21	10	47
K65122	2 3/4	5.50	2.00	2.100	10	21	10	47

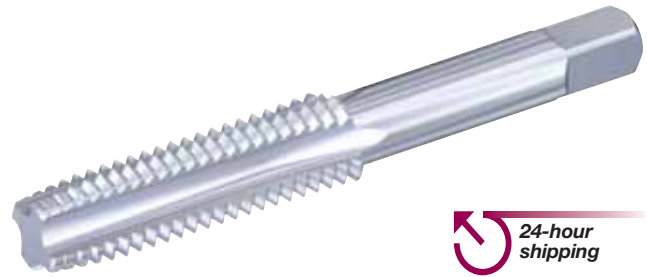
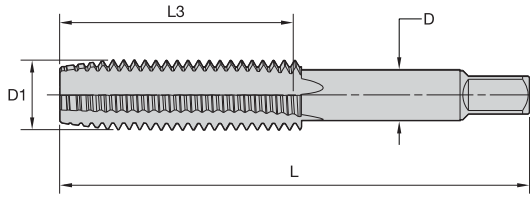
Ships in 24 Hours

NOTE: Consult customer service for price and delivery of taps with more threads per inch or finer pitch. Quantities above max will be delivered as regular special order.

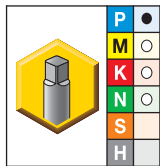
Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	24





■ KHSST Hand • Taper, Plug, or Bottoming Chamfer • Metric ANSI



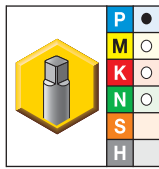
- first choice
- alternate choice

Taps

uncoated	D1 size	L	L3	D	number of flutes	D limit max	pitch min
K65288	M1.5	1.63	0.31	0.141	2	3	0.3
K65708	M1.6	1.69	0.31	0.141	2	3	0.3
K65289	M1.8	1.69	0.38	0.141	2	4	0.3
K65290	M2	1.75	0.44	0.141	2	4	0.3
K65301	M2	1.75	0.44	0.141	3	4	0.3
K65713	M2.2	1.75	0.44	0.141	3	4	0.3
K65291	M2.5	1.81	0.50	0.141	2	5	0.3
K65302	M2.5	1.81	0.50	0.141	3	5	0.3
K65292	M3	1.94	0.63	0.141	2	5	0.3
K65303	M3	1.94	0.63	0.141	3	5	0.3
K64852	M3	1.94	0.63	0.141	4	5	0.3
K65293	M3.5	2.00	0.69	0.141	2	7	0.3
K65304	M3.5	2.00	0.69	0.141	3	7	0.3
K64850	M3.5	2.00	0.69	0.141	4	7	0.3
K65294	M4	2.13	0.75	0.168	2	7	0.3
K65305	M4	2.13	0.75	0.168	3	7	0.3
K65317	M4	2.13	0.75	0.168	4	7	0.3
K65306	M4.5	2.38	0.88	0.194	3	7	0.3
K65318	M4.5	2.38	0.88	0.194	4	7	0.3
K64259	M5	2.38	0.88	0.194	2	7	0.3
K64271	M5	2.38	0.88	0.194	3	7	0.3
K64280	M5	2.38	0.88	0.194	4	7	0.3
K65298	M6	2.50	1.00	0.255	2	7	0.3
K65308	M6	2.50	1.00	0.255	3	7	0.3
K65321	M6	2.50	1.00	0.255	4	7	0.3
K65715	M6.3	2.50	1.00	0.255	3	7	0.3
K65717	M6.3	2.50	1.00	0.255	4	7	0.3
K65299	M7	2.72	1.13	0.318	2	7	0.3
K65309	M7	2.72	1.13	0.318	3	7	0.3
K65322	M7	2.72	1.13	0.318	4	7	0.3
K65711	M8	2.72	1.13	0.318	2	7	0.3
K65716	M8	2.72	1.13	0.318	3	7	0.3
K65718	M8	2.72	1.13	0.318	4	7	0.3
K65300	M9	2.94	1.25	0.381	2	7	0.3

(continued)

(KHSST Hand • Taper, Plug, or Bottoming Chamfer • Metric ANSI continued)



uncoated	D1 size	L	L3	D	number of flutes	D limit max	pitch min
K65310	M9	2.94	1.25	0.381	3	7	0.3
K65323	M9	2.94	1.25	0.381	4	7	0.3
K65712	M10	2.94	1.25	0.381	2	7	0.3
K64275	M10	2.94	1.25	0.381	3	7	0.3
K64285	M10	2.94	1.25	0.381	4	7	0.3
K65312	M11	3.16	1.44	0.323	3	15	0.3
K65325	M11	3.16	1.44	0.323	4	15	0.3
K65313	M12	3.38	1.66	0.367	3	15	0.3
K65326	M12	3.38	1.66	0.367	4	15	0.3
K65719	M12	3.38	1.66	0.367	6	15	0.3
K65314	M14	3.59	1.66	0.429	3	15	0.4
K65327	M14	3.59	1.66	0.429	4	15	0.4
K65720	M14	3.59	1.66	0.429	6	15	0.4
K64831	M15	3.81	1.81	0.480	4	15	0.4
K65315	M16	3.81	1.81	0.480	3	15	0.4
K65328	M16	3.81	1.81	0.480	4	15	0.4
K65721	M16	3.81	1.81	0.480	6	15	0.4
K65316	M18	4.03	1.81	0.542	3	15	0.4
K65329	M18	4.03	1.81	0.542	4	15	0.4
K65722	M18	4.03	1.81	0.542	6	15	0.4
K65330	M20	4.47	2.00	0.652	4	15	0.4
K65723	M20	4.47	2.00	0.652	6	15	0.4
K65331	M22	4.69	2.22	0.697	4	15	0.4
K65724	M22	4.69	2.22	0.697	6	15	0.4
K65332	M24	4.91	2.22	0.760	4	15	0.4
K65725	M24	4.91	2.22	0.760	6	15	0.4
K65333	M25	3.75	2.50	0.800	4	15	0.4
K65726	M25	5.13	2.50	0.800	6	15	0.4

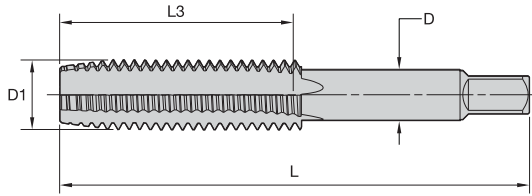


Ships in 24 Hours

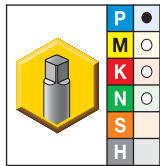
NOTE: Consult customer service for price and delivery of taps with more threads per inch or finer pitch. Quantities above max will be delivered as regular special order.

Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	23
24	47
48	72



■ KHSST Oversized Hand • Taper, Plug, or Bottoming Chamfer • Metric ANSI



● first choice
○ alternate choice

Taps

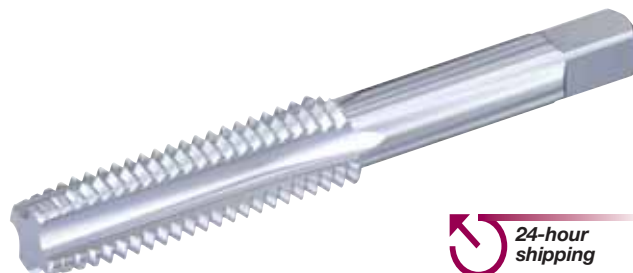
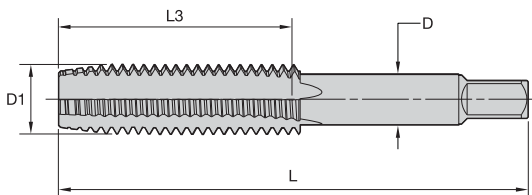
uncoated	D1 size	L	L3	D	number of flutes	D limit max	pitch min
K65783	M3.5	2.00	0.69	0.141	3	13	0.3
K65433	M4	2.13	0.75	0.168	4	13	0.3
K65784	M4	2.13	0.75	0.168	3	13	0.3
K65434	M4.5	2.38	0.88	0.194	4	13	0.3
K65804	M5	2.38	0.88	0.194	3	13	0.3
K65806	M5	2.38	0.88	0.194	4	13	0.3
K65436	M6	2.50	1.00	0.255	4	13	0.3
K65787	M6	2.50	1.00	0.255	3	13	0.3
K65437	M7	2.72	1.13	0.318	4	13	0.3
K65789	M8	2.72	1.13	0.318	3	13	0.3
K65800	M8	2.72	1.13	0.318	4	13	0.3
K65438	M9	2.94	1.25	0.381	4	13	0.3
K65808	M10	2.94	1.25	0.381	4	13	0.3

Ships in 24 Hours

NOTE: Consult customer service for price and delivery of taps with more threads per inch or finer pitch. Quantities above max will be delivered as regular special order.

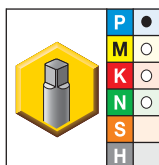
Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	23
24	48



24-hour shipping

■ KHSST Hand • Large Metric Sizes • Long Series • Taper, Plug or Bottoming Chamfer • Metric ANSI



● first choice
○ alternate choice

uncoated	D1 size	L	L3	D	number of flutes	D limit max	pitch min
K65334	M27	5.13	2.50	0.896	4	21	2
K65727	M27	5.13	2.50	0.896	6	21	2
K65335	M28	5.44	2.56	0.896	4	21	2
K65728	M28	5.44	2.56	0.896	6	21	2
K65336	M30	5.44	2.56	1.021	4	21	2
K65342	M30	5.44	2.56	1.021	6	21	2
K65337	M33	5.75	2.56	1.108	4	21	2
K65344	M33	5.75	2.56	1.108	6	21	2
K65338	M36	6.06	3.00	1.108	4	21	2
K65729	M36	6.06	3.00	1.108	6	21	2
K65339	M38	6.38	3.00	1.233	4	21	2
K65347	M38	6.38	3.00	1.233	6	21	2
K65349	M39	6.69	3.19	1.305	6	21	3
K64856	M42	7.00	3.19	1.430	6	21	3
K65362	M45	7.31	3.56	1.519	8	21	3
K65351	M45	7.31	3.56	1.519	6	21	3
K65353	M48	7.63	3.56	1.644	6	21	3
K65364	M48	7.63	3.56	1.644	8	21	3
K65355	M56	8.25	3.56	1.894	6	21	3
K65366	M56	8.25	3.56	1.894	8	21	3
K65368	M64	8.75	4.00	2.250	8	21	3
K65357	M64	8.75	4.00	2.250	6	21	3



Ships in 24 Hours

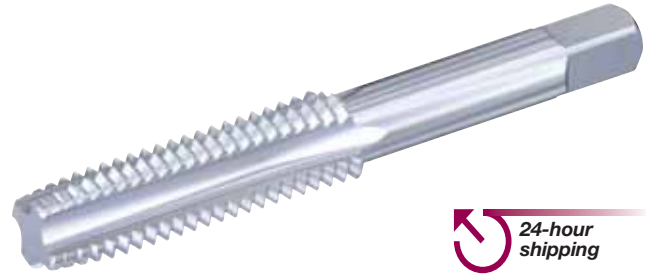
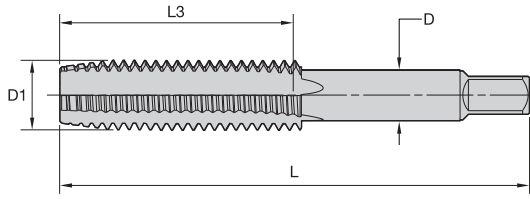
NOTE: Consult customer service for price and delivery of taps with more threads per inch or finer pitch. Quantities above max will be delivered as regular special order.

Pricing Based on Order Quantity

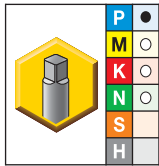
min	max
1	1
2	2
3	5
6	8
9	11
12	24

Special Taps from Blanks

Large-Sized Hand Taps • Through Holes in General Machining Applications



■ KHSST Hand • Large Metric Sizes • Short Series • Plug or Bottoming Chamfer • Metric ANSI



- first choice
- alternate choice

Taps

uncoated	D1 size	L	L3	D	number of flutes	D limit max	pitch	
							min	max
K65340	M27	4.00	1.50	0.896	6	21	0.5	3
K65430	M27	4.00	1.50	0.896	6	21	0.5	3
K65341	M28	4.00	1.50	0.896	6	21	0.5	3
K65343	M30	4.00	1.50	1.021	6	21	0.5	3
K65345	M33	4.00	1.50	1.108	6	21	0.5	3
K65346	M36	4.00	1.50	1.233	6	21	0.5	3
K65348	M38	4.00	1.50	1.233	6	21	0.5	3
K65350	M39	5.00	2.00	1.305	6	21	0.5	3
K65352	M45	5.00	2.00	1.519	6	21	0.5	3
K65354	M48	5.00	2.00	1.644	6	21	0.5	3
K65356	M56	5.25	2.00	1.894	6	21	0.6	3
K65358	M64	5.50	2.00	2.100	6	21	0.6	3

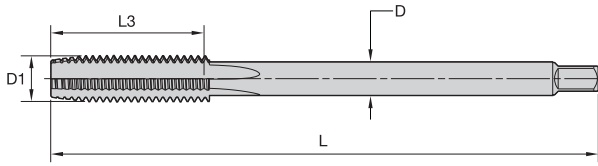
Ships in 24 Hours

NOTE: Consult customer service for price and delivery of taps with more threads per inch or finer pitch. Quantities above max will be delivered as regular special order.

Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	24





■ KHSST Extended-Length Hand Taps • Machine Screw and Fractional • Taper, Plug, or Bottoming Chamfer

L=4"		L=6"		L=8"		L=10"		D1 size	L3	D	number of flutes	H limit max	TPI max
uncoated	uncoated	uncoated	uncoated	uncoated	uncoated	uncoated	uncoated						
K65814	K65815	—	—	#6	0.69	0.141	2	13	100				
K65214	K64575	—	—	#6	0.69	0.141	3	13	100				
K67184	—	—	—	#6	0.69	0.141	4	13	100				
K65816	K65817	—	—	#8	0.75	0.168	2	13	100				
K65826	K65827	—	—	#8	0.75	0.168	3	13	100				
K65215	K65202	—	—	#8	0.75	0.168	4	13	100				
K65818	K65819	—	—	#10	0.88	0.194	2	13	100				
K65828	K65829	—	—	#10	0.88	0.194	3	13	100				
K65216	K64577	—	—	#10	0.88	0.194	4	13	100				
—	K65820	K65821	—	1/4	1.00	0.255	2	13	80				
—	K65830	K65831	—	1/4	1.00	0.255	3	13	80				
—	K65230	K65254	—	1/4	1.00	0.255	4	13	80				
—	K65823	K65824	—	5/16	1.13	0.318	2	13	80				
—	K65833	K65834	K65835	5/16	1.13	0.318	3	13	80				
—	K67231	K65255	K65279	5/16	1.13	0.318	4	13	80				
—	K67259	—	—	3/8	1.25	0.381	2	13	80				
—	K65836	K65837	—	3/8	1.25	0.381	3	13	80				
—	K65232	K65256	K65280	3/8	1.25	0.381	4	13	80				
—	K65839	—	—	7/16	1.44	0.323	3	15	80				
—	K65234	K65258	K65282	7/16	1.44	0.323	4	15	80				
—	K65842	K65843	—	1/2	1.66	0.367	3	15	80				
—	K65235	K65259	K65283	1/2	1.66	0.367	4	15	80				
—	K65845	K65846	K65847	5/8	1.81	0.480	3	15	64				
—	K65236	K65260	K65284	5/8	1.81	0.480	4	15	64				
—	K65848	K65849	K65850	3/4	2.00	0.590	3	15	64				
—	K65237	K65261	K65285	3/4	2.00	0.590	4	15	64				



Ships in 24 Hours

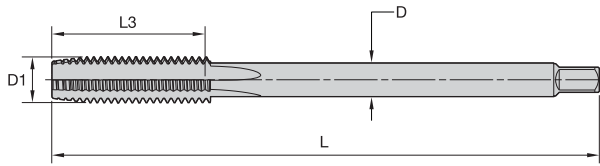
NOTE: Consult customer service for price and delivery of taps with more threads per inch or finer pitch. Quantities above max will be delivered as regular special order.

Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	23
24	48

Special Taps from Blanks

Extension Hand Taps • Small Shank • Long-Reach Applications



■ KHSST Extended Length Hand Taps • Taper, Plug or Bottoming Chamfer Tap



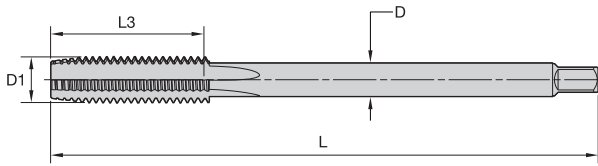
uncoated	uncoated	D1 size	L	L3	D	number of flutes	H limit max	TPI max
K67208	K67211	1/4	4.00	1.00	0.185	2	13	80
K67209	K67212	1/4	4.00	1.00	0.185	3	13	80
K67210	K67213	1/4	4.00	1.00	0.185	4	13	80
K67226	K67229	5/16	4.00	1.13	0.240	2	13	80
K67227	K67230	5/16	4.00	1.13	0.240	3	13	80
K67228	—	5/16	4.00	1.13	0.240	4	13	80
K67253	K67256	3/8	4.00	1.25	0.275	2	13	80
K67254	K67257	3/8	4.00	1.25	0.275	3	13	80
K67255	K67258	3/8	4.00	1.25	0.275	4	13	80

Ships in 24 Hours

NOTE: Consult customer service for price and delivery of taps with more threads per inch or finer pitch. Quantities above max will be delivered as regular special order.

Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	23
24	48



24-hour shipping

■ KHSST Extended-Length Hand Taps • Taper, Plug, or Bottoming Chamfer • Metric ANSI

				D1 size	L3	D	number of flutes	H limit max	TPI max
uncoated	uncoated	uncoated	uncoated	M3.5	0.69	0.141	2	13	0.3
K65871	—	—	—	M3.5	0.69	0.141	3	13	0.3
K65491	—	—	—	M3.5	0.69	0.141	4	13	0.3
K67188	K67189	—	—	M4	0.75	0.168	2	13	0.3
K65873	K65874	—	—	M4	0.75	0.168	3	13	0.3
—	K65890	—	—	M4	0.75	0.168	4	13	0.3
—	K65495	—	—	M5	0.88	0.194	3	13	0.3
K65917	K65918	—	—	M5	0.88	0.194	4	13	0.3
K65919	K65920	—	—	M6	1.00	0.255	2	13	0.3
—	K65877	—	K65895	M6	1.00	0.255	3	13	0.3
—	K65893	—	K65581	M6	1.00	0.255	4	13	0.3
—	K65571	—	—	M8	1.13	0.318	2	13	0.3
—	—	K65887	—	M8	1.13	0.318	3	13	0.3
—	K65902	K65903	K65904	M8	1.13	0.318	4	13	0.3
—	K65859	K65860	K65861	M9	1.25	0.381	2	13	0.3
—	K67269	—	—	M10	1.25	0.381	2	13	0.3
—	K67279	—	—	M10	1.25	0.381	3	13	0.3
—	K65905	K65906	K65907	M10	1.25	0.381	4	13	0.3
—	K65233	K65257	K65281	M11	1.44	0.323	3	15	0.3
—	K65865	—	—	M11	1.44	0.323	4	15	0.3
—	K65911	K65912	K65910	M12	1.44	0.367	3	15	0.4
—	K65908	K65909	K65584	M12	1.44	0.367	4	15	0.4
—	K65574	K65579	—	M16	1.81	0.480	3	15	0.4
—	K65868	K65869	K65870	M16	1.81	0.480	4	15	0.4
—	K65914	K65915	K65916						



Ships in 24 Hours

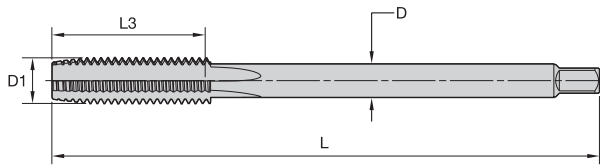
NOTE: Consult customer service for price and delivery of taps with more threads per inch or finer pitch. Quantities above max will be delivered as regular special order.

Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	23
24	48

Special Taps from Blanks

Extension Hand Taps • Small Shank • Long-Reach Applications



■ KHSST Extended-Length Hand Taps • Small Shank • Taper, Plug, or Bottoming Chamfer • Metric ANSI



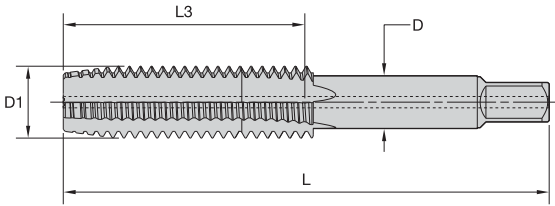
uncoated	uncoated	D1 size	L3	D	number of flutes	H limit max	TPI max
K67217	K67220	M6	1.00	0.185	2	13	0.3
K67218	K67221	M6	1.00	0.185	3	13	0.3
K67219	K67222	M6	1.00	0.185	4	13	0.3
K67235	K67238	M7	1.13	0.240	2	13	0.3
K67236	K67239	M7	1.13	0.240	3	13	0.3
K67237	K67240	M7	1.13	0.240	4	13	0.3
K67244	K67247	M8	1.13	0.240	2	13	0.3
K67245	K67248	M8	1.13	0.240	3	13	0.3
K67246	K67249	M8	1.13	0.240	4	13	0.3
K67263	K67266	M9	1.25	0.275	2	13	0.3
K67264	K67267	M9	1.25	0.275	3	13	0.3
K67265	K67268	M9	1.25	0.275	4	13	0.3
K67273	K67276	M10	1.25	0.275	2	13	0.3
K67274	K67277	M10	1.25	0.275	3	13	0.3
K67275	K67278	M10	1.25	0.275	4	13	0.3

Ships in 24 Hours

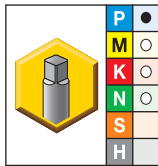
NOTE: Consult customer service for price and delivery of taps with more threads per inch or finer pitch. Quantities above max will be delivered as regular special order.

Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	23
24	48



■ KHSST Hand • Fractional Sizes • Plug or Bottoming Chamfer • Internal Coolant



- first choice
- alternate choice

uncoated	D1 size	L	L3	D	number of flutes	H limit max	TPI max
K65753	3/8	2.94	0.75	0.381	3	13	80
K65754	7/16	3.16	0.88	0.323	4	13	80
K65755	1/2	3.38	0.94	0.367	4	13	80
K65756	9/16	3.59	1.00	0.429	4	13	64
K65757	5/8	3.81	1.09	0.480	4	13	64
K65758	3/4	4.25	1.22	0.590	4	13	64
K65760	1	5.13	1.50	0.800	4	13	64

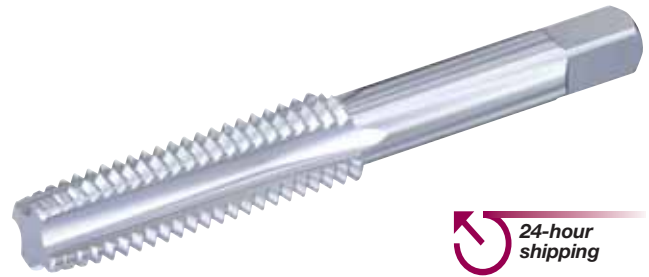
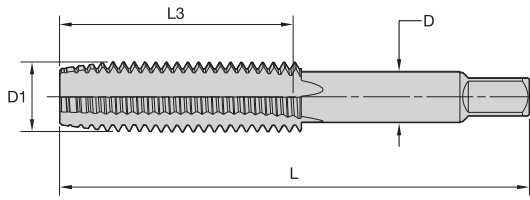


Ships in 24 Hours

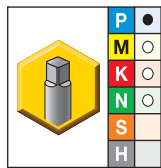
NOTE: Consult customer service for price and delivery of taps with more threads per inch or finer pitch. For through hole application, oil hole taps with coolant exiting in the chamfer area are recommended; please consult customer service for price and delivery. Quantities above max will be delivered as regular special order.

Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	23
24	47
48	72



■ KHSST STI Hand • Machine Screw and Fractional Sizes • Taper, Plug, or Bottoming Chamfer



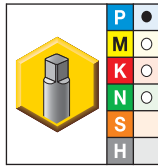
● first choice
○ alternate choice

Taps

uncoated	D1 size	L	L3	D	number of flutes	H limit max
K67604	#2 - 56	1.88	0.56	0.141	2	5
K65286	#2 - 56	1.75	0.56	0.141	3	5
K67605	#3 - 48	2.00	0.63	0.141	2	5
K65287	#3 - 48	2.00	0.63	0.141	3	5
K67606	#3 - 48	2.00	0.63	0.141	4	5
K68376	#3 - 56	1.81	0.63	0.141	3	5
K67607	#4 - 40	2.00	0.69	0.141	2	7
K64616	#4 - 40	2.00	0.69	0.141	3	7
K67608	#4 - 40	2.00	0.69	0.141	4	7
K68315	#4 - 48	2.00	0.69	0.141	3	7
K67609	#5 - 40	2.13	0.75	0.168	2	7
K64617	#5 - 40	2.13	0.75	0.168	3	7
K67610	#5 - 40	2.13	0.75	0.168	4	7
K67611	#6 - 32	2.38	0.88	0.194	2	7
K64618	#6 - 32	2.38	0.88	0.194	3	7
K67612	#6 - 32	2.38	0.88	0.194	4	7
K68316	#6 - 40	2.38	0.88	0.194	3	7
K64830	#8 - 32	2.38	0.94	0.220	2	7
K65147	#8 - 32	2.38	0.94	0.220	3	7
K67613	#8 - 32	2.38	0.94	0.220	4	7
K67614	#8 - 36	2.38	0.94	0.220	2	7
K66281	#8 - 36	2.38	0.94	0.220	3	7
K67615	#8 - 36	2.38	0.94	0.220	4	7
K67616	#10 - 24	2.50	1.00	0.255	2	7
K64619	#10 - 24	2.50	1.00	0.255	3	7
K67617	#10 - 24	2.50	1.00	0.255	4	7
K67620	#10 - 24	2.50	1.00	0.255	4	7
K64846	#10 - 32	2.50	1.00	0.255	2	7
K67619	#10 - 32	2.50	1.00	0.255	2	7
K66282	#10 - 32	2.50	1.00	0.255	3	7
K67622	1/4 - 20	2.72	1.13	0.318	2	7
K64621	1/4 - 20	2.72	1.13	0.318	3	7
K67623	1/4 - 20	2.72	1.13	0.318	4	7
K67625	1/4 - 28	2.72	1.13	0.318	2	7

(continued)

(KHSST STI Hand • Machine Screw and Fractional Sizes • Taper, Plug, or Bottoming Chamfer continued)



uncoated	D1 size	L	L3	D	number of flutes	H limit max
K66283	1/4 - 28	2.72	1.13	0.318	3	7
K67626	1/4 - 28	2.72	1.13	0.318	4	7
K67628	5/16 - 18	2.94	1.25	0.381	2	7
K67629	5/16 - 18	2.94	1.25	0.381	3	7
K64630	5/16 - 18	2.94	1.25	0.381	4	7
K67631	5/16 - 24	2.94	1.25	0.381	2	7
K67632	5/16 - 24	2.94	1.25	0.381	3	7
K66284	5/16 - 24	2.94	1.25	0.381	4	7
K67634	3/8 - 16	3.38	1.66	0.367	3	7
K64631	3/8 - 16	3.38	1.66	0.367	4	7
K67636	3/8 - 24	3.16	1.44	0.323	3	7
K66285	3/8 - 24	3.16	1.44	0.323	4	7
K67638	7/16 - 14	3.59	1.66	0.429	3	15
K64632	7/16 - 14	3.59	1.66	0.429	4	15
K67640	7/16 - 20	3.38	1.66	0.367	3	15
K66286	7/16 - 20	3.38	1.66	0.367	4	15
K67642	1/2 - 13	3.81	1.81	0.480	3	15
K64633	1/2 - 13	3.81	1.81	0.480	4	15
K67644	1/2 - 20	3.59	1.66	0.429	3	15
K66287	1/2 - 20	3.59	1.66	0.429	4	15
K67646	9/16 - 12	4.03	1.81	0.542	3	15
K67648	9/16 - 18	3.81	1.81	0.480	3	15
K66288	9/16 - 18	3.81	1.81	0.480	4	15
K67650	5/8 - 11	4.25	2.00	0.590	3	15
K64635	5/8 - 11	4.25	2.00	0.590	4	15
K67652	5/8 - 18	4.03	1.81	0.542	3	15
K66289	5/8 - 18	4.03	1.81	0.542	4	15
K67654	3/4 - 10	4.69	2.22	0.697	3	15
K64636	3/4 - 10	4.69	2.22	0.697	4	15
K67656	3/4 - 16	4.47	2.00	0.651	3	15
K66290	3/4 - 16	4.47	2.00	0.651	4	15
K67658	7/8 - 14	5.13	2.50	0.800	3	15
K64638	7/8 - 9	5.13	2.50	0.896	4	15

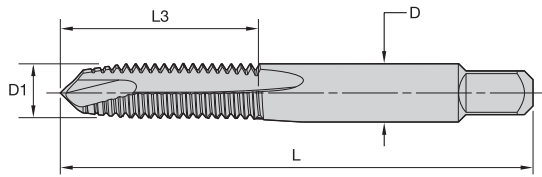


Ships in 24 Hours

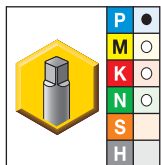
NOTE: Consult customer service for price and delivery of taps with more threads per inch or finer pitch. Quantities above max will be delivered as regular special order.

Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	23
24	47
48	72



■ KHSST Spiral Point • Machine Screw and Fractional Sizes • Plug or Bottoming Chamfer Tap



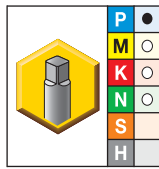
● first choice
○ alternate choice

Taps

uncoated	D1 size	L	L3	D	number of flutes	H limit max	TPI max
K64350	#0	1.63	0.31	0.141	2	3	100
K64351	#1	1.69	0.38	0.141	2	4	100
K64352	#2	1.75	0.44	0.141	2	4	100
K64353	#3	1.81	0.50	0.141	2	5	100
K64354	#4	1.88	0.56	0.141	2	5	100
K64736	#5	1.94	0.63	0.141	2	5	100
K64355	#5	1.94	0.63	0.141	2	5	100
K64356	#6	2.00	0.69	0.141	2	7	100
K64839	#6	2.00	0.69	0.141	3	7	100
K64357	#8	2.13	0.75	0.168	2	7	100
K65193	#8	2.13	0.75	0.168	3	7	100
K64358	#10	2.38	0.88	0.194	2	7	100
K65142	#10	2.38	0.88	0.194	3	7	100
K64840	#10	2.38	0.88	0.194	4	7	100
K64360	#12	2.38	0.94	0.220	2	7	100
K65143	#12	2.38	0.94	0.220	3	7	100
K64361	1/4	2.50	1.00	0.255	2	7	80
K64376	1/4	2.50	1.00	0.255	3	7	80

(continued)

(KHSST Spiral Point • Machine Screw and Fractional Sizes • Plug or Bottoming Chamfer Tap continued)



uncoated	D1 size	L	L3	D	number of flutes	H limit max	TPI max
K64832	1/4	2.50	1.00	0.255	4	7	80
K64362	5/16	2.72	1.13	0.318	2	7	80
K64377	5/16	2.72	1.13	0.318	3	7	80
K64854	3/8	2.94	1.25	0.381	2	7	80
K64378	3/8	2.94	1.25	0.381	3	7	80
K64380	7/16	3.16	1.44	0.323	3	15	80
K64381	1/2	3.38	1.66	0.367	3	15	80
K64382	9/16	3.59	1.66	0.429	3	15	64
K64826	9/16	3.59	1.66	0.429	4	15	64
K64383	5/8	3.81	1.81	0.480	3	15	64
K64838	5/8	3.81	1.81	0.480	4	15	64
K64384	11/16	4.03	1.81	0.542	3	15	64
K64385	3/4	4.25	2.00	0.590	3	15	64
K64829	3/4	4.25	2.00	0.590	4	15	64
K64386	13/16	4.47	2.00	0.652	3	15	64
K64387	7/8	4.69	2.22	0.697	3	15	64
K65144	15/16	4.91	2.22	0.3759	3	15	64
K64388	1	5.13	2.50	0.800	3	15	64

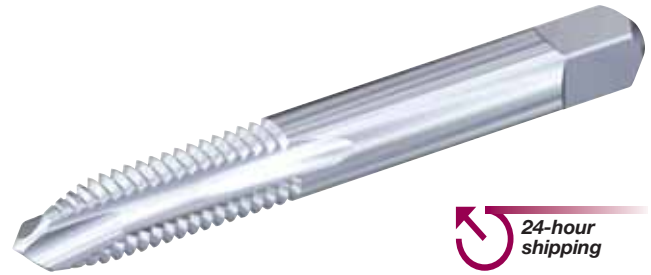
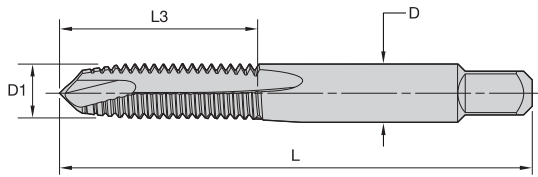


Ships in 24 Hours

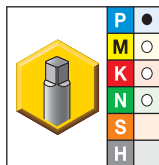
NOTE: Consult customer service for price and delivery of taps with more threads per inch or finer pitch. Quantities above max will be delivered as regular special order.

Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	23
24	47
48	72



■ KHSST Spiral Point • Plug or Bottoming Chamfer Tap • Metric ANSI



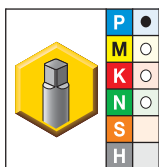
● first choice
○ alternate choice

Taps

uncoated	D1 size	L	L3	D	number of flutes	D limit max	pitch min
K65381	M1.5	1.625	0.31	0.141	2	3	0.30
K65766	M1.6	1.688	0.31	0.141	2	3	0.30
K65382	M1.8	1.688	0.38	0.141	2	4	0.30
K65383	M2	1.750	0.44	0.141	2	4	0.30
K65767	M2.2	1.750	0.44	0.141	2	4	0.30
K65384	M2.5	1.813	0.50	0.141	2	5	0.30
K65385	M3	1.938	0.63	0.141	2	5	0.30
K65386	M3.5	2.000	0.69	0.141	2	7	0.30
K64849	M3.5	2.000	0.69	0.141	3	7	0.30
K65387	M4	2.125	0.75	0.168	2	7	0.30
K65393	M4	2.125	0.75	0.168	3	7	0.30
K65388	M4.5	2.375	0.88	0.194	2	7	0.30
K65394	M4.5	2.375	0.88	0.194	3	7	0.30
K64359	M5	2.375	0.88	0.194	2	7	0.30
K65395	M5	2.375	0.88	0.194	3	7	0.30
K64827	M5	2.375	0.88	0.194	4	7	0.30
K65390	M5.5	2.375	0.88	0.190	2	7	0.30
K65391	M6	2.500	1.00	0.255	2	7	0.30
K65397	M6	2.500	1.00	0.255	3	7	0.30
K65768	M6.3	2.500	1.00	0.255	2	7	0.30
K65770	M6.3	2.500	1.00	0.255	3	7	0.30
K65392	M7	2.719	1.13	0.318	2	7	0.30
K65398	M7	2.719	1.13	0.318	3	7	0.30
K65769	M8	2.719	1.13	0.318	2	7	0.30
K65771	M8	2.719	1.13	0.318	3	7	0.30
K64845	M8	2.719	1.13	0.318	4	7	0.30
K65399	M9	2.938	1.25	0.381	3	7	0.30
K64847	M10	2.938	1.25	0.381	2	7	0.30

(continued)

(KHSST Spiral Point • Plug or Bottoming Chamfer Tap • Metric ANSI continued)



uncoated	D1 size	L	L3	D	number of flutes	D limit max	pitch min
K64379	M10	2.938	1.25	0.381	3	7	0.30
K65401	M11	3.156	1.44	0.323	3	15	0.30
K65402	M12	3.375	1.66	0.367	3	15	0.30
K65403	M14	3.594	1.66	0.429	3	15	0.40
K65404	M16	3.813	1.81	0.480	3	15	0.40
K64828	M16	3.813	1.81	0.480	4	15	0.40
K65405	M18	4.031	1.81	0.542	3	15	0.40
K64833	M18	4.031	1.81	0.542	4	15	0.40
K65406	M20	4.468	2.00	0.652	3	15	0.40
K65407	M22	4.688	2.22	0.697	3	15	0.40
K65408	M24	4.906	2.22	0.760	3	15	0.40
K65409	M25	5.125	2.50	0.800	3	15	0.40

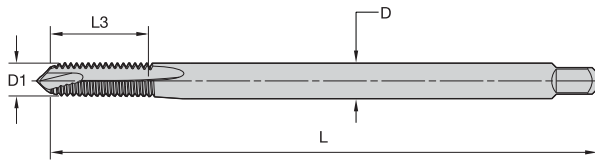
Ships in 24 Hours

NOTE: Consult customer service for price and delivery of taps with more threads per inch or finer pitch. Quantities above max will be delivered as regular special order.

Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	23
24	47
48	72





■ KHSST Spiral Point • Machine Screw or Fractional Sizes • Plug or Bottoming Chamfer Tap

Taps

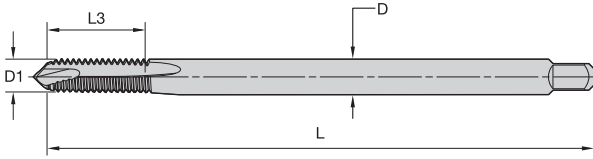
L=4"		L=6"		L=8"		L=10"		D1 size	L3	D	number of flutes	H limit max	TPI max
uncoated	uncoated	uncoated	uncoated	uncoated	uncoated	uncoated	uncoated						
K65206	K64566	—	—	#6	0.69	0.141	2	13	100				
K65207	K64567	—	—	#8	0.75	0.168	2	13	100				
K65211	K65225	—	—	#8	0.75	0.168	3	13	100				
K65208	K64568	—	—	#10	0.88	0.194	2	13	100				
K65212	—	—	—	#10	0.88	0.194	3	13	100				
—	K64570	K65238	K65262	1/4	1.00	0.255	2	13	80				
—	K65228	K65246	—	1/4	1.00	0.255	3	13	80				
—	K64571	K65239	—	5/16	1.13	0.318	2	13	80				
—	K65229	K65247	—	5/16	1.13	0.318	3	13	80				
—	K64572	K65248	K65272	3/8	1.25	0.381	3	13	80				
—	K65269	K65250	K65274	7/16	1.44	0.323	3	15	80				
—	K64574	K65251	K65275	1/2	1.66	0.367	3	13	80				
—	K65268	K65252	K65276	5/8	1.81	0.480	3	15	64				
—	K65267	K65253	K65277	3/4	2.00	0.590	3	15	64				

Ships in 24 Hours

NOTE: Consult customer service for price and delivery of taps with more threads per inch or finer pitch. Quantities above max will be delivered as regular special order.

Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	23
24	48



■ KHSST Spiral Point • Fractional Sizes • Small Shank • Plug or Bottoming Chamfer Tap



uncoated	uncoated	uncoated	uncoated	D1 size	L3	D	number of flutes	H limit max	TPI max
K67293	K67296	—	—	1/4	1.00	0.185	2	13	80
K67294	K67297	—	—	1/4	1.00	0.185	3	13	80
K67317	K67320	—	—	5/16	1.12	0.240	2	13	80
K67318	K67321	—	—	5/16	1.12	0.240	3	13	80
K67358	K67361	—	—	3/8	1.25	0.275	2	13	80
K67359	K67362	—	—	3/8	1.25	0.275	3	13	80

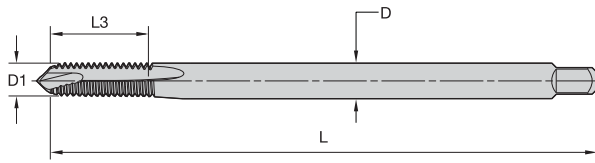
Ships in 24 Hours

NOTE: Consult customer service for price and delivery of taps with more threads per inch or finer pitch. Quantities above max will be delivered as regular special order.

Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	23
24	48





■ KHSST Spiral Point • Plug or Bottoming Chamfer Tap • Metric ANSI

Taps

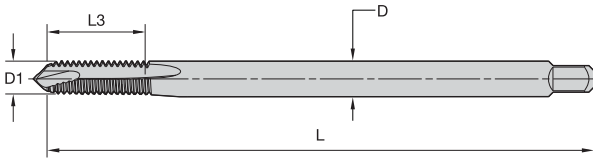
L=4"		L=6"		L=8"		L=10"		D1 size	L3	D	number of flutes	D limit max	pitch min
uncoated	uncoated	uncoated	uncoated	uncoated	uncoated	uncoated	uncoated						
K65470	—	—	—	M3.5	0.69	0.141	3	13	0.3				
K65450	K65453	—	—	M4	0.75	0.168	2	13	0.3				
K65471	—	—	—	M4	0.75	0.168	3	13	0.3				
K65472	—	—	—	M4.5	0.88	0.194	3	13	0.3				
—	K64569	—	—	M5	0.88	0.194	2	13	0.3				
K65213	K65227	—	—	M5	0.88	0.194	3	13	0.3				
—	K65455	—	—	M6	1.00	0.255	2	13	0.3				
—	K65476	K65481	K65486	M6	1.00	0.255	3	13	0.3				
—	K65458	—	—	M6.3	1.00	0.255	3	13	0.3				
—	K65477	—	—	M7	1.13	0.318	3	13	0.3				
—	K65464	K65466	K65678	M8	1.13	0.318	3	13	0.3				
—	K65457	—	—	M9	1.25	0.381	3	13	0.3				
—	K64573	K65249	K65273	M10	1.25	0.381	3	13	0.3				
—	K65681	—	—	M11	1.44	0.323	3	15	0.3				
—	K65468	K65484	K65489	M12	1.66	0.367	3	15	0.3				
—	K65480	K65485	K65490	M16	1.81	0.48	3	15	0.4				

Ships in 24 Hours

NOTE: Consult customer service for price and delivery of taps with more threads per inch or finer pitch. Quantities above max will be delivered as regular special order.

Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	23
24	48



■ KHSST Spiral Point • Small Shank • Plug or Bottoming Chamfer Tap • Metric ANSI



uncoated	uncoated	uncoated	uncoated	D1 size	L3	D	number of flutes	D limit max	pitch min
K67305	K67308	—	—	M6	1.00	0.185	2	13	0.3
K67306	K67309	—	—	M6	1.00	0.185	3	13	0.3
K67328	K67331	—	—	M7	1.12	0.240	2	13	0.3
K67329	K67332	—	—	M7	1.12	0.240	3	13	0.3
K67343	K67346	—	—	M8	1.12	0.240	2	13	0.3
K67344	K67347	—	—	M8	1.12	0.240	3	13	0.3
K67373	K67376	—	—	M9	1.25	0.275	2	13	0.3
K67374	K67377	—	—	M9	1.25	0.275	3	13	0.3
K67388	K67391	—	—	M10	1.25	0.275	2	13	0.3
K67389	K67392	—	—	M10	1.25	0.275	3	13	0.3

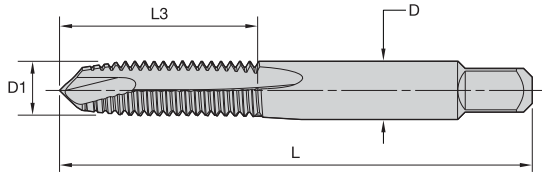


Ships in 24 Hours

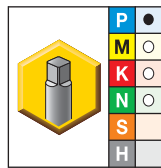
NOTE: Consult customer service for price and delivery of taps with more threads per inch or finer pitch. Quantities above max will be delivered as regular special order.

Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	23
24	48



■ KHSST Oversized Spiral Point • Fractional Sizes • Plug or Bottoming Chamfer Tap



- first choice
- alternate choice

Taps

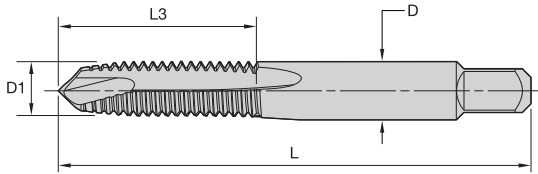
uncoated	D1 size	L	L3	D	number of flutes	H limit max	TPI max
K64735	#4	1.875	0.56	0.141	2	11	100
K64737	#6	2.000	0.69	0.141	2	11	100
K65182	#6	2.000	0.69	0.141	3	13	100
K64738	#8	2.125	0.75	0.168	2	13	100
K65183	#8	2.125	0.75	0.168	3	13	100
K64739	#10	2.375	0.88	0.194	2	13	100
K65184	#10	2.375	0.88	0.194	3	13	100
K64740	#12	2.375	0.94	0.220	2	13	100
K64741	1/4	2.500	1.00	0.255	2	13	80
K65186	1/4	2.500	1.00	0.255	3	13	80
K64742	5/16	2.719	1.13	0.318	2	13	80
K65187	5/16	2.719	1.13	0.318	3	13	80
K64767	3/8	2.938	1.25	0.381	3	13	80

Ships in 24 Hours

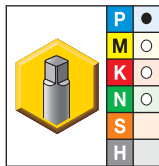
NOTE: Consult customer service for price and delivery of taps with more threads per inch or finer pitch. Quantities above max will be delivered as regular special order.

Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	23
24	47
48	72



■ KHSST Oversized Spiral Point • Plug or Bottoming Chamfer Tap • Metric ANSI



- first choice
- alternate choice

uncoated	D1 size	L	L3	D	number of flutes	D limit max	pitch min
K65416	M3.5	2.00	0.69	0.141	3	13	0.3
K65411	M4	2.13	0.75	0.168	2	13	0.3
K65809	M5	2.38	0.88	0.194	2	13	0.3
K65811	M5	2.38	0.88	0.194	3	13	0.3
K65414	M6	2.50	1.00	0.255	2	13	0.3
K65420	M6	2.50	1.00	0.255	3	13	0.3
K65421	M7	2.72	1.13	0.318	3	13	0.3
K65801	M8	2.72	1.13	0.318	2	13	0.3
K65802	M8	2.72	1.13	0.318	3	13	0.3
K65813	M10	2.94	1.25	0.381	3	13	0.3

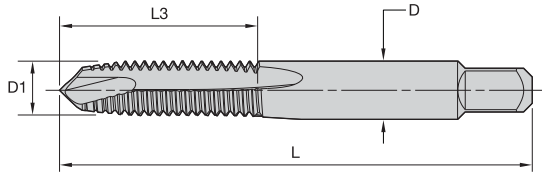


Ships in 24 Hours

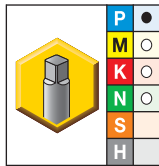
NOTE: Consult customer service for price and delivery of taps with more threads per inch or finer pitch. Quantities above max will be delivered as regular special order.

Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	23
24	47
48	72



■ KHSST STI Spiral Point • Plug or Bottoming Chamfer Tap • Metric ANSI



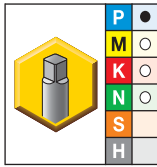
● first choice
○ alternate choice

Taps

uncoated	D1 size	L	L3	D	number of flutes	H limit max
K66291	#2 - 56	1.875	0.56	0.141	2	5
K67660	#2 - 56	1.875	0.56	0.141	3	5
K66292	#3 - 48	2.000	0.63	0.141	2	5
K67661	#3 - 48	2.000	0.63	0.141	3	5
K68333	#3 - 56	1.938	0.63	0.141	2	5
K66293	#4 - 40	2.000	0.69	0.141	2	7
K67662	#4 - 40	2.000	0.69	0.141	3	7
K72015	#4 - 48	2.000	0.69	0.141	2	7
K66294	#5 - 40	2.125	0.75	0.168	2	7
K67663	#5 - 40	2.125	0.75	0.168	3	7
K66295	#6 - 32	2.375	0.88	0.194	2	7
K67664	#6 - 32	2.375	0.88	0.194	3	7
K68323	#6 - 40	2.375	0.88	0.194	2	7
K66296	#8 - 32	2.375	0.94	0.220	2	7
K67665	#8 - 32	2.375	0.94	0.220	3	7
K64890	#8 - 32	2.375	0.94	0.220	3	7
K67666	#8 - 32	2.375	0.94	0.220	4	7
K66297	#8 - 36	2.375	0.94	0.220	2	7
K67667	#8 - 36	2.375	0.94	0.220	3	7
K67668	#8 - 36	2.375	0.94	0.220	4	7
K64653	#10 - 24	2.500	1.00	0.255	2	7
K67669	#10 - 24	2.500	1.00	0.255	3	7
K67670	#10 - 24	2.500	1.00	0.255	4	7
K66298	#10 - 32	2.500	1.00	0.255	2	7
K67671	#10 - 32	2.500	1.00	0.255	3	7
K67672	#10 - 32	2.500	1.00	0.255	4	7
K64655	1/4 - 20	2.719	1.13	0.318	2	7
K67673	1/4 - 20	2.719	1.13	0.318	3	7
K67674	1/4 - 20	2.719	1.13	0.318	4	7
K66299	1/4 - 28	2.719	1.13	0.318	2	7
K67675	1/4 - 28	2.719	1.13	0.318	3	7
K67676	1/4 - 28	2.719	1.13	0.318	4	7
K67677	5/16 - 18	2.938	1.25	0.381	2	7
K64656	5/16 - 18	2.938	1.25	0.381	3	7

(continued)

(KHSST STI Spiral Point • Plug or Bottoming Chamfer Tap • Metric ANSI, continued)



uncoated	D1 size	L	L3	D	number of flutes	H limit max
K67678	5/16 - 18	2.938	1.25	0.381	4	7
K67679	5/16 - 24	2.938	1.25	0.381	2	7
K66300	5/16 - 24	2.938	1.25	0.381	3	7
K67680	5/16 - 24	2.938	1.25	0.381	4	7
K64657	3/8 - 16	3.375	1.66	0.367	3	7
K67681	3/8 - 16	3.375	1.66	0.367	4	7
K66301	3/8 - 24	3.156	1.44	0.323	3	7
K67682	3/8 - 24	3.156	1.44	0.323	4	7
K64658	7/16 - 14	3.594	1.66	0.429	3	15
K67683	7/16 - 14	3.594	1.66	0.429	4	15
K66302	7/16 - 20	3.375	1.66	0.367	3	15
K67684	7/16 - 20	3.375	1.66	0.367	4	15
K64659	1/2 - 13	3.813	1.81	0.480	3	15
K67685	1/2 - 13	3.813	1.81	0.480	4	15
K66309	1/2 - 20	3.594	1.66	0.429	3	15
K67686	1/2 - 20	3.594	1.66	0.429	4	15
K67687	9/16 - 12	4.031	1.81	0.542	3	15
K67688	9/16 - 12	4.031	1.81	0.542	4	15
K67689	9/16 - 18	3.813	1.81	0.480	3	15
K67690	9/16 - 18	3.813	1.81	0.480	4	15
K67691	5/8 - 11	4.250	2.00	0.590	3	15
K67692	5/8 - 11	4.250	2.00	0.590	4	15
K67693	5/8 - 18	4.031	1.81	0.542	3	15
K67694	5/8 - 18	4.031	1.81	0.542	4	15
K67695	3/4 - 10	4.688	2.22	0.697	3	15
K67696	3/4 - 10	4.688	2.22	0.697	4	15
K67697	3/4 - 16	4.468	2.00	0.489	3	15
K67698	3/4 - 16	4.468	2.00	0.489	4	15
K67699	7/8 - 14	5.125	2.50	0.800	3	15
K67700	7/8 - 14	5.125	2.50	0.800	4	15

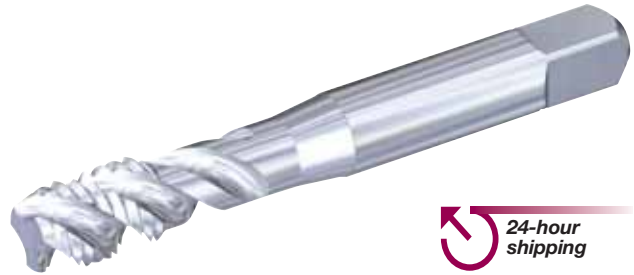
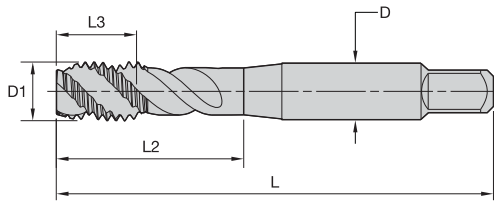


48 Hour Lead Time

NOTE: Consult customer service for price and delivery of taps with more threads per inch or finer pitch. Quantities above max will be delivered as regular special order.

Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	23
24	47
48	72



■ KHSST Spiral Flute • Machine Screw and Fractional • Plug or Bottoming Chamfer



- first choice
- alternate choice

Taps

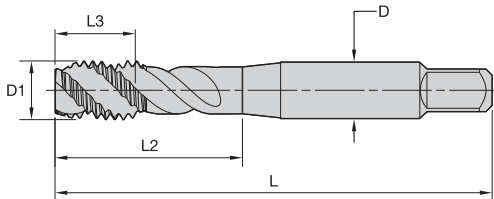
uncoated	uncoated	D1 size	L	L3	L2	D	number of flutes	H limit max	TPI max
K65160	K65161	#2	1.75	0.44	—	0.141	2	4	100
K64455	K64466	#3	1.81	0.50	—	0.141	2	5	100
K64456	K64467	#4	1.88	0.56	—	0.141	2	5	100
K64457	K64468	#5	1.94	0.63	—	0.141	2	5	100
K65167	K65172	#6	2.00	0.38	0.69	0.141	3	7	100
K65168	K64476	#8	2.13	0.38	0.75	0.168	3	7	100
K65169	K64477	#10	2.38	0.50	0.88	0.194	3	7	100
K65171	K64479	#12	2.38	0.50	0.94	0.220	3	7	100
K64470	K64480	1/4	2.50	0.63	1.00	0.255	3	7	80
K64471	K64481	5/16	2.72	0.69	1.12	0.318	3	7	80
K64472	K64482	3/8	2.94	0.75	1.25	0.381	3	7	80
K64474	K64484	7/16	3.16	0.88	—	0.323	3	15	80
K64475	K64485	1/2	3.38	0.94	—	0.367	3	15	80
K64848	—	—	—	—	—	—	—	—	—
K64496	K64502	9/16	3.59	1.00	—	0.429	4	15	64
K64497	K64503	5/8	3.81	1.09	—	0.480	4	15	64
K64498	K64504	11/16	4.03	1.09	—	0.542	4	15	64
K64499	K64505	3/4	4.25	1.22	—	0.590	4	15	64
K65690	K65691	13/16	4.47	1.22	—	0.652	4	15	64
K64500	K64506	7/8	4.69	1.34	—	0.697	4	15	64
K65173	K65174	15/16	4.91	1.34	—	0.760	4	15	64
K64501	K64507	1	5.13	1.50	—	0.800	4	15	64

Ships in 24 Hours

NOTE: Spiral-flute taps optional with no neck available per table 302 dimensions (page L284); consult customer service for delivery time and price. Quantities above max will be delivered as regular special order.

Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	23
24	47
48	72



■ KHSST Spiral Flute • Plug or Bottoming Chamfer Tap • Metric ANSI



- first choice
- alternate choice

uncoated	uncoated	D1 size	L	L3	L2	D	number of flutes	D limit max	pitch min
K65479	K65506	M2	1.75	0.44	—	0.141	2	4	0.30
—	K65773	M2.2	1.81	0.44	—	0.141	2	4	0.30
K65498	K65507	M2.5	1.81	0.50	—	0.141	2	5	0.30
—	K65508	M3	1.94	0.63	—	0.141	2	5	0.30
K65515	K65526	M3.5	2.00	0.38	0.69	0.141	3	7	0.30
K65516	K65527	M4	2.13	0.38	0.75	0.168	3	7	0.30
K65517	K65528	M4.5	2.38	0.50	0.88	0.194	3	7	0.30
K64478	—	—	—	—	—	—	—	—	—
K65520	K65531	M6	2.50	0.63	1.00	0.255	3	7	0.30
K65521	K65532	M7	2.72	0.69	1.12	0.318	3	7	0.30
K65775	K65777	M8	2.72	0.69	1.12	0.318	3	7	0.30
K65522	K65533	M9	2.94	0.75	1.25	0.381	3	7	0.30
K64473	K64483	M10	2.94	0.75	1.25	0.381	3	7	0.30
—	K65535	M11	3.375	0.94	—	0.367	3	15	0.30
K65525	K65536	M12	3.38	0.94	—	0.367	3	15	0.30
K65537	K65543	M14	3.59	1.00	—	0.429	4	15	0.40
K65538	K65544	M16	3.81	1.09	—	0.480	4	15	0.40
K65539	K65545	M18	4.03	1.09	—	0.542	4	15	0.40
K65778	K65779	M20	4.47	1.22	—	0.652	4	15	0.40
K65540	K65546	M22	4.69	1.34	—	0.697	4	15	0.40
K65541	K65547	M24	4.91	1.34	—	0.760	4	15	0.40

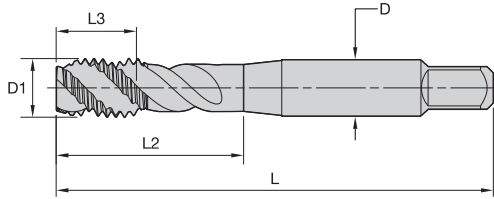


Ships in 24 Hours

NOTE: Spiral-flute taps optional with no neck available per table 302 dimensions (page L284); consult customer service for delivery time and price. Quantities above max will be delivered as regular special order.

Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	23
24	47
48	72



■ KHSST STI Spiral Flute • Machine Screw and Fractional • Plug or Bottoming Chamfer



Taps

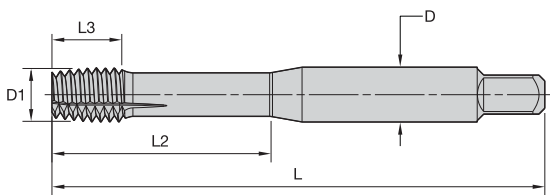
uncoated	uncoated	D1 size	L	L3	L2	D	number of flutes	H limit max	TPI max
K67701	K68281	#2 - 56	1.88	0.56	—	0.141	2	5	100
K67702	K68282	#3 - 48	2.00	0.63	—	0.141	2	7	100
K67703	K68283	#3 - 48	1.94	0.63	—	0.141	3	5	100
K67704	K68284	#4 - 40	2.00	0.69	—	0.141	2	7	100
K67705	K68285	#4 - 40	2.00	0.69	—	0.141	3	7	100
K67706	K68286	#5 - 40	2.13	0.75	—	0.168	2	7	100
K67707	K68287	#5 - 40	2.13	0.75	—	0.168	3	7	100
K67708	K68288	#6 - 32	2.38	0.88	0.69	0.194	2	7	100
K68472	K68317	#6 - 32	2.38	0.88	0.69	0.194	3	7	100
—	K68411	#6 - 40	2.38	0.37	0.69	0.168	3	7	100
K67709	K68289	#8 - 32	2.38	0.94	0.75	0.220	3	7	100
K67710	K68290	#8 - 36	2.38	0.94	0.75	0.220	3	7	100
K67711	K68291	#10 - 24	2.50	1.00	0.88	0.255	3	7	80
K67712	K68292	#10 - 32	2.5	1	0.88	0.255	3	7	80
K67713	K68293	1/4 - 20	2.72	1.13	1.00	0.318	3	7	80
K67714	K68294	1/4 - 28	2.72	1.13	1.00	0.318	3	7	80
K67715	K68295	5/16 - 18	2.94	1.25	1.12	0.381	3	7	80
K67716	K68296	5/16 - 24	2.94	1.25	1.12	0.381	3	7	80
K67717	K68297	3/8 - 16	3.38	1.66	1.25	0.367	3	7	80
K67718	K68298	3/8 - 24	3.16	1.44	1.25	0.323	3	7	80
K67719	K68299	7/16 - 14	3.59	1.66	—	0.429	3	15	80
K67720	K68300	7/16 - 20	3.375	1.656	—	0.367	3	15	80
K67721	K68301	1/2 - 13	3.813	1.81	—	0.480	3	15	64
K67722	K68302	1/2 - 20	3.594	1.66	—	0.429	3	15	64
K67723	K68303	9/16 - 12	4.031	1.81	—	0.542	3	15	64
K67724	K68304	9/16 - 18	3.813	1.81	—	0.480	3	15	64
K67725	K68305	5/8 - 11	4.25	2	—	0.590	3	15	64
K67726	K68306	5/8 - 18	4.25	2	—	0.590	3	15	64
K67727	K68307	3/4 - 10	4.688	2.22	—	0.697	3	15	64
K67728	K68308	3/4 - 16	4.468	2	—	0.489	3	15	64
K67729	K68309	7/8 - 14	5.125	2.5	—	0.800	3	15	64

48 Hour Lead Time (up to 47 pieces)

NOTE: Spiral-flute taps optional with no neck available per table 302 dimensions (page L284); consult customer service for delivery time and price. Quantities above max will be delivered as regular special order.

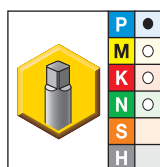
Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	23
24	47
48	72



24-hour shipping

■ KHSST Forming Taps • Machine Screw and Fractional • Plug or Bottoming Entry Taper



● first choice
○ alternate choice

uncoated	D1 size	L	L3	L2	D	number of oil grooves	H limit max	TPI max
K64508	#0	1.63	0.31	—	0.141	—	7	100
K64509	#1	1.69	0.38	—	0.141	—	7	100
K64510	#2	1.75	0.44	—	0.141	—	11	100
K64511	#3	1.81	0.50	—	0.141	—	11	100
K64512	#4	1.88	0.56	—	0.141	—	11	100
K64513	#5	1.94	0.63	—	0.141	4	11	100
K64514	#6	2.00	0.38	0.69	0.141	4	11	100
K64515	#8	2.13	0.38	0.75	0.168	4	13	100
K64516	#10	2.38	0.50	0.88	0.194	4	13	100
K64518	#12	2.38	0.50	0.94	0.220	4	13	100
K64519	1/4"	2.50	0.63	1.00	0.255	4	13	80
K64520	5/16"	2.72	0.69	1.13	0.318	4	13	80
K64521	3/8"	2.94	0.75	1.25	0.381	4	13	80
K64523	7/16"	3.16	0.88	—	0.323	4	15	80
K64524	1/2"	3.38	0.94	—	0.367	4	15	80
K64525	9/16"	3.59	1.00	—	0.429	6	15	64
K64526	5/8"	3.81	1.09	—	0.480	6	15	64
K64527	3/4"	4.25	1.22	—	0.590	6	15	64
K65176	7/8"	4.69	1.33	—	0.697	6	15	64
K65178	1"	5.13	1.50	—	0.800	6	15	64

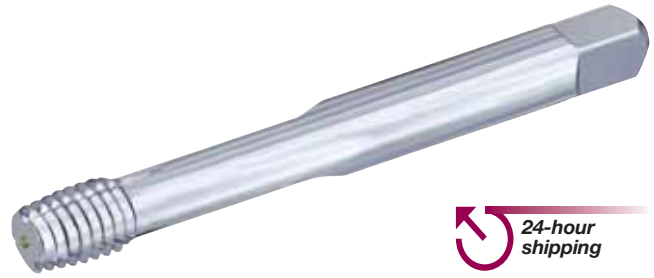
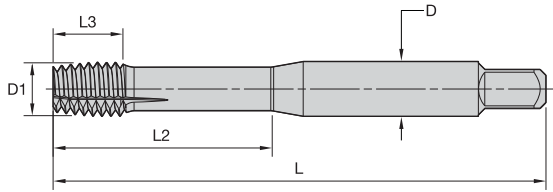


Ships in 24 Hours

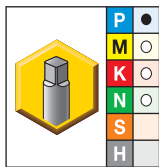
NOTE: Consult customer service for price and delivery of taps with more threads per inch or finer pitch.
Forming taps larger than #4 will be supplied with Table 302A (page L285) dimensions and oil grooves unless otherwise specified.
Forming taps without neck can be supplied according Table 302 (page L284) dimensions, consult our customer service for prices and delivery time.
Quantities above max will be delivered as regular special order.

Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	23
24	47
48	72



■ KHSST Forming Taps • Plug or Bottom Entry Taper • Metric ANSI



● first choice
○ alternate choice

Taps

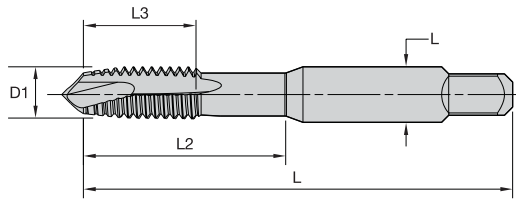
uncoated	D1 size	L	L3	L2	D	number of oil grooves	D limit max	pitch min
K65549	M1.6	1.63	0.31	—	0.141	—	7	0.30
K65550	M1.8	1.69	0.38	—	0.141	—	7	0.30
K65551	M2	1.75	0.44	—	0.141	—	11	0.30
K65552	M2.5	1.81	0.50	—	0.141	—	11	0.30
K65553	M3	1.94	0.63	—	0.141	4	11	0.30
K65554	M3.5	2.00	0.38	0.69	0.141	4	11	0.30
K65555	M4	2.13	0.38	0.75	0.168	4	13	0.30
K65556	M4.5	2.38	0.50	0.88	0.194	4	13	0.30
K64517	M5	2.38	0.50	0.88	0.194	4	13	0.30
K65559	M6	2.50	0.63	1.00	0.255	4	13	0.30
K65560	M8	2.72	0.69	1.13	0.318	4	13	0.30
K65561	M9	2.94	0.75	1.25	0.381	4	13	0.30
K64522	M10	2.94	0.75	1.25	0.381	4	13	0.30
K65563	M11	3.16	0.88	—	0.323	4	15	0.30
K65564	M12	3.38	0.94	—	0.367	4	15	0.30
K65565	M14	3.59	1.00	—	0.429	6	15	0.4
K65566	M16	3.81	1.09	—	0.480	6	15	0.4
K65567	M20	4.47	1.31	—	0.652	6	15	0.4
K65568	M22	4.69	1.33	—	0.697	6	15	0.4
K65569	M24	4.91	1.34	—	0.760	6	15	0.4
K65570	M25	5.13	1.50	—	0.800	6	15	0.4

Ships in 24 Hours

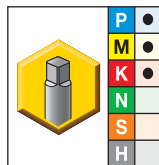
NOTE: Consult customer service for price and delivery of taps with more threads per inch or finer pitch.
Forming taps larger than #4 will be supplied with Table 302A (page L285) dimensions and oil grooves unless otherwise specified.
Forming taps without neck can be supplied according Table 302 (page L284) dimensions, consult our customer service for prices and delivery time.
Quantities above max will be delivered as regular special order.

Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	23
24	47
48	72



■ K-SS Spiral Point • Machine Screw and Fractional • Plug Chamfer



● first choice
○ alternate choice

oxide	D1 size	L	L3	L2	D	number of flutes	H limit max	TPI max
K83000	#2	1.75	0.44	—	0.141	2	13	100
K83001	#3	1.81	0.50	—	0.141	2	13	100
K83002	#4	1.88	0.34	0.56	0.141	2	13	100
K83003	#5	1.94	0.37	0.62	0.141	3	13	100
K83004	#6	2.00	0.39	0.81	0.141	3	13	100
K83005	#8	2.00	0.43	0.87	0.168	3	13	100
K83006	#10	2.38	0.51	1.06	0.194	3	13	100
K83007	#12	2.38	0.55	1.15	0.220	3	13	100
K83008	1/4	2.50	0.56	1.23	0.255	3	13	80
K83009	5/16	2.72	0.63	1.39	0.318	3	13	80
K83010	3/8	2.94	0.71	1.55	0.381	3	13	80
K83011	7/16	3.16	0.88	—	0.323	3	15	80
K83012	1/2	3.38	0.92	—	0.367	3	15	80
K83013	9/16	3.59	0.98	—	0.429	3	15	64
K83014	5/8	3.81	1.06	—	0.480	3	15	64
K64844	11/16	4.031	1.25	—	0.542	3	15	64
K83015	3/4	4.25	1.21	—	0.59	3	15	64

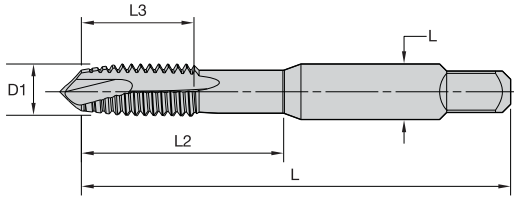


5 Day Lead Time

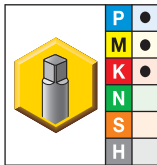
NOTE: Consult customer service for price and delivery of taps with more threads per inch or finer pitch. Quantities above max will be delivered as regular special order.

Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	23
24	47
48	72



■ K-SS Spiral Point • Plug Chamfer • Metric ANSI



● first choice
○ alternate choice

Taps

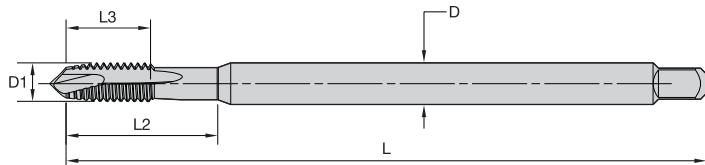
oxide	D1 size	L	L3	L2	D	number of flutes	D limit max	pitch min
K68488	M2	1.75	0.44	—	0.141	2	11	0.3
K68438	M2.5	1.81	0.50	—	0.141	2	11	0.3
K83052	M3	1.94	0.37	0.62	0.141	3	13	0.3
K83053	M3.5	2.00	0.39	0.81	0.141	3	13	0.3
K83054	M4	2.00	0.43	0.87	0.168	3	13	0.3
K83055	M5	2.38	0.51	1.06	0.190	3	13	0.3
K83056	M6	2.50	0.56	1.23	0.255	3	13	0.3
K83057	M7	2.72	0.63	1.39	0.318	3	13	0.3
K83058	M8	2.72	0.63	1.39	0.318	3	13	0.3
K72214	M9	2.94	0.71	1.55	0.381	3	13	0.3
K83060	M10	2.94	0.71	1.55	0.381	3	13	0.3
K72136	M11	3.16	0.88	—	0.323	3	15	0.3
K83062	M12	3.38	0.92	—	0.367	3	15	0.3
K83064	M14	3.59	0.98	—	0.429	3	15	0.4
K83199	M15	3.81	1.06	—	0.480	3	15	0.4
K83066	M16	3.813	1.06	—	0.48	3	15	0.4
K83068	M18	4.031	1.07	—	0.542	3	15	0.4

5 Day Lead Time

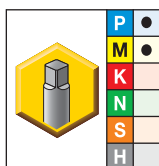
NOTE: Consult customer service for price and delivery of taps with more threads per inch or finer pitch. Quantities above max will be delivered as regular special order.

Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	23
24	47
48	72



■ K-SS 6" • Machine Screw and Fractional • Plug Chamfer



- first choice
- alternate choice

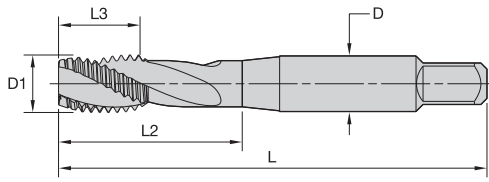
oxide	D1 size	L	L3	L2	D	number of flutes	H limit max	TPI max
K83032	#4	6.00	0.34	0.56	0.141	2	13	100
K83033	#6	6.00	0.39	0.81	0.141	3	13	100
K83034	#8	6.00	0.43	0.87	0.168	3	13	100
K83035	#10	6.00	0.51	1.06	0.194	3	13	100
K83036	1/4	6.00	0.56	1.23	0.255	3	13	80
K83037	5/16	6.00	0.63	1.39	0.318	3	13	80
K83038	3/8	6.00	0.71	1.55	0.381	3	13	80
K83039	7/16	6.00	0.88	—	0.323	3	15	80
K83040	1/2	6.00	0.92	—	0.367	3	15	80
K83178	M5	6.00	0.51	1.06	0.194	3	13	0.3
K83179	M6	6.00	0.56	1.23	0.255	3	13	0.3
K68312	M8	6.00	0.63	1.39	0.318	3	13	0.3
K68313	M10	6.00	0.71	1.55	0.381	3	13	0.3

5 Day Lead Time

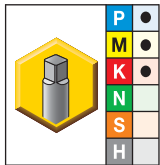
NOTE: Consult customer service for price and delivery of taps with more threads per inch or finer pitch. Quantities above max will be delivered as regular special order.

Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	23
24	47
48	72



■ K-SS Spiral Flute • Machine Screw and Fractional • Chamfer 2 1/2–3 1/2 Pitches



● first choice
○ alternate choice

Taps

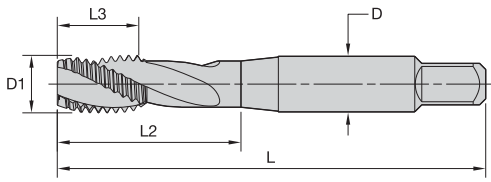
oxide	D1 size	L	L3	L2	D	number of flutes	H limit max	TPI max
K83016	#4	1.88	0.31	0.56	0.141	2	13	100
K83017	#5	1.94	0.19	0.63	0.141	3	13	100
K83018	#6	2.00	0.26	0.81	0.141	3	13	100
K83019	#8	2.13	0.26	0.87	0.168	3	13	100
K83020	#10	2.38	0.33	1.06	0.194	3	13	100
K83021	#12	2.38	0.34	1.12	0.220	3	13	100
K83022	1/4	2.50	0.40	1.23	0.255	3	13	80
K83023	5/16	2.72	0.43	1.39	0.318	3	13	80
K83024	3/8	2.94	0.51	1.55	0.381	3	13	80
K83025	7/16	3.16	0.50	—	0.323	3	15	80
K83026	1/2	3.38	0.57	—	0.367	3	15	80
K83027	9/16	3.59	0.63	—	0.429	3	15	64
K83028	5/8	3.81	0.69	—	0.480	3	15	64
K64843	11/16	4.03	0.61	—	0.542	3	15	64
K83029	3/4	4.25	0.76	—	0.590	4	15	64

5 Day Lead Time

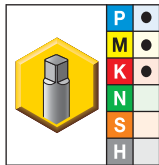
NOTE: Consult customer service for price and delivery of taps with more threads per inch or finer pitch. Quantities above max will be delivered as regular special order.

Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	23
24	47
48	72



■ K-SS Spiral Flute • Chamfer 2 1/2-3 1/2 Pitches



● first choice
○ alternate choice

oxide	D1 size	L	L3	L2	D	number of flutes	D limit max	pitch min
K83070	M3	1.94	0.19	0.63	0.141	3	13	0.3
K83071	M3.5	2.00	0.26	0.81	0.141	3	13	0.3
K83072	M4	2.13	0.26	0.87	0.168	3	13	0.3
K72181	M4.5	2.38	0.33	1.06	0.194	3	13	0.3
K83073	M5	2.38	0.33	1.06	0.194	3	13	0.3
K83074	M6	2.50	0.40	1.23	0.255	3	13	0.3
K83075	M7	2.72	0.43	1.39	0.318	3	13	0.3
K83076	M8	2.72	0.43	1.39	0.318	3	13	0.3
K68480	M9	2.94	0.51	1.55	0.381	3	13	0.3
K83078	M10	2.94	0.51	1.55	0.381	3	13	0.3
K83176	M11	3.16	0.50	—	0.323	3	13	0.3
K83080	M12	3.38	0.57	—	0.367	3	15	0.3
K83082	M14	3.59	0.63	—	0.429	3	15	0.4
K83084	M16	3.81	0.69	—	0.480	3	15	0.4
K83086	M18	4.03	0.61	—	0.542	4	15	0.4

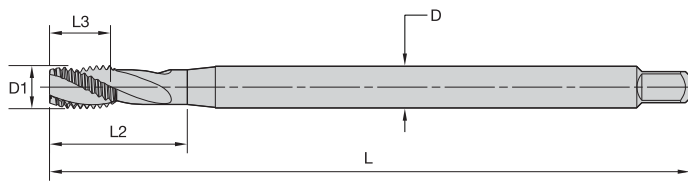


5 Day Lead Time

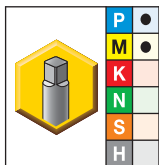
NOTE: Consult customer service for price and delivery of taps with more threads per inch or finer pitch. Quantities above max will be delivered as regular special order.

Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	23
24	47
48	72



■ K-SS Spiral Flute 6" • Machine Screw and Fractional • Chamfer 2 1/2–3 1/2 Pitches



- first choice
- alternate choice

Taps

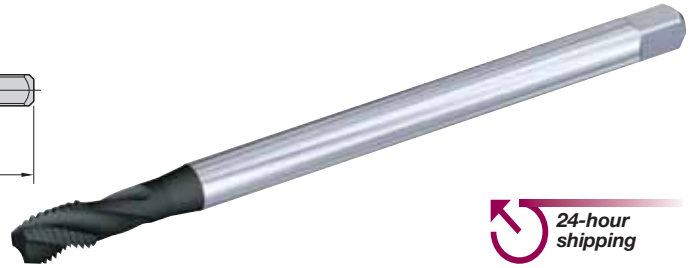
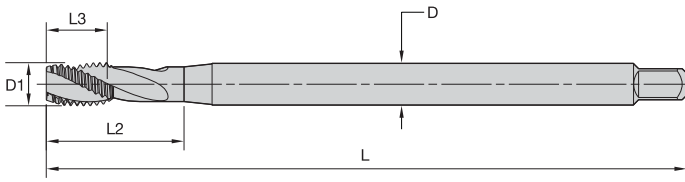
oxide	D1 size	L	L3	L2	D	number of flutes	H limit max	TPI max
K83043	#4	6.00	0.34	0.56	0.141	2	11	100
K83044	#6	6.00	0.39	0.81	0.141	3	13	100
K83045	#8	6.00	0.43	0.87	0.168	3	13	100
K83046	#10	6.00	0.51	1.06	0.194	3	13	100
K83047	1/4	6.00	0.56	1.23	0.255	3	13	80
K83048	5/16	6.00	0.63	1.39	0.318	3	13	80
K83049	3/8	6.00	0.71	1.55	0.381	3	13	80
K83050	7/16	6.00	0.88	—	0.323	3	15	80
K83051	1/2	6.00	0.92	—	0.367	3	15	80

Ships in 5 days

NOTE: Consult customer service for price and delivery of taps with more threads per inch or finer pitch. Quantities above max will be delivered as regular special order.

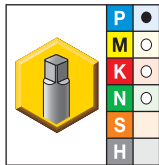
Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	23
24	47
48	72



24-hour shipping

■ K-SS Spiral Flute 6" • Metric ANSI • Chamfer 2 1/2-3 1/2 Pitches



● first choice
○ alternate choice

oxide	D1 size	L	L3	L2	D	number of flutes	D limit max	pitch min
K83163	M4	6.00	0.43	0.87	0.168	3	13	0.3
K72159	M5	6.00	0.51	1.06	0.194	3	13	0.3
K68489	M6	6.00	0.56	1.23	0.255	3	13	0.3
K68490	M7	6.00	0.63	1.39	0.318	3	13	0.3
K83149	M8	6.00	0.63	1.39	0.318	3	15	0.3
K68491	M9	6.00	0.71	1.55	0.381	3	13	0.3
K83155	M10	6.00	0.71	1.55	0.381	3	15	0.3
K68492	M11	6.00	0.88	—	0.323	3	15	0.3
K68493	M12	6.00	0.92	—	0.367	3	15	0.3
K68494	M12.5	6.00	0.92	—	0.367	3	15	0.3

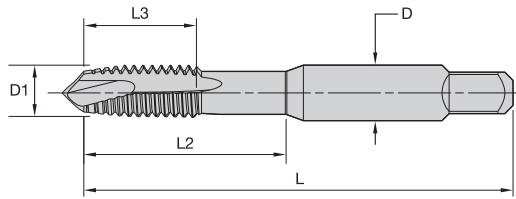


Ships in 24 Hours

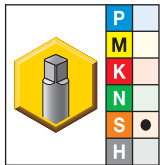
NOTE: Consult customer service for price and delivery of taps with more threads per inch or finer pitch. Quantities above max will be delivered as regular special order.

Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	23
24	47
48	72



■ K-NI Spiral Point • Machine Screw and Fractional • Plug Chamfer



● first choice
○ alternate choice

Taps

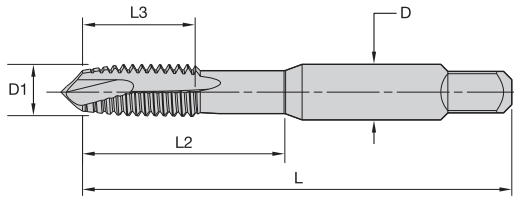
oxide/nitride	D1 size	L	L3	L2	D	number of flutes	H limit max	TPI max
K83104	#2	1.75	0.44	—	0.141	2	13	100
K83105	#4	1.88	0.34	0.56	0.141	2	13	100
K83106	#5	1.94	0.37	0.62	0.141	3	13	100
K83107	#6	2.00	0.39	0.81	0.141	3	13	100
K83108	#8	2.00	0.43	0.87	0.168	3	13	100
K83109	#10	2.38	0.51	1.06	0.194	3	13	80
K83110	1/4	2.50	0.56	1.23	0.255	3	13	80
K83111	5/16	2.72	0.63	1.39	0.318	3	13	80
K83112	3/8	2.94	0.71	1.55	0.381	3	13	80
K83113	7/16	3.16	0.88	—	0.323	3	15	80
K83114	1/2	3.38	0.92	—	0.367	3	15	80
K72009	9/16	3.59	0.98	—	0.429	3	15	64
K83115	5/8	3.81	1.06	—	0.480	3	15	64
K83116	3/4	4.25	1.21	—	0.59	3	15	64

5 Day Lead Time

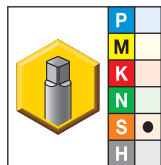
NOTE: Consult customer service for price and delivery of taps with more threads per inch or finer pitch. Quantities above max will be delivered as regular special order.

Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	23
24	47
48	72



■ K-NI Spiral Point • Plug Chamfer • Metric ANSI



● first choice
○ alternate choice

oxide/nitride	D1 size	L	L3	L2	D	number of flutes	D limit max	pitch min
K68479	M2	1.75	0.44	—	0.141	2	11	0.3
K68439	M2.2	1.75	0.44	—	0.141	2	11	0.3
K83200	M2.5	1.81	0.50	—	0.141	2	11	0.3
K83181	M3	1.94	0.37	0.62	0.141	2	13	0.3
K83168	M3.5	2.13	0.39	0.81	0.141	3	13	0.3
K83180	M4	2.13	0.43	0.87	0.168	3	13	0.3
K83470	M5	2.38	0.51	1.06	0.190	3	13	0.3
K72067	M6	2.50	0.56	1.23	0.255	3	13	0.3
K72061	M6.3	2.50	0.56	1.23	0.255	3	13	0.3
K72075	M7	2.72	0.63	1.39	0.318	3	13	0.3
K83469	M8	2.72	0.63	1.39	0.318	3	13	0.3
K67550	M9	2.94	0.71	1.55	0.381	3	13	0.3
K83202	M9	2.94	0.71	1.55	0.381	3	13	0.3
K72083	M10	2.94	0.71	1.55	0.381	3	13	0.3
K83185	M11	3.16	0.88	—	0.323	3	15	0.3
K72078	M12	3.38	0.92	—	0.367	3	15	0.3
K72158	M14	3.594	0.98	—	0.429	3	15	0.4
K83161	M16	3.813	1.06	—	0.48	3	15	0.4

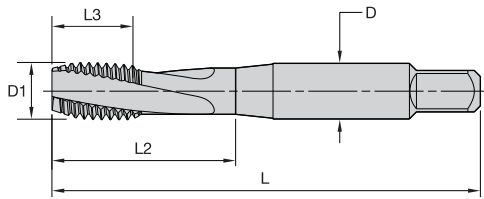


5 Day Lead Time

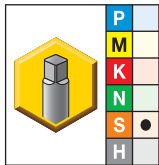
NOTE: Consult customer service for price and delivery of taps with more threads per inch or finer pitch. Quantities above max will be delivered as regular special order.

Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	23
24	47
48	72



■ K-NI Spiral Flute • Machine Screw and Fractional • 3-4 Pitches Chamfer



● first choice
○ alternate choice

Taps

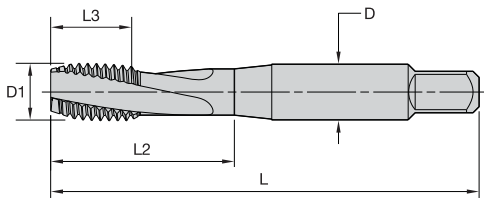
oxide/nitride	D1 size	L	L3	L2	D	number of flutes	H limit max	TPI max
K83117	#2	1.75	0.44	—	0.141	3	13	100
K83118	#4	1.88	0.34	0.56	0.141	3	13	100
K83119	#5	1.94	0.37	0.62	0.141	3	13	100
K83120	#6	2.00	0.39	0.81	0.141	3	13	100
K83121	#8	2.13	0.43	0.87	0.168	3	13	100
K83122	#10	2.38	0.51	1.06	0.194	3	13	100
K83123	1/4	2.50	0.56	1.23	0.255	3	13	80
K83124	5/16	2.72	0.63	1.39	0.318	3	13	80
K83125	3/8	2.94	0.71	1.55	0.381	3	13	80
K83126	7/16	3.16	0.88	—	0.323	3	15	80
K83127	1/2	3.38	0.92	—	0.367	3	15	80
K72099	9/16	3.59	0.98	—	0.429	4	15	64
K83128	5/8	3.81	1.06	—	0.480	4	15	64
K83129	3/4	4.25	1.21	—	0.590	—	15	64

5 Day Lead Time

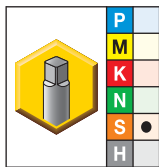
NOTE: Consult customer service for price and delivery of taps with more threads per inch or finer pitch. Quantities above max will be delivered as regular special order.

Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	23
24	47
48	72



■ K-NI Spiral Flute • 3–4 Pitches Chamfer • Metric ANSI



● first choice
○ alternate choice

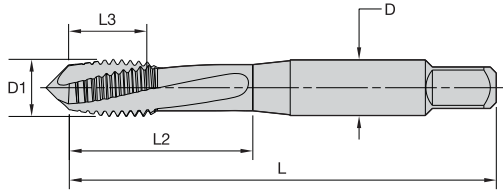
oxide/nitride	D1 size	L	L3	L2	D	number of flutes	D limit max	pitch min
K83177	M2	1.75	0.44	—	0.141	2	13	0.3
K72055	M2.2	1.75	0.44	—	0.141	3	13	0.3
K83171	M3	1.94	0.37	0.62	0.141	3	13	0.3
K72144	M3.5	2.00	0.39	0.81	0.141	3	13	0.3
K72119	M4	2.13	0.43	0.87	0.168	3	13	0.3
K72108	M5	2.38	0.51	1.06	0.194	3	13	0.3
K83157	M6	2.50	0.56	1.23	0.255	3	13	0.3
K72143	M7	2.72	0.63	1.39	0.318	3	13	0.3
K83154	M8	2.72	0.63	1.39	0.318	3	13	0.3
K83160	M9	2.94	0.71	1.55	0.381	3	13	0.3
K83158	M10	2.94	0.71	1.55	0.381	3	13	0.3
K83167	M11	3.16	0.88	—	0.323	3	15	0.3
K83159	M12	3.38	0.92	—	0.367	3	15	0.3
K72211	M14	3.59	0.98	—	0.429	3	15	0.4
K68461	M16	3.81	1.06	—	0.480	4	15	0.4
K72212	M18	4.03	1.07	—	0.541	4	15	0.4

5 Day Lead Time

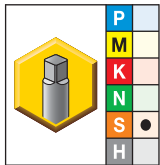
NOTE: Consult customer service for price and delivery of taps with more threads per inch or finer pitch. Quantities above max will be delivered as regular special order.

Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	23
24	47
48	72



■ K-TI Left-Hand Spiral Flute • Machine Screw and Fractional • Plug Chamfer



- first choice
- alternate choice

Taps

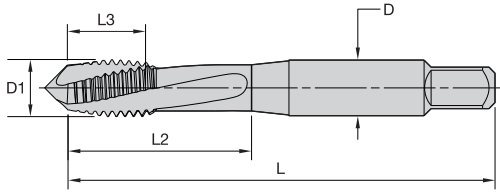
nitride	D1 size	L	L3	L2	D	number of flutes	H limit max	TPI max
K83130	#4	1.88	0.34	0.56	0.141	3	13	100
K83131	#5	1.94	0.37	0.62	0.141	3	13	100
K83133	#8	2.00	0.43	0.87	0.168	3	13	100
K83132	#6	2.13	0.39	0.81	0.141	3	13	100
K83134	#10	2.38	0.51	1.06	0.194	3	13	100
K83135	1/4	2.50	0.56	1.23	0.255	3	13	80
K83136	5/16	2.72	0.63	1.39	0.318	3	13	80
K83137	3/8	2.94	0.71	1.55	0.381	3	13	80
K83138	7/16	3.16	0.88	—	0.323	3	15	80
K83139	1/2	3.38	0.92	—	0.367	3	15	80

5 Day Lead Time

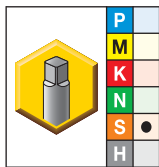
NOTE: Consult customer service for price and delivery of taps with more threads per inch or finer pitch. Quantities above max will be delivered as regular special order.

Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	23
24	47
48	72



■ K-TI Left-Hand Spiral Flute • Plug Chamfer • Metric ANSI



- first choice
- alternate choice

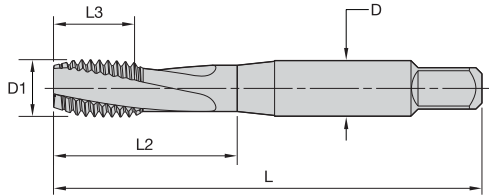
nitride	D1 size	L	L3	L2	D	number of flutes	D limit max	pitch min
K72017	M3	1.94	0.37	0.62	0.141	3	13	0.3
K83151	M3.5	2.13	0.39	0.81	0.141	3	13	0.3
K72059	M4	2.00	0.43	0.87	0.168	3	13	0.3
K83152	M5	2.38	0.51	1.06	0.190	3	13	0.3
K83165	M6	2.50	0.56	1.23	0.255	3	13	0.3
K83156	M10	2.94	0.71	1.55	0.381	3	13	0.3
K83170	M12	3.38	0.92	—	0.367	3	15	0.3

5 Day Lead Time

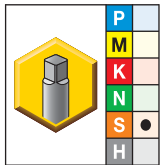
NOTE: Consult customer service for price and delivery of taps with more threads per inch or finer pitch. Quantities above max will be delivered as regular special order.

Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	23
24	47
48	72



■ K-TI Spiral Flute • Machine Screw and Fractional • 3–4 Pitches Chamfer



● first choice
○ alternate choice

Taps

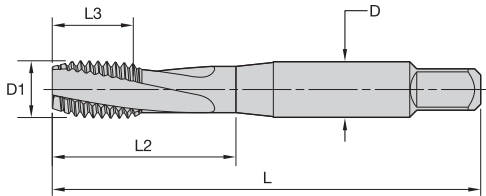
nitride	D1 size	L	L3	L2	D	number of flutes	H limit max	TPI max
K83140	#4	1.88	0.34	0.56	0.141	3	13	100
K83102	#5	1.94	0.37	0.62	0.141	3	13	100
K83141	#6	2.00	0.39	0.81	0.141	3	13	100
K83142	#8	2.13	0.43	0.87	0.168	3	13	100
K83143	#10	2.38	0.51	1.06	0.194	3	13	100
K83144	1/4	2.50	0.56	1.23	0.255	3	13	80
K83145	5/16	2.72	0.63	1.39	0.318	3	13	80
K83146	3/8	2.94	0.71	1.55	0.381	3	13	80
K83147	7/16	3.16	0.88	—	0.323	3	15	80
K83148	1/2	3.38	0.92	—	0.367	3	15	80

5 Day Lead Time

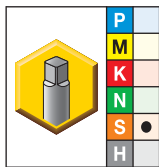
NOTE: Consult customer service for price and delivery of taps with more threads per inch or finer pitch. Quantities above max will be delivered as regular special order.

Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	23
24	47
48	72



■ K-TI Spiral Flute • 3-4 Pitches Chamfer • Metric ANSI



- first choice
- alternate choice

nitride	D1 size	L	L3	L2	D	number of flutes	D limit max	pitch min
K72087	M3	1.94	0.37	0.62	0.141	3	13	0.3
K83183	M4	2.13	0.43	0.87	0.168	3	13	0.3
K83184	M4.5	2.38	0.51	1.06	0.194	3	13	0.3
K83184	M5	2.38	0.51	1.06	0.194	3	13	0.3
K83150	M6	2.50	0.56	1.23	0.255	3	13	0.3
K68353	M8	2.72	0.63	1.39	0.318	3	13	0.3
K83468	M10	2.94	0.71	1.55	0.381	3	13	0.3
K83162	M12	3.38	0.92	—	0.367	3	15	0.3

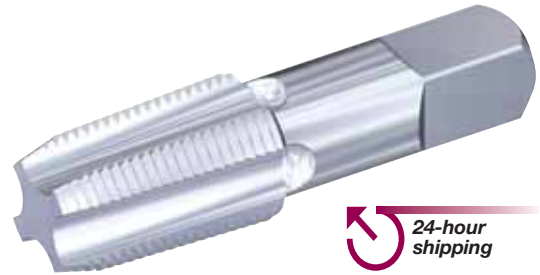
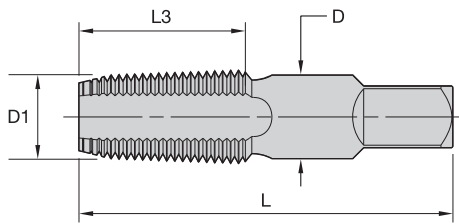


5 Day Lead Time

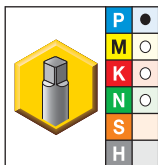
NOTE: Consult customer service for price and delivery of taps with more threads per inch or finer pitch. Quantities above max will be delivered as regular special order.

Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	23
24	47
48	72



■ KHSST Taper Pipe Tap



● first choice
○ alternate choice

Taps

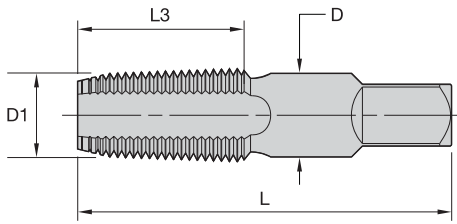
uncoated	D1 size	L	L3	D	number of flutes	thread form	projection min
K64687	1/16 - 27	2.13	0.69	0.380	4	NPT	0.136
K64688	1/8 - 27	2.13	0.75	0.438	4	NPT	0.136
K64689	1/8 - 27	2.13	0.75	0.313	4	NPT	0.136
K64690	1/4 - 18	2.44	1.06	0.563	4	NPT	0.221
K64691	3/8 - 18	2.56	1.06	0.700	4	NPT	0.221
K64692	1/2 - 14	3.13	1.38	0.688	4	NPT	0.285
K64706	3/4 - 14	3.25	1.38	0.906	5	NPT	0.285
K64707	1 - 11 1/2	3.75	1.75	1.125	5	NPT	0.360
K64708	1 1/4 - 11 1/2	4.00	1.75	1.313	5	NPT	0.368
K64713	1 1/2 - 11 1/2	4.25	1.75	1.500	7	NPT	0.381
K64714	2 - 11 1/2	4.50	1.75	1.880	7	NPT	0.349
K64715	2 1/2 - 8	5.50	2.56	2.250	7	NPT	0.488
K64716	3 - 8	6.00	2.63	2.630	7	NPT	0.488
K64717	3 1/2 - 8	6.50	2.69	2.813	9	NPT	0.500
K65181	4 - 8	6.75	2.75	3.000	9	NPT	0.512
K66225	1/16 - 27	2.13	0.69	0.380	4	NPTF	0.136
K66226	1/8 - 27	2.13	0.75	0.438	4	NPTF	0.136
K66227	1/8 - 27	2.13	0.75	0.313	4	NPTF	0.136
K66228	1/4 - 18	2.44	1.06	0.563	4	NPTF	0.221
K66229	3/8 - 18	2.56	1.06	0.700	4	NPTF	0.221
K66230	1/2 - 14	3.13	1.38	0.688	4	NPTF	0.285
K66231	3/4 - 14	3.25	1.38	0.906	5	NPTF	0.285
K66232	1 - 11 1/2	3.75	1.75	1.125	5	NPTF	0.360
K66233	1 1/4 - 11 1/2	4.00	1.75	1.000	5	NPTF	0.368
K66234	1 1/2 - 11 1/2	4.25	1.75	1.500	7	NPTF	0.381
K66235	2 - 11 1/2	4.50	1.75	1.880	7	NPTF	0.349
K66236	2 1/2 - 8	5.50	2.56	2.250	7	NPTF	0.488

Ships in 24 Hours

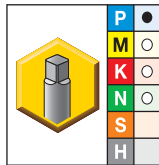
NOTE: Projection tolerance +/- 1/32 unless otherwise specified.
Additional lead time for surface treatments.
Quantities above max will be delivered as regular special order.
NPT taps may be used for ANPT applications.

Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	23
24	48



■ KHSST Taper Pipe • Interrupted Threads



● first choice
○ alternate choice

uncoated	D1 size	L	L3	D	number of flutes	thread form	projection min
K65638	1/16 - 27	2.13	0.69	0.380	3	NPT	0.136
K65639	1/8 - 27	2.13	0.75	0.438	5	NPT	0.136
K65640	1/8 - 27	2.13	0.75	0.313	5	NPT	0.136
K65641	1/4 - 18	2.44	1.06	0.563	5	NPT	0.221
K65642	3/8 - 18	2.56	1.06	0.700	5	NPT	0.221
K65643	1/2 - 14	3.13	1.38	0.688	5	NPT	0.285
K65632	3/4 - 14	3.25	1.38	0.906	5	NPT	0.285
K65633	1 - 11 1/2	3.75	1.75	1.125	5	NPT	0.360
K65634	1 1/4 - 11 1/2	4.00	1.75	1.313	5	NPT	0.368
K65635	1 1/2 - 11 1/2	4.25	1.75	1.500	7	NPT	0.381
K65636	2 - 11 1/2	4.50	1.75	1.880	7	NPT	0.349
K65637	2 1/2 - 8	5.50	2.56	2.250	7	NPT	0.488
K65644	3 - 8	6.00	2.63	2.630	7	NPT	0.488
K65645	3 1/2 - 8	6.50	2.69	2.813	9	NPT	0.500
K65662	1/16 - 27	2.13	0.69	0.380	3	NPTF	0.136
K65663	1/8 - 27	2.13	0.75	0.438	5	NPTF	0.136
K65664	1/8 - 27	2.13	0.75	0.313	5	NPTF	0.136
K65665	1/4 - 18	2.44	1.06	0.563	5	NPTF	0.221
K65666	3/8 - 18	2.56	1.38	0.688	5	NPTF	0.221
K65667	1/2 - 14	3.13	1.38	0.906	5	NPTF	0.285
K65668	3/4 - 14	3.25	1.75	1.125	5	NPTF	0.285
K65669	1 - 11 1/2	3.75	1.75	1.000	5	NPTF	0.360
K65670	1 1/4 - 11 1/2	4.00	1.75	1.500	5	NPTF	0.368
K65671	1 1/2 - 11 1/2	4.25	1.75	1.880	7	NPTF	0.381
K66261	2 - 11 1/2	4.50	2.56	2.250	7	NPTF	0.349
K66263	3 - 8	6.00	2.63	2.630	7	NPTF	0.488

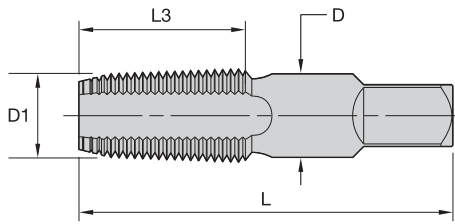


Ships in 48 Hours

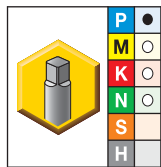
NOTE: Projection tolerance +/- 1/32 unless otherwise specified.
Additional lead time for surface treatments.
Quantities above max will be delivered as regular special order.
NPT taps may be used for ANPT applications.

Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	23
24	48



■ KHSST British Whitworth Taper Pipe



● first choice
○ alternate choice

Taps

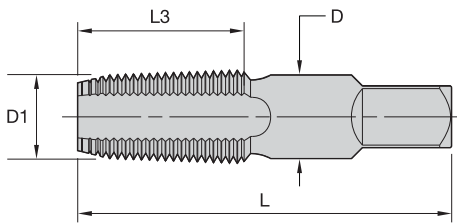
uncoated	D1 size	L	L3	D	number of flutes	thread designation
K66240	1/16 - 28	2.13	0.69	0.313	4	Rc (BSPT)
K66246	1/16 - 28	2.13	0.69	0.313	5	Rc (BSPT)
K66247	1/8 - 28	2.13	0.75	0.438	5	Rc (BSPT)
K66241	1/8 - 28	2.13	0.75	0.438	4	Rc (BSPT)
K66242	1/8 - 28	2.13	0.75	0.313	4	Rc (BSPT)
K66248	1/8 - 28	2.13	0.75	0.313	5	Rc (BSPT)
K66243	1/4 - 19	2.44	1.06	0.563	4	Rc (BSPT)
K66249	1/4 - 19	2.44	1.06	0.563	5	Rc (BSPT)
K65956	3/8 - 19	2.56	1.06	0.700	4	Rc (BSPT)
K66244	3/8 - 19	2.56	1.06	0.700	4	Rc (BSPT)
K66250	3/8 - 19	2.56	1.06	0.700	5	Rc (BSPT)
K66245	1/2 - 14	3.13	1.38	0.688	4	Rc (BSPT)
K66251	1/2 - 14	3.13	1.38	0.688	5	Rc (BSPT)
K66252	3/4 - 14	3.25	1.38	0.906	5	Rc (BSPT)
K66253	1 - 11	3.75	1.75	1.125	5	Rc (BSPT)
K66254	1 1/4 - 11	4.00	1.75	1.313	5	Rc (BSPT)
K66255	1 1/2 - 11	4.25	1.75	1.500	7	Rc (BSPT)
K66256	2 - 11	4.50	1.75	1.875	7	Rc (BSPT)
K66257	2 1/2 - 11	5.50	2.56	2.250	7	Rc (BSPT)
K66258	3 - 11	6.00	2.63	2.625	7	Rc (BSPT)

72 Hour Lead Time (up to 47 pieces)

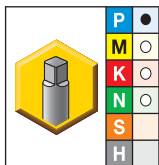
NOTE: Special hook or rake available on sizes 1/16" through 1".
Projection Tolerance +/- 1/32 unless otherwise specified.
Additional lead time for surface treatments.
Quantities above max will be delivered as regular special order.

Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	23
24	48



■ KHSST British Whitworth Taper Pipe • Interrupted Thread



● first choice
○ alternate choice

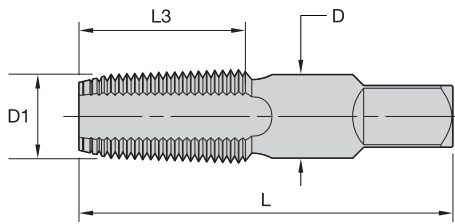
uncoated	D1 size	L	L3	D	number of flutes	thread designation
K66266	1/16 - 28	2.13	0.69	0.313	3	Rc (BSPT)
K66268	1/8 - 28	2.13	0.75	0.313	5	Rc (BSPT)
K66267	1/8 - 28	2.13	0.75	0.438	5	Rc (BSPT)
K66269	1/4 - 19	2.44	1.06	0.563	5	Rc (BSPT)
K66270	3/9 - 19	2.56	1.06	0.700	5	Rc (BSPT)
K66271	1/2 - 14	3.13	1.38	0.688	5	Rc (BSPT)
K66272	3/4 - 14	3.25	1.38	0.906	5	Rc (BSPT)
K66273	1 - 11	3.75	1.75	1.125	5	Rc (BSPT)
K66274	1 1/4 - 11	4.00	1.75	1.313	5	Rc (BSPT)
K66275	1 1/2 - 11	4.25	1.75	1.500	7	Rc (BSPT)
K66276	2 - 11	4.50	1.75	1.875	7	Rc (BSPT)

96 Hour Lead Time (up to 47 pieces)

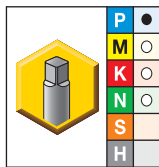
NOTE: Special hook or rake available on sizes 1/16" through 1".
Projection Tolerance +/- 1/32 unless otherwise specified.
Additional lead time for surface treatments.
Quantities above max will be delivered as regular special order.

Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	23
24	48



■ KHSST Straight Pipe



- first choice
- alternate choice

Taps

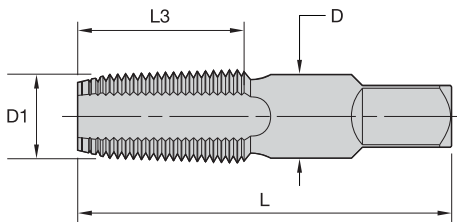
uncoated	D1 size	L	L3	D	number of flutes	thread form
K64718	1/16 - 27	2.13	0.69	0.313	4	NPS
K64719	1/8 - 27	2.13	0.75	0.313	4	NPS
K64720	1/8 - 27	2.13	0.75	0.438	4	NPS
K64721	1/4 - 18	2.50	1.06	0.563	4	NPS
K64722	3/8 - 18	2.56	1.06	0.700	4	NPS
K64723	1/2 - 14	3.13	1.38	0.688	4	NPS
K64724	3/4 - 14	3.25	1.38	0.906	5	NPS
K64725	1 - 11 1/2	3.75	1.75	1.125	5	NPS
K64726	1 1/4 - 11 1/2	4.00	1.75	1.313	5	NPS
K64727	1 1/2 - 11 1/2	4.25	1.75	1.500	7	NPS
K65982	1/16 - 27	2.13	0.69	0.313	4	NPSF
K65983	1/8 - 27	2.13	0.75	0.313	4	NPSF
K65984	1/8 - 27	2.13	0.75	0.438	4	NPSF
K65985	1/4 - 18	2.50	1.06	0.563	4	NPSF
K65986	3/8 - 18	2.56	1.06	0.700	4	NPSF
K65987	1/2 - 14	3.13	1.38	0.688	4	NPSF
K65988	3/4 - 14	3.25	1.38	0.906	5	NPSF
K65989	1 - 11 1/2	3.75	1.75	1.125	5	NPSF
K65990	1 1/4 - 11 1/2	4.00	1.75	1.313	5	NPSF
K65991	1 1/2 - 11 1/2	4.25	1.75	1.500	7	NPSF
K65992	2 - 11 1/2	4.50	1.75	1.875	7	NPSF

Ships in 24 Hours

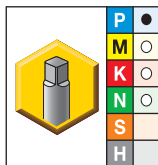
NOTE: Special hook or rake available on sizes 1/16" through 1".
Projection tolerance +/- 1/32 unless otherwise specified.
Additional lead time for surface treatments.
Quantities above max will be delivered as regular special order.

Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	23
24	48



■ KHSST British Whitworth Straight Pipe



● first choice
○ alternate choice

uncoated	D1 size	L	L3	D	number of flutes	thread designation
K65993	1/16 - 28	2.13	0.69	0.313	4	G (BSPF)
K65994	1/8 - 28	2.13	0.75	0.313	4	G (BSPF)
K65995	1/8 - 28	2.13	0.75	0.438	4	G (BSPF)
K65996	1/4 - 19	2.50	1.06	0.563	4	G (BSPF)
K65997	3/8 - 19	2.56	1.06	0.700	4	G (BSPF)
K65998	1/2 - 14	3.13	1.38	0.688	4	G (BSPF)
K65999	3/4 - 14	3.25	1.38	0.906	5	G (BSPF)
K65153	1 - 11	3.75	1.75	1.125	5	G (BSPF)
K65154	1 1/4 - 11	4.00	1.75	1.313	5	G (BSPF)
K65155	1 1/2 - 11	4.25	1.75	1.500	7	G (BSPF)
K65156	2 - 11	4.50	1.75	1.875	7	G (BSPF)
K72161	1/16 - 28	2.13	0.69	0.313	4	RP (BSPP)
K72162	1/8 - 28	2.13	0.75	0.313	4	RP (BSPP)
K72163	1/8 - 28	2.13	0.75	0.438	4	RP (BSPP)
K72164	1/4 - 19	2.50	1.06	0.563	4	RP (BSPP)
K72165	3/8 - 19	2.56	1.06	0.700	4	RP (BSPP)
K72166	1/2 - 14	3.13	1.38	0.688	4	RP (BSPP)
K72167	3/4 - 14	3.25	1.38	0.906	5	RP (BSPP)
K72168	1 - 11	3.75	1.75	1.125	5	RP (BSPP)
K72169	1 1/4 - 11	4.00	1.75	1.313	5	RP (BSPP)
K72170	1 1/2 - 11	4.25	1.75	1.500	7	RP (BSPP)
K72171	2 - 11	4.50	1.75	1.875	7	RP (BSPP)



72 Hour Lead Time (up to 47 pieces)

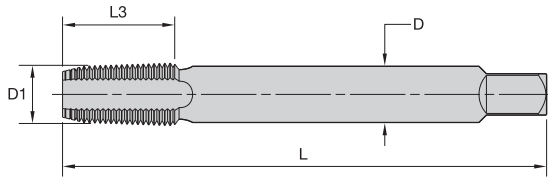
NOTE: Special hook or rake available on sizes 1/16" through 1".
Projection Tolerance +/- 1/32 unless otherwise specified.
Additional lead time for surface treatments.
Quantities above max will be delivered as regular special order.

Pricing Based on Order Quantity

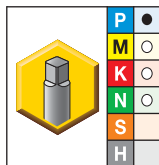
min	max
1	1
2	2
3	5
6	8
9	11
12	23
24	48

Special Taps from Blanks

Extended 6" Length • NPT/ANPT and NPTF Production Taper Pipe Taps



■ KHSST Taper Pipe Tap • Extended 6" Length



- first choice
- alternate choice

Taps

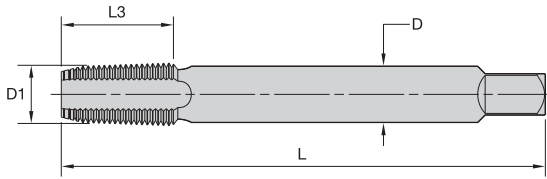
uncoated	D1 size	L	L3	D	number of flutes	thread form	projection min
K64729	1/8 - 27	6.00	0.75	0.380	4	NPT	0.136
K64730	1/4 - 18	6.00	1.06	0.438	4	NPT	0.221
K64731	3/8 - 18	6.00	1.06	0.700	4	NPT	0.221
K64732	1/2 - 14	6.00	1.38	0.688	4	NPT	0.285
K64733	3/4 - 14	6.00	1.38	0.906	5	NPT	0.285
K64734	1 - 11 1/2	6.00	1.75	1.125	5	NPT	0.360
K65942	1/8 - 27	6.00	0.75	0.380	4	NPTF	0.136
K65943	1/4 - 18	6.00	1.06	0.438	4	NPTF	0.221
K65944	3/8 - 18	6.00	1.06	0.700	4	NPTF	0.221
K65945	1/2 - 14	6.00	1.38	0.688	4	NPTF	0.285
K65946	3/4 - 14	6.00	1.38	0.906	5	NPTF	0.285
K65947	1 - 11 1/2	6.00	1.75	1.125	5	NPTF	0.360

Ships in 48 Hours

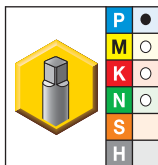
NOTE: Additional lead time for surface treatments.
Quantities above max will be delivered as regular special order.

Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	24



■ KHSST Taper Pipe • Interrupted Threads • Extended 6" Length



● first choice
 ○ alternate choice

uncoated	D1 size	L	L3	D	number of flutes	thread form	projection min
K65672	1/8 - 27	6.00	0.75	0.380	5	NPT	0.136
K65673	1/4 - 18	6.00	1.06	0.438	5	NPT	0.221
K65674	3/8 - 18	6.00	1.06	0.700	5	NPT	0.221
K65675	1/2 - 14	6.00	1.38	0.688	5	NPT	0.285
K65676	3/4 - 14	6.00	1.38	0.906	5	NPT	0.285
K65677	1 - 11 1/2	6.00	1.75	1.125	5	NPT	0.360
K65924	1/8 - 27	6.00	0.75	0.380	5	NPTF	0.136
K65925	1/4 - 18	6.00	1.06	0.438	5	NPTF	0.221
K65926	3/8 - 18	6.00	1.06	0.700	5	NPTF	0.221
K65927	1/2 - 14	6.00	1.38	0.688	5	NPTF	0.285
K65928	3/4 - 14	6.00	1.38	0.906	5	NPTF	0.285
K65929	1 - 11 1/2	6.00	1.75	1.125	5	NPTF	0.360

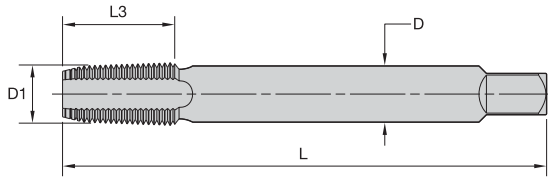


Ships in 72 Hours

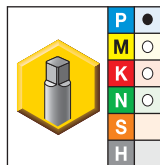
NOTE: Additional lead time for surface treatments.
 Quantities above max will be delivered as regular special order.

Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	24



KHSST British Whitworth Taper Pipe • 6" Extension



- first choice
- alternate choice

Taps

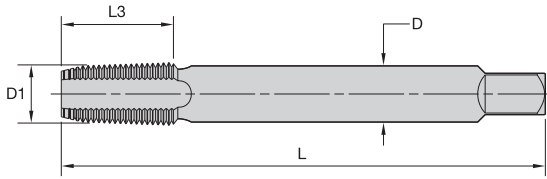
uncoated	D1 size	L	L3	D	number of flutes	thread designation
K65954	1/8 - 28	6.00	0.75	0.438	4	Rc (BSPT)
K65955	1/4 - 19	6.00	1.06	0.563	4	Rc (BSPT)
K65956	3/9 - 19	6.00	1.06	0.700	4	Rc (BSPT)
K65957	1/2 - 14	6.00	1.38	0.688	4	Rc (BSPT)
K65958	3/4 - 14	6.00	1.38	0.906	5	Rc (BSPT)
K65959	1 - 11	6.00	1.75	1.125	5	Rc (BSPT)

72 Hour Lead Time (up to 23 pieces)

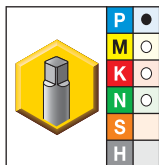
NOTE: Additional lead time for surface treatments.
Quantities above max will be delivered as regular special order.

Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	24



■ KHSST British Whitworth Taper Pipe • 6" Extension • Interrupted Thread



- first choice
- alternate choice

uncoated	D1 size	L	L3	D	number of flutes	thread designation
K65936	1/8 - 28	6.00	0.75	0.438	5	Rc (BSPT)
K65937	1/4 - 19	6.00	1.06	0.563	5	Rc (BSPT)
K65938	3/8 - 19	6.00	1.06	0.700	5	Rc (BSPT)
K65939	1/2 - 14	6.00	1.38	0.688	5	Rc (BSPT)
K65940	3/4 - 14	6.00	1.38	0.906	5	Rc (BSPT)
K65941	1 - 11	6.00	1.75	1.125	5	Rc (BSPT)

72 Hour Lead Time (up to 23 pieces)

NOTE: Additional lead time for surface treatments.
Quantities above max will be delivered as regular special order.

Pricing Based on Order Quantity

min	max
1	1
2	2
3	5
6	8
9	11
12	24



Taps and Thread Milling Technical Information

The technical information in the following section can be used to assist you with your tapping and thread milling operations. Whether you are simply searching for information about tap dimensions and recommendations, or you're trying to solve basic tapping and thread milling problems, you will find the relevant data here.

This Section Includes the Following Information:

- Illustrations of tap terms.
- Explanations of tap chamfers.
- Dimensional information for various tap styles and lengths.
- Tap limitation data.
- Chip handling methods for different tap styles.
- Tap recommendations.
- Descriptions of screw thread tolerance and tolerance information.
- Information regarding surface treatments and coatings.
- Guidelines and tables for determining tapping speeds.
- Troubleshooting charts.
- Hardness conversion table.
- A guide to Kennametal tapping application icons.
- Taps custom order worksheet.
- Thread Milling application sheet.

This section will further your knowledge of tapping and thread milling operations enabling you to maximize the value of your tools.

How to Apply This Technical Information

Below is an example of where the technical information in this catalog can be useful:

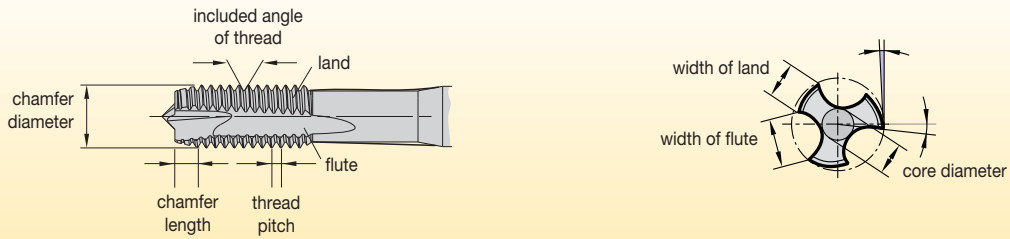
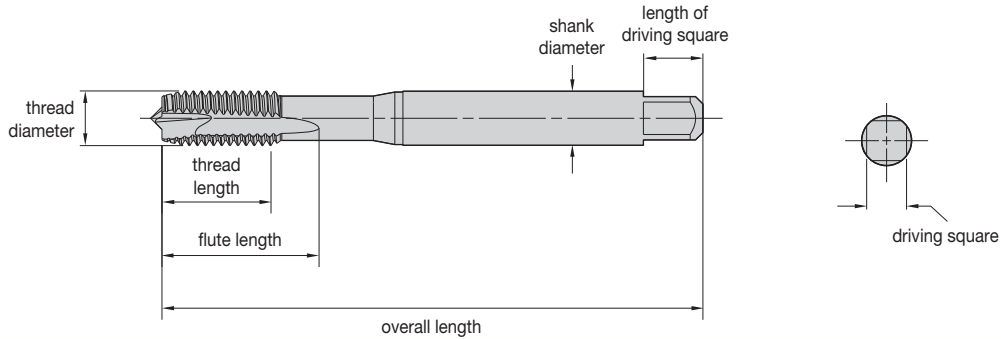
Problem

- Thread holes are oversized and taps are experiencing low life when working with stainless steel materials.

Solution

- Consult the troubleshooting portion of the Technical Information section to discover ways to correct the issue.

Definitions and Angles, Centers and Flute Forms



Taps

Flute Forms



Straight-flute, form C plug chamfer without spiral point



Right-hand spiral flute

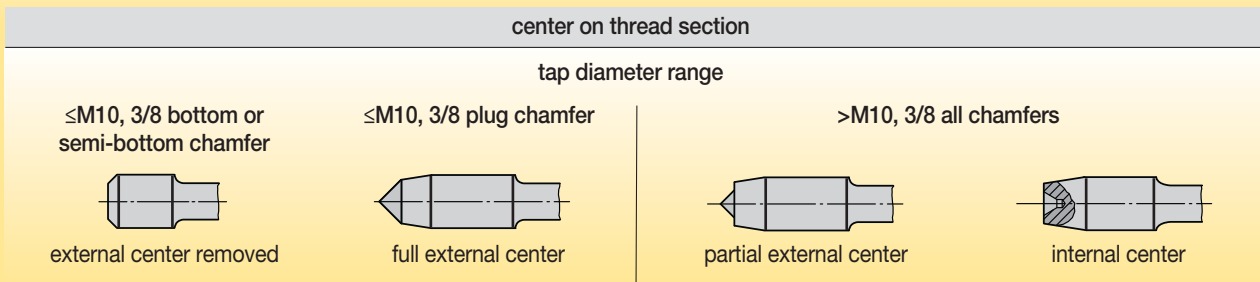


Straight-flute, form B plug chamfer with spiral point



Left-hand spiral flute

Types of Centers (Standard to DIN 2197/DIN 2175)



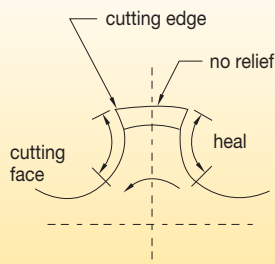
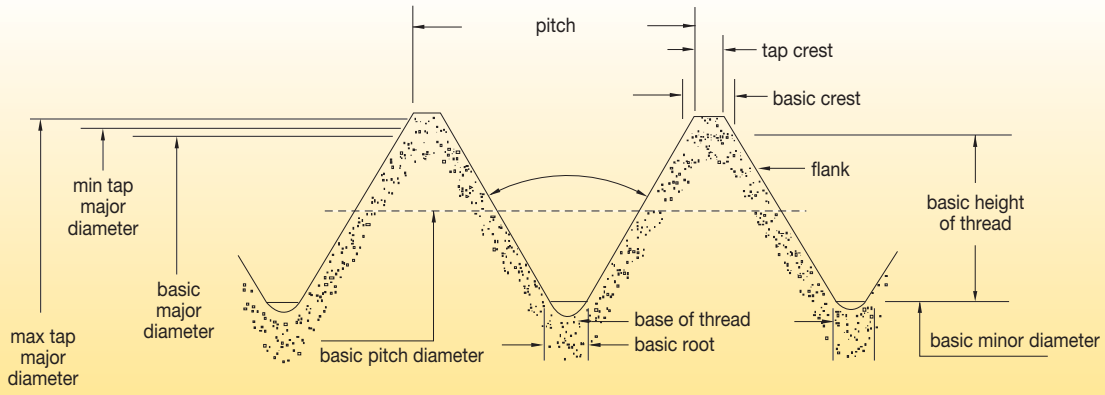
Coolant Hole Types



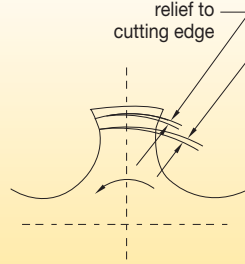
Axial coolant delivery with axial coolant exit hole



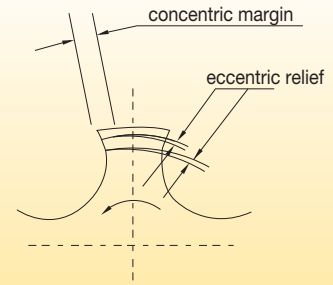
Axial coolant delivery with radial coolant hole exiting in the flutes



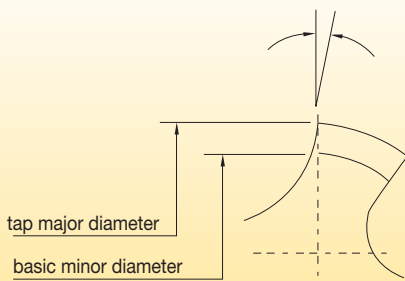
Concentric



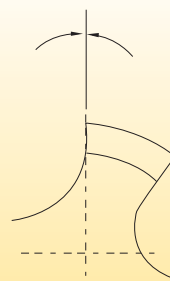
Eccentric Relief



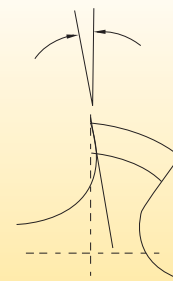
Con-Eccentric Relief



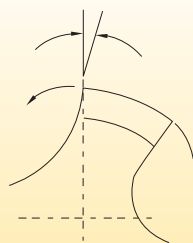
Negative Hook



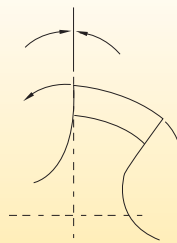
0° Hook



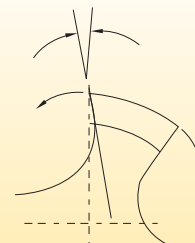
Positive Hook



Negative Rake



Radial Rake

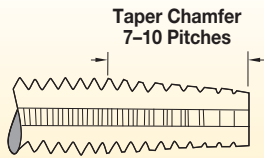


Positive Rake

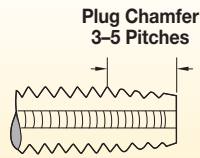
Reprinted with permission from United States Cutting Tool Institute (USCTI).

Taps

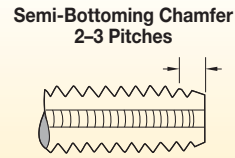
■ Tap Chamfers • ANSI Taps



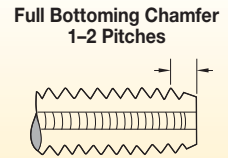
Taper (7–10 pitches)
The taper chamfer has the longest standard chamfer ensuring easier starting. It provides the longest life because of more working teeth.



Plug (3–5 pitches)
The most common chamfer for use by hand or machine in through. This chamfer is more efficient than a bottoming or modified bottoming chamfer.

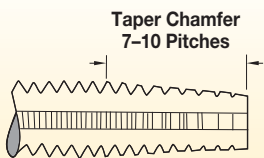


Semi-Bottom (2–3 pitches)
This short chamfer enables threading close to the bottom of blind holes. Due to the slightly longer chamfer and more working teeth, this chamfer is more efficient than a bottoming chamfer.

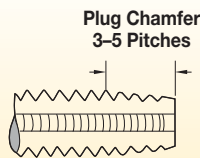


Bottoming (1–2 pitches)
For threading close to the bottom of blind holes, the bottoming chamfer is the least efficient chamfer available.

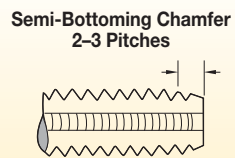
■ Tap Chamfers • DIN Taps



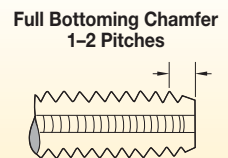
Form A (6–8 pitches)
The Form A chamfer has the longest standard chamfer ensuring easier starting. It provides the longest life because of more working teeth.



Form B/D (3.5–5 pitches)
The most common chamfers for use by hand or machine in through hole. Form B applies to spiral-point taps, and Form D applies to straight-flute and spiral-flute taps. This chamfer is more efficient than a Form E or Form C chamfers.

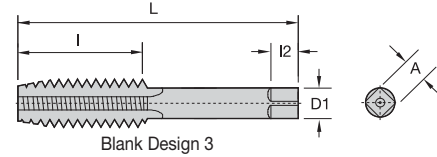
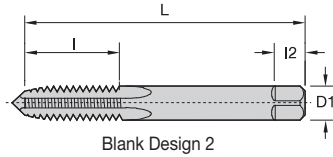
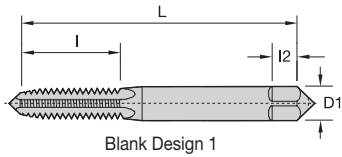


Form C (2–3 pitches)
This short chamfer enables threading close to the bottom of blind holes. Due to the slightly longer chamfer and more working teeth, this chamfer is more efficient than a Form E chamfer.



Form E (1.5–2 pitches)
For threading close to the bottom of blind holes, the Form E chamfer is the least efficient chamfer available.

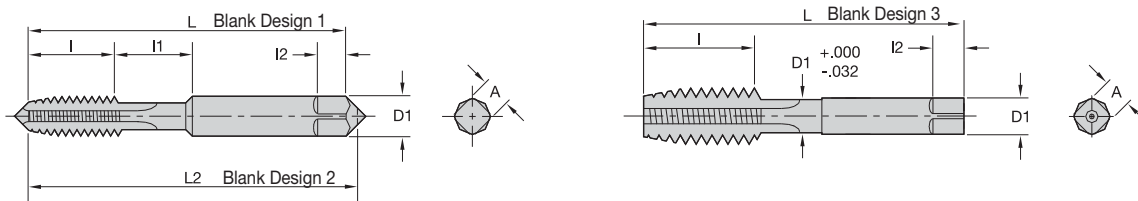




Taps

nominal diameter range (in)	machine screw size number (in)	nominal fractional diameter (in)	nominal metric diameter mm (in)	blank design number	overall length L	thread length l	square length l2	shank diameter D1	square size A
.052-.065	0 (.0600)	—	M1.6 (.0630)	1	1.63	.31	.19	.1410	.110
.065-.078	1 (.0730)	—	M1.8 (.0709)	1	1.69	.38	.19	.1410	.110
.078-.091	2 (.0860)	—	M2 (0787), M2.2 (.0866)	1	1.75	.44	.19	.1410	.110
.091-.104	3 (.0990)	—	M2.5 (.0984)	1	1.81	.50	.19	.1410	.110
.104-.117	4 (.1120)	—	—	1	1.88	.56	.19	.1410	.110
.117-.130	5 (.1250)	—	M3 (.1181)	1	1.94	.63	.19	.1410	.110
.130-.145	6 (.1380)	—	M3.5 (.1378)	1	2.00	.69	.19	.1410	.110
.145-.171	8 (.1640)	—	M4 (.1575)	1	2.13	.75	.25	.1680	.131
.171-.197	10 (.1900)	—	M4.5 (.1772), M5 (.1969)	1	2.38	.88	.25	.1940	.152
.197-.223	12 (.2160)	—	—	1	2.38	.94	.28	.2200	.165
.223-.260	—	1/4 (.2500)	M6 (.2362)	2	2.50	1.00	.31	.2550	.191
.260-.323	—	5/16 (.3125)	M7 (.2756), M8 (.3150)	2	2.72	1.13	.38	.3180	.238
.323-.395	—	3/8 (.3750)	M10 (.3937)	2	2.94	1.25	.44	.3810	.286
.395-.448	—	7/16 (.4375)	—	3	3.16	1.44	.41	.3230	.242
.448-.510	—	1/2 (.5000)	M12 (.4724)	3	3.38	1.66	.44	.3670	.275
.510-.573	—	9/16 (.5625)	M14 (.5512)	3	3.59	1.66	.50	.4290	.322
.573-.635	—	5/8 (.6250)	M16 (.6299)	3	3.81	1.81	.56	.4800	.360
.635-.709	—	11/16 (.6875)	M18 (.7087)	3	4.03	1.81	.63	.5420	.406
.709-.760	—	3/4 (.7500)	—	3	4.25	2.00	.69	.5900	.442
.760-.823	—	13/16 (.8125)	M20 (.7874)	3	4.47	2.00	.69	.6520	.489
.823-.885	—	7/8 (.8750)	M22 (.8661)	3	4.69	2.22	.75	.6970	.523
.885-.948	—	15/16 (.9375)	M24 (.9449)	3	4.91	2.22	.75	.7600	.570
.948-1.010	—	1 (1.0000)	M25 (.9843)	3	5.13	2.50	.81	.8000	.600
1.010-1.073	—	1 1/16 (1.0625)	M27 (1.0630)	3	5.13	2.50	.88	.8960	.672
1.073-1.135	—	1 1/8 (1.1250)	—	3	5.44	2.56	.88	.8960	.672
1.135-1.198	—	1 3/16 (1.1875)	M30 (1.1811)	3	5.44	2.56	1.00	1.0210	.766
1.198-1.260	—	1 1/4 (1.2500)	—	3	5.75	2.56	1.00	1.0210	.766
1.260-1.323	—	1 5/16 (1.3125)	M33 (1.2992)	3	5.75	2.56	1.06	1.1080	.831
1.323-1.385	—	1 3/8 (1.3750)	—	3	6.06	3.00	1.06	1.1080	.831
1.358-1.448	—	1 7/16 (1.4375)	M36 (1.4173)	3	6.06	3.00	1.13	1.2330	.925
1.448-1.510	—	1 1/2 (1.5000)	—	3	6.38	3.00	1.13	1.2330	.925
1.510-1.635	—	1 5/8 (1.6250)	M39 (1.5354)	3	6.69	3.19	1.13	1.3050	.979
1.635-1.760	—	1 3/4 (1.7500)	M42 (1.6535)	3	7.00	3.19	1.25	1.4300	1.072
1.760-1.885	—	1 7/8 (1.8750)	—	3	7.31	3.56	1.25	1.5190	1.139
1.885-2.010	—	2 (2.0000)	M48 (1.8898)	3	7.63	3.56	1.38	1.6440	1.233
2.010-2.135	—	2 1/8 (2.1250)	—	3	8.00	3.56	1.38	1.7690	1.327
2.135-2.260	—	2 1/4 (2.2500)	M56 (2.2047)	3	8.25	3.56	1.44	1.8940	1.420
2.260-2.385	—	2 3/8 (2.3750)	—	3	8.50	4.00	1.44	2.0190	1.514
2.385-2.510	—	2 1/2 (2.5000)	—	3	8.75	4.00	1.50	2.1000	1.575
2.510-2.635	—	2 5/8 (2.6250)	M64 (2.5197)	3	8.75	4.00	1.50	2.2250	1.669
2.635-2.760	—	2 3/4 (2.7500)	—	3	9.25	4.00	1.56	2.3500	1.762
2.760-2.885	—	2 7/8 (2.8750)	M72 (2.8346)	3	9.25	4.00	1.56	2.4750	1.856
2.885-3.010	—	3 (3.0000)	—	3	9.75	4.56	1.63	2.5430	1.907
3.010-3.135	—	3 1/8 (3.1250)	—	3	9.75	4.56	1.63	2.6680	2.001
3.135-3.260	—	3 1/4 (3.2500)	M80 (3.1496)	3	10.00	4.56	1.75	2.7930	2.095
3.260-3.385	—	3 3/8 (3.3750)	—	3	10.00	4.56	1.75	2.8830	2.162
3.385-3.510	—	3 1/2 (3.5000)	—	3	10.25	4.94	2.00	3.0080	2.256
3.510-3.635	—	3 5/8 (3.6250)	M90 (3.5433)	3	10.25	4.94	2.00	3.1330	2.350
3.635-3.760	—	3 3/4 (3.7500)	—	3	10.50	5.31	2.13	3.2170	2.413
3.760-3.885	—	3 7/8 (3.8750)	—	3	10.50	5.31	2.13	3.3420	2.506
3.885-4.010	—	4 (4.0000)	M100 (3.9370)	3	10.75	5.31	2.25	3.4670	2.600

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General Dimensions

nominal diameter range (in)	machine screw size number (in)	nominal fractional diameter (in)	nominal metric diameter mm (in)	blank design number	Tap Dimensions—Inches					
					overall length L	thread length l	neck length l1	square length l2	shank diameter D1	size of square A
.104 .117	4 (.1120)	—	—	1	1.88	.31	.25	.19	.1410	.110
.117 .130	5 (.1250)	—	M3 (.1181)	1	1.94	.31	.31	.19	.1410	.110
.130 .145	6 (.1380)	—	M3.5 (.1378)	1	2.00	.38	.31	.19	.1410	.110
.145 .171	8 (.1640)	—	M4 (.1575)	1	2.13	.38	.38	.25	.1680	.131
.171 .197	10 (.1900)	—	M4.5 (.1772)	1	2.38	.50	.38	.25	.1940	.152
— —	— —	—	M5 (.1969)	—	—	—	—	—	—	—
.197 .223	12 (.2160)	—	—	1	2.38	.50	.44	.28	.2200	.165
.223 .260	—	1/4 (.2500)	M6 (.2362)	2	2.50	.63	.38	.31	.2550	.191
.260 .323	—	5/16 (.3125)	M7 (.2756), M8 (.3150)	2	2.72	.69	.44	.38	.3180	.238
.323 .395	—	3/8 (.3750)	M10 (.3937)	2	2.94	.75	.50	.44	.3810	.286
.395 .448	—	7/16 (.4375)	—	3	3.16	.88	—	.41	.3230	.242
.448 .510	—	1/2 (.5000)	M12 (.4724)	3	3.38	.94	—	.44	.3670	.275
.510 .573	—	9/16 (.5625)	M14 (.5541)	3	3.59	1.00	—	.50	.4290	.322
.573 .635	—	5/8 (.6250)	M16 (.6299)	3	3.81	1.09	—	.56	.4800	.360
.635 .709	—	11/16 (.6875)	M18 (.7087)	3	4.03	1.09	—	.63	.5420	.406
.709 .760	—	3/4 (.7500)	—	3	4.25	1.22	—	.69	.5900	.442
.760 .823	—	13/16 (.8125)	M20 (.7874)	3	4.47	1.22	—	.69	.6520	.489
.823 .885	—	7/8 (.8750)	M22 (.8661)	3	4.69	1.34	—	.75	.3670	.523
.885 .948	—	15/16 (.9375)	M24 (.9449)	3	4.91	1.34	—	.75	.7600	.570
.948 1.010	—	1 (1.0000)	M25 (.9843)	3	5.13	1.50	—	.81	.8000	.600

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NOTES: Thread length l is based on a length of 12 pitches of the UNC thread series. Thread length l is a minimum value and has no tolerance. When thread length l is added to neck length l1, the total shall be no less than the minimum USCTI Table 302 thread length l. Unless otherwise specified, all tolerances are in accordance with USCTI Table 302. For eccentricity tolerances, see USCTI Table 317. Table 302 is provided for reference only. Kennametal's tap dimensions may differ.

Tolerances

element	nominal diameter range (in)	direction	tolerance (in)
length overall — L	.0520–1.0100	plus or minus	.031
	1.0100–4.0100	plus or minus	.063
length of thread — l	.0520–.2230	plus or minus	.047
	.2230–.5100	plus or minus	.063
	.5100–1.5100	plus or minus	.094
length of square — l2	1.5100–4.0100	plus or minus	.125
	.0520–1.0100	plus or minus	.031
	1.0100–4.0100	plus or minus	.063
diameter of shank — d1	.0520–.2230	minus	.0015
	.2230–.6350	minus	.0015
	.6350–1.0100	minus	.0020
	1.0100–1.5100	minus	.0020
	1.5100–2.0100	minus	.0030
size of square — A	2.0100–4.0100	minus	.0030
	.0520–.5100	minus	.004
	.5100–1.0100	minus	.006
	1.0100–2.0100	minus	.008
	2.0100–4.0100	minus	.010

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Special Taps

Unless otherwise specified:

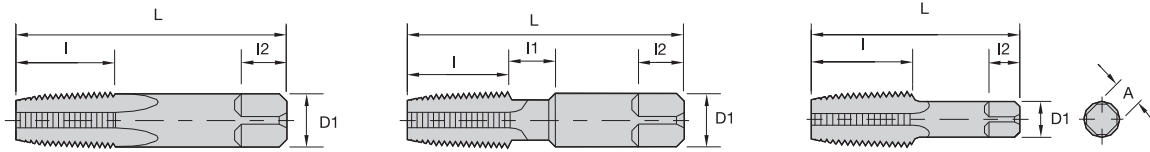
Special taps over 1.010–1.510" diameter inclusive, having 14 or more threads per inch or 1.75mm pitch and finer, and sizes over 1.510" diameter with 10 or more threads per inch or 2.5mm pitch and finer, are made to general dimensions shown in USCTI Table 303.

Special tap thread limits are determined using the formulas shown in USCTI Table 331 for Unified Inch Screw Threads and USCTI Table 341 for metric m-profile screw threads.

NOTES: Tap sizes .395" and smaller have an external center on the thread end (may be removed on bottoming taps). Sizes .125" and smaller have an external center on the shank end. Sizes .224–.395" have truncated partial cone centers on the shank end (length of cone approximately 1/4 of diameter of shank). Sizes over .395" have internal centers on both the thread and shank ends.

For standard thread limits and tolerances for Unified Inch Screw Threads, see USCTI Table 327, and for metric threads, see USCTI Table 337.

For eccentricity tolerances of tap elements, see USCTI Table 317.



■ General Dimensions

■ Tolerances

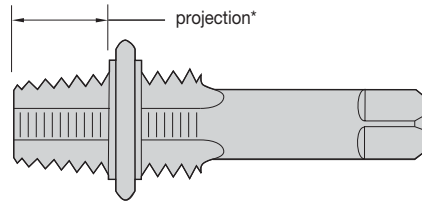
nominal size (in)	dimensions (in)					
	length overall L	length of thread l	length of square l2	diameter of shank D1	size of square A	length optional neck l1
1/16	2.13	.69	.38	.3125	.234	.375
1/8	2.13	.75	.38	.3125	.234	–
1/8	2.13	.75	.38	.4375	.328	.375
1/4	2.44	1.06	.44	.5625	.421	.375
3/8	2.56	1.06	.50	.7000	.531	.375
1/2	3.13	1.38	.63	.6875	.515	–
3/4	3.25	1.38	.69	.9063	.679	–
1	3.75	1.75	.81	1.1250	.843	–
1 1/4	4.00	1.75	.94	1.3125	.984	–
1 1/2	4.25	1.75	1.00	1.5000	1.125	–
2	4.25	1.75	1.13	1.8750	1.406	–
2 1/2	5.50	2.56	1.25	2.2500	1.687	–
3	6.00	2.63	1.38	2.6250	1.968	–
3 1/2	6.50	2.69	1.50	2.8125	2.108	–
4	6.75	2.75	1.56	3.0000	2.250	–

element	range	direction	tolerance
length overall – L	1/16–3/4 inc.	plus/minus	.031
	1–4 inc.	plus/minus	.063
length of thread – l	1/16–3/4 inc.	plus/minus	.063
	1–1 1/4 inc.	plus/minus	.094
length of square – l2	1 1/2–4	plus/minus	.125
	1/16–3/4 inc.	plus/minus	.031
diameter of shank – d1	1–4 inc.	plus/minus	.063
	1/16–1/8	minus	.0015
size of square – a	1/4–1 inc.	minus	.0020
	1 1/4–4 inc.	minus	.0030
	1/16–1/8	minus	.004
	1/4–3/4 inc.	minus	.006
	1–4 inc.	minus	.008

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Taps

American National Standard Taper Pipe Thread Form (NPT)
Aeronautical National Taper Pipe Thread Form (ANPT)
Dryseal American National Standard Taper Pipe Thread Form (NPTF)



nominal size (in)	threads per inch	projection* (in)	projection tolerance + / -	taper per foot limits		length L1	tap drill size** NPT, ANPT, NPTF
				min	max		
1/16	27	.312	.063	.719	.781	.160	C
1/8	27	.312	.063	.719	.781	.1615	Q
1/4	18	.459	.063	.719	.781	.2278	7/16
3/8	18	.454	.063	.719	.781	.240	9/16
1/2	14	.579	.063	.719	.781	.320	45/64
3/4	14	.565	.063	.719	.781	.339	29/32
1	11 1/2	.678	.094	.719	.781	.400	1 9/64
1 1/4	11 1/2	.686	.094	.719	.781	.420	1 31/64
1 1/2	11 1/2	.699	.094	.719	.781	.420	1 23/32
2	11 1/2	.667	.094	.719	.781	.436	2 3/16
2 1/2	8	.925	.094	.734	.781	.682	2 39/64
3	8	.925	.094	.734	.781	.766	3 15/64
3 1/2	8	.938	.125	.734	.781	.821	-
4	8	.950	.125	.734	.781	.844	-

NOTE: *Distance small end of tap projects through L1 taper thread ring gage.

**Recommended size given permits direct tapping without reaming the hole, but only gives a full thread for approximately the L1 length.

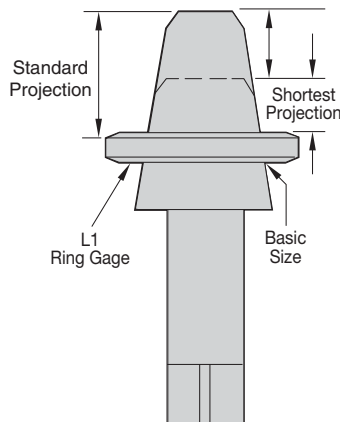
■ Pipe Taps

General-purpose pipe taps are appropriate for threading a wide variety of materials, both ferrous and non-ferrous.

Ground thread pipe taps are standard in American Standard Pipe Form (NPT) and American Standard Dryseal Pipe Form (NPTF). NPT threads require the use of a sealer, like Teflon® tape or pipe compound. Dryseal taps are used to tap fittings which will give a pressure-tight joint without the use of a sealer.

The nominal size of a pipe tap is that of the pipe fitting to be tapped, not the actual size of the tap. The thread tapers 3/4" per foot.

All pipe taps are furnished with 2 1/2–3 1/2 thread chamfer.

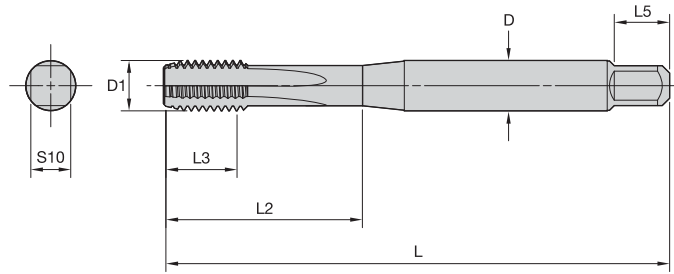


Short projection pipe taps are made with a projection shorter than standard for taper pipe tapping where the depth of tapping is limited.

Special short projection taper pipe taps can be furnished with American National Standard Taper Pipe thread (ANPT) or Dryseal American National Standard Taper Pipe thread (NPTF, PTF-SAE Short, or PTF-SPL Extra Short).

For information on short projection pipe taps and hole preparation for NPT, NPTF, and ANPT internal pipe threads, consult Kennametal Technical Bulletins.

Special short projection pipe taps and left-hand pipe taps are available through Lightning Service.

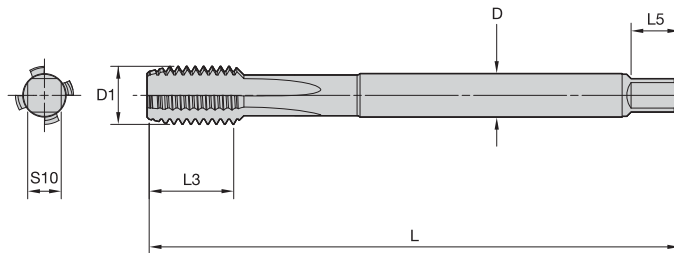


■ DIN 371

D1	pitch	D	L	L3*	L2	L5	S10
M3	0.5	3.5	56	11	18	6	2.7
M3.5	0.6	4	56	12	20	6	3
M4	0.7	4.5	63	13	21	6	3.4
M4.5	0.75	6	70	16	25	8	4.9
M5	0.8	6	70	16	25	8	4.9
M6	1	6	80	19	30	8	4.9
M7	1	7	80	19	30	8	5.5
M8	0.75	8	80	18	30	9	6.2
M8	1.25	8	90	22	35	9	6.2
M9	0.75	9	80	18	30	10	7
M9	1.25	9	90	22	35	10	7
M10	1	10	90	20	35	11	8
M10	1.5	10	100	24	39	11	8

*Maximum

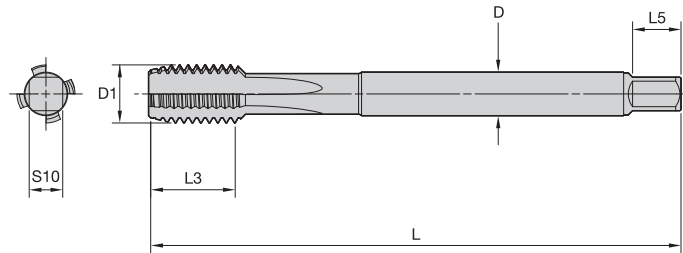
Taps



■ DIN 376

D1	pitch	D	L	L3*	L5	S10
M8	1.25	6	90	22	8	4.9
M9	1.25	7	90	22	8	5.5
M10	1.5	7	100	24	8	5.5
M11	1.5	8	100	24	9	6.2
M12	1.75	9	110	28	10	7
M14	2	11	110	30	12	9
M16	2	12	110	32	12	9
M18	2.5	14	125	34	14	11
M20	2.5	16	140	34	15	12
M22	2.5	18	140	34	17	14.5
M24	3	18	160	38	17	14.5
M27	3	20	160	38	19	16
M30	3.5	22	180	45	21	18
M33	3.5	25	180	50	23	20
M36	4	28	200	56	25	22
M39	4	32	200	60	27	24
M42	4.5	32	200	60	27	24
M45	4.5	36	220	65	32	29

*Maximum



■ DIN 374

D1	pitch		D	L	L3*	L5	S10
	minimum	maximum					
M8	0.2	0.75	6	80	18	8	4.9
M8	—	1	6	90	22	8	4.9
M9	0.2	0.75	7	80	18	8	5.5
M9	—	1	7	90	22	8	5.5
M10	0.2	1	7	90	20	8	5.5
M10	—	1.25	7	100	24	8	5.5
M11	0.35	1	8	90	20	9	6.2
M12	0.35	1.5	9	100	22	10	7
M14	0.35	1.5	11	100	22	12	9
M16	0.35	1.5	12	100	22	12	9
M16	—	2	12	110	32	12	9
M18	0.35	1.5	14	110	25	14	11
M18	—	2	14	125	34	14	11
M20	0.35	1.5	16	125	25	15	12
M20	—	2	16	140	34	15	12
M22	0.35	1.5	18	125	25	17	14.5
M22	—	2	18	140	34	17	14.5
M24	0.35	2	18	140	28	17	14.5
M27	0.35	2	20	140	28	19	16
M30	0.35	2	22	150	28	21	18
M30	—	3	22	180	45	21	18

*Maximum



Taps

Through Holes Push Chips



- Spiral point or LHSF (Left-Hand Spiral Flute).
- Ideal for materials with long chips.

Blind Holes Pull Chips



- RHSF (Right-Hand Spiral Flute).
- Ideal for materials with long chips.

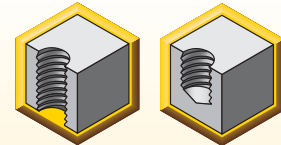
Blind or Through Holes Store Chips



- STFL (Straight Flute).
- Ideal for materials with short chips.

STFL

Blind or Through Holes No Chips



- Forming.
- Ideal for ductile materials <32 HRC.

Forming

■ Unified Inch Screw Threads

size	threads per inch		recommended tap limits		internal thread pitch diameter limits (in)		
	NC UNC	NC UNC	class 2B	class 3B	min all classes (BASIC)	max class 2B	max class 3B
0	—	80	H2	H1	.0519	.0542	.0536
1	64	—	H2	H1	.0629	.0655	.0648
1	—	72	H2	H1	.0640	.0665	.0659
2	56	—	H2	H1	.0744	.0772	.0765
2	—	64	H2	H1	.0759	.0786	.0779
3	48	—	H2	H1	.0855	.0885	.0877
3	—	56	H2	H1	.0874	.0902	.0895
4	40	—	H2	H2	.0958	.0991	.0982
4	—	48	H2	H1	.0985	.1016	.100
5	40	—	H2	H2	.1088	.1121	.1113
5	—	44	H2	H1	.1102	.1134	.1126
6	32	—	H3	H2	.1177	.1214	.1204
6	—	40	H2	H2	.1218	.1252	.1243
8	32	—	H3	H2	.1437	.1475	.1465
8	—	36	H2	H2	.1460	.1496	.1487
10	24	—	H3	H3	.1629	.1672	.1661
10	—	32	H3	H2	.1697	.1736	.1726
12	24	—	H3	H3	.1889	.1933	.1922
12	—	28	H3	H3	.1928	.1970	.1959
1/4	20	—	H5	H3	.2175	.2224	.2211
1/4	—	28	H4	H3	.2268	.2311	.2300
5/16	18	—	H5	H3	.2764	.2817	.2803
5/16	—	24	H4	H3	.2854	.2902	.2890
3/8	16	—	H5	H3	.3344	.3401	.3387
3/8	—	24	H4	H3	.3479	.3528	.3516
7/16	14	—	H5	H3	.3911	.3972	.3957
7/16	—	20	H5	H3	.4050	.4104	.4091
1/2	13	—	H5	H3	.4500	.4565	.4548
1/2	—	20	H5	H3	.4675	.4731	.4717
9/16	12	—	H5	H3	.5084	.5152	.5135
9/16	—	18	H5	H3	.5264	.5323	.5308
5/8	11	—	H5	H3	.5660	.5732	.5714
5/8	—	18	H5	H3	.5889	.5949	.5934
3/4	10	—	H5	H5	.6850	.6927	.6907
3/4	—	16	H5	H3	.7094	.7159	.7143
7/8	9	—	H6	H4	.8028	.8110	.8089
7/8	—	14	H6	H4	.8286	.8356	.8339



NOTE: The above recommended taps normally produce the class of thread indicated in average materials when used with reasonable care. However, if the tap specified does not give a satisfactory gage fit in the work, a choice of some other limit tap will be necessary.

■ Unified Inch Screw Threads

size	threads per inch		recommended tap limits		internal thread pitch diameter limits (in)		
	NC UNC	NC UNC	class 2B	class 3B	min all classes (BASIC)	max class 2B	max class 3B
1	8	—	H8	H4	.9188	.9276	.9254
1	—	12	H8	H4	.9188	.9276	.9254
1	15 NS		H6	H4	.9536	.9609	.9590
2	7	—	H8	H4	1.0332	1.0416	1.0393
2	—	12	H6	H4	1.0709	1.0787	1.0768
1 1/4	7	—	H8	H4	1.1572	1.1668	1.1644
1 1/4	—	12	H6	H4	1.1959	1.2039	1.2019
1 3/8	6	—	H8	H4	1.2667	1.2771	1.2745
1 3/8	—	12	H6	H4	1.3209	1.3291	1.3270
1 1/2	6	—	H8	H4	1.3917	1.4022	1.3996
1 1/2	—	12	H6	H4	1.4459	1.4542	1.4522

■ Tap Recommendations for Class 6H Metric Screw Threads

thread size		recommended tap limit number	internal thread — product limits — class 6H			
nominal diameter (mm)	pitch (mm)		pitch diameter (mm)		pitch diameter (in)	
			min	max	min	max
1,6	0,35	D3	1,373	1,458	.05406	.05740
2	0,4	D3	1,740	1,830	.06850	.07205
2,5	0,45	D3	2,208	2,303	.08693	.09067
3	0,5	D3	2,675	2,775	.10531	.10925
3,5	0,6	D4	3,110	3,222	.12244	.12685
4	0,7	D4	3,545	3,663	.13957	.14421
4,5	0,75	D4	4,013	4,131	.15789	.16264
5	0,8	D4	4,480	4,605	.17638	.18130
6	1	D5	5,350	5,500	.21063	.21654
7	1	D5	6,350	6,500	.25000	.25591
8	1,25	D5	7,188	7,348	.28299	.28929
10	1,5	D6	9,026	9,206	.35535	.36244
12	1,75	D6	10,863	11,063	.42768	.43555
14	2	D7	12,701	12,913	.50004	.50839
16	2	D7	14,701	14,913	.57878	.58713
20	2,5	D7	18,376	18,600	.72346	.73228
24	3	D8	22,051	22,316	.86815	.87858
30	3,5	D9	27,727	28,007	1.09161	1.10264
36	4	D9	33,402	33,702	1.31504	1.32685

In addition to the nominal size and pitch of a tap, there is another important dimensional factor to be considered when selecting a ground thread tap for a given job. This factor is the pitch diameter tap limit, "H" and "L". "H" represents (high) above basic pitch diameter; "L" (low) is below basic pitch diameter. Tap limits have been established to provide a choice in the selection of the tap size best suited to produce the class of thread desired.

Figure 1 illustrates the numbering system and the .0005" diameter increment separation between successive limits. Because the starting point is basic pitch diameter, dividing the limit number by two establishes, in thousandths of an inch, the amount the maximum tap pitch diameter is above basic in the "H" series and the amount the minimum tap pitch diameter is under basic in the "L" series.

Figure 2 illustrates the positioning of the tap limits in relation to the various classes of threads for a 1/4-20 size.

Figure 1

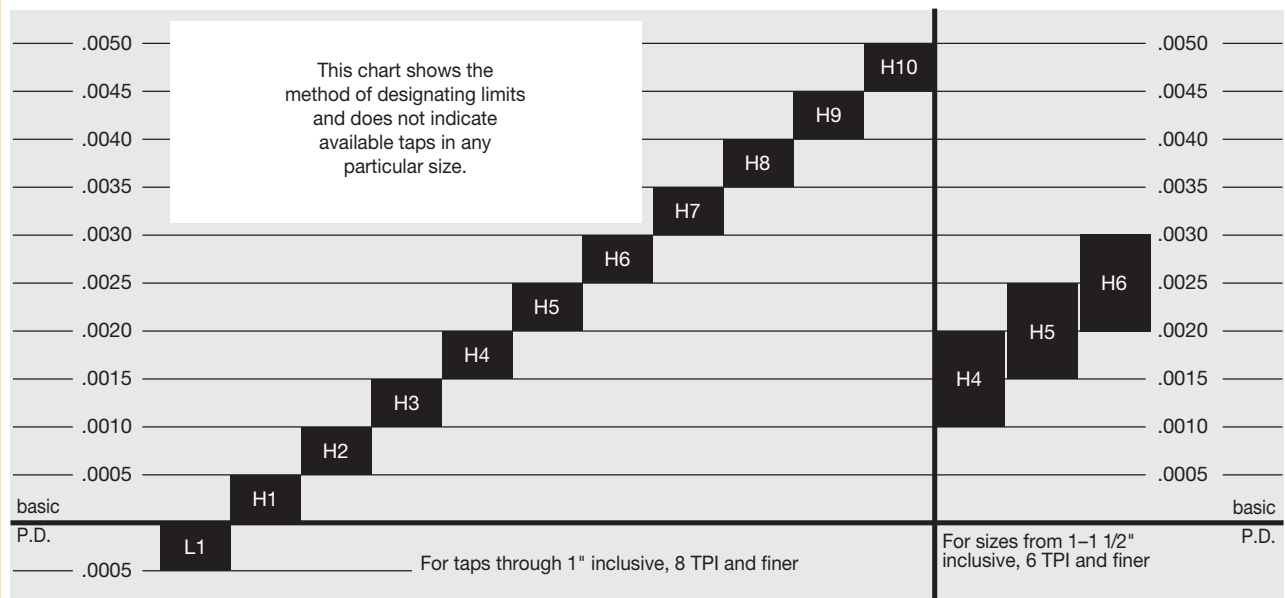
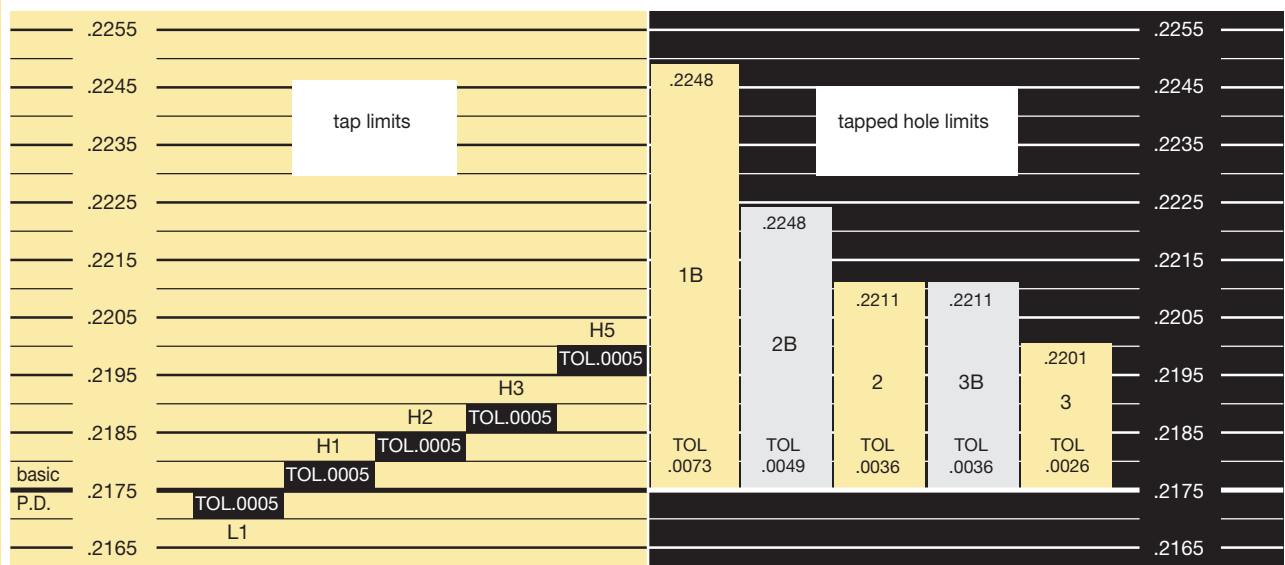


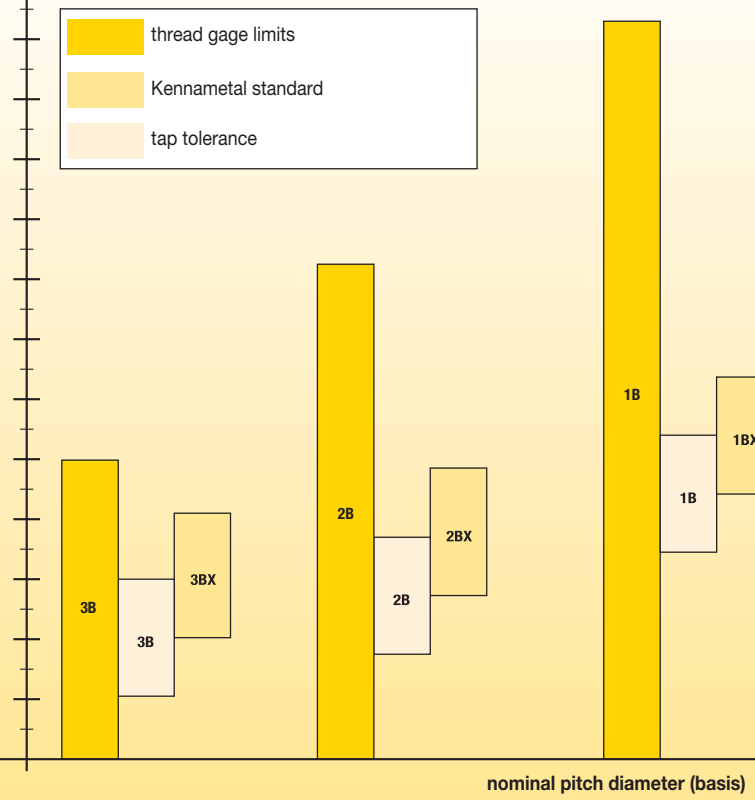
Figure 2

Class of Thread – 1/4-20 UNC and NC



Taps

Internal Unified Thread



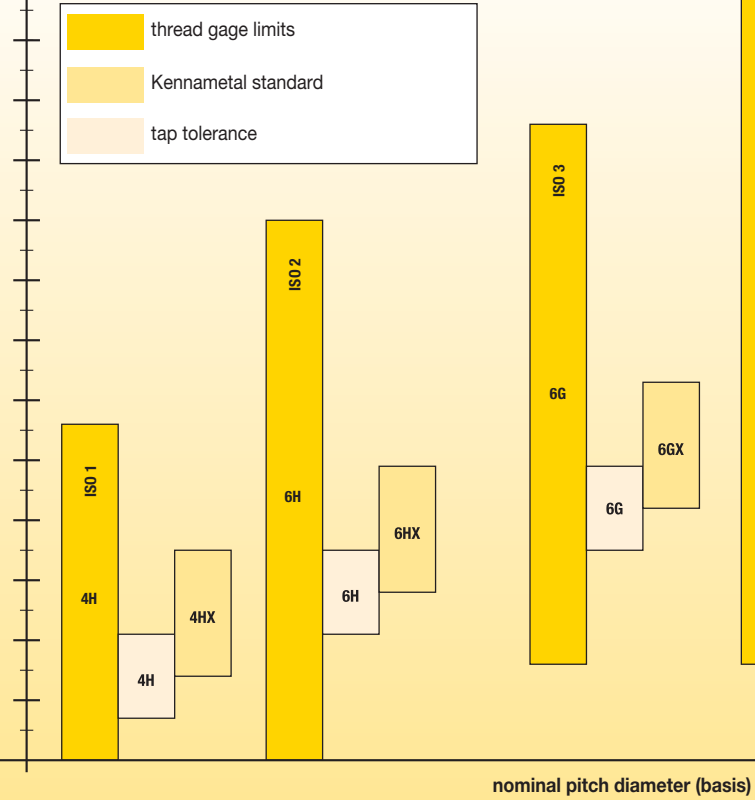
For the tap user's convenience, new generation Kennametal taps are sized for the intended class of fit of the internal screw thread. ISO standard 2857 specifies the manufacturing tolerances of the tap pitch diameters for ISO metric threads of tolerances classes 4H to 8H and 4G to 6G.

Examples:
 4H tap corresponds to ISO 1
 6H tap corresponds to ISO 2
 6G tap corresponds to ISO 3

Similarly, ASME B1.1 recommends tap pitch diameter tolerances for 1B, 2B, and 3B classes of fit.

However, it is recognized in many tapping applications that taps should have a pitch diameter that is larger than industry standards. These applications include tapping abrasive materials or CNC applications where machine and tool concentricity is excellent. Taps manufactured to Kennametal standards are designated with an X after the class of fit (example 6HX or 3BX). These graphs illustrate the differences.

Internal Metric Thread



It is generally recognized that, in mass production, it is impossible to reproduce in exact detail the theoretically perfect product as laid out on the drawing board. The allowed slight variation between the theoretically perfect product drawing and each unit of the actual product is called the tolerance.

Allowance

An intentional difference in correlated dimensions of mating parts. It is the minimum clearance or maximum interference between such parts.

Angle of Thread

The angle included between the flanks of the thread measured in an axial plane.

Half Angle of Thread

The angle included between a flank of the thread and the normal (90°) to the axis, measured in an axial plane.

Lead of Thread

The distance a screw thread advances axially in one turn. On a single-thread screw, the lead and pitch are identical. On a double thread, the lead is 2x pitch; on a triple thread, the lead is 3x pitch, etc.

Major Diameter

The largest diameter of a straight-screw thread.

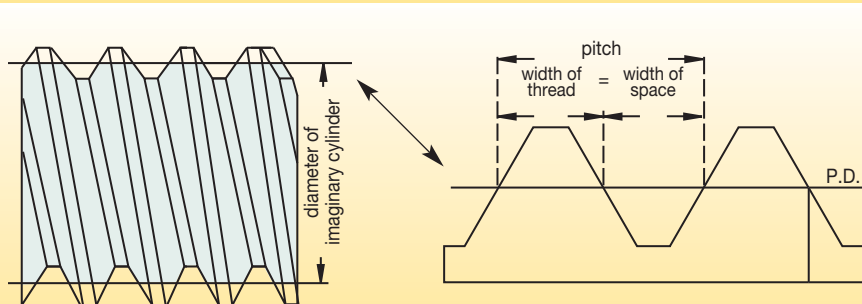
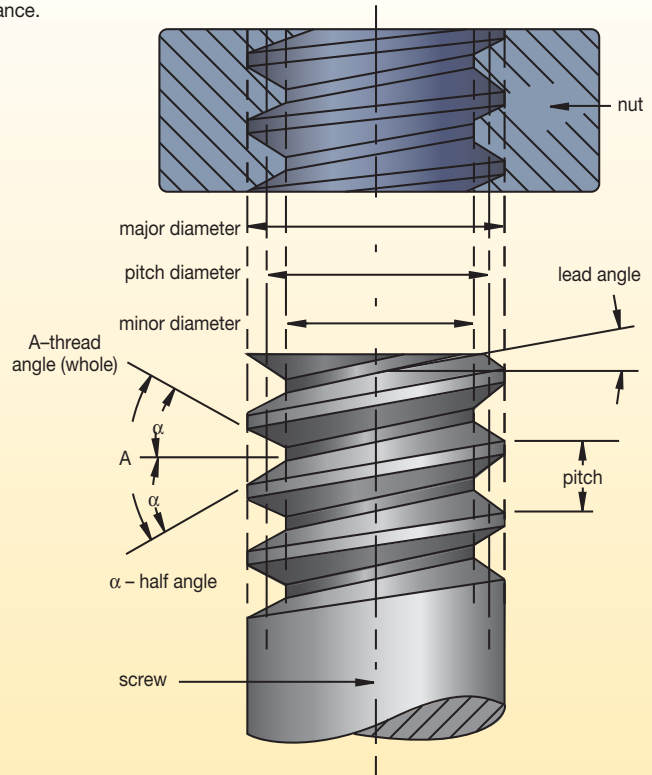
Minor Diameter

The smallest diameter of a straight-screw thread.

Pitch

The distance from a point on a screw thread to a corresponding point on the next thread measured parallel to the axis.

$$\text{The pitch in inches} = \frac{1}{\text{number of threads per inch}}$$



Pitch Diameter

On a straight-screw thread, the diameter of an imaginary cylinder that would pass through the threads at such points as to make equal the width of the threads and the width of the spaces cut by the surface of the cylinder.

Factors when trying to determine the best tapping speeds:

- Material to be tapped
- Length of chamfer on tap
- Percentage of full thread to be cut
- Length of hole (depth of thread)
- Pitch of thread
- Cutting fluids
- Machine equipment
- Horizontal or vertical tapping

The best and most efficient operating speeds for taps cannot be calculated with the same certainty, as for many other metalcutting tools.

With other tools, the feed per revolution can be set at any desired point and can be varied as conditions demand. Taps, on the other hand, must always be advanced at a rate equal to one pitch for every revolution, or one lead in the case of multi-start threads.

The style of tap may vary the conditions. For example, with a bottoming tap, the chamfer cuts a heavy chip while with a taper tap, the chamfer cuts a very thin chip.

The depth of thread also varies, depending on the pitch. The coarser the thread, the greater the advance of the tap per revolution and the greater the amount of material removed.

The method of feeding the tap, and the type of equipment for driving, also influences the permissible speeds. If taps are mechanically fed at the proper rate of advance, they can be operated at higher speeds than if used with flexible tapping holders on machines with poor feed control.

Speeds may be modified to take into account any or all of these factors:

- Speeds must be lowered as length of thread increases because, in deep thread holes, the accumulated chips increase friction and interfere with lubrication.
- Bottoming taps must be run slower than plug taps.
- Tapping full height of thread calls for slower speed than if the commercial 75% height only is required.
- Coarse-thread taps in the larger diameters should be run more slowly than fine-thread taps of the same diameters.
- The quantity and quality of cutting fluid may affect the permissible speeds as much as 100%.
- Taper threaded taps, such as pipe taps, should be operated from 1/2–3/4 the speed of a straight thread tap of comparable major diameter.
- Increase the speed of coolant taps up to 25%.

RPM Formulas

SFM = Surface Feet per Minute

RPM = Revolutions per Minute

IPM = Inches per Minute

TPI = Threads per Inch

S m/min = Surface Meters per Minute

$\Pi = 3.1416$

mm/min = millimeters per minute

P = Pitch (1/number of threads per inch)

Inch Sizes

$$\text{SFM} = \frac{\text{RPM} \times \text{tool diameter}}{3.82} \quad \text{or} \quad 0.26 \times \text{RPM} \times \text{tool diameter}$$

$$\text{RPM} = \frac{3.82 \times \text{SFM}}{\text{tool diameter}}$$

$$\text{IPM} = \frac{\text{RPM}}{\text{TPI}^*} \quad \text{or} \quad *P \times \text{RPM}$$

Metric Sizes

$$\text{S m/min} = \frac{\Pi \times \text{tool diameter} \times \text{RPM}}{1000}$$

$$\text{RPM} = \frac{\text{mm/min} \times 1000}{\Pi \times \text{tool diameter}}$$

$$\text{mm/min} = \text{mm P} \times \text{RPM}$$

■ **UNC/UNF and NPT/NPTF**

tap size	taper pipe taps	surface feet per minute (SFM)																	
		5'	10'	15'	20'	25'	30'	40'	50'	60'	70'	80'	90'	100'	110'	120'	130'	140'	150'
		revolutions per minute (RPM)																	
0		318	637	955	1273	1592	1910	2546	3183	3820	4456	5093	5729	6366	7003	7639	8276	8913	9549
1		273	546	819	1046	1308	1570	2093	2617	3140	3663	4186	4710	5233	5756	6279	6805	7326	1849
2		212	424	637	888	1110	1333	1777	2221	2665	3109	3554	3999	4442	4886	5330	5774	6218	6662
3		191	382	573	772	964	1157	1543	1929	2315	2701	3086	3472	3858	4244	4629	5015	5401	5787
4		174	347	521	682	853	1023	1364	1705	2046	2387	2728	3069	3411	3751	4092	4434	4775	5115
5		147	294	441	611	764	917	1222	1528	1833	2139	2445	2750	3056	3361	3667	3973	4278	4584
6		136	273	409	553	691	829	1106	1382	1659	1935	2212	2488	2766	3042	3318	3595	3871	4148
8		119	239	358	466	583	699	932	1165	1398	1631	1864	2097	2330	2563	2796	3029	3262	3495
10		101	201	302	402	502	603	804	1005	1205	1406	1607	1808	2009	2210	2411	2612	2813	3014
12		87	174	260	354	442	531	707	884	1061	1238	1415	1592	1769	1945	2122	2300	2476	2653
1/4		76	153	229	306	382	458	611	764	917	1070	1222	1375	1528	1681	1833	1986	2139	2292
5/16		62	123	185	245	306	367	489	611	733	856	978	1100	1222	1345	1467	1589	1711	1833
3/8		50	101	151	204	255	305	407	509	611	713	815	917	1019	1120	1222	1324	1426	1528
7/16	1/8	43	87	130	175	219	262	349	437	524	611	698	786	873	960	1048	1135	1222	1310
1/2	—	38	76	115	153	191	229	305	382	458	535	611	688	764	840	917	993	1070	1146
9/16	1/4	34	68	102	137	172	206	274	342	410	478	547	616	683	752	820	888	952	1020
5/8	—	32	64	96	122	153	183	244	306	367	428	489	550	611	672	733	794	856	917
11/16	3/8	28	55	83	111	138	167	222	278	333	389	444	500	556	611	667	722	778	833
3/4	—	25	51	76	102	128	153	203	255	305	357	407	458	509	560	611	662	713	764
7/8	1/2	22	43	65	87	109	131	175	218	262	306	350	392	437	480	524	568	611	655
1	—	19	38	57	76	96	115	153	191	230	268	305	344	382	420	458	497	535	573
1 1/8	3/4	17	34	51	68	84	102	136	170	204	238	272	306	340	373	407	441	475	509
1 1/4	—	15	31	46	61	76	92	122	153	183	214	244	275	305	336	367	397	428	458
1 3/8	1	14	28	42	56	69	83	111	139	167	194	222	250	278	306	333	361	389	417
1 1/2	—	13	25	38	51	63	76	102	127	153	178	204	229	255	280	305	331	356	382
1 5/8		12	23	35	47	59	71	94	118	141	165	188	212	235	259	282	306	329	353
1 3/4		11	22	33	44	55	65	87	109	131	153	175	196	218	240	262	284	306	327
1 7/8		10	20	30	41	51	61	81	102	122	143	163	183	204	224	244	265	285	306
2		9	19	29	38	48	57	76	96	115	134	153	172	191	210	229	248	267	287



■ **Metric**

metric taps	vc = meters per minute (m/min)																	
	1,5	3	4,5	6	7,5	10	12	15	18	21	24	27	30	33	36	39	42	45
revolutions per minute (RPM)																		
M1	490	979	1469	1959	2449	2938	3918	4897	5877	6856	7836	8815	9795	10774	11754	12733	13713	14692
M2	242	484	725	967	1209	1451	1934	2418	2901	3385	3868	4352	4835	5319	5803	6286	6770	7253
M3	162	324	486	647	809	971	1295	1619	1942	2266	2590	2914	3237	3561	3885	4208	4532	4856
M3.5	138	277	415	554	692	830	1107	1384	1661	1938	2214	2491	2768	3045	3322	3599	3875	4152
M4	122	243	365	487	608	730	973	1217	1460	1703	1946	2190	2433	2676	2920	3163	3406	3650
M5	97	194	291	388	485	582	776	970	1163	1357	1551	1745	1939	2133	2327	2521	2715	2905
M6	81	162	243	324	405	486	647	809	971	1133	1295	1457	1619	1781	1942	2104	2266	2428
M7	69	138	208	277	346	415	554	692	830	969	1107	1246	1384	1522	1661	1799	1938	2076
M8	61	121	182	243	303	364	485	606	728	849	970	1091	1213	1334	1455	1577	1698	1819
M10	48	97	145	194	242	291	388	485	582	679	776	873	970	1067	1163	1260	1357	1454
M12	40	81	121	162	202	243	324	405	486	567	647	728	809	890	971	1052	1133	1214
M14	35	69	104	139	173	208	277	347	416	485	555	624	693	763	832	901	971	1040
M16	30	61	91	121	152	182	243	303	364	424	485	546	606	667	728	788	849	910
M18	27	54	81	108	135	162	216	269	323	377	431	485	539	593	647	700	754	808
M20	24	49	73	97	121	146	194	243	291	340	388	437	485	534	582	631	680	728
M22	22	44	66	88	110	132	176	221	265	309	353	397	441	485	529	573	618	662
M24	20	40	61	81	101	121	162	202	243	283	323	364	404	445	485	526	566	606
M27	18	36	54	72	90	108	144	180	216	252	287	323	359	395	431	467	503	539
M30	16	32	49	65	81	97	129	162	194	226	259	291	323	356	388	420	453	485

Partial List of Solutions to Tapping Problems

application	symptom	common cause	remedy
general	gage out of limits	tap size and gage mismatch	select tap size for gage
	oversize thread	alignment, spindle feed	correct
	oversize at top	runout or alignment	correct
	go gage binds part way	worn tool, tap cuts off lead	replace tap, synchronous holder
	thread shaving	feed error, high axial force	program, synchronous holder
	chipping	high cutting force, worn tap	tap geometry, replace tap
	breakage	chip jamming flutes	tap geometry, tapping depth
	—	worn tool, high torque	replace tap with new tool
	short life, low speed	excessive wear	SC or HSS-E-PM HP taps
steel	birdnest blind hole	long, ductile chips	GT30 GP6505 (oxide), peck feed
	chipping	high material hardness	GT00, GT02 WP31MG (TiN)
	breakage in blind holes	hole depth >2D, chip jamming	GT04 WH36MG (TiN/MoS ₂)
stainless steel	oversize thread, low life	galling	GT20, GT30 GM6515 (TiN-CrC/C)
	short life	work hardened core hole	replace drill
cast iron	excessive wear	abrasion	GT40 GP6520 (TiCN)
aluminum, cast	excessive wear	high silicon	GT40 GP6520 (TiCN)
aluminum, wrought	oversize thread	galling	GT70, GT80 WN48EG (DLC)
nickel, cobalt alloys	short life	high cutting temperature	GT10, GT12 WS32MG (TiCN)
titanium	short life	high cutting temperature	GT14, GT16 WN35MG (TiN-DLC)

Taps

coating	properties and application	precautions
Titanium Nitride (TiN)	Proprietary TiN coating (hardness 2300 Vickers) offers significantly improved wear life and thread finish, often at higher tapping speeds, in a broad range of materials, especially steels, irons, and plastics. Golden color.	Use with caution in non-ferrous materials such as aluminum because of tendency to gall.
Titanium Carbonitride (TiCN)	Proprietary TiCN coating (hardness 3000 Vickers) is harder, tougher, and more wear resistant than TiN under conditions of moderate cutting temperatures. Like TiN, TiCN may be used at higher cutting speeds in a broad range of materials, especially steels and irons. Blue-gray color.	Use with caution in non-ferrous materials such as aluminum because of tendency to gall. TiAlN is a better choice when used at extreme temperatures.
Titanium Nitride + Chromium Carbide Carbon (TiN + CrC/C)	Proprietary coating (hardness 2300 Vickers) that combines the wear resistance of smooth TiN coating with a lubricous top layer of chromium carbide carbon. Effective in stainless steel and non-ferrous materials including aluminum and titanium. Ideal choice for 300 series stainless steels, wrought, and die cast aluminums. Black/gray color.	Effective in both ferrous and non-ferrous materials.
Titanium Aluminum Nitride (TiAlN)	Nanolayer TiAlN coating (hardness 3300 Vickers) offers improved wear life and thread finish, especially in conditions where high temperatures can be generated. Use for PH stainless steels and nickel-based alloys like INCONEL®. Violet/gray color.	Use with caution in non-ferrous materials because of tendency to gall.
Chromium Nitride (CrN)	CrN is medium hard (hardness 1800 Vickers) and has a lower wear resistance than TiN, TiCN, and TiAlN. However, unlike these coatings, CrN does not gall when used in some non-ferrous work materials. Use for brass, bronze, zinc alloys, and magnesium alloys. Silver color.	Ineffective in ferrous materials.
Nitride	Hardened case extends wear life in abrasive materials. Use for aluminum and other non-ferrous materials.	Avoid on taper pipe, fast spiral, and small diameter (<#6) or fine pitch taps due to tendency for thread chipping.
Oxide	Helps prevent galling in ferrous (iron-based) materials. For free machining steel. Use for steels, stainless steels, and irons.	Has a tendency to cause galling in non-ferrous materials such as aluminum.
Nitride and Oxide	Combines the benefits of nitride and oxide surface treatments. For steels, stainless steels, and nickel alloys.	See precautions for nitride and oxide surface treatments.



Thread Mills

Taps

	vibration marks	major crest wear	edge chipping	cone shaped thread	entry marks
cutting speed	check	reduce	—	—	—
feed per tooth	check	increase	reduce	—	—
workpiece clamping	improve	improve	improve	—	improve
machine tool stability	improve	improve	improve	—	improve
cantilever arm	shorten	shorten	—	—	shorten
helix angle	increase	reduce	—	—	—
radial runout	check	check	—	—	—
coating	—	improve	improve	—	—
milling operation	—	climb mill	climb mill	climb mill	—
line feed/ entry ramp	check	check	—	—	improve
coolant pressure	—	check (>20 bar, 290 psi)	check (>20 bar, 290 psi)	—	—



drill size	decimal (in)	drill size	decimal (in)	drill size	decimal (in)	drill size	decimal (in)	drill size	decimal (in)	drill size	decimal (in)
0,30mm	.0118	54	.0550	3,10mm	.1220	5,50mm	.2165	8,50mm	.3346	9/16	.5625
0,32mm	.0126	1,40mm	.0551	1/18	.1250	7/32	.2188	8,60mm	.3386	14,50mm	.5709
80	.0135	1,45mm	.0571	3,20mm	.1260	5,60mm	.2205	R	.3390	37/64	.5781
0,35mm	.0138	1,50mm	.0591	30	.1285	2	.2210	8,70mm	.3425	14,75mm	.5807
79	.0145	53	.0595	3,30mm	.1299	5,70mm	.2244	11/32	.3438	15,00mm	.5906
0,38mm	.0150	1,55mm	.0610	3,40mm	.1339	1	.2280	8,80mm	.3465	19/32	.5938
1/64	.0156	1/16	.0625	29	.1360	5,80mm	.2283	S	.3480	15,25mm	.6004
0,40mm	.0157	1,60mm	.0630	3,50mm	.1378	5,90mm	.2323	8,90mm	.3504	39/64	.6094
78	.0160	52	.0635	28	.1405	A	.2340	9,00mm	.3543	15,50mm	.6102
0,42mm	.0165	1,65mm	.0650	9/64	.1406	15/64	.2344	T	.3580	15,75mm	.6201
0,45mm	.0177	1,70mm	.0669	3,60mm	.1417	6,00mm	.2362	9,10mm	.3583	5/8	.6250
77	.0180	51	.0670	27	.1440	B	.2380	23/64	.3594	16,00mm	.6299
0,48mm	.0189	1,75mm	.0689	3,70mm	.1457	6,10mm	.2402	9,20mm	.3622	16,25mm	.6398
0,50mm	.0197	50	.0700	26	.1470	C	.2420	9,30mm	.3661	41/64	.6406
76	.0200	1,80mm	.0709	25	.1495	6,20mm	.2441	U	.3680	16,50mm	.6496
75	.0210	1,85mm	.0728	3,80mm	.1496	D	.2460	9,40mm	.3701	21/32	.6562
0,55mm	.0217	49	.0730	24	.1520	6,30mm	.2480	9,50mm	.3740	16,75mm	.6594
74	.0225	1,90mm	.0748	3,90mm	.1535	1/4, E	.2500	3/8	.3750	17,00mm	.6693
0,60mm	.0236	48	.0760	23	.1540	6,40mm	.2520	V	.3770	43/64	.6719
73	.0240	1,95mm	.0768	5/32	.1562	6,50mm	.2559	9,60mm	.3780	17,25mm	.6791
0,62mm	.0244	5/64	.0781	22	.1570	F	.2570	9,70mm	.3819	11/16	.6875
72	.0250	47	.0785	4,00mm	.1575	6,60mm	.2598	9,80mm	.3858	17,50mm	.6890
0,65mm	.0256	2,00mm	.0787	21	.1590	G	.2610	W	.3860	45/64	.7031
71	.0260	2,05mm	.0807	20	.1610	6,70mm	.2638	9,90mm	.3898	18,00mm	.7087
0,70mm	.0276	46	.0810	4,10mm	.1614	17/64	.2656	25/64	.3906	23/32	.7188
70	.0280	45	.0820	4,20mm	.1654	H	.2660	10,00mm	.3937	18,50mm	.7283
69	.0292	2,10mm	.0827	19	.1660	6,80mm	.2677	X	.3970	47/64	.7344
0,75mm	.0295	2,15mm	.0846	4,30mm	.1693	6,90mm	.2717	10,20mm	.4016	19,00mm	.7480
68	.0310	44	.0860	18	.1695	I	.2720	Y	.4040	3/4	.7500
1/32	.0312	2,20mm	.0866	11/64	.1719	7,00mm	.2756	13/32	.4062	49/64	.7656
0,80mm	.0315	2,25mm	.0886	17	.1730	J	.2770	Z	.4130	19,50mm	.7677
67	.0320	43	.0890	4,40mm	.1732	7,10mm	.2795	10,50mm	.4134	25/32	.7812
66	.0330	2,30mm	.0906	16	.1770	K	.2810	27/64	.4219	20,00mm	.7874
0,85mm	.0335	2,35mm	.0925	4,50mm	.1772	9/32	.2812	10,80mm	.4252	51/64	.7969
65	.0350	42	.0935	15	.1800	7,20mm	.2835	11,00mm	.4331	20,50mm	.8071
0,90mm	.0354	3/32	.0938	4,60mm	.1811	7,30mm	.2874	7/16	.4375	13/16	.8125
64	.0360	2,40mm	.0945	14	.1820	L	.2900	11,20mm	.4409	21,00mm	.8268
63	.0370	41	.0960	4,70mm, 13	.1850	7,40mm	.2913	11,50mm	.4528	53/64	.8281
0,95mm	.0374	2,45mm	.0965	3/16	.1875	M	.2950	29/64	.4531	27/32	.8438
62	.0380	40	.0980	4,80mm, 12	.1890	7,50mm	.2953	11,80mm	.4646	21,50mm	.8465
61	.0390	2,50mm	.0984	11	.1910	19/64	.2969	15/32	.4688	55/64	.8594
1,00mm	.0394	39	.0995	4,90mm	.1929	7,60mm	.2992	12,00mm	.4724	22,00mm	.8661
60	.0400	38	.1015	10	.1935	N	.3020	12,20mm	.4803	7/8	.8750
59	.0410	2,60mm	.1024	9	.1960	7,70mm	.3031	31/64	.4844	22,50mm	.8858
1,05mm	.0413	37	.1040	5,00mm	.1969	7,80mm	.3071	12,50mm	.4921	57/64	.8906
58	.0420	2,70mm	.1063	8	.1990	7,90mm	.3110	1/2	.5000	23,00mm	.9055
57	.0430	36	.1065	5,10mm	.2008	5/16	.3125	12,80mm	.5039	29/32	.9062
1,10mm	.0433	7/64	.1094	7	.2010	8,00mm	.3150	13,00mm	.5118	59/64	.9219
1,15mm	.0453	35	.1100	13/64	.2031	O	.3160	33/64	.5156	23,50mm	.9252
56	.0465	2,80mm	.1102	6	.2040	8,10mm	.3189	13,20mm	.5197	15/16	.9375
3/64	.0469	34	.1110	5,20mm	.2047	8,20mm	.3228	17/32	.5312	24,00mm	.9449
1,20mm	.0472	33	.1130	5	.2055	P	.3230	13,50mm	.5315	61/64	.9531
1,25mm	.0492	2,90mm	.1142	5,30mm	.2087	8,30mm	.3268	13,80mm	.5433	24,50mm	.9646
1,30mm	.0512	32	.1160	4	.2090	21/64	.3281	35/64	.5469	31/32	.9688
55	.0520	3,00mm	.1181	5,40mm	.2126	8,40mm	.3307	14,00mm	.5512	25,00mm	.9843
1,35mm	.0531	31	.1200	3	.2130	Q	.3320	14,25mm	.5610	63/64	.9844
—	—	—	—	—	—	—	—	—	—	1"	1.0000

Metric
 Fractional
 Wire gage
 Letter size

Tap Custom-Order Worksheet

Use this Custom-Order Worksheet to modify an existing product to meet your specifications. If your custom requirements do not fall into these categories, simply contact your Kennametal Distributor.

Trust our experienced distributors and Kennametal engineering team to design the best solution for you.

1. Start with the standard product most similar to your specifications:

catalog number

grade/coating

2. Type of tap needed:

- solid carbide high performance HSS general purpose spiral point
 hand forming spiral flute
 _____ pipe (and style) _____ other

3. Direction of cut (circle one):

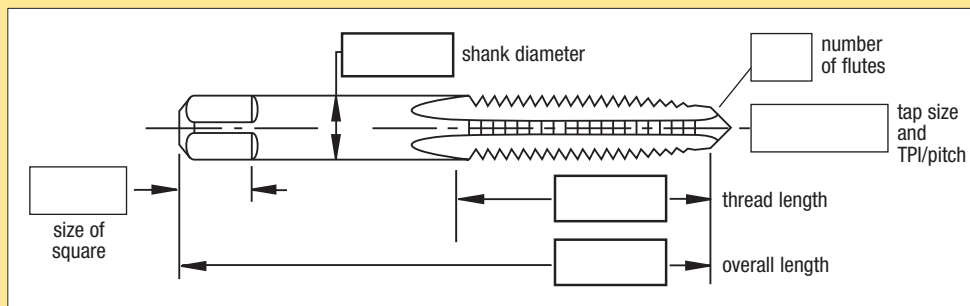
left hand

right hand

4. Material overview:

- ANSI DIN JIS other

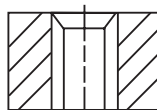
5. Desired dimension:



6. Choose one:

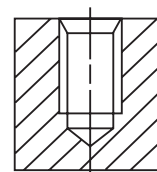
through hole:

hole diameter _____
hole depth _____



blind hole:

hole diameter _____
hole depth _____



7. Chamfer:

- taper: 7-10 pitch plug: 3-5 pitch semi-bottom: 2-3 pitch bottom: 1-2 pitch



8. Class of fit:

H limit

metric D limit

diameter pitch limit

9. Workpiece material:

10. Hardness:

11. Number of taps required:

12. Price

Contact your Authorized Kennametal Distributor partners.

13. Other comments or special characteristics:

customer company name

date

address

phone number

city, state, zip

fax number

customer contact

customer email address

sales representative

Taps

Application Sheet for Thread Milling

Test form thread data:

Date:

Customer Data

Company:

Department:

Street:

Position:

Postal code:

Telephone:

City:

Fax:

Country:

E-mail:

Tool Data

Engaged Kennametal tool:

Tool life:

Competitive tool:

Workpiece Data

Thread size:

Name of workpiece:

Class of fit:

Picture, sketch...

Thread depth: mm

Thread type: Through hole Blind hole

Drill hole ø: mm

Depth of drill hole: mm

Type of drilled hole: Drilled No hole

Material:

Hardness:

Machine Data

Manufacturer:

Description:

CNC-machine type: Turning machine Milling machine

Working direction: Horizontal Vertical

Control type: DIN Heidenhain

Coolant: Emulsion MQL
 Compressed air Dry

Coolant supply type: Internal External

Coolant pressure: Bar

Revolutions max: 1/min

Spindle power: kW

Clamping device: Weldon® Collet
 Shrinking Hydraulic expansion

Cutting Conditions

Cutting speed v_c : m/min Revolutions: 1/min

Feed f_z : mm/tooth Programmed feed: mm/min

Milling direction: Climb milling Down milling Type of feed: Feed on contour Feed on center

Allocated cut over depth of thread: Yes No Allocated cut over profile: By depth of profile By thread depth

Number of cuts: Number of cuts:



Knowing the hardness of the work material to be tapped is essential in selecting the best tap for the job.

10 mm/min ball 3000 kg	120° cone 150 kg	1/16" ball 100 kg	model C	1000 lb per sq. in.	10 mm/min ball 3000 kg	120° cone 150 kg	1/16" ball 100 kg	model C	1000 lb per sq. in.
Brinell	Rockwell C	Rockwell B	Shore Scleroscope	tensile strength	Brinell	Rockwell C	Rockwell B	Shore Scleroscope	tensile strength
800	72	—	100	—	276	30	105	42	136
780	71	—	99	—	269	29	104	41	132
760	70	—	98	—	261	28	103	40	129
745	68	—	97	367	258	27	102	39	127
725	67	—	96	357	255	26	102	39	125
712	66	—	95	350	249	25	101	38	123
682	65	—	93	337	245	24	100	37	119
668	64	—	91	326	240	23	99	36	117
652	63	—	89	318	237	23	99	35	115
626	62	—	87	306	229	22	98	34	113
614	61	—	85	299	224	21	97	33	110
601	60	—	83	292	217	20	96	33	107
590	59	—	81	290	211	19	95	32	104
576	57	—	79	281	206	18	94	32	102
552	56	—	76	270	203	17	94	31	100
545	55	—	75	268	200	16	93	31	98
529	54	—	74	259	196	15	92	30	96
514	53	120	72	254	191	14	92	30	94
502	52	119	70	247	187	13	91	29	92
495	51	119	69	244	185	12	91	29	91
477	49	118	67	233	183	11	90	28	90
461	48	117	66	227	180	10	89	28	89
451	47	117	65	223	175	9	88	27	86
444	46	116	64	219	170	7	87	27	84
427	46	115	62	209	167	6	87	27	82
415	44	115	60	204	165	5	86	26	81
401	43	114	58	196	163	4	85	26	80
388	42	114	57	191	160	3	84	25	78
375	41	113	55	184	156	2	83	25	76
370	40	112	54	182	154	1	82	25	75
362	39	111	53	179	152	—	82	24	74
351	38	111	51	173	150	—	81	24	74
346	37	110	50	170	147	—	80	24	72
341	37	110	49	168	145	—	79	23	71
331	36	109	47	163	143	—	79	23	70
323	35	109	46	158	141	—	78	23	69
311	34	108	46	153	140	—	77	22	69
301	33	107	45	148	135	—	75	22	67
293	32	106	44	144	130	—	72	22	65
285	31	105	43	140	—	—	—	—	—

Taps

Application Icons

Countersinking/ Stroke Chamfering	Drilling: Flat Bottom	Drilling: Blind	Tapping: Through Hole	Tapping: Blind Hole
Tapping: Pipe Thread	HSS: High-Speed Steel	HSS-E: High-Speed Steel with Cobalt Alloy for Materials with Higher Hardness	HSS-E-PM: High-Speed Steel with Cobalt Alloy for Materials with Higher Hardness (PM = Powder Metal Steel)	HM: (Carbide)
Drilling Depth: 2x	Threading: Through Hole	Threading: Blind Hole		

Geometry Icons

Corner Style: Ball Nose	Shank: Cylindrical Plain	Shank: Cylindrical with Square	Square Shank: L = 4"	Square Shank: L = 6"
Square Shank: L = 8"	Square Shank: L = 10"	Chamfer Form A (6-8)	Chamfer Form B (3-5)	Chamfer Form: (3-4)
Chamfer Form C (2-3)	Chamfer Form D (3,5-5)	Chamfer Form E (1,5-2)	Chamfer Form: (2,5-3,5)	Chamfer Form: (4-6)
Chamfer Form: (1-2)	Tapping Helix Angle: 0°	Tapping Helix Angle: 8°	Tapping Helix Angle: 10°	Tapping Helix Angle: 15°
Tapping Helix Angle: 15°	Tapping Helix Angle: 25°	Tapping Helix Angle: 30°	Tapping Helix Angle: 42°	Tapping Helix Angle: 45°
Tapping Helix Angle: 49°				



Feature Icons

DIN Number 371	DIN Number 374	DIN Number 376	DIN Number 2174	Tapping: Through Coolant
Flood Coolant: Tapping	Coolant: Through Coolant	Through Coolant: Axial: Tapping	Class of Fit: 2B	Class of Fit: 3B
Class of Fit: 6H	Class of Fit: 6HX	Class of Fit: 2BX	Class of Fit: 3BX	American Tapered Pipe Thread for Threads with Dryseal Material
American Tapered Pipe Thread for Threads without Dryseal Material	American National Standards Institute	American Standard Straight Pipe Threads	American Standard Straight Pipe Threads Dryseal	British Standard Pipe Fitting Thread
British Standard Pipe Taper Thread	Whitworth Pipe Thread	Cylindrical Whitworth Pipe Thread	Tapered Whitworth Pipe Thread	Unified Fine Thread
Unified Coarse Thread	ISO Metric Coarse Thread	ISO Metric Fine Thread		

Taps

DIN — German Institute
for Standardization

ANSI — American National
Standards Institute



More than just the right tool • the ultimate solution.

That's **Beyond BLAST™** 
That's **Different Thinking.**

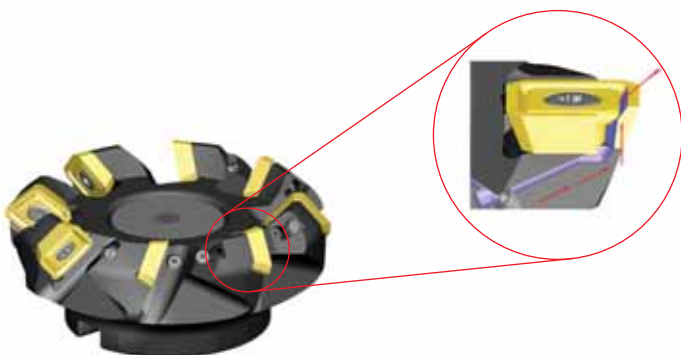
At Kennametal, innovation follows vision. Our revolutionary products and services are inspired by asking “what if?” The solutions that follow — like our Beyond BLAST through-coolant inserts — deliver remarkable results in the world’s most demanding machining environments.

A cutting-edge insert that delivers coolant precisely at the cutting edge. Now that’s Different Thinking. That’s Kennametal.

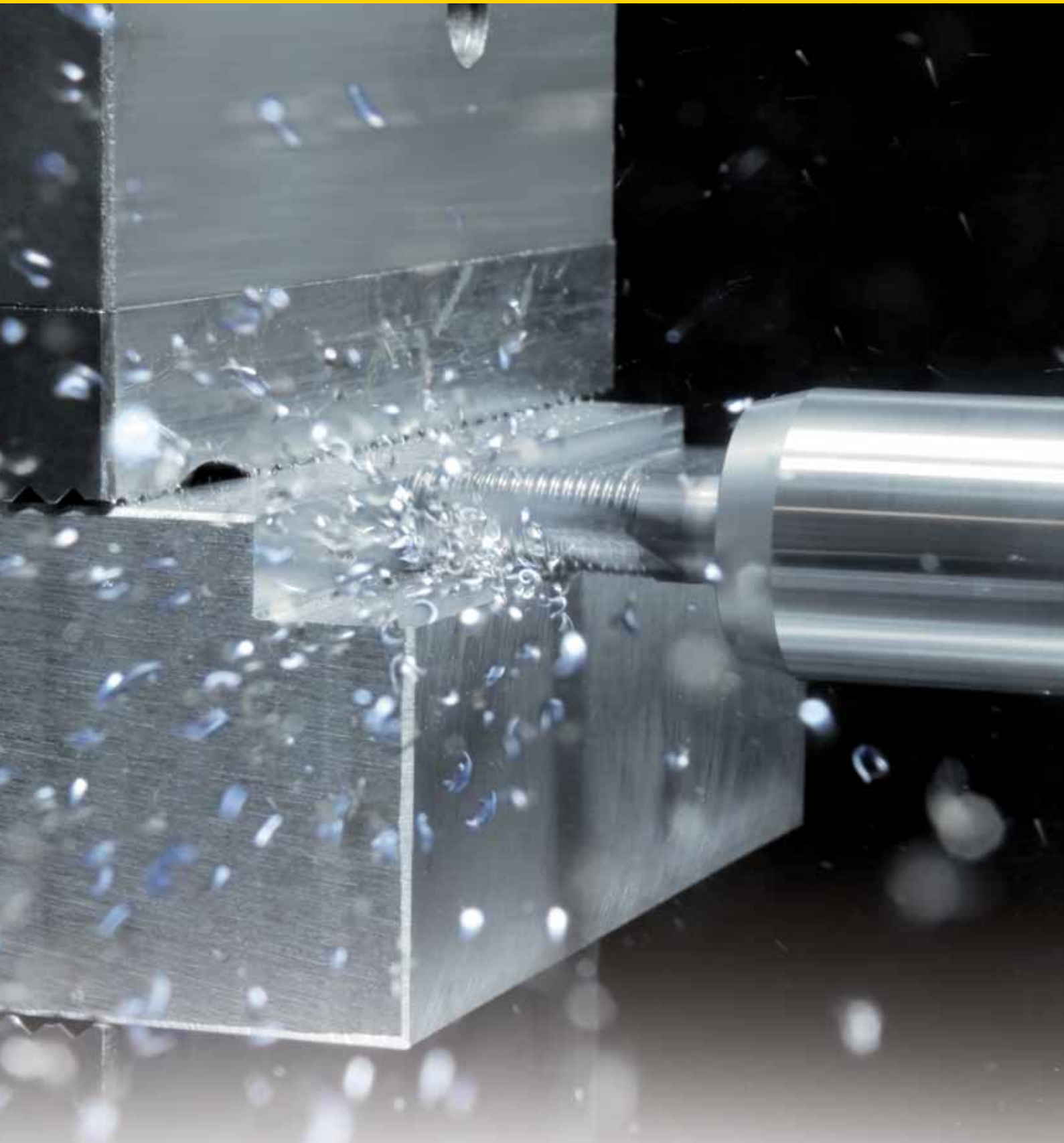
To learn more about your productivity gains using Beyond BLAST technology, visit www.kennametal.com.

Milling

- Beyond BLAST technology uses low-pressure conditions to offer many of the high-pressure performance benefits.
- Delivers superior performance on titanium, using either high- or low-pressure coolant systems.
- Effective thermal management results in reduced cutting temperatures, improved lubricity, superior chip control, and longer tool life.
- Beyond BLAST for milling increases tool life by up to 100% compared with conventional coolant delivery systems.



beyond™ BLAST™



Beyond™ Solid End Mills —
High-performance milling in a new dimension.

Solid End Milling

Tool Selection Guide	M2–M5
Grades and Grade Descriptions	M6–M7
High-Performance Solid Carbide End Mills	M8–M80
HARVI — Titanium, Stainless Steel, and Steel	M8–M30
KenFeed — High-Feed Machining	M31–M34
Hard Steel Machining	M35–M40
Aluminum Machining	M41–M61
CFRP Machining	M62–M68
Finishing Applications	M69–M74, M111–M112
Roughing Applications	M75–M80
General Application Solid Carbide End Mills	M81–M105
General Application Solid Carbide End Mills Portfolio Extension	M108–M110
High-Performance Solid Carbide End Mills Portfolio Extension	M111–M113



beyond	*Beyond™ grade.	series	diameter (inch)	length of cut	flute Z	helix	internal coolant
HARVI I™*		HPHV	1/8-1 1/4	1.8-2 x D1	ZU=4	38°	
HARVI I*		UADE	1/4-1	1.5 x D1	ZU=4	38°	
HARVI I*		HPRSHV	1/2-1	1-1.2 x D1	ZU=4	38°	
HARVI I*		HPHVBN	1/8-1	1.5-4 x D1	ZU=4	38°	
HARVI II™*		UCDE	3/16-1	1.75-3.3 x D1	ZU=5	38°	
HARVI II*		UCDE	1/4-1	1.75-2 x D1	ZU=5	38°	
HARVI II		UGDE	1/4-1	3-5 x D1	ZU=5	43°	
HARVI I		HPHVT	1/2-1 1/4	1.25-1.8 x D1	ZU=4	38°	
HARVI II		UDDE	1/2-1	1.75-2.5 x D1	ZU=5	38°	
KenFeed™		KMDA	1/4-3/4	.05 x D1	ZU=6	20°	
KenFeed		KHDA	1/4-3/4	.03 x D1	ZU=6	20°	
Hard Steels		HPFDM	1/4-1	1.5-3.5 x D1	ZU=X	30°	
Hard Steels		HPRDM	3/16-3/4	1 x D1	ZU=X	35°	
Hard Steels Ball Nose		HPBNDM	1/8-3/4	1 x D1	ZU=4	15°	
Aluminum MaxiMet™		ABDF	3/16-1	2 x D1	ZU=2	45°	
Aluminum MaxiMet		ABDE	3/16-1	1.2-2 x D1	ZU=3	38°	
Aluminum MaxiMet		ABDF	1/4-1	1.25-1.5 x D1	ZU=2	45°	
Aluminum MaxiMet		ABDE	1/4-1	1.25-1.5 x D1	ZU=3	38°	
Aluminum		AADF	1/8-1	2-3.25 x D1	ZU=2	40°	
Aluminum		AADE	1/8-1	2-4 x D1	ZU=3	37°	
Aluminum		SFRHEC	1/4-1	2.25-3 x D1	ZU=3	37°	
CFRP		CCNC	1/4-1/2	3 x D1	ZU=X	20°	
CFRP		CDDC	1/4-1/2	3 x D1	ZU=6	25°	
CFRP		CBDB	1/4-1/2	3 x D1	ZU=X	15°	

Solid End Milling

					shank	center cutting	neck	P	M	K	N	S	H		product page(s)	cutting data page(s)
		✓	✓			✓		●	●	●	○	○		M9-M13	M26	
			✓			✓	✓	●	●	●	○	○		M14	M26	
	✓	✓				✓		●	●	●				M15	M27	
				✓		✓		●	●	●	●	○		M16	M27	
	✓		✓					●	●	●	○	○		M17-M18	M28	
			✓				✓	●	●	●	○	○		M19	M28	
			✓					●	○	○	●	○		M20-M21	M29	
	✓	✓				✓		○	○	○	●			M22	M29	
	✓		✓					○	○	○	●			M23	M30	
✓							✓	●			○			M32	M34	
✓							✓				●			M33	M34	
	✓					✓		●			●			M36	M39	
			✓			✓	✓	●	○	○	○	●		M37	M39	
				✓		✓	✓	●			●			M38	M40	
	✓		✓			✓					●			M42	M60	
	✓		✓			✓					●			M43	M60	
	✓		✓			✓	✓				●			M44-M45	M60	
	✓		✓			✓	✓				●			M46-M47	M60	
	✓		✓			✓					●			M48-M52	M61	
	✓		✓			✓					●			M53-M57	M61	
		✓				✓					●			M58	M61	
		✓									●			M63	M67	
		✓									●			M64	M67	
		✓									●			M65	M67	

● first choice
○ alternate choice

Solid End Milling



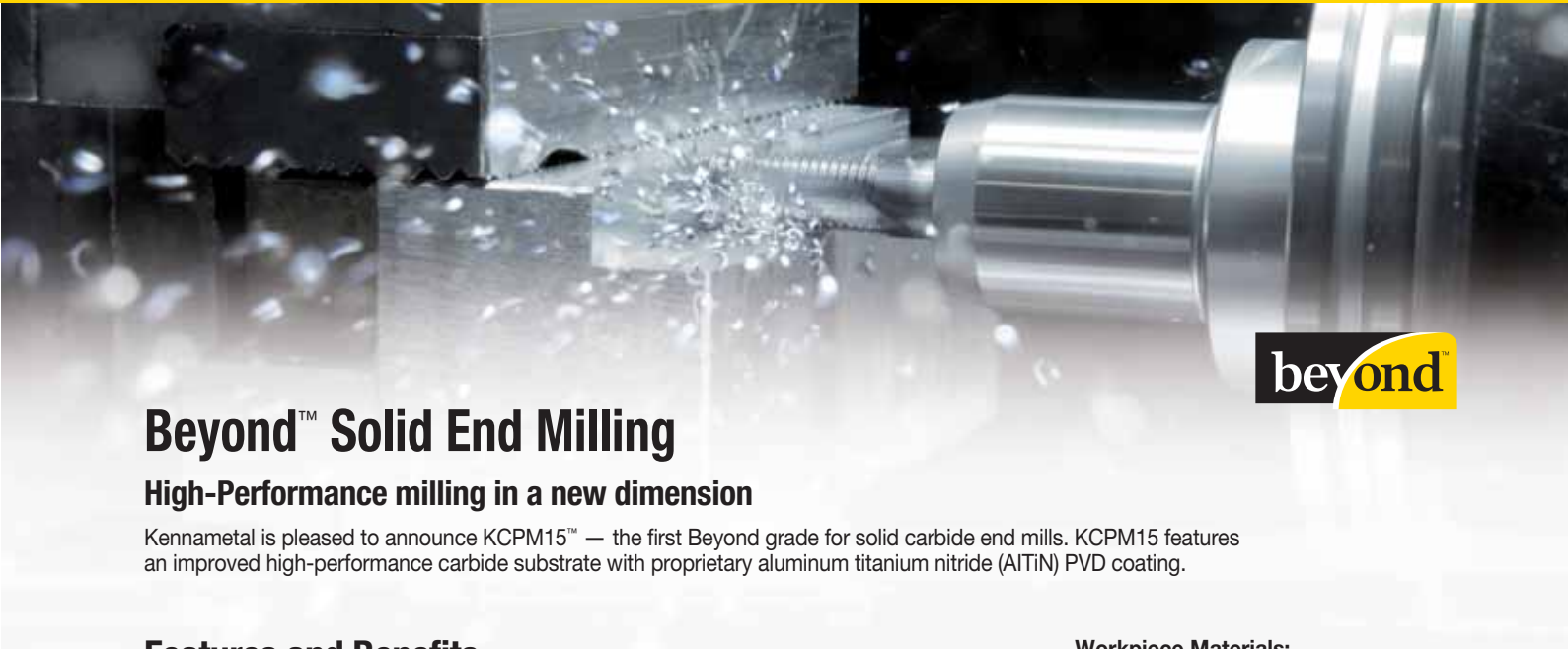
Solid End Milling

beyond *Beyond™ grade.		series	diameter (inch)	length of cut	flute Z	helix	internal coolant
CFRP		CRBD	3/8–1/2	1.5–2 x D1			
HP Finisher		HPFSS	1/8–3/4	2–4 x D1			
HP Finisher		HPFSS	1/8–1	2–3.25 x D1			
HP Finisher		HPFT	1/4–1	2.25–3 x D1			
HP Rougher		HPRSS	1/4–3/4	2–3 x D1			
HP Rougher		MDRHEC	5/16–3/4	2–2.6 x D1			
HP Rougher		HPRST	1/4–1	1.5 x D1			
GP		HEC	1/64–1	2–4 x D1			
GOmill™		UEDE	5/64–1/2	1.25–2 x D1			
GP		HEC	9/64–1	1.5–4 x D1			
GOmill		UEDE	5/32–1/2	1.25–1.7 x D1			
GP		HEC	1/64–1 1/4	1.6–2 x D1			
GP		CRHEC	1/8–1	1.5–4 x D1			
GP		HHEC	1/8–1	1.5–4 x D1			
GOmill		UEBD	5/64–1/2	1.25–2 x D1			
GP		BNEC	1/64–1	2–3 x D1			
GOmill		UEBD	5/64–1/2	1.25–2 x D1			
GP		BNEC	1/32–1/2	2–2.5 x D1			
GP		BNEC	1/64–1	2–3 x D1			
GP	General Application Portfolio Extension						
HP	High-Performance Portfolio Extension						

					shank	center cutting	neck	P	M	K	N	S	H		product page(s)	cutting data page(s)	
				<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>						<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	M66	M68
			<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	M70	M73
	<input checked="" type="checkbox"/>					<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	M71	M73
	<input checked="" type="checkbox"/>					<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			M72	M74
			<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	M76	M79
		<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	M77	M79
			<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	M78	M80
	<input checked="" type="checkbox"/>					<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	M83-M84	M99
	<input checked="" type="checkbox"/>					<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	M85	M101
	<input checked="" type="checkbox"/>					<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	M86	M99
		<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	M87	M101
	<input checked="" type="checkbox"/>					<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	M88-M89	M100
			<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	M90	M102
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				<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	M97-M98	M105
															M108-M110	M114-M115	
															M111-M113	M115-M116	

Solid End Milling

● first choice
○ alternate choice



beyond™

Beyond™ Solid End Milling

High-Performance milling in a new dimension


Kennametal is pleased to announce KCPM15™ — the first Beyond grade for solid carbide end mills. KCPM15 features an improved high-performance carbide substrate with proprietary aluminum titanium nitride (AlTiN) PVD coating.

Features and Benefits

- Engineered to increase tool life and productivity by 30%.
- For use in milling steels and stainless steels.
- Improved resistance to cratering, flank wear, and depth-of-cut notching.

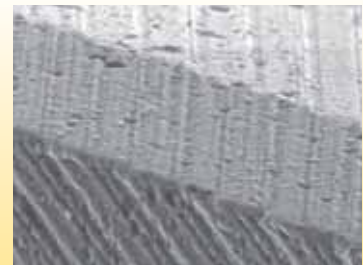
Workpiece Materials:

P	Steel
M	Stainless Steel
K	Cast Iron

Coating	Grade Description	
KCPM15  AlTiN	Coated carbide grade with thick PVD coating and optimized chemistry and process for increased wear resistance. Outstanding protection in milling stainless steel to mitigate crater, DOCN (depth-of-cut notching), and flank wear. Excellent performance up to 52 HRC.	P M K

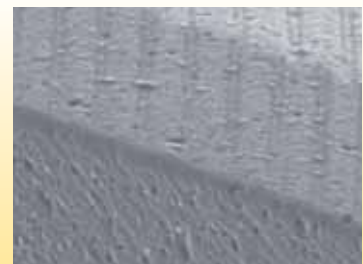
Conventional End Mill Cutting Edge

Conventional



KCPM15 End Mill Cutting Edge

New KCPM15 grade



View: 1st and 2nd Relief.



HARVI™ Line Solid Carbide End Mills

Primary Application

HARVI takes high-performance roughing, semi-finishing, slotting, and profiling to the next level. The line is designed to provide maximum metal removal rates by achieving supreme surface conditions. A wide range of diameters and corner radii are available from stock.

Features and Benefits

Higher Productivity and Profitability

- Best suited for applications in the aerospace, medical, die and mold, automotive, and general engineering markets.
- Outstanding performance in stainless steel, titanium, INCONEL®, and other high-temperature alloys and steels.
- Increased metal removal rates in roughing and finishing operations.
- Excellent performance in both slotting and side milling operations.

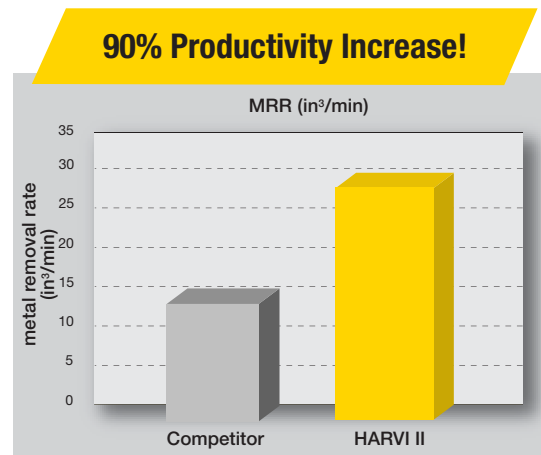


NOTE: Unequal flute spacing.

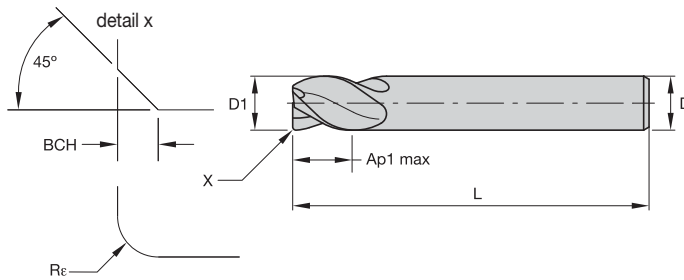
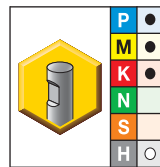
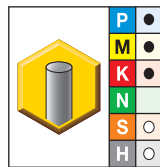
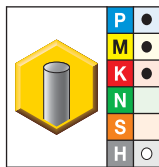
Featured Application: Slotting an Engine Ring

- Operation:** Slotting
- Customer:** Aerospace manufacturer
- Workpiece:** Engine ring
- Material:** SST nickel-based alloy EZ3NCT25 (25% nickel, 13% chromium) at 245 HB
- Solution:** HARVI II™ 5-flute in KCPM15 (AlTiN coating)
- Results:** 90% increase in metal removal rate

	COMPETITOR	HARVI II™
coating:	TiAlN	AlTiN
end mill:	4-flute .472" .04" radius	5-flute .472" .04" radius
material:	SST nickel-based alloy	SST nickel-based alloy
depth of cut (ap):	.44"	.44"
width of cut (ae):	.472"	.472"
speed (vc):	100 SFM	132 SFM
RPM (N):	800 RPM	1,060 RPM
feed rate (vf):	4.41 IPM	8.3 IPM
chip load per tooth (fz):	0.0014 IPT	0.0016 IPT
metal removal rate:	0.91 in ³ /min	1.73 in ³ /min



- Center cutting.
- Unequal flute spacing minimizes chatter for smoother machining.

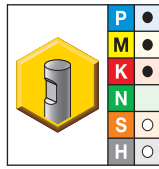
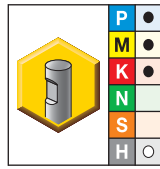
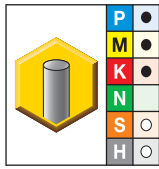
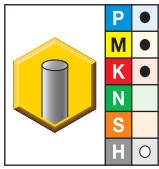

NEW!
beyond™


- first choice
- alternate choice

	KCPM15	KC635M	KCPM15	KC635M	D1	D	Ap1 max	L	Re	BCH
HPHV125S4025CH	●	—	—	—	1/8	1/8	1/4	1 1/2	—	.015
HPHV125S4025	—	—	—	—	1/8	1/8	1/4	1 1/2	—	—
HPHV125S4025LR015	—	—	—	—	1/8	1/8	1/4	2 1/2	.015	—
HPHV125S4025L	—	—	—	—	1/8	1/8	1/4	2 1/2	—	—
HPHV125S4050R015	—	—	—	—	1/8	1/8	1/2	2	.015	—
HPHV125S4050CH	—	—	—	—	1/8	1/8	1/2	2	—	.015
HPHV125S4050	—	—	—	—	1/8	1/8	1/2	2	—	—
HPHV125S4050LR015	—	—	—	—	1/8	1/8	1/2	2 1/2	.015	—
HPHV125S4050L	—	—	—	—	1/8	1/8	1/2	2 1/2	—	—
HPHV188S4031CH	—	—	—	—	3/16	3/16	5/16	1 1/2	—	.015
HPHV188S4031	—	—	—	—	3/16	3/16	5/16	1 1/2	—	—
HPHV188S4031LR015	—	—	—	—	3/16	3/16	5/16	2 1/2	.015	—
HPHV188S4031L	—	—	—	—	3/16	3/16	5/16	2 1/2	—	—
HPHV188S4063R015	—	—	—	—	3/16	3/16	5/8	2 1/4	.015	—
HPHV188S4063R030	—	—	—	—	3/16	3/16	5/8	2 1/4	.030	—
HPHV188S4063CH	—	—	—	—	3/16	3/16	5/8	2 1/4	—	.015
HPHV188S4063	—	—	—	—	3/16	3/16	5/8	2 1/4	—	—
HPHV188S4063LR015	—	—	—	—	3/16	3/16	5/8	2 1/2	.015	—
HPHV188S4063LR030	—	—	—	—	3/16	3/16	5/8	2 1/2	.030	—
HPHV188S4063L	—	—	—	—	3/16	3/16	5/8	2 1/2	—	—
HPHV250S4038R030	—	—	—	—	1/4	1/4	3/8	2	.030	—
HPHV250S4038CH	—	—	—	—	1/4	1/4	3/8	2	—	.015
HPHV250S4038	—	—	—	—	1/4	1/4	3/8	2	—	—
HPHV250S4038LR015	—	—	—	—	1/4	1/4	3/8	2 1/2	.015	—
HPHV250S4038LR030	—	—	—	—	1/4	1/4	3/8	2 1/2	.030	—
HPHV250S4038L	—	—	—	—	1/4	1/4	3/8	2 1/2	—	—
HPHV250S4050R015	—	—	—	—	1/4	1/4	1/2	2 1/2	.015	—
HPHV250S4050R030	—	—	—	—	1/4	1/4	1/2	2 1/2	.030	—
HPHV250S4050R060	—	—	—	—	1/4	1/4	1/2	2 1/2	.060	—
HPHV250S4050	—	—	—	—	1/4	1/4	1/2	2 1/2	—	—
HPHV250S4075R015	—	—	—	—	1/4	1/4	3/4	2 1/2	.015	—
HPHV250S4075R030	—	—	—	—	1/4	1/4	3/4	2 1/2	.030	—
HPHV250S4075R060	—	—	—	—	1/4	1/4	3/4	2 1/2	.060	—
HPHV250S4075CH	—	—	—	—	1/4	1/4	3/4	2 1/2	—	.015
HPHV250S4075	—	—	—	—	1/4	1/4	3/4	2 1/2	—	—
HPHV250S4100R015	—	—	—	—	1/4	1/4	1	3	.015	—

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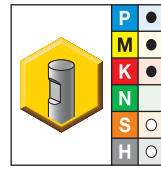
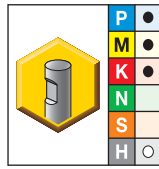
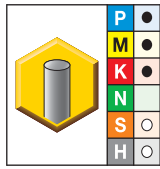
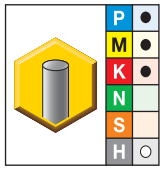


	KCPM15	KC635M	KCPM15	KC635M	D1	D	Ap1 max	L	Re	BCH
	HPHV250S4100R030	—	—	—	1/4	1/4	1	3	.030	—
	HPHV250S4100	—	—	—	1/4	1/4	1	3	—	—
	HPHV250S4125R015	—	—	—	1/4	1/4	1 1/2	3 1/4	.015	—
	HPHV250S4125R030	—	—	—	1/4	1/4	1 1/2	3 1/4	.030	—
	HPHV250S4125CH	—	—	—	1/4	1/4	1 1/4	3 1/4	—	.015
	HPHV250S4125	—	—	—	1/4	1/4	1 1/4	3 1/4	—	—
	HPHV250S4175R015	—	—	—	1/4	1/4	1 3/4	4	.015	—
	HPHV250S4175R030	—	—	—	1/4	1/4	1 3/4	4	.030	—
	—	HPHV250S4175	—	—	1/4	1/4	1 3/4	4	—	—
	HPHV312S4050R030	—	—	—	5/16	5/16	1/2	2	.030	—
	HPHV312S4050CH	—	—	—	5/16	5/16	1/2	2	—	.015
	HPHV312S4050	—	—	—	5/16	5/16	1/2	2	—	—
	HPHV312S4050LR015	—	—	—	5/16	5/16	1/2	2 1/2	.015	—
	HPHV312S4050LR030	—	—	—	5/16	5/16	1/2	2 1/2	.030	—
	HPHV312S4050L	—	—	—	5/16	5/16	1/2	2 1/2	—	—
	HPHV312S4075R015	—	—	—	5/16	5/16	3/4	2 1/2	.015	—
	HPHV312S4075R030	—	—	—	5/16	5/16	3/4	2 1/2	.030	—
	HPHV312S4075R060	—	—	—	5/16	5/16	3/4	2 1/2	.060	—
	HPHV312S4075CH	—	—	—	5/16	5/16	3/4	2 1/2	—	.015
	HPHV312S4075	—	—	—	5/16	5/16	3/4	2 1/2	—	—
	HPHV312S4125R030	—	—	—	5/16	5/16	1 1/4	3 1/4	.030	—
	—	—	—	HPHV312S4125	5/16	5/16	1 1/4	3 1/4	—	—
	—	—	—	HPHV312S4163	5/16	5/16	1 5/8	4	—	—
	HPHV375S4050R030	—	—	—	3/8	3/8	1/2	2	.030	—
	HPHV375S4050CH	—	—	—	3/8	3/8	1/2	2	—	.020
	HPHV375S4050	—	—	—	3/8	3/8	1/2	2	—	—
	HPHV375S4050LR015	—	—	—	3/8	3/8	1/2	2 1/2	.015	—
	HPHV375S4050LR030	—	—	—	3/8	3/8	1/2	2 1/2	.030	—
	HPHV375S4050L	—	—	—	3/8	3/8	1/2	2 1/2	—	—
	HPHV375S4088R015	—	—	—	3/8	3/8	7/8	2 1/2	.015	—
	HPHV375S4088R030	—	—	—	3/8	3/8	7/8	2 1/2	.030	—
	HPHV375S4088R060	—	—	—	3/8	3/8	7/8	2 1/2	.060	—
	HPHV375S4088R090	—	—	—	3/8	3/8	7/8	2 1/2	.090	—
	HPHV375S4088CH	—	—	—	3/8	3/8	7/8	2 1/2	—	.020
	HPHV375S4088	—	—	—	3/8	3/8	7/8	2 1/2	—	—
	HPHV375S4088LR015	—	—	—	3/8	3/8	7/8	3	.015	—
	HPHV375S4088LR030	—	—	—	3/8	3/8	7/8	3	.030	—
	HPHV375S4088LR060	—	—	—	3/8	3/8	7/8	3	.060	—
	HPHV375S4088LR090	—	—	—	3/8	3/8	7/8	3	.090	—
	HPHV375S4088L	—	—	—	3/8	3/8	7/8	3	—	—
	HPHV375S4100R015	—	—	—	3/8	3/8	1	3	.015	—
	HPHV375S4100R030	—	—	—	3/8	3/8	1	3	.030	—
	HPHV375S4100R060	—	—	—	3/8	3/8	1	3	.060	—
	HPHV375S4100	—	—	—	3/8	3/8	1	3	—	—
	HPHV375S4125R015	—	—	—	3/8	3/8	1 1/4	3	.015	—
	HPHV375S4125R030	—	—	—	3/8	3/8	1 1/4	3	.030	—

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Solid End Milling

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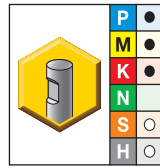
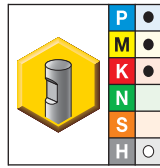
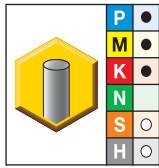
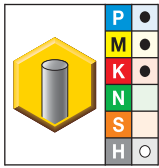


	KCPM15	KC635M	KCPM15	KC635M	D1	D	Ap1 max	L	Re	BCH
HPHV375S4125R060	—	—	—	—	3/8	3/8	1 1/4	3	.060	—
HPHV375S4125	—	—	—	—	3/8	3/8	1 1/4	3	—	—
HPHV375S4150R030	—	—	—	—	3/8	3/8	1 1/2	4	.030	—
HPHV375S4150R060	—	—	—	—	3/8	3/8	1 1/2	4	.060	—
HPHV375S4150	—	—	—	—	3/8	3/8	1 1/2	4	—	—
HPHV375S4250R030	—	—	—	—	3/8	3/8	2 1/2	4	.030	—
HPHV375S4250R060	—	—	—	—	3/8	3/8	2 1/2	4	.060	—
—	—	HPHV375S4250	—	—	3/8	3/8	2 1/2	4	—	—
—	—	—	—	—	3/8	3/8	2 1/2	4	—	—
HPHV438S4063CH	—	—	—	—	7/16	7/16	5/8	2 1/2	—	.020
—	—	HPHV438S4063	—	—	7/16	7/16	5/8	2 1/2	—	—
—	—	—	—	—	7/16	7/16	5/8	2 1/2	—	—
HPHV438S4088CH	—	—	—	—	7/16	7/16	7/8	2 1/2	—	.020
—	—	HPHV438S4088	—	—	7/16	7/16	7/8	2 1/2	—	—
—	—	—	—	—	7/16	7/16	7/8	2 1/2	—	—
HPHV438S4113R015	—	—	—	—	7/16	7/16	1 1/8	3 1/2	.015	—
—	—	HPHV438S4200	—	—	7/16	7/16	2	4	—	—
—	—	—	—	—	7/16	7/16	2	4	—	—
—	—	HPHV438S4300	—	—	7/16	7/16	3	5	—	—
—	—	—	—	—	7/16	7/16	3	5	—	—
—	—	—	HPHV500S4063R030	—	1/2	1/2	5/8	2 1/2	.030	—
—	—	—	HPHV500S4063R060	—	1/2	1/2	5/8	2 1/2	.060	—
—	—	—	HPHV500S4063	—	1/2	1/2	5/8	2 1/2	—	—
—	—	—	—	—	1/2	1/2	5/8	2 1/2	—	—
—	—	—	HPHV500S4063CH	—	1/2	1/2	5/8	2 1/2	—	.020
—	—	—	HPHV500S4063LR015	—	1/2	1/2	5/8	3	.015	—
—	—	—	—	—	1/2	1/2	5/8	3	.015	—
—	—	—	HPHV500S4063LR030	—	1/2	1/2	5/8	3	.030	—
—	—	—	HPHV500S4063LR060	—	1/2	1/2	5/8	3	.060	—
—	—	—	—	—	1/2	1/2	5/8	3	.060	—
—	—	—	HPHV500S4063L	—	1/2	1/2	5/8	3	—	—
—	—	—	HPHV500S4100R030	—	1/2	1/2	1	3	.030	—
—	—	—	—	—	1/2	1/2	1	3	.030	—
—	—	—	HPHV500S4100R060	—	1/2	1/2	1	3	.060	—
—	—	—	HPHV500S4100CH	—	1/2	1/2	1	3	—	.020
—	—	—	—	—	1/2	1/2	1	3	—	—
—	—	—	HPHV500S4100	—	1/2	1/2	1	3	—	—
—	—	—	HPHV500S4125R015	—	1/2	1/2	1 1/4	3	.015	—
—	—	—	—	—	1/2	1/2	1 1/4	3	.015	—
—	—	—	HPHV500S4125R030	—	1/2	1/2	1 1/4	3	.030	—
—	—	—	HPHV500S4125R060	—	1/2	1/2	1 1/4	3	.060	—
—	—	—	—	—	1/2	1/2	1 1/4	3	.060	—
—	—	—	HPHV500S4125R090	—	1/2	1/2	1 1/4	3	.090	—
—	—	—	HPHV500S4125R120	—	1/2	1/2	1 1/4	3	.120	—
—	—	—	—	—	1/2	1/2	1 1/4	3	.120	—
—	—	—	HPHV500S4125CH	—	1/2	1/2	1 1/4	3	—	.020
—	—	—	HPHV500S4125	—	1/2	1/2	1 1/4	3	—	—
—	—	—	—	—	1/2	1/2	1 1/4	3	—	—
—	—	—	HPHV500S4150R030	—	1/2	1/2	1 1/2	4	.030	—
—	—	—	HPHV500S4150R060	—	1/2	1/2	1 1/2	4	.060	—
—	—	—	—	—	1/2	1/2	1 1/2	4	.060	—
—	—	—	HPHV500S4150CH	—	1/2	1/2	1 1/2	4	—	.020
—	—	—	HPHV500S4150	—	1/2	1/2	1 1/2	4	—	—
—	—	—	—	—	1/2	1/2	1 1/2	4	—	—
—	—	—	HPHV500S4163R030	—	1/2	1/2	1 5/8	4	.030	—
—	—	—	HPHV500S4163R060	—	1/2	1/2	1 5/8	4	.060	—
—	—	—	—	—	1/2	1/2	1 5/8	4	.060	—
—	—	—	HPHV500S4163R120	—	1/2	1/2	1 5/8	4	.120	—
—	—	—	HPHV500S4163	—	1/2	1/2	1 5/8	4	—	—
—	—	—	—	—	1/2	1/2	1 5/8	4	—	—
—	—	—	HPHV500S4200R030	—	1/2	1/2	2	4	.030	—
—	—	—	—	—	1/2	1/2	2	4	.030	—
—	—	—	—	HPHV500S4200R060	1/2	1/2	2	4	.060	—
—	—	—	—	—	1/2	1/2	2	4	.060	—
—	—	—	HPHV500S4200CH	—	1/2	1/2	2	4	—	.020
—	—	—	HPHV500S4200	—	1/2	1/2	2	4	—	—

Solid End Milling

(continued)

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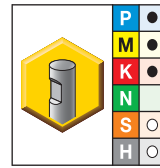
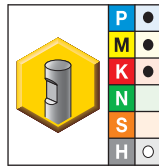
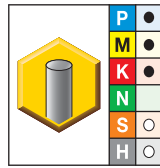
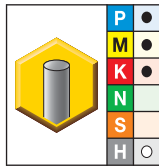


KCPM15	KC635M	KCPM15	KC635M	D1	D	Ap1 max	L	Re	BCH
-	-	HPHV500S4250R030	-	1/2	1/2	2 1/2	4 1/2	.030	-
-	-	HPHV500S4250R060	-	1/2	1/2	2 1/2	4 1/2	.060	-
-	-	-	HPHV500S4250	1/2	1/2	2 1/2	4 1/2	-	-
-	-	HPHV500S4300R030	-	1/2	1/2	3	5	.030	-
-	-	HPHV500S4300R060	-	1/2	1/2	3	5	.060	-
-	-	-	HPHV500S4300	1/2	1/2	3	5	-	-
-	-	HPHV625S4075R060	-	5/8	5/8	3/4	3	.060	-
-	-	HPHV625S4075R120	-	5/8	5/8	3/4	3	.120	-
-	-	HPHV625S4075	-	5/8	5/8	3/4	3	-	-
-	-	HPHV625S4075CH	-	5/8	5/8	3/4	3	-	.020
-	-	HPHV625S4075LR015	-	5/8	5/8	3/4	3 1/2	.015	-
-	-	HPHV625S4075LR030	-	5/8	5/8	3/4	3 1/2	.030	-
-	-	HPHV625S4075LR060	-	5/8	5/8	3/4	3 1/2	.060	-
-	-	HPHV625S4075LR120	-	5/8	5/8	3/4	3 1/2	.120	-
-	-	HPHV625S4075L	-	5/8	5/8	3/4	3 1/2	-	-
-	-	HPHV625S4125R030	-	5/8	5/8	1 1/4	3 1/2	.030	-
-	-	HPHV625S4125R060	-	5/8	5/8	1 1/4	3 1/2	.060	-
-	-	HPHV625S4125R090	-	5/8	5/8	1 1/4	3 1/2	.090	-
-	-	HPHV625S4125R120	-	5/8	5/8	1 1/4	3 1/2	.120	-
-	-	HPHV625S4125CH	-	5/8	5/8	1 1/4	3 1/2	-	.020
-	-	HPHV625S4125	-	5/8	5/8	1 1/4	3 1/2	-	-
-	-	HPHV625S4163R030	-	5/8	5/8	1 5/8	3 1/2	.030	-
-	-	HPHV625S4163R120	-	5/8	5/8	1 5/8	3 1/2	.120	-
-	-	HPHV625S4163	HPHV625S4163	5/8	5/8	1 5/8	3 1/2	-	-
-	-	HPHV625S4163R060	HPHV625S4163R060	5/8	5/8	1 5/8	4 1/8	.060	-
-	-	-	HPHV625S4163CH	5/8	5/8	1 5/8	4 1/8	-	.020
-	-	HPHV625S4213R030	-	5/8	5/8	2 1/8	4	.030	-
-	-	HPHV625S4213R120	-	5/8	5/8	2 1/8	4	.120	-
-	-	HPHV625S4213	-	5/8	5/8	2 1/8	4	-	-
-	-	HPHV625S4225R060	-	5/8	5/8	2 1/4	5	.060	-
-	-	-	HPHV625S4225	5/8	5/8	2 1/4	5	-	-
-	-	-	HPHV625S4300	5/8	5/8	3	5 1/4	-	-
-	-	-	HPHV750S4088R030	3/4	3/4	7/8	3 1/2	.030	-
-	-	-	HPHV750S4088R060	3/4	3/4	7/8	3 1/2	.060	-
-	-	-	HPHV750S4088R120	3/4	3/4	7/8	3 1/2	.120	-
-	-	HPHV750S4088CH	-	3/4	3/4	7/8	3 1/2	-	.020
-	-	HPHV750S4088	-	3/4	3/4	7/8	3 1/2	-	-
-	-	HPHV750S4088LR030	-	3/4	3/4	7/8	4	.030	-
-	-	HPHV750S4088L	-	3/4	3/4	7/8	4	-	-
-	-	HPHV750S4150R015	-	3/4	3/4	1 1/2	4	.015	-
-	-	HPHV750S4150R030	-	3/4	3/4	1 1/2	4	.030	-
-	-	HPHV750S4150R060	-	3/4	3/4	1 1/2	4	.060	-
-	-	HPHV750S4150R090	-	3/4	3/4	1 1/2	4	.090	-
-	-	HPHV750S4150R120	-	3/4	3/4	1 1/2	4	.120	-
-	-	HPHV750S4150CH	-	3/4	3/4	1 1/2	4	-	.020
-	-	HPHV750S4150	-	3/4	3/4	1 1/2	4	-	-

(continued)

Solid End Milling

(continued)



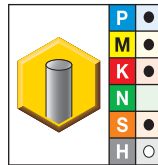
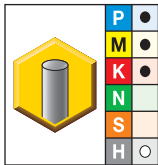
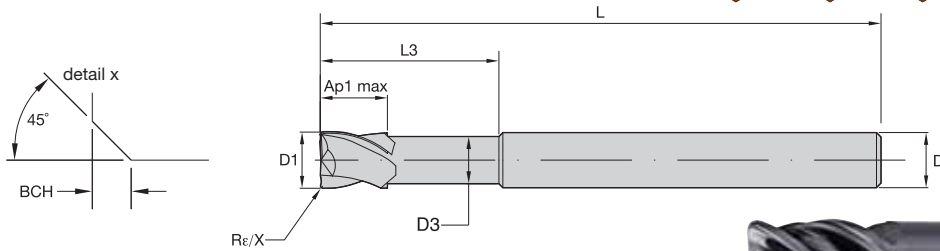
KCPM15	KC635M	KCPM15	KC635M	D1	D	Ap1 max	L	R _e	BCH
-	-	HPHV750S4163R030	-	3/4	3/4	1 5/8	4	.030	-
-	-	HPHV750S4163R060	-	3/4	3/4	1 5/8	4	.060	-
-	-	HPHV750S4163R120	-	3/4	3/4	1 5/8	4	.120	-
-	-	HPHV750S4163CH	-	3/4	3/4	1 5/8	4	-	.020
-	-	-	HPHV750S4163	3/4	3/4	1 5/8	4	-	-
-	-	HPHV750S4225R030	-	3/4	3/4	2 1/4	5	.030	-
-	-	HPHV750S4225R060	-	3/4	3/4	2 1/4	5	.060	-
-	-	HPHV750S4225CH	-	3/4	3/4	2 1/4	5	-	.020
-	-	HPHV750S4225	HPHV750S4225	3/4	3/4	2 1/4	5	-	-
-	-	-	HPHV750S4300R030	3/4	3/4	3	6	.030	-
-	-	-	HPHV750S4300R060	3/4	3/4	3	6	.060	-
-	-	HPHV750S4300CH	-	3/4	3/4	3	6	-	.020
-	-	HPHV750S4300	-	3/4	3/4	3	6	-	-
-	-	HPHV750S4400R030	-	3/4	3/4	4	6 1/4	.030	-
-	-	HPHV750S4400R060	-	3/4	3/4	4	6 1/4	.060	-
-	-	-	HPHV750S4400	3/4	3/4	4	6 1/4	-	-
-	-	HPHV1000S4150R030	-	1	1	1 1/2	4	.030	-
-	-	HPHV1000S4150R060	-	1	1	1 1/2	4	.060	-
-	-	HPHV1000S4150R090	-	1	1	1 1/2	4	.090	-
-	-	HPHV1000S4150R120	-	1	1	1 1/2	4	.120	-
-	-	HPHV1000S4150R250	-	1	1	1 1/2	4	.250	-
-	-	HPHV1000S4150CH	-	1	1	1 1/2	4	-	.020
-	-	HPHV1000S4150	-	1	1	1 1/2	4	-	-
-	-	HPHV1000S4200R030	-	1	1	2	4	.030	-
-	-	HPHV1000S4200R060	-	1	1	2	4	.060	-
-	-	HPHV1000S4200R120	-	1	1	2	4	.120	-
-	-	HPHV1000S4200R250	-	1	1	2	4	.250	-
-	-	-	HPHV1000S4200CH	1	1	2	5	-	.020
-	-	HPHV1000S4200	HPHV1000S4200	1	1	2	5	-	-
-	-	HPHV1000S4225R030	-	1	1	2 1/4	5	.030	-
-	-	HPHV1000S4225R060	-	1	1	2 1/4	5	.060	-
-	-	HPHV1000S4225CH	-	1	1	2 1/4	5	-	.020
-	-	HPHV1000S4225	-	1	1	2 1/4	5	-	-
-	-	HPHV1000S4263R030	-	1	1	2 5/8	5	.030	-
-	-	HPHV1000S4263CH	-	1	1	2 5/8	5	-	.020
-	-	HPHV1000S4263	-	1	1	2 5/8	5	-	-
-	-	HPHV1000S4300R030	-	1	1	3	6	.030	-
-	-	HPHV1000S4300R060	-	1	1	3	6	.060	-
-	-	HPHV1000S4300CH	HPHV1000S4300	1	1	3	6	-	-
-	-	HPHV1000S4400R030	-	1	1	4	7	.030	-
-	-	HPHV1000S4400R060	-	1	1	4	7	.060	-
-	-	HPHV1000S4400CH	-	1	1	4	7	-	.020
-	-	-	HPHV1000S4400	1	1	4	7	-	-
-	-	HPHV1250S4225R030	-	1 1/4	1 1/4	2 1/4	5	.030	-
-	-	HPHV1250S4225R120	-	1 1/4	1 1/4	2 1/4	5	.120	-
-	-	HPHV1250S4225CH	-	1 1/4	1 1/4	2 1/4	5	-	.020
-	-	-	HPHV1250S4225	1 1/4	1 1/4	2 1/4	5	-	-

NOTE: For application data, see page M26.

End Mill Tolerances

D1	tolerance	D	tolerance h6
All	+0.000/-0.002"	≤1/8"	+0/-0.00024"
		>1/8-1/4"	+0/-0.00031"
		>1/4-3/8"	+0/-0.00035"
		>3/8-23/32"	+0/-0.00043"
		>23/32-1 3/16"	+0/-0.00051"

- Center cutting.
- Unequal flute spacing minimizes chatter for smoother machining.



- first choice
- alternate choice

		D1	D	D3	Ap1 max	L3	L	Re	BCH
KCPM15	UADE0250J4AQA	1/4	1/4	.235	3/8	1 1/4	4	.015	—
	UADE0250J4AQB	1/4	1/4	.235	3/8	1 1/4	4	.030	—
—	UADE0250J4AQCH	1/4	1/4	.235	3/8	1 1/4	4	—	.016
	UADE0375J4AQC	3/8	3/8	.353	1/2	1 7/8	4	.060	—
—	UADE0375J4AQCH	3/8	3/8	.353	1/2	1 7/8	4	—	.020
	UADE0375J4AQA	3/8	3/8	.345	1/2	2	4	.015	—
UADE0375J4AQB	UADE0375J4AQB	3/8	3/8	.345	1/2	2	4	.030	—
	UADE0500J4AQB	1/2	1/2	.470	5/8	2 1/4	4	.030	—
UADE0625J4AQB	UADE0625J4AQB	5/8	5/8	.587	3/4	2 1/4	4	.030	—
	UADE0750J4AQB	3/4	3/4	.700	1	2 1/4	4 1/2	.030	—
UADE0750J4BQB	UADE0750J4BQB	3/4	3/4	.700	1	3 1/4	5 1/2	.030	—
	UADE1000J4BQB	1	1	.939	1 1/8	3 1/4	5 1/2	.030	—

NOTE: For application data, see page M27.

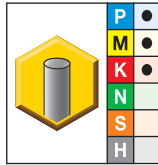
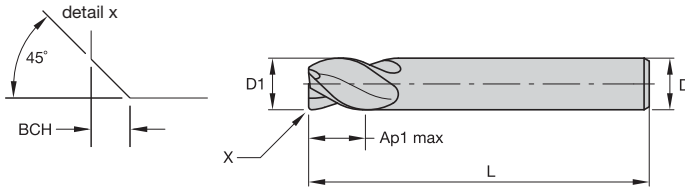


For Weldon® shank offering, please refer to www.kennametal.com/e-catalog.

End Mill Tolerances

D1	tolerance	D	tolerance h6
All	+0.000/-0.002"	≤1/8"	+0/-0.00024"
		>1/8-1/4"	+0/-0.00031"
		>1/4-3/8"	+0/-0.00035"
		>3/8-23/32"	+0/-0.00043"
		>23/32-1 3/16"	+0/-0.00051"

- Kennametal standard dimensions.
- Center cutting.
- Unequal flute spacing minimizes chatter for smoother machining.



- first choice
- alternate choice

KCPM15	D1	D	Ap1 max	L	BCH
HPRSHV500S4600CH	1/2	1/2	5/8	6	.020
HPRSHV500S4600	1/2	1/2	5/8	6	—
HPRSHV625S4600CH	5/8	5/8	3/4	6	.020
HPRSHV625S4600	5/8	5/8	3/4	6	—
HPRSHV750S4600	3/4	3/4	1	6	—
HPRSHV750S4600CH	3/4	3/4	1	6	.020
HPRSHV750S4500CH	3/4	3/4	1	5	.020
HPRSHV1000S4600CH	1	1	1 1/8	6	.020
HPRSHV1000S4600	1	1	1 1/8	6	—
HPRSHV1000S4700CH	1	1	1 1/8	7	.020

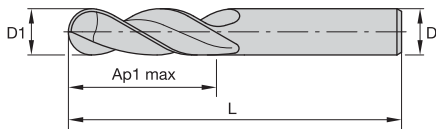
NOTE: For application data, see page M27.

End Mill Tolerances

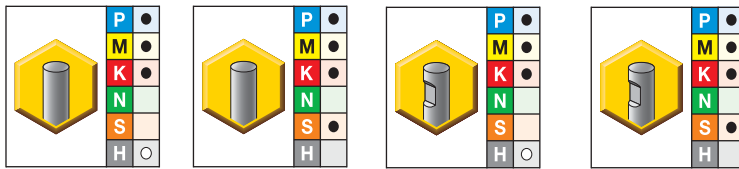
D1	tolerance	D	tolerance h6
All	+0.000/-0.002"	≤1/8"	+0/-0.00024"
		>1/8-1/4"	+0/-0.00031"
		>1/4-3/8"	+0/-0.00035"
		>3/8-23/32"	+0/-0.00043"
		>23/32-1 3/16"	+0/-0.00051"

Solid End Milling

- Center cutting.
- Unequal flute spacing minimizes chatter for smoother machining.



NEW!
beyond™



- first choice
- alternate choice

	KCPM15	KC633M	KCPM15	KC633M	D1	D	Ap1 max	L
HPHVBN125S4050	HPHVBN125S4050	HPHVBN125S4050	HPHVBN125S4050	HPHVBN125S4050	1/8	1/8	1/2	2
—	—	HPHVBN156S4050	—	—	5/32	3/16	9/16	2
—	—	HPHVBN094S4050	—	—	3/32	1/8	3/16	1 1/2
HPHVBN188S4063	HPHVBN188S4063	HPHVBN188S4063	HPHVBN188S4063	HPHVBN188S4063	3/16	3/16	5/8	2 1/4
HPHVBN250S4075	HPHVBN250S4075	—	—	—	1/4	1/4	3/4	2 1/2
HPHVBN312S4075	HPHVBN312S4075	—	—	—	5/16	5/16	3/4	2 1/2
HPHVBN375S4088	HPHVBN375S4088	—	—	—	3/8	3/8	7/8	2 1/2
HPHVBN438S4088	HPHVBN438S4088	—	—	—	7/16	7/16	7/8	2 1/2
—	—	HPHVBN500S4100	HPHVBN500S4100	HPHVBN500S4100	1/2	1/2	1	3
—	—	HPHVBN500S4125	HPHVBN500S4125	HPHVBN500S4125	1/2	1/2	1 1/4	3
—	—	HPHVBN625S4125	HPHVBN625S4125	HPHVBN625S4125	5/8	5/8	1 1/4	3 1/2
—	—	HPHVBN750S4150	HPHVBN750S4150	HPHVBN750S4150	3/4	3/4	1 1/2	4
—	—	HPHVBN1000S4150	HPHVBN1000S4150	HPHVBN1000S4150	1	1	1 1/2	4

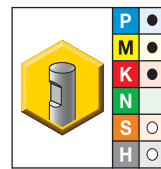
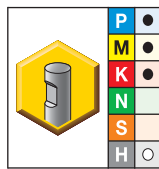
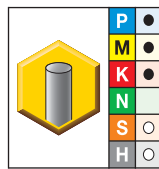
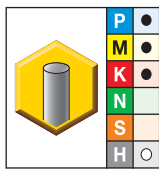
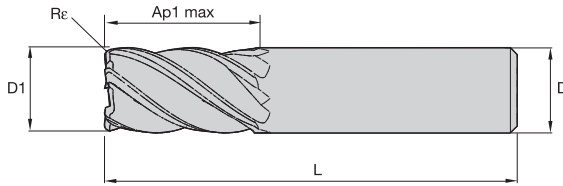
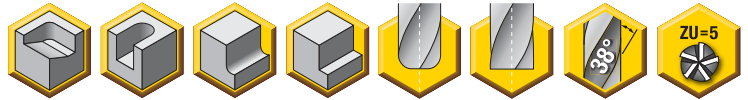
NOTE: For application data, see page M27.

End Mill Tolerances

D1	tolerance	D	tolerance h6
All	+0.000/-0.002"	≤1/8"	+0/-0.00024"
		>1/8-1/4"	+0/-0.00031"
		>1/4-3/8"	+0/-0.00035"
		>3/8-23/32"	+0/-0.00043"
		>23/32-1 3/16"	+0/-0.00051"

Solid End Milling

- Kennametal standard dimensions.
- Non-center cutting.
- Unequal flute spacing minimizes chatter for smoother machining.
- Single tool for both roughing and finishing operations for fewer setups.
- Five-flute geometry enables slotting up to 1 x D.



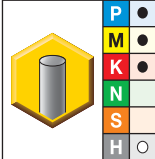
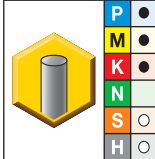
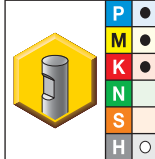
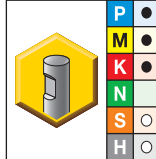
- first choice
- alternate choice

		KCPM15	KC643M	KCPM15	KC643M	D1	D	Ap1 max	L	Re
UCDE188J5BRA	UCDE188J5BRA	—	—	—	—	3/16	3/16	5/8	2 1/4	.015
UCDE188J5BRB	UCDE188J5BRB	—	—	—	—	3/16	3/16	5/8	2 1/4	.030
UCDE188J5BS	UCDE188J5BS	—	—	—	—	3/16	3/16	5/8	2 1/4	—
—	UCDE219J5BS	—	—	—	—	7/32	1/4	5/8	2 1/2	—
UCDE250J5BRA	UCDE250J5BRA	—	—	—	—	1/4	1/4	3/4	2 1/2	.015
UCDE250J5BRB	UCDE250J5BRB	—	—	—	—	1/4	1/4	3/4	2 1/2	.030
UCDE250J5BS	UCDE250J5BS	—	—	—	—	1/4	1/4	3/4	2 1/2	—
—	UCDE281J5BS	—	—	—	—	9/32	5/16	3/4	2 1/2	—
UCDE312J5BRA	UCDE312J5BRA	—	—	—	—	5/16	5/16	3/4	2 1/2	.015
UCDE312J5BRB	UCDE312J5BRB	—	—	—	—	5/16	5/16	3/4	2 1/2	.030
UCDE312J5BS	UCDE312J5BS	—	—	—	—	5/16	5/16	3/4	2 1/2	—
—	UCDE344J5BS	—	—	—	—	11/32	3/8	1	2 1/2	—
UCDE375J5BRA	UCDE375J5BRA	—	—	—	—	3/8	3/8	7/8	2 1/2	.015
UCDE375J5BRB	UCDE375J5BRB	—	—	—	—	3/8	3/8	7/8	2 1/2	.030
UCDE375J5BS	UCDE375J5BS	—	—	—	—	3/8	3/8	7/8	2 1/2	—
—	UCDE375J5CRA	—	—	—	—	3/8	3/8	1	3	.015
—	UCDE375J5CRB	—	—	—	—	3/8	3/8	1	3	.030
—	UCDE438J5BS	—	—	—	—	7/16	7/16	1	2 1/2	—
UCDE500J5BRA	UCDE500J5BRA	UCDE500K5BRA	UCDE500K5BRA	UCDE500K5BRA	UCDE500K5BRA	1/2	1/2	1 1/4	3	.015
UCDE500J5BRB	UCDE500J5BRB	UCDE500K5BRB	UCDE500K5BRB	UCDE500K5BRB	UCDE500K5BRB	1/2	1/2	1 1/4	3	.030
—	UCDE500J5BRD	—	—	—	—	1/2	1/2	1 1/4	3	.060
UCDE500J5BRF	UCDE500J5BRF	UCDE500K5BRF	UCDE500K5BRF	UCDE500K5BRF	UCDE500K5BRF	1/2	1/2	1 1/4	3	.120
UCDE500J5BS	UCDE500J5BS	UCDE500K5BS	UCDE500K5BS	UCDE500K5BS	UCDE500K5BS	1/2	1/2	1 1/4	3	—
—	UCDE562J5BRA	—	—	—	—	9/16	5/8	1 1/4	3 1/2	.015
—	UCDE562J5BRB	—	—	—	—	9/16	5/8	1 1/4	3 1/2	.030
—	UCDE562J5BS	—	—	—	—	9/16	5/8	1 1/4	3 1/2	—
—	UCDE625J5BRA	—	—	—	—	5/8	5/8	1 1/4	3 1/2	.015
UCDE625J5BRB	UCDE625J5BRB	UCDE625K5BRB	UCDE625K5BRB	UCDE625K5BRB	UCDE625K5BRB	5/8	5/8	1 1/4	3 1/2	.030
—	UCDE625J5BRD	—	—	—	—	5/8	5/8	1 1/4	3 1/2	.060
UCDE625J5BS	UCDE625J5BS	UCDE625K5BS	UCDE625K5BS	UCDE625K5BS	UCDE625K5BS	5/8	5/8	1 1/4	3 1/2	—
—	UCDE750J5BRA	—	—	—	—	3/4	3/4	1 1/2	4	.015
UCDE750J5BRB	UCDE750J5BRB	UCDE750K5BRB	UCDE750K5BRB	UCDE750K5BRB	UCDE750K5BRB	3/4	3/4	1 1/2	4	.030
UCDE750J5BRD	UCDE750J5BRD	—	—	—	—	3/4	3/4	1 1/2	4	.060
UCDE750J5BRE	UCDE750J5BRE	—	—	—	—	3/4	3/4	1 1/2	4	.090
UCDE750J5BRF	UCDE750J5BRF	UCDE750K5BRF	UCDE750K5BRF	UCDE750K5BRF	UCDE750K5BRF	3/4	3/4	1 1/2	4	.120
UCDE750J5BS	UCDE750J5BS	UCDE750K5BS	UCDE750K5BS	UCDE750K5BS	UCDE750K5BS	3/4	3/4	1 1/2	4	—
—	UCDE750J5CRB	—	—	—	—	3/4	3/4	1 5/8	4	.030
—	UCDE750J5CRD	—	—	—	—	3/4	3/4	1 5/8	4	.060

Solid End Milling

(continued)

(continued)

					D1	D	Ap1 max	L	Re
	KCPM15	KC643M	KCPM15	KC643M					
	—	UCDE750J5CRE	—	—	3/4	3/4	1 5/8	4	.090
	—	UCDE750J5CRF	—	—	3/4	3/4	1 5/8	4	.120
	—	UCDE750J5CS	—	—	3/4	3/4	1 5/8	4	—
	—	UCDE1000J5BRA	—	—	1	1	1 3/4	4 1/2	.015
	UCDE1000J5BRB	UCDE1000J5BRB	UCDE1000K5BRB	UCDE1000K5BRB	1	1	1 3/4	4 1/2	.030
	UCDE1000J5BRD	UCDE1000J5BRD	—	—	1	1	1 3/4	4 1/2	.060
	UCDE1000J5BRE	UCDE1000J5BRE	—	—	1	1	1 3/4	4 1/2	.090
	UCDE1000J5BRF	UCDE1000J5BRF	UCDE1000K5BRF	UCDE1000K5BRF	1	1	1 3/4	4 1/2	.120
	UCDE1000J5BS	UCDE1000J5BS	UCDE1000K5BS	UCDE1000K5BS	1	1	1 3/4	4 1/2	—

NOTE: For application data, see page M28.

End Mill Tolerances

D1	tolerance	D	tolerance h6
All	+ .000/- .002"	≤1/8"	+0/- .00024"
		>1/8-1/4"	+0/- .00031"
		>1/4-3/8"	+0/- .00035"
		>3/8-23/32"	+0/- .00043"
		>23/32-1 3/16"	+0/- .00051"

Solid End Milling



Carbide Recycling

Help preserve and protect our planet!

It's easy for your company to be environmentally conscious with the Kennametal Carbide Recycling Program.

By sending us your used carbide tools, you help preserve and protect the environment and ensure that these products are recycled responsibly. Kennametal accepts any coated or non-coated carbide items, including inserts, drills, reamers, and taps.



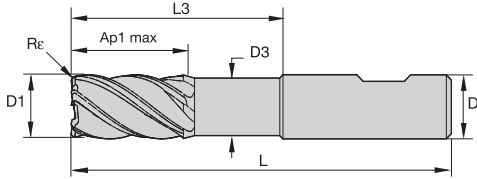
By using the Kennametal Carbide Recycling Program, you will receive:

- A partner who cares about a sustainable environment.
- Easy-to-use web portal to value your used carbide.
- Access to our popular Green Box™ options for carbide collection.
- Systematic and efficient disposal of carbide materials.
- Improved profitability.

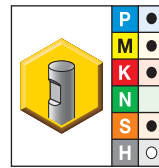
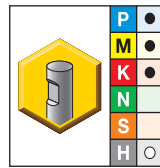
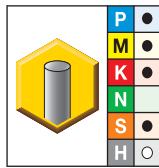
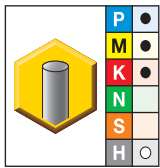
Program is not currently available in all geographical areas.

For more information, please visit www.kennametal.com/carbiderecycling.

- Non-center cutting.
- Unequal flute spacing minimizes chatter for smoother machining.
- Single tool for both roughing and finishing operations for fewer setups.
- Five-flute geometry enables slotting up to 1 x D.



NEW!
beyond



- first choice
- alternate choice

	KCPM15	KC643M	KCPM15	KC643M	D1	D	D3	Ap1 max	L3	L	Re
UCDE250J5ARA		UCDE250J5ARA	—	—	1/4	1/4	.235	1/2	1 1/4	4	.015
UCDE375J5ARA		UCDE375J5ARA	—	—	3/8	3/8	.353	7/8	1 7/8	4	.015
—	—	—	UCDE500K5ARB	UCDE500K5ARB	1/2	1/2	.470	1 1/4	2 1/4	4	.030
—	—	—	UCDE625K5ARB	UCDE625K5ARB	5/8	5/8	.588	1 1/4	2 1/4	4	.030
—	—	—	UCDE750K5ARB	UCDE750K5ARB	3/4	3/4	.705	1 1/2	3 1/4	5 1/2	.030
—	—	—	UCDE1000K5ARB	UCDE1000K5ARB	1	1	.940	1 3/4	3 1/4	5 1/2	.030

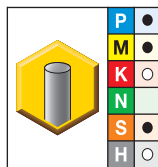
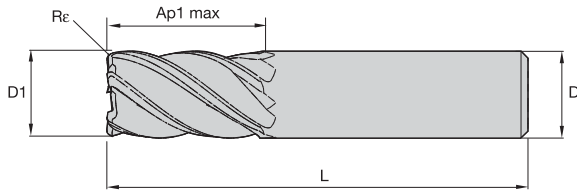
NOTE: For application data, see page M28.

End Mill Tolerances

D1	tolerance	D	tolerance h6
All	+0.00/-0.002"	≤1/8"	+0/-0.00024"
		>1/8-1/4"	+0/-0.00031"
		>1/4-3/8"	+0/-0.00035"
		>3/8-23/32"	+0/-0.00043"
		>23/32-1 3/16"	+0/-0.00051"

Solid End Milling

- Kennametal standard dimensions.
- Non-center cutting.
- Unequal flute spacing minimizes chatter for smoother machining.
- For finishing and semi-finishing applications.



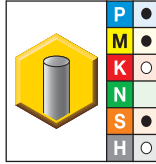
- first choice
- alternate choice

Solid End Milling

KC643M	D1	D	Ap1 max	L	Re
UGDE0250J5AE	1/4	1/4	3/4	2 1/2	—
UGDE0250J5ARA	1/4	1/4	3/4	2 1/2	.0156
UGDE0250J5ARB	1/4	1/4	3/4	2 1/2	.0313
UGDE0250J5BE	1/4	1/4	1 1/4	3	—
UGDE0250J5BRA	1/4	1/4	1 1/4	3	.0156
UGDE0250J5BRB	1/4	1/4	1 1/4	3	.0313
UGDE0312J5AE	5/16	5/16	15/16	3	—
UGDE0312J5ARA	5/16	5/16	15/16	3	.0156
UGDE0312J5ARB	5/16	5/16	15/16	3	.0313
UGDE0312J5BE	5/16	5/16	1 1/4	3 1/2	—
UGDE0312J5BRA	5/16	5/16	1 1/4	3 1/2	.0156
UGDE0312J5BRB	5/16	5/16	1 1/4	3 1/2	.0313
UGDE0375J5AE	3/8	3/8	1 1/8	4	—
UGDE0375J5ARA	3/8	3/8	1 1/8	4	.0156
UGDE0375J5ARB	3/8	3/8	1 1/8	4	.0313
UGDE0375J5ARC	3/8	3/8	1 1/8	4	.0625
UGDE0375J5BE	3/8	3/8	1 7/8	4	—
UGDE0375J5BRA	3/8	3/8	1 7/8	4	.0156
UGDE0375J5BRB	3/8	3/8	1 7/8	4	.0313
UGDE0375J5BRC	3/8	3/8	1 7/8	4	.0625
UGDE0500J5AE	1/2	1/2	1 1/2	4	—
UGDE0500J5ARA	1/2	1/2	1 1/2	4	.0156
UGDE0500J5ARB	1/2	1/2	1 1/2	4	.0313
UGDE0500J5ARC	1/2	1/2	1 1/2	4	.0625
UGDE0500J5BE	1/2	1/2	2 1/2	5	—
UGDE0500J5BRA	1/2	1/2	2 1/2	5	.0156
UGDE0500J5BRB	1/2	1/2	2 1/2	5	.0313
UGDE0500J5BRC	1/2	1/2	2 1/2	5	.0625
UGDE0625J5AE	5/8	5/8	1 7/8	5	—
UGDE0625J5ARA	5/8	5/8	1 7/8	5	.0156
UGDE0625J5ARB	5/8	5/8	1 7/8	5	.0313
UGDE0625J5ARC	5/8	5/8	1 7/8	5	.0625
UGDE0625J5ARD	5/8	5/8	1 7/8	5	.1250
UGDE0625J5BE	5/8	5/8	3 1/8	6	—
UGDE0625J5BRA	5/8	5/8	3 1/8	6	.0156
UGDE0625J5BRB	5/8	5/8	3 1/8	6	.0313

(continued)

(continued)



KC643M	D1	D	Ap1 max	L	Re
UGDE0625J5BRC	5/8	5/8	3 1/8	6	.0625
UGDE0625J5BRD	5/8	5/8	3 1/8	6	.1250
UGDE0750J5AE	3/4	3/4	2 1/4	5	—
UGDE0750J5ARA	3/4	3/4	2 1/4	5	.0156
UGDE0750J5ARB	3/4	3/4	2 1/4	5	.0313
UGDE0750J5ARC	3/4	3/4	2 1/4	5	.0625
UGDE0750J5ARD	3/4	3/4	2 1/4	5	.1250
UGDE0750J5BE	3/4	3/4	3 3/4	7	—
UGDE0750J5BRA	3/4	3/4	3 3/4	7	.0156
UGDE0750J5BRB	3/4	3/4	3 3/4	7	.0313
UGDE0750J5BRC	3/4	3/4	3 3/4	7	.0625
UGDE0750J5BRD	3/4	3/4	3 3/4	7	.1250
UGDE1000J5AE	1	1	3	6	—
UGDE1000J5ARA	1	1	3	6	.0156
UGDE1000J5ARB	1	1	3	6	.0313
UGDE1000J5ARC	1	1	3	6	.0625
UGDE1000J5ARD	1	1	3	6	.1250
UGDE1000J5BE	1	1	5	7 1/2	—
UGDE1000J5BRA	1	1	5	7 1/2	.0156
UGDE1000J5BRB	1	1	5	7 1/2	.0313
UGDE1000J5BRC	1	1	5	7 1/2	.0625
UGDE1000J5BRD	1	1	5	7 1/2	.1250

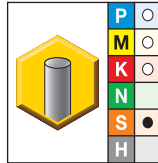
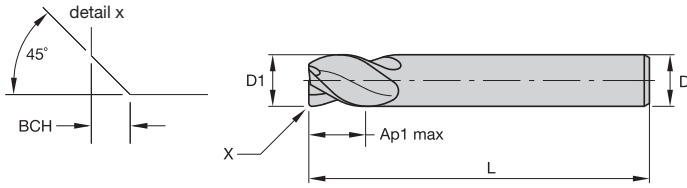
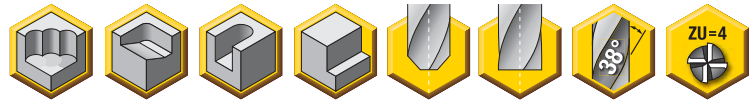
NOTE: For application data, see page M29.

End Mill Tolerances

D1	tolerance	D	tolerance h6
All	+0.000/-0.002"	≤1/8"	+0/-0.00024"
		>1/8-1/4"	+0/-0.00031"
		>1/4-3/8"	+0/-0.00035"
		>3/8-23/32"	+0/-0.00043"
		>23/32-1 3/16"	+0/-0.00051"

Solid End Milling

• Center cutting.



● first choice
○ alternate choice

KC643M	D1	D	Ap1 max	L	BCH
HPHVT500S4063CH	1/2	1/2	5/8	2 1/2	.020
HPHVT500S4063	1/2	1/2	5/8	2 1/2	—
HPHVT500S4125CH	1/2	1/2	1 1/4	3	.020
HPHVT500S4125	1/2	1/2	1 1/4	3	—
HPHVT625S4075	5/8	5/8	3/4	3	—
HPHVT625S4075CH	5/8	5/8	3/4	3	.020
HPHVT625S4125CH	5/8	5/8	1 1/4	3 1/2	.020
HPHVT625S4125	5/8	5/8	1 1/4	3 1/2	—
HPHVT750S4088CH	3/4	3/4	7/8	3 1/2	.020
HPHVT750S4088	3/4	3/4	7/8	3 1/2	—
HPHVT750S4150CH	3/4	3/4	1 1/2	4	.020
HPHVT750S4150	3/4	3/4	1 1/2	4	—
HPHVT1000S4150CH	1	1	1 1/2	4	.020
HPHVT1000S4150	1	1	1 1/2	4	—
HPHVT1250S4225CH	1 1/4	1 1/4	2 1/4	5	.020
HPHVT1250S4225	1 1/4	1 1/4	2 1/4	5	—

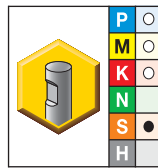
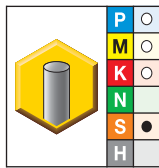
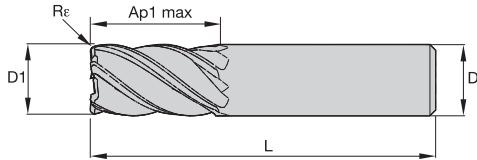
NOTE: For application data, see page M29.

End Mill Tolerances

D1	tolerance	D	tolerance h6
All	+.000/-.002"	≤1/8"	+0/-.00024"
		>1/8–1/4"	+0/-.00031"
		>1/4–3/8"	+0/-.00035"
		>3/8–23/32"	+0/-.00043"
		>23/32–1 3/16"	+0/-.00051"

Solid End Milling

- Kennametal standard dimensions.
- Non-center cutting.
- Unequal flute spacing minimizes chatter for smoother machining.
- Single tool for both roughing and finishing operations for fewer setups.
- Optimized geometry for titanium machining.
- Five-flute geometry enables slotting up to 1 x D.



- first choice
- alternate choice

KC643M		UDDE500K5B		D1	D	Ap1 max	L	Rε
UDDE500J5BRA	UDDE500K5BRA	1/2	1/2	1 1/4	3	.015		
UDDE500J5BRB	UDDE500K5BRB	1/2	1/2	1 1/4	3	.030		
UDDE500J5BRF	UDDE500K5BRF	1/2	1/2	1 1/4	3	.120		
UDDE500J5BS	UDDE500K5BS	1/2	1/2	1 1/4	3	—		
UDDE625J5BRB	UDDE625K5BRB	5/8	5/8	1 1/4	3 1/2	.030		
UDDE625J5BS	UDDE625K5BS	5/8	5/8	1 1/4	3 1/2	—		
UDDE750J5BRB	UDDE750K5BRB	3/4	3/4	1 1/2	4	.030		
UDDE750J5BRF	UDDE750K5BRF	3/4	3/4	1 1/2	4	.120		
UDDE750J5BS	UDDE750K5BS	3/4	3/4	1 1/2	4	—		
UDDE1000J5BRB	UDDE1000K5BRB	1	1	1 3/4	4 1/2	.030		
UDDE1000J5BRF	UDDE1000K5BRF	1	1	1 3/4	4 1/2	.120		
UDDE1000J5BS	UDDE1000K5BS	1	1	1 3/4	4 1/2	—		

NOTE: For application data, see page M30.

End Mill Tolerances

D1	tolerance	D	tolerance h6
All	+0.000/-0.002"	≤1/8"	+0/-0.00024"
		>1/8-1/4"	+0/-0.00031"
		>1/4-3/8"	+0/-0.00035"
		>3/8-23/32"	+0/-0.00043"
		>23/32-1 3/16"	+0/-0.00051"

Solid End Milling

High-Performance Solid Carbide End Mills

In High-Performance Cutting (HPC), slow microcreeping can cause the cutting tool to be pulled out of the chuck, **turning high-quality workpieces to scrap.**

SAFE-λOCK™
by HAIMER

Be on the Safe Side with SAFE-λOCK™ in High-Performance Cutting (HPC)



Benefits

- Highly accurate clamping due to positive connection.
- No loss of accuracy.
- No pull out or spinning of the tool.
- No damage to the workpiece or machine.
- Groove on tool shank is directed so the tool will be pulled into the chuck (depending on direction of rotation).



Order Information

Kennametal high-performance end mills with a shank diameter of 1/2" and larger are available with **SAFE-λOCK™** technology, as a special tool, upon request. Please contact your local customer service location to receive a quote.

Features

- Form-closed clamping.
- High accuracy clamping.
- Helical grooves.

Functions

- No pull out.
- Excellent runout.
- Adjustable clamping length.

Benefits

- Reduce scrap rate.
- Higher tool life.
- No need to change NC program after regrinding.



Customized-Solution Example for Highest Metal Removal Rates



The HARVI II UDDE proprietary design with **unequal flute spacing** and unique core geometry for chatter-free machining enables slotting operations in titanium up to 1 x D.

SAFE-λOCK™

The safety belt for high-performance solid carbide end mills provides a form-closed clamping with high accuracy and helical grooves for length adjustment.

■ HPHV

Material Group	Side Milling (A) and Slotting (B)			KCPM15				KC635M				Feed per Tooth — fz information is for side milling (A). For slotting (B), reduce fz by 20%.									
	A		B	Cutting Speed — vc SFM								D1 — Diameter									
	ap	ae	ap	min	max	min	max	inch	1/8	3/16	1/4	5/16	3/8	7/16	1/2	5/8	3/4	1	1 1/4		
										0.125	0.188	0.250	0.313	0.375	0.438	0.500	0.625	0.750	1.000	1.250	
P	1	1.25 x D	0.5 x D	1 x D	490	660	490	660	fz	0.0009	0.0014	0.0018	0.0023	0.0027	0.0031	0.0035	0.0039	0.0043	0.0050	0.0062	
	2	1.25 x D	0.5 x D	1 x D	460	620	460	620	fz	0.0009	0.0014	0.0018	0.0023	0.0027	0.0031	0.0035	0.0039	0.0043	0.0050	0.0062	
	3	1.25 x D	0.5 x D	1 x D	390	520	390	520	fz	0.0007	0.0011	0.0015	0.0020	0.0023	0.0026	0.0029	0.0034	0.0038	0.0046	0.0057	
	4	1.25 x D	0.5 x D	0.75 x D	300	490	300	490	fz	0.0007	0.0010	0.0014	0.0018	0.0020	0.0023	0.0026	0.0030	0.0033	0.0039	0.0049	
	5	1.25 x D	0.5 x D	1 x D	200	330	200	330	fz	0.0006	0.0009	0.0012	0.0016	0.0018	0.0021	0.0023	0.0027	0.0030	0.0036	0.0046	
	6	1.25 x D	0.5 x D	0.75 x D	160	250	160	250	fz	0.0005	0.0008	0.0010	0.0013	0.0015	0.0017	0.0019	0.0022	0.0024	0.0028	0.0036	
M	1	1.25 x D	0.5 x D	1 x D	260	330	260	330	fz	0.0007	0.0011	0.0015	0.0020	0.0023	0.0026	0.0029	0.0034	0.0038	0.0046	0.0057	
	2	1.25 x D	0.5 x D	1 x D	200	260	200	260	fz	0.0006	0.0009	0.0012	0.0016	0.0018	0.0021	0.0023	0.0027	0.0030	0.0036	0.0046	
	3	1.25 x D	0.5 x D	1 x D	200	260	200	260	fz	0.0005	0.0008	0.0010	0.0013	0.0015	0.0017	0.0019	0.0022	0.0024	0.0028	0.0036	
K	1	1.25 x D	0.5 x D	1 x D	390	520	390	520	fz	0.0009	0.0014	0.0018	0.0023	0.0027	0.0031	0.0035	0.0039	0.0043	0.0050	0.0062	
	2	1.25 x D	0.5 x D	1 x D	360	460	360	460	fz	0.0007	0.0011	0.0015	0.0020	0.0023	0.0026	0.0029	0.0034	0.0038	0.0046	0.0057	
	3	1.25 x D	0.5 x D	1 x D	330	430	330	430	fz	0.0006	0.0009	0.0012	0.0016	0.0018	0.0021	0.0023	0.0027	0.0030	0.0036	0.0046	
S	1	1.0 x D	0.3 x D	0.3 x D	—	—	160	300	fz	0.0007	0.0011	0.0015	0.0020	0.0023	0.0026	0.0029	0.0034	0.0038	0.0046	0.0057	
	2	1.25 x D	0.5 x D	1 x D	—	—	160	260	fz	0.0006	0.0009	0.0012	0.0016	0.0018	0.0021	0.0023	0.0027	0.0030	0.0036	0.0046	
	3	1.0 x D	0.3 x D	0.3 x D	—	—	70	130	fz	0.0004	0.0006	0.0008	0.0010	0.0012	0.0014	0.0016	0.0018	0.0020	0.0025	0.0031	
	4	1.25 x D	0.5 x D	1 x D	—	—	150	210	fz	0.0005	0.0008	0.0011	0.0014	0.0017	0.0019	0.0022	0.0025	0.0028	0.0033	0.0042	
H	1	1.25 x D	0.5 x D	0.75 x D	260	460	260	460	fz	0.0007	0.0010	0.0014	0.0018	0.0020	0.0023	0.0026	0.0030	0.0033	0.0039	0.0049	

NOTE: These guidelines may require variations to achieve optimum results.
 Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
 Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
 Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >1/2" diameter.

■ UADE • Extended Neck

Material Group	Side Milling (A) and Slotting (B)			KCPM15				KC633M				Feed per Tooth — fz information is for side milling (A). For slotting (B), reduce fz by 20%.					
	A		B	Cutting Speed — vc SFM								D1 — Diameter					
	ap	ae	ap	min	max	min	max	inch	1/4	3/8	1/2	5/8	3/4	1			
									0.250	0.375	0.500	0.625	0.750	1.000			
P	1	0.75 x D	0.5 x D	0.75 x D	500	650	500	650	fz	0.0018	0.0027	0.0035	0.0039	0.0043	0.0050		
	2	0.75 x D	0.5 x D	0.75 x D	450	625	450	625	fz	0.0018	0.0027	0.0035	0.0039	0.0043	0.0050		
	3	0.75 x D	0.5 x D	0.75 x D	400	525	400	525	fz	0.0015	0.0023	0.0029	0.0034	0.0038	0.0046		
	4	0.75 x D	0.5 x D	0.5 x D	300	475	300	475	fz	0.0014	0.0020	0.0026	0.0030	0.0033	0.0039		
	5	0.75 x D	0.5 x D	0.75 x D	200	325	200	325	fz	0.0012	0.0018	0.0023	0.0027	0.0030	0.0036		
	6	0.75 x D	0.5 x D	0.5 x D	150	225	150	225	fz	0.0010	0.0015	0.0019	0.0022	0.0024	0.0028		
M	1	0.75 x D	0.5 x D	0.75 x D	260	330	260	330	fz	0.0015	0.0023	0.0029	0.0034	0.0038	0.0046		
	2	0.75 x D	0.5 x D	0.75 x D	200	260	200	260	fz	0.0012	0.0018	0.0023	0.0027	0.0030	0.0036		
	3	0.75 x D	0.5 x D	0.75 x D	200	260	200	260	fz	0.0010	0.0015	0.0019	0.0022	0.0024	0.0028		
K	1	0.75 x D	0.5 x D	0.75 x D	390	520	390	520	fz	0.0018	0.0027	0.0035	0.0039	0.0043	0.0050		
	2	0.75 x D	0.5 x D	0.75 x D	360	460	360	460	fz	0.0015	0.0023	0.0029	0.0034	0.0038	0.0046		
	3	0.75 x D	0.5 x D	0.75 x D	330	430	330	430	fz	0.0012	0.0018	0.0023	0.0027	0.0030	0.0036		
S	1	0.75 x D	0.3 x D	0.3 x D	—	—	150	275	fz	0.0015	0.0023	0.0029	0.0034	0.0038	0.0046		
	2	0.75 x D	0.5 x D	0.75 x D	—	—	160	260	fz	0.0012	0.0018	0.0023	0.0027	0.0030	0.0036		
	3	0.75 x D	0.3 x D	0.3 x D	—	—	70	130	fz	0.0008	0.0012	0.0016	0.0018	0.0020	0.0025		
	4	0.75 x D	0.5 x D	0.75 x D	—	—	150	210	fz	0.0011	0.0017	0.0022	0.0025	0.0028	0.0033		
H	1	0.75 x D	0.5 x D	0.5 x D	260	450	260	450	fz	0.0014	0.0020	0.0026	0.0030	0.0033	0.0039		

NOTE: Side milling applications — For longest reach (L3) tools, reduce ae by 30%.
 Slot milling applications — For longest reach (L3) tools, reduce ap by 30%.
 Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
 Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
 Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >1/2" diameter.

Solid End Milling

■ HPRSHV

Material Group					Feed per Tooth — fz information is for side milling (A). For slotting (B), reduce fz by 20%.									
	Side Milling (A) and Slotting (B)		KCPM15		D1 — Diameter									
	A		B		Cutting Speed — vc SFM									
	ap	ae	ap	min	max	inch	1/4	3/8	1/2	5/8	3/4	1		
P	1	0.75 x D	0.5 x D	0.75 x D	500	650	fz	0.0018	0.0027	0.0035	0.0039	0.0043	0.0050	
	2	0.75 x D	0.5 x D	0.75 x D	450	625	fz	0.0018	0.0027	0.0035	0.0039	0.0043	0.0050	
	3	0.75 x D	0.5 x D	0.75 x D	400	525	fz	0.0015	0.0023	0.0029	0.0034	0.0038	0.0046	
	4	0.75 x D	0.5 x D	0.5 x D	300	475	fz	0.0014	0.0020	0.0026	0.0030	0.0033	0.0039	
	5	1.5 x D	0.5 x D	0.75 x D	200	325	fz	0.0012	0.0018	0.0023	0.0027	0.0030	0.0036	
	6	0.75 x D	0.5 x D	0.5 x D	150	225	fz	0.0010	0.0015	0.0019	0.0022	0.0024	0.0028	
M	1	0.75 x D	0.5 x D	0.75 x D	260	330	fz	0.0015	0.0023	0.0029	0.0034	0.0038	0.0046	
	2	0.75 x D	0.5 x D	0.75 x D	200	260	fz	0.0012	0.0018	0.0023	0.0027	0.0030	0.0036	
	3	0.75 x D	0.5 x D	0.75 x D	200	260	fz	0.0010	0.0015	0.0019	0.0022	0.0024	0.0028	
K	1	0.75 x D	0.5 x D	0.75 x D	390	520	fz	0.0018	0.0027	0.0035	0.0039	0.0043	0.0050	
	2	0.75 x D	0.5 x D	0.75 x D	360	460	fz	0.0015	0.0023	0.0029	0.0034	0.0038	0.0046	
	3	0.75 x D	0.5 x D	0.75 x D	330	430	fz	0.0012	0.0018	0.0023	0.0027	0.0030	0.0036	

NOTE: Slot milling applications — For longest reach (L3) tools, reduce ap by 30%.

Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >1/2" diameter.

■ HPHVBN

Material Group					Feed per Tooth — fz information is for side milling (A). For slotting (B), reduce fz by 20%.															
	Side Milling (A) and Slotting (B)		KCPM15		KC633M		D1 — Diameter													
	A		B		Cutting Speed — vc SFM															
	ap	ae	ap	min	max	min	max	inch	1/8	3/16	1/4	5/16	3/8	7/16	1/2	5/8	3/4	1	1 1/4	
P	1	1.25 x D	0.5 x D	1 x D	490	660	490	660	fz	0.0009	0.0014	0.0018	0.0023	0.0027	0.0031	0.0035	0.0039	0.0043	0.0050	0.0062
	2	1.25 x D	0.5 x D	1 x D	460	620	460	620	fz	0.0009	0.0014	0.0018	0.0023	0.0027	0.0031	0.0035	0.0039	0.0043	0.0050	0.0062
	3	1.25 x D	0.5 x D	1 x D	390	520	390	520	fz	0.0007	0.0011	0.0015	0.0020	0.0023	0.0026	0.0029	0.0034	0.0038	0.0046	0.0057
	4	1.25 x D	0.5 x D	0.75 x D	300	490	300	490	fz	0.0007	0.0010	0.0014	0.0018	0.0020	0.0023	0.0026	0.0030	0.0033	0.0039	0.0049
	5	1.25 x D	0.5 x D	1 x D	200	330	200	330	fz	0.0006	0.0009	0.0012	0.0016	0.0018	0.0021	0.0023	0.0027	0.0030	0.0036	0.0046
	6	1.25 x D	0.5 x D	0.75 x D	160	250	160	250	fz	0.0005	0.0008	0.0010	0.0013	0.0015	0.0017	0.0019	0.0022	0.0024	0.0028	0.0036
M	1	1.25 x D	0.5 x D	1 x D	260	330	260	330	fz	0.0007	0.0011	0.0015	0.0020	0.0023	0.0026	0.0029	0.0034	0.0038	0.0046	0.0057
	2	1.25 x D	0.5 x D	1 x D	200	260	200	260	fz	0.0006	0.0009	0.0012	0.0016	0.0018	0.0021	0.0023	0.0027	0.0030	0.0036	0.0046
	3	1.25 x D	0.5 x D	1 x D	200	260	200	260	fz	0.0005	0.0008	0.0010	0.0013	0.0015	0.0017	0.0019	0.0022	0.0024	0.0028	0.0036
K	1	1.25 x D	0.5 x D	1 x D	390	520	390	520	fz	0.0009	0.0014	0.0018	0.0023	0.0027	0.0031	0.0035	0.0039	0.0043	0.0050	0.0062
	2	1.25 x D	0.5 x D	1 x D	360	460	360	460	fz	0.0007	0.0011	0.0015	0.0020	0.0023	0.0026	0.0029	0.0034	0.0038	0.0046	0.0057
	3	1.25 x D	0.5 x D	1 x D	330	430	330	430	fz	0.0006	0.0009	0.0012	0.0016	0.0018	0.0021	0.0023	0.0027	0.0030	0.0036	0.0046
S	1	1.0 x D	0.3 x D	0.3 x D	—	—	160	300	fz	0.0007	0.0011	0.0015	0.0020	0.0023	0.0026	0.0029	0.0034	0.0038	0.0046	0.0057
	2	1.25 x D	0.5 x D	1 x D	—	—	160	260	fz	0.0006	0.0009	0.0012	0.0016	0.0018	0.0021	0.0023	0.0027	0.0030	0.0036	0.0046
	3	1.0 x D	0.3 x D	0.3 x D	—	—	70	130	fz	0.0004	0.0006	0.0008	0.0010	0.0012	0.0014	0.0016	0.0018	0.0020	0.0025	0.0031
	4	1.25 x D	0.5 x D	1 x D	—	—	150	210	fz	0.0005	0.0008	0.0011	0.0014	0.0017	0.0019	0.0022	0.0025	0.0028	0.0033	0.0042
H	1	1.25 x D	0.5 x D	0.75 x D	260	460	—	—	fz	0.0007	0.0010	0.0014	0.0018	0.0020	0.0023	0.0026	0.0030	0.0033	0.0039	0.0049

NOTE: These guidelines may require variations to achieve optimum results.

Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >1/2" diameter.

■ UCDE

Material Group																
	Side Milling (A) and Slotting (B)			KCPM15/KC643M		Feed per Tooth — fz information is for side milling (A). For slotting (B), reduce fz by 20%.										
	A		B	Cutting Speed — vc SFM		D1 — Diameter										
	ap	ae	ap	min	max	inch	3/16	1/4	5/16	3/8	7/16	1/2	5/8	3/4	1	
P	1	1.25 x D	0.5 x D	1 x D	490	660	fz	0.0014	0.0018	0.0023	0.0027	0.0031	0.0035	0.0039	0.0043	0.0050
	2	1.25 x D	0.5 x D	1 x D	460	620	fz	0.0014	0.0018	0.0023	0.0027	0.0031	0.0035	0.0039	0.0043	0.0050
	3	1.25 x D	0.5 x D	1 x D	390	520	fz	0.0011	0.0015	0.0020	0.0023	0.0026	0.0029	0.0034	0.0038	0.0046
	4	1.25 x D	0.5 x D	0.75 x D	300	490	fz	0.0010	0.0014	0.0018	0.0020	0.0023	0.0026	0.0030	0.0033	0.0039
	5	1.25 x D	0.5 x D	1 x D	200	330	fz	0.0009	0.0012	0.0016	0.0018	0.0021	0.0023	0.0027	0.0030	0.0036
	6	1.25 x D	0.5 x D	0.75 x D	160	250	fz	0.0008	0.0010	0.0013	0.0015	0.0017	0.0019	0.0022	0.0024	0.0028
M	1	1.25 x D	0.5 x D	1 x D	260	330	fz	0.0011	0.0015	0.0020	0.0023	0.0026	0.0029	0.0034	0.0038	0.0046
	2	1.25 x D	0.5 x D	1 x D	200	260	fz	0.0009	0.0012	0.0016	0.0018	0.0021	0.0023	0.0027	0.0030	0.0036
	3	1.25 x D	0.5 x D	1 x D	200	260	fz	0.0008	0.0010	0.0013	0.0015	0.0017	0.0019	0.0022	0.0024	0.0028
K	1	1.25 x D	0.5 x D	1 x D	390	520	fz	0.0014	0.0018	0.0023	0.0027	0.0031	0.0035	0.0039	0.0043	0.0050
	2	1.25 x D	0.5 x D	1 x D	360	460	fz	0.0011	0.0015	0.0020	0.0023	0.0026	0.0029	0.0034	0.0038	0.0046
	3	1.25 x D	0.5 x D	1 x D	330	430	fz	0.0009	0.0012	0.0016	0.0018	0.0021	0.0023	0.0027	0.0030	0.0036
S	1	1.0 x D	0.3 x D	0.3 x D	160	300	fz	0.0011	0.0015	0.0020	0.0023	0.0026	0.0029	0.0034	0.0038	0.0046
	2	1.25 x D	0.5 x D	1 x D	160	260	fz	0.0009	0.0012	0.0016	0.0018	0.0021	0.0023	0.0027	0.0030	0.0036
	3	1.0 x D	0.3 x D	0.3 x D	70	130	fz	0.0006	0.0008	0.0010	0.0012	0.0014	0.0016	0.0018	0.0020	0.0025
	4	1.25 x D	0.5 x D	1 x D	150	210	fz	0.0008	0.0011	0.0014	0.0017	0.0019	0.0022	0.0025	0.0028	0.0033
H	1	1.25 x D	0.5 x D	0.75 x D	260	460	fz	0.0010	0.0014	0.0018	0.0020	0.0023	0.0026	0.0030	0.0033	0.0039

Solid End Milling

■ UCDE • Extended Neck

Material Group													
	Side Milling (A) and Slotting (B)			KCPM15/KC643M		Feed per Tooth — fz information is for side milling (A). For slotting (B), reduce fz by 20%.							
	A		B	Cutting Speed — vc SFM		D1 — Diameter							
	ap	ae	ap	min	max	inch	1/4	3/8	1/2	5/8	3/4	1	
P	1	0.75 x D	0.5 x D	0.75 x D	490	660	fz	0.0018	0.0027	0.0035	0.0039	0.0043	0.0050
	2	0.75 x D	0.5 x D	0.75 x D	460	620	fz	0.0018	0.0027	0.0035	0.0039	0.0043	0.0050
	3	0.75 x D	0.5 x D	0.75 x D	390	520	fz	0.0015	0.0023	0.0029	0.0034	0.0038	0.0046
	4	0.75 x D	0.5 x D	0.5 x D	300	490	fz	0.0014	0.0020	0.0026	0.0030	0.0033	0.0039
	5	0.75 x D	0.5 x D	0.75 x D	200	330	fz	0.0012	0.0018	0.0023	0.0027	0.0030	0.0036
	6	0.75 x D	0.5 x D	0.5 x D	160	250	fz	0.0010	0.0015	0.0019	0.0022	0.0024	0.0028
M	1	0.75 x D	0.5 x D	0.75 x D	260	330	fz	0.0015	0.0023	0.0029	0.0034	0.0038	0.0046
	2	0.75 x D	0.5 x D	0.75 x D	200	260	fz	0.0012	0.0018	0.0023	0.0027	0.0030	0.0036
	3	0.75 x D	0.5 x D	0.75 x D	200	260	fz	0.0010	0.0015	0.0019	0.0022	0.0024	0.0028
K	1	0.75 x D	0.5 x D	0.75 x D	390	520	fz	0.0018	0.0027	0.0035	0.0039	0.0043	0.0050
	2	0.75 x D	0.5 x D	0.75 x D	360	460	fz	0.0015	0.0023	0.0029	0.0034	0.0038	0.0046
	3	0.75 x D	0.5 x D	0.75 x D	330	430	fz	0.0012	0.0018	0.0023	0.0027	0.0030	0.0036
S	1	0.75 x D	0.3 x D	0.3 x D	160	300	fz	0.0015	0.0023	0.0029	0.0034	0.0038	0.0046
	2	0.75 x D	0.5 x D	0.75 x D	160	260	fz	0.0012	0.0018	0.0023	0.0027	0.0030	0.0036
	3	0.75 x D	0.3 x D	0.3 x D	70	130	fz	0.0008	0.0012	0.0016	0.0018	0.0020	0.0025
	4	0.75 x D	0.5 x D	0.75 x D	150	210	fz	0.0011	0.0017	0.0022	0.0025	0.0028	0.0033
H	1	0.75 x D	0.5 x D	0.5 x D	260	460	fz	0.0014	0.0020	0.0026	0.0030	0.0033	0.0039

NOTE: These guidelines may require variations to achieve optimum results.
 Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
 Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
 Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >1/2" diameter.

■ UGDE • 3 x D and 5 x D Lengths of Cut

Material Group												
	Side Milling (A)		KC643M		Feed per Tooth – fz information is for side milling (A).							
	A		Cutting Speed – vc SFM		D1 – Diameter							
	ap	ae	min	max	inch	1/4 0.250	5/16 0.313	3/8 0.375	1/2 0.500	5/8 0.625	3/4 0.750	1 1.000
P	1	Ap1 max 0.05 x D	490	1320	fz	0.00183	0.00234	0.0027	0.00345	0.00394	0.00428	0.00495
	2	Ap1 max 0.05 x D	460	1254	fz	0.00183	0.00234	0.0027	0.00345	0.00394	0.00428	0.00495
	3	Ap1 max 0.05 x D	390	1056	fz	0.00151	0.00195	0.00227	0.00293	0.00341	0.00379	0.00455
	4	Ap1 max 0.05 x D	300	990	fz	0.00137	0.00175	0.00203	0.0026	0.003	0.0033	0.0039
	5	Ap1 max 0.05 x D	200	660	fz	0.00123	0.00156	0.00182	0.00234	0.00273	0.00303	0.00364
	6	Ap1 max 0.05 x D	160	495	fz	0.00103	0.00131	0.00152	0.00194	0.00223	0.00243	0.00284
M	1	Ap1 max 0.05 x D	260	759	fz	0.00151	0.00195	0.00227	0.00293	0.00341	0.00379	0.00455
	2	Ap1 max 0.05 x D	200	528	fz	0.00123	0.00156	0.00182	0.00234	0.00273	0.00303	0.00364
	3	Ap1 max 0.05 x D	200	462	fz	0.00103	0.00131	0.00152	0.00194	0.00223	0.00243	0.00284
K	1	Ap1 max 0.05 x D	390	990	fz	0.00183	0.00234	0.0027	0.00345	0.00394	0.00428	0.00495
	2	Ap1 max 0.05 x D	360	858	fz	0.00151	0.00195	0.00227	0.00293	0.00341	0.00379	0.00455
	3	Ap1 max 0.05 x D	330	858	fz	0.00123	0.00156	0.00182	0.00234	0.00273	0.00303	0.00364
S	1	Ap1 max 0.05 x D	160	594	fz	0.00151	0.00195	0.00227	0.00293	0.00341	0.00379	0.00455
	2	Ap1 max 0.05 x D	160	264	fz	0.00081	0.00103	0.0012	0.00155	0.00181	0.00203	0.00245
	3	Ap1 max 0.05 x D	70	528	fz	0.00123	0.00156	0.00182	0.00234	0.00273	0.00303	0.00364
	4	Ap1 max 0.05 x D	150	396	fz	0.00107	0.00144	0.00167	0.00215	0.00251	0.00278	0.00334
H	1	Ap1 max 0.05 x D	260	462	fz	0.00137	0.00175	0.00203	0.0026	0.003	0.0033	0.0039

NOTE: For the above cutting data, do not exceed an overall ae of .031".

Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >1/2" diameter.

■ HPHVT

Material Group												
	Side Milling (A) and Slotting (B)			KC643M		Feed per Tooth – fz information is for side milling (A). For slotting (B), reduce fz by 20%.						
	A		B	Cutting Speed – vc SFM		D1 – Diameter						
	ap	ae	ap	min	max	inch	1/2 0.500	5/8 0.625	3/4 0.750	1 1.000	1 1/4 1.250	
P	5	1.25 x D	0.5 x D	1 x D	200	330	fz	0.0023	0.0027	0.0030	0.0036	0.0046
	6	1.25 x D	0.5 x D	0.75 x D	160	250	fz	0.0019	0.0022	0.0024	0.0028	0.0036
S	2	1.0 x D	0.3 x D	0.3 x D	160	260	fz	0.0029	0.0034	0.0038	0.0046	0.0031
	3	1.0 x D	0.3 x D	0.3 x D	70	130	fz	0.0016	0.0018	0.0020	0.0025	0.0046
	4	1.25 x D	0.5 x D	1 x D	150	210	fz	0.0022	0.0025	0.0028	0.0033	0.0042

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >1/2" diameter.

■ UDDE

	Side Milling (A) and Slotting (B)		KC643M		Feed per Tooth — fz information is for side milling (A). For slotting (B), reduce fz by 20%.								
	A		B	Cutting Speed — vc SFM		D1 — Diameter							
Material Group	ap	ae	ap	min	max	inch	1/4 0.250	3/8 0.375	1/2 0.500	5/8 0.625	3/4 0.750	1 1.000	
P	5	1.25 x D	0.5 x D	1 x D	200	325	fz	0.0012	0.0018	0.0023	0.0027	0.0003	0.0036
	6	1.25 x D	0.5 x D	0.75 x D	150	225	fz	0.0010	0.0015	0.0019	0.0022	0.0024	0.0028
S	2	1.0 x D	0.3 x D	0.3 x D	70	130	fz	0.0008	0.0012	0.0016	0.0018	0.0020	0.0025
	3	1.25 x D	0.5 x D	1 x D	160	260	fz	0.0012	0.0018	0.0023	0.0027	0.0030	0.0036
	4	1.25 x D	0.5 x D	1 x D	150	210	fz	0.0011	0.0017	0.0022	0.0025	0.0028	0.0033

NOTE: These guidelines may require variations to achieve optimum results.
 Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
 Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
 Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >1/2" diameter.



Solid End Milling

Looking for a product that's not shown in this catalog?
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Online product catalog available 24/7

Visit <http://www.kennametal.com/endmilling/> to browse our electronic catalog any time you're looking for Kennametal's best tooling solutions. It's fast, free, and always available. The online e-catalog is updated weekly with products and solutions for milling, turning, drilling, and tooling systems applications.



KenFeed™ End Mills for High-Feed Milling

Primary Application

Specifically engineered to machine hardened steel up to 67 HRC at extreme speeds and feeds.

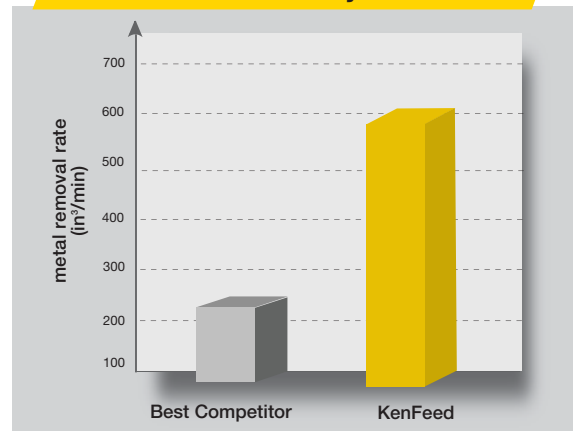
- Unique tool with new 6-flute style for high productivity.
- Necked shanks provide extended reach in deep cavities.
- High feed rates up to .0230" per tooth on a 3/4" tool.
- Machine hardened materials at 2–3x the metal removal rate of competitive end mills.
- Wide range of cutting diameters: down to 6mm for small and medium pocket work.
- Innovative new geometry maximizes metal removal rates.
- High metal removal rates lower manufacturing costs.

Featured Application: Milling a Mold

- Operation:** Pocket milling
Customer: Die and mold manufacturer
Workpiece: Mold
Material: AISI 4340 hardened steel (52 HRC)
Results: 3x better metal removal rate than competitive tool!
 Machined at more than 3x faster feed!

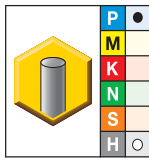
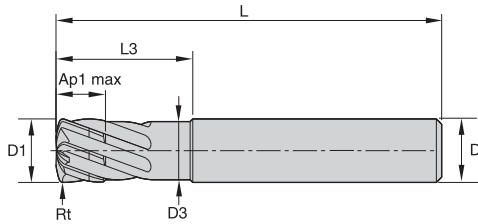


Increased Metal Removal Rate by 191%



	COMPETITOR	KenFeed
tool:	4-flute H/P for die and mold	KMDA0500J6ANA
material:	medium-hardened steel	medium-hardened steel
surface speed:	400 SFM	530 SFM
feed per tooth:	.013"	.013"
depth of cut:	.031"	.023"
table feed:	170 in/min	600 in/min
metal removal rate:	1.4 in ³ /min	3.7 in ³ /min

- Kennametal standard dimensions.
- Non-center cutting.
- High feed.



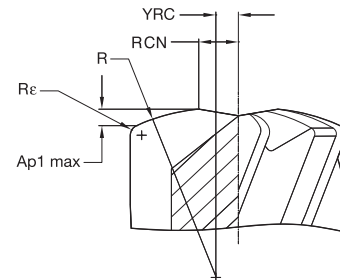
- first choice
- alternate choice

KC639M	D1	D	D3	Ap1 max	L3	L	Re
KMDA0250J6ANA	1/4	1/4	.211	.013	3/4	2 1/2	.016
KMDA0312J6ANA	5/16	5/16	.273	.017	1	3	.020
KMDA0375J6ANA	3/8	3/8	.336	.020	1 1/4	4	.023
KMDA0500J6ANA	1/2	1/2	.461	.027	1 1/2	4	.032
KMDA0625J6ANA	5/8	5/8	.586	.033	2	5	.040
KMDA0750J6ANA	3/4	3/4	.711	.040	2 1/2	5	.047

NOTE: For application data, see page M34.

Solid End Milling

End Mill Tolerances			
D1	tolerance	D	tolerance h6
All	+0.000/-0.002"	≤1/8"	+0/-0.00024"
		>1/8-1/4"	+0/-0.00031"
		>1/4-3/8"	+0/-0.00035"
		>3/8-23/32"	+0/-0.00043"
		>23/32-1 3/16"	+0/-0.00051"

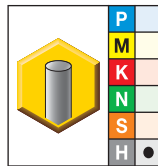
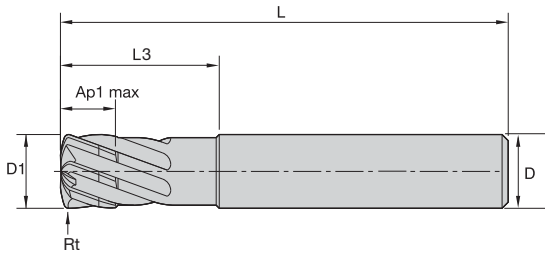


■ Programming Data

catalog number	geometrical parameters							ramping guide for circular and linear ramping						
	D1	Ap1 max	R	Re	YRC	RCN	circular interpolation		linear ramping					
							optimal range of circle diameter for a single pass		calculated length per ramp angle					
							smallest	largest	1°	2°	3°	4°	5°	
KMDA0250J6ANA	1/4	0.0133	0.250	0.0160	0.0313	0.0525	0.355	0.500	0.762	0.381	0.254	0.190	0.152	
KMDA0312J6ANA	5/16	0.0166	0.313	0.0200	0.0391	0.0656	0.444	0.625	0.953	0.476	0.317	0.238	0.190	
KMDA0375J6ANA	3/8	0.0200	0.375	0.0235	0.0469	0.0788	0.533	0.750	1.143	0.572	0.381	0.285	0.228	
KMDA0500J6ANA	1/2	0.0266	0.500	0.0320	0.0625	0.1050	0.710	1.000	1.525	0.762	0.508	0.381	0.304	
KMDA0625J6ANA	5/8	0.0333	0.625	0.0400	0.0781	0.1313	0.888	1.250	1.906	0.953	0.635	0.476	0.380	
KMDA0750J6ANA	3/4	0.0399	0.750	0.0470	0.0938	0.1575	1.065	1.500	2.287	1.143	0.762	0.571	0.456	
									recommended % of programmed feed rate to use while ramping					
									100%	70%	50%	30%	10%	

YRC = distance from centerline to the crown of the R radius.
 RCN = distance from centerline to the start of the cutting edge. This dimension can also help determine the minimum circle size when helical ramping.
 R = the head radius size.
 Re = the shoulder radius or radius at the corner of the cutter.

- Kennametal standard dimensions.
- Non-center cutting.
- High feed.

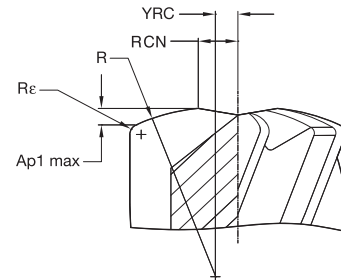


- first choice
- alternate choice

KC639M	D1	D	Ap1 max	L3	L	Re
KHDA0250J6ANA	1/4	1/4	.0082	.750	2 1/2	.016
KHDA0312J6ANA	5/16	5/16	.0103	1.000	3	.020
KHDA0375J6ANA	3/8	3/8	.0123	1.250	3 1/2	.020
KHDA0500J6ANA	1/2	1/2	.0164	1.500	4	.023
KHDA0625J6ANA	5/8	5/8	.0205	2.000	4 1/2	.032
KHDA0750J6ANA	3/4	3/4	.0250	2.500	5	.040

NOTE: For application data, see page M34.

End Mill Tolerances			
D1	tolerance	D	tolerance h6
All	+0.000/-0.002"	≤1/8"	+0/-0.00024"
		>1/8–1/4"	+0/-0.00031"
		>1/4–3/8"	+0/-0.00035"
		>3/8–23/32"	+0/-0.00043"
		>23/32–1 3/16"	+0/-0.00051"



Solid End Milling

■ Programming Data

catalog number	geometrical parameters						ramping guide for circular and linear ramping								
	D1	Ap1 max	R	Re	YRC	RCN	circular interpolation				linear ramping				
							optimal range of circle diameter for a single pass		calculated length per ramp angle		1°	2°	3°	4°	5°
						smallest	largest								
KHDA0250J6ANA	1/4	0.0082	0.375	0.0160	0.0313	0.0550	0.360	0.500	0.470	0.235	0.157	0.117	0.094		
KHDA0312J6ANA	5/16	0.0103	0.469	0.0200	0.0391	0.0688	0.450	0.625	0.588	0.294	0.196	0.147	0.117		
KHDA0375J6ANA	3/8	0.0123	0.563	0.0240	0.0469	0.0825	0.540	0.750	0.706	0.353	0.235	0.176	0.141		
KHDA0500J6ANA	1/2	0.0164	0.750	0.0320	0.0625	0.1100	0.720	1.000	0.941	0.470	0.313	0.235	0.188		
KHDA0625J6ANA	5/8	0.0205	0.938	0.0400	0.0781	0.1375	0.900	1.250	1.176	0.588	0.392	0.294	0.235		
KHDA0750J6ANA	3/4	0.0246	1.125	0.0470	0.0938	0.1650	1.080	1.500	1.411	0.705	0.470	0.352	0.282		

recommended % of programmed feed rate to use while ramping 100% 70% 50% 30% 10%

YRC = distance from centerline to the crown of the R radius.
 RCN = distance from centerline to the start of the cutting edge. This dimension can also help determine the minimum circle size when helical ramping.
 R = the head radius size.
 Re = the shoulder radius or radius at the corner of the cutter.

■ KMDA • Steels with Hardness <52 HRC

				KC639M		D1 – Diameter						
		3D Milling/Profiling		Cutting Speed – vc SFM								
Material Group		ap	ae	min	max	inch	1/4 0.250	5/16 0.313	3/8 0.375	1/2 0.500	5/8 0.625	3/4 0.750
P	4	0.05 x D	0.55 x D	528	594	fz	0.0130	0.0160	0.0190	0.0250	0.0260	0.0280
H	1	0.05 x D	0.55 x D	462	528	fz	0.0130	0.0160	0.0190	0.0250	0.0260	0.0280
	2	0.05 x D	0.55 x D	330	396	fz	0.0080	0.0090	0.0110	0.0150	0.0190	0.0230

■ KHDA • Steels with Hardness >52 HRC

				KC639M		D1 – Diameter						
		3D Milling/Profiling		Cutting Speed – vc SFM								
Material Group		ap	ae	min	max	inch	1/4 0.250	5/16 0.313	3/8 0.375	1/2 0.500	5/8 0.625	3/4 0.750
H	2	0.03 x D	0.55 x D	330	396	fz	0.0080	0.0090	0.0110	0.0150	0.0190	0.0230
	3	0.03 x D	0.55 x D	265	330	fz	0.0080	0.0090	0.0110	0.0150	0.0190	0.0230
	4	0.03 x D	0.55 x D	165	230	fz	0.0060	0.0080	0.0090	0.0130	0.0160	0.0190

NOTE: These guidelines may require variations to achieve optimum results.

Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >1/2" diameter.

Solid End Milling

Best-in-Class Performance for Machining Hard Materials

Using Kennametal Solid End Mills will:

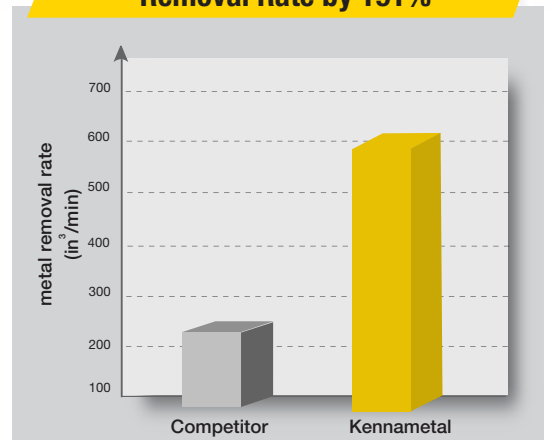
- Reduce the number of tools needed.
- Offer excellent chip evacuation.
- Promote maximum productivity.
- Increase removal rates.
- Enable higher speeds.
- Ensure accuracy.
- Reduce manufacturing costs.
- Provide long tool life.

Featured Application KenFeed™: Milling a Mold

- Operation:** Pocket milling
Customer: Die and mold manufacturer
Workpiece: Mold
Material: AISI 4340 hardened steel (52 HRC)
Results: 3x better metal removal rate than competitive tool!
 Machined at more than 3x faster feed!

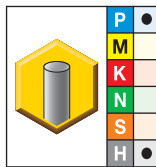
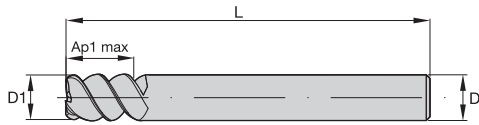
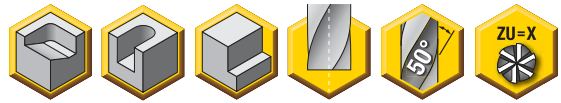


Increased Metal Removal Rate by 191%



	COMPETITOR	KenFeed
tool:	4-flute H/P for die and mold	KMDA0500J6ANA
material:	medium-hardened steel	medium-hardened steel
surface speed:	400 SFM	530 SFM
feed per tooth:	.013"	.013"
depth of cut:	.031"	.023"
table feed:	170 in/min	600 in/min
metal removal rate:	1.4 in ³ /min	3.7 in ³ /min

- Kennametal standard dimensions.
- Center cutting.



- first choice
- alternate choice

Solid End Milling

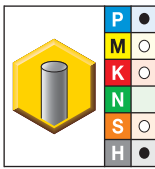
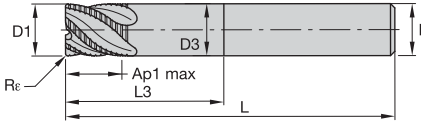
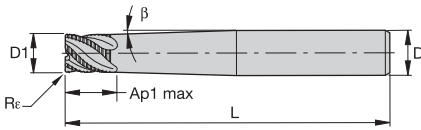
	D1	D	Ap1 max	L	Z U
KC633M					
HPFDM250S4038	1/4	1/4	3/8	3	4
HPFDM250S4063	1/4	1/4	5/8	3	4
HPFDM250S4088	1/4	1/4	7/8	3	4
HPFDM312S4050	5/16	5/16	1/2	4	4
HPFDM312S4075	5/16	5/16	3/4	4	4
HPFDM312S4113	5/16	5/16	1 1/8	4	4
HPFDM375S4056	3/8	3/8	9/16	4	4
HPFDM375S5094	3/8	3/8	15/16	4	5
HPFDM375S5131	3/8	3/8	1 5/16	4	5
HPFDM500S4075	1/2	1/2	3/4	5	4
HPFDM500S6125	1/2	1/2	1 1/4	5	6
HPFDM500S6175	1/2	1/2	1 3/4	5	6
HPFDM625S4094	5/8	5/8	15/16	5	4
HPFDM625S6156	5/8	5/8	1 9/16	5	6
HPFDM625S6219	5/8	5/8	2 3/16	5	6
HPFDM750S4113	3/4	3/4	1 1/8	6	4
HPFDM750S6188	3/4	3/4	1 7/8	6	6
HPFDM750S6263	3/4	3/4	2 5/8	6	6
HPFDM1000S5150	1	1	1 1/2	6	5
HPFDM1000S6250	1	1	2 1/2	6	6
HPFDM1000S6350	1	1	3 1/2	6	6

NOTE: For application data, see page M39.

End Mill Tolerances

D1	tolerance	D	tolerance h6
All	+0.000/-0.002"	≤1/8"	+0/-0.00024"
		>1/8-1/4"	+0/-0.00031"
		>1/4-3/8"	+0/-0.00035"
		>3/8-23/32"	+0/-0.00043"
		>23/32-1 3/16"	+0/-0.00051"

- Kennametal standard dimensions.
- Center cutting.
- Shallow-pitch profile.



- first choice
- alternate choice

	D1	D	D3	Ap1 max	L3	L	Re	β	Z U
KC633M									
HPRDM188S3019	3/16	1/4	—	3/16	—	3	.030	2.5	3
HPRDM250S4025	1/4	3/8	—	1/4	—	4	.030	2.5	4
HPRDM312S4031	5/16	3/8	—	5/16	—	4	.030	2.5	4
HPRDM375S4038	3/8	1/2	—	3/8	—	5	.030	2.5	4
HPRDM500S4050	1/2	5/8	—	1/2	—	5	.040	2.5	4
HPRDM625S6063	5/8	5/8	.59	5/8	1 7/8	5	.040	—	6
HPRDM750S6075	3/4	3/4	.71	3/4	2 1/4	6	.050	—	6

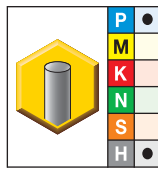
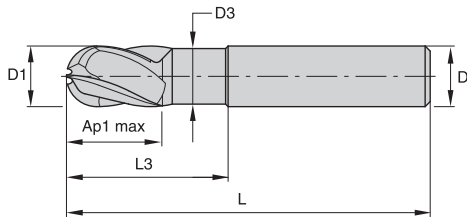
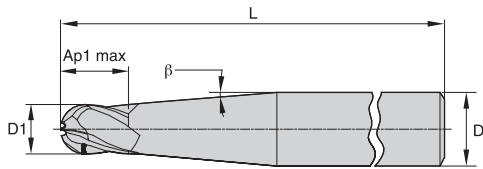
NOTE: For application data, see page M39.

End Mill Tolerances

D1	tolerance	D	tolerance h6
All	+0.000/-0.002"	≤1/8"	+0/-0.00024"
		>1/8-1/4"	+0/-0.00031"
		>1/4-3/8"	+0/-0.00035"
		>3/8-23/32"	+0/-0.00043"
		>23/32-1 3/16"	+0/-0.00051"

Solid End Milling

- Kennametal standard dimensions.
- Center cutting.



KC633M

- first choice
- alternate choice

	D1	D	D3	Ap1 max	L3	L	β
HPBNDM125S4013	1/8	1/4	—	1/8	1.56	3	2.5
HPBNDM188S4019	3/16	1/4	—	3/16	.90	3	2.5
HPBNDM250S4025	1/4	3/8	—	1/4	1.68	4	2.5
HPBNDM375S4038	3/8	1/2	—	3/8	1.81	5	2.5
HPBNDM500S4050	1/2	5/8	—	1/2	1.93	5	2.5
HPBNDM625S4063	5/8	5/8	.59	5/8	1.87	5	—
HPBNDM750S4075	3/4	3/4	.71	3/4	2.25	6	—

NOTE: For application data, see page M40.

Solid End Milling

End Mill Tolerances

D1	tolerance	D	tolerance h6
All	+0.000/-0.002"	≤1/8"	+0/-0.00024"
		>1/8-1/4"	+0/-0.00031"
		>1/4-3/8"	+0/-0.00035"
		>3/8-23/32"	+0/-0.00043"
		>23/32-1 3/16"	+0/-0.00051"

HPFDM

Material Group														
	Side Milling (A) and Slotting (B)			KC633M		Feed per Tooth — fz information is for side milling (A). For slotting (B), reduce fz by 20%.								
	A		B	Cutting Speed — vc SFM		D1 — Diameter								
	ap	ae	ap	min	max	inch	1/4 0.25	5/16 0.31	3/8 0.38	1/2 0.50	5/8 0.63	3/4 0.75	1 1.00	
P	3	1 x D	0.4 x D	1 x D	390	520	fz	0.0017	0.0021	0.0025	0.0032	0.0037	0.0042	0.0050
	4	1 x D	0.4 x D	0.75 x D	300	490	fz	0.0015	0.0019	0.0022	0.0029	0.0033	0.0036	0.0043
H	1	1 x D	0.4 x D	0.75 x D	260	460	fz	0.0015	0.0019	0.0022	0.0029	0.0033	0.0036	0.0043
	2	1 x D	0.3 x D	0.5 x D	230	390	fz	0.0011	0.0014	0.0017	0.0021	0.0024	0.0027	0.0031
	3	1 x D	0.15 x D	0.3 x D	200	300	fz	0.0009	0.0011	0.0013	0.0017	0.0020	0.0022	0.0027
	4	1 x D	0.1 x D	0.15 x D	160	230	fz	0.0006	0.0008	0.0009	0.0011	0.0013	0.0015	0.0018

NOTE: These guidelines may require variations to achieve optimum results.
 Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
 Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
 For better surface finish, reduce feed per tooth.

HPRDM

Material Group																
	Side Milling (A) and Slotting (B)			KC633M		Feed per Tooth — fz information is for side milling (A). For slotting (B), reduce fz by 20%.										
	A		B	Cutting Speed — vc SFM		D1 — Diameter										
	ap	ae	ap	min	max	inch	5/32 0.156	3/16 0.188	1/4 0.250	5/16 0.313	3/8 0.375	1/2 0.500	5/8 0.625	3/4 0.750	1 1.000	
P	3	0.8 x D	0.5 x D	0.75 x D	520	590	fz	0.0008	0.0009	0.0013	0.0017	0.0019	0.0026	0.0031	0.0038	0.0046
	4	0.8 x D	0.5 x D	0.5 x D	460	520	fz	0.0007	0.0009	0.0012	0.0015	0.0017	0.0023	0.0027	0.0033	0.0039
	5	0.8 x D	0.5 x D	0.75 x D	200	330	fz	0.0006	0.0008	0.0010	0.0013	0.0015	0.0021	0.0025	0.0030	0.0036
	6	0.8 x D	0.4 x D	0.5 x D	160	260	fz	0.0005	0.0007	0.0009	0.0011	0.0013	0.0017	0.0020	0.0024	0.0028
M	1	0.8 x D	0.5 x D	0.75 x D	260	330	fz	0.0008	0.0009	0.0013	0.0017	0.0019	0.0026	0.0031	0.0038	0.0046
	2	0.8 x D	0.5 x D	0.75 x D	200	260	fz	0.0006	0.0008	0.0010	0.0013	0.0015	0.0021	0.0025	0.0030	0.0036
	3	0.8 x D	0.5 x D	0.75 x D	200	260	fz	0.0005	0.0007	0.0009	0.0011	0.0013	0.0017	0.0020	0.0024	0.0028
K	1	0.8 x D	0.5 x D	0.75 x D	390	520	fz	0.0009	0.0011	0.0016	0.0020	0.0023	0.0031	0.0035	0.0043	0.0050
	2	0.8 x D	0.5 x D	0.75 x D	360	460	fz	0.0008	0.0009	0.0013	0.0017	0.0019	0.0026	0.0031	0.0038	0.0046
	3	0.8 x D	0.5 x D	0.75 x D	330	430	fz	0.0006	0.0008	0.0010	0.0013	0.0015	0.0021	0.0025	0.0030	0.0036
S	1	0.8 x D	0.5 x D	0.75 x D	300	380	fz	0.0008	0.0009	0.0013	0.0017	0.0019	0.0026	0.0031	0.0038	0.0046
	2	0.8 x D	0.5 x D	0.75 x D	300	380	fz	0.0008	0.0009	0.0013	0.0017	0.0019	0.0026	0.0031	0.0038	0.0046
	3	0.8 x D	0.3 x D	0.3 x D	70	130	fz	0.0004	0.0005	0.0007	0.0009	0.0010	0.0014	0.0016	0.0020	0.0025
	4	0.8 x D	0.3 x D	0.5 x D	150	210	fz	0.0005	0.0007	0.0009	0.0012	0.0014	0.0019	0.0023	0.0028	0.0033
H	1	0.8 x D	0.5 x D	0.5 x D	390	460	fz	0.0007	0.0009	0.0012	0.0015	0.0017	0.0023	0.0027	0.0033	0.0039
	2	0.8 x D	0.3 x D	0.3 x D	260	430	fz	0.0005	0.0007	0.0009	0.0011	0.0013	0.0017	0.0020	0.0024	0.0028
	3	0.8 x D	0.3 x D	0.3 x D	230	330	fz	0.0004	0.0005	0.0007	0.0009	0.0010	0.0014	0.0016	0.0019	0.0023

NOTE: These guidelines may require variations to achieve optimum results.
 Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
 Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
 When using tools with six flutes, reduce slotting ap by 40%.
 Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >1/2" diameter.

Solid End Milling

■ HPBNDM

				KC633M		Feed per Tooth – Finishing										
		3D Milling/Profiling		Cutting Speed – vc SFM		D1 – Diameter										
Material Group	ap	ae	min	max	inch	1/8 0.125	5/32 0.156	3/16 0.188	1/4 0.250	5/16 0.313	3/8 0.375	1/2 0.500	5/8 0.625	3/4 0.750		
P	3	0.04 x D	0.04 x D	1360	1540	fz	0.0033	0.0042	0.0052	0.0070	0.0090	0.0105	0.0135	0.0157	0.0175	
	4	0.04 x D	0.04 x D	1190	1360	fz	0.0031	0.0039	0.0047	0.0063	0.0081	0.0093	0.0120	0.0139	0.0152	
H	1	0.03 x D	0.03 x D	950	1330	fz	0.0033	0.0041	0.0050	0.0068	0.0086	0.0100	0.0128	0.0148	0.0163	
	2	0.03 x D	0.03 x D	670	1140	fz	0.0025	0.0031	0.0038	0.0051	0.0065	0.0075	0.0096	0.0110	0.0120	
	3	0.02 x D	0.02 x D	710	1060	fz	0.0021	0.0026	0.0032	0.0043	0.0054	0.0063	0.0082	0.0095	0.0107	
	4	0.02 x D	0.02 x D	590	830	fz	0.0014	0.0017	0.0021	0.0028	0.0036	0.0042	0.0054	0.0063	0.0070	

				KC633M		Feed per Tooth – Semi-Finishing										
		3D Milling/Profiling		Cutting Speed – vc SFM		D1 – Diameter										
Material Group	ap	ae	min	max	inch	1/8 0.125	5/32 0.156	3/16 0.188	1/4 0.250	5/16 0.313	3/8 0.375	1/2 0.500	5/8 0.625	3/4 0.750		
P	3	0.01 x D	0.05 x D	890	1000	fz	0.0022	0.0027	0.0033	0.0045	0.0059	0.0068	0.0088	0.0102	0.0114	
	4	0.01 x D	0.05 x D	780	890	fz	0.0020	0.0025	0.0030	0.0041	0.0053	0.0061	0.0078	0.0090	0.0099	
H	1	0.07 x D	0.1 x D	660	920	fz	0.0025	0.0031	0.0038	0.0051	0.0066	0.0076	0.0098	0.0113	0.0124	
	2	0.05 x D	0.04 x D	530	910	fz	0.0022	0.0027	0.0033	0.0044	0.0057	0.0065	0.0084	0.0096	0.0105	
	3	0.03 x D	0.03 x D	570	860	fz	0.0019	0.0025	0.0030	0.0040	0.0051	0.0059	0.0076	0.0089	0.0100	
	4	0.03 x D	0.03 x D	480	670	fz	0.0013	0.0016	0.0020	0.0027	0.0034	0.0039	0.0051	0.0059	0.0066	

Solid End Milling

				KC633M		Feed per Tooth – Roughing										
		3D Milling/Profiling		Cutting Speed – vc SFM		D1 – Diameter										
Material Group	ap	ae	min	max	inch	1/8 0.125	5/32 0.156	3/16 0.188	1/4 0.250	5/16 0.313	3/8 0.375	1/2 0.500	5/8 0.625	3/4 0.750		
P	3	0.02 x D	0.01 x D	680	770	fz	0.0010	0.0012	0.0015	0.0020	0.0026	0.0030	0.0039	0.0046	0.0051	
	4	0.02 x D	0.01 x D	600	680	fz	0.0009	0.0011	0.0014	0.0018	0.0023	0.0027	0.0035	0.0040	0.0044	
H	1	0.15 x D	0.01 x D	460	640	fz	0.0013	0.0017	0.0020	0.0028	0.0035	0.0041	0.0052	0.0060	0.0066	
	2	0.01 x D	0.75 x D	390	670	fz	0.0015	0.0019	0.0023	0.0031	0.0039	0.0045	0.0058	0.0067	0.0073	
	3	0.05 x D	0.05 x D	450	680	fz	0.0017	0.0021	0.0026	0.0035	0.0044	0.0052	0.0067	0.0078	0.0087	
	4	0.05 x D	0.05 x D	380	530	fz	0.0011	0.0014	0.0017	0.0023	0.0030	0.0034	0.0044	0.0052	0.0058	

NOTE: These guidelines may require variations to achieve optimum results.

MaxiMet™ Carbide End Mills for High Metal Removal Rates and Superior Surface Finishes

Primary Application

Designed to significantly reduce machining time in aluminum! The innovative geometry designs include a wiper facet for superior surface finish on aluminum parts. MaxiMet takes roughing and finishing cuts with one tool.

Features and Benefits

Higher Productivity and Profitability

- Use only one tool for roughing and finishing operations.
- Slotting is effective up to full 1 x D axial depth. Side milling is effective up to 0.5 x D radial and 1.5 x D axial depth.
- Three-flute series uses unequal flute spacing for chatter-free performance.
- Effective in a full range of machine speeds.
- Multiple corner radii and extended neck configurations are available as standard.

Featured Application: Machining a Block

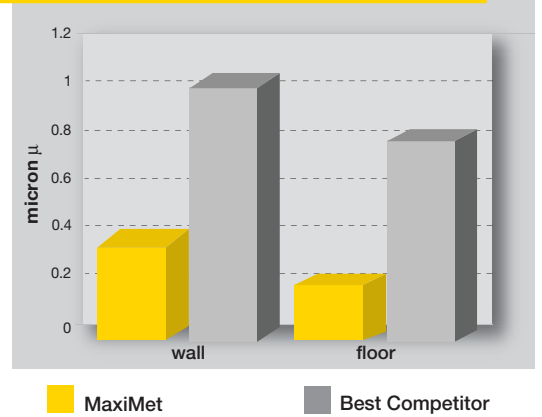
- Operation:** Slotting
Workpiece: Aluminum block
Material: 6061 aluminum
Solution: MaxiMet solid carbide end mill
Results: 100% better surface finish on walls and floor



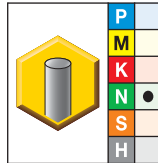
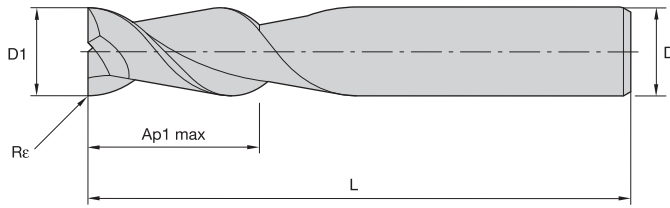
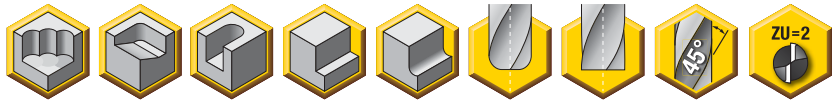
◀ Solid End Milling

	COMPETITOR	MaxiMet
grade:	uncoated tools	uncoated tools
end mill:	5/8"	5/8"
	3-flute	3-flute MaxiMet
material:	aluminum	aluminum
depth of cut (ap):	0.3150"	0.3150"
width of cut (ae):	0.3150"	0.3150"
speed (vc):	2,000 SFM	2,000 SFM
RPM (N):	12,000 RPM	12,000 RPM
feed rate (vf):	142 IPM	142 IPM
chip load per tooth (fz):	.004 IPT	.004 IPT
metal removal rate:	14 in ³ /min	14 in ³ /min

MaxiMet Delivered 100% Better Surface Finish!



- Center cutting.
- Effective in thin wall applications.
- Wiper facet, special end gash, and flute geometry provide better surface finishes.
- Unique geometry delivers maximum metal removal rates.



- first choice
- alternate choice

Solid End Milling

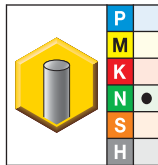
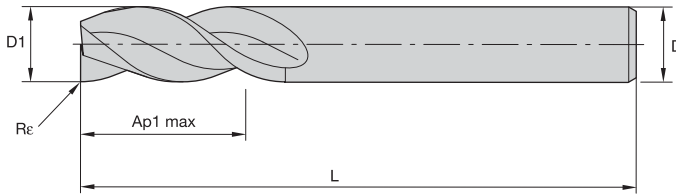
	D1	D	Ap1 max	L	Re
K600					
ABDF0188J2ARA	3/16	3/16	3/8	2	.015
ABDF0188J2AS	3/16	3/16	3/8	2	—
ABDF0250J2ARA	1/4	1/4	1/2	2 1/2	.015
ABDF0250J2ARB	1/4	1/4	1/2	2 1/2	.030
ABDF0250J2AS	1/4	1/4	1/2	2 1/2	—
ABDF0312J2ARA	5/16	5/16	5/8	2 1/2	.015
ABDF0312J2ARB	5/16	5/16	5/8	2 1/2	.030
ABDF0312J2AS	5/16	5/16	5/8	2 1/2	—
ABDF0375J2ARB	3/8	3/8	3/4	2 1/2	.030
ABDF0375J2AS	3/8	3/8	3/4	2 1/2	—
ABDF0500J2ARB	1/2	1/2	1 1/4	3	.030
ABDF0500J2ARC	1/2	1/2	1 1/4	3	.060
ABDF0500J2ARE	1/2	1/2	1 1/4	3	.120
ABDF0500J2AS	1/2	1/2	1 1/4	3	—
ABDF0625J2AS	5/8	5/8	1 1/4	3 1/2	—
ABDF0625J2BRB	5/8	5/8	1 5/8	3 1/2	.030
ABDF0625J2BRC	5/8	5/8	1 5/8	3 1/2	.060
ABDF0625J2BRE	5/8	5/8	1 5/8	3 1/2	.120
ABDF0625J2BS	5/8	5/8	1 5/8	3 1/2	—
ABDF0750J2ARB	3/4	3/4	1 1/2	4	.030
ABDF0750J2ARC	3/4	3/4	1 1/2	4	.060
ABDF0750J2ARE	3/4	3/4	1 1/2	4	.120
ABDF0750J2AS	3/4	3/4	1 1/2	4	—
ABDF0750J2BRB	3/4	3/4	1 5/8	4	.030
ABDF0750J2BRC	3/4	3/4	1 5/8	4	.060
ABDF0750J2BRE	3/4	3/4	1 5/8	4	.120
ABDF0750J2BS	3/4	3/4	1 5/8	4	—
ABDF1000J2ARB	1	1	1 1/2	4	.030
ABDF1000J2ARC	1	1	1 1/2	4	.060
ABDF1000J2ARE	1	1	1 1/2	4	.120
ABDF1000J2AS	1	1	1 1/2	4	—
ABDF1000J2BRB	1	1	2	5	.030
ABDF1000J2BRC	1	1	2	5	.060
ABDF1000J2BRE	1	1	2	5	.120
ABDF1000J2BS	1	1	2	5	—

NOTE: For application data, see page M60.

End Mill Tolerances

D1	tolerance h6	D	tolerance h6
<1/8"	+0/-0.002"	<1/8"	+0/-0.00024"
1/8-7/32"	+0/-0.002"	1/8-7/32"	+0/-0.00031"
1/4-3/8"	+0/-0.00035"	1/4-3/8"	+0/-0.00035"
13/32-11/16"	+0/-0.00043"	13/32-11/16"	+0/-0.00043"
23/32-1 3/16"	+0/-0.00051"	23/32-1 3/16"	+0/-0.00051"

- Center cutting.
- Effective in thin wall applications.
- Wiper facet, special end gash, and flute geometry provide better surface finishes.
- Unique geometry delivers maximum metal removal rates.



- first choice
- alternate choice

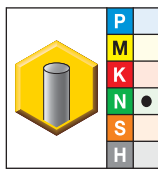
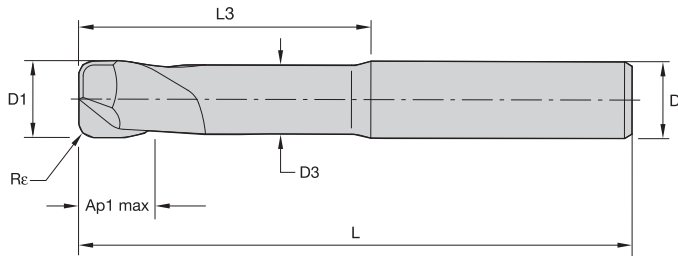
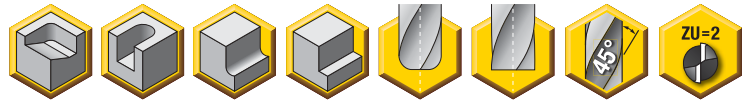
K600	D1	D	Ap1 max	L	Re
ABDE0188J3ARA	3/16	3/16	7/32	2	.0150
ABDE0188J3AS	3/16	3/16	7/32	2	—
ABDE0250J3ARB	1/4	1/4	1/2	2 1/2	.0300
ABDE0250J3AS	1/4	1/4	1/2	2 1/2	—
ABDE0312J3ARB	5/16	5/16	5/8	2 1/2	.0300
ABDE0312J3AS	5/16	5/16	5/8	2 1/2	—
ABDE0375J3ARB	3/8	3/8	3/4	2 1/2	.0300
ABDE0375J3AS	3/8	3/8	3/4	2 1/2	—
ABDE0500J3ARB	1/2	1/2	1 1/4	3	.0300
ABDE0500J3ARC	1/2	1/2	1 1/4	3	.0600
ABDE0500J3ARE	1/2	1/2	1 1/4	3	.1200
ABDE0500J3AS	1/2	1/2	1 1/4	3	—
ABDE0625J3AS	5/8	5/8	1 1/4	3 1/2	—
ABDE0625J3BRB	5/8	5/8	1 5/8	3 1/2	.0300
ABDE0625J3BS	5/8	5/8	1 5/8	3 1/2	—
ABDE0750J3ARB	3/4	3/4	1 1/2	4	.0300
ABDE0750J3ARC	3/4	3/4	1 1/2	4	.0600
ABDE0750J3ARE	3/4	3/4	1 1/2	4	.1200
ABDE0750J3AS	3/4	3/4	1 1/2	4	—
ABDE0750J3BRB	3/4	3/4	1 5/8	4	.0300
ABDE0750J3BRC	3/4	3/4	1 5/8	4	.0600
ABDE0750J3BRE	3/4	3/4	1 5/8	4	.1200
ABDE0750J3BS	3/4	3/4	1 5/8	4	—
ABDE1000J3ARB	1	1	1 1/2	4	.0300
ABDE1000J3ARC	1	1	1 1/2	4	.0600
ABDE1000J3ARE	1	1	1 1/2	4	.1200
ABDE1000J3AS	1	1	1 1/2	4	—
ABDE1000J3BRB	1	1	2	5	.0300
ABDE1000J3BRC	1	1	2	5	.0600
ABDE1000J3BRE	1	1	2	5	.1200
ABDE1000J3BS	1	1	2	5	—

NOTE: For application data, see page M60.

End Mill Tolerances

D1	tolerance h6	D	tolerance h6
<1/8"	+0/-0.002"	<1/8"	+0/-0.00024"
1/8–7/32"	+0/-0.002"	1/8–7/32"	+0/-0.00031"
1/4–3/8"	+0/-0.00035"	1/4–3/8"	+0/-0.00035"
13/32–11/16"	+0/-0.00043"	13/32–11/16"	+0/-0.00043"
23/32–1 3/16"	+0/-0.00051"	23/32–1 3/16"	+0/-0.00051"

- Kennametal standard dimensions.
- Center cutting.
- Effective in thin wall applications.
- Wiper facet, special end gash, and flute geometry provide better surface finishes.
- Unique geometry delivers maximum metal removal rates.



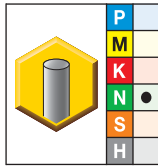
- first choice
- alternate choice

Solid End Milling

	D1	D	D3	Ap1 max	Rc	L	L3
K600							
ABDF0250J2BQB	1/4	1/4	.235	3/8	0.03	4	1 1/8
ABDF0250J2CQB	1/4	1/4	.235	3/8	0.03	4	2 1/8
ABDF0250J2AQB	1/4	1/4	.235	3/8	0.03	4	3/4
ABDF0250J2BQ	1/4	1/4	.235	3/8	—	4	1 1/8
ABDF0250J2CQ	1/4	1/4	.235	3/8	—	4	2 1/8
ABDF0250J2AQ	1/4	1/4	.235	3/8	—	4	3/4
ABDF0312J2AQB	5/16	5/16	.294	7/16	0.03	4	1 1/8
ABDF0375J2AQB	3/8	3/8	.352	1/2	0.03	4	1 1/8
ABDF0375J2BQB	3/8	3/8	.352	1/2	0.03	4	2 1/8
ABDF0375J2AQ	3/8	3/8	.352	1/2	—	4	1 1/8
ABDF0375J2BQ	3/8	3/8	.352	1/2	—	4	2 1/8
ABDF0500J2BQB	1/2	1/2	.469	5/8	0.03	4	2 1/4
ABDF0500J2AQB	1/2	1/2	.469	5/8	0.03	4	1 3/8
ABDF0500J2BQC	1/2	1/2	.469	5/8	0.06	4	2 1/4
ABDF0500J2BQD	1/2	1/2	.469	5/8	0.09	4	2 1/4
ABDF0500J2AQE	1/2	1/2	.469	5/8	0.12	4	1 3/8
ABDF0500J2BQE	1/2	1/2	.469	5/8	0.12	4	2 1/4
ABDF0500J2BQ	1/2	1/2	.469	5/8	—	4	2 1/4
ABDF0500J2AQ	1/2	1/2	.469	5/8	—	4	1 3/8
ABDF0500J2CQB	1/2	1/2	.469	5/8	0.03	6	3 3/8
ABDF0500J2CQC	1/2	1/2	.469	5/8	0.06	6	3 3/8
ABDF0500J2CQD	1/2	1/2	.469	5/8	0.09	6	3 3/8
ABDF0500J2CQE	1/2	1/2	.469	5/8	0.12	6	3 3/8
ABDF0500J2CQ	1/2	1/2	.469	5/8	—	6	3 3/8
ABDF0625J2AQB	5/8	5/8	.587	3/4	0.03	4	1 5/8
ABDF0625J2AQ	5/8	5/8	.587	3/4	—	4	1 5/8
ABDF0625J2BQB	5/8	5/8	.587	3/4	0.03	6	3 3/8
ABDF0625J2BQE	5/8	5/8	.587	3/4	0.12	6	3 3/8
ABDF0625J2BQ	5/8	5/8	.587	3/4	—	6	3 3/8
ABDF0750J2AQB	3/4	3/4	.705	1	0.03	4	1 5/8
ABDF0750J2AQE	3/4	3/4	.705	1	0.12	4	1 5/8
ABDF0750J2AQ	3/4	3/4	.705	1	—	4	1 5/8
ABDF0750J2BQB	3/4	3/4	.705	1	0.03	6	2 1/2
ABDF0750J2CQB	3/4	3/4	.705	1	0.03	6	3 3/8

(continued)

(continued)



K600	D1	D	D3	Ap1 max	Re	L	L3
ABDF0750J2BQC	3/4	3/4	.705	1	0.06	6	2 1/2
ABDF0750J2BQD	3/4	3/4	.705	1	0.09	6	2 1/2
ABDF0750J2BQE	3/4	3/4	.705	1	0.12	6	2 1/2
ABDF0750J2BQ	3/4	3/4	.705	1	—	6	2 1/2
ABDF0750J2CQ	3/4	3/4	.705	1	—	6	3 3/8
ABDF1000J2AQB	1	1	.940	1 1/4	0.03	5	2 3/8
ABDF1000J2AQE	1	1	.940	1 1/4	0.12	5	2 3/8
ABDF1000J2AQ	1	1	.940	1 1/4	—	5	2 3/8
ABDF1000J2BQB	1	1	.940	1 1/4	0.03	7	3 3/8
ABDF1000J2CQB	1	1	.940	1 1/4	0.03	7	4 3/8
ABDF1000J2BQE	1	1	.940	1 1/4	0.12	7	3 3/8
ABDF1000J2BQ	1	1	.940	1 1/4	—	7	3 3/8
ABDF1000J2CQ	1	1	.940	1 1/4	—	7	4 3/8

NOTE: For application data, see page M60.

End Mill Tolerances

D1	tolerance h6	D	tolerance h6
<1/8"	+0/- .002"	<1/8"	+0/- .00024"
1/8-7/32"	+0/- .002"	1/8-7/32"	+0/- .00031"
1/4-3/8"	+0/- .00035"	1/4-3/8"	+0/- .00035"
13/32-11/16"	+0/- .00043"	13/32-11/16"	+0/- .00043"
23/32-1 3/16"	+0/- .00051"	23/32-1 3/16"	+0/- .00051"

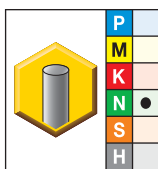
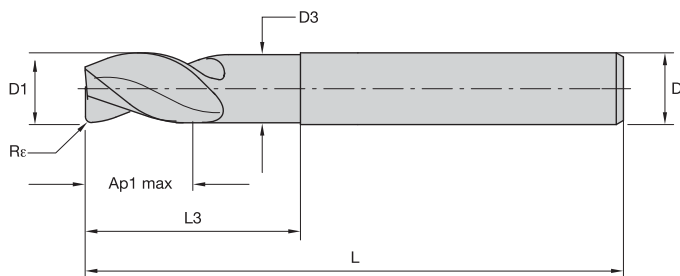
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- Kennametal standard dimensions.
- Center cutting.
- Effective in thin wall applications.
- Wiper facet, special end gash, and flute geometry provide better surface finishes.
- Unique geometry delivers maximum metal removal rates.



K600

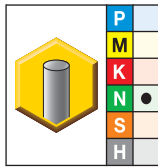
- first choice
- alternate choice

	D1	D	D3	Ap1 max	L	Re	L3
ABDE0250J3CQ	1/4	1/4	.234	3/8	4	—	2 1/8
ABDE0250J3BQB	1/4	1/4	.234	3/8	4	0.03	1 1/8
ABDE0250J3BQ	1/4	1/4	.234	3/8	4	—	1 1/8
ABDE0250J3AQ	1/4	1/4	.234	3/8	4	—	3/4
ABDE0250J3AQB	1/4	1/4	.234	3/8	4	0.03	3/4
ABDE0250J3CQB	1/4	1/4	.234	3/8	4	0.03	2 1/8
ABDE0312J3AQB	5/16	5/16	.293	7/16	4	0.03	1 1/8
ABDE0375J3AQ	3/8	3/8	.351	1/2	4	—	1 1/8
ABDE0375J3BQ	3/8	3/8	.351	1/2	4	—	2 1/8
ABDE0375J3BQB	3/8	3/8	.351	1/2	4	0.03	2 1/8
ABDE0375J3AQB	3/8	3/8	.351	1/2	4	0.03	1 1/8
ABDE0500J3BQE	1/2	1/2	.469	5/8	4	0.12	2 1/4
ABDE0500J3AQB	1/2	1/2	.469	5/8	4	0.03	1 3/8
ABDE0500J3BQC	1/2	1/2	.469	5/8	4	0.06	2 1/4
ABDE0500J3BQB	1/2	1/2	.469	5/8	4	0.03	2 1/4
ABDE0500J3AQ	1/2	1/2	.469	5/8	4	—	1 3/8
ABDE0500J3BQ	1/2	1/2	.469	5/8	4	—	2 1/4
ABDE0500J3BQD	1/2	1/2	.469	5/8	4	0.09	2 1/4
ABDE0500J3AQE	1/2	1/2	.469	5/8	4	0.12	1 3/8
ABDE0500J3CQ	1/2	1/2	.469	5/8	6	—	3 3/8
ABDE0500J3CQC	1/2	1/2	.469	5/8	6	0.06	3 3/8
ABDE0500J3CQD	1/2	1/2	.469	5/8	6	0.09	3 3/8
ABDE0500J3CQE	1/2	1/2	.469	5/8	6	0.12	3 3/8
ABDE0500J3CQB	1/2	1/2	.469	5/8	6	0.03	3 3/8
ABDE0625J3AQB	5/8	5/8	.585	3/4	4	0.03	1 5/8
ABDE0625J3AQ	5/8	5/8	.585	3/4	4	—	1 5/8
ABDE0625J3BQE	5/8	5/8	.585	3/4	6	0.12	3 3/8
ABDE0625J3BQB	5/8	5/8	.585	3/4	6	0.03	3 3/8
ABDE0625J3BQ	5/8	5/8	.585	3/4	6	—	3 3/8
ABDE0750J3AQB	3/4	3/4	.705	1	4	0.03	1 5/8
ABDE0750J3AQ	3/4	3/4	.705	1	4	—	1 5/8
ABDE0750J3AQE	3/4	3/4	.705	1	4	0.12	1 5/8
ABDE0750J3CQB	3/4	3/4	.705	1	6	0.03	3 3/8
ABDE0750J3BQC	3/4	3/4	.705	1	6	0.06	2 1/2

(continued)

Solid End Milling

(continued)



K600	D1	D	D3	Ap1 max	L	Re	L3
ABDE0750J3BQE	3/4	3/4	.705	1	6	0.12	2 1/2
ABDE0750J3BQD	3/4	3/4	.705	1	6	0.09	2 1/2
ABDE0750J3CQ	3/4	3/4	.705	1	6	—	3 3/8
ABDE0750J3BQ	3/4	3/4	.705	1	6	—	2 1/2
ABDE0750J3BQB	3/4	3/4	.705	1	6	0.03	2 1/2
ABDE1000J3AQ	1	1	.940	1 1/4	5	—	2 3/8
ABDE1000J3AQB	1	1	.940	1 1/4	5	0.03	2 3/8
ABDE1000J3AQE	1	1	.940	1 1/4	5	0.12	2 3/8
ABDE1000J3CQB	1	1	.940	1 1/4	7	0.03	4 3/8
ABDE1000J3BQ	1	1	.940	1 1/4	7	—	3 3/8
ABDE1000J3CQ	1	1	.940	1 1/4	7	—	4 3/8
ABDE1000J3BQB	1	1	.940	1 1/4	7	0.03	3 3/8
ABDE1000J3BQE	1	1	.940	1 1/4	7	0.12	3 3/8

NOTE: For application data, see page M60.

End Mill Tolerances

D1	tolerance h6	D	tolerance h6
<1/8"	+0/-.002"	<1/8"	+0/-.00024"
1/8-7/32"	+0/-.002"	1/8-7/32"	+0/-.00031"
1/4-3/8"	+0/-.00035"	1/4-3/8"	+0/-.00035"
13/32-11/16"	+0/-.00043"	13/32-11/16"	+0/-.00043"
23/32-1 3/16"	+0/-.00051"	23/32-1 3/16"	+0/-.00051"



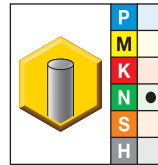
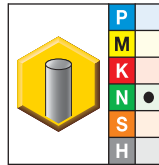
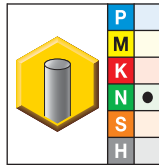
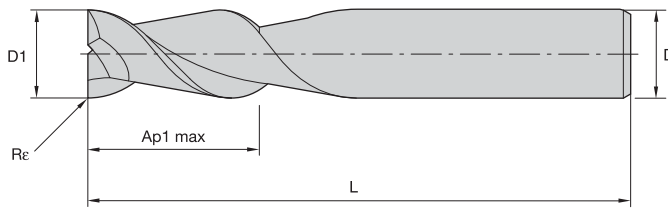
Solid End Milling

High-Performance Solid Carbide End Mills • Aluminum

AADF • Double Rake Flute Form



- Double rake flute form.
- Center cutting.



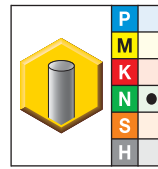
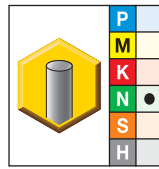
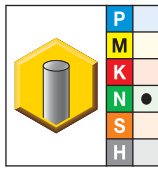
- first choice
- alternate choice

Solid End Milling

	K600	KC651M	KC625M	D1	D	Ap1 max	L	Re
AADF125J2F	—	—	AADF125J2F	1/8	1/8	1/4	1 1/2	—
AADF0125J2A	—	AADF0125J2A	AADF0125J2A	1/8	1/8	1/4	2	—
AADF125J2G	—	—	AADF125J2G	1/8	1/8	3/8	1 1/2	—
AADF0125J2CRA	—	—	—	1/8	1/8	3/8	2	0.015
AADF0125J2CRB	—	—	—	1/8	1/8	3/8	2	0.03
AADF0125J2C	—	—	—	1/8	1/8	3/8	2	—
AADF0125J2BRA	—	AADF0125J2BRA	—	1/8	1/8	1/2	2	0.015
AADF0125J2B	—	AADF0125J2B	AADF0125J2B	1/8	1/8	1/2	2	—
AADF0125J2DRA	—	—	—	1/8	1/8	1/2	2 1/2	0.015
AADF0125J2DRB	—	—	—	1/8	1/8	1/2	2 1/2	0.03
AADF0125J2D	—	—	—	1/8	1/8	1/2	2 1/2	—
AADF0125J2ERA	—	—	—	1/8	1/8	3/4	2 1/2	0.015
AADF0125J2ERB	—	—	—	1/8	1/8	3/4	2 1/2	0.03
AADF0125J2E	—	—	—	1/8	1/8	3/4	2 1/2	—
AADF156J2A	—	—	AADF156J2A	5/32	3/16	9/16	2	—
AADF0188J2A	—	AADF0188J2A	AADF0188J2A	3/16	3/16	5/16	2	—
—	—	—	AADF188J2A	3/16	3/16	5/16	2	—
AADF0188J2CRA	—	—	—	3/16	3/16	5/16	2 1/2	0.015
AADF0188J2CRB	—	—	—	3/16	3/16	5/16	2 1/2	0.03
AADF0188J2C	—	—	—	3/16	3/16	5/16	2 1/2	—
—	—	—	AADF188J2F	3/16	3/16	9/16	2	—
AADF0188J2DRA	—	—	—	3/16	3/16	9/16	2 1/2	0.015
AADF0188J2DRB	—	—	—	3/16	3/16	9/16	2 1/2	0.03
AADF0188J2D	—	—	—	3/16	3/16	9/16	2 1/2	—
AADF0188J2BRA	—	AADF0188J2BRA	—	3/16	3/16	5/8	2	0.015
AADF0188J2B	—	AADF0188J2B	AADF0188J2B	3/16	3/16	5/8	2	—
AADF188J2E	—	—	—	3/16	3/16	3/4	2 1/2	—
AADF219J2A	—	—	AADF219J2A	7/32	1/4	3/4	2 1/2	—
AADF0250J2ARA	—	—	—	1/4	1/4	3/8	2	0.015
AADF0250J2ARB	—	AADF0250J2ARB	—	1/4	1/4	3/8	2	0.03
AADF0250J2A	—	AADF0250J2A	AADF0250J2A	1/4	1/4	3/8	2	—
AADF250J2H	—	—	AADF250J2H	1/4	1/4	3/8	2 1/2	—

(continued)

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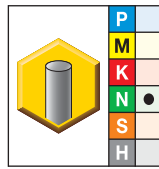
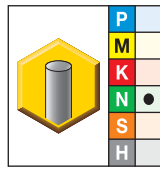
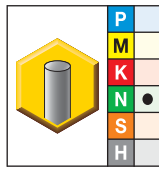


K600		KC651M	KC625M	D1	D	Ap1 max	L	R
AADF0250J2DRA	—	—	—	1/4	1/4	1/2	2 1/2	0.015
AADF0250J2DRB	—	—	—	1/4	1/4	1/2	2 1/2	0.03
AADF0250J2D	—	—	—	1/4	1/4	1/2	2 1/2	—
AADF0250J2ERA	—	—	—	1/4	1/4	5/8	2 1/2	0.015
AADF0250J2ERB	—	—	—	1/4	1/4	5/8	2 1/2	0.03
AADF0250J2E	—	—	—	1/4	1/4	5/8	2 1/2	—
AADF0250J2BRA	AADF0250J2BRA	—	—	1/4	1/4	3/4	2 1/2	0.015
AADF0250J2BRB	AADF0250J2BRB	—	—	1/4	1/4	3/4	2 1/2	0.03
AADF0250J2B	AADF0250J2B	AADF0250J2B	—	1/4	1/4	3/4	2 1/2	—
AADF0250J2FRA	—	—	—	1/4	1/4	1	3	0.015
AADF0250J2FRB	—	—	—	1/4	1/4	1	3	0.03
AADF0250J2F	—	—	—	1/4	1/4	1	3	—
AADF250J2I	—	AADF250J2I	—	1/4	1/4	1 1/8	3	—
AADF0250J2CRA	AADF0250J2CRA	—	—	1/4	1/4	1 1/4	3 1/4	0.015
AADF0250J2CRB	AADF0250J2CRB	—	—	1/4	1/4	1 1/4	3 1/4	0.03
AADF0250J2C	AADF0250J2C	AADF0250J2C	—	1/4	1/4	1 1/4	3 1/4	—
AADF0250J2GRA	—	—	—	1/4	1/4	1 3/4	4	0.015
AADF0250J2GRB	—	—	—	1/4	1/4	1 3/4	4	0.03
AADF0250J2G	—	—	—	1/4	1/4	1 3/4	4	—
—	—	AADF0312J2E	—	5/16	5/16	7/16	2	—
AADF0312J2ARB	AADF0312J2ARB	—	—	5/16	5/16	13/16	2 1/2	0.03
AADF0312J2A	AADF0312J2A	AADF0312J2A	—	5/16	5/16	13/16	2 1/2	—
—	—	AADF312J2A	—	5/16	5/16	13/16	2 1/2	—
AADF0312J2BRA	—	—	—	5/16	5/16	1	3	0.015
AADF0312J2BRB	—	—	—	5/16	5/16	1	3	0.03
AADF0312J2BRC	—	—	—	5/16	5/16	1	3	0.06
AADF0312J2B	—	—	—	5/16	5/16	1	3	—
AADF312J2C	—	—	—	5/16	5/16	1 1/8	3	—
—	—	AADF0312J2D	—	5/16	5/16	1 1/4	3 1/4	—
AADF0312J2ARC	AADF0312J2ARC	—	—	5/16	3/8	13/16	2 1/2	0.06
AADF344J2A	—	—	—	11/32	3/8	1	2 1/2	—
AADF0375J2ARA	—	—	—	3/8	3/8	1/2	2	0.015
AADF0375J2ARB	—	—	—	3/8	3/8	1/2	2	0.03
AADF0375J2A	AADF0375J2A	AADF0375J2A	—	3/8	3/8	1/2	2	—
AADF375J2F	—	AADF375J2J	—	3/8	3/8	1/2	2 1/2	—
AADF0375J2BRB	AADF0375J2BRB	—	—	3/8	3/8	7/8	2 1/2	0.03
AADF0375J2BRC	AADF0375J2BRC	—	—	3/8	3/8	7/8	2 1/2	0.06
AADF0375J2B	AADF0375J2B	AADF0375J2B	—	3/8	3/8	7/8	2 1/2	—
AADF0375J2DRA	—	—	—	3/8	3/8	1	3	0.015
AADF0375J2DRB	—	—	—	3/8	3/8	1	3	0.03
AADF0375J2DRC	—	—	—	3/8	3/8	1	3	0.06
AADF0375J2D	—	—	—	3/8	3/8	1	3	—
AADF375J2H	—	AADF375J2H	—	3/8	3/8	1 1/8	3	—
AADF0375J2ERA	—	—	—	3/8	3/8	1 1/4	3 1/2	0.015

(continued)

Solid End Milling

(continued)

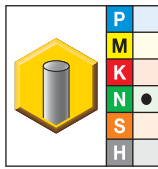
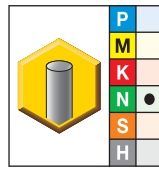
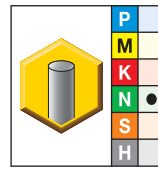


Solid End Milling

	K600	KC651M	KC625M	D1	D	Ap1 max	L	Re
AADF0375J2ERB		—	—	3/8	3/8	1 1/4	3 1/2	0.03
AADF0375J2ERC		—	—	3/8	3/8	1 1/4	3 1/2	0.06
AADF0375J2E		—	—	3/8	3/8	1 1/4	3 1/2	—
AADF0375J2CRA		—	—	3/8	3/8	1 1/2	4	0.015
AADF0375J2CRB		AADF0375J2CRB	—	3/8	3/8	1 1/2	4	0.03
AADF0375J2CRC		AADF0375J2CRC	—	3/8	3/8	1 1/2	4	0.06
AADF0375J2C		AADF0375J2C	AADF0375J2C	3/8	3/8	1 1/2	4	—
AADF375J2G		—	AADF375J2G	3/8	3/8	1 3/4	4	—
—		—	AADF0438J2A	7/16	7/16	7/8	2 1/2	—
—		—	AADF438J2A	7/16	7/16	7/8	2 1/2	—
AADF438J2B		—	—	7/16	7/16	2	4 1/2	—
AADF0500J2ARB		AADF0500J2ARB	—	1/2	1/2	5/8	2 1/2	0.03
AADF0500J2ARC		AADF0500J2ARC	—	1/2	1/2	5/8	2 1/2	0.06
AADF0500J2A		AADF0500J2A	AADF0500J2A	1/2	1/2	5/8	2 1/2	—
AADF0500J2ERA		—	—	1/2	1/2	5/8	3	0.015
AADF0500J2ERB		—	—	1/2	1/2	5/8	3	0.03
AADF0500J2ERC		—	—	1/2	1/2	5/8	3	0.06
AADF0500J2E		—	AADF500J2E	1/2	1/2	5/8	3	—
AADF0500J2FRA		—	—	1/2	1/2	1	3	0.015
AADF0500J2FRB		—	—	1/2	1/2	1	3	0.03
AADF0500J2FRC		—	—	1/2	1/2	1	3	0.06
AADF0500J2F		—	AADF0500J2F	1/2	1/2	1	3	—
AADF500J2F		—	AADF500J2F	1/2	1/2	1	3	—
AADF0500J2BRA		—	—	1/2	1/2	1 1/4	3	0.015
AADF0500J2BRB		AADF0500J2BRB	—	1/2	1/2	1 1/4	3	0.03
AADF0500J2BRC		AADF0500J2BRC	—	1/2	1/2	1 1/4	3	0.06
AADF0500J2BRE		AADF0500J2BRE	—	1/2	1/2	1 1/4	3	0.12
AADF500J2B		AADF0500J2B	AADF0500J2B	1/2	1/2	1 1/4	3	—
—		—	AADF0500J2K	1/2	1/2	1 1/2	4	—
AADF0500J2GRA		—	—	1/2	1/2	1 5/8	4	0.015
AADF0500J2GRB		—	—	1/2	1/2	1 5/8	4	0.03
AADF0500J2GRC		—	—	1/2	1/2	1 5/8	4	0.06
AADF0500J2G		—	—	1/2	1/2	1 5/8	4	—
AADF0500J2CRA		—	—	1/2	1/2	2	4	0.015
AADF0500J2CRB		AADF0500J2CRB	—	1/2	1/2	2	4	0.03
AADF0500J2CRC		AADF0500J2CRC	—	1/2	1/2	2	4	0.06
AADF0500J2C		AADF0500J2C	AADF0500J2C	1/2	1/2	2	4	—
AADF500J2L		—	AADF500J2L	1/2	1/2	2	4 1/2	—
AADF0500J2DRB		AADF0500J2DRB	—	1/2	1/2	2 1/2	5	0.03
AADF0500J2DRC		AADF0500J2DRC	—	1/2	1/2	2 1/2	5	0.06
AADF0500J2DRA		—	—	1/2	1/2	2 1/2	5	0.015
AADF0500J2D		AADF0500J2D	AADF0500J2D	1/2	1/2	2 1/2	5	—
AADF500J2J		—	AADF0500J2J	1/2	1/2	3	5	—
AADF0500J2HRA		—	—	1/2	1/2	3 1/8	6	0.015

(continued)

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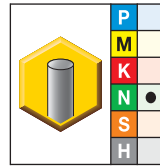
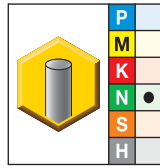
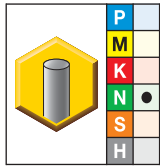

K600

KC651M

KC625M

			D1	D	Ap1 max	L	Re
AADF0500J2HRB	—	—	1/2	1/2	3 1/8	6	0.03
AADF0500J2HRC	—	—	1/2	1/2	3 1/8	6	0.06
AADF0500J2H	—	—	1/2	1/2	3 1/8	6	—
AADF0625J2C	—	AADF0625J2C	5/8	5/8	3/4	3	—
AADF0625J2CRA	—	—	5/8	5/8	3/4	3 1/2	0.015
AADF0625J2CRB	—	—	5/8	5/8	3/4	3 1/2	0.03
AADF0625J2CRC	—	—	5/8	5/8	3/4	3 1/2	0.06
—	—	AADF0625J2C	5/8	5/8	3/4	3 1/2	—
AADF0625J2ARC	AADF0625J2ARC	—	5/8	5/8	1 1/4	3 1/2	0.06
AADF0625J2A	AADF0625J2A	AADF0625J2A	5/8	5/8	1 1/4	3 1/2	—
—	—	AADF0625J2A	5/8	5/8	1 1/4	3 1/2	—
AADF0625J2DRA	—	—	5/8	5/8	1 5/8	3 1/2	0.015
AADF0625J2DRB	—	—	5/8	5/8	1 5/8	3 1/2	0.03
AADF0625J2DRC	—	—	5/8	5/8	1 5/8	3 1/2	0.06
AADF0625J2DRE	—	—	5/8	5/8	1 5/8	3 1/2	0.12
AADF0625J2D	—	AADF0625J2D	5/8	5/8	1 5/8	3 1/2	—
AADF0625J2ERA	—	—	5/8	5/8	2 1/8	4	0.015
AADF0625J2ERB	—	—	5/8	5/8	2 1/8	4	0.03
AADF0625J2ERC	—	—	5/8	5/8	2 1/8	4	0.06
AADF0625J2ERE	—	—	5/8	5/8	2 1/8	4	0.12
AADF0625J2E	—	—	5/8	5/8	2 1/8	4	—
AADF0625J2BRB	—	—	5/8	5/8	2 1/4	5	0.03
AADF0625J2BRC	AADF0625J2BRC	—	5/8	5/8	2 1/4	5	0.06
AADF0625J2B	AADF0625J2B	—	5/8	5/8	2 1/4	5	—
AADF0625J2FRA	—	—	5/8	5/8	2 1/2	5	0.015
AADF0625J2FRB	—	—	5/8	5/8	2 1/2	5	0.03
AADF0625J2FRC	—	—	5/8	5/8	2 1/2	5	0.06
AADF0625J2F	—	—	5/8	5/8	2 1/2	5	—
—	—	AADF0625J2H	5/8	5/8	3	5 1/4	—
AADF0625J2GRA	—	—	5/8	5/8	3 1/4	6	0.015
AADF0625J2GRB	—	—	5/8	5/8	3 1/4	6	0.03
AADF0625J2GRC	—	—	5/8	5/8	3 1/4	6	0.06
AADF0625J2G	—	—	5/8	5/8	3 1/4	6	—
AADF0750J2A	AADF0750J2A	AADF0750J2A	3/4	3/4	7/8	3	—
AADF0750J2FRA	—	—	3/4	3/4	1	4	0.015
AADF0750J2FRB	—	—	3/4	3/4	1	4	0.03
AADF0750J2FRC	—	—	3/4	3/4	1	4	0.06
AADF0750J2F	—	AADF0750J2F	3/4	3/4	1	4	—
AADF0750J2BRB	AADF0750J2BRB	—	3/4	3/4	1 1/2	4	0.03
AADF0750J2BRC	AADF0750J2BRC	—	3/4	3/4	1 1/2	4	0.06
AADF0750J2BRE	AADF0750J2BRE	—	3/4	3/4	1 1/2	4	0.12
AADF0750J2B	AADF0750J2B	AADF0750J2B	3/4	3/4	1 1/2	4	—
AADF0750J2ERA	—	—	3/4	3/4	1 5/8	4	0.015
AADF0750J2ERE	—	—	3/4	3/4	1 5/8	4	0.12

Solid End Milling

(continued)

(continued)



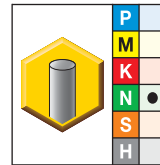
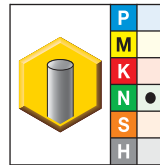
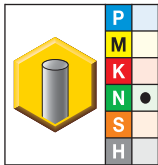
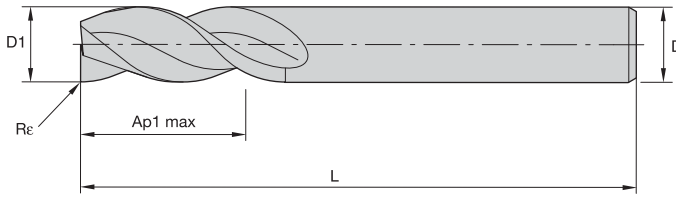
	K600	KC651M	KC625M	D1	D	Ap1 max	L	Re
	—	—	AADF0750J2E	3/4	3/4	1 5/8	4	—
AADF0750J2CRA	—	—	—	3/4	3/4	2 1/4	5	0.015
AADF0750J2CRB	—	AADF0750J2CRB	—	3/4	3/4	2 1/4	5	0.03
AADF0750J2CRC	—	AADF0750J2CRC	—	3/4	3/4	2 1/4	5	0.06
AADF0750J2CRE	—	—	—	3/4	3/4	2 1/4	5	0.12
AADF0750J2C	—	AADF0750J2C	AADF0750J2C	3/4	3/4	2 1/4	5	—
—	—	—	AADF750J2C	3/4	3/4	2 1/4	5	—
AADF0750J2GRA	—	—	—	3/4	3/4	3 1/4	6	0.015
AADF0750J2GRB	—	—	—	3/4	3/4	3 1/4	6	0.03
AADF0750J2GRC	—	—	—	3/4	3/4	3 1/4	6	0.06
AADF0750J2GRD	—	—	—	3/4	3/4	3 1/4	6	0.09
AADF0750J2GRE	—	—	—	3/4	3/4	3 1/4	6	0.12
AADF750J2H	—	—	AADF0750J2H	3/4	3/4	4	6 1/4	—
AADF0750J2DRB	—	AADF0750J2DRB	—	3/4	3/4	3	5 1/4	0.03
AADF0750J2DRC	—	AADF0750J2DRC	—	3/4	3/4	3	5 1/4	0.06
AADF0750J2D	—	AADF0750J2D	AADF0750J2D	3/4	3/4	3	5 1/4	—
AADF1000J2FRA	—	—	—	1	1	1 1/4	4	0.015
AADF1000J2FRB	—	—	—	1	1	1 1/4	4	0.03
AADF1000J2FRC	—	—	—	1	1	1 1/4	4	0.06
AADF1000J2FRD	—	—	—	1	1	1 1/4	4	0.09
AADF1000J2FRE	—	—	—	1	1	1 1/4	4	0.12
AADF1000J2ARB	—	AADF1000J2ARB	—	1	1	1 1/2	4	0.03
AADF1000J2ARC	—	AADF1000J2ARC	—	1	1	1 1/2	4	0.06
AADF1000J2ARE	—	AADF1000J2ARE	—	1	1	1 1/2	4	0.12
AADF1000J2A	—	AADF1000J2A	AADF1000J2A	1	1	1 1/2	4	—
AADF1000J2DRA	—	—	—	1	1	2	5	0.015
AADF1000J2DRC	—	—	—	1	1	2	5	0.06
AADF1000J2DRD	—	—	—	1	1	2	5	0.09
AADF1000J2DRE	—	—	—	1	1	2	5	0.12
AADF1000J2D	—	—	—	1	1	2	5	—
AADF1000J2BRB	—	AADF1000J2BRB	—	1	1	2 1/4	5	0.03
AADF1000J2BRC	—	AADF1000J2BRC	—	1	1	2 1/4	5	0.06
AADF1000J2BRD	—	—	—	1	1	2 1/4	5	0.09
AADF1000J2BRE	—	—	—	1	1	2 1/4	5	0.12
AADF1000J2B	—	AADF1000J2B	AADF1000J2B	1	1	2 1/4	5	—
AADF1000J2GRA	—	—	—	1	1	2 5/8	6	0.015
AADF1000J2GRC	—	—	—	1	1	2 5/8	6	0.06
AADF1000J2GRD	—	—	—	1	1	2 5/8	6	0.09
AADF1000J2GRE	—	—	—	1	1	2 5/8	6	0.12
AADF1000J2CRB	—	AADF1000J2CRB	—	1	1	3	5	0.03
AADF1000J2CRC	—	AADF1000J2CRC	—	1	1	3	5	0.06
AADF1000J2C	—	AADF1000J2C	—	1	1	3	5	—
AADF1000J2ERA	—	—	—	1	1	3 1/4	6	0.015
AADF1000J2ERB	—	—	—	1	1	3 1/4	6	0.03
AADF1000J2ERC	—	—	—	1	1	3 1/4	6	0.06
AADF1000J2ERD	—	—	—	1	1	3 1/4	6	0.09
AADF1000J2ERE	—	—	—	1	1	3 1/4	6	0.12
AADF1000J2E	—	—	—	1	1	3 1/4	6	—
AADF1000J2H	—	—	—	1	1	4	6 1/2	—

NOTE: For application data, see page M61.

End Mill Tolerances

D1	tolerance h6	D	tolerance h6
<1/8"	+0/- .002"	<1/8"	+0/- .00024"
1/8–7/32"	+0/- .002"	1/8–7/32"	+0/- .00031"
1/4–3/8"	+0/- .00035"	1/4–3/8"	+0/- .00035"
13/32–11/16"	+0/- .00043"	13/32–11/16"	+0/- .00043"
23/32–1 3/16"	+0/- .00051"	23/32–1 3/16"	+0/- .00051"

- Double rake flute form.
- Center cutting.

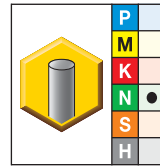
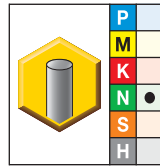
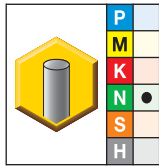


K600		KC625M	KC651M	D1	D	Ap1 max	L	Rε
AADE125J3G		AADE125J3G	—	1/8	1/8	1/4	1 1/2	—
AADE0125J3A		—	—	1/8	1/8	1/4	2	—
AADE0125J3ARA		—	—	1/8	1/8	1/4	2	.015
AADE125J3F		AADE125J3F	—	1/8	1/8	3/8	1 1/2	—
AADE0125J3CRA		—	—	1/8	1/8	3/8	2	.015
AADE0125J3C		—	—	1/8	1/8	3/8	2	—
AADE0125J3FRA		—	—	1/8	1/8	1/2	1 1/2	.010
AADE0125J3DRA		—	—	1/8	1/8	1/2	3	.015
AADE0125J3D		—	—	1/8	1/8	1/2	3	—
AADE0125J3E		—	—	1/8	1/8	3/4	3	—
AADE0125J3ERA		—	—	1/8	1/8	3/4	3	.015
AADE0188J3CRA		—	—	3/16	3/16	5/16	3	.015
AADE0188J3C		—	—	3/16	3/16	5/16	3	—
AADE188J3G		AADE188J3G	—	3/16	3/16	5/16	2	—
AADE188J3F		AADE188J3F	—	3/16	3/16	9/16	2	—
AADE0188J3DRA		—	—	3/16	3/16	9/16	3	.015
AADE0188J3D		—	—	3/16	3/16	9/16	3	—
AADE0188J3BRA		—	—	3/16	3/16	5/8	2	.010
AADE0188J3E		—	—	3/16	3/16	3/4	3	—
AADE0188J3ERA		—	—	3/16	3/16	3/4	3	.015
AADE0250J3ARA		—	—	1/4	1/4	3/8	2	.015
AADE0250J3ARB		—	AADE0250J3ARB	1/4	1/4	3/8	2	.030
AADE0250J3A		AADE0250J3A	AADE0250J3A	1/4	1/4	3/8	2	—
AADE0250J3HRB		AADE0250J3HRB	—	1/4	1/4	1/2	2	.018
AADE0250J3DRA		—	—	1/4	1/4	1/2	2 1/2	.015
AADE0250J3D		—	—	1/4	1/4	1/2	2 1/2	—
AADE0250J3ERA		—	—	1/4	1/4	5/8	2 1/2	.015
AADE0250J3E		—	—	1/4	1/4	5/8	2 1/2	—
AADE0250J3BRB		AADE0250J3BRB	AADE0250J3BRB	1/4	1/4	3/4	2 1/2	.030
AADE0250J3BRA		—	AADE0250J3BRA	1/4	1/4	3/4	2 1/2	.015
AADE0250J3B		AADE0250J3B	AADE0250J3B	1/4	1/4	3/4	2 1/2	—
AADE250J3B		AADE250J3B	—	1/4	1/4	3/4	2 1/2	—
AADE0250J3F		—	—	1/4	1/4	1	3	—
AADE0250J3FRA		—	—	1/4	1/4	1	3	.015
AADE250J3H		AADE250J3H	—	1/4	1/4	1 1/4	3	—
AADE0250J3CRB		—	AADE0250J3CRB	1/4	1/4	1 1/4	3 1/4	.030
AADE0250J3CRA		—	AADE0250J3CRA	1/4	1/4	1 1/4	3 1/4	.015
AADE0250J3C		AADE0250J3C	AADE0250J3C	1/4	1/4	1 1/4	3 1/4	—
AADE0250J3GRA		—	—	1/4	1/4	1 3/4	4	.015
AADE0250J3G		AADE0250J3G	—	1/4	1/4	1 3/4	4	—
AADE0250J3GRB		—	—	1/4	1/4	1 3/4	4	.030
AADE312J3C		AADE312J3C	—	5/16	5/16	7/16	2	—
AADE0312J3CRB		—	—	5/16	5/16	7/16	2	.030
AADE0312J3ERB		—	—	5/16	5/16	7/16	2	.018
AADE0312J3C		AADE0312J3C	—	5/16	5/16	7/16	2	—
AADE0312J3BRB		—	—	5/16	5/16	13/16	2 1/2	.018

Solid End Milling

(continued)

(continued)

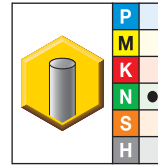
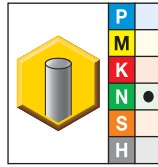
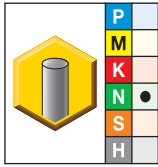


	K600	KC625M	KC651M	D1	D	Ap1 max	L	R _e
	AADE0312J3ARB	—	AADE0312J3ARB	5/16	5/16	13/16	2 1/2	.030
	AADE0312J3ARC	—	AADE0312J3ARC	5/16	5/16	13/16	2 1/2	.060
	AADE312J3A	AADE312J3A	AADE0312J3A	5/16	5/16	13/16	2 1/2	—
	AADE0312J3BRA	—	—	5/16	5/16	1	3	.015
	AADE0312J3B	—	—	5/16	5/16	1	3	—
	AADE0312J3D	AADE0312J3D	—	5/16	5/16	1 1/4	3 1/4	—
	AADE0312J3DRB	—	—	5/16	5/16	1 1/4	3 1/4	.030
	AADE0375J3ARB	AADE0375J3ARB	—	3/8	3/8	1/2	2	.030
	AADE0375J3A	AADE0375J3A	AADE0375J3A	3/8	3/8	1/2	2	—
	—	AADE375J3A	—	3/8	3/8	1/2	2	—
	AADE0375J3FRA	—	—	3/8	3/8	1/2	3	.015
	AADE0375J3F	—	—	3/8	3/8	1/2	3	—
	AADE0375J3GRA	—	—	3/8	3/8	3/4	2 1/2	.015
	AADE0375J3G	—	—	3/8	3/8	3/4	2 1/2	—
	—	AADE375J3B	—	3/8	3/8	7/8	2 1/2	—
	AADE0375J3BRB	AADE0375J3BRB	AADE0375J3BRB	3/8	3/8	7/8	2 1/2	.030
	AADE0375J3B	AADE0375J3B	AADE0375J3B	3/8	3/8	7/8	2 1/2	—
	AADE0375J3BRC	—	AADE0375J3BRC	3/8	3/8	7/8	2 1/2	.060
	AADE0375J3DRA	—	—	3/8	3/8	1	3	.015
	AADE0375J3DRC	—	—	3/8	3/8	1	3	.060
	AADE0375J3D	—	—	3/8	3/8	1	3	—
	AADE0375J3DRB	—	—	3/8	3/8	1	3	.030
	AADE375J3I	AADE375J3I	—	3/8	3/8	1 1/8	3	—
	AADE0375J3E	—	—	3/8	3/8	1 1/4	3 1/2	—
	AADE0375J3ERB	—	—	3/8	3/8	1 1/4	3 1/2	.030
	AADE0375J3ERA	—	—	3/8	3/8	1 1/4	3 1/2	.015
	AADE0375J3ERC	—	—	3/8	3/8	1 1/4	3 1/2	.060
	AADE0375J3CRB	—	AADE0375J3CRB	3/8	3/8	1 1/2	4	.030
	AADE0375J3C	AADE0375J3C	AADE0375J3C	3/8	3/8	1 1/2	4	—
	AADE0375J3CRC	—	AADE0375J3CRC	3/8	3/8	1 1/2	4	.060
	AADE0375J3H	—	—	3/8	3/8	2	4	—
	AADE0375J3K	AADE0375J3K	—	3/8	3/8	2 1/2	4	—
	AADE0375J3KRC	—	—	3/8	3/8	2 1/2	4	.060
	AADE0375J3KRB	—	—	3/8	3/8	2 1/2	4	.030
	AADE0375J3J	—	—	3/8	3/8	2 1/2	5	—
	AADE438J3A	AADE438J3A	—	7/16	7/16	9/16	2 1/2	—
	AADE0438J3ARB	—	—	7/16	7/16	7/8	2 1/2	.018
	AADE0438J3A	AADE0438J3A	—	7/16	7/16	7/8	2 1/2	—
	AADE438J3B	AADE438J3B	—	7/16	7/16	7/8	2 1/2	—
	AADE438J3C	AADE438J3C	—	7/16	7/16	2	4	—
	AADE0500J3A	AADE500J3A	AADE0500J3A	1/2	1/2	5/8	2 1/2	—
	AADE0500J3ARC	—	AADE0500J3ARC	1/2	1/2	5/8	2 1/2	.060
	AADE0500J3ARB	AADE0500J3ARB	AADE0500J3ARB	1/2	1/2	5/8	2 1/2	.030
	AADE0500J3FRB	AADE0500J3FRB	—	1/2	1/2	1	3	.030
	AADE0500J3F	AADE0500J3F	—	1/2	1/2	1	3	—
	AADE0500J3FRA	—	—	1/2	1/2	1	3	.015
	AADE0500J3FRC	—	—	1/2	1/2	1	3	.060
	—	AADE500J3F	—	1/2	1/2	1	3	—

(continued)

Solid End Milling

(continued)

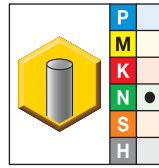
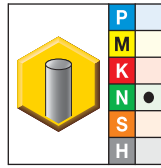
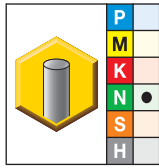


K600	KC625M	KC651M	D1	D	Ap1 max	L	Re
AADE0500J3BRE	—	AADE0500J3BRE	1/2	1/2	1 1/4	3	.120
AADE0500J3BRC	—	AADE0500J3BRC	1/2	1/2	1 1/4	3	.060
AADE0500J3BRB	AADE0500J3BRB	AADE0500J3BRB	1/2	1/2	1 1/4	3	.030
AADE0500J3B	AADE0500J3B	AADE0500J3B	1/2	1/2	1 1/4	3	—
AADE0500J3BRA	—	—	1/2	1/2	1 1/4	3	.015
AADE0500J3KRB	—	—	1/2	1/2	1 1/2	4	.030
AADE0500J3KRC	—	—	1/2	1/2	1 1/2	4	.060
AADE0500J3K	AADE0500J3K	—	1/2	1/2	1 1/2	4	—
AADE0500J3GRB	—	—	1/2	1/2	1 5/8	4	.030
AADE0500J3G	—	—	1/2	1/2	1 5/8	4	—
AADE0500J3GRA	—	—	1/2	1/2	1 5/8	4	.015
AADE0500J3GRD	—	—	1/2	1/2	1 5/8	4	.090
AADE0500J3GRC	—	—	1/2	1/2	1 5/8	4	.060
AADE0500J3CRC	—	AADE0500J3CRC	1/2	1/2	2	4	.060
AADE0500J3CRA	—	—	1/2	1/2	2	4	.015
AADE0500J3CRB	—	AADE0500J3CRB	1/2	1/2	2	4	.030
AADE0500J3C	AADE0500J3C	AADE0500J3C	1/2	1/2	2	4	—
AADE0500J3H	AADE0500J3H	—	1/2	1/2	2	4 1/2	—
AADE0500J3DRB	—	AADE0500J3DRB	1/2	1/2	2 1/2	5	.030
AADE0500J3DRC	—	AADE0500J3DRC	1/2	1/2	2 1/2	5	.060
AADE0500J3D	AADE0500J3D	AADE0500J3D	1/2	1/2	2 1/2	5	—
AADE0500J3L	AADE0500J3L	—	1/2	1/2	3	5	—
AADE0500J3LRB	—	—	1/2	1/2	3	5	.030
AADE0500J3LRC	—	—	1/2	1/2	3	5	.060
AADE0500J3H	—	—	1/2	1/2	3 1/8	6	—
AADE625J3I	—	—	5/8	5/8	3/4	3	—
AADE0625J3IRC	—	—	5/8	5/8	3/4	3	.060
AADE0625J3IRD	—	—	5/8	5/8	3/4	3	.120
AADE0625J3C	—	—	5/8	5/8	3/4	3 1/2	—
AADE0625J3CRA	—	—	5/8	5/8	3/4	3 1/2	.015
AADE0625J3CRB	—	—	5/8	5/8	3/4	3 1/2	.030
AADE0625J3CRC	—	—	5/8	5/8	3/4	3 1/2	.060
AADE0625J3A	AADE0625J3A	AADE0625J3A	5/8	5/8	1 1/4	3 1/2	—
AADE0625J3ARC	—	AADE0625J3ARC	5/8	5/8	1 1/4	3 1/2	.060
AADE0625J3ARB	—	—	5/8	5/8	1 1/4	3 1/2	.030
AADE0625J3DRB	—	—	5/8	5/8	1 5/8	3 1/2	.030
AADE0625J3DRE	—	—	5/8	5/8	1 5/8	3 1/2	.120
AADE0625J3DRC	—	—	5/8	5/8	1 5/8	3 1/2	.060
AADE0625J3DRA	—	—	5/8	5/8	1 5/8	3 1/2	.015
AADE0625J3D	AADE0625J3D	—	5/8	5/8	1 5/8	3 1/2	—
AADE0625J3E	—	—	5/8	5/8	2 1/8	4	—
AADE0625J3B	AADE0625J3B	AADE0625J3B	5/8	5/8	2 1/4	5	—
AADE0625J3BRC	—	AADE0625J3BRC	5/8	5/8	2 1/4	5	.060
AADE0625J3F	—	—	5/8	5/8	2 1/2	5	—
AADE0625J3FRE	—	—	5/8	5/8	2 1/2	5	.120
AADE0625J3HRC	—	—	5/8	5/8	3	5 1/4	.060
AADE0625J3H	AADE0625J3H	—	5/8	5/8	3	5 1/4	—
AADE0625J3G	—	—	5/8	5/8	3 1/4	6	—

Solid End Milling

(continued)

(continued)

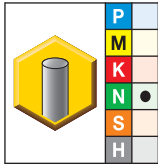
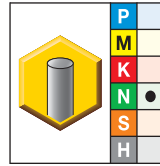
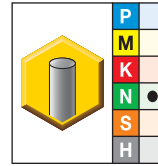


	K600	KC625M	KC651M	D1	D	Ap1 max	L	Re
	AADE0750J3ARC	—	—	3/4	3/4	7/8	3	.060
	AADE0750J3A	AADE0750J3A	AADE0750J3A	3/4	3/4	7/8	3	—
	AADE0750J3ARB	—	—	3/4	3/4	7/8	3	.030
	AADE0750J3ARD	—	—	3/4	3/4	7/8	3	.120
	AADE750J3K	AADE750J3K	—	3/4	3/4	1	3	—
	AADE0750J3FRD	—	—	3/4	3/4	1	4	.090
	AADE0750J3F	—	—	3/4	3/4	1	4	—
	AADE0750J3FRA	—	—	3/4	3/4	1	4	.015
	AADE0750J3BRE	—	AADE0750J3BRE	3/4	3/4	1 1/2	4	.120
	AADE0750J3B	AADE0750J3B	AADE0750J3B	3/4	3/4	1 1/2	4	—
	—	AADE750J3B	—	3/4	3/4	1 1/2	4	—
	AADE0750J3CRC	AADE0750J3CRC	AADE0750J3CRC	3/4	3/4	1 1/2	4	.030
	AADE0750J3BRC	—	AADE0750J3BRC	3/4	3/4	1 1/2	4	.060
	AADE0750J3BRB	—	AADE0750J3BRB	3/4	3/4	1 1/2	4	.030
	AADE0750J3HRD	—	—	3/4	3/4	1 5/8	4	.090
	AADE0750J3HRE	—	—	3/4	3/4	1 5/8	4	.120
	AADE0750J3H	AADE0750J3H	—	3/4	3/4	1 5/8	4	—
	AADE0750J3HRA	—	—	3/4	3/4	1 5/8	4	.015
	AADE0750J3HRB	—	—	3/4	3/4	1 5/8	4	.030
	AADE0750J3CRE	—	—	3/4	3/4	2 1/4	5	.120
	AADE0750J3C	AADE0750J3C	AADE0750J3C	3/4	3/4	2 1/4	5	—
	AADE0750J3CRD	—	—	3/4	3/4	2 1/4	5	.090
	AADE0750J3CRB	—	AADE0750J3CRB	3/4	3/4	2 1/4	5	.030
	AADE0750J3CRA	—	—	3/4	3/4	2 1/4	5	.015
	—	AADE750J3C	—	3/4	3/4	2 1/4	5	—
	AADE0750J3D	AADE0750J3D	AADE0750J3D	3/4	3/4	3	5 1/4	—
	AADE0750J3DRB	—	AADE0750J3DRB	3/4	3/4	3	5 1/4	.030
	AADE0750J3DRC	—	AADE0750J3DRC	3/4	3/4	3	5 1/4	.060
	AADE0750J3G	—	—	3/4	3/4	3 1/4	6	—
	AADE0750J3GRC	—	—	3/4	3/4	3 1/4	6	.060
	AADE0750J3GRD	—	—	3/4	3/4	3 1/4	6	.090
	AADE0750J3GRE	—	—	3/4	3/4	3 1/4	6	.120
	AADE0750J3GRB	—	—	3/4	3/4	3 1/4	6	.030
	AADE0750J3GRA	—	—	3/4	3/4	3 1/4	6	.015
	AADE0750J3K	AADE0750J3K	—	3/4	3/4	4	6 1/4	—
	AADE750J3J	AADE750J3J	—	3/4	3/4	4	6 1/2	—
	AADE0750J3JRA	—	—	3/4	3/4	4	6 1/2	.015
	AADE0750J3JRB	—	—	3/4	3/4	4	6 1/2	.030
	AADE0750J3JRC	—	—	3/4	3/4	4	6 1/2	.060
	AADE0750J3JRE	—	—	3/4	3/4	4	6 1/2	.120
	AADE0750J3JRD	—	—	3/4	3/4	4	6 1/2	.090
	AADE1000J3FRE	—	—	1	1	1 1/4	4	.120
	AADE1000J3FRB	—	—	1	1	1 1/4	4	.030
	AADE1000J3FRC	—	—	1	1	1 1/4	4	.060
	AADE1000J3FRD	—	—	1	1	1 1/4	4	.090
	AADE1000J3FRA	—	—	1	1	1 1/4	4	.015
	AADE1000J3F	AADE1000J3F	—	1	1	1 1/4	4	—
	AADE1000J3ARB	—	AADE1000J3ARB	1	1	1 1/2	4	.030
	AADE1000J3ARC	—	AADE1000J3ARC	1	1	1 1/2	4	.060
	AADE1000J3ARE	—	AADE1000J3ARE	1	1	1 1/2	4	.120
	AADE1000J3A	AADE1000J3A	AADE1000J3A	1	1	1 1/2	4	—
	AADE1000J3JRC	—	—	1	1	2	4	.060

(continued)

Solid End Milling

(continued)


K600

KC625M

KC651M

			D1	D	Ap1 max	L	Re
AADE1000J3JRE	—	—	1	1	2	4	.120
AADE1000J3K	AADE1000J3K	—	1	1	2	4 1/2	—
AADE1000J3DRC	—	—	1	1	2	5	.060
AADE1000J3DRD	—	—	1	1	2	5	.090
AADE1000J3DRE	—	—	1	1	2	5	.120
AADE1000J3DRA	—	—	1	1	2	5	.015
AADE1000J3DRB	—	—	1	1	2	5	.030
AADE1000J3D	—	—	1	1	2	5	—
AADE1000J3BRC	—	AADE1000J3BRC	1	1	2 1/4	5	.060
AADE1000J3BRB	—	AADE1000J3BRB	1	1	2 1/4	5	.030
AADE1000J3B	AADE1000J3B	AADE1000J3B	1	1	2 1/4	5	—
AADE1000J3GRB	—	—	1	1	2 5/8	6	.030
AADE1000J3G	AADE1000J3G	—	1	1	2 5/8	6	—
AADE1000J3GRE	—	—	1	1	2 5/8	6	.120
AADE1000J3CRC	—	AADE1000J3CRC	1	1	3	5 1/2	.060
AADE1000J3CRB	—	AADE1000J3CRB	1	1	3	5 1/2	.030
AADE1000J3C	—	AADE1000J3C	1	1	3	5 1/2	—
AADE1000J3ERD	—	—	1	1	3 1/4	6	.090
AADE1000J3ERE	—	—	1	1	3 1/4	6	.120
AADE1000J3ERC	—	—	1	1	3 1/4	6	.060
AADE1000J3ERB	—	—	1	1	3 1/4	6	.030
AADE1000J3ERA	—	—	1	1	3 1/4	6	.015
AADE1000J3E	—	—	1	1	3 1/4	6	—
AADE1000J3I	AADE1000J3I	—	1	1	4	7	—
AADE1000J3HRD	—	—	1	1	4 1/8	7	.090
AADE1000J3HRB	—	—	1	1	4 1/8	7	.030
AADE1000J3H	—	—	1	1	4 1/8	7	—
AADE1000J3HRC	—	—	1	1	4 1/8	7	.060
AADE1000J3HRA	—	—	1	1	4 1/8	7	.015
AADE1000J3HRE	—	—	1	1	4 1/8	7	.120

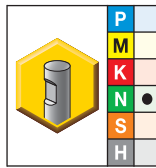
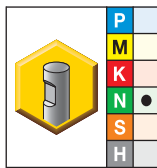
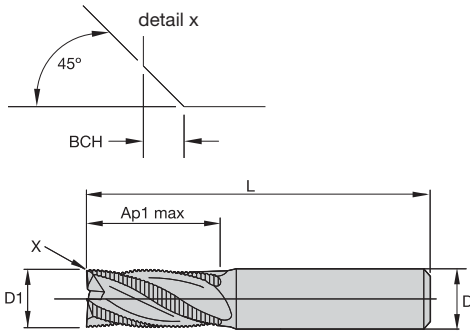
Solid End Milling

NOTE: For application data, see page C33.

End Mill Tolerances

D1	tolerance h6	D	tolerance h6
<1/8"	+0/-.002"	<1/8"	+0/-.00024"
1/8–7/32"	+0/-.002"	1/8–7/32"	+0/-.00031"
1/4–3/8"	+0/-.00035"	1/4–3/8"	+0/-.00035"
13/32–11/16"	+0/-.00043"	13/32–11/16"	+0/-.00043"
23/32–1 3/16"	+0/-.00051"	23/32–1 3/16"	+0/-.00051"

- Kennametal standard dimensions.
- Center cutting.
- Coarse pitch profile.



- first choice
- alternate choice

K600		KC625M		D1	D	Ap1 max	L	BCH
SFRHEC250S3075		SFRHEC250S3075		1/4	1/4	3/4	2 1/2	.0236
SFRHEC312S3075		SFRHEC312S3075		5/16	5/16	3/4	2 1/2	.0236
SFRHEC375S3088		SFRHEC375S3088		3/8	3/8	7/8	2 1/2	.0236
SFRHEC500S3100		SFRHEC500S3100		1/2	1/2	1	3	.0394
SFRHEC500S3200		SFRHEC500S3200		1/2	1/2	2	4 1/2	.0394
SFRHEC625S3125		SFRHEC625S3125		5/8	5/8	1 1/4	3 1/2	.0394
SFRHEC625S3225		SFRHEC625S3225		5/8	5/8	2 1/4	5	.0394
SFRHEC750S3150		SFRHEC750S3150		3/4	3/4	1 1/2	4	.0394
SFRHEC750S3225		SFRHEC750S3225		3/4	3/4	2 1/4	5	.0394
SFRHEC100S3150		SFRHEC100S3150		1	1	1 1/2	4	.0394
SFRHEC100S3225		SFRHEC100S3225		1	1	2 1/4	5	.0394

NOTE: For application data, see page M61.

Solid End Milling

End Mill Tolerances

D1	d11	D	tolerance h6
<1/8"	-.0008/-0.0031"	<1/8"	+0/-0.00024"
1/8-7/32"	-.0012/-0.0041"	1/8-7/32"	+0/-0.00031"
1/4-3/8"	-.0016/-0.0051"	1/4-3/8"	+0/-0.00035"
13/32-11/16"	-.002/-0.0063"	13/32-11/16"	+0/-0.00043"
23/32-1-3/16"	-.0026/-0.0077"	23/32-1-3/16"	+0/-0.00051"



MaxiMetTM

Superior Finishing

**Designed to significantly reduce machining time in aluminum!
The innovative geometry designs include a wiper facet for superior surface finish on aluminum parts. MaxiMet handles roughing and finishing cuts with one tool.**

- Use only one tool for roughing and finishing operations.
- Slotting is effective up to full 1 x D axial depth; side milling is effective up to 0.5 x D radial, by 1.5 x D axial depth.
- Three-flute series uses unequal flute spacing for chatter-free performance.
- Effective in a full range of machine speeds.
- Multiple corner radii and extended neck configurations are available as standard.

Visit www.kennametal.com or contact your local Authorized Kennametal Distributor.

www.kennametal.com



■ ABDE... and ABDF ...

		Side Milling (A) and Slotting (B)		K600		Feed per Tooth – fz information is for side milling (A). For slotting (B), reduce fz by 20%.								
		A		B		Cutting Speed – vc SFM		D1 – Diameter						
Material Group	ap	ae	ap	min	max	inch	1/4	5/16	3/8	1/2	5/8	3/4	1	
N 1	1 x D	0.5 x D	1 x D	1600	6500	fz	0.0023	0.0028	0.0034	0.0055	0.0065	0.0080	0.0095	
N 2	1 x D	0.5 x D	1 x D	1600	4500	fz	0.0020	0.0025	0.0030	0.0050	0.0060	0.0070	0.0090	

		Side Milling (A) and Slotting (B)		K600		Feed per Tooth – fz information is for side milling (A). For slotting (B), reduce fz by 20%.								
		A		B		Cutting Speed – vc SFM		D1 – Diameter						
Material Group	ap	ae	ap	min	max	inch	1/4	5/16	3/8	1/2	5/8	3/4	1	
N 1	1 x D	0.5 x D	1 x D	1600	6500	fz	0.0023	0.0028	0.0034	0.0055	0.0065	0.0080	0.0095	
N 2	1 x D	0.5 x D	1 x D	1600	4500	fz	0.0020	0.0025	0.0030	0.0050	0.0060	0.0070	0.0090	

Solid End Milling

■ ABDF... & ABDE... with Neck

		Side Milling (A) and Slotting (B)		K600		Feed per Tooth – fz information is for side milling (A). For slotting (B), reduce fz by 20%.									
		A		B		Cutting Speed – vc SFM		D1 – Diameter							
Material Group	ap	ae	ap	min	max	inch	1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1
N 1	1 x D	0.5 x D	1 x D	1600	6500	fz	0.0011	0.0017	0.0023	0.0028	0.0034	0.0055	0.0065	0.0080	0.0095
N 2	1 x D	0.5 x D	1 x D	1600	4500	fz	0.0010	0.0015	0.0020	0.0025	0.0030	0.0050	0.0060	0.0070	0.0090

		Side Milling (A) and Slotting (B)		K600		Feed per Tooth – fz information is for side milling (A). For slotting (B), reduce fz by 20%.									
		A		B		Cutting Speed – vc SFM		D1 – Diameter							
Material Group	ap	ae	ap	min	max	inch	1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1
N 1	1 x D	0.5 x D	1 x D	1600	6500	fz	0.0011	0.0017	0.0023	0.0028	0.0034	0.0055	0.0065	0.0080	0.0095
N 2	1 x D	0.5 x D	1 x D	1600	4500	fz	0.0010	0.0015	0.0020	0.0025	0.0030	0.0050	0.0060	0.0070	0.0090

NOTE: These guidelines may require variations to achieve optimum results.
 For longest reach (L3) tools, reduce ae by 30%.
 For cutting aluminum with high silicon, coating is recommended.
 ap for spindle with ceramic bearings, multiply by 0.5.
 For better surface finish, reduce feed per tooth.
 Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >1/2" diameter.

■ AADE and AADF

	Side Milling (A) and Slotting (B)			K600/KC651M/ KC625M		Feed per Tooth — fz information is for side milling (A). For slotting (B), reduce fz by 20%.													
	A		B	Cutting Speed — vc SFM		D1 — Diameter													
Material Group	ap	ae	ap	min	max	inch	1/8	3/16	1/4	5/16	3/8	7/16	1/2	5/8	3/4	1			
1	1 x D	0.5 x D	1.0 x D	1600	6500	fz	0.0011	0.0017	0.0023	0.0028	0.0034	0.0039	0.0055	0.0065	0.0080	0.0095			
2	1 x D	0.5 x D	1.0 x D	1600	4500	fz	0.0010	0.0015	0.0020	0.0025	0.0030	0.0035	0.0050	0.0060	0.0070	0.0090			

	Side Milling (A) and Slotting (B)			K600/KC651M/ KC625M		Feed per Tooth — fz information is for side milling (A). For slotting (B), reduce fz by 20%.													
	A		B	Cutting Speed — vc SFM		D1 — Diameter													
Material Group	ap	ae	ap	min	max	inch	1/8	3/16	1/4	5/16	3/8	7/16	1/2	5/8	3/4	1			
1	1 x D	0.5 x D	1.0 x D	1600	6500	fz	0.0011	0.0017	0.0023	0.0028	0.0034	0.0039	0.0055	0.0065	0.0080	0.0095			
2	1 x D	0.5 x D	1.0 x D	1600	4500	fz	0.0010	0.0015	0.0020	0.0025	0.0030	0.0035	0.0050	0.0060	0.0070	0.0090			

NOTE: These guidelines may require variations to achieve optimum results.
 For cutting aluminum with high silicon, coating is recommended.
 ap for spindle with ceramic bearings, multiply by 0.5.
 For better surface finish, reduce feed per tooth.
 Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >1/2" diameter.

Solid End Milling

■ SFRHEC

	Side Milling (A) and Slotting (B)			K600/KC625M		Feed per Tooth — fz information is for side milling (A). For slotting (B), reduce fz by 20%.													
	A		B	Cutting Speed — vc SFM		D1 — Diameter													
Material Group	ap	ae	ap	min	max	inch	1/4	3/8	1/2	5/8	3/4	1							
1	1.25 x D	0.5 x D	1 x D	1650	6500	fz	0.0028	0.0041	0.0055	0.0070	0.0085	0.0110							
2	1.25 x D	0.5 x D	1 x D	1650	5050	fz	0.0025	0.0037	0.0050	0.0060	0.0075	0.0010							

NOTE: These guidelines may require variations to achieve optimum results.
 For cutting aluminum with high silicon, coating is recommended.
 ap for spindle with ceramic bearings, multiply by 0.5.
 Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >1/2" diameter.

Go Beyond™ Traditional CFRP Milling Grades • Maximize Productivity with KCN05™ Solid Carbide Routers



Primary Application

Kennametal has the correct milling solutions engineered for machining difficult CFRP (Carbon-Fiber reinforced polymer) and non-ferrous components. KCN05 solid carbide router products provide excellent tool life and produce smooth finishes with improved edge quality. The unique geometries are free cutting, reduce heat generation, and provide high-quality machined surfaces.

Features and Benefits

Compression-Style Router

- Cutters are designed to provide high feed rates.
- Produce excellent quality edges on both sides on the material.
- Up-cut/down-cut geometry establishes stable cutting conditions.

Down-Cut-Style Router

- Intended for surface work.
- Great ramping capabilities for producing pockets.
- Geometry produces down forces to eliminate surface delamination.

Burr-Style Router

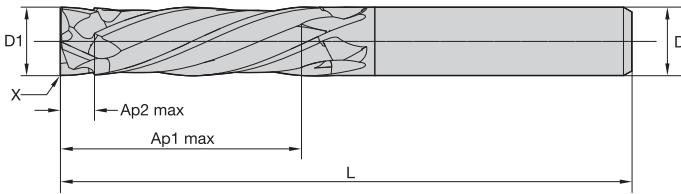
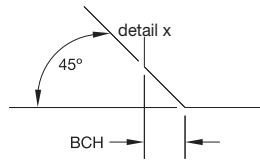
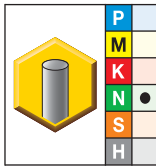
- Designed for trimming fiberglass and CFRP.
- Excellent temperature control.
- Good surface quality.

Ball-End-Style Router

- Specially designed for slotting and profiling.
- Excellent tool life.



- Kennametal standard dimensions.
- Aerospace composites and fiberglass.
- Internal air coolant for ZU=4.


beyond


- first choice
- alternate choice

KCN05	D1	D	Ap1 max	Ap2 max	L	BCH	Z U
CCNC0250J3AH	1/4	1/4	3/4	.13	2 1/2	.005	3
CCNC0250J3BH	1/4	1/4	1 1/2	.13	4	.005	3
CCNC0375J4AH	3/8	3/8	3/4	.13	3 1/4	.005	4
CCNC0375J4BH	3/8	3/8	1 1/2	.13	4	.005	4
CCNC0500J4AH	1/2	1/2	3/4	.13	3 1/4	.005	4
CCNC0500J4BH	1/2	1/2	1 1/2	.13	4	.005	4

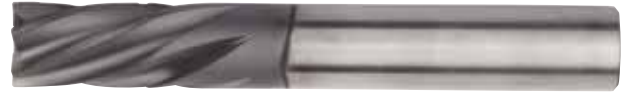
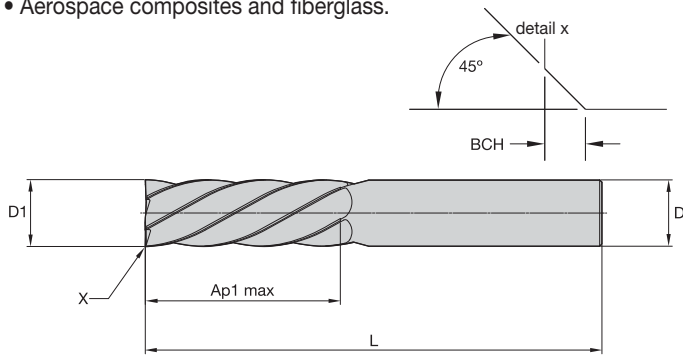
NOTE: For application data, see page M67.

End Mill Tolerances

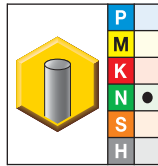
D1	tolerance	D	tolerance h6
All	+.000/-0.003"	≤1/8"	+0/-0.00024"
		>1/8-1/4"	+0/-0.00031"
		>1/4-3/8"	+0/-0.00035"
		>3/8-23/32"	+0/-0.00043"
		>23/32-1 3/16"	+0/-0.00051"

Solid End Milling

- Kennametal standard dimensions.
- Aerospace composites and fiberglass.



beyond



- first choice
- alternate choice

	D1	D	Ap1 max	L	BCH
KCN05					
CDDC0250J6AH	1/4	1/4	3/4	2 1/2	.010
CDDC0250J6BH	1/4	1/4	1 1/2	4	.010
CDDC0375J6AH	3/8	3/8	3/4	3 1/4	.010
CDDC0375J6BH	3/8	3/8	1 1/2	4	.010
CDDC0500J6AH	1/2	1/2	3/4	3 1/4	.010
CDDC0500J6BH	1/2	1/2	1 1/2	4	.010

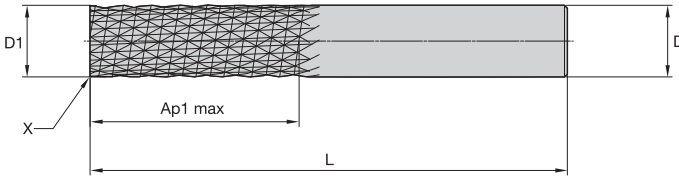
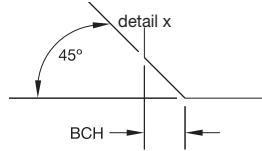
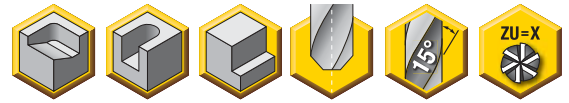
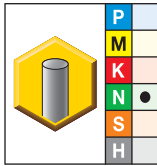
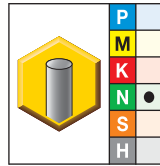
NOTE: For application data, see page M67.

Solid End Milling

End Mill Tolerances

D1	tolerance	D	tolerance h6
All	+.000/- .003"	≤1/8"	+0/- .00024"
		>1/8-1/4"	+0/- .00031"
		>1/4-3/8"	+0/- .00035"
		>3/8-23/32"	+0/- .00043"
		>23/32-1 3/16"	+0/- .00051"

- Kennametal standard dimensions.
- Aerospace composites and fiberglass.


beyond

K600

KCN05

- first choice
- alternate choice

		D1	D	Ap1 max	L	BCH	Z U
CBDB0250JXAS	CBDB0250JXAS	1/4	1/4	3/4	2 1/2	.020	12
CBDB0250JXBS	CBDB0250JXBS	1/4	1/4	1 1/2	4	.020	12
CBDB0375JXAS	CBDB0375JXAS	3/8	3/8	3/4	3 1/4	.035	12
CBDB0375JXBS	CBDB0375JXBS	3/8	3/8	1 1/2	4	.035	12
CBDB0500JXAS	CBDB0500JXAS	1/2	1/2	3/4	3 1/4	.045	12
CBDB0500JXBS	CBDB0500JXBS	1/2	1/2	1 1/2	4	.045	12

NOTE: For application data, see page M67.
 12 RHS/RHC flutes, 10 LHS/RHC flutes, 6 end teeth.
 For tolerance table, see page M64.

Additional point styles are available upon request:

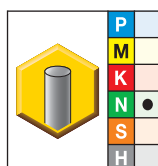
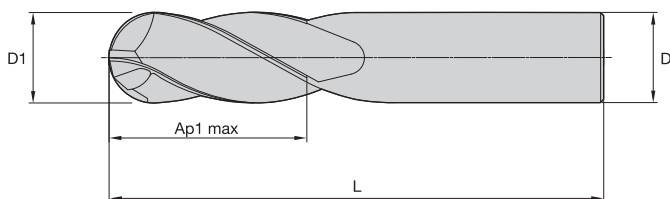

End Mill End Cutting

Drill-Point Cutting

Non-End Cutting

Solid End Milling

- Kennametal standard dimensions.
- Aerospace composites and fiberglass.



- first choice
- alternate choice

	D1	D	Ap1 max	L
KCN05				
CRBD0375J4AR	3/8	3/8	3/4	3 1/4
CRBD0500J4AR	1/2	1/2	3/4	3 1/4

NOTE: For application data, see page M68.
 For tolerance table, see page M64.




Solid End Milling

Solid End Milling Application Videos




Check out our new KennametalSolutions Channel on YouTube!
 You can find application videos for our solid end milling products there.
 Just go to: www.youtube.com/KennametalSolutions.




■ Compression-Style Router • CCNC • Inch

Material Group										
	A		 KCN05				Feed per Tooth — fz information is for side milling (A). For slotting (B), reduce fz by 10%.			
			Cutting Speed — vc SFM				D1 — Diameter			
	ap	ae	min	max	frac	1/4	3/8	1/2		
N	5	Ap1 max	0.5 x D	330	500	fz	0.0007	0.0012	0.0014	

■ Down-Cut Router • CDDC • Inch



Material Group										
	A		 KCN05				Feed per Tooth — fz information is for side milling (A). For slotting (B), reduce fz by 10%.			
			Cutting Speed — vc SFM				D1 — Diameter			
	ap	ae	min	max	frac	1/4	3/8	1/2		
N	5	Ap1 max	1 x D	330	500	fz	0.018	0.030	0.036	



■ Burr-Style Router • CBDB • Inch

Material Group												
	A		B		K600		 KCN05		Feed per Revolution — Inch per revolution (IPR) information is for side milling (A). For slotting (B), reduce IPR by 10%.			
					Cutting Speed — vc SFM				D1 — Diameter			
	ap	ae	ap		min	max	min	max	frac	1/4	3/8	1/2
N	5	Ap1 max	0.2 x D	1 x D	265	400	330	500	IPR	0.0059	0.0098	0.0118



NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >1/2" diameter.

■ Ball-Nose-Style Router • CRBD • Inch

Material Group	 A		 beyond KCN05				Feed per Tooth – Finishing	
							Cutting Speed – vc SFM				D1 – Diameter
			N 5	ap	ae	min	max	frac	3/8	1/2
	0.04 x D	0.04 x D	1370	1540	fz	0.011	0.013	

Material Group	 A		 beyond KCN05				Feed per Tooth – Semi-Finishing	
							Cutting Speed – vc SFM				D1 – Diameter
			N 5	ap	ae	min	max	frac	3/8	1/2
	0.1 x D	0.05 x D	900	1000	fz	0.007	0.008	

Solid End Milling

Material Group	 A		 beyond KCN05				Feed per Tooth – Roughing	
							Cutting Speed – vc SFM				D1 – Diameter
			N 5	ap	ae	min	max	frac	3/8	1/2
	0.2 x D	0.1 x D	690	770	fz	0.0030	0.0037	

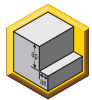
NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
 Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
 Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >1/2" diameter.

High-Performance Solid Carbide End Mills • Finishing

Features and Benefits

- Best surface finish.
- 5-/6-flute portfolio.
- Multiple helix offering.
- Multiflute finisher.

Applications:



Side Milling



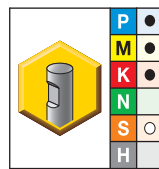
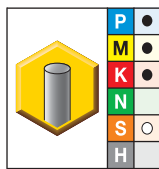
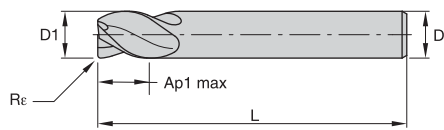
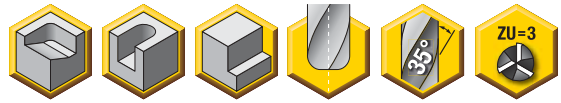
Slotting

Workpiece Materials:

P	Steel
M	Stainless Steel
K	Cast Iron
S	High-Temp Alloys
H	Hardened Materials



• Center cutting.



● first choice
○ alternate choice

Solid End Milling

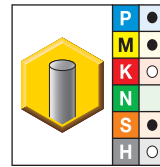
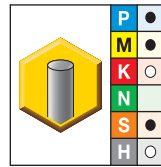
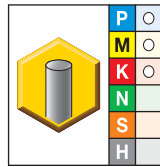
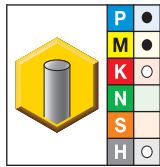
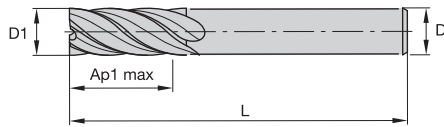
	KC635M	KC635M	D1	D	Ap1 max	L	Re
HPFSS125S3050	—	—	1/8	1/8	1/2	1 1/2	.010
HPFSS125S3025	—	—	1/8	1/8	1/4	1 1/2	.010
HPFSS188S3056	—	—	3/16	3/16	9/16	2	.010
HPFSS188S3031	—	—	3/16	3/16	5/16	2	.010
HPFSS250S3038	—	—	1/4	1/4	3/8	2	.020
HPFSS250S3050	—	—	1/4	1/4	1/2	2	.020
HPFSS250S3075	—	—	1/4	1/4	3/4	2 1/2	.020
HPFSS312S3044	—	—	5/16	5/16	7/16	2	.020
HPFSS312S3081	—	—	5/16	5/16	13/16	2 1/2	.020
HPFSS375S3050	—	—	3/8	3/8	1/2	2	.020
HPFSS375S3088	—	—	3/8	3/8	7/8	2 1/2	.020
—	—	HPFSS500S3063	1/2	1/2	5/8	2 1/2	.030
—	—	HPFSS500S3125	1/2	1/2	1 1/4	3	.030
—	—	HPFSS625S3075	5/8	5/8	3/4	3	.030
—	—	HPFSS625S3163	5/8	5/8	1 5/8	4	.030
—	—	HPFSS750S3088	3/4	3/4	7/8	3	.030
—	—	HPFSS750S3163	3/4	3/4	1 5/8	4	.030

NOTE: For application data, see page M73.

End Mill Tolerances

D1	tolerance	D	tolerance h6
All	+0.000/-0.002"	≤1/8"	+0/-0.00024"
		>1/8-1/4"	+0/-0.00031"
		>1/4-3/8"	+0/-0.00035"
		>3/8-23/32"	+0/-0.00043"
		>23/32-1 3/16"	+0/-0.00051"

- Kennametal standard dimensions.
- Center cutting.



- first choice
- alternate choice

	KCPM15	K600	KC625M	KC635M	D1	D	Ap1 max	L
—	—	HPFSS125S5025	HPFSS125S5025	HPFSS125S5025	1/8	1/8	1/4	1 1/2
—	—	HPFSS125S5050	HPFSS125S5050	HPFSS125S5050	1/8	1/8	1/2	1 1/2
—	—	HPFSS156S5056	HPFSS156S5056	HPFSS156S5056	5/32	3/16	9/16	2
—	—	HPFSS188S5031	HPFSS188S5031	HPFSS188S5031	3/16	3/16	5/16	2
HPFSS188S5056	—	—	—	HPFSS188S5056	3/16	3/16	9/16	2
—	—	HPFSS188S5063	HPFSS188S5063	—	3/16	3/16	5/8	2
—	—	HPFSS219S5075	HPFSS219S5075	HPFSS219S5075	7/32	1/4	3/4	2 1/2
HPFSS250S5038	—	—	—	HPFSS250S5038	1/4	1/4	3/8	2
—	—	HPFSS250S5050	HPFSS250S5050	HPFSS250S5050	1/4	1/4	1/2	2
HPFSS250S5075	—	HPFSS250S5075	HPFSS250S5075	HPFSS250S5075	1/4	1/4	3/4	2 1/2
HPFSS250S5125	—	HPFSS250S5125	HPFSS250S5125	HPFSS250S5125	1/4	1/4	1 1/4	4
—	—	HPFSS281S5081	—	—	9/32	5/16	13/16	2 1/2
—	—	—	—	HPFSS312S5044	5/16	5/16	7/16	2
—	—	HPFSS312S5050	HPFSS312S5050	—	5/16	5/16	1/2	2
—	—	HPFSS312S5081	HPFSS312S5081	HPFSS312S5081	5/16	5/16	13/16	2 1/2
—	—	HPFSS312S5125	HPFSS312S5125	HPFSS312S5125	5/16	5/16	1 1/4	4
—	—	HPFSS344S5088	HPFSS344S5088	—	11/32	3/8	7/8	2 1/2
HPFSS375S5050	—	—	—	HPFSS375S5050	3/8	3/8	1/2	2
—	—	HPFSS375S5063	HPFSS375S5063	—	3/8	3/8	5/8	2
HPFSS375S5088	—	HPFSS375S5088	HPFSS375S5088	HPFSS375S5088	3/8	3/8	7/8	2 1/2
HPFSS375S5150	—	HPFSS375S5150	HPFSS375S5150	HPFSS375S5150	3/8	3/8	1 1/2	4
—	—	HPFSS406S5100	HPFSS406S5100	—	13/32	7/16	1	2 1/2
—	—	HPFSS438S5063	HPFSS438S5063	—	7/16	7/16	5/8	2 1/2
—	—	HPFSS438S5088	HPFSS438S5088	—	7/16	7/16	7/8	2 1/2
—	—	HPFSS438S5200	HPFSS438S5200	—	7/16	7/16	2	4



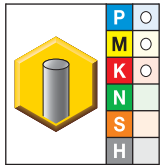
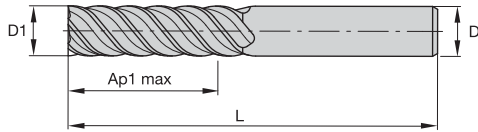
NOTE: For application data, see page M73.

For Weldon® shank offering, please refer to www.kennametal.com/e-catalog.

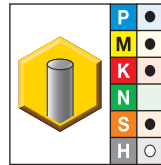
End Mill Tolerances

D1	tolerance	D	tolerance h6
All	+0.000/-0.002"	≤1/8"	+0/-0.00024"
		>1/8-1/4"	+0/-0.00031"
		>1/4-3/8"	+0/-0.00035"
		>3/8-23/32"	+0/-0.00043"
		>23/32-1 3/16"	+0/-0.00051"

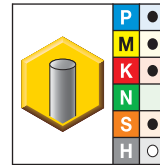
- Kennametal standard dimensions.
- Center cutting.



K600



KC625M



KC635M

- first choice
- alternate choice

Solid End Milling

			D1	D	Ap1 max	L
—	—	HPFT188S6063	3/16	3/16	5/8	2
HPFT250S6038	HPFT250S6038	HPFT250S6038	1/4	1/4	3/8	2
HPFT250S6075	HPFT250S6075	HPFT250S6075	1/4	1/4	3/4	2 1/2
—	HPFT250S6112	HPFT250S6113	1/4	1/4	1 1/8	3
HPFT312S6081	HPFT312S6081	HPFT312S6081	5/16	5/16	13/16	2 1/2
HPFT312S6112	HPFT312S6112	—	5/16	5/16	1 1/8	3
—	HPFT375S6050	HPFT375S6050	3/8	3/8	1/2	2
HPFT375S6088	HPFT375S6088	HPFT375S6088	3/8	3/8	7/8	2 1/2
HPFT375S6112	HPFT375S6112	HPFT375S6113	3/8	3/8	1 1/8	3
—	HPFT438S6088	HPFT438S6088	7/16	7/16	7/8	2 1/2
—	HPFT438S6200	—	7/16	7/16	2	4
—	HPFT500S6063	HPFT500S6063	1/2	1/2	5/8	2 1/2
HPFT500S6100	HPFT500S6100	HPFT500S6100	1/2	1/2	1	3
HPFT500S6200	HPFT500S6200	HPFT500S6200	1/2	1/2	2	4 1/2
HPFT500S6300	HPFT500S6300	HPFT500S6300	1/2	1/2	3	5
HPFT625S6075	HPFT625S6075	—	5/8	5/8	3/4	3
HPFT625S6125	HPFT625S6125	HPFT625S6125	5/8	5/8	1 1/4	3 1/2
HPFT625S6300	HPFT625S6300	HPFT625S6300	5/8	5/8	3	5
HPFT625S6225	HPFT625S6225	HPFT625S6225	5/8	5/8	2 1/4	5
—	HPFT750S6088	HPFT750S6088	3/4	3/4	7/8	3 1/2
HPFT750S6150	HPFT750S6150	HPFT750S6150	3/4	3/4	1 1/2	4
HPFT750S6225	HPFT750S6225	HPFT750S6225	3/4	3/4	2 1/4	5
HPFT750S6300	HPFT750S6300	HPFT750S6300	3/4	3/4	3	5 1/4
HPFT750S6400	HPFT750S6400	HPFT750S6400	3/4	3/4	4	6 1/4
—	HPFT1000S6150	HPFT1000S6150	1	1	1 1/2	4
—	—	HPFT1000S6225	1	1	2 1/4	5
HPFT1000S6300	—	—	1	1	3	5 1/2
—	—	HPFT1000S6400	1	1	4	6 1/2

NOTE: For application data, see page M74.

End Mill Tolerances

D1	tolerance	D	tolerance h6
All	+0.000/-0.002"	≤1/8"	+0/-0.00024"
		>1/8-1/4"	+0/-0.00031"
		>1/4-3/8"	+0/-0.00035"
		>3/8-23/32"	+0/-0.00043"
		>23/32-1 3/16"	+0/-0.00051"

HPFSS 3-Flute • With Radius • Soft Steels and Stainless Steels

Material Group	Side Milling (A) and Slotting (B)		KC635M		Feed per Tooth – fz information is for side milling (A). For slotting (B), reduce fz by 20%.													
	A		B	Cutting Speed – vc SFM		D1 – Diameter												
	ap	ae	ap	min	max	inch	1/8	3/16	1/4	5/16	3/8	7/16	1/2	5/8	3/4	1	1 1/4	
							0.125	0.188	0.250	0.313	0.375	0.438	0.500	0.625	0.750	1.000	1.250	
P	1	1 x D	0.5 x D	0.5 x D	500	650	fz	0.0009	0.0014	0.0018	0.0023	0.0027	0.0031	0.0035	0.0039	0.0043	0.0050	0.0062
	2	1 x D	0.5 x D	0.5 x D	450	625	fz	0.0009	0.0014	0.0018	0.0023	0.0027	0.0031	0.0035	0.0039	0.0043	0.0050	0.0062
	3	1 x D	0.5 x D	0.5 x D	400	525	fz	0.0007	0.0011	0.0015	0.0020	0.0023	0.0026	0.0029	0.0034	0.0038	0.0046	0.0057
	4	1 x D	0.5 x D	0.5 x D	350	475	fz	0.0007	0.0010	0.0014	0.0018	0.0020	0.0023	0.0026	0.0030	0.0033	0.0039	0.0049
	5	1 x D	0.5 x D	0.5 x D	200	325	fz	0.0006	0.0009	0.0012	0.0016	0.0018	0.0021	0.0023	0.0027	0.0030	0.0036	0.0046
	6	1 x D	0.5 x D	0.5 x D	150	225	fz	0.0005	0.0008	0.0010	0.0013	0.0015	0.0017	0.0019	0.0022	0.0024	0.0028	0.0036
M	1	1 x D	0.5 x D	0.5 x D	250	325	fz	0.0007	0.0011	0.0015	0.0020	0.0023	0.0026	0.0029	0.0034	0.0038	0.0046	0.0057
	2	1 x D	0.5 x D	0.5 x D	190	260	fz	0.0006	0.0009	0.0012	0.0016	0.0018	0.0021	0.0023	0.0027	0.0030	0.0036	0.0046
	3	1 x D	0.5 x D	0.5 x D	200	260	fz	0.0005	0.0008	0.0010	0.0013	0.0015	0.0017	0.0019	0.0022	0.0024	0.0028	0.0036
K	1	1 x D	0.5 x D	0.5 x D	400	525	fz	0.0009	0.0014	0.0018	0.0023	0.0027	0.0031	0.0035	0.0039	0.0043	0.0050	0.0062
	2	1 x D	0.5 x D	0.5 x D	360	460	fz	0.0007	0.0011	0.0015	0.0020	0.0023	0.0026	0.0029	0.0034	0.0038	0.0046	0.0057
	3	1 x D	0.5 x D	0.5 x D	330	430	fz	0.0006	0.0009	0.0012	0.0016	0.0018	0.0021	0.0023	0.0027	0.0030	0.0036	0.0046
S	1	1 x D	0.3 x D	0.3 x D	150	275	fz	0.0007	0.0011	0.0015	0.0020	0.0023	0.0026	0.0029	0.0034	0.0038	0.0046	0.0057
	2	1 x D	0.3 x D	0.3 x D	150	275	fz	0.0007	0.0011	0.0015	0.0020	0.0023	0.0026	0.0029	0.0034	0.0038	0.0046	0.0057
	3	1 x D	0.3 x D	0.3 x D	65	125	fz	0.0004	0.0006	0.0008	0.0010	0.0012	0.0014	0.0016	0.0018	0.0020	0.0025	0.0031
	4	1 x D	0.5 x D	0.5 x D	150	220	fz	0.0005	0.0008	0.0011	0.0014	0.0017	0.0019	0.0022	0.0025	0.0028	0.0033	0.0042

NOTE: These guidelines may require variations to achieve optimum results.

HPFSS 5-Flute • Soft Steels and Stainless Steels

Material Group	Side Milling		KCPM15 KC635M		KC625M		KC600		Feed per Tooth – fz information is for side milling.										
	ap	ae	min	max	min	max	min	max	inch	1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1	
										0.125	0.188	0.250	0.313	0.375	0.500	0.625	0.750	1.000	
P	1	1.5 x D	0.15 x D	500	650	400	520	200	260	fz	0.0009	0.0014	0.0018	0.0023	0.0027	0.0035	0.0039	0.0043	0.0050
	2	1.5 x D	0.15 x D	450	625	360	500	180	250	fz	0.0009	0.0014	0.0018	0.0023	0.0027	0.0035	0.0039	0.0043	0.0050
	3	1.5 x D	0.1 x D	400	525	320	420	160	210	fz	0.0007	0.0011	0.0015	0.0020	0.0023	0.0029	0.0034	0.0038	0.0046
	4	1.5 x D	0.1 x D	300	475	240	380	–	–	fz	0.0007	0.0010	0.0014	0.0018	0.0020	0.0026	0.0030	0.0033	0.0039
	5	1.5 x D	0.1 x D	200	325	160	260	–	–	fz	0.0006	0.0009	0.0012	0.0016	0.0018	0.0023	0.0027	0.0030	0.0036
	6	1.5 x D	0.1 x D	150	225	120	180	–	–	fz	0.0005	0.0008	0.0010	0.0013	0.0015	0.0019	0.0022	0.0024	0.0028
M	1	1.5 x D	0.15 x D	260	330	208	264	104	132	fz	0.0007	0.0011	0.0015	0.0020	0.0023	0.0029	0.0034	0.0038	0.0046
	2	1.5 x D	0.1 x D	200	260	160	208	–	–	fz	0.0006	0.0009	0.0012	0.0016	0.0018	0.0023	0.0027	0.0030	0.0036
	3	1.5 x D	0.1 x D	200	260	160	208	–	–	fz	0.0005	0.0008	0.0010	0.0013	0.0015	0.0019	0.0022	0.0024	0.0028
K	1	1.5 x D	0.15 x D	390	520	312	416	156	208	fz	0.0009	0.0014	0.0018	0.0023	0.0027	0.0035	0.0039	0.0043	0.0050
	2	1.5 x D	0.15 x D	360	460	288	368	–	–	fz	0.0007	0.0011	0.0015	0.0020	0.0023	0.0029	0.0034	0.0038	0.0046
	3	1.5 x D	0.1 x D	330	430	264	344	–	–	fz	0.0006	0.0009	0.0012	0.0016	0.0018	0.0023	0.0027	0.0030	0.0036
S	1	1.5 x D	0.1 x D	150	275	120	220	–	–	fz	0.0007	0.0011	0.0015	0.0020	0.0023	0.0029	0.0034	0.0038	0.0046
	2	1.5 x D	0.1 x D	150	275	120	220	–	–	fz	0.0007	0.0011	0.0015	0.0020	0.0023	0.0029	0.0034	0.0038	0.0046
	3	1.5 x D	0.15 x D	70	130	56	104	–	–	fz	0.0004	0.0006	0.0008	0.0010	0.0012	0.0016	0.0018	0.0020	0.0025
	4	1.5 x D	0.15 x D	150	210	120	168	–	–	fz	0.0005	0.0008	0.0011	0.0014	0.0017	0.0022	0.0025	0.0028	0.0033
H	1	1.5 x D	0.1 x D	260	450	208	360	–	–	fz	0.0007	0.0010	0.0014	0.0018	0.0020	0.0026	0.0030	0.0033	0.0039

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >1/2" diameter.

■ HPFT • 6-Flute

		Side Milling		KC635M	KC625M	K600		Feed per Tooth — fz information is for side milling.												
				Cutting Speed — vc SFM						D1 — Diameter										
Material Group		ap	ae	min	max	min	max	min	max	inch	1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1	
											0.125	0.188	0.250	0.313	0.375	0.500	0.625	0.750	1.000	
P	1	1 x D	0.5 x D	590	720	472	576	236	288	fz	0.0009	0.0014	0.0018	0.0023	0.0027	0.0035	0.0039	0.0043	0.0050	
	2	1 x D	0.5 x D	520	660	416	528	208	264	fz	0.0009	0.0014	0.0018	0.0023	0.0027	0.0035	0.0039	0.0043	0.0050	
	3	1 x D	0.5 x D	520	590	416	472	208	236	fz	0.0007	0.0011	0.0015	0.0020	0.0023	0.0029	0.0034	0.0038	0.0046	
	4	1 x D	0.5 x D	460	520	368	416	—	—	fz	0.0007	0.0010	0.0014	0.0018	0.0020	0.0026	0.0030	0.0033	0.0039	
	5	1 x D	0.5 x D	200	330	160	264	—	—	fz	0.0006	0.0009	0.0012	0.0016	0.0018	0.0023	0.0027	0.0030	0.0036	
	6	1 x D	0.5 x D	160	260	128	208	—	—	fz	0.0005	0.0008	0.0010	0.0013	0.0015	0.0019	0.0022	0.0024	0.0028	
M	1	1 x D	0.5 x D	260	330	208	264	104	132	fz	0.0007	0.0011	0.0015	0.0020	0.0023	0.0029	0.0034	0.0038	0.0046	
	2	1 x D	0.5 x D	200	260	160	208	—	—	fz	0.0006	0.0009	0.0012	0.0016	0.0018	0.0023	0.0027	0.0030	0.0036	
	3	1 x D	0.5 x D	200	260	160	208	—	—	fz	0.0005	0.0008	0.0010	0.0013	0.0015	0.0019	0.0022	0.0024	0.0028	
K	1	1 x D	0.5 x D	390	520	312	514	156	208	fz	0.0009	0.0014	0.0018	0.0023	0.0027	0.0035	0.0039	0.0043	0.0050	
	2	1 x D	0.5 x D	360	460	288	460	—	—	fz	0.0007	0.0011	0.0015	0.0020	0.0023	0.0029	0.0034	0.0038	0.0046	
	3	1 x D	0.5 x D	330	430	264	344	—	—	fz	0.0006	0.0009	0.0012	0.0016	0.0018	0.0023	0.0027	0.0030	0.0036	
S	1	1 x D	0.5 x D	300	380	240	304	—	—	fz	0.0007	0.0011	0.0015	0.0020	0.0023	0.0029	0.0034	0.0038	0.0046	
	2	1 x D	0.5 x D	70	130	56	104	—	—	fz	0.0004	0.0006	0.0008	0.0010	0.0012	0.0016	0.0018	0.0020	0.0025	
	3	1 x D	0.5 x D	160	260	128	208	—	—	fz	0.0006	0.0009	0.0012	0.0016	0.0018	0.0023	0.0027	0.0030	0.0036	
	4	1 x D	0.5 x D	150	210	120	168	—	—	fz	0.0005	0.0008	0.0011	0.0014	0.0017	0.0022	0.0025	0.0028	0.0033	
H	1	1 x D	0.5 x D	330	460	264	368	—	—	fz	0.0007	0.0010	0.0014	0.0018	0.0020	0.0026	0.0030	0.0033	0.0039	

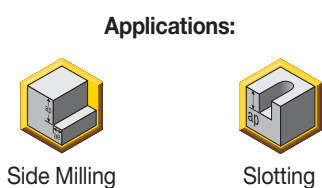
NOTE: These guidelines may require variations to achieve optimum results.
 Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
 Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
 For tools 2 x D < LOC < 3 x D, ae = 0.25 x D; for tools with LOC longer than 3 x D, ae = 0.1 x D.

Solid End Milling

High-Performance Solid Carbide End Mills • Roughing

Features and Benefits

- Highest metal removal rates.
- Innovative roughing geometries.
- Different radius styles.

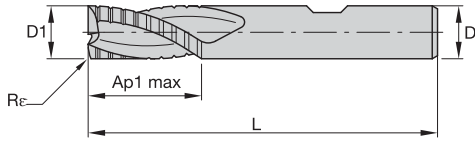


Workpiece Materials:

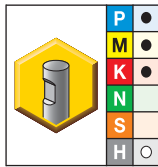
P	Steel
M	Stainless Steel
K	Cast Iron
S	High-Temp Alloys
H	Hardened Materials



- Kennametal standard dimensions.
- Center cutting.
- Chipbreaker profile.



beyond



- first choice
- alternate choice

KCPM15	D1	D	Ap1 max	L	Re
HPRSS250S3075	1/4	1/4	3/4	2 1/2	.020
HPRSS375S3100	3/8	3/8	1	2 1/2	.020
HPRSS500S3125	1/2	1/2	1 1/4	3	.030
HPRSS625S3163	5/8	5/8	1 5/8	3 1/2	.030
HPRSS750S3163	3/4	3/4	1 5/8	4	.030

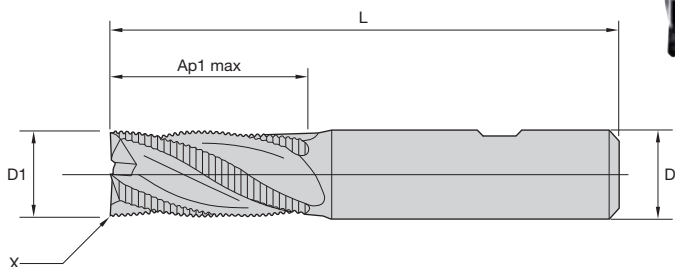
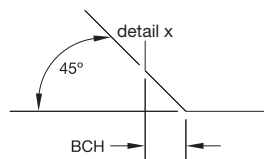
NOTE: For application data, see page M79.

Solid End Milling

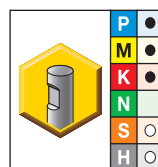
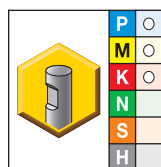
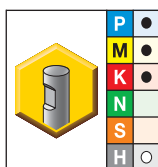
End Mill Tolerances

D1	d11	D	tolerance h6
<1/8"	-.0008/- .0031"	<1/8"	+0/- .00024"
1/8-7/32"	-.0012/- .0041"	1/8-7/32"	+0/- .00031"
1/4-3/8"	-.0016/- .0051"	1/4-3/8"	+0/- .00035"
13/32-11/16"	-.002/- .0063"	13/32-11/16"	+0/- .00043"
23/32-1 3/16"	-.0026/- .0077"	23/32-1 3/16"	+0/- .00051"

- Center cutting.
- Fine-pitch profile.



beyond



- first choice
- alternate choice

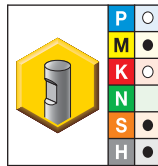
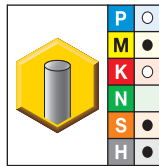
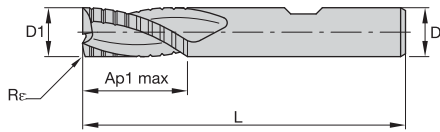
			D1	D	Ap1 max	L	BCH	Z	U
KCPM15	K600	KC625M							
MDRHEC312S4081	—	—	5/16	5/16	13/16	2 1/2	.012	4	
MDRHEC375S4038	MDRHEC375S4038	—	3/8	3/8	1/2	2	.020	4	
MDRHEC375S4088	MDRHEC375S4088	—	3/8	3/8	7/8	2 1/2	.020	4	
MDRHEC500S4050	MDRHEC500S4050	MDRHEC500S4050	1/2	1/2	1/2	2 1/2	—	4	
MDRHEC500S4100	MDRHEC500S4100	MDRHEC500S4100	1/2	1/2	1	3	.020	4	
MDRHEC625S4063	MDRHEC625S4063	MDRHEC625S4063	5/8	5/8	5/8	3	—	4	
MDRHEC625S4125	MDRHEC625S4125	MDRHEC625S4125	5/8	5/8	1 1/4	3 1/2	—	4	
MDRHEC750S4075	MDRHEC750S4075	MDRHEC750S4075	3/4	3/4	3/4	3 1/2	—	4	
MDRHEC750S4150	MDRHEC750S4150	MDRHEC750S4150	3/4	3/4	1 1/2	4	—	4	
—	—	MDRHEC100S5100	1	1	1	3 1/2	—	5	
—	MDRHEC100S5150	MDRHEC100S5150	1	1	1 1/2	4	—	5	

NOTE: For application data, see page M79.

End Mill Tolerances

D1	d11	D	tolerance h6
<1/8"	-.0008/-0.0031"	<1/8"	+0/-0.00024"
1/8–7/32"	-.0012/-0.0041"	1/8–7/32"	+0/-0.00031"
1/4–3/8"	-.0016/-0.0051"	1/4–3/8"	+0/-0.00035"
13/32–11/16"	-.002/-0.0063"	13/32–11/16"	+0/-0.00043"
23/32–1 3/16"	-.0026/-0.0077"	23/32–1 3/16"	+0/-0.00051"

- Kennametal standard dimensions.
- Center cutting.
- Shallow-pitch profile.



- first choice
- alternate choice

	KC643M	KC643M	D1	D	Ap1 max	L	Re	Z U
	HPRST250S4038	—	1/4	1/4	3/8	2	.030	4
	HPRST250S4075	—	1/4	1/4	3/4	2 1/2	.030	4
	HPRST375S4050	—	3/8	3/8	1/2	2	.030	4
	HPRST375S4088	—	3/8	3/8	7/8	2 1/2	.030	4
	—	HPRST500S4063	1/2	1/2	5/8	2 1/2	.040	4
	—	HPRST500S4125	1/2	1/2	1 1/4	3	.040	4
	—	HPRST625S4075	5/8	5/8	3/4	3	.040	4
	—	HPRST625S6125	5/8	5/8	1 1/4	3 1/2	.040	6
	—	HPRST625S4125	5/8	5/8	1 1/4	3 1/2	.040	4
	—	HPRST750S4088	3/4	3/4	7/8	3 1/2	.050	4
	—	HPRST750S6150	3/4	3/4	1 1/2	4	.050	6
	—	HPRST750S4150	3/4	3/4	1 1/2	4	.050	4
	—	HPRST1000S4150	1	1	1 1/2	4	.050	4
	—	HPRST1000S6150	1	1	1 1/2	4	.050	6

NOTE: For application data, see page M80.

Solid End Milling

End Mill Tolerances

D1	d11	D	tolerance h6
<1/8"	-.0008/-0.0031"	<1/8"	+0/-0.00024"
1/8-7/32"	-.0012/-0.0041"	1/8-7/32"	+0/-0.00031"
1/4-3/8"	-.001/-0.0051"	1/4-3/8"	+0/-0.00035"
13/32-11/16"	-.002/-0.0063"	13/32-11/16"	+0/-0.00043"
23/32-1 3/16"	-.0026/-0.0077"	23/32-1 3/16"	+0/-0.00051"

■ HPRSS

Material Group	Side Milling (A) and Slotting (B)		KCPM15		Feed per Tooth — fz information is for side milling (A). For slotting (B), reduce fz by 20%.											
	A		B		Cutting Speed — vc SFM		D1 — Diameter									
	ap	ae	ap		min	max	inch	1/4	5/16	3/8	1/2	5/8	3/4	1		
								0.250	0.313	0.375	0.500	0.625	0.750	1.000		
P	1	1 x D	0.5 x D	0.75 x D	500	650	fz	0.0018	0.0023	0.0027	0.0035	0.0039	0.0043	0.0050		
	2	1 x D	0.5 x D	0.75 x D	450	625	fz	0.0018	0.0023	0.0027	0.0035	0.0039	0.0043	0.0050		
	3	1 x D	0.5 x D	0.75 x D	400	525	fz	0.0015	0.0020	0.0023	0.0029	0.0034	0.0038	0.0046		
	4	1 x D	0.4 x D	0.3 x D	350	475	fz	0.0014	0.0018	0.0020	0.0026	0.0030	0.0033	0.0039		
	5	1 x D	0.5 x D	0.75 x D	200	325	fz	0.0012	0.0016	0.0018	0.0023	0.0027	0.0030	0.0036		
	6	1 x D	0.4 x D	0.3 x D	150	225	fz	0.0010	0.0013	0.0015	0.0019	0.0022	0.0024	0.0028		
M	1	1 x D	0.5 x D	0.75 x D	250	325	fz	0.0015	0.0020	0.0023	0.0029	0.0034	0.0038	0.0046		
	2	1 x D	0.5 x D	0.75 x D	190	260	fz	0.0012	0.0016	0.0018	0.0023	0.0027	0.0030	0.0036		
	3	1 x D	0.5 x D	0.75 x D	200	260	fz	0.0010	0.0013	0.0015	0.0019	0.0022	0.0024	0.0028		
K	1	1 x D	0.5 x D	0.75 x D	400	525	fz	0.0018	0.0023	0.0027	0.0035	0.0039	0.0043	0.0050		
	2	1 x D	0.5 x D	0.75 x D	360	460	fz	0.0015	0.0020	0.0023	0.0029	0.0034	0.0038	0.0046		
	3	1 x D	0.5 x D	0.75 x D	330	430	fz	0.0012	0.0016	0.0018	0.0023	0.0027	0.0030	0.0036		
H	1	1 x D	0.4 x D	0.3 x D	300	450	fz	0.0014	0.0018	0.0020	0.0026	0.0030	0.0033	0.0039		

■ MDRHEC

Material Group	Side Milling (A) and Slotting (B)		KCPM15		KC625M		K600		Feed per Tooth — fz information is for side milling (A). For slotting (B), reduce fz by 20%.									
	A		B		Cutting Speed — vc SFM				D1 — Diameter									
	ap	ae	ap		min	max	min	max	min	max	inch	1/4	5/16	3/8	1/2	5/8	3/4	1
												0.250	0.313	0.375	0.500	0.625	0.750	1.000
P	1	1 x D	0.5 x D	0.5 x D	500	650	400	520	200	260	fz	0.0015	0.0019	0.0022	0.0028	0.0032	0.0034	0.0040
	2	1 x D	0.5 x D	0.5 x D	450	625	360	500	180	250	fz	0.0015	0.0019	0.0022	0.0028	0.0032	0.0034	0.0040
	3	1 x D	0.4 x D	0.5 x D	400	525	320	420	—	—	fz	0.0012	0.0016	0.0018	0.0023	0.0027	0.0030	0.0036
	4	1 x D	0.3 x D	0.4 x D	350	475	280	380	—	—	fz	0.0011	0.0014	0.0016	0.0021	0.0024	0.0026	0.0031
	5	1 x D	0.4 x D	0.5 x D	200	325	160	260	—	—	fz	0.0010	0.0013	0.0015	0.0019	0.0022	0.0024	0.0029
M	1	1 x D	0.4 x D	0.5 x D	250	325	200	260	100	130	fz	0.0012	0.0016	0.0018	0.0023	0.0027	0.0030	0.0036
	2	1 x D	0.4 x D	0.5 x D	190	260	152	208	—	—	fz	0.0010	0.0013	0.0015	0.0019	0.0022	0.0024	0.0029
	3	1 x D	0.4 x D	0.5 x D	200	260	160	208	—	—	fz	0.0008	0.0011	0.0012	0.0016	0.0018	0.0019	0.0023
K	1	1 x D	0.5 x D	0.5 x D	400	525	320	420	160	210	fz	0.0015	0.0019	0.0022	0.0028	0.0032	0.0034	0.0040
	2	1 x D	0.4 x D	0.5 x D	360	460	288	368	—	—	fz	0.0012	0.0016	0.0018	0.0023	0.0027	0.0030	0.0036
	3	1 x D	0.4 x D	0.5 x D	330	430	264	344	—	—	fz	0.0010	0.0013	0.0015	0.0019	0.0022	0.0024	0.0029
S	1	1 x D	0.4 x D	0.5 x D	—	—	120	220	—	—	fz	0.0012	0.0016	0.0018	0.0023	0.0027	0.0030	0.0036
	2	1 x D	0.4 x D	0.5 x D	—	—	128	220	—	—	fz	0.0010	0.0013	0.0015	0.0019	0.0022	0.0024	0.0029
H	1	1 x D	0.3 x D	0.4 x D	260	460	208	368	—	—	fz	0.0011	0.0014	0.0016	0.0021	0.0024	0.0026	0.0031

NOTE: These guidelines may require variations to achieve optimum results.

Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >1/2" diameter.

■ HPRST

Material Group													
	Side Milling (A) and Slotting (B)			KC643M		Feed per Tooth — fz information is for side milling (A). For slotting (B), reduce fz by 20%.							
	A		B	Cutting Speed — vc SFM		D1 — Diameter							
	ap	ae	ap	min	max	inch	1/4 0.250	3/8 0.375	1/2 0.500	5/8 0.625	3/4 0.750	1 1.000	
P	3	1 x D	0.5 x D	0.5 x D	390	520	fz	0.0013	0.0019	0.0026	0.0031	0.0038	0.0046
	4	1 x D	0.3 x D	0.4 x D	360	490	fz	0.0012	0.0017	0.0023	0.0027	0.0033	0.0039
	5	1 x D	0.5 x D	0.5 x D	200	330	fz	0.0010	0.0015	0.0021	0.0025	0.0030	0.0036
	6	1 x D	0.3 x D	0.4 x D	160	250	fz	0.0009	0.0013	0.0017	0.0020	0.0024	0.0028
M	1	1 x D	0.5 x D	0.5 x D	260	330	fz	0.0013	0.0019	0.0026	0.0031	0.0038	0.0046
	2	1 x D	0.5 x D	0.5 x D	200	260	fz	0.0010	0.0015	0.0021	0.0025	0.0030	0.0036
	3	1 x D	0.5 x D	0.5 x D	200	260	fz	0.0009	0.0013	0.0017	0.0020	0.0024	0.0028
K	1	1 x D	0.5 x D	0.5 x D	390	520	fz	0.0016	0.0023	0.0031	0.0035	0.0043	0.0050
	2	1 x D	0.5 x D	0.5 x D	360	460	fz	0.0013	0.0019	0.0026	0.0031	0.0038	0.0046
	3	1 x D	0.5 x D	0.5 x D	330	430	fz	0.0010	0.0015	0.0021	0.0025	0.0030	0.0036
S	1	1 x D	0.3 x D	0.3 x D	160	300	fz	0.0013	0.0019	0.0026	0.0031	0.0038	0.0046
	2	1 x D	0.3 x D	0.3 x D	70	130	fz	0.0007	0.0010	0.0014	0.0016	0.0020	0.0025
	3	1 x D	0.4 x D	0.4 x D	160	260	fz	0.0010	0.0015	0.0021	0.0025	0.0030	0.0036
	4	1 x D	0.4 x D	0.4 x D	150	210	fz	0.0009	0.0014	0.0019	0.0023	0.0028	0.0033
H	1	1 x D	0.3 x D	0.3 x D	260	460	fz	0.0012	0.0017	0.0023	0.0027	0.0033	0.0039
	2	1 x D	0.2 x D	0.2 x D	230	390	fz	0.0009	0.0013	0.0017	0.0020	0.0024	0.0028
	3	0.8 x D	0.2 x D	0.2 x D	200	300	fz	0.0004	0.0005	0.0007	0.0009	0.0010	0.0014

NOTE: These guidelines may require variations to achieve optimum results.
 Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
 Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
 For rougher tool with six flutes, use ap in slotting, reduce by 40%.

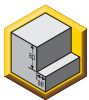
Solid End Milling

General Application Solid Carbide End Mills

Features and Benefits

- Wide range of diameters.
- Short, regular, long, and extra-long overall length.
- Different coatings.

Applications:



Side Milling



Slotting



3-D Milling

Workpiece Materials:

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous Materials
S	High-Temp Alloys
H	Hardened Materials





GOmill™ • The Economical Milling Cutter Line



Primary Application

The GOmill line is specifically engineered to work on short length-of-cut applications in multiple workpiece materials, like soft and hard steels up to 48 HRC, stainless steels, high-temperature alloys, and cast iron. With the very short overall length and soft cutting geometries, the line is made to conform to the growing market of millturn machines.

The 3-flute sharp and 4-flute chamfer versions support roughing, semi-finishing, and finishing applications. The 3-flute ball nose tool supports roughing and semi-finishing applications. The 2-flute ball nose version requires finishing applications. All three geometries work in slotting as well as side milling applications up to 1 x D depth of cut.

Features and Benefits

- Unequal flute spacing.
- AlTiN coating.
- Short overall tool length.
- Positive rake angle.
- Better surface finish and tool life.
- Universal usage on multiple workpiece materials.
- Higher cutting conditions, higher productivity, lower price due to less carbide.
- Lower power consumption.

Portfolio:

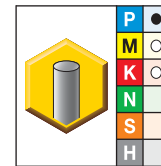
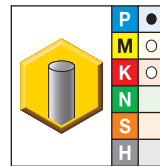
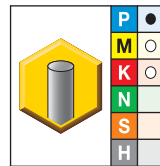
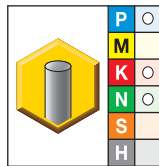
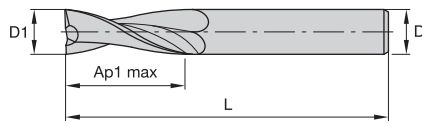
- 4-flute square end, chamfer corner, 5/32–1/2".
- 3-flute square end, sharp corner, 5/64–1/2".
- 3-flute ball nose, 5/64–1/2".
- 2-flute ball nose, 5/64–1/2".

Functions:

- Less vibrations.
- Optimum combination of hardness and toughness.
- Extremely stable.
- Soft cutting.



- Kennametal standard dimensions.
- Center cutting.

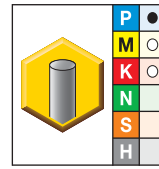
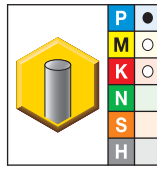
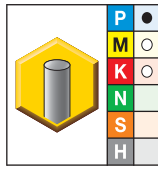
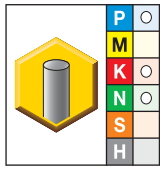


- first choice
- alternate choice

K600		KC610M		KC625M		KC635M		D1	D	Ap1 max	L
HEC016S2	HEC016S2	HEC016S2	HEC016S2	HEC16S2	HEC16S2	—	—	1/64	1/8	1/32	1 1/2
HEC031S2	HEC031S2	HEC031S2	HEC031S2	HEC31S2	HEC31S2	HEC031S2	HEC031S2	1/32	1/8	5/64	1 1/2
HEC047S2	HEC047S2	HEC047S2	HEC047S2	—	—	—	—	3/64	1/8	7/64	1 1/2
—	—	—	—	HEC47S2	HEC47S2	—	—	3/64	1/8	1/8	1 1/2
HEC47S2013	—	—	—	—	—	—	—	3/64	1/8	1/8	1 1/2
—	HEC062S2013	HEC062S2013	HEC062S2013	HEC63S2013	HEC63S2013	HEC062S2013	HEC062S2013	1/16	1/8	1/8	1 1/2
HEC062S2	HEC062S2	HEC062S2	HEC062S2	HEC63S2018	HEC63S2018	HEC062S2	HEC062S2	1/16	1/8	3/16	1 1/2
HEC63S2	—	—	—	HEC63S2	HEC63S2	—	—	1/16	1/8	1/2	2
HEC078S2	HEC078S2	HEC078S2	HEC078S2	HEC78S2	HEC78S2	—	—	5/64	1/8	3/16	1 1/2
—	HEC094S2018	HEC094S2018	HEC094S2018	HEC94S2018	HEC94S2018	HEC094S2018	HEC094S2018	3/32	1/8	3/16	1 1/2
HEC094S2	HEC094S2	HEC094S2	HEC094S2	HEC94S2	HEC94S2	HEC094S2	HEC094S2	3/32	1/8	3/8	1 1/2
HEC094S2063	HEC094S2063	HEC094S2063	HEC094S2063	—	—	HEC094S2063	HEC094S2063	3/32	1/8	5/8	2
HEC109S2	HEC109S2	HEC109S2	HEC109S2	HEC109S2	HEC109S2	—	—	7/64	1/8	3/8	1 1/2
HEC125S2025	HEC125S2025	HEC125S2025	HEC125S2025	HEC125S2025	HEC125S2025	HEC125S2025	HEC125S2025	1/8	1/8	1/4	1 1/2
HEC125S2	HEC125S2	HEC125S2	HEC125S2	HEC125S2	HEC125S2	HEC125S2	HEC125S2	1/8	1/8	1/2	1 1/2
HEC125S2075	HEC125S2075	HEC125S2075	HEC125S2075	HEC125S2075	HEC125S2075	HEC125S2075	HEC125S2075	1/8	1/8	3/4	2 1/4
HEC125S2100	HEC125S2100	HEC125S2100	HEC125S2100	HEC125S2100	HEC125S2100	HEC125S2100	HEC125S2100	1/8	1/8	1	3
HEC141S2	HEC141S2	HEC141S2	HEC141S2	—	—	—	—	9/64	3/16	9/16	2
HEC156S2031	HEC156S2031	HEC156S2031	HEC156S2031	HEC156S2031	HEC156S2031	HEC156S2031	HEC156S2031	5/32	3/16	5/16	2
HEC156S2	HEC156S2	HEC156S2	HEC156S2	HEC156S2	HEC156S2	HEC156S2	HEC156S2	5/32	3/16	9/16	2
—	HEC172S2	HEC172S2	HEC172S2	—	—	—	—	11/64	3/16	5/8	2
HEC188S2031	HEC188S2031	HEC188S2031	HEC188S2031	HEC188S2031	HEC188S2031	HEC188S2031	HEC188S2031	3/16	3/16	5/16	1 1/2
HEC188S2	HEC188S2	HEC188S2	HEC188S2	HEC188S2	HEC188S2	HEC188S2	HEC188S2	3/16	3/16	5/8	2
HEC188S2075	HEC188S2075	HEC188S2075	HEC188S2075	HEC188S2075	HEC188S2075	HEC188S2075	HEC188S2075	3/16	3/16	3/4	2 1/2
HEC188S2113	HEC188S2113	HEC188S2113	HEC188S2113	HEC188S2113	HEC188S2113	HEC188S2113	HEC188S2113	3/16	3/16	1 1/8	3
HEC203S2	HEC203S2	HEC203S2	HEC203S2	—	—	—	—	13/64	1/4	5/8	2 1/2
HEC219S2044	HEC219S2044	HEC219S2044	HEC219S2044	HEC219S2044	HEC219S2044	HEC219S2044	HEC219S2044	7/32	1/4	7/16	2
HEC219S2	HEC219S2	HEC219S2	HEC219S2	HEC219S2	HEC219S2	HEC219S2	HEC219S2	7/32	1/4	5/8	2 1/2
HEC234S2	HEC234S2	HEC234S2	HEC234S2	—	—	—	—	15/64	1/4	3/4	2 1/2
HEC250S2050	HEC250S2050	HEC250S2050	HEC250S2050	HEC250S2050	HEC250S2050	HEC250S2050	HEC250S2050	1/4	1/4	1/2	2
HEC250S2	HEC250S2	HEC250S2	HEC250S2	HEC250S2	HEC250S2	HEC250S2	HEC250S2	1/4	1/4	3/4	2 1/2
HEC250S2113	HEC250S2113	HEC250S2113	HEC250S2113	HEC250S2113	HEC250S2113	HEC250S2113	HEC250S2113	1/4	1/4	1 1/8	3
HEC250S2150	HEC250S2150	HEC250S2150	HEC250S2150	HEC250S2150	HEC250S2150	HEC250S2150	HEC250S2150	1/4	1/4	1 1/2	4
HEC266S2	HEC266S2	HEC266S2	HEC266S2	—	—	—	—	17/64	5/16	3/4	2 1/2
HEC281S2	HEC281S2	HEC281S2	HEC281S2	—	—	HEC281S2	HEC281S2	9/32	5/16	3/4	2 1/2
HEC297S2	HEC297S2	HEC297S2	HEC297S2	—	—	—	—	19/64	5/16	13/16	2 1/2
HEC312S2050	HEC312S2050	HEC312S2050	HEC312S2050	—	—	HEC312S2050	HEC312S2050	5/16	5/16	1/2	2
HEC312S2	HEC312S2	HEC312S2	HEC312S2	HEC312S2	HEC312S2	HEC312S2	HEC312S2	5/16	5/16	13/16	2 1/2
HEC312S2113	HEC312S2113	HEC312S2113	HEC312S2113	—	—	HEC312S2113	HEC312S2113	5/16	5/16	1 1/8	3
HEC312S2163	HEC312S2163	HEC312S2163	HEC312S2163	HEC312S2163	HEC312S2163	HEC312S2163	HEC312S2163	5/16	5/16	1 5/8	4
HEC328S2	HEC328S2	HEC328S2	HEC328S2	—	—	—	—	21/64	3/8	1	2 1/2
HEC344S2	HEC344S2	HEC344S2	HEC344S2	HEC344S2	HEC344S2	—	—	11/32	3/8	1	2 1/2

(continued)

(continued)



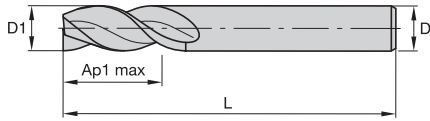
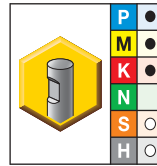
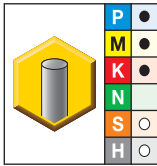
K600		KC610M		KC625M		KC635M		D1	D	Ap1 max	L
HEC375S2063	HEC375S2063	HEC375S2063	HEC375S2063	HEC375S2063	HEC375S2063	HEC375S2063	HEC375S2063	3/8	3/8	5/8	2
HEC375S2088	HEC375S2088	HEC375S2088	HEC375S2088	HEC375S2088	HEC375S2088	HEC375S2088	HEC375S2088	3/8	3/8	7/8	2 1/2
HEC375S2	HEC375S2	HEC375S2	HEC375S2	HEC375S2	HEC375S2	HEC375S2	HEC375S2	3/8	3/8	1	2 1/2
HEC375S2113	HEC375S2113	HEC375S2113	HEC375S2113	HEC375S2113	HEC375S2113	HEC375S2113	HEC375S2113	3/8	3/8	1 1/8	3
HEC375S2175	HEC375S2175	HEC375S2175	HEC375S2175	HEC375S2175	HEC375S2175	HEC375S2175	HEC375S2175	3/8	3/8	1 3/4	4
—	HEC391S2100	—	HEC391S2100	—	HEC391S2100	—	HEC391S2100	25/64	7/16	1	2 3/4
—	HEC406S2100	—	HEC406S2100	—	HEC406S2100	—	HEC406S2100	13/32	7/16	1	2 3/4
HEC438S2063	HEC438S2063	HEC438S2063	HEC438S2063	HEC438S2063	HEC438S2063	HEC438S2063	HEC438S2063	7/16	7/16	5/8	2 1/2
HEC438S2	HEC438S2	HEC438S2	HEC438S2	HEC438S2	HEC438S2	HEC438S2	HEC438S2	7/16	7/16	1	2 1/2
HEC438S2200	HEC438S2200	HEC438S2200	HEC438S2200	HEC438S2200	HEC438S2200	HEC438S2200	HEC438S2200	7/16	7/16	2	4
—	HEC469S2	—	HEC469S2	—	HEC469S2	—	HEC469S2	15/32	1/2	1	3
HEC500S2063	HEC500S2063	HEC500S2063	HEC500S2063	HEC500S2063	HEC500S2063	HEC500S2063	HEC500S2063	1/2	1/2	5/8	2 1/2
HEC500S2	HEC500S2	HEC500S2	HEC500S2	HEC500S2	HEC500S2	HEC500S2	HEC500S2	1/2	1/2	1	3
HEC500S2200	HEC500S2200	HEC500S2200	HEC500S2200	HEC500S2200	HEC500S2200	HEC500S2200	HEC500S2200	1/2	1/2	2	4
HEC500S2200L	—	—	HEC500S2200L	—	HEC500S2200L	—	HEC500S2200L	1/2	1/2	2	4 1/2
HEC500S2300	HEC500S2300	HEC500S2300	HEC500S2300	HEC500S2300	HEC500S2300	HEC500S2300	HEC500S2300	1/2	1/2	3	6
HEC562S2075	HEC562S2075	HEC562S2075	HEC562S2075	HEC562S2075	HEC562S2075	HEC562S2075	HEC562S2075	9/16	9/16	3/4	3
HEC562S2125	HEC562S2125	HEC562S2125	HEC562S2125	HEC562S2125	HEC562S2125	HEC562S2125	HEC562S2125	9/16	9/16	1 1/4	3 1/2
HEC562S2225	HEC562S2225	HEC562S2225	HEC562S2225	HEC562S2225	HEC562S2225	HEC562S2225	HEC562S2225	9/16	9/16	2 1/4	5
HEC625S2075	HEC625S2075	HEC625S2075	HEC625S2075	HEC625S2075	HEC625S2075	HEC625S2075	HEC625S2075	5/8	5/8	3/4	3
HEC625S2	HEC625S2	HEC625S2	HEC625S2	HEC625S2	HEC625S2	HEC625S2	HEC625S2	5/8	5/8	1 1/4	3 1/2
HEC625S2225	HEC625S2225	HEC625S2225	HEC625S2225	HEC625S2225	HEC625S2225	HEC625S2225	HEC625S2225	5/8	5/8	2 1/4	5
HEC625S2400	—	HEC625S2400	HEC625S2400	HEC625S2400	HEC625S2400	HEC625S2400	HEC625S2400	5/8	5/8	4	7
HEC688S2	HEC688S2	HEC688S2	HEC688S2	HEC688S2	HEC688S2	HEC688S2	HEC688S2	11/16	3/4	1 3/8	4
HEC750S2100	HEC750S2100	HEC750S2100	HEC750S2100	HEC750S2100	HEC750S2100	HEC750S2100	HEC750S2100	3/4	3/4	1	3
HEC750S2	HEC750S2	HEC750S2	HEC750S2	HEC750S2	HEC750S2	HEC750S2	HEC750S2	3/4	3/4	1 1/2	4
HEC750S2225	HEC750S2225	HEC750S2225	HEC750S2225	HEC750S2225	HEC750S2225	HEC750S2225	HEC750S2225	3/4	3/4	2 1/4	5
HEC750S2300	HEC750S2300	HEC750S2300	HEC750S2300	HEC750S2300	HEC750S2300	HEC750S2300	HEC750S2300	3/4	3/4	3	6
HEC750S2400	—	HEC750S2400	HEC750S2400	HEC750S2400	HEC750S2400	HEC750S2400	HEC750S2400	3/4	3/4	4	7
HEC875S2	HEC875S2	HEC875S2	HEC875S2	HEC875S2	HEC875S2	HEC875S2	HEC875S2	7/8	7/8	1 1/2	4
—	—	—	HEC875S2225	—	HEC875S2225	—	HEC875S2225	7/8	7/8	2 1/4	5
—	—	HEC1000S2	HEC1000S2	—	HEC1000S2	—	HEC1000S2	1	1	1 1/2	4
HEC100S2	HEC100S2	HEC100S2	HEC100S2	HEC100S2	HEC100S2	HEC100S2	HEC100S2	1	1	1 1/2	4
HEC100S2225	HEC100S2225	HEC100S2225	HEC100S2225	HEC100S2225	HEC100S2225	HEC100S2225	HEC100S2225	1	1	2 1/4	5
—	HEC100S2300	—	HEC100S2300	—	HEC100S2300	—	HEC100S2300	1	1	3	6
HEC100S2400	—	HEC100S2400	HEC100S2400	—	HEC100S2400	—	HEC100S2400	1	1	4	7

NOTE: For application data, see page M99.

End Mill Tolerances

D1	tolerance	D	tolerance h6
All	+0.000/-0.002"	≤1/8"	+0/-0.00024"
		>1/8-1/4"	+0/-0.00031"
		>1/4-3/8"	+0/-0.00035"
		>3/8-23/32"	+0/-0.00043"
		>23/32-1 3/16"	+0/-0.00051"

- Kennametal standard dimensions.
- Center cutting.
- Unequal flute spacing minimizes chatter for smoother machining.
- Single tool for both roughing and finishing operations for fewer setups.


GOMill


- first choice
- alternate choice

KC643M		KC643M		D1	D	Ap1 max	L
UEDE0078J3AS	UEDE0078K3AS	5/64	1/4	5/32	1 1/2		
UEDE0094J3AS	UEDE0094K3AS	3/32	1/4	5/32	1 1/2		
UEDE0125J3AS	UEDE0125K3AS	1/8	1/4	13/64	1 1/2		
UEDE0156J3AS	UEDE0156K3AS	5/32	1/4	17/64	1 1/2		
UEDE0188J3AS	UEDE0188K3AS	3/16	1/4	19/64	1 1/2		
UEDE0250J3AS	UEDE0250K3AS	1/4	1/4	21/64	1 1/2		
UEDE0312J3AS	UEDE0312K3AS	5/16	5/16	27/64	1 3/4		
UEDE0375J3AS	UEDE0375K3AS	3/8	3/8	31/64	2		
UEDE0437J3AS	UEDE0437K3AS	7/16	7/16	9/16	2 5/32		
UEDE0500J3AS	UEDE0500K3AS	1/2	1/2	5/8	2 5/32		

NOTE: For application data, see page M101.

End Mill Tolerances

D1	tolerance	D	tolerance h6
All	+0.000/-0.002"	≤1/8"	+0/-0.00024"
		>1/8-1/4"	+0/-0.00031"
		>1/4-3/8"	+0/-0.00035"
		>3/8-23/32"	+0/-0.00043"
		>23/32-1 3/16"	+0/-0.00051"

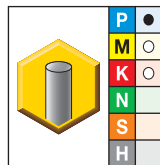
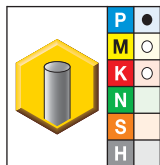
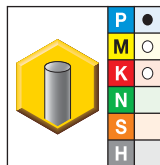
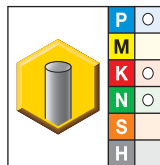
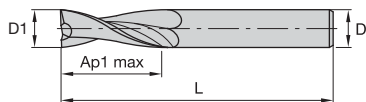
Solid End Milling

General Application Finishing End Mills

HEC • Conventional Lengths



- Kennametal standard dimensions.
- Center cutting.



- first choice
- alternate choice

	K600	KC610M	KC625M	KC635M	D1	D	Ap1 max	L	Re
	—	HEC031S3	—	—	1/32	1/8	5/64	1 1/2	—
	HEC047S3	HEC047S3	—	—	3/64	1/8	7/64	1 1/2	—
	HEC062S3	HEC062S3	—	—	1/16	1/8	3/16	1 1/2	—
	HEC094S3	HEC094S3	—	—	3/32	1/8	3/8	1 1/2	—
	HEC109S3	HEC109S3	—	—	7/64	1/8	3/8	1 1/2	—
	HEC125S3	HEC125S3	—	—	1/8	1/8	1/2	1 1/2	—
	HEC125S350R10	—	HEC125S350R10	HEC125S350R10	1/8	1/8	1/2	1 1/2	.010
	HEC125S325R10	—	HEC125S325R10	HEC125S325R10	1/8	1/8	1/4	1 1/2	.010
	HEC141S3	HEC141S3	—	—	9/64	3/16	9/16	2	—
	HEC156S3	HEC156S3	—	—	5/32	3/16	9/16	2	—
	HEC156S356R10	—	—	HEC156S356R10	5/32	5/32	9/16	2	.010
	HEC188S356R10	—	HEC188S331R10	HEC188S331R10	3/16	3/16	5/16	2	.010
	HEC188S3	HEC188S3	—	—	3/16	3/16	5/8	2	—
	HEC188S363R10	—	HEC188S363R10	HEC188S363R10	3/16	3/16	5/8	2	.010
	—	HEC203S3	—	—	13/64	1/4	5/8	2 1/2	—
	HEC219S375R20	—	HEC219S375R20	HEC219S375R20	7/32	1/4	3/4	2 1/2	.020
	HEC219S3	HEC219S3	—	—	7/32	1/4	5/8	2 1/2	—
	HEC250S350R20	—	HEC250S350R20	HEC250S350R20	1/4	1/4	1/2	2	.020
	HEC250S3	HEC250S3	—	—	1/4	1/4	3/4	2 1/2	—
	HEC250S375R20	—	HEC250S375R20	HEC250S375R20	1/4	1/4	3/4	2 1/2	.020
	—	HEC281S3	HEC281S381R20	HEC281S381R20	9/32	5/16	13/16	2 1/2	.020
	HEC281S3	HEC281S3	—	—	9/32	5/16	3/4	2 1/2	—
	HEC312S350R20	—	HEC312S350R20	HEC312S350R20	5/16	5/16	1/2	2	.020
	HEC312S381R20	—	HEC312S381R20	HEC312S381R20	5/16	5/16	13/16	2 1/2	.020
	HEC312S3	HEC312S3	—	—	5/16	5/16	13/16	2 1/2	—
	—	HEC328S3	—	—	21/64	3/8	1	2 1/2	—
	HEC344S388R20	—	—	—	11/32	11/32	7/8	2 1/2	.020
	HEC344S3	HEC344S3	—	—	11/32	3/8	1	2 1/2	—
	HEC375S3	HEC375S3	—	—	3/8	3/8	1	2 1/2	—
	HEC375S3113	HEC375S3113	—	—	3/8	3/8	1 1/8	3	—
	HEC375S350R20	—	HEC375S350R20	HEC375S350R20	3/8	3/8	1/2	2	.020
	HEC375S388R20	—	HEC375S388R20	HEC375S388R20	3/8	3/8	7/8	2 1/2	.020
	HEC375S3088	HEC375S3088	—	—	3/8	3/8	7/8	2 1/2	—
	—	HEC406S3	—	—	13/32	7/16	1	2 1/2	—
	HEC438S3	HEC438S3	—	—	7/16	7/16	1	2 1/2	—
	—	—	HEC438S363R20	HEC438S363R20	7/16	7/16	5/8	2 1/2	.020
	HEC438S388R20	—	—	HEC438S388R20	7/16	7/16	7/8	2 1/2	.020
	HEC500S3	HEC500S3	—	—	1/2	1/2	1	3	—
	HEC500S3200	HEC500S3200	—	—	1/2	1/2	2	4	—
	HEC563S3113	—	—	—	9/16	9/16	1 1/8	3 1/2	—
	HEC625S3	HEC625S3	—	—	5/8	5/8	1 1/4	3 1/2	—
	HEC688S3138	—	—	—	11/16	3/4	1 3/8	4	—
	HEC750S3	HEC750S3	—	—	3/4	3/4	1 1/2	4	—
	HEC750S3225	HEC750S3225	—	—	3/4	3/4	2 1/4	5	—
	HEC100S3	HEC100S3	—	—	1	1	1 1/2	4	—
	HEC100S3225	HEC100S3225	—	—	1	1	2 1/4	5	—

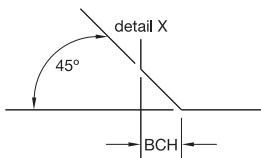
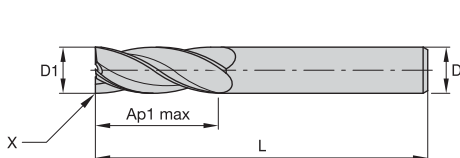
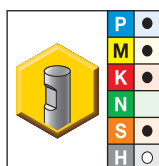
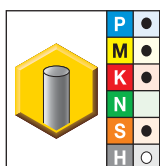
NOTE: For application data, see page M99.

End Mill Tolerances

D1	tolerance	D	tolerance h6
All	+0.000/-0.002"	≤1/8"	+0/-0.00024"
		>1/8-1/4"	+0/-0.00031"
		>1/4-3/8"	+0/-0.00035"
		>3/8-23/32"	+0/-0.00043"
		>23/32-1 3/16"	+0/-0.00051"



- Kennametal standard dimensions.
- Center cutting.
- Unequal flute spacing minimizes chatter for smoother machining.
- Single tool for both roughing and finishing operations for fewer setups.


GOMill


- first choice
- alternate choice

KC643M		KC643M		D1	D	Ap1 max	L	BCH
UEDE0156J4AH	UEDE0156K4AH	5/32	1/4	17/64	1 1/2	.016		
UEDE0188J4AH	UEDE0188K4AH	3/16	1/4	19/64	1 1/2	.016		
UEDE0250J4AH	UEDE0250K4AH	1/4	1/4	21/64	1 1/2	.016		
UEDE0312J4AH	UEDE0312K4AH	5/16	5/16	27/64	1 3/4	.016		
UEDE0375J4AH	UEDE0375K4AH	3/8	3/8	31/64	2	.020		
UEDE0437J4AH	UEDE0437K4AH	7/16	7/16	9/16	2 5/32	.020		
UEDE0500J4AH	UEDE0500K4AH	1/2	1/2	5/8	2 5/32	.020		

NOTE: For application data, see page M101.

End Mill Tolerances

D1	tolerance	D	tolerance h6
All	+0.000/-0.002"	≤1/8"	+0/-0.00024"
		>1/8-1/4"	+0/-0.00031"
		>1/4-3/8"	+0/-0.00035"
		>3/8-23/32"	+0/-0.00043"
		>23/32-1 3/16"	+0/-0.00051"



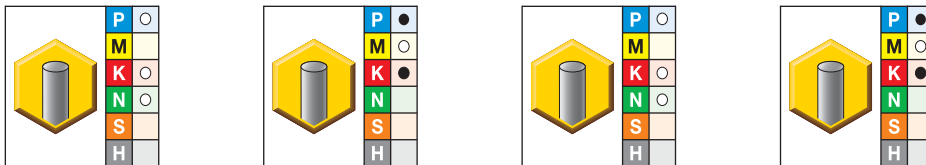
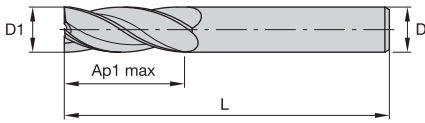
Solid End Milling

General Application Solid Carbide End Mills

HEC • Conventional Lengths



- Kennametal standard dimensions.
- Center cutting.



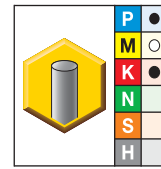
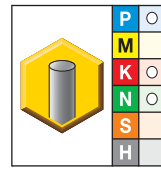
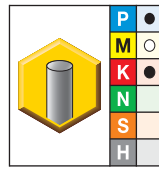
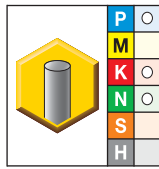
- first choice
- alternate choice

Solid End Milling

	K600	KC610M	KC625M	KC635M	D1	D	Ap1 max	L
HEC016S4	HEC016S4	HEC016S4	—	—	1/64	1/8	1/32	1 1/2
HEC031S4	HEC031S4	HEC031S4	—	HEC031S4	1/32	1/8	5/64	1 1/2
HEC047S4	HEC047S4	HEC047S4	—	—	3/64	1/8	7/64	1 1/2
HEC062S4013	HEC062S4013	HEC062S4013	—	HEC062S4013	1/16	1/8	1/8	1 1/2
HEC062S4	HEC062S4	—	—	HEC062S4	1/16	1/8	3/16	1 1/2
HEC062S4050	—	—	HEC062S4050	—	1/16	1/8	1/2	2
HEC078S4	HEC078S4	HEC078S4	—	—	5/64	1/8	3/16	1 1/2
HEC094S4018	HEC094S4018	HEC094S4018	—	HEC094S4018	3/32	1/8	3/16	1 1/2
HEC094S4	HEC094S4	HEC094S4	—	HEC094S4	3/32	1/8	3/8	1 1/2
HEC094S4063	HEC094S4063	HEC094S4063	—	HEC094S4063	3/32	1/8	5/8	2
HEC109S4	HEC109S4	HEC109S4	—	—	7/64	1/8	3/8	1 1/2
HEC125S4025	HEC125S4025	HEC125S4025	—	HEC125S4025	1/8	1/8	1/4	1 1/2
HEC125S4	HEC125S4	HEC125S4	—	HEC125S4	1/8	1/8	1/2	1 1/2
HEC125S4075	HEC125S4075	HEC125S4075	—	HEC125S4075	1/8	1/8	3/4	2 1/4
HEC125S4100	HEC125S4100	HEC125S4100	—	HEC125S4100	1/8	1/8	1	3
HEC141S4	HEC141S4	HEC141S4	—	—	9/64	3/16	9/16	2
HEC156S4031	HEC156S4031	HEC156S4031	—	HEC156S4031	5/32	3/16	5/16	2
HEC156S4	HEC156S4	HEC156S4	—	HEC156S4	5/32	3/16	9/16	2
HEC172S4	HEC172S4	HEC172S4	—	—	11/64	3/16	5/8	2
HEC188S4	HEC188S4	HEC188S4	—	HEC188S4	3/16	3/16	5/8	2
HEC188S4031	HEC188S4031	HEC188S4031	—	HEC188S4031	3/16	3/16	3/4	1 1/2
HEC188S4075	HEC188S4075	HEC188S4075	—	HEC188S4075	3/16	3/16	3/4	2 1/2
HEC188S4113	HEC188S4113	HEC188S4113	—	HEC188S4113	3/16	3/16	1 1/8	3
HEC203S4	HEC203S4	HEC203S4	—	—	13/64	1/4	5/8	2 1/2
HEC219S4044	HEC219S4044	HEC219S4044	—	HEC219S4044	7/32	1/4	7/16	2
HEC219S4	HEC219S4	HEC219S4	—	HEC219S4	7/32	1/4	5/8	2 1/2
HEC234S4	HEC234S4	HEC234S4	—	—	15/64	1/4	3/4	2 1/2
HEC250S4038	—	—	—	—	1/4	1/4	3/8	2
HEC250S4050	HEC250S4050	HEC250S4050	—	HEC250S4050	1/4	1/4	1/2	2
HEC250S4	HEC250S4	HEC250S4	HEC250S4	HEC250S4	1/4	1/4	3/4	2 1/2
HEC250S4113	HEC250S4113	HEC250S4113	—	HEC250S4113	1/4	1/4	1 1/8	3
HEC250S4150	HEC250S4150	HEC250S4150	—	HEC250S4150	1/4	1/4	1 1/2	4
HEC250S4150L	—	—	—	HEC250S4150L	1/4	1/4	1 1/2	6
HEC266S4	HEC266S4	HEC266S4	—	—	17/64	5/16	3/4	2 1/2
HEC281S4	HEC281S4	HEC281S4	—	HEC281S4	9/32	5/16	3/4	2 1/2
HEC297S4	HEC297S4	HEC297S4	—	—	19/64	5/16	13/16	2 1/2
HEC313S4044	—	—	—	—	5/16	5/16	7/16	2
HEC312S4050	HEC312S4050	HEC312S4050	—	HEC312S4050	5/16	5/16	1/2	2
HEC312S4	HEC312S4	HEC312S4	—	HEC312S4	5/16	5/16	13/16	2 1/2
HEC312S4113	HEC312S4113	HEC312S4113	—	HEC312S4113	5/16	5/16	1 1/8	3
HEC312S4163	HEC312S4163	HEC312S4163	—	HEC312S4163	5/16	5/16	1 5/8	4
—	HEC328S4	HEC328S4	—	—	21/64	3/8	1	2 1/2
HEC344S4	HEC344S4	HEC344S4	—	—	11/32	3/8	1	2 1/2
HEC360S4	HEC360S4	HEC360S4	—	—	23/64	3/8	1	2 1/2

(continued)

(continued)



K600		KC610M		KC625M		KC635M		D1	D	Ap1 max	L
HEC375S4063	HEC375S4063	HEC375S4063	HEC375S4063	—	HEC375S4063	3/8	3/8	5/8	2		
HEC375S4088	HEC375S4088	HEC375S4088	HEC375S4088	—	HEC375S4088	3/8	3/8	7/8	2 1/2		
HEC375S4	HEC375S4	—	HEC375S4	—	HEC375S4	3/8	3/8	1	2 1/2		
HEC375S4100	—	HEC375S4100	HEC375S4100	—	HEC375S4100	3/8	3/8	1	4		
HEC375S4113	HEC375S4113	—	HEC375S4113	—	HEC375S4113	3/8	3/8	1 1/8	3		
HEC375S4150L	—	—	HEC375S4150L	—	HEC375S4150L	3/8	3/8	1 1/2	6		
HEC375S4175	HEC375S4175	—	HEC375S4175	—	HEC375S4175	3/8	3/8	1 3/4	4		
—	HEC391S4100	—	HEC391S4100	—	—	25/64	7/16	1	2 3/4		
—	HEC406S4100	—	HEC406S4100	—	—	13/32	7/16	1	2 3/4		
—	HEC422S4100	—	HEC422S4100	—	—	27/64	7/16	1	2 3/4		
HEC438S4063	HEC438S4063	—	HEC438S4063	—	HEC438S4063	7/16	7/16	5/8	2 1/2		
HEC438S4088	—	—	HEC438S4088	—	—	7/16	7/16	7/8	2 1/2		
HEC438S4	HEC438S4	—	HEC438S4	—	HEC438S4	7/16	7/16	1	2 1/2		
HEC438S4100	HEC438S4100	—	HEC438S4100	—	HEC438S4100	7/16	7/16	1	2 3/4		
HEC438S4200	HEC438S4200	—	HEC438S4200	—	HEC438S4200	7/16	7/16	2	4 1/2		
HEC438S4600	HEC438S4600	—	HEC438S4600	—	—	7/16	7/16	3	6		
HEC453S4100	—	—	HEC453S4100	—	—	29/64	1/2	1	3		
—	HEC469S4	—	HEC469S4	—	—	15/32	1/2	1	3		
—	HEC484S4	—	HEC484S4	—	—	31/64	1/2	1	3		
HEC500S4063	HEC500S4063	—	HEC500S4063	—	HEC500S4063	1/2	1/2	5/8	2 1/2		
HEC500S4	HEC500S4	HEC500S4	HEC500S4	HEC500S4	HEC500S4	1/2	1/2	1	3		
HEC500S4100	—	HEC500S4100	HEC500S4100	HEC500S4100	HEC500S4100	1/2	1/2	1	4		
HEC500S4200	HEC500S4200	—	HEC500S4200	—	HEC500S4200	1/2	1/2	2	4		
HEC500S4450	HEC500S4450	—	HEC500S4450	—	—	1/2	1/2	2	4 1/2		
HEC500S4300	HEC500S4300	—	HEC500S4300	—	HEC500S4300	1/2	1/2	3	6		
HEC562S4075	HEC562S4075	—	HEC562S4075	—	—	9/16	9/16	3/4	3		
HEC562S4125	HEC562S4125	—	HEC562S4125	—	HEC562S4125	9/16	9/16	1 1/4	3 1/2		
HEC562S4225	HEC562S4225	—	HEC562S4225	—	HEC562S4225	9/16	9/16	2 1/4	5		
HEC625S4075	HEC625S4075	—	HEC625S4075	—	HEC625S4075	5/8	5/8	3/4	3		
HEC625S4	HEC625S4	—	HEC625S4	—	HEC625S4	5/8	5/8	1 1/4	3 1/2		
HEC625S4225	HEC625S4225	—	HEC625S4225	—	HEC625S4225	5/8	5/8	2 1/4	5		
HEC625S4400	—	—	HEC625S4400	—	HEC625S4400	5/8	5/8	4	7		
HEC688S4	HEC688S4	—	HEC688S4	—	—	11/16	3/4	1 3/8	4		
HEC750S4100	HEC750S4100	—	HEC750S4100	—	HEC750S4100	3/4	3/4	1	3		
HEC750S4	HEC750S4	HEC750S4	HEC750S4	HEC750S4	HEC750S4	3/4	3/4	1 1/2	4		
HEC750S4225	HEC750S4225	—	HEC750S4225	—	HEC750S4225	3/4	3/4	2 1/4	5		
HEC750S4300	HEC750S4300	—	HEC750S4300	—	HEC750S4300	3/4	3/4	3	6		
HEC750S4400	—	—	HEC750S4400	—	HEC750S4400	3/4	3/4	4	7		
HEC875S4	HEC875S4	—	HEC875S4	—	—	7/8	7/8	1 1/2	4		
HEC875S4225	—	—	HEC875S4225	—	HEC875S4225	7/8	7/8	2 1/4	5		
HEC100S4	HEC100S4	—	HEC100S4	—	HEC100S4	1	1	1 1/2	4		
HEC100S4225	HEC100S4225	—	HEC100S4225	—	HEC100S4225	1	1	2 1/4	5		
HEC100S4300	HEC100S4300	—	HEC100S4300	—	HEC100S4300	1	1	3	6		
HEC100S4400	—	—	HEC100S4400	—	HEC100S4400	1	1	4	7		
HEC1250S4200	—	—	HEC1250S4200	—	HEC1250S4200	1 1/4	1 1/4	2	4 1/2		



NOTE: For application data, see page M100.

End Mill Tolerances

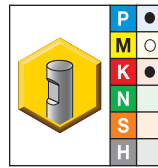
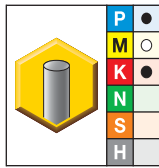
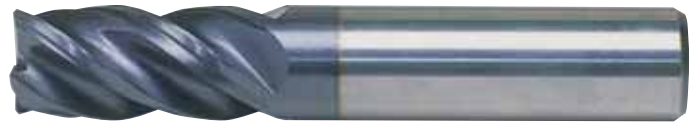
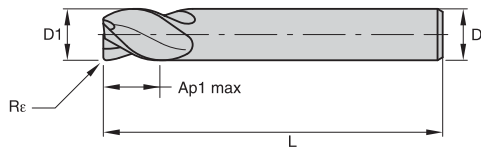
D1	tolerance	D	tolerance h6
All	+0.000/-0.002"	≤1/8"	+0/-0.00024"
		>1/8-1/4"	+0/-0.00031"
		>1/4-3/8"	+0/-0.00035"
		>3/8-23/32"	+0/-0.00043"
		>23/32-1 3/16"	+0/-0.00051"

General Application Solid Carbide End Mills

CRHEC • Conventional Lengths



- Kennametal standard dimensions.
- Center cutting.



- first choice
- alternate choice

Solid End Milling

KC635M		KC635M	D1	D	Ap1 max	L	Re
CRHEC125S4R15	—	—	1/8	1/8	1/2	1 1/2	.015
CRHEC125S4R20	—	—	1/8	1/8	1/2	1 1/2	.020
CRHEC188S4R15	—	—	3/16	3/16	5/8	2	.015
CRHEC188S4R20	—	—	3/16	3/16	5/8	2	.020
CRHEC188S4R30	—	—	3/16	3/16	5/8	2	.030
CRHEC250S4R15	—	—	1/4	1/4	3/4	2 1/2	.015
CRHEC250S4R20	—	—	1/4	1/4	3/4	2 1/2	.020
CRHEC250S4R30	—	—	1/4	1/4	3/4	2 1/2	.030
CRHEC250S4R45	—	—	1/4	1/4	3/4	2 1/2	.045
CRHEC312S4R15	—	—	5/16	5/16	13/16	2 1/2	.015
CRHEC312S4R20	—	—	5/16	5/16	13/16	2 1/2	.020
CRHEC312S4R30	—	—	5/16	5/16	13/16	2 1/2	.030
CRHEC312S4R45	—	—	5/16	5/16	13/16	2 1/2	.045
—	—	CRHEC375S4R15	3/8	3/8	1	2 1/2	.015
—	—	CRHEC375S4R20	3/8	3/8	1	2 1/2	.020
—	—	CRHEC375S4R30	3/8	3/8	1	2 1/2	.030
—	—	CRHEC375S4R45	3/8	3/8	1	2 1/2	.045
—	—	CRHEC500S4R15	1/2	1/2	1	3	.015
—	—	CRHEC500S4R20	1/2	1/2	1	3	.020
—	—	CRHEC500S4R30	1/2	1/2	1	3	.030
—	—	CRHEC500S4R45	1/2	1/2	1	3	.045
—	—	CRHEC500S4R60	1/2	1/2	1	3	.060
—	—	CRHEC625S4R15	5/8	5/8	1 1/4	3 1/2	.015
—	—	CRHEC625S4R30	5/8	5/8	1 1/4	3 1/2	.030
—	—	CRHEC625S4R60	5/8	5/8	1 1/4	3 1/2	.060
—	—	CRHEC625S4R90	5/8	5/8	1 1/4	3 1/2	.090
—	—	CRHEC750S4R15	3/4	3/4	1 1/2	4	.015
—	—	CRHEC750S4R20	3/4	3/4	1 1/2	4	.020
—	—	CRHEC750S4R30	3/4	3/4	1 1/2	4	.030
—	—	CRHEC750S4R60	3/4	3/4	1 1/2	4	.060
—	—	CRHEC750S4R90	3/4	3/4	1 1/2	4	.090
—	—	CRHEC750S4R125	3/4	3/4	1 1/2	4	.125
—	—	CRHEC100S4R15	1	1	1 1/2	4	.015
—	—	CRHEC100S4R30	1	1	1 1/2	4	.030
—	—	CRHEC100S4R60	1	1	1 1/2	4	.060
—	—	CRHEC100S4R90	1	1	1 1/2	4	.090
—	—	CRHEC100S4R125	1	1	1 1/2	4	.125

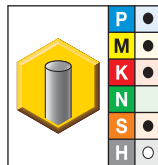
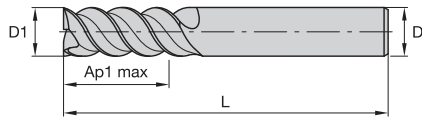
NOTE: For application data, see page M102.

End Mill Tolerances

D1	tolerance	D	tolerance h6
All	+0.000/-0.002"	≤1/8"	+0/-0.00024"
		>1/8-1/4"	+0/-0.00031"
		>1/4-3/8"	+0/-0.00035"
		>3/8-23/32"	+0/-0.00043"
		>23/32-1 3/16"	+0/-0.00051"



- Kennametal standard dimensions.
- Center cutting.



- first choice
- alternate choice

	D1	D	Ap1 max	L
KC635M				
HHEC125S3	1/8	1/4	1/2	2 1/2
HHEC188S3	3/16	1/4	5/8	2 1/2
HHEC250S3	1/4	1/4	3/4	2 1/2
HHEC312S3	5/16	5/16	13/16	2 1/2
HHEC375S3	3/8	3/8	7/8	2 1/2
HHEC438S3	7/16	7/16	1	3
HHEC500S3	1/2	1/2	1	3
HHEC562S3	9/16	9/16	1 1/4	3 1/2
HHEC625S3	5/8	5/8	1 1/4	3 1/2
HHEC750S3	3/4	3/4	1 1/2	4
HHEC100S3	1	1	1 1/2	4

NOTE: For application data, see page M102.

End Mill Tolerances

D1	tolerance	D	tolerance h6
All	+0.000/-0.002"	≤1/8"	+0/-0.00024"
		>1/8-1/4"	+0/-0.00031"
		>1/4-3/8"	+0/-0.00035"
		>3/8-23/32"	+0/-0.00043"
		>23/32-1 3/16"	+0/-0.00051"

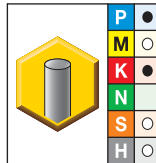
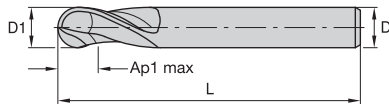
Solid End Milling

General Application Solide Carbide End Mills

UEBD • GOMill™ • Short



- Kennametal standard dimensions.
- Center cutting.
- Single tool for both semi-finishing and finishing operations for fewer setups.



- first choice
- alternate choice

KC643M	D1	D	Ap1 max	L
UEBD0078J2A	5/64	1/4	5/32	1 1/2
UEBD0094J2A	3/32	1/4	5/32	1 1/2
UEBD0125J2A	1/8	1/4	13/64	1 1/2
UEBD0156J2A	5/32	1/4	17/64	1 1/2
UEBD0188J2A	3/16	1/4	19/64	1 1/2
UEBD0250J2A	1/4	1/4	21/64	1 1/2
UEBD0312J2A	5/16	5/16	27/64	1 3/4
UEBD0375J2A	3/8	3/8	31/64	2
UEBD0437J2A	7/16	7/16	9/16	2 5/32
UEBD0500J2A	1/2	1/2	5/8	2 5/32

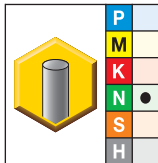
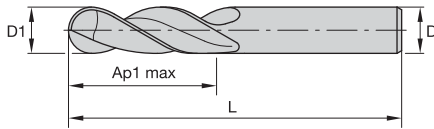
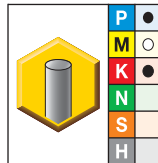
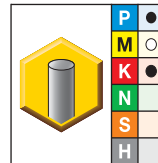
NOTE: For application data, see page M103.

Solid End Milling

End Mill Tolerances

D1	tolerance	D	tolerance h6
All	+0.000/-0.002"	≤1/8"	+0/-0.00024"
		>1/8-1/4"	+0/-0.00031"
		>1/4-3/8"	+0/-0.00035"
		>3/8-23/32"	+0/-0.00043"
		>23/32-1 3/16"	+0/-0.00051"

- Kennametal standard dimensions.
- Center cutting.


K600

KC610M

KC635M

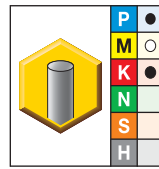
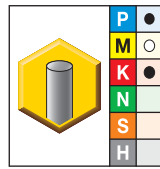
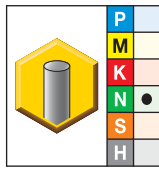
- first choice
- alternate choice

			D1	D	Ap1 max	L
BNEC016S2	BNEC016S2	—	1/64	1/8	1/32	1 1/2
BNEC031S2	BNEC031S2	BNEC031S2	1/32	1/8	5/64	1 1/2
BNEC047S2	BNEC047S2	—	3/64	1/8	1/8	1 1/2
BNEC062S2	BNEC062S2	BNEC062S2	1/16	1/8	3/16	1 1/2
BNEC078S2	BNEC078S2	—	5/64	1/8	3/16	1 1/2
BNEC094S2018	BNEC094S2018	BNEC094S2018	3/32	1/8	3/16	1 1/2
BNEC094S2	BNEC094S2	BNEC094S2	3/32	1/8	3/8	1 1/2
BNEC109S2	BNEC109S2	—	7/64	1/8	3/8	1 1/2
BNEC125S2025	BNEC125S2025	BNEC125S2025	1/8	1/8	1/4	1 1/2
BNEC125S2	BNEC125S2	BNEC125S2	1/8	1/8	1/2	1 1/2
BNEC125S2075	BNEC125S2075	BNEC125S2075	1/8	1/8	3/4	2 1/4
BNEC125S2075L	BNEC125S2075L	BNEC125S2075L	1/8	1/8	3/4	3
BNEC156S2031	BNEC156S2031	BNEC156S2031	5/32	3/16	5/16	2
BNEC156S2	BNEC156S2	BNEC156S2	5/32	3/16	9/16	2
BNEC188S2031	BNEC188S2031	BNEC188S2031	3/16	3/16	5/16	1 1/2
BNEC188S2	BNEC188S2	BNEC188S2	3/16	3/16	5/8	2
BNEC188S2075	BNEC188S2075	BNEC188S2075	3/16	3/16	3/4	2 1/2
BNEC188S2100	BNEC188S2100	BNEC188S2100	3/16	3/16	1	4
BNEC188S2300	BNEC188S2300	—	3/16	3/16	1 1/8	3
BNEC219S2	BNEC219S2	—	7/32	1/4	5/8	2 1/2
BNEC250S2050	BNEC250S2050	BNEC250S2050	1/4	1/4	1/2	2
BNEC250S2	BNEC250S2	BNEC250S2	1/4	1/4	3/4	2 1/2
BNEC250S2113	BNEC250S2113	BNEC250S2113	1/4	1/4	1 1/8	3
BNEC250S2150	BNEC250S2150	BNEC250S2150	1/4	1/4	1 1/2	4
BNEC250S2150L	BNEC250S2150L	BNEC250S2150L	1/4	1/4	1 1/2	6
BNEC312S2050	BNEC312S2050	BNEC312S2050	5/16	5/16	1/2	2
BNEC312S2	BNEC312S2	BNEC312S2	5/16	5/16	13/16	2 1/2
—	BNEC312S2113	BNEC312S2113	5/16	5/16	1 1/8	3
BNEC312S2150	BNEC312S2150	BNEC312S2150	5/16	5/16	1 1/2	6
BNEC375S2063	BNEC375S2063	BNEC375S2063	3/8	3/8	5/8	2
BNEC375S2088	BNEC375S2088	BNEC375S2088	3/8	3/8	7/8	2 1/2
BNEC375S2113	BNEC375S2113	BNEC375S2113	3/8	3/8	1 1/8	3
BNEC375S2175	BNEC375S2175	BNEC375S2175	3/8	3/8	1 3/4	4
BNEC375S2300L	BNEC375S2300L	BNEC375S2300L	3/8	3/8	3	6
BNEC406S2100	BNEC406S2100	—	13/32	7/16	1	2 1/2
BNEC438S2100	BNEC438S2100	BNEC438S2100	7/16	7/16	1	2 1/2
BNEC500S2063	BNEC500S2063	BNEC500S2063	1/2	1/2	5/8	2 1/2
BNEC500S2	BNEC500S2	BNEC500S2	1/2	1/2	1	3
BNEC500S2150	BNEC500S2150	BNEC500S2150	1/2	1/2	1 1/2	6
BNEC500S2200	BNEC500S2200	BNEC500S2200	1/2	1/2	2	4

(continued)

Solid End Milling

(continued)



K600		KC610M		KC635M		D1	D	Ap1 max	L
BNEC500S2300	BNEC500S2300	BNEC500S2300	BNEC500S2300	BNEC500S2300	BNEC500S2300	1/2	1/2	3	6
BNEC562S2	BNEC562S2	BNEC562S2	BNEC562S2	BNEC562S2	BNEC562S2	9/16	9/16	1 1/4	3 1/2
BNEC625S2	BNEC625S2	BNEC625S2	BNEC625S2	BNEC625S2	BNEC625S2	5/8	5/8	1 1/4	3 1/2
BNEC625S2225	—	—	—	—	—	5/8	5/8	2 1/4	5
BNEC625S2300	BNEC625S2300	BNEC625S2300	BNEC625S2300	BNEC625S2300	BNEC625S2300	5/8	5/8	3	6
BNEC750S2100	BNEC750S2100	BNEC750S2100	BNEC750S2100	BNEC750S2100	BNEC750S2100	3/4	3/4	1	3
BNEC750S2	BNEC750S2	BNEC750S2	BNEC750S2	BNEC750S2	BNEC750S2	3/4	3/4	1 1/2	4
BNEC750S2200	BNEC750S2200	BNEC750S2200	BNEC750S2200	BNEC750S2200	BNEC750S2200	3/4	3/4	2	6
BNEC750S2225	—	—	—	—	—	3/4	3/4	2 1/4	5
BNEC750S2600	BNEC750S2600	BNEC750S2600	BNEC750S2600	—	—	3/4	3/4	3	6
—	BNEC875S2	BNEC875S2	BNEC875S2	BNEC875S2	BNEC875S2	7/8	7/8	1 1/2	4
BNEC100S2	BNEC100S2	BNEC100S2	BNEC100S2	BNEC100S2	BNEC100S2	1	1	1 1/2	4
BNEC100S2225	—	—	—	—	—	1	1	2 1/4	5
BNEC100S2300	BNEC100S2300	BNEC100S2300	BNEC100S2300	BNEC100S2300	BNEC100S2300	1	1	3	6

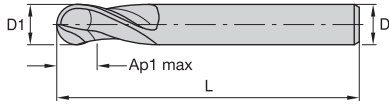
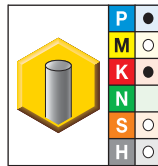
NOTE: For application data, see page M104.

End Mill Tolerances

D1	tolerance	D	tolerance h6
All	+0.000/-0.003"	≤1/8"	+0/-0.00024"
		>1/8-1/4"	+0/-0.00031"
		>1/4-3/8"	+0/-0.00035"
		>3/8-23/32"	+0/-0.00043"
		>23/32-1 3/16"	+0/-0.00051"

Solid End Milling

- Kennametal standard dimensions.
- Center cutting.
- Unequal flute spacing minimizes chatter for smoother machining.
- Single tool for both roughing and semi-finishing operations for fewer setups.


GOMill


- first choice
- alternate choice

KC643M	D1	D	Ap1 max	L
UEBD0078J3A	5/64	1/4	5/32	1 1/2
UEBD0094J3A	3/32	1/4	5/32	1 1/2
UEBD0125J3A	1/8	1/4	13/64	1 1/2
UEBD0156J3A	5/32	1/4	17/64	1 1/2
UEBD0188J3A	3/16	1/4	19/64	1 1/2
UEBD0250J3A	1/4	1/4	21/64	1 1/2
UEBD0312J3A	5/16	5/16	27/64	1 3/4
UEBD0375J3A	3/8	3/8	31/64	2
UEBD0437J3A	7/16	7/16	9/16	2 5/32
UEBD0500J3A	1/2	1/2	5/8	2 5/32

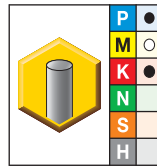
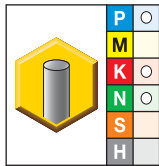
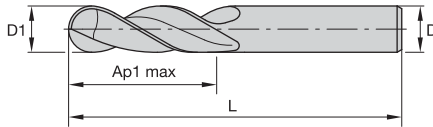
NOTE: For application data, see page M103.

End Mill Tolerances

D1	tolerance	D	tolerance h6
All	+0.000/-0.002"	≤1/8"	+0/-0.00024"
		>1/8-1/4"	+0/-0.00031"
		>1/4-3/8"	+0/-0.00035"
		>3/8-23/32"	+0/-0.00043"
		>23/32-1 3/16"	+0/-0.00051"

Solid End Milling

- Kennametal standard dimensions.
- Center cutting.



- first choice
- alternate choice

K600		KC610M		D1	D	Ap1 max	L
BNEC031S3		BNEC031S3		1/32	1/8	5/64	1 1/2
—		BNEC062S3		1/16	1/8	3/16	1 1/2
BNEC094S3		BNEC094S3		3/32	1/8	3/8	1 1/2
—		BNEC109S3		7/64	1/8	3/8	1 1/2
BNEC125S3		BNEC125S3		1/8	1/8	1/2	1 1/2
BNEC188S3		BNEC188S3		3/16	3/16	5/8	2
BNEC250S3		BNEC250S3		1/4	1/4	3/4	2 1/2
—		BNEC312S3		5/16	5/16	13/16	2 1/2
BNEC375S3088		BNEC375S3088		3/8	3/8	7/8	2 1/2
BNEC500S3		BNEC500S3		1/2	1/2	1	3

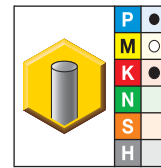
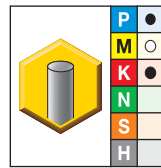
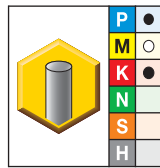
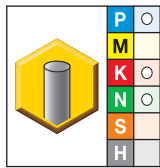
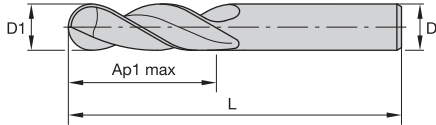
NOTE: For application data, see page M104.

Solid End Milling

End Mill Tolerances

D1	tolerance	D	tolerance h6
All	+0.000/-0.002"	≤1/8"	+0/-0.00024"
		>1/8-1/4"	+0/-0.00031"
		>1/4-3/8"	+0/-0.00035"
		>3/8-23/32"	+0/-0.00043"
		>23/32-1 3/16"	+0/-0.00051"

- Kennametal standard dimensions.
- Center cutting.



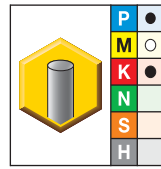
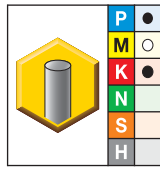
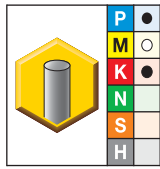
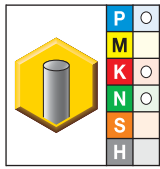
- first choice
- alternate choice

				D1	D	Ap1 max	L
K600	KC610M	KC625M	KC635M				
—	BNEC016S4	—	—	1/64	1/8	1/32	1 1/2
BNEC031S4	BNEC031S4	—	BNEC031S4	1/32	1/8	5/64	1 1/2
BNEC047S4	BNEC047S4	—	—	3/64	1/8	1/8	1 1/2
BNEC062S4	BNEC062S4	—	BNEC062S4	1/16	1/8	3/16	1 1/2
BNEC078S4O	—	—	—	5/64	1/8	3/16	1 1/2
BNEC078S4	BNEC078S4	—	—	5/64	1/8	3/16	1 1/2
BNEC094S4O18	BNEC094S4O18	—	BNEC094S4O18	3/32	1/8	3/16	1 1/2
BNEC094S4	BNEC094S4	—	BNEC094S4	3/32	1/8	3/8	1 1/2
BNEC109S4O	—	—	—	7/64	1/8	3/8	1 1/2
BNEC109S4	BNEC109S4	—	—	7/64	1/8	3/8	1 1/2
BNEC125S4O25	BNEC125S4O25	—	BNEC125S4O25	1/8	1/8	1/4	1 1/2
BNEC125S4	BNEC125S4	—	BNEC125S4	1/8	1/8	1/2	1 1/2
BNEC125S4O75	BNEC125S4O75	—	BNEC125S4O75	1/8	1/8	3/4	2 1/4
BNEC125S4O75L	BNEC125S4O75L	—	BNEC125S4O75L	1/8	1/8	3/4	3
BNEC125S4300	BNEC125S4300	—	—	1/8	1/8	1	3
BNEC141S4	BNEC141S4	—	—	9/64	3/16	5/16	2
BNEC141S4O	—	—	—	9/64	3/16	9/16	2
BNEC156S4O31	BNEC156S4O31	—	BNEC156S4O31	5/32	3/16	5/16	2
BNEC156S4	BNEC156S4	—	BNEC156S4	5/32	3/16	9/16	2
BNEC172S4	BNEC172S4	—	—	11/64	3/16	5/16	2
BNEC172S4O	—	—	—	11/64	3/16	5/8	2
BNEC188S4O31	BNEC188S4O31	—	BNEC188S4O31	3/16	3/16	5/16	1 1/2
BNEC188S4	BNEC188S4	—	BNEC188S4	3/16	3/16	5/8	2
BNEC188S4O75	BNEC188S4O75	—	BNEC188S4O75	3/16	3/16	3/4	2 1/2
BNEC188S4100	BNEC188S4100	—	BNEC188S4100	3/16	3/16	1	4
BNEC188S4300	BNEC188S4300	—	—	3/16	3/16	1 1/8	3
BNEC203S4	BNEC203S4	—	—	13/64	1/4	5/8	2 1/2
BNEC219S4O44	—	BNEC219S4O44	—	7/32	1/4	7/16	2
BNEC219S4	BNEC219S4	—	—	7/32	1/4	5/8	2 1/2
BNEC219S4O	—	—	—	7/32	1/4	5/8	2 1/2
BNEC234S4	BNEC234S4	—	—	15/64	1/4	3/4	2 1/2
BNEC250S4O50	BNEC250S4O50	—	BNEC250S4O50	1/4	1/4	1/2	2
BNEC250S4	BNEC250S4	—	BNEC250S4	1/4	1/4	3/4	2 1/2
BNEC250S4113	BNEC250S4113	—	BNEC250S4113	1/4	1/4	1 1/8	3
BNEC250S4150	BNEC250S4150	—	BNEC250S4150	1/4	1/4	1 1/2	4
BNEC250S4150L	BNEC250S4150L	—	BNEC250S4150L	1/4	1/4	1 1/2	6

(continued)

Solid End Milling

(continued)



				D1	D	Ap1 max	L
K600	KC610M	KC625M	KC635M				
BNEC266S4	BNEC266S4	—	—	17/64	5/16	3/4	2 1/2
BNEC281S4	BNEC281S4	—	—	9/32	5/16	3/4	2 1/2
BNEC312S4050	BNEC312S4050	—	BNEC312S4050	5/16	5/16	1/2	2
BNEC312S4	BNEC312S4	—	BNEC312S4	5/16	5/16	13/16	2 1/2
BNEC312S4113	BNEC312S4113	—	BNEC312S4113	5/16	5/16	1 1/8	3
BNEC312S4150	BNEC312S4150	—	BNEC312S4150	5/16	5/16	1 1/2	6
BNEC312S4400	BNEC312S4400	—	—	5/16	5/16	1 5/8	4
—	BNEC344S4	—	—	11/32	3/8	1	2 1/2
BNEC375S4050	—	—	—	3/8	3/8	1/2	2
BNEC375S4063	BNEC375S4063	—	BNEC375S4063	3/8	3/8	5/8	2
BNEC375S4088	BNEC375S4088	—	BNEC375S4088	3/8	3/8	7/8	2 1/2
BNEC375S4	BNEC375S4	—	BNEC375S4	3/8	3/8	1	2 1/2
BNEC375S4113	BNEC375S4113	—	BNEC375S4113	3/8	3/8	1 1/8	3
BNEC375S4175	BNEC375S4175	—	BNEC375S4175	3/8	3/8	1 3/4	4
BNEC375S4300L	BNEC375S4300L	—	BNEC375S4300	3/8	3/8	3	6
BNEC406S4100	BNEC406S4100	—	—	13/32	7/16	1	2 1/2
BNEC438S4063	—	BNEC438S4063	—	7/16	7/16	5/8	2 1/2
BNEC438S4100	BNEC438S4100	—	BNEC438S4100	7/16	7/16	1	2 1/2
BNEC500S4063	BNEC500S4063	—	BNEC500S4063	1/2	1/2	5/8	2 1/2
BNEC500S4	BNEC500S4	—	BNEC500S4	1/2	1/2	1	3
BNEC500S4150	BNEC500S4150	—	BNEC500S4150	1/2	1/2	1 1/2	6
BNEC500S4200	BNEC500S4200	—	BNEC500S4200	1/2	1/2	2	4
BNEC500S4450	BNEC500S4450	—	—	1/2	1/2	2	4 1/2
BNEC500S4300	BNEC500S4300	—	BNEC500S4300	1/2	1/2	3	6
BNEC562S4	BNEC562S4	—	BNEC562S4	9/16	9/16	1 1/4	3 1/2
—	—	BNEC625S4075	BNEC625S4075	5/8	5/8	3/4	3
BNEC625S4	BNEC625S4	—	BNEC625S4	5/8	5/8	1 1/4	3 1/2
BNEC625S4225	—	—	—	5/8	5/8	2 1/4	5
BNEC625S4300	BNEC625S4300	—	BNEC625S4300	5/8	5/8	3	6
BNEC750S4100	BNEC750S4100	—	BNEC750S4100	3/4	3/4	1	3
BNEC750S4	BNEC750S4	—	BNEC750S4	3/4	3/4	1 1/2	4
BNEC750S4200	BNEC750S4200	—	BNEC750S4200	3/4	3/4	2	6
BNEC750S4600	BNEC750S4600	—	—	3/4	3/4	3	6
BNEC750S4300	—	—	—	3/4	3/4	3	6
BNEC875S4	BNEC875S4	—	BNEC875S4	7/8	7/8	1 1/2	4
BNEC100S4	BNEC100S4	—	BNEC100S4	1	1	1 1/2	4
BNEC100S4225	—	BNEC100S4225	—	1	1	2 1/4	5
BNEC100S4300	BNEC100S4300	—	BNEC100S4300	1	1	3	6

NOTE: For application data, see page M105.

End Mill Tolerances

D1	tolerance	D	tolerance h6
All	+0.000/-0.002"	≤1/8"	+0/-0.00024"
		>1/8-1/4"	+0/-0.00031"
		>1/4-3/8"	+0/-0.00035"
		>3/8-23/32"	+0/-0.00043"
		>23/32-1 3/16"	+0/-0.00051"

■ HEC • 2-Flute

Material Group	Side Milling (A) and Slotting (B)			K600		KC610M KC625M		KC635M		Feed per Tooth – fz information is for side milling (A). For slotting (B), reduce fz by 20%.									
	A		B	Cutting Speed – vc SFM						D1 – Diameter									
	ap	ae	ap	min	max	min	max	min	max	inch	1/16 0.06	1/8 0.13	1/4 0.250	3/8 0.38	1/2 0.50	5/8 0.63	3/4 0.75	1 1.00	
	1 x D	0.1 x D	0.25 x D																
P	1	1 x D	0.1 x D	0.25 x D	200	265	390	525	490	660	fz	0.0003	0.0007	0.0015	0.0022	0.0028	0.0032	0.0034	0.0040
	2	1 x D	0.1 x D	0.25 x D	185	250	370	500	460	620	fz	0.0003	0.0007	0.0015	0.0022	0.0028	0.0032	0.0034	0.0040
	3	1 x D	0.1 x D	0.25 x D	—	—	310	416	390	520	fz	0.0003	0.0006	0.0012	0.0018	0.0023	0.0027	0.0030	0.0036
	4	1 x D	0.1 x D	0.25 x D	—	—	240	400	300	490	fz	0.0002	0.0005	0.0011	0.0016	0.0021	0.0024	0.0026	0.0031
M	1	1 x D	0.1 x D	0.25 x D	—	—	210	265	260	330	fz	0.0002	0.0006	0.0012	0.0018	0.0023	0.0027	0.0030	0.0036
	2	1 x D	0.1 x D	0.25 x D	—	—	160	210	200	260	fz	0.0003	0.0005	0.0010	0.0015	0.0019	0.0022	0.0024	0.0029
K	1	1 x D	0.1 x D	0.25 x D	155	210	310	415	390	520	fz	0.0004	0.0007	0.0015	0.0022	0.0028	0.0032	0.0034	0.0040
	2	1 x D	0.1 x D	0.25 x D	—	—	290	370	360	460	fz	0.0003	0.0006	0.0012	0.0018	0.0023	0.0027	0.0030	0.0036
N	1	1 x D	0.1 x D	0.25 x D	1640	6550	—	—	—	—	fz	0.0003	0.0007	0.0015	0.0022	0.0028	0.0032	0.0034	0.0040
	2	1 x D	0.1 x D	0.25 x D	1640	4900	—	—	—	—	fz	0.0003	0.0006	0.0012	0.0018	0.0024	0.0027	0.0030	0.0037
	5	1 x D	0.1 x D	0.25 x D	820	2450	—	—	—	—	fz	0.0002	0.0005	0.0010	0.0015	0.0019	0.0022	0.0024	0.0029
	6	1 x D	0.1 x D	0.25 x D	330	1650	—	—	—	—	fz	0.0005	0.0010	0.0020	0.0030	0.0040	0.0050	0.0060	0.0081

■ HEC • 3-Flute

Material Group	Side Milling (A) and Slotting (B)			K600		KC610M		Feed per Tooth – fz information is for side milling (A). For slotting (B), reduce fz by 20%.									
	A		B	Cutting Speed – vc SFM				D1 – Diameter									
	ap	ae	ap	min	max	min	max	inch	1/16 0.06	1/8 0.13	1/4 0.250	3/8 0.38	1/2 0.50	5/8 0.63	3/4 0.75	1 1.00	
	1 x D	0.1 x D	0.25 x D														
P	1	1 x D	0.1 x D	0.25 x D	200	265	390	525	fz	0.0003	0.0007	0.0015	0.0022	0.0028	0.0032	0.0034	0.0040
	2	1 x D	0.1 x D	0.25 x D	185	250	370	500	fz	0.0003	0.0007	0.0015	0.0022	0.0028	0.0032	0.0034	0.0040
	3	1 x D	0.1 x D	0.25 x D	—	—	310	416	fz	0.0003	0.0006	0.0012	0.0018	0.0023	0.0027	0.0030	0.0036
	4	1 x D	0.1 x D	0.25 x D	—	—	240	400	fz	0.0002	0.0005	0.0011	0.0016	0.0021	0.0024	0.0026	0.0031
M	1	1 x D	0.1 x D	0.25 x D	—	—	210	265	fz	0.0002	0.0006	0.0012	0.0018	0.0023	0.0027	0.0030	0.0036
	2	1 x D	0.1 x D	0.25 x D	—	—	160	210	fz	0.0003	0.0005	0.0010	0.0015	0.0019	0.0022	0.0024	0.0029
K	1	1 x D	0.1 x D	0.25 x D	155	210	310	415	fz	0.0004	0.0007	0.0015	0.0022	0.0028	0.0032	0.0034	0.0040
	2	1 x D	0.1 x D	0.25 x D	—	—	290	370	fz	0.0003	0.0006	0.0012	0.0018	0.0023	0.0027	0.0030	0.0036
N	1	1 x D	0.1 x D	0.25 x D	1640	6550	—	—	fz	0.0003	0.0007	0.0015	0.0022	0.0028	0.0032	0.0034	0.0040
	2	1 x D	0.1 x D	0.25 x D	1640	4900	—	—	fz	0.0003	0.0006	0.0012	0.0018	0.0024	0.0027	0.0030	0.0037
	5	1 x D	0.1 x D	0.25 x D	820	2450	—	—	fz	0.0002	0.0005	0.0010	0.0015	0.0019	0.0022	0.0024	0.0029
	6	1 x D	0.1 x D	0.25 x D	330	1650	—	—	fz	0.0005	0.0010	0.0020	0.0030	0.0040	0.0050	0.0060	0.0081

NOTE: These guidelines may require variations to achieve optimum results.
 Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
 Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
 Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >1/2" diameter.
 For long lengths, reduce fz by 20%.

■ HEC • 4-Flute

Material Group	Side Milling (A) and Slotting (B)			K600		KC610M KC625M		KC635M		Feed per Tooth – fz information is for side milling (A). For slotting (B), reduce fz by 20%.									
	A		B	Cutting Speed – vc SFM		TiCN Cutting Speed – vc SFM		TiAlN Cutting Speed – vc SFM		D1 – Diameter									
	ap	ae	ap	min	max	min	max	min	max	inch	1/16 0.06	1/8 0.13	1/4 0.250	3/8 0.38	1/2 0.50	5/8 0.63	3/4 0.75	1 1.00	
P	1	1 x D	0.1 x D	0.25 x D	200	265	390	525	490	660	fz	0.0003	0.0007	0.0015	0.0022	0.0028	0.0032	0.0034	0.0040
	2	1 x D	0.1 x D	0.25 x D	185	250	370	500	460	620	fz	0.0003	0.0007	0.0015	0.0022	0.0028	0.0032	0.0034	0.0040
	3	1 x D	0.1 x D	0.25 x D	–	–	310	416	390	520	fz	0.0003	0.0006	0.0012	0.0018	0.0023	0.0027	0.0030	0.0036
	4	1 x D	0.1 x D	0.25 x D	–	–	240	400	300	490	fz	0.0002	0.0005	0.0011	0.0016	0.0021	0.0024	0.0026	0.0031
M	1	1 x D	0.1 x D	0.25 x D	–	–	210	265	260	330	fz	0.0002	0.0006	0.0012	0.0018	0.0023	0.0027	0.0030	0.0036
	2	1 x D	0.1 x D	0.25 x D	–	–	160	210	200	260	fz	0.0003	0.0005	0.0010	0.0015	0.0019	0.0022	0.0024	0.0029
K	1	1 x D	0.1 x D	0.25 x D	155	210	310	415	390	520	fz	0.0004	0.0007	0.0015	0.0022	0.0028	0.0032	0.0034	0.0040
	2	1 x D	0.1 x D	0.25 x D	–	–	290	370	360	460	fz	0.0003	0.0006	0.0012	0.0018	0.0023	0.0027	0.0030	0.0036
N	1	1 x D	0.1 x D	0.25 x D	1640	6550	–	–	–	–	fz	0.0003	0.0007	0.0015	0.0022	0.0028	0.0032	0.0034	0.0040
	2	1 x D	0.1 x D	0.25 x D	1640	4900	–	–	–	–	fz	0.0003	0.0006	0.0012	0.0018	0.0024	0.0027	0.0030	0.0037
	5	1 x D	0.1 x D	0.25 x D	820	2450	–	–	–	–	fz	0.0002	0.0005	0.0010	0.0015	0.0019	0.0022	0.0024	0.0029
	6	1 x D	0.1 x D	0.25 x D	330	1650	–	–	–	–	fz	0.0005	0.0010	0.0020	0.0030	0.0040	0.0050	0.0060	0.0081

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
 Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
 Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >1/2" diameter.
 For long lengths, reduce fz by 20%.
 These guidelines may require variations to achieve optimum results.



Solid End Milling

■ UEDE • 3-Flute


Material Group	Side Milling (A) and Slotting (B)		KC643M		Feed per Tooth – fz information is for side milling (A). For slotting (B), reduce fz by 20%.									
	A		B	Cutting Speed – vc SFM			D1 – Diameter							
	ap	ae	ap	min	max	inch	5/64 0.08	1/8 0.13	5/32 0.16	1/4 0.250	5/16 0.31	3/8 0.38	1/2 0.50	
	P	1	1.5 x D	0.5 x D	1 x D	495	660	fz	0.00054	0.00088	0.00111	0.00183	0.00234	0.00270	0.00345
2		1.5 x D	0.5 x D	1 x D	462	627	fz	0.00054	0.00088	0.00111	0.00183	0.00234	0.00270	0.00345
3		1.5 x D	0.5 x D	1 x D	396	528	fz	0.00044	0.00072	0.00091	0.00151	0.00195	0.00227	0.00293
4		1.5 x D	0.5 x D	0.75 x D	297	495	fz	0.00041	0.00066	0.00084	0.00137	0.00175	0.00203	0.00260
5		1.5 x D	0.5 x D	1 x D	198	330	fz	0.00037	0.00059	0.00075	0.00123	0.00156	0.00182	0.00234
6		1.5 x D	0.5 x D	0.75 x D	165	248	fz	0.00031	0.00050	0.00063	0.00103	0.00131	0.00152	0.00194
M	1	1.5 x D	0.5 x D	1 x D	297	380	fz	0.00044	0.00072	0.00091	0.00151	0.00195	0.00227	0.00293
	2	1.5 x D	0.5 x D	1 x D	198	264	fz	0.00037	0.00059	0.00075	0.00123	0.00156	0.00182	0.00234
	3	1.5 x D	0.5 x D	1 x D	198	231	fz	0.00031	0.00050	0.00063	0.00103	0.00131	0.00152	0.00194
K	1	1.5 x D	0.5 x D	1 x D	396	495	fz	0.00054	0.00088	0.00111	0.00183	0.00234	0.00270	0.00345
	2	1.5 x D	0.5 x D	1 x D	363	429	fz	0.00044	0.00072	0.00091	0.00151	0.00195	0.00227	0.00293
	3	1.5 x D	0.5 x D	1 x D	330	429	fz	0.00037	0.00059	0.00075	0.00123	0.00156	0.00182	0.00234
S	1	1.5 x D	0.3 x D	0.3 x D	165	297	fz	0.00044	0.00072	0.00091	0.00151	0.00195	0.00227	0.00293
	2	1.5 x D	0.3 x D	0.3 x D	82.5	132	fz	0.00024	0.00039	0.00050	0.00081	0.00103	0.00120	0.00155
	3	1.5 x D	0.5 x D	1 x D	198	264	fz	0.00037	0.00059	0.00075	0.00123	0.00156	0.00182	0.00234
	4	1.5 x D	0.5 x D	1 x D	165	198	fz	0.00028	0.00048	0.00062	0.00107	0.00144	0.00167	0.00215
H	1	1.5 x D	0.5 x D	0.75 x D	264	140	fz	0.00041	0.00066	0.00084	0.00137	0.00175	0.00203	0.00260

■ UEDE • 4-Flute


Material Group	Side Milling (A) and Slotting (B)		KC643M		Feed per Tooth – fz information is for side milling (A). For slotting (B), reduce fz by 20%.							
	A		B	Cutting Speed – vc SFM			D1 – Diameter					
	ap	ae	ap	min	max	inch	5/32 0.16	1/4 0.250	5/16 0.31	3/8 0.38	1/2 0.50	
	P	1	1.5 x D	0.5 x D	1 x D	495	660	fz	0.00111	0.00183	0.00234	0.00270	0.00345
2		1.5 x D	0.5 x D	1 x D	462	627	fz	0.00111	0.00183	0.00234	0.00270	0.00345
3		1.5 x D	0.5 x D	1 x D	396	528	fz	0.00091	0.00151	0.00195	0.00227	0.00293
4		1.5 x D	0.5 x D	0.75 x D	297	495	fz	0.00084	0.00137	0.00175	0.00203	0.00260
5		1.5 x D	0.5 x D	1 x D	198	330	fz	0.00075	0.00123	0.00156	0.00182	0.00234
6		1.5 x D	0.5 x D	0.75 x D	165	248	fz	0.00063	0.00103	0.00131	0.00152	0.00194
M	1	1.5 x D	0.5 x D	1 x D	297	380	fz	0.00091	0.00151	0.00195	0.00227	0.00293
	2	1.5 x D	0.5 x D	1 x D	198	264	fz	0.00075	0.00123	0.00156	0.00182	0.00234
	3	1.5 x D	0.5 x D	1 x D	198	231	fz	0.00063	0.00103	0.00131	0.00152	0.00194
K	1	1.5 x D	0.5 x D	1 x D	396	495	fz	0.00111	0.00183	0.00234	0.00270	0.00345
	2	1.5 x D	0.5 x D	1 x D	363	429	fz	0.00091	0.00151	0.00195	0.00227	0.00293
	3	1.5 x D	0.5 x D	1 x D	330	429	fz	0.00075	0.00123	0.00156	0.00182	0.00234
S	1	1.5 x D	0.3 x D	0.3 x D	165	297	fz	0.00091	0.00151	0.00195	0.00227	0.00293
	2	1.5 x D	0.3 x D	0.3 x D	82.5	132	fz	0.00050	0.00081	0.00103	0.00120	0.00155
	3	1.5 x D	0.5 x D	1 x D	198	264	fz	0.00075	0.00123	0.00156	0.00182	0.00234
	4	1.5 x D	0.5 x D	1 x D	165	198	fz	0.00062	0.00107	0.00144	0.00167	0.00215
H	1	1.5 x D	0.5 x D	0.75 x D	264	140	fz	0.00084	0.00137	0.00175	0.00203	0.00260

NOTE: These guidelines may require variations to achieve optimum results.

Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >1/2" diameter.

■ CRHEC

Material Group	Side Milling (A) and Slotting (B)			KC635M		Feed per Tooth — fz information is for side milling (A). For slotting (B), reduce fz by 20%.										
	A		B	Cutting Speed — vc SFM		D1 — Diameter										
	ap	ae	ap	min	max	inch	1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1	
							0.13	0.19	0.250	0.31	0.38	0.50	0.63	0.75	1.000	
P	1	1 x D	0.1 x D	0.5 x D	490	660	fz	0.0007	0.0011	0.0015	0.0019	0.0022	0.0028	0.0032	0.0034	0.004
	2	1 x D	0.1 x D	0.5 x D	460	620	fz	0.0007	0.0011	0.0015	0.0019	0.0022	0.0028	0.0032	0.0034	0.004
	3	1 x D	0.1 x D	0.5 x D	390	520	fz	0.0006	0.0009	0.0012	0.0016	0.0018	0.0023	0.0027	0.003	0.0036
	4	1 x D	0.1 x D	0.5 x D	300	490	fz	0.0005	0.0008	0.0011	0.0014	0.0016	0.0021	0.0024	0.0026	0.0031
M	1	1 x D	0.1 x D	0.5 x D	260	330	fz	0.0006	0.0009	0.0012	0.0016	0.0018	0.0023	0.0027	0.003	0.0036
	2	1 x D	0.1 x D	0.5 x D	200	260	fz	0.0005	0.0007	0.001	0.0013	0.0015	0.0019	0.0022	0.0024	0.0029
K	1	1 x D	0.1 x D	0.5 x D	390	520	fz	0.0007	0.0011	0.0015	0.0019	0.0022	0.0028	0.0032	0.0034	0.004
	2	1 x D	0.1 x D	0.5 x D	360	460	fz	0.0006	0.0009	0.0012	0.0016	0.0018	0.0023	0.0027	0.003	0.0036

■ HHEC

Material Group	Side Milling (A) and Slotting (B)			KC635M		Feed per Tooth — fz information is for side milling (A). For slotting (B), reduce fz by 20%.										
	A		B	Cutting Speed — vc m/min		D1 — Diameter										
	ap	ae	ap	min	max	inch	1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1	
							0.13	0.19	0.250	0.31	0.38	0.50	0.63	0.75	1.00	
P	3	1.5 x D	0.3 x D	0.5 x D	394	525	fz	0.0006	0.0009	0.0012	0.0016	0.0018	0.0023	0.0027	0.0030	0.0040
	4	1.5 x D	0.3 x D	0.3 x D	295	492	fz	0.0005	0.0008	0.0011	0.0014	0.0016	0.0021	0.0024	0.0026	0.0035
	5	1.5 x D	0.3 x D	0.5 x D	197	328	fz	0.0005	0.0007	0.0010	0.0013	0.0015	0.0019	0.0022	0.0024	0.0032
	6	1.5 x D	0.3 x D	0.3 x D	164	246	fz	0.0004	0.0006	0.0008	0.0011	0.0012	0.0016	0.0018	0.0019	0.0026
M	1	1.5 x D	0.3 x D	0.5 x D	262	328	fz	0.0006	0.0009	0.0012	0.0016	0.0018	0.0023	0.0027	0.0030	0.0040
	2	1.5 x D	0.3 x D	0.5 x D	197	262	fz	0.0005	0.0007	0.0010	0.0013	0.0015	0.0019	0.0022	0.0024	0.0032
	3	1.5 x D	0.3 x D	0.5 x D	197	262	fz	0.0004	0.0006	0.0008	0.0011	0.0012	0.0016	0.0018	0.0019	0.0026
K	1	1.5 x D	0.3 x D	0.5 x D	394	525	fz	0.0007	0.0011	0.0015	0.0019	0.0022	0.0028	0.0032	0.0034	0.0046
	2	1.5 x D	0.3 x D	0.5 x D	361	459	fz	0.0006	0.0009	0.0012	0.0016	0.0018	0.0023	0.0027	0.0030	0.0040
	3	1.5 x D	0.3 x D	0.5 x D	328	426	fz	0.0005	0.0007	0.0010	0.0013	0.0015	0.0019	0.0022	0.0024	0.0032
S	1	1.5 x D	0.3 x D	0.3 x D	164	295	fz	0.0006	0.0009	0.0012	0.0016	0.0018	0.0023	0.0027	0.0030	0.0040
	2	1.5 x D	0.3 x D	0.3 x D	66	131	fz	0.0003	0.0005	0.0006	0.0008	0.0010	0.0012	0.0015	0.0016	0.0022
	3	1.5 x D	0.3 x D	0.5 x D	164	262	fz	0.0005	0.0007	0.0010	0.0013	0.0015	0.0019	0.0022	0.0024	0.0032
	4	1.5 x D	0.3 x D	0.3 x D	148	213	fz	0.0004	0.0006	0.0009	0.0012	0.0013	0.0017	0.0020	0.0022	0.0030
H	1	1.5 x D	0.3 x D	0.5 x D	262	459	fz	0.0005	0.0008	0.0011	0.0014	0.0016	0.0021	0.0024	0.0026	0.0035

NOTE: These guidelines may require variations to achieve optimum results.
 Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
 Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
 Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >1/2" diameter.

Solid End Milling

■ UEBD • 2-Flute



Material Group	Side Milling (A) and Slotting (B)			KC643M		Feed per Tooth – fz information is for side milling (A). For slotting (B), reduce fz by 20%.								
	A		B	Cutting Speed –vc SFM		D1 – Diameter								
	ap	ae	ap	min	max	inch	5/64 0.08	1/8 0.13	5/32 0.16	1/4 0.25	5/16 0.31	3/8 0.38	1/2 0.50	
P	1	1.5xD	0.5xD	1 x D	495	660	fz	0.00054	0.00088	0.00011	0.00183	0.00234	0.00270	0.00345
	2	1.5xD	0.5xD	1 x D	462	627	fz	0.00054	0.00088	0.00011	0.00183	0.00234	0.00270	0.00345
	3	1.5xD	0.5xD	1 x D	396	528	fz	0.00044	0.00072	0.00091	0.00151	0.00195	0.00227	0.00293
	4	1.5xD	0.5xD	0.75 x D	297	495	fz	0.00041	0.00066	0.00084	0.00137	0.00175	0.00203	0.00260
	5	1.5xD	0.5xD	1 x D	198	330	fz	0.00037	0.00059	0.00075	0.00123	0.00156	0.00182	0.00234
	6	1.5xD	0.5xD	0.75 x D	165	247,5	fz	0.00031	0.00050	0.00063	0.00103	0.00131	0.00152	0.00194
M	1	1.5xD	0.5xD	1 x D	297	379,5	fz	0.00044	0.00072	0.00091	0.00151	0.00195	0.00227	0.00293
	2	1.5xD	0.5xD	1 x D	198	264	fz	0.00037	0.00059	0.00075	0.00123	0.00156	0.00182	0.00234
	3	1.5xD	0.5xD	1 x D	198	231	fz	0.00031	0.00050	0.00063	0.00103	0.00131	0.00152	0.00194
K	1	1.5xD	0.5xD	1 x D	396	495	fz	0.00054	0.00088	0.00011	0.00183	0.00234	0.00270	0.00345
	2	1.5xD	0.5xD	1 x D	363	429	fz	0.00044	0.00072	0.00091	0.00151	0.00195	0.00227	0.00293
	3	1.5xD	0.5xD	1 x D	330	429	fz	0.00037	0.00059	0.00075	0.00123	0.00156	0.00182	0.00234
S	1	1.5xD	0.3xD	0.3 x D	165	297	fz	0.00044	0.00072	0.00091	0.00151	0.00195	0.00227	0.00293
	2	1.5xD	0.3xD	0.3 x D	82,5	132	fz	0.00024	0.00039	0.00050	0.00081	0.00103	0.00120	0.00155
	3	1.5xD	0.5xD	1 x D	198	264	fz	0.00037	0.00059	0.00075	0.00123	0.00156	0.00182	0.00234
	4	1.5xD	0.5xD	1 x D	165	198	fz	0.00028	0.00048	0.00062	0.00170	0.00144	0.00167	0.00215
H	1	1.5xD	0.5xD	0.75 x D	264	140	fz	0.00041	0.00066	0.00084	0.00137	0.00175	0.00203	0.00260

■ UEBD • 3-Flute



Material Group	Side Milling (A) and Slotting (B)			KC643M		Feed per Tooth – fz information is for side milling (A). For slotting (B), reduce fz by 20%.								
	A		B	Cutting Speed –vc SFM		D1 – Diameter								
	ap	ae	ap	min	max	inch	5/64 0.08	1/8 0.13	5/32 0.16	1/4 0.25	5/16 0.31	3/8 0.38	1/2 0.50	
P	1	1.5xD	0.5xD	1 x D	495	660	fz	0.00054	0.00088	0.00011	0.00183	0.00234	0.00270	0.00345
	2	1.5xD	0.5xD	1 x D	462	627	fz	0.00054	0.00088	0.00011	0.00183	0.00234	0.00270	0.00345
	3	1.5xD	0.5xD	1 x D	396	528	fz	0.00044	0.00072	0.00091	0.00151	0.00195	0.00227	0.00293
	4	1.5xD	0.5xD	0.75 x D	297	495	fz	0.00041	0.00066	0.00084	0.00137	0.00175	0.00203	0.00260
	5	1.5xD	0.5xD	1 x D	198	330	fz	0.00037	0.00059	0.00075	0.00123	0.00156	0.00182	0.00234
	6	1.5xD	0.5xD	0.75 x D	165	247,5	fz	0.00031	0.00050	0.00063	0.00103	0.00131	0.00152	0.00194
M	1	1.5xD	0.5xD	1 x D	297	379,5	fz	0.00044	0.00072	0.00091	0.00151	0.00195	0.00227	0.00293
	2	1.5xD	0.5xD	1 x D	198	264	fz	0.00037	0.00059	0.00075	0.00123	0.00156	0.00182	0.00234
	3	1.5xD	0.5xD	1 x D	198	231	fz	0.00031	0.00050	0.00063	0.00103	0.00131	0.00152	0.00194
K	1	1.5xD	0.5xD	1 x D	396	495	fz	0.00054	0.00088	0.00011	0.00183	0.00234	0.00270	0.00345
	2	1.5xD	0.5xD	1 x D	363	429	fz	0.00044	0.00072	0.00091	0.00151	0.00195	0.00227	0.00293
	3	1.5xD	0.5xD	1 x D	330	429	fz	0.00037	0.00059	0.00075	0.00123	0.00156	0.00182	0.00234
S	1	1.5xD	0.3xD	0.3 x D	165	297	fz	0.00044	0.00072	0.00091	0.00151	0.00195	0.00227	0.00293
	2	1.5xD	0.3xD	0.3 x D	82,5	132	fz	0.00024	0.00039	0.00050	0.00081	0.00103	0.00120	0.00155
	3	1.5xD	0.5xD	1 x D	198	264	fz	0.00037	0.00059	0.00075	0.00123	0.00156	0.00182	0.00234
	4	1.5xD	0.5xD	1 x D	165	198	fz	0.00028	0.00048	0.00062	0.00170	0.00144	0.00167	0.00215
H	1	1.5xD	0.5xD	0.75 x D	264	140	fz	0.00041	0.00066	0.00084	0.00137	0.00175	0.00203	0.00260

NOTE: These guidelines may require variations to achieve optimum results.

Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >12mm diameter.

BNEC • 2-Flute

Material Group	Side Milling (A) and Slotting (B)			K600		KC610M		KC635M		Feed per Tooth – fz information is for side milling (A). For slotting (B), reduce fz by 20%.									
	A		B	Cutting Speed – vc SFM						D1 – Diameter									
	ap	ae	ap	min	max	min	max	min	max	inch	1/16	1/8	1/4	3/8	1/2	5/8	3/4	1	
											0.063	0.125	0.250	0.375	0.500	0.625	0.750	1.000	
P	1	1-1.5 x D	0.1 x D	0.25 x D	200	265	390	525	490	660	fz	0.0003	0.0007	0.0015	0.0022	0.0028	0.0032	0.0034	0.004
	2	1-1.5 x D	0.1 x D	0.25 x D	185	250	370	500	460	620	fz	0.0003	0.0006	0.0012	0.0018	0.0023	0.0027	0.003	0.0036
	3	1-1.5 x D	0.1 x D	0.25 x D	–	–	310	416	390	520	fz	0.0002	0.0005	0.0011	0.0016	0.0021	0.0024	0.0026	0.0031
	4	1-1.5 x D	0.1 x D	0.25 x D	–	–	240	400	300	490	fz	0.0002	0.0006	0.0012	0.0018	0.0023	0.0027	0.003	0.0036
M	1	1-1.5 x D	0.1 x D	0.25 x D	–	–	210	265	260	330	fz	0.0003	0.0005	0.001	0.0015	0.0019	0.0022	0.0024	0.0029
	2	1-1.5 x D	0.1 x D	0.25 x D	–	–	160	210	200	260	fz	0.0004	0.0007	0.0015	0.0022	0.0028	0.0032	0.0034	0.004
K	1	1-1.5 x D	0.1 x D	0.25 x D	155	210	310	415	390	520	fz	0.0003	0.0006	0.0012	0.0018	0.0023	0.0027	0.003	0.0036
	2	1-1.5 x D	0.1 x D	0.25 x D	–	–	290	370	360	460	fz	0.0003	0.0007	0.0015	0.0022	0.0028	0.0032	0.0034	0.004
N	1	1-1.5 x D	0.1 x D	0.25 x D	1640	6550	–	–	–	–	fz	0.0003	0.0006	0.0012	0.0018	0.0024	0.0027	0.003	0.0037
	2	1-1.5 x D	0.1 x D	0.25 x D	1640	4900	–	–	–	–	fz	0.0002	0.0005	0.001	0.0015	0.0019	0.0022	0.0024	0.0029
	5	1-1.5 x D	0.1 x D	0.25 x D	820	2450	–	–	–	–	fz	0.0005	0.001	0.002	0.003	0.004	0.005	0.006	0.0081
	6	1-1.5 x D	0.1 x D	0.25 x D	330	1650	–	–	–	–	fz	0.0005	0.0010	0.0020	0.0030	0.0040	0.0050	0.0060	0.0081

BNEC • 3-Flute

Solid End Milling

Material Group	Side Milling (A) and Slotting (B)			K600		KC610M		Feed per Tooth – fz information is for side milling (A). For slotting (B), reduce fz by 20%.												
	A		B	Cutting Speed – vc SFM						D1 – Diameter										
	ap	ae	ap	min	max	min	max	inch	1/16	1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1		
										0.063	0.125	0.188	0.250	0.313	0.375	0.500	0.625	0.750	1.000	
P	1	1-1.5 x D	0.1 x D	0.25 x D	200	265	390	525	fz	0.0003	0.0007	0.0011	0.0015	0.0019	0.0022	0.0028	0.0032	0.0034	0.0040	
	2	1-1.5 x D	0.1 x D	0.25 x D	185	250	370	500	fz	0.0003	0.0007	0.0011	0.0015	0.0019	0.0022	0.0028	0.0032	0.0034	0.0040	
	3	1-1.5 x D	0.1 x D	0.25 x D	–	–	310	416	fz	0.0003	0.0006	0.0009	0.0012	0.0016	0.0018	0.0023	0.0027	0.0030	0.0036	
	4	1-1.5 x D	0.1 x D	0.25 x D	–	–	240	400	fz	0.0002	0.0005	0.0008	0.0011	0.0014	0.0016	0.0021	0.0024	0.0026	0.0031	
M	1	1-1.5 x D	0.1 x D	0.25 x D	–	–	210	265	fz	0.0002	0.0006	0.0009	0.0012	0.0016	0.0018	0.0023	0.0027	0.0030	0.0036	
	2	1-1.5 x D	0.1 x D	0.25 x D	–	–	160	210	fz	0.0003	0.0005	0.0007	0.0010	0.0013	0.0015	0.0019	0.0022	0.0024	0.0029	
K	1	1-1.5 x D	0.1 x D	0.25 x D	155	210	310	415	fz	0.0004	0.0007	0.0011	0.0015	0.0019	0.0022	0.0028	0.0032	0.0034	0.0040	
	2	1-1.5 x D	0.1 x D	0.25 x D	–	–	290	370	fz	0.0003	0.0006	0.0009	0.0012	0.0016	0.0018	0.0023	0.0027	0.0030	0.0036	
N	1	1-1.5 x D	0.1 x D	0.25 x D	1640	6550	–	–	fz	0.0003	0.0007	0.0011	0.0015	0.0019	0.0022	0.0028	0.0032	0.0034	0.0040	
	2	1-1.5 x D	0.1 x D	0.25 x D	1640	4900	–	–	fz	0.0003	0.0006	0.0009	0.0012	0.0016	0.0018	0.0024	0.0027	0.0030	0.0037	
	5	1-1.5 x D	0.1 x D	0.25 x D	820	2450	–	–	fz	0.0002	0.0005	0.0007	0.0010	0.0013	0.0015	0.0019	0.0022	0.0024	0.0029	
	6	1-1.5 x D	0.1 x D	0.25 x D	330	1650	–	–	fz	0.0005	0.0010	0.0015	0.0020	0.0025	0.0030	0.0040	0.0050	0.0060	0.0081	

NOTE: These guidelines may require variations to achieve optimum results.

Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >1/2" diameter.

For long lengths, reduce fz by 20%.

BNEC• 4-Flute

Material Group	Side Milling (A) and Slotting (B)			K600		KC610M KC625M		KC635M		Feed per Tooth — fz information is for side milling (A). For slotting (B), reduce fz by 20%.									
	A		B	Cutting Speed — vc SFM						D1 — Diameter									
	ap	ae	ap	min	max	min	max	min	max	inch	1/16	1/8	1/4	3/8	1/2	5/8	3/4	1	
											0.063	0.125	0.250	0.375	0.500	0.625	0.750	1.000	
P	1	1-1.5 x D	0.1 x D	0.25 x D	200	265	390	525	490	660	fz	0.0003	0.0007	0.0015	0.0022	0.0028	0.0032	0.0034	0.0040
	2	1-1.5 x D	0.1 x D	0.25 x D	185	250	370	500	460	620	fz	0.0003	0.0007	0.0015	0.0022	0.0028	0.0032	0.0034	0.0040
	3	1-1.5 x D	0.1 x D	0.25 x D	—	—	310	416	390	520	fz	0.0003	0.0006	0.0012	0.0018	0.0023	0.0027	0.0030	0.0036
	4	1-1.5 x D	0.1 x D	0.25 x D	—	—	240	400	300	490	fz	0.0002	0.0005	0.0011	0.0016	0.0021	0.0024	0.0026	0.0031
M	1	1-1.5 x D	0.1 x D	0.25 x D	—	—	210	265	260	330	fz	0.0002	0.0006	0.0012	0.0018	0.0023	0.0027	0.0030	0.0036
	2	1-1.5 x D	0.1 x D	0.25 x D	—	—	160	210	200	260	fz	0.0003	0.0005	0.0010	0.0015	0.0019	0.0022	0.0024	0.0029
K	1	1-1.5 x D	0.1 x D	0.25 x D	155	210	310	415	390	520	fz	0.0004	0.0007	0.0015	0.0022	0.0028	0.0032	0.0034	0.0040
	2	1-1.5 x D	0.1 x D	0.25 x D	—	—	290	370	360	460	fz	0.0003	0.0006	0.0012	0.0018	0.0023	0.0027	0.0030	0.0036
N	1	1-1.5 x D	0.1 x D	0.25 x D	1640	6550	—	—	—	—	fz	0.0003	0.0007	0.0015	0.0022	0.0028	0.0032	0.0034	0.0040
	2	1-1.5 x D	0.1 x D	0.25 x D	1640	4900	—	—	—	—	fz	0.0003	0.0006	0.0012	0.0018	0.0024	0.0027	0.0030	0.0037
	5	1-1.5 x D	0.1 x D	0.25 x D	820	2450	—	—	—	—	fz	0.0002	0.0005	0.0010	0.0015	0.0019	0.0022	0.0024	0.0029
	6	1-1.5 x D	0.1 x D	0.25 x D	330	1650	—	—	—	—	fz	0.0005	0.0010	0.0020	0.0030	0.0040	0.0050	0.0060	0.0081

NOTE: These guidelines may require variations to achieve optimum results.

Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >1/2" diameter.

For long lengths, reduce fz by 20%.



Solid Carbide End Mills —

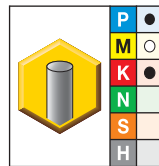
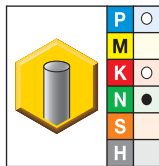
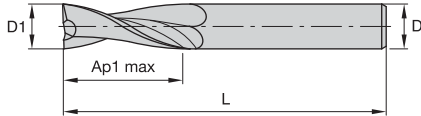
Portfolio Extension

Solid End Milling Portfolio Extension

General Application Solid Carbide End Mills Portfolio Extension .....	.M108–M110
HECL • 2-Flute, Long-Reach .....	.M108
BNECL • Ball Nose, Long-Reach .....	.M109
GADC • 6-Flute .....	.M110
High-Performance Solid Carbide End Mills Portfolio Extension .....	.M111–M113
FMDE • 5-Flute .....	.M111
HPFF • 6-Flute .....	.M112
HARVI • UABE • 4-Flute, Ball Nose .....	.M113



- Kennametal standard dimensions.
- Center cutting.



- first choice
- alternate choice

Solid End Milling

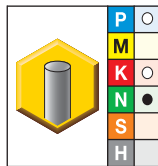
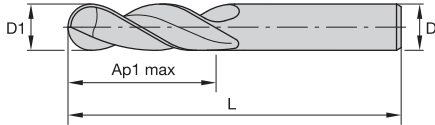
		D1	D	Ap1 max	L
K600	KC625M				
HECL125S2075	HECL125S2075	1/8	1/8	3/4	3
HECL188S2100	HECL188S2100	3/16	3/16	1	4
HECL250S2100	HECL250S2100	1/4	1/4	1	4
HECL250S2150	—	1/4	1/4	1 1/2	6
HECL312S2100	HECL312S2100	5/16	5/16	1	4
HECL312S2150	HECL312S2150	5/16	5/16	1 1/2	6
HECL375S2100	HECL375S2100	3/8	3/8	1	4
HECL375S2300	HECL375S2300	3/8	3/8	3	6
HECL438S2100	—	7/16	7/16	1	4
HECL500S2100	HECL500S2100	1/2	1/2	1	4
HECL500S2150	HECL500S2150	1/2	1/2	1 1/2	6
—	HECL625S2200	5/8	5/8	2	6
—	HECL750S2200	3/4	3/4	2	6

NOTE: For application data, see page M114.

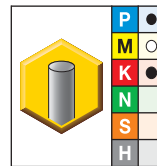
End Mill Tolerances

D1	tolerance	D	tolerance h6
All	+0.000/-0.003"	≤1/8"	+0/-0.00024"
		>1/8-1/4"	+0/-0.00031"
		>1/4-3/8"	+0/-0.00035"
		>3/8-23/32"	+0/-0.00043"
		>23/32-1 3/16"	+0/-0.00051"

- Kennametal standard dimensions.
- Center cutting.



K600



KC625M

- first choice
- alternate choice

		D1	D	Ap1 max	L
BNECL125S2075	BNECL125S2075	1/8	1/8	3/4	3
BNECL188S2100	BNECL188S2100	3/16	3/16	1	4
BNECL250S2100	BNECL250S2100	1/4	1/4	1	3
BNECL250S2150	BNECL250S2150	1/4	1/4	1 1/2	6
BNECL312S2100	BNECL312S2100	5/16	5/16	1	4
BNECL312S2150	—	5/16	5/16	1 1/2	6
BNECL375S2100	BNECL375S2100	3/8	3/8	1	4
BNECL375S2150	BNECL375S2150	3/8	3/8	1 1/2	6
—	BNECL375S2300	3/8	3/8	3	6
—	BNECL438S2300	7/16	7/16	3	6
BNECL500S2100	BNECL500S2100	1/2	1/2	1	4
BNECL500S2150	BNECL500S2150	1/2	1/2	1 1/2	6
—	BNECL750S2200	3/4	3/4	2	6

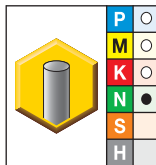
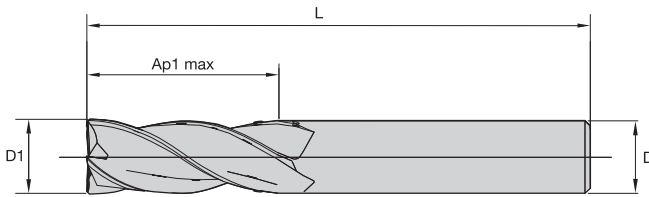
NOTE: For application data, see page M114.

End Mill Tolerances

D1	tolerance	D	tolerance h6
All	+.000/-.003"	≤1/8"	+0/-.00024"
		>1/8-1/4"	+0/-.00031"
		>1/4-3/8"	+0/-.00035"
		>3/8-23/32"	+0/-.00043"
		>23/32-1 3/16"	+0/-.00051"

Solid End Milling

- Center cutting.



- first choice
- alternate choice

	D1	D	Ap1 max	L
K600				
GADC0250J6ASA	1/4	1/4	3/4	2 1/2
GADC0313J6ASA	5/16	5/16	13/16	2 1/2
GADC0375J6ASA	3/8	3/8	7/8	2 1/2
GADC0375J6CSB	3/8	3/8	1 1/8	3
GADC0438J6ASC	7/16	7/16	2	4 1/2
GADC0500J6ASA	1/2	1/2	1	3

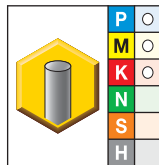
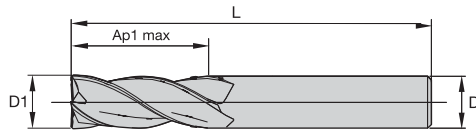
NOTE: For application data, see page M115.

Solid End Milling

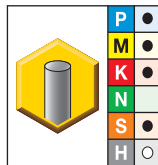
End Mill Tolerances

D1	tolerance	D	tolerance h6
All	+0.000/-0.002"	≤1/8"	+0/-0.00024"
		>1/8-1/4"	+0/-0.00031"
		>1/4-3/8"	+0/-0.00035"
		>3/8-23/32"	+0/-0.00043"
		>23/32-1 3/16"	+0/-0.00051"

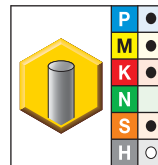
- Kennametal standard dimensions.
- Center cutting.



K600



KC625M



KC633M

- first choice
- alternate choice

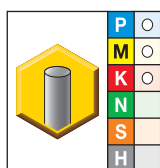
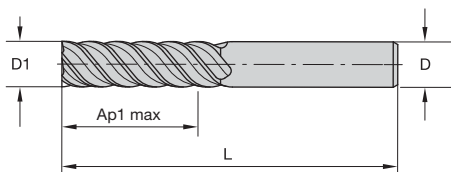
			D1	D	Ap1 max	L
FMDE0125J5ASA	FMDE0125J5ASA	FMDE0125J5ASA	1/8	1/8	1/2	1 1/2
FMDE0188J5ASA	FMDE0188J5ASA	FMDE0188J5ASA	3/16	3/16	5/8	2
FMDE0250J5ASA	FMDE0250J5ASA	FMDE0250J5ASA	1/4	1/4	3/8	2
FMDE0250J5BSB	FMDE0250J5BSB	FMDE0250J5BSB	1/4	1/4	3/4	2 1/2
FMDE0250J5CSC	FMDE0250J5CSC	FMDE0250J5CSC	1/4	1/4	1 1/4	4
FMDE0313J5ASA	FMDE0313J5ASA	FMDE0313J5ASA	5/16	5/16	7/16	2
FMDE0313J5BSB	FMDE0313J5BSB	—	5/16	5/16	13/16	2 1/2
FMDE0313J5CSC	—	—	5/16	5/16	1 1/4	4
FMDE0375J5ASA	FMDE0375J5ASA	FMDE0375J5ASA	3/8	3/8	1/2	2
FMDE0375J5BSB	FMDE0375J5BSB	FMDE0375J5BSB	3/8	3/8	7/8	2 1/2
FMDE0375J5CSC	FMDE0375J5CSC	—	3/8	3/8	1 1/2	4
FMDE0500J5ASA	FMDE0500J5ASA	—	1/2	1/2	5/8	2 1/2
FMDE0500J5BSB	FMDE0500J5BSB	FMDE0500J5BSB	1/2	1/2	1	3
FMDE0500J5CSC	FMDE0500J5CSC	FMDE0500J5CSC	1/2	1/2	1 1/4	3
FMDE0500J5DSD	FMDE0500J5DSD	FMDE0500J5DSD	1/2	1/2	2	4 1/2
FMDE0625J5ASA	FMDE0625J5ASA	—	5/8	5/8	3/4	3
FMDE0625J5BSB	FMDE0625J5BSB	—	5/8	5/8	1 1/4	3 1/2
FMDE0625J5CSC	FMDE0625J5CSC	—	5/8	5/8	2 1/4	5
—	FMDE0750J5ASA	—	3/4	3/4	1	3
FMDE0750J5BSB	FMDE0750J5BSB	FMDE0750J5BSB	3/4	3/4	1 1/2	4
FMDE0750J5CSC	FMDE0750J5CSC	FMDE0750J5CSC	3/4	3/4	2 1/4	5
—	FMDE1000J5ASA	—	1	1	2 1/4	5

NOTE: For application data, see page M115.

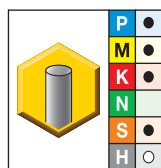
End Mill Tolerances

D1	tolerance	D	tolerance h6
All	+0.000/-0.002"	≤1/8"	+0/-0.00024"
		>1/8–1/4"	+0/-0.00031"
		>1/4–3/8"	+0/-0.00035"
		>3/8–23/32"	+0/-0.00043"
		>23/32–1 3/16"	+0/-0.00051"

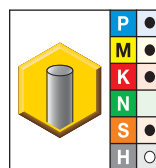
- Kennametal standard dimensions.
- Center cutting.



K600



KC625M



KC635M

- first choice
- alternate choice

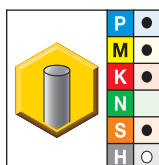
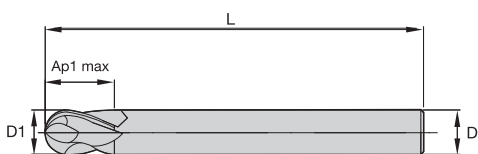
			D1	D	Ap1 max	L	Z	U
—	—	HPFF125S4050	1/8	1/8	1/2	1 1/2	4	
HPFF250S6038	HPFF250S6038	HPFF250S6038	1/4	1/4	3/8	2	6	
HPFF250S6075	HPFF250S6075	HPFF250S6075	1/4	1/4	3/4	2 1/2	6	
HPFF250S6113	HPFF250S6113	HPFF250S6113	1/4	1/4	1 1/8	3	6	
HPFF312S6081	HPFF312S6081	HPFF312S6081	5/16	5/16	13/16	2 1/2	6	
HPFF312S6113	HPFF312S6113	HPFF312S6113	5/16	5/16	1 1/8	3	6	
HPFF375S6050	HPFF375S6050	HPFF375S6050	3/8	3/8	1/2	2	6	
HPFF375S6088	HPFF375S6088	HPFF375S6088	3/8	3/8	7/8	2 1/2	6	
HPFF375S6113	HPFF375S6113	HPFF375S6113	3/8	3/8	1 1/8	3	6	
HPFF500S6063	HPFF500S6063	HPFF500S6063	1/2	1/2	5/8	2 1/2	6	
HPFF500S6100	HPFF500S6100	HPFF500S6100	1/2	1/2	1	3	6	
HPFF500S6200	HPFF500S6200	HPFF500S6200	1/2	1/2	2	4 1/2	6	
—	—	HPFF625S6075	5/8	5/8	3/4	3	6	
HPFF625S6125	HPFF625S6125	HPFF625S6125	5/8	5/8	1 1/4	3 1/2	6	
HPFF625S6225	HPFF625S6225	HPFF625S6225	5/8	5/8	2 1/4	5	6	
HPFF750S6100	HPFF750S6100	—	3/4	3/4	1	3 1/2	6	
HPFF750S6150	HPFF750S6150	HPFF750S6150	3/4	3/4	1 1/2	4	6	
HPFF750S6225	HPFF750S6225	HPFF750S6225	3/4	3/4	2 1/4	5	6	
HPFF100S6225	—	—	1	1	2 1/4	5	6	

NOTE: For application data, see page M116.

End Mill Tolerances

D1	tolerance	D	tolerance h6
All	+0.000/-0.002"	≤1/8"	+0/-0.00024"
		>1/8-1/4"	+0/-0.00031"
		>1/4-3/8"	+0/-0.00035"
		>3/8-23/32"	+0/-0.00043"
		>23/32-1 3/16"	+0/-0.00051"

- Kennametal standard dimensions.
- Unequal flute spacing minimizes chatter for smoother machining.
- Center cutting.



- first choice
- alternate choice

	D1	D	Ap1 max	L
KC633M				
UABE0250J4BLA	1/4	1/4	3/8	4
UABE0375J4BLA	3/8	3/8	1/2	4
UABE0500J4BLA	1/2	1/2	5/8	5
UABE0625J4BLA	5/8	5/8	3/4	6
UABE0750J4BLA	3/4	3/4	1	6

NOTE: For application data, see page M116.

End Mill Tolerances

D1	tolerance	D	tolerance h6
All	+.000/-.002"	≤1/8"	+0/-.00024"
		>1/8-1/4"	+0/-.00031"
		>1/4-3/8"	+0/-.00035"
		>3/8-23/32"	+0/-.00043"
		>23/32-1 3/16"	+0/-.00051"



Solid End Milling

■ HECL • 2-Flute

		Side Milling (A) and Slotting (B)			K600		KC625M		Feed per Tooth — fz information is for side milling (A). For slotting (B), reduce fz by 20%.											
Material Group	A		B	Cutting Speed — vc SFM						D1 — Diameter										
	ap	ae	ap	min	max	min	max	inch	1/16 0,06	1/8 0,13	3/16 0,19	1/4 0,25	5/16 0,31	3/8 0,38	7/16 0,44	1/2 0,50	5/8 0,63	3/4 0,75	1 1,00	
	P	1	1-1.5 x D	0.1 x D	0.25 x D	200	265	390	525	fz	0.0003	0.0007	0.0011	0.0015	0.0019	0.0022	0.0025	0.0028	0.0032	0.0034	0.004
2		1-1.5 x D	0.1 x D	0.25 x D	185	250	370	500	fz	0.0003	0.0007	0.0011	0.0015	0.0019	0.0022	0.0025	0.0028	0.0032	0.0034	0.004
3		1-1.5 x D	0.1 x D	0.25 x D	—	—	310	416	fz	0.0003	0.0006	0.0009	0.0012	0.0016	0.0018	0.0021	0.0023	0.0027	0.003	0.0036
4		1-1.5 x D	0.1 x D	0.25 x D	—	—	240	400	fz	0.0002	0.0005	0.0008	0.0011	0.0014	0.0016	0.0019	0.0021	0.0024	0.0026	0.0031
M	1	1-1.5 x D	0.1 x D	0.25 x D	—	—	210	265	fz	0.0002	0.0006	0.0009	0.0012	0.0016	0.0018	0.0021	0.0023	0.0027	0.003	0.0036
	2	1-1.5 x D	0.1 x D	0.25 x D	—	—	160	210	fz	0.0003	0.0005	0.0007	0.001	0.0013	0.0015	0.0017	0.0019	0.0022	0.0024	0.0029
K	1	1-1.5 x D	0.1 x D	0.25 x D	155	210	310	415	fz	0.0004	0.0007	0.0011	0.0015	0.0019	0.0022	0.0025	0.0028	0.0032	0.0034	0.004
	2	1-1.5 x D	0.1 x D	0.25 x D	—	—	290	370	fz	0.0003	0.0006	0.0009	0.0012	0.0016	0.0018	0.0021	0.0023	0.0027	0.003	0.0036
N	1	1-1.5 x D	0.1 x D	0.25 x D	1640	6550	—	—	fz	0.0003	0.0007	0.0011	0.0015	0.0019	0.0022	0.0025	0.0028	0.0032	0.0034	0.004
	2	1-1.5 x D	0.1 x D	0.25 x D	1640	4900	—	—	fz	0.0003	0.0006	0.0009	0.0012	0.0016	0.0018	0.0021	0.0024	0.0027	0.003	0.0037
	5	1-1.5 x D	0.1 x D	0.25 x D	820	2450	—	—	fz	0.0002	0.0005	0.0007	0.001	0.0013	0.0015	0.0017	0.0019	0.0022	0.0024	0.0029
	6	1-1.5 x D	0.1 x D	0.25 x D	330	1650	—	—	fz	0.0005	0.001	0.0015	0.002	0.0025	0.003	0.0035	0.004	0.005	0.006	0.0081

NOTE: These guidelines may require variations to achieve optimum results.
 Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
 Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
 Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >1/2" diameter.

Solid End Milling

■ BNECL • 2-Flute

		Side Milling (A) and Slotting (B)			K600		KC610M		KC635M		Feed per Tooth — fz information is for side milling (A). For slotting (B), reduce fz by 20%.									
Material Group	A		B	Cutting Speed — vc SFM						D1 — Diameter										
	ap	ae	ap	min	max	min	max	min	max	inch	1/16 0.0003	1/8 0.0007	1/4 0.0015	3/8 0.0022	1/2 0.0028	5/8 0.0032	3/4 0.0034	1 0.004		
	P	1	1-1.5 x D	0.1 x D	0.25 x D	200	265	390	525	490	660	fz	0.0003	0.0007	0.0015	0.0022	0.0028	0.0032	0.0034	0.004
2		1-1.5 x D	0.1 x D	0.25 x D	185	250	370	500	460	620	fz	0.0003	0.0006	0.0012	0.0018	0.0023	0.0027	0.003	0.0036	
3		1-1.5 x D	0.1 x D	0.25 x D	—	—	310	416	390	520	fz	0.0002	0.0005	0.0011	0.0016	0.0021	0.0024	0.0026	0.0031	
4		1-1.5 x D	0.1 x D	0.25 x D	—	—	240	400	300	490	fz	0.0002	0.0006	0.0012	0.0018	0.0023	0.0027	0.003	0.0036	
M	1	1-1.5 x D	0.1 x D	0.25 x D	—	—	210	265	260	330	fz	0.0003	0.0005	0.001	0.0015	0.0019	0.0022	0.0024	0.0029	
	2	1-1.5 x D	0.1 x D	0.25 x D	—	—	160	210	200	260	fz	0.0004	0.0007	0.0015	0.0022	0.0028	0.0032	0.0034	0.004	
K	1	1-1.5 x D	0.1 x D	0.25 x D	155	210	310	415	390	520	fz	0.0003	0.0006	0.0012	0.0018	0.0023	0.0027	0.003	0.0036	
	2	1-1.5 x D	0.1 x D	0.25 x D	—	—	290	370	360	460	fz	0.0003	0.0007	0.0015	0.0022	0.0028	0.0032	0.0034	0.004	
N	1	1-1.5 x D	0.1 x D	0.25 x D	1640	6550	—	—	—	—	fz	0.0003	0.0006	0.0012	0.0018	0.0024	0.0027	0.003	0.0037	
	2	1-1.5 x D	0.1 x D	0.25 x D	1640	4900	—	—	—	—	fz	0.0002	0.0005	0.001	0.0015	0.0019	0.0022	0.0024	0.0029	
	5	1-1.5 x D	0.1 x D	0.25 x D	820	2450	—	—	—	—	fz	0.0005	0.001	0.002	0.003	0.004	0.005	0.006	0.0081	
	6	1-1.5 x D	0.1 x D	0.25 x D	330	1650	—	—	—	—	fz	0.0005	0.0010	0.0020	0.0030	0.0040	0.0050	0.0060	0.0081	

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
 Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
 Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >1/2" diameter.
 For long lengths, reduce fz by 20%.

■ GADC

Material Group	Side Milling (A) and Slotting (B)		K600		Feed per Tooth — fz information is for side milling (A). For slotting (B), reduce fz by 20%.															
	A		B		Cutting Speed — vc SFM		D1 — Diameter													
	ap	ae	ap	min	max	inch	1/16	1/8	3/16	1/4	5/16	3/8	7/16	1/2	5/8	3/4	1			
							0.063	0.125	0.188	0.250	0.313	0.375	0.438	0.500	0.625	0.750	1.000			
P	1	1 x D	0.1 x D	0.25 x D	200	265	fz	0.0003	0.0007	0.0011	0.0015	0.0019	0.0022	0.0025	0.0028	0.0032	0.0034	0.0040		
	2	1 x D	0.1 x D	0.25 x D	185	250	fz	0.0003	0.0007	0.0011	0.0015	0.0019	0.0022	0.0025	0.0028	0.0032	0.0034	0.0040		
M	1	1 x D	0.1 x D	0.25 x D	100	135	fz	0.0002	0.0006	0.0009	0.0012	0.0016	0.0018	0.0021	0.0023	0.0027	0.003	0.0036		
K	1	1 x D	0.1 x D	0.25 x D	155	210	fz	0.0004	0.0007	0.0011	0.0015	0.0019	0.0022	0.0025	0.0028	0.0032	0.0034	0.0040		
N	5	1 x D	0.1 x D	0.25 x D	820	2450	fz	0.0002	0.0005	0.0007	0.0010	0.0013	0.0015	0.0017	0.0019	0.0022	0.0024	0.0029		
	6	1 x D	0.1 x D	0.25 x D	330	1650	fz	0.0005	0.0010	0.0015	0.0020	0.0025	0.0030	0.0035	0.0040	0.0050	0.0060	0.0081		

NOTE: These guidelines may require variations to achieve optimum results.
 Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
 Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
 Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >1/2" diameter.

■ FMDE • 5-Flute

Material Group	Side Milling		KC633M		KC625M		KC600		D1 — Diameter										
	ap	ae	min	max	min	max	min	max	inch	1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1	
										0.125	0.188	0.250	0.313	0.375	0.500	0.625	0.750	1.000	
P	1	1.5 x D	0.15 x D	500	650	400	520	200	260	fz	0.0009	0.0014	0.0018	0.0023	0.0027	0.0035	0.0039	0.0043	0.0050
	2	1.5 x D	0.15 x D	450	625	360	500	180	250	fz	0.0009	0.0014	0.0018	0.0023	0.0027	0.0035	0.0039	0.0043	0.0050
	3	1.5 x D	0.1 x D	400	525	320	420	160	210	fz	0.0007	0.0011	0.0015	0.0020	0.0023	0.0029	0.0034	0.0038	0.0046
	4	1.5 x D	0.1 x D	300	475	240	380	—	—	fz	0.0007	0.0010	0.0014	0.0018	0.0020	0.0026	0.0030	0.0033	0.0039
	5	1.5 x D	0.1 x D	200	325	160	260	—	—	fz	0.0006	0.0009	0.0012	0.0016	0.0018	0.0023	0.0027	0.0030	0.0036
	6	1.5 x D	0.1 x D	150	225	120	180	—	—	fz	0.0005	0.0008	0.0010	0.0013	0.0015	0.0019	0.0022	0.0024	0.0028
M	1	1.5 x D	0.15 x D	260	330	208	264	104	132	fz	0.0007	0.0011	0.0015	0.0020	0.0023	0.0029	0.0034	0.0038	0.0046
	2	1.5 x D	0.1 x D	200	260	160	208	—	—	fz	0.0006	0.0009	0.0012	0.0016	0.0018	0.0023	0.0027	0.0030	0.0036
	3	1.5 x D	0.1 x D	200	260	160	208	—	—	fz	0.0005	0.0008	0.0010	0.0013	0.0015	0.0019	0.0022	0.0024	0.0028
K	1	1.5 x D	0.15 x D	390	520	312	416	156	208	fz	0.0009	0.0014	0.0018	0.0023	0.0027	0.0035	0.0039	0.0043	0.0050
	2	1.5 x D	0.15 x D	360	460	288	368	—	—	fz	0.0007	0.0011	0.0015	0.0020	0.0023	0.0029	0.0034	0.0038	0.0046
	3	1.5 x D	0.1 x D	330	430	264	344	—	—	fz	0.0006	0.0009	0.0012	0.0016	0.0018	0.0023	0.0027	0.0030	0.0036
S	1	1.5 x D	0.1 x D	150	275	120	220	—	—	fz	0.0007	0.0011	0.0015	0.0020	0.0023	0.0029	0.0034	0.0038	0.0046
	2	1.5 x D	0.1 x D	150	275	120	220	—	—	fz	0.0007	0.0011	0.0015	0.0020	0.0023	0.0029	0.0034	0.0038	0.0046
	3	1.5 x D	0.15 x D	70	130	56	104	—	—	fz	0.0004	0.0006	0.0008	0.0010	0.0012	0.0016	0.0018	0.0020	0.0025
	4	1.5 x D	0.15 x D	150	210	120	168	—	—	fz	0.0005	0.0008	0.0011	0.0014	0.0017	0.0022	0.0025	0.0028	0.0033
H	1	1.5 x D	0.1 x D	260	450	208	360	—	—	fz	0.0007	0.0010	0.0014	0.0018	0.0020	0.0026	0.0030	0.0033	0.0039

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
 Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
 Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >1/2" diameter.

Solid End Milling

■ HPPF • 6-Flute

		Side Milling		KC635M		KC625M		K600		D1 – Diameter									
				Cutting Speed – vc SFM															
Material Group		ap	ae	min	max	min	max	min	max	inch	1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1
											0.125	0.188	0.250	0.313	0.375	0.500	0.625	0.750	1.000
P	1	1 x D	0.5 x D	590	720	472	576	236	288	fz	0.0009	0.0014	0.0018	0.0023	0.0027	0.0035	0.0039	0.0043	0.0050
	2	1 x D	0.5 x D	520	660	416	528	208	264	fz	0.0009	0.0014	0.0018	0.0023	0.0027	0.0035	0.0039	0.0043	0.0050
	3	1 x D	0.5 x D	520	590	416	472	208	236	fz	0.0007	0.0011	0.0015	0.0020	0.0023	0.0029	0.0034	0.0038	0.0046
	4	1 x D	0.5 x D	460	520	368	416	—	—	fz	0.0007	0.0010	0.0014	0.0018	0.0020	0.0026	0.0030	0.0033	0.0039
	5	1 x D	0.5 x D	200	330	160	264	—	—	fz	0.0006	0.0009	0.0012	0.0016	0.0018	0.0023	0.0027	0.0030	0.0036
	6	1 x D	0.5 x D	160	260	128	208	—	—	fz	0.0005	0.0008	0.0010	0.0013	0.0015	0.0019	0.0022	0.0024	0.0028
M	1	1 x D	0.5 x D	260	330	208	264	104	132	fz	0.0007	0.0011	0.0015	0.0020	0.0023	0.0029	0.0034	0.0038	0.0046
	2	1 x D	0.5 x D	200	260	160	208	—	—	fz	0.0006	0.0009	0.0012	0.0016	0.0018	0.0023	0.0027	0.0030	0.0036
	3	1 x D	0.5 x D	200	260	160	208	—	—	fz	0.0005	0.0008	0.0010	0.0013	0.0015	0.0019	0.0022	0.0024	0.0028
K	1	1 x D	0.5 x D	390	520	312	514	156	208	fz	0.0009	0.0014	0.0018	0.0023	0.0027	0.0035	0.0039	0.0043	0.0050
	2	1 x D	0.5 x D	360	460	288	460	—	—	fz	0.0007	0.0011	0.0015	0.0020	0.0023	0.0029	0.0034	0.0038	0.0046
	3	1 x D	0.5 x D	330	430	264	344	—	—	fz	0.0006	0.0009	0.0012	0.0016	0.0018	0.0023	0.0027	0.0030	0.0036
S	1	1 x D	0.5 x D	300	380	240	304	—	—	fz	0.0007	0.0011	0.0015	0.0020	0.0023	0.0029	0.0034	0.0038	0.0046
	2	1 x D	0.5 x D	70	130	56	104	—	—	fz	0.0004	0.0006	0.0008	0.0010	0.0012	0.0016	0.0018	0.0020	0.0025
	3	1 x D	0.5 x D	160	260	128	208	—	—	fz	0.0006	0.0009	0.0012	0.0016	0.0018	0.0023	0.0027	0.0030	0.0036
	4	1 x D	0.5 x D	150	210	120	168	—	—	fz	0.0005	0.0008	0.0011	0.0014	0.0017	0.0022	0.0025	0.0028	0.0033
H	1	1 x D	0.5 x D	330	460	264	368	—	—	fz	0.0007	0.0010	0.0014	0.0018	0.0020	0.0026	0.0030	0.0033	0.0039

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
For tools 2 x D < LOC < 3 x D, ae=0.25 x D; for tools with LOC longer than 3 x D, ae=0.1 x D.
These guidelines may require variations to achieve optimum results.

Solid End Milling

■ UABE

		Side Milling (A) and Slotting (B)		KCPM15/ KC633M		Feed per Tooth – fz information is for side milling (A). For slotting (B), reduce fz by 20%.															
		A		B		Cutting Speed – vc SFM						D1 – Diameter									
Material Group		ap	ae	ap	min	max	inch	1/8	3/16	1/4	5/16	3/8	7/16	1/2	5/8	3/4	1	1 1/4			
								0.125	0.188	0.250	0.313	0.375	0.438	0.500	0.625	0.750	1.000	1.250			
P	1	1.25 x D	0.5 x D	1 x D	490	660	fz	0.0009	0.0014	0.0018	0.0023	0.0027	0.0031	0.0035	0.0039	0.0043	0.0050	0.0062			
	2	1.25 x D	0.5 x D	1 x D	460	620	fz	0.0009	0.0014	0.0018	0.0023	0.0027	0.0031	0.0035	0.0039	0.0043	0.0050	0.0062			
	3	1.25 x D	0.5 x D	1 x D	390	520	fz	0.0007	0.0011	0.0015	0.0020	0.0023	0.0026	0.0029	0.0034	0.0038	0.0046	0.0057			
	4	1.25 x D	0.5 x D	0.75 x D	300	490	fz	0.0007	0.0010	0.0014	0.0018	0.0020	0.0023	0.0026	0.0030	0.0033	0.0039	0.0049			
	5	1.25 x D	0.5 x D	1 x D	200	330	fz	0.0006	0.0009	0.0012	0.0016	0.0018	0.0021	0.0023	0.0027	0.0030	0.0036	0.0046			
	6	1.25 x D	0.5 x D	0.75 x D	160	250	fz	0.0005	0.0008	0.0010	0.0013	0.0015	0.0017	0.0019	0.0022	0.0024	0.0028	0.0036			
M	1	1.25 x D	0.5 x D	1 x D	260	330	fz	0.0007	0.0011	0.0015	0.0020	0.0023	0.0026	0.0029	0.0034	0.0038	0.0046	0.0057			
	2	1.25 x D	0.5 x D	1 x D	200	260	fz	0.0006	0.0009	0.0012	0.0016	0.0018	0.0021	0.0023	0.0027	0.0030	0.0036	0.0046			
	3	1.25 x D	0.5 x D	1 x D	200	260	fz	0.0005	0.0008	0.0010	0.0013	0.0015	0.0017	0.0019	0.0022	0.0024	0.0028	0.0036			
K	1	1.25 x D	0.5 x D	1 x D	390	520	fz	0.0009	0.0014	0.0018	0.0023	0.0027	0.0031	0.0035	0.0039	0.0043	0.0050	0.0062			
	2	1.25 x D	0.5 x D	1 x D	360	460	fz	0.0007	0.0011	0.0015	0.0020	0.0023	0.0026	0.0029	0.0034	0.0038	0.0046	0.0057			
	3	1.25 x D	0.5 x D	1 x D	330	430	fz	0.0006	0.0009	0.0012	0.0016	0.0018	0.0021	0.0023	0.0027	0.0030	0.0036	0.0046			
S	1	1.0 x D	0.3 x D	0.3 x D	160	300	fz	0.0007	0.0011	0.0015	0.0020	0.0023	0.0026	0.0029	0.0034	0.0038	0.0046	0.0057			
	2	1.25 x D	0.5 x D	1 x D	160	260	fz	0.0006	0.0009	0.0012	0.0016	0.0018	0.0021	0.0023	0.0027	0.0030	0.0036	0.0046			
	3	1.0 x D	0.3 x D	0.3 x D	70	130	fz	0.0004	0.0006	0.0008	0.0010	0.0012	0.0014	0.0016	0.0018	0.0020	0.0025	0.0031			
	4	1.25 x D	0.5 x D	1 x D	150	210	fz	0.0005	0.0008	0.0011	0.0014	0.0017	0.0019	0.0022	0.0025	0.0028	0.0033	0.0042			
H	1	1.25 x D	0.5 x D	0.75 x D	260	460	fz	0.0007	0.0010	0.0014	0.0018	0.0020	0.0023	0.0026	0.0030	0.0033	0.0039	0.0049			

NOTE: These guidelines may require variations to achieve optimum results.
Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >1/2" diameter.



High-Performance Milling Chucks

- Heavy- and fine-milling capabilities.
- Prebalanced G6.3 @ 20,000 RPM — six threaded M6 holes to accept set screws for fine balancing.
- Heavy milling — tighten locknut until O-ring on back face of locknut just touches the flange on the chuck body to achieve runout .0004" 3 x D1.
- Fine milling — tighten as above, then back the locknut off 1/8–1/4 turn to achieve runout .0002" 3 x D1.
- Sub-zero heat treatment for material stability.
- Through-the-toolholder coolant capability using stop screw as sealing device.
- 3/8" axial adjustment stop screw.

Experience the advantages at your Authorized Kennametal Distributor or at www.kennametal.com.

www.kennametal.com

 **KENNAMETAL®**

Indexable Milling Products

Our latest Metalcutting Innovations are designed to deliver higher productivity, longer tool life, and increased application versatility.



FACE MILLS

See Section O for more details.

Dodeka™ Series Platform

MEGA Series Platform

Beyond BLAST™ KSSM™ 45°

KSSM 45°

KSOM™ and KSOM Mini

Fix-Perfect™ Series Platform

HexaCut™ Series Platform

KSSR™ 6°

KCMS™ Cartridge Milling System

KSCM™ PCD AluMill™

Fix-Perfect 0° Aluminum

Chamfer Mills (60°, 45°, 30°)

SHOULDER MILLS

See Section P for more details.

Mill 1-10™ Platform

Mill 1-14™ Platform

Mill 1-18™ Platform

Mill 1-25™ Platform

KSSM™ Platform

KSSM-KSSP, Helical Cutters Platform

KFSR™ Helical Platform



For more information about the latest products and services from Kennametal, please contact your Kennametal Representative or Authorized Kennametal Distributor, or visit www.kennametal.com.



SLOTING CUTTERS

See Section Q for more details.

KTMS™ T-Slot Platform

KVNS™ Platform

SN Platform

LN Platform

KSSM™ Platform

COPY MILLS

See Section R for more details.

KenFeed™ 2X

KenFeed Mini

Rodeka™ Platform

KDM Platform

KSRM™ Platform

Beyond BLAST™ KSRM Platform

KDMB™ and KDMT™ Platforms

Z-Axis • Plunge Milling Cutters

KDMR™ • Multifunction Cutters

KIPR™ and KSSP™ • Round Ceramic Milling Cutters

THREAD MILLS

See Section S for more details.

Indexable End Mills

- Weldon® Shank • TM25
- Conical Thread • TMT25
- Mini Thread Mills • STN
- Tapered Thread • STN

Indexable Inserts



The Most Advanced Milling Solutions in the Industry

For unsurpassed quality, value, and performance, you can trust Kennametal to provide the most comprehensive line of reliable metalcutting tools. Whatever your indexable milling product requirements, be assured that you will find the appropriate solution in this all-inclusive, easy-to-use guide.

For every milling application, workpiece, or equipment need, we offer the best tools on the market, designed to reduce your machining time, provide superior surface finishes, and outperform the competition.

Choose your application:

- Face Milling
- Chamfer Milling
- Shoulder Milling
- Slotting
- Copy Milling
- Ceramic Milling
- Thread Milling

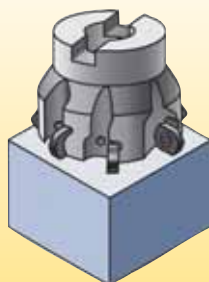
Identify material to be machined:

Each tool has a material grid marked with a letter indicating the materials that can be machined.

- first choice
- alternate choice

P	○	Steel
M	●	Stainless Steel
K	○	Cast Iron
N	○	Non-Ferrous Materials
S	○	High-Temp Alloys
H	○	Hardened Materials

Face Mills



Lead angle

$k = 75^\circ$

Dodeka™ Mini • High-Feed

Tool name



Illustration of the product



Ap1: .064"
Cutting Edges: 12
Dia: 1-3"

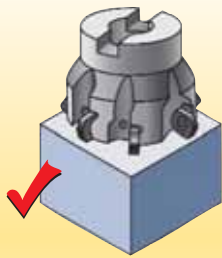
Pages: 04-05

Location of introduction detail, tool bodies, inserts, and cutting data

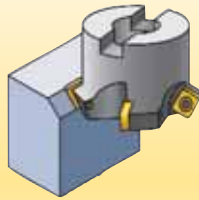
Select tool based on maximum depth of cut and diameter required:
Information is given in this area to provide specific detail as a quick reference.

How to Navigate the 2013 Catalog

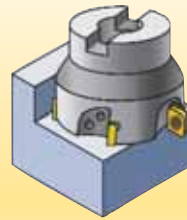
Step 1 • Select Application



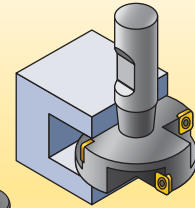
Face Milling



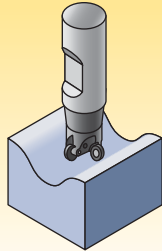
Chamfer Milling



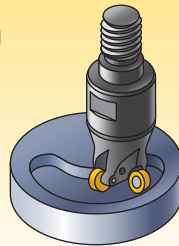
Shoulder Milling
(End Milling)



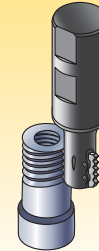
Slotting



Copy Milling



Ceramic Milling

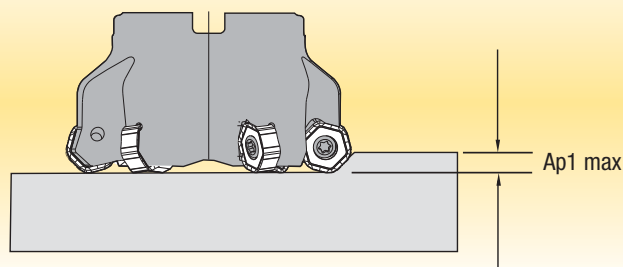


Thread Milling

Step 2 • Select Workpiece Material

ISO Description		● first choice ○ alternate choice	Material Group	
Steel	P	●	P1-P2	Carbon steels
			P3-P4	Alloy steels and tool steels
			P5-P6	Ferritic, martensitic, and PH stainless steels
Stainless Steel	M	●	M1-M2	Austenitic stainless steels
			M3	Duplex stainless steels (ferritic and austenitic mixture)
Cast Iron	K	●	K1-K2	Gray, ductile, CGI, and malleable cast irons >80 KSI
			K3	Ductile, CGI, and malleable cast irons >80 KSI
Non-Ferrous Materials	N	●	N1-N2	Aluminum alloys <12.2% Si
			N3	Aluminum alloys >12.2% Si
High-Temp Alloys	S	●	S1-S2	Iron- and cobalt-based heat-resistant alloys
			S3	Nickel-based heat-resistant alloys
			S4	Alpha-Beta titanium alloys
Hardened Materials	H	○	H1	Hardened steels and irons

Step 3 • Select a Maximum Axial Depth of Cut (A_p)



How to Navigate the 2013 Catalog (continued)

Step 4 • Select Milling Cutter from Application Selector

Face milling **1** →

Material **2** →

Dodeka™ Mini 45°

Ap1: .127"
Cutting Edges: 12
Dia: 1-5"

3 Axial depth of cut

k = 45° Pages: O8-O10

Select the Cutter

Dodeka Mini 45° • Shell Mills

order number	catalog number	D1	D1 max	D	D6	L	Ap1 max	Z	lbs	max RPM
4130426	KSHR150HN4345M3	1.500	1.822	.500	1.440	1.575	.127	4	.57	16700
4130427	KSHR150HN4345F3	1.500	1.822	.500	1.440	1.575	.127	5	.56	16700
4130428	KSHR200HN4345C3	2.000	2.321	.750	1.750	1.575	.127	4	.93	12500
4130429	KSHR200HN4345M3	2.000	2.321	.750	1.750	1.575	.127	5	.93	12500
4130430	KSHR200HN4345F3	2.000	2.321	.750	1.750	1.575	.127	6	.97	12500
4130431	KSHR250HN4345C3	2.500	2.821	.750	1.750	1.575	.127	4	1.20	10000
4130432	KSHR250HN4345M3	2.500	2.821	.750	1.750	1.575	.127	6	1.27	10000
4130493	KSHR250HN4345F3	2.500	2.821	.750	1.750	1.575	.127	8	1.29	10000
4130494	KSHR300HN4345C4	3.000	3.321	1.000	2.189	1.750	.127	5	1.90	8300
4130495	KSHR300HN4345M4	3.000	3.321	1.000	2.189	1.750	.127	8	2.09	8300

4 →

Step 5 • Insert Selection Guide

Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	.E..LD	KC725M	.S..GD	KC725M	.S..HD	KC725M
P3-P4	.E..LD	KCPK30	.S..GD	KCPK30	.S..HD	KCPK30
P5-P6	.E..LD	KCPM20	.S..GD	KCPM20	.S..HD	KCPM20
M1-M2	.E..LD	KC725M	.S..GD	KC725M	.S..HD	KC725M
M3	.E..LD	KCPK30	.S..GD	KCPK30	.S..HD	KCPK30
K1-K2	.E..LD	KCK15	.S..GD	KCK15	.S..HD	KCK15
K3	.E..LD	KCPK30	.S..GD	KCPK30	.S..HD	KCPK30
N1-N2	.F..LDJ	K313	.F..LDJ	KC410M	.E..LD	KC510M
N3	.F..LDJ	KC410M	.E..LD	KC510M	.E..LD	KC510M
S1-S2	.E..LD	KC725M	.S..GD	KC725M	.S..HD	KC725M
S3	.E..LD	KC725M	.S..GD	KC725M	.S..HD	KC725M
S4	.S..GD	KC725M	.S..HD	KC725M	-	-
H1	.E..LD	KC510M	.S..GD	KC522M	-	-

5 →

How to Navigate the 2013 Catalog *(continued)*

■ Step 6 • Insert Chart, Providing the Inserts and Grades

Material Group	K313	KC410M	KC510M	KC520M	KC522M	KC725M	KCK15	KCPM20	KCPK30
P									
M									
K									
N									
S									
H									

catalog number	D	BS	L10	Re	S	hm	cutting edges
HNPJ43ANSNGD	.472	.057	.254	.039	.175	.003	12

6

■ Step 7 • Defining the Feed per Tooth

Geometry (S.GD)

20% radial width of cut, follow arrows for value.

% = radial width of cut (Ae) ÷ cutter diameter (D1)

Using a round or ball nose insert, consider the axial depth of cut; see separate chart on the cutter page.

■ Recommended Starting Feeds [IPT]

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)														Insert Geometry				
	10%				20%				30%				40%				50-100%		
F..LDJ	.005	.010	.019	.004	.007	.014	.003	.006	.012	.003	.006	.012	.003	.006	.011	F..LDJ			
E..LD	.005	.014	.029	.004	.011	.021	.003	.009	.019	.003	.009	.017	.003	.008	.017	E..LD			
S..GD	.010	.022	.038	.007	.016	.028	.006	.014	.024	.006	.013	.022	.006	.013	.022	S..GD			
S..HD	.010	.024	.039	.007	.018	.029	.006	.015	.025	.006	.014	.023	.006	.014	.023	S..HD			

NOTE: Use "Light Machining" values as starting feed rate.

7

7

Always consider starting with the "Light Machining" value. Once established, increase the feed per tooth from the chart.

These are minimum values and can be increased when the application has been proven.

Light Machining — Low Feed Rate, High Speed

General Purpose — Normal Feed, Normal Speed

Heavy Machining — Higher Feed, Reduced Speed

■ Step 8 • Recommended Starting Speeds [SFM]

8

Material Group	KCPM20	KC725M	KCK15	KCPK30									
P	1	2170	1910	1760	1030	900	840	—	—	—	1780	1560	1450
	2	1340	1210	1090	860	760	640	—	—	—	1100	1000	900
	3	1210	1090	1000	790	670	550	—	—	—	1000	900	820
	4	910	840	760	710	590	470	—	—	—	740	690	620
	5	1090	980	900	590	530	470	—	—	—	1020	910	830
	6	760	660	570	520	400	310	—	—	—	620	540	—
M	1	880	790	680	670	590	540	—	—	—	820	720	620
	2	800	700	620	610	520	430	—	—	—	730	640	550
	3	640	570	490	460	400	310	—	—	—	570	520	460
K	1	1420	1280	1150	—	—	—	1660	1510	1340	1160	1050	940
	2	1130	1010	920	—	—	—	1310	1170	1090	920	830	760
	3	950	840	780	—	—	—	1100	980	900	770	690	640
N	1-2	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—	—	—	—
S	1	—	—	—	140	120	100	—	—	—	—	—	—
	2	—	—	—	140	120	100	—	—	—	—	—	—
	3	—	—	—	180	140	100	—	—	—	—	—	—
	4	—	—	—	240	180	120	—	—	—	—	—	—
H	1	—	—	—	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—

8

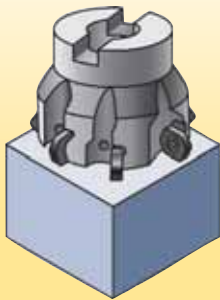
Choose the Application

- Face Milling
- Chamfer Milling
- Shoulder Milling
- Slotting
- Copy Milling
- Ceramic Milling
- Thread Milling







- first choice
- alternate choice

P	○	Steel
M	●	Stainless Steel
K	●	Cast Iron
N	●	Non-Ferrous Materials
S	○	High-Temp Alloys
H	○	Hardened Materials

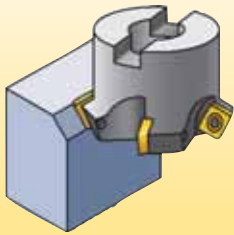
Face Mills








<p>Dodeka™ Mini • High-Feed</p> <p>Ap1: .064" Cutting Edges: 12 Dia: 1–3" k = 75° Pages: O4–O5</p>	<p>Dodeka™ Mini 45°</p> <p>Ap1: .127" Cutting Edges: 12 Dia: 1–5" k = 45° Pages: O8–O10</p>	<p>Dodeka™ Mini 30° • Heavy Duty</p> <p>Ap1: .174" Cutting Edges: 12 Dia: 1.5–5" k = 30° Page: O13</p>	
<p>Dodeka™ • High-Feed • 75°</p> <p>Ap1: .087" Cutting Edges: 12 Dia: 2–6" k = 75° Page: O16</p>	<p>Dodeka™</p> <p>Ap1: .178" Cutting Edges: 12 Dia: 2–12" k = 45° Page: O19</p>	<p>Dodeka MAX™</p> <p>Ap1: .315" Cutting Edges: 12 Dia: 3–12" k = 45° Page: O24</p>	
<p>MEGA 45° • Heavy Duty</p> <p>Ap1: .675" Cutting Edges: 4 Dia: 5–12" k = 45° Page: O30</p>	<p>MEGA 15 • Heavy Duty</p> <p>Ap1: .238" Cutting Edges: 4 Dia: 5–12" k = 75° Page: O36</p>	<p>MEGA 60 • Heavy Duty</p> <p>Ap1: .840" Cutting Edges: 4 Dia: 5–12" k = 30° Page: O38</p>	<p>MEGA 90 • Heavy Duty</p> <p>Ap1: 1.0" Cutting Edges: 4 Dia: 5–12" k = 0° Page: O41</p>
<p>Beyond BLAST™ KSSM 45°</p> <p>Ap1: .260" Cutting Edges: 4 Dia: 2–8" k = 45° Page: O46</p>	<p>KSSM™ 45°</p> <p>Ap1: .260" Cutting Edges: 4 Dia: 1.26–7.87" k = 45° Pages: O50–O51</p>	<p>KSOM™ Mini</p> <p>Ap1: .138" (8 cutting edges) Ap2: .354" (4 cutting edges) Dia: 1.25–6" k = 47° Pages: O58–O59</p>	<p>KSOM™</p> <p>Ap1: .197" (8 cutting edges) Ap2: .461" (4 cutting edges) Dia: 2.5–6" k = 47° Page: O64</p>
<p>Fix-Perfect™ • Finisher</p> <p>Ap1: .040" Cutting Edges: 4 Dia: 4–8" k = 60° Page: O70</p>	<p>Fix-Perfect™ 20° • Cast Iron • IC 12</p> <p>Ap1: .232" (8 cutting edges) Ap2: .374" (4 cutting edges) Dia: 2–10" k = 20° Page: O74</p>	<p>Fix-Perfect™ 0° • Cast Iron • IC 12</p> <p>Ap1: .236" (8 cutting edges) Ap2: .394" (4 cutting edges) Dia: 2–6" k = 0° Page: O78</p>	<p>Fix-Perfect™ 20° • Cast Iron • IC 15</p> <p>Ap1: .256" (8 cutting edges) Ap2: .374" (4 cutting edges) Dia: 2–10" k = 20° Page: O82</p>

<p>HexaCut™ 45° • Cast Iron</p>  <p>Ap1: .256" Cutting Edges: 12 Dia: 3.15–12" k = 45° Page: O89</p>	<p>HexaCut™ 30° • Cast Iron</p>  <p>Ap1: .315" Cutting Edges: 12 Dia: 3.15–12" k = 30° Page: O94</p>	<p>KSSR™ • Left and Right Hand</p>  <p>Ap1: .197" Cutting Edges: 8 Dia: 2.5–10" k = 6° Pages: O102–O103</p>
<p>KCMS™ • Cartridge Milling System</p>  <p>26 alternative cartridges NOTE: See cartridges for Ap1 value Dia: 5–12" Variable Pages: O110–O111</p>	<p>KSCM™ AluMill™</p>  <p>Ap1: .118" Cutting Edge: 1 Dia: 2.5–12" k = 0° Pages: O113–O114</p>	<p>Fix-Perfect™ 0° • Aluminum</p>  <p>Ap1: .205" (PCD) Ap1: .374" (carbide) Cutting Edges: 4 Dia: 1.5–8" k = 0° Pages: O123–O125</p>

Chamfer Mills

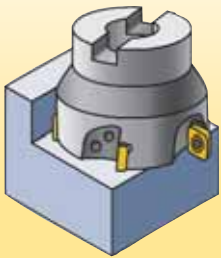




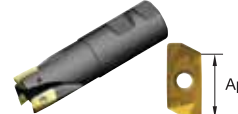

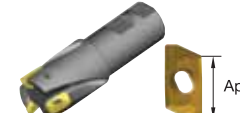



<p>Chamfer Mill • End Mills 60° • SDEB</p>  <p>Ap1: .137" Cutting Edges: 4 Dia: .46–.75" k = 60° Pages: O130–O131</p>	<p>Chamfer Mill • End Mills 45° • SDEB</p>  <p>Ap1: .195" Cutting Edges: 4 Dia: .46–1.20" k = 45° Page: O130</p>	<p>Chamfer Mill • End Mills 30° • SDEB</p>  <p>Ap1: .136" Cutting Edges: 4 Dia: .46–.75" k = 30° Page: O131</p>
<p>Chamfer Mill • End Mills 45° • SEHW43</p>  <p>Ap1: .221" Cutting Edges: 4 Dia: 1.50–1.97" k = 45° Page: O134</p>	<p>Chamfer Mill • Bridgeport 45° • SEHW43</p>  <p>Ap1: .221" Cutting Edges: 4 Dia: 1.97" k = 45° Page: O135</p>	

- first choice
- alternate choice

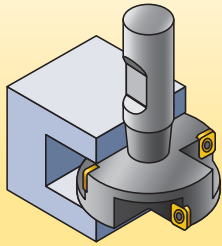
P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous Materials
S	High-Temp Alloys
H	Hardened Materials













Shoulder Mills



<p>Mill 1-10™</p>  <p>Ap1: .396" Cutting Edges: 2 Dia: .500–4.00" k = 0° Pages: P3–P7</p>	<p>Mill 1-10™ Helical</p>  <p>Ap1: .70–1.80" Cutting Edges: 2 Dia: .750–2.00" k = 0° Pages: P13–P16</p>	<p>Mill 1-14™</p>  <p>Ap1: .551–.580" Cutting Edges: 2 Dia: .625–4.00" k = 0° Pages: P23–P27</p>	
<p>Mill 1-14™ Helical</p>  <p>Ap1: 1.10–2.13" Cutting Edges: 2 Dia: 1.25–2.50" k = 0° Pages: P35–P37</p>	<p>Mill 1-18™</p>  <p>Ap1: .64–.71" Cutting Edges: 2 Dia: .97–8.00" k = 0° Pages: P47–P52</p>	<p>Mill 1-25™</p>  <p>Ap1: .98" Cutting Edges: 2 Dia: 1.50–5.00" k = 0° Pages: P59–P62</p>	
<p>KSSM™ 0° IC 10</p>  <p>Ap1: .259" Cutting Edges: 4 Dia: .750–3.0" k = 0° Pages: P67–P69</p>	<p>KSSM™ 0° IC 12</p>  <p>Ap1: .361" Cutting Edges: 4 Dia: 2.00–10.00" k = 0° Page: P73</p>	<p>KSSM™ • Helical 0° IC 12</p>  <p>Ap1: 1.691–4.110" Cutting Edges: 4 Dia: 2.00–3.00" k = 0° Pages: P79–P81</p>	<p>KSSM™ 0° • IC 15</p>  <p>Ap1: .484" Cutting Edges: 4 Dia: 2.00–8.00" k = 0° Page: P86</p>
<p>KFSR™</p>  <p>Ap1: .925–1.770" Cutting Edges: 2 Dia: 3.00–4.00" k = 0° Page: P91</p>			

Slotting

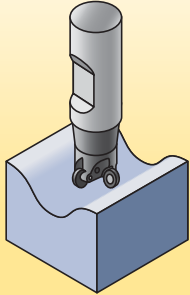


<p>T-Slot Cutter</p>   <p>Ap1: 9–22mm Cutting Edges: 4 Dia: 21–50mm k = 0° Page: Q3</p>	<p>KVNS™ A2™ Slotting Cutters</p>   <p>Ap1: .063–.245" Cutting Edge: 1 Dia: 2.5–10" k = 0° Pages: Q9–Q10</p>	<p>0° SN Slotting Cutters</p>   <p>B min = .161–.187" Cutting Edges: 4 Dia: 3–6" k = 0° Page: Q15</p>
<p>0° LN Slotting Cutters</p>   <p>B min = .250–.500" Cutting Edges: 4 Dia: 2.5–8" k = 0° Pages: Q19–Q20</p>	<p>KSSM™ Slotting Cutters • IC 10</p>   <p>B min = .551–.709" Cutting Edges: 4 Dia: 4–12" k = 0° Pages: Q27–Q35</p>	<p>KSSM™ Slotting Cutters • IC 12</p>   <p>B min = .709–.917" Cutting Edges: 4 Dia: 5–12" k = 0° Pages: Q39–Q50</p>

● first choice
○ alternate choice

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous Materials
S	High-Temp Alloys
H	Hardened Materials





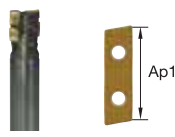
Copy Mills

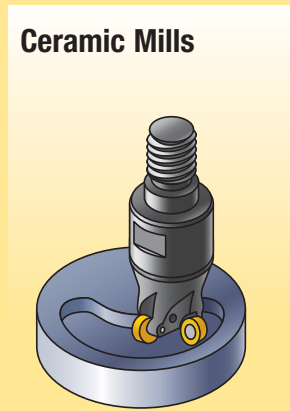




	<p>KenFeed™ 2X Series</p> <p>Ap1: .059" Cutting Edges: 6 Dia: 1–3" Pages: R3–R4</p> <p>HF</p>		<p>KenFeed™ Mini</p> <p>Ap1: .033–.040" Cutting Edges: 3 Dia: .625–1" Page: R9</p> <p>HF</p>

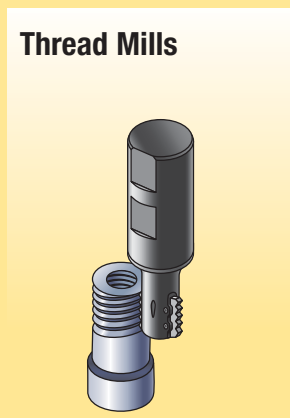
	<p>KDR Rodeka™ IC 12</p> <p>Ap1: .117"/.236" Cutting Edges: 12/8 Dia: 1.25–4" Pages: R13–R15, R19</p> <p>Round</p>





	<p>KDM • RD.X07...</p> <p>Ap1: .138" Dia: .5–1" Pages: R21–R22</p> <p>Round</p>		<p>KDM • RD.X10...</p> <p>Ap1: .197" Dia: .75–2" Pages: R25–R26</p> <p>Round</p>		<p>KDM • RD.X12...</p> <p>Ap1: .236" Dia: 1–4" Pages: R30–R31</p> <p>Round</p>		<p>KDM • RD.X16...</p> <p>Ap1: .315" Dia: 1.25–6" Page: R35</p> <p>Round</p>
	<p>KSRM™ • RP.T12</p> <p>Ap1: .236" Dia: 1.25–4" Pages: R39–R41</p> <p>Round</p>		<p>KSRM™ • RP.T16</p> <p>Ap1: .315" Dia: 1.5–6" Pages: R45–R47</p> <p>Round</p>		<p>KSRM™ • IC 3/4"</p> <p>Ap1: .375" Dia: 2–8" Pages: R51–R52</p> <p>Round</p>		<p>KSRM™ • IC 1.0"</p> <p>Ap1: .50" Dia: 3–8" Page: R56</p> <p>Round</p>
	<p>Beyond BLAST™ • KSRM™ • IC 3/4"</p> <p>Ap1: .375" Dia: 2–8" Pages: R61–R62</p> <p>Round</p>		<p>Beyond BLAST™ • KSRM™ • IC 1.0"</p> <p>Ap1: .50" Dia: 3–8" Page: R66</p> <p>Round</p>				

<p>Ball Nose End Mills • KDMB™</p>  <p>Ap1: .125-.625" Dia: .25-1.25" Pages: R71-R73</p>	<p>Ball Nose End Mills • KDMT™</p>  <p>Ap1: .118-.236" Dia: .5-1" Page: R87</p>	<p>KDMT™ High-Feed</p>  <p>Ap1: up to .04" Dia: .5-.75" Page: R88</p> <p>HF</p>
<p>Z-Axis Plunge Mill</p>  <p>Ap1: .433" Dia: 1.25-6" k = 1.5° Pages: R93-R96</p>	<p>KDMR • Multi-Functional</p>  <p>Ap1: up to 2.126" Ap2: up to .374" Dia: 6.3-1.984" k = 0° Page: R103</p>	



<p>Ceramic Mills • RP</p>  <p>Ap1: .125-.250" Dia: .625-4.00" Round Pages: R109-R111</p>	<p>Ceramic Mills • RN</p>  <p>Ap1: .249" Dia: 2.00-4.00" Round Page: R115</p>
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<p>Thread Mills</p>  <p>Inserts: Long: STN 16, STN 27 Normal: STN 11, STN 16, STN 27 Mini: STN 10 Dia: .354-1.46" Page: S9</p>	<p>Thread Mills • Tapered Thread</p>  <p>Inserts: STN 11, STN 16, STN 27 Dia: .390-1.654" Page: S10</p>
<p>Thread Mills</p>  <p>Inserts: TM25 Dia: .670-1.18" Page: S4</p>	<p>Conical Thread Mills</p>  <p>Inserts: TM25 Dia: .550-1.100" Page: S5</p>

How Do Catalog Numbers Work?

Each character in our catalog number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.



HNGJ535ENLD

H	N	G	J	5	3																
Insert Shape	Insert Clearance Angle	Tolerance Class	Geometry and Clamping Type	Size	Thickness																
A Parallelogram 85° C Rhomboid 80° E 75° H Hexagon 120° L Rectangular 90° O Octagon 135° R Round S Square 90° T Triangular 60° X Kennametal Standard Form	A 3° B 5° C 7° D 15° E 20° F 25° G 30° N 0° P 11°	 Indexable inserts with facets/wipers Indexable inserts with corner radii	 Insert thickness	<table border="1"> <thead> <tr> <th>A</th> <th>symbol</th> </tr> </thead> <tbody> <tr><td>1.000</td><td>8</td></tr> <tr><td>.750</td><td>6</td></tr> <tr><td>.625</td><td>5</td></tr> <tr><td>.500</td><td>4</td></tr> <tr><td>.375</td><td>3</td></tr> <tr><td>.250</td><td>2</td></tr> </tbody> </table> inscribed circle "A" For shapes A, L, and X, see position #1; use length of leading cutting edge in increments of 1/4".	A	symbol	1.000	8	.750	6	.625	5	.500	4	.375	3	.250	2	 insert thickness		
A	symbol																				
1.000	8																				
.750	6																				
.625	5																				
.500	4																				
.375	3																				
.250	2																				
				<table border="1"> <thead> <tr> <th>T</th> <th>in 1/16"</th> </tr> </thead> <tbody> <tr><td>.0938</td><td>1.5</td></tr> <tr><td>.125</td><td>2</td></tr> <tr><td>.1562</td><td>2.5</td></tr> <tr><td>.1875</td><td>3</td></tr> <tr><td>.2188</td><td>3.5</td></tr> <tr><td>.2500</td><td>4</td></tr> <tr><td>.3125</td><td>5</td></tr> </tbody> </table>	T	in 1/16"	.0938	1.5	.125	2	.1562	2.5	.1875	3	.2188	3.5	.2500	4	.3125	5	
T	in 1/16"																				
.0938	1.5																				
.125	2																				
.1562	2.5																				
.1875	3																				
.2188	3.5																				
.2500	4																				
.3125	5																				

tolerance class	tolerance on "A"	tolerance on "M"	tolerance on "T"	tolerance class	tolerance on "A"	tolerance on "M"	tolerance on "T"
A	.001	.0002	.001	J	.002-.005*	.0002	.001
B	.001	.0002	.005	K	.002-.005*	.0005	.001
C	.001	.0005	.001	L	.002-.005*	.001	.001
D	.001	.0005	.005	M	.002-.005*	.003-.008*	.005
E	.001	.001	.001	N	.002-.005*	.003-.008*	.001
F	.0005	.0002	.001	P**	.0015	.0015	.0015
G	.001	.001	.005	U	.003-.010*	.005-.015*	.005
H	.0005	.0005	.001	—	—	—	—

*See table below for tolerances according to insert size and class.
**Kennametal standard only.

A	tolerances on "A"		tolerances on "M"	
	classes J, K, L, M, N	class U	classes M & N	class U
.1875-.3937	.002	.003	.003	.005
.4375-.5625	.003	.005	.005	.008
.5906-.8125	.004	.007	.006	.011
.8661-1.188	.005	.010	.007	.015
1.250-1.378	.006	.010	.008	.015

symbol	hole	shape of hole	chipbreaker	shape of insert's section
N	without		without	
R			single sided	
F			double sided	
A	cylindrical hole		without	
M			single sided	
G			double sided	
W	partly cylindrical hole, 40-60° countersink		without	
T			single sided	
Q	partly cylindrical hole, 40-60° double countersink		without	
U			double sided	
B	partly cylindrical hole, 70-90° countersink		without	
H			single sided	
C	partly cylindrical hole, 70-90° double countersink		without	
J			double sided	
X			special design	

By referencing this easy-to-use guide, you can identify the correct product to meet your needs.



HNGJ535ENLD

5
Corner Configuration

E
Cutting Edge Form

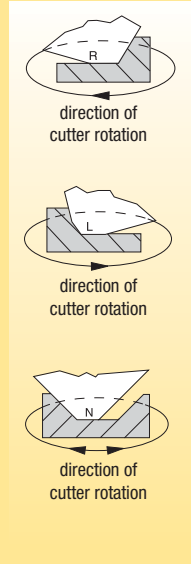
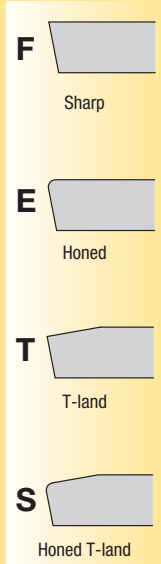
N
Insert Hand

-
Facet Width

L
Edge Prep Size

D
Rake Face Angle

Added Info



.0312	2
.0469	3
.0625	4
.0938	6

Facet width is number of 1/64" increments (1/32" for old styles).

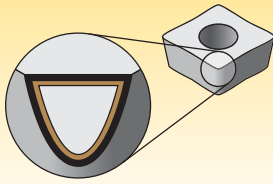
J = Polished rake face
P = Partial T-land
W = Wiper/radiused facet

radius			
0	.004	If letter is replaced by number(s), refer to table for radius "r".	wiper edge clearance P
0.5	.008		A 3°
1	1/64	lead angle K	B 5°
2	1/32		C 7°
3	3/64	A 45°	D 15°
4	1/16	D handed 30°	E 20°
5	5/64	K neutral 30°	F 25°
6	3/32	E handed 15°	G 30°
7	7/64	L neutral 15°	N 0°
8	1/8	P 0°	P 11°

L = Light — sharp or lightly honed and/or T-land
G = General — medium hone and/or T-land
H = Heavy — large hone and/or T-land

N	A	B	C	P	D	E	F	G
0° or less	3°	5°	7°	11°	15°	20°	25°	30°

Nominal or average angle of rake on insert face at leading cutting edge before edge prep and before installation.



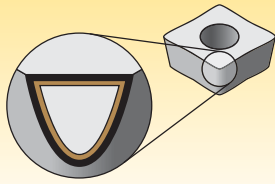
Coatings provide high-speed capability and are engineered for finishing to heavy roughing.

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous Materials
S	High-Temp Alloys
H	Hardened Materials

wear resistance ← → toughness

Grade

Coating	Grade Description	05	10	15	20	25	30	35	40	45
KC530M 	A premium TiAlN-PVD-coated carbide grade enabling extended tool life at moderate feeds and high cutting speeds. First choice for milling in all steels, including die and mold steels, and is recommended for use without coolant.	P								
		M								
KC537M 	A tough, general-purpose TiAlN-PVD-coated carbide grade for medium to heavy milling applications for use in all steels and cast irons. KC537M can be used either wet or dry.	P								
		M								
		K								
KC5410 	An extremely hard TiB ₂ -PVD-coated grade that provides very good wear characteristics at high cutting speeds and is best suited for machining aluminum with <10% silicon and other non-ferrous materials. KC5410 resists built-up edge, can help reduce the burring effect, and will generate excellent surface finishes.	N								
KC610M 	A high-performance, TiN-TiCN-TiN-PVD-coated carbide grade characterized by good hardness and wear resistance for milling all types of material and is the first choice for steel. KC610M should be used with coolant or minimal lubrication.	P								
		M								
		K								
		S								
KC620M 	A TiN-PVD-coated carbide grade suitable for machining cast iron, non-ferrous materials, and aluminum alloys that can be used for wet or dry machining.	P								
		K								
		N								
KC635M 	A high-performance, TiAlN-PVD-coated grade characterized by high hardness and wear resistance. KC635M is suitable for cutting hard materials up to 65 HRC and is first choice for stainless steel.	P								
		M								
		K								
KCPM20 	KCPM20 is a multilayered TiN-MT-TiCN-Al ₂ O ₃ -CVD-coated carbide grade with advanced Beyond™ post-coat treatment. The substrate is a well-balanced combination of wear resistance and toughness. KCPM20 is primarily for light and general machining of steels and stainless steels or roughing of cast irons.	P								
		M								
		K								
KC715M 	KC715M has a deformed substrate and PVD coating that can handle high temperatures and higher surface speeds making it ideal for dry machining. KC715M is primarily for use in light and general machining of steel, stainless steel, and cast steel.	P								



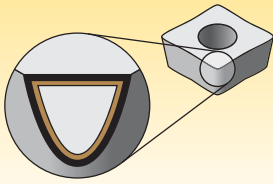
Coatings provide high-speed capability and are engineered for finishing to heavy roughing.

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous Materials
S	High-Temp Alloys
H	Hardened Materials

wear resistance ← → toughness

Grade

Coating	Grade Description		05	10	15	20	25	30	35	40	45
KC720M	A TiAlN-TiN-PVD-coated carbide grade engineered to provide balanced wear and deformation resistance in combination with excellent breakage resistance.	P									
		M									
KC725M	A high-performance TiAlN-PVD-coated carbide grade for milling steel, stainless steel, and ductile cast iron. The good thermal shock resistance of the substrate makes this grade ideal for both wet and dry machining. KC725M is primarily for use in general and heavy machining.	P									
		M									
		S									
KC730M	A TiN-PVD-coated carbide grade with a tough substrate and is recommended for general milling with moderate speeds. KC730M can be used wet or dry.	P									
		M									
KC735M	A TiN-PVD-coated carbide grade offering an unusual combination of high toughness and wear resistance. Even under extreme toughness requirements, KC735M achieves outstanding results in general and heavy machining applications and is suitable for dry and wet machining.	P									
		M									
KCK15	A multilayered TiN-MT-TiCN-Al ₂ O ₃ -CVD-coated carbide grade with advanced Beyond™ post-coat treatment. KCK15 is a wear-resistant grade with balanced toughness for general milling of cast irons at higher speeds. Best results in dry but can also be used wet.	K									
KTPK20	A multilayered TiAlN-AlCrN-PVD-coated cermet. This tough cermet is primarily for use in light and general machining of steel, stainless steel, and cast iron and performs best dry.	P									
		M									
		K									
KCPK30	A multilayered TiN-TiCN-Al ₂ O ₃ -CVD-coated carbide grade with advanced Beyond™ post-coat treatment and a very tough substrate. KCPK30 has a wide application area in general and rough milling of steels and cast irons. It performs best dry but can also be used wet.	P									
		K									
KCMP30	A multilayered TiN-TiCN-Al ₂ O ₃ -CVD-coated carbide grade with advanced Beyond™ post-coat treatment and a very tough substrate. KCMP30 has a wide application area in general and rough milling of steels. It performs best dry but can also be used wet.	P									
		M									
		S									



Coatings provide high-speed capability and are engineered for finishing to heavy roughing.

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous Materials
S	High-Temp Alloys
H	Hardened Materials

wear resistance ← → toughness

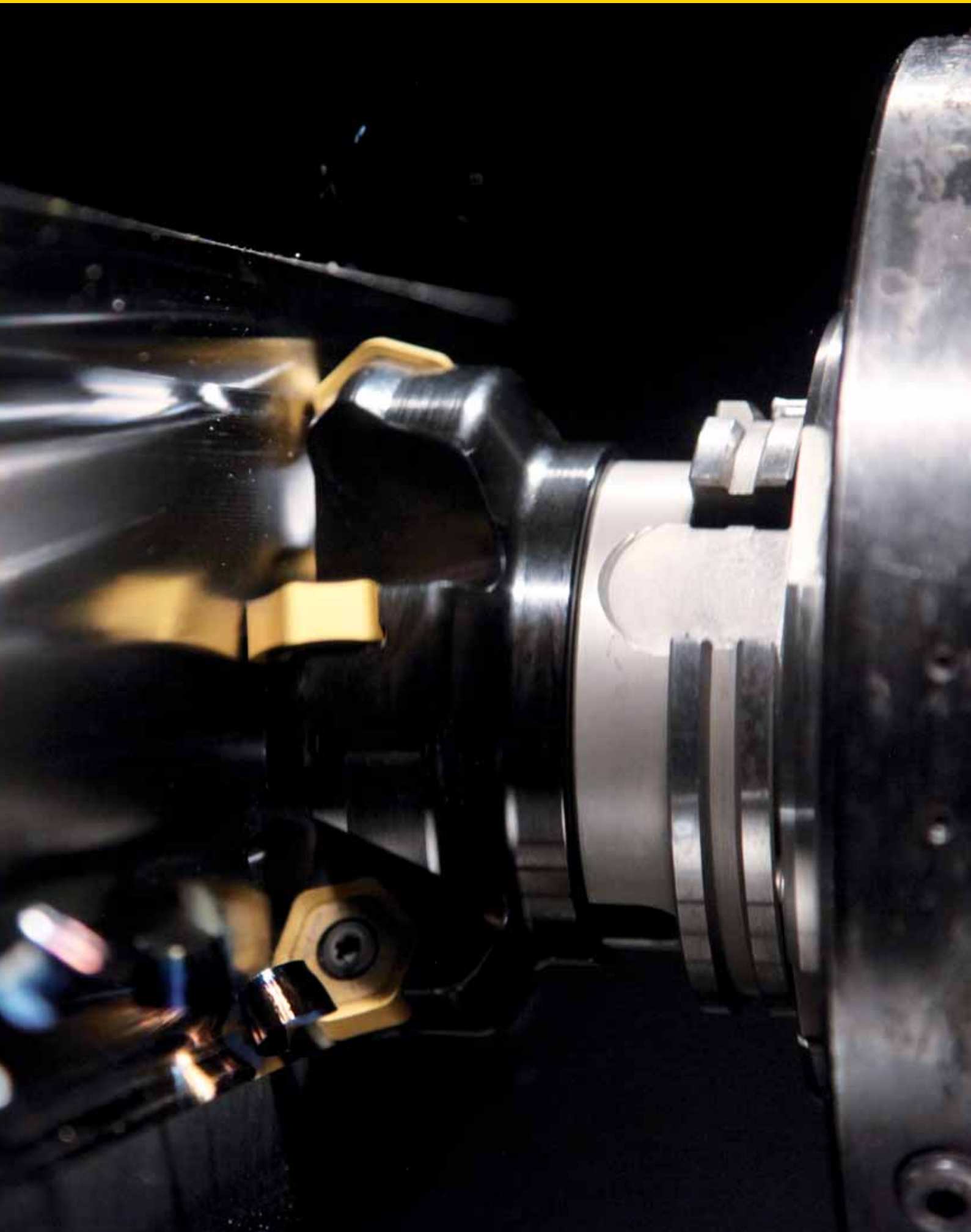
Grade

Coating	Grade Description	05	10	15	20	25	30	35	40	45
KYSP30 	Combines excellent wear properties, fracture toughness, and thermal shock resistance for general purpose to finish machining of high-temperature alloys. KYSP30 provides superior depth-of-cut notch resistance compared to whisker ceramics.									
KYS30 	KYS30 is the latest in the line of α/βSiAlON grades for general purpose to finish machining of high-temperature alloys. This grade provides excellent wear characteristics, with better toughness and thermal shock resistance than whisker ceramics. KYS30 also gives improved thermal stability.									
KB1340 	A PCBN cutting material with micrograin structure for light to general machining of gray cast iron and hard materials. The grade has good wear resistance and is ideal for finishing.									
KD1410 	A PCD-tip brazed to carbide for machining aluminum with a very high silicon content, abrasive non-ferrous materials, and fiber-reinforced plastics. KD1410 can be used at very high cutting speeds, even where good surface finishes are required. This grade can be used both wet or dry but is suggested to use coolant where good surface finishes are required.									
KD1415 	PCD-tip brazed to carbide for general machining of aluminum with a low silicon content, non-ferrous heavy metals, and plastics. KD1415 can be used at high cutting speeds and for continuous cutting, even where outstanding surface finishes are required. KD1415 is suitable for wet and dry machining.									
KD1420 	A varied-grain, PCD-brazed tip grade suited for machining low silicon aluminum, non-ferrous heavy metals, and plastics. It can be used for high cutting speeds where outstanding surface finishes are required and is suitable for dry and wet machining.									

Grade Conversion by Name Only

KSSR™ – Face Mill Platform
 HexaCut™ – Face Mill Platform
 Machining cast iron only.
 Inserts are the same; only the grade name changes.

old TN grade names	NEW grade name
TN2510	KC914M
TN5505	KC907M
TN5515	KC917M
TN5520	KC924M
TN6510	KC514M
TN6520	KC524M
TN6525	KC527M
TN6540	KC537M
TN7525	KC927M



Face Mills

Dodeka Series • Performance Booster (12 True Edges per Insert) .....	.02–026
Dodeka Mini .....	.04–015
Dodeka .....	.016–022
Dodeka MAX .....	.024–026
MEGA Series • Heavy-Duty Machining .....	.028–043
MEGA 45° .....	.028–033
MEGA 15 .....	.036–037
MEGA 60 .....	.038–040
MEGA 90 .....	.041–043
Beyond BLAST KSSM 45° • First Choice for Machining Titanium .....	.044–048
KSSM 45° • Conventional Machining .....	.049–054
KSOM Mini • KSOM • Best-in-Class Free-Cutting Face Mills .....	.056–067
Fix-Perfect Series .....	.068–085
Fix-Perfect Finisher • Cast Iron .....	.070–072
Fix-Perfect 20° • Cast Iron .....	.074–077, 082–085
Fix-Perfect 0° • Cast Iron .....	.078–081
HexaCut Series .....	.086–099
HexaCut 45° • Cast Iron .....	.089–093
HexaCut 30° • Cast Iron .....	.094–099
KSSR 6° • Cast Iron • Roughing and Finishing (6° Lead) .....	.0100–0107
KCMS Cartridge Milling System .....	.0108–0111
KSCM PCD AluMill .....	.0112–0121
Fix-Perfect 0° Aluminum .....	.0122–0128
Chamfer Mills (60°, 45°, 30°) .....	.0129–0137

Dodeka™ Series • Leader in Advanced Face Milling Applications

Primary Application

Dodeka, Dodeka Mini, and Dodeka MAX™ are the most comprehensive face milling boosters on the market today. Twelve true cutting edges per insert mean low cost per edge and high productivity. With Beyond™ premium milling grades, you will see up to 30% higher Metal Removal Rates (MRR), 25% lower cutting forces due to real soft cutting action, and up to 35% better tool life in light to heavy machining.

Features and Benefits

Dodeka Mini Series • Most comprehensive face milling booster in the market, up to $A_{p1} \text{ max} = .174''$

All different cutter body variations can be loaded with one insert style.

Dodeka Mini High-Feed



12 True Cutting Edges  **75° lead**

Insert HNGJ43
HNPJ43

$A_{p1} \text{ max} = .064''$

Dodeka Mini HF can be loaded with all Dodeka Mini standard inserts, except wiper inserts.

Dodeka Mini 45°



12 True Cutting Edges  **45° lead**

Insert HNGJ43
HNPJ43

$A_{p1} \text{ max} = .127''$

Best-in-class leader in face milling up to $A_{p1} \text{ max} = .127''$. Excellent choice for near net shape strategies and driven tools.

Dodeka Mini 30°



12 True Cutting Edges  **30° lead**

Insert HNGJ43
HNPJ43

$A_{p1} \text{ max} = .174''$

Achieve a higher axial depth-of-cut capability up to $A_{p1} = .174''$ with standard Dodeka Mini inserts.

Dodeka™ Mini Series

insert size HN.J43
Ap1 max = .174"
page O4–O15

Dodeka™

insert size HN.J535
Ap1 max = .178"
page O16–O22

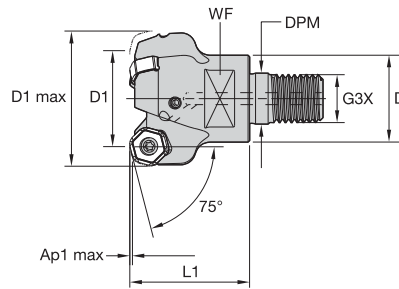
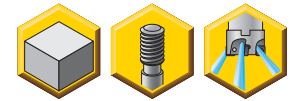


Dodeka MAX™

insert size HN.J75
Ap1 max = .315"
page O24–O26

P M K N S Capable in all material groups • Excellent results in machining titanium

- Twelve cutting edges per insert.
- High-Feed capability.



■ Dodeka Mini High-Feed 75° • Screw-On End Mills

order number	catalog number	D1	D1 max	D	DPM	G3X	L1	WF	Ap1 max	Z lbs	max RPM
4136401	KSHRHF100D02M16HN43	1.000	1.518	1.142	.669	M16	1.250	.866	.064	2 .39	19800
4136402	KSHRHF100D03M16HN43	1.000	1.518	1.142	.669	M16	1.250	.866	.064	3 .36	19800
4136403	KSHRHF125D03M16HN43	1.250	1.768	1.142	.669	M16	1.500	.866	.065	3 .50	17600
4136404	KSHRHF125D04M16HN43	1.250	1.768	1.142	.669	M16	1.500	.866	.065	4 .52	17600
4136405	KSHRHF150D04M16HN43	1.500	2.018	1.142	.669	M16	1.500	.866	.065	4 .58	15800
4136406	KSHRHF150D05M16HN43	1.500	2.018	1.142	.669	M16	1.500	.866	.065	5 .59	15800

■ Spare Parts



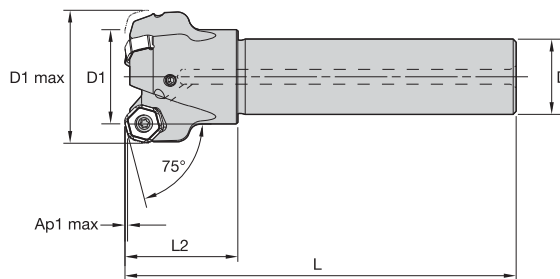
insert screw



wrench

D1	insert screw	in. lbs.	wrench
1.000	193.492	31	170.025
1.250	193.492	31	170.025
1.500	193.492	31	170.025

Face Mills



■ Dodeka Mini High-Feed 75° • Cylindrical End Mills

order number	catalog number	D1	D1 max	D	L	L2	Ap1 max	Z lbs	max RPM
4136407	KSHRHF100D02C075HN43L480	1.000	1.518	.750	4.800	1.250	.064	2 .73	19800
4136408	KSHRHF100D03C075HN43L480	1.000	1.518	.750	4.800	1.250	.064	3 .69	19800
4136409	KSHRHF125D03C100HN43L520	1.250	1.768	1.000	5.200	1.500	.065	3 1.27	17600
4136410	KSHRHF125D04C100HN43L520	1.250	1.768	1.000	5.200	1.500	.065	4 1.28	17600

■ Spare Parts



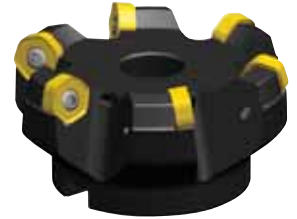
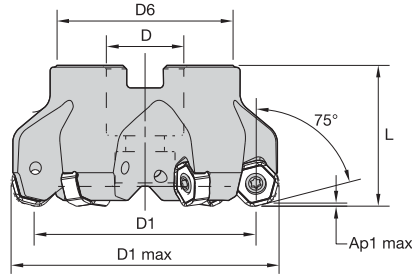
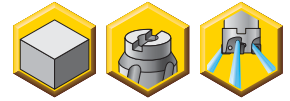
insert screw



wrench

D1	insert screw	in. lbs.	wrench
1.000	193.492	31	170.025
1.250	193.492	31	170.025

- Twelve cutting edges per insert.
- High-Feed capability.



■ Dodeka Mini High-Feed 75° • Shell Mills

order number	catalog number	D1	D1 max	D	D6	L	Ap1 max	Z	lbs	max RPM
4136411	KSHRHF150HN43F3	1.500	2.018	.750	1.750	1.575	.065	5	.75	16700
4136412	KSHRHF200HN43M3	2.000	2.517	.750	1.750	1.575	.065	5	1.10	12500
4136413	KSHRHF250HN43M3	2.500	3.017	.750	1.750	1.575	.065	6	1.49	10000
4136414	KSHRHF300HN43M4	3.000	3.517	1.000	2.189	1.750	.065	8	2.21	8300

■ Spare Parts



insert screw



socket-head cap screw



wrench

D1	in. lbs.	socket-head cap screw	wrench
1.500	31	S445	170.025
2.000	31	S445	170.025
2.500	31	S445	170.025
3.000	31	S458	170.025

Dodeka Mini High-Feed



First choice for long reach face milling applications or light fixtures.

Chip thinning effect due to lead angle 14.5°. Tremendous enlargement of feed rate and Metal Removal Rate (MRR).

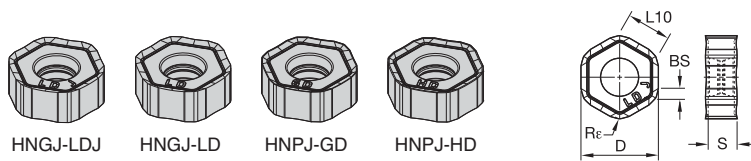
Up to 40% shorter machining cycle time.

Face Mills

Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	.E..LD	KC725M	.S..GD	KC725M	.S..HD	KC725M
P3-P4	.E..LD	KCPK30	.S..GD	KCPK30	.S..HD	KCPK30
P5-P6	.E..LD	KCPM20	.S..GD	KCPM20	.S..HD	KCPM20
M1-M2	.E..LD	KC725M	.S..GD	KC725M	.S..HD	KC725M
M3	.E..LD	KCPK30	.S..GD	KCPK30	.S..HD	KCPK30
K1-K2	.E..LD	KCK15	.S..GD	KCK15	.S..HD	KCK15
K3	.E..LD	KCPK30	.S..GD	KCPK30	.S..HD	KCPK30
N1-N2	.F..LDJ	K313	.F..LDJ	KC410M	.E..LD	KC510M
N3	.F..LDJ	KC410M	.E..LD	KC510M	.E..LD	KC510M
S1-S2	.E..LD	KC725M	.S..GD	KC725M	.S..HD	KC725M
S3	.E..LD	KC725M	.S..GD	KC725M	.S..HD	KC725M
S4	.S..GD	KC725M	.S..HD	KC725M	—	—
H1	—	—	—	—	—	—

Indexable Inserts



P	●																			
M	●																			
K	●																			
N	●	●	○																	
S	●																			
H	●																			

● first choice
○ alternate choice

Face Mills

HNGJ-LDJ

catalog number	D	BS	L10	Re	S	hm	cutting edges	K313	KC410M	KC510M	KC520M	KC522M	KC725M	KCK15	KCPM20	KCPK30
HNGJ43ANFNLDJ	.472	.060	.254	.039	.176	.001	12	●	●							

HNGJ-LD

catalog number	D	BS	L10	Re	S	hm	cutting edges	K313	KC410M	KC510M	KC520M	KC522M	KC725M	KCK15	KCPM20	KCPK30
HNGJ43ANENLD	.472	.060	.254	.039	.176	.002	12			●						
HNGJ438ANENLD	.472	—	.253	.126	.177	.002	12				●	●	●	●	●	●

HNPJ-GD

catalog number	D	BS	L10	Re	S	hm	cutting edges	K313	KC410M	KC510M	KC520M	KC522M	KC725M	KCK15	KCPM20	KCPK30
HNPJ43ANSNGD	.472	.057	.254	.039	.175	.003	12				●	●	●	●	●	●

HNPJ-HD

catalog number	D	BS	L10	Re	S	hm	cutting edges	K313	KC410M	KC510M	KC520M	KC522M	KC725M	KCK15	KCPM20	KCPK30
HNPJ43ANSNHD	.472	.057	.254	.039	.173	.006	12				●	●	●	●	●	●
HNPJ438ANSNHD	.472	—	.253	.126	.174	.004	12				●	●	●	●	●	●

Recommended Starting Speeds [SFM]

Material Group		K313			KC410M			KC510M			KC520M			KC522M		
P	1	—	—	—	—	—	—	—	—	—	—	—	—	1300	1130	1060
	2	—	—	—	—	—	—	—	—	—	—	—	—	1080	950	790
	3	—	—	—	—	—	—	—	—	—	—	—	—	1000	840	700
	4	—	—	—	—	—	—	960	780	660	—	—	—	890	730	590
	5	—	—	—	—	—	—	—	—	—	—	—	—	730	660	590
	6	—	—	—	—	—	—	—	—	—	—	—	—	650	490	400
M	1	—	—	—	—	—	—	—	—	—	—	—	—	800	710	650
	2	—	—	—	—	—	—	—	—	—	—	—	—	730	620	520
	3	—	—	—	—	—	—	—	—	—	—	—	—	550	480	370
K	1	—	—	—	—	—	—	1150	1040	940	1060	960	850	900	820	720
	2	—	—	—	—	—	—	910	820	760	830	740	700	710	640	590
	3	—	—	—	—	—	—	770	680	620	700	620	560	590	530	480
N	1-2	3130	2740	2350	4790	4260	3920	2520	2240	2060	—	—	—	—	—	—
	3	—	—	—	4260	3920	3600	2280	2100	1920	—	—	—	—	—	—
S	1	—	—	—	—	—	—	—	—	—	—	—	—	160	140	110
	2	—	—	—	—	—	—	—	—	—	—	—	—	160	140	110
	3	—	—	—	—	—	—	—	—	—	—	—	—	200	160	110
	4	—	—	—	—	—	—	—	—	—	—	—	—	280	200	140
H	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Material Group		KCPM20			KC725M			KCK15			KCPK30		
P	1	2170	1910	1760	1030	900	840	—	—	—	1780	1560	1450
	2	1340	1210	1090	860	760	640	—	—	—	1100	1000	900
	3	1210	1090	1000	790	670	550	—	—	—	1000	900	820
	4	910	840	760	710	590	470	—	—	—	740	690	620
	5	1090	980	900	590	530	470	—	—	—	1020	910	830
	6	760	660	570	520	400	310	—	—	—	620	540	—
M	1	880	790	680	670	590	540	—	—	—	820	720	620
	2	800	700	620	610	520	430	—	—	—	730	640	550
	3	640	570	490	460	400	310	—	—	—	570	520	460
K	1	1420	1280	1150	—	—	—	1660	1510	1340	1160	1050	940
	2	1130	1010	920	—	—	—	1310	1170	1090	920	830	760
	3	950	840	780	—	—	—	1100	980	900	770	690	640
N	1-2	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—
S	1	—	—	—	140	120	100	—	—	—	—	—	—
	2	—	—	—	140	120	100	—	—	—	—	—	—
	3	—	—	—	180	140	100	—	—	—	—	—	—
	4	—	—	—	240	180	120	—	—	—	—	—	—
H	1	—	—	—	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

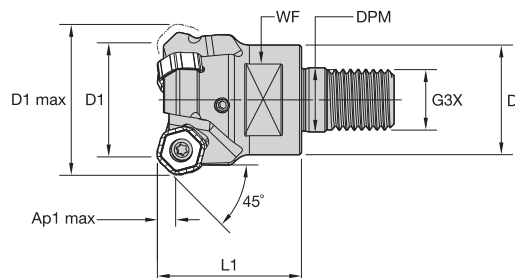
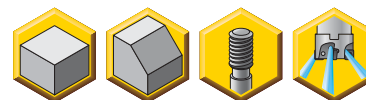
Recommended Starting Feeds [IPT]

Light Machining	General Purpose	Heavy Machining
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Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.F..LDJ	.013	.027	.055	.010	.019	.039	.008	.017	.034	.008	.016	.032	.008	.015	.031	.F..LDJ
.E..LD	.013	.040	.086	.010	.029	.060	.008	.025	.051	.008	.024	.047	.008	.023	.046	.E..LD
.S..GD	.027	.060	.104	.019	.043	.071	.017	.037	.060	.016	.034	.056	.015	.033	.054	.S..GD
.S..HD	.027	.070	.121	.019	.049	.081	.017	.042	.068	.016	.040	.063	.015	.039	.062	.S..HD

NOTE: Use "Light Machining" values as starting feed rate.

- Twelve cutting edges per insert.
- Maximum number of teeth per diameter.
- Productivity booster in all materials.



■ Dodeka Mini 45° • Screw-On End Mills

order number	catalog number	D1	D1 max	D	DPM	G3X	L1	WF	Ap1 max	Z lbs	max RPM
4130252	KSHR100D02M16HN06	1.000	1.322	1.142	.669	M16	1.250	.866	.127	2 .32	19800
4130383	KSHR100D03M16HN06	1.000	1.322	1.142	.669	M16	1.250	.866	.127	3 .29	19800
4130384	KSHR125D03M16HN06	1.250	1.572	1.142	.669	M16	1.500	.866	.127	3 .43	17600
4130385	KSHR125D04M16HN06	1.250	1.572	1.142	.669	M16	1.500	.866	.127	4 .42	17600
4130386	KSHR150D04M16HN06	1.500	1.822	1.142	.669	M16	1.500	.866	.127	4 .51	15800
4130387	KSHR150D05M16HN06	1.500	1.822	1.142	.669	M16	1.500	.866	.127	5 .51	15800

■ Spare Parts



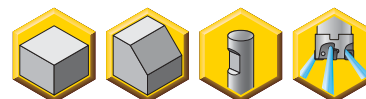
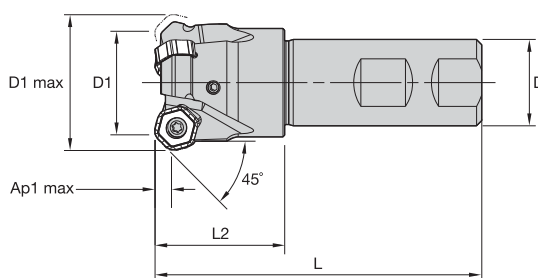
insert
screw



wrench

D1	insert screw	in. lbs.	wrench
1.000	193.492	31	170.025
1.250	193.492	31	170.025
1.500	193.492	31	170.025

Face Mills



■ Dodeka Mini 45° • Weldon® End Mills

order number	catalog number	D1	D1 max	D	L	L2	Ap1 max	Z lbs	max RPM
4130514	KSHR100D02W075HN06	1.000	1.322	.750	3.280	1.250	.127	2 .46	19800
4130515	KSHR100D03W075HN06	1.000	1.322	.750	3.280	1.250	.127	3 .44	19800
4130516	KSHR125D03W100HN06	1.250	1.572	1.000	3.780	1.500	.127	3 .88	17600
4130517	KSHR125D04W100HN06	1.250	1.572	1.000	3.780	1.500	.127	4 .89	17600

■ Spare Parts



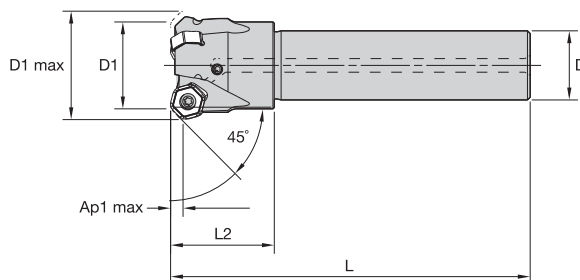
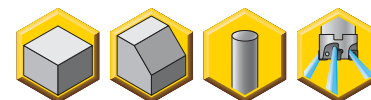
insert
screw



wrench

D1	insert screw	in. lbs.	wrench
1.000	193.492	31	170.025
1.250	193.492	31	170.025

- Twelve cutting edges per insert.
- Maximum number of teeth per diameter.
- Productivity booster in all materials.



■ Dodeka Mini 45° • Cylindrical End Mills

order number	catalog number	D1	D1 max	D	L	L2	Ap1 max	Z	lbs	max RPM
4130518	KSHR100D02C075HN06L480	1.000	1.322	.750	4.800	1.250	.127	2	.64	19800
4130519	KSHR100D03C075HN06L480	1.000	1.322	.750	4.800	1.250	.127	3	.62	19800
4130522	KSHR100D02C100HN06L800	1.000	1.322	1.000	8.000	1.250	.127	2	1.66	19800
4130533	KSHR100D03C100HN06L800	1.000	1.322	1.000	8.000	1.250	.127	3	1.64	19800
4130520	KSHR125D03C100HN06L520	1.250	1.572	1.000	5.200	1.500	.127	3	1.19	17600
4130521	KSHR125D04C100HN06L520	1.250	1.572	1.000	5.200	1.500	.127	4	1.20	17600

■ Spare Parts



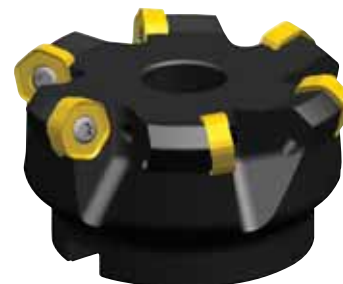
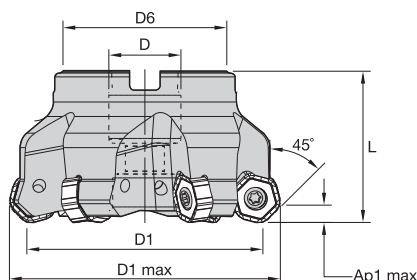
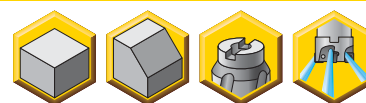
insert
screw



wrench

D1	insert screw	in. lbs.	wrench
1.000	193.492	31	170.025
1.250	193.492	31	170.025

- Twelve cutting edges per insert.
- Maximum number of teeth per diameter.
- Productivity booster in all materials.



■ Dodeka Mini 45° • Shell Mills

order number	catalog number	D1	D1 max	D	D6	L	Ap1 max	Z	lbs	max RPM
4130426	KSHR150HN4345M3	1.500	1.822	.500	1.440	1.575	.127	4	.57	16700
4130427	KSHR150HN4345F3	1.500	1.822	.500	1.440	1.575	.127	5	.56	16700
4130428	KSHR200HN4345C3	2.000	2.321	.750	1.750	1.575	.127	4	.93	12500
4130429	KSHR200HN4345M3	2.000	2.321	.750	1.750	1.575	.127	5	.93	12500
4130430	KSHR200HN4345F3	2.000	2.321	.750	1.750	1.575	.127	6	.97	12500
4130431	KSHR250HN4345C3	2.500	2.821	.750	1.750	1.575	.127	4	1.20	10000
4130432	KSHR250HN4345M3	2.500	2.821	.750	1.750	1.575	.127	6	1.27	10000
4130493	KSHR250HN4345F3	2.500	2.821	.750	1.750	1.575	.127	8	1.29	10000
4130494	KSHR300HN4345C4	3.000	3.321	1.000	2.189	1.750	.127	5	1.90	8300
4130495	KSHR300HN4345M4	3.000	3.321	1.000	2.189	1.750	.127	8	2.09	8300
4130496	KSHR300HN4345F4	3.000	3.321	1.000	2.189	1.750	.127	10	2.07	8300
4130497	KSHR400HN4345C6	4.000	4.321	1.500	3.661	1.750	.127	6	3.48	6300
4130498	KSHR400HN4345M6	4.000	4.321	1.500	3.661	1.750	.127	9	3.66	6300
4130499	KSHR400HN4345F6	4.000	4.321	1.500	3.661	1.750	.127	12	3.62	6300
4130500	KSHR500HN4345C6	5.000	5.320	1.500	3.652	2.380	.127	8	6.38	5000
4130501	KSHR500HN4345M6	5.000	5.320	1.500	3.652	2.380	.127	12	6.59	5000
4130502	KSHR500HN4345F6	5.000	5.320	1.500	3.652	2.380	.127	16	6.70	5000

Face Mills

■ Spare Parts



insert screw



wrench



socket-head cap screw

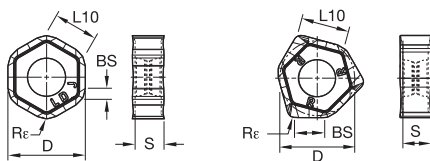
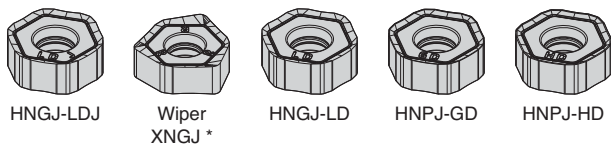


coolant lock screw assembly

D1	insert screw	in. lbs.	wrench	socket-head cap screw	coolant lock screw assembly
1.500	193.492	31	170.025	S424	—
2.000	193.492	31	170.025	S445	—
2.500	193.492	31	170.025	S445	—
3.000	193.492	31	170.025	S458	—
4.000	193.492	31	170.025	—	S2165C
5.000	193.492	31	170.025	—	S2163C

Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	.E..LD	KC725M	.S..GD	KC725M	.S..HD	KC725M
P3-P4	.E..LD	KCPK30	.S..GD	KCPK30	.S..HD	KCPK30
P5-P6	.E..LD	KCPM20	.S..GD	KCPM20	.S..HD	KCPM20
M1-M2	.E..LD	KC725M	.S..GD	KC725M	.S..HD	KC725M
M3	.E..LD	KCPK30	.S..GD	KCPK30	.S..HD	KCPK30
K1-K2	.E..LD	KCK15	.S..GD	KCK15	.S..HD	KCK15
K3	.E..LD	KCPK30	.S..GD	KCPK30	.S..HD	KCPK30
N1-N2	.F..LDJ	K313	.F..LDJ	KC410M	.E..LD	KC510M
N3	.F..LDJ	KC410M	.E..LD	KC510M	.E..LD	KC510M
S1-S2	.E..LD	KC725M	.S..GD	KC725M	.S..HD	KC725M
S3	.E..LD	KC725M	.S..GD	KC725M	.S..HD	KC725M
S4	.S..GD	KC725M	.S..HD	KC725M	—	—
H1	.E..LD	KC510M	.S..GD	KC522M	—	—

Indexable Inserts


- first choice
- alternate choice

P	M	K	N	S	H
●	○	○	○	○	○
○	○	○	○	○	○
○	○	○	○	○	○
○	○	○	○	○	○
○	○	○	○	○	○
○	○	○	○	○	○

HNGJ-LDJ/XNGJ-LDJ

catalog number	D	BS	L10	Re	S	hm	cutting edges	K313	KC410M	KC510M	KC520M	KC522M	KC725M	KCK15	KCPM20	KCPK30
HNGJ43ANFNLDJ	.472	.060	.254	.039	.176	.001	12	●	●							
XNGJ43ANFNLDJ3W	.472	.189	.283	.063	.178	.001	3	●	●							

* For Wiper insert XNGJ, 3 left-hand (LH) and 3 right-hand (RH) wiper edges per insert.

HNGJ-LD/XNGJ-LD

catalog number	D	BS	L10	Re	S	hm	cutting edges	K313	KC410M	KC510M	KC520M	KC522M	KC725M	KCK15	KCPM20	KCPK30
HNGJ43ANENLD	.472	.060	.254	.039	.176	.002	12				●	●	●	●	●	●
HNGJ438ANENLD	.472	—	.253	.126	.177	.002	12				●	●	●	●	●	●
XNGJ43ANENLD3W	.472	.189	.283	.063	.178	.002	3				●	●	●	●	●	●

* For Wiper insert XNGJ, 3 left-hand (LH) and 3 right-hand (RH) wiper edges per insert.

HNPJ-GD

catalog number	D	BS	L10	Re	S	hm	cutting edges	K313	KC410M	KC510M	KC520M	KC522M	KC725M	KCK15	KCPM20	KCPK30
HNPJ43ANSNGD	.472	.057	.254	.039	.175	.003	12				●	●	●	●	●	●

HNPJ-HD

catalog number	D	BS	L10	Re	S	hm	cutting edges	K313	KC410M	KC510M	KC520M	KC522M	KC725M	KCK15	KCPM20	KCPK30
HNPJ43ANSNHD	.472	.057	.254	.039	.173	.006	12				●	●	●	●	●	●
HNPJ438ANSNHD	.472	—	.253	.126	.174	.004	12				●	●	●	●	●	●

Face Mills

■ Recommended Starting Speeds [SFM]

Material Group		K313			KC410M			KC510M			KC520M			KC522M		
P	1	—	—	—	—	—	—	—	—	—	—	—	—	1300	1130	1060
	2	—	—	—	—	—	—	—	—	—	—	—	—	1080	950	790
	3	—	—	—	—	—	—	—	—	—	—	—	—	1000	840	700
	4	—	—	—	—	—	—	960	780	660	—	—	—	890	730	590
	5	—	—	—	—	—	—	—	—	—	—	—	—	730	660	590
	6	—	—	—	—	—	—	—	—	—	—	—	—	650	490	400
M	1	—	—	—	—	—	—	—	—	—	—	—	—	800	710	650
	2	—	—	—	—	—	—	—	—	—	—	—	—	730	620	520
	3	—	—	—	—	—	—	—	—	—	—	—	—	550	480	370
K	1	—	—	—	—	—	—	1150	1040	940	1060	960	850	900	820	720
	2	—	—	—	—	—	—	910	820	760	830	740	700	710	640	590
	3	—	—	—	—	—	—	770	680	620	700	620	560	590	530	480
N	1-2	3130	2740	2350	4790	4260	3920	2520	2240	2060	—	—	—	—	—	—
	3	—	—	—	4260	3920	3600	2280	2100	1920	—	—	—	—	—	—
S	1	—	—	—	—	—	—	—	—	—	—	—	—	160	140	110
	2	—	—	—	—	—	—	—	—	—	—	—	—	160	140	110
	3	—	—	—	—	—	—	—	—	—	—	—	—	200	160	110
	4	—	—	—	—	—	—	—	—	—	—	—	—	280	200	140
H	1	—	—	—	—	—	—	630	510	360	—	—	—	470	360	280
	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Material Group		KCPM20			KC725M			KCK15			KCPK30		
P	1	2170	1910	1760	1030	900	840	—	—	—	1780	1560	1450
	2	1340	1210	1090	860	760	640	—	—	—	1100	1000	900
	3	1210	1090	1000	790	670	550	—	—	—	1000	900	820
	4	910	840	760	710	590	470	—	—	—	740	690	620
	5	1090	980	900	590	530	470	—	—	—	1020	910	830
	6	760	660	570	520	400	310	—	—	—	620	540	—
M	1	880	790	680	670	590	540	—	—	—	820	720	620
	2	800	700	620	610	520	430	—	—	—	730	640	550
	3	640	570	490	460	400	310	—	—	—	570	520	460
K	1	1420	1280	1150	—	—	—	1660	1510	1340	1160	1050	940
	2	1130	1010	920	—	—	—	1310	1170	1090	920	830	760
	3	950	840	780	—	—	—	1100	980	900	770	690	640
N	1-2	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—
S	1	—	—	—	140	120	100	—	—	—	—	—	—
	2	—	—	—	140	120	100	—	—	—	—	—	—
	3	—	—	—	180	140	100	—	—	—	—	—	—
	4	—	—	—	240	180	120	—	—	—	—	—	—
H	1	—	—	—	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

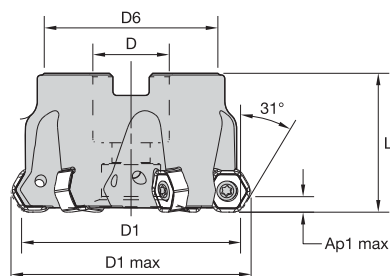
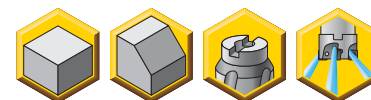
■ Recommended Starting Feeds [IPT]

Light Machining	General Purpose	Heavy Machining
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Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.F..LDJ	.005	.010	.019	.004	.007	.014	.003	.006	.012	.003	.006	.012	.003	.006	.011	.F..LDJ
.E..LD	.005	.014	.029	.004	.011	.021	.003	.009	.019	.003	.009	.017	.003	.008	.017	.E..LD
.S..GD	.010	.022	.038	.007	.016	.028	.006	.014	.024	.006	.013	.022	.006	.013	.022	.S..GD
.S..HD	.010	.024	.039	.007	.018	.029	.006	.015	.025	.006	.014	.023	.006	.014	.023	.S..HD

NOTE: Use "Light Machining" values as starting feed rate.

- Twelve cutting edges per insert.
- Higher A_{p1} max with standard inserts.
- Productivity booster in all materials.



■ Dodeka Mini 30° • Shell Mills

order number	catalog number	D1	D1 max	D	D6	L	Ap1 max	Z	lbs	max RPM
4136389	KSHRHD150HN43M2	1.500	1.744	.500	1.440	1.575	.174	4	.48	16700
4136390	KSHRHD150HN43F2	1.500	1.744	.500	1.440	1.575	.174	5	.48	16700
4136391	KSHRHD200HN43C3	2.000	2.242	.750	1.750	1.575	.174	4	.85	12500
4136392	KSHRHD200HN43M3	2.000	2.242	.750	1.750	1.575	.174	5	.87	12500
4136393	KSHRHD250HN43C3	2.500	2.743	.750	1.750	1.575	.174	4	1.17	10000
4136394	KSHRHD250HN43M3	2.500	2.743	.750	1.750	1.575	.174	6	1.21	10000
4136395	KSHRHD300HN43C4	3.000	3.241	1.000	2.189	1.750	.174	5	1.86	8300
4136396	KSHRHD300HN43M4	3.000	3.241	1.000	2.189	1.750	.174	8	1.96	8300
4136397	KSHRHD400HN43C6	4.000	4.243	1.500	3.661	1.750	.174	6	3.36	6300
4136398	KSHRHD400HN43M6	4.000	4.243	1.500	3.661	1.750	.174	9	3.51	6300
4136399	KSHRHD500HN43C6	5.000	5.240	1.500	3.652	2.380	.175	8	6.31	5000
4136400	KSHRHD500HN43M6	5.000	5.240	1.500	3.652	2.380	.175	12	6.53	5000

■ Spare Parts



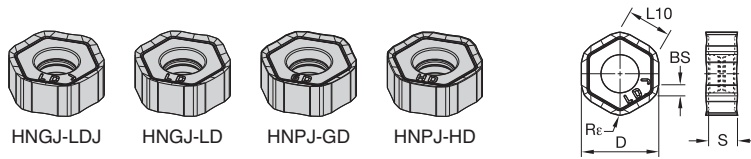
D1	insert screw	in. lbs.	wrench	socket-head cap screw	coolant lock screw assembly
1.500	193.492	31	170.025	S424	—
2.000	193.492	31	170.025	S445	—
2.500	193.492	31	170.025	S445	—
3.000	193.492	31	170.025	S458	—
4.000	193.492	31	170.025	—	S2165C
5.000	193.492	31	170.025	—	S2163C

Face Mills

Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	.E..LD	KC725M	.S..GD	KC725M	.S..HD	KC725M
P3-P4	.E..LD	KCPK30	.S..GD	KCPK30	.S..HD	KCPK30
P5-P6	.E..LD	KCPM20	.S..GD	KCPM20	.S..HD	KCPM20
M1-M2	.E..LD	KC725M	.S..GD	KC725M	.S..HD	KC725M
M3	.E..LD	KCPK30	.S..GD	KCPK30	.S..HD	KCPK30
K1-K2	.E..LD	KCK15	.S..GD	KCK15	.S..HD	KCK15
K3	.E..LD	KCPK30	.S..GD	KCPK30	.S..HD	KCPK30
N1-N2	.F..LDJ	K313	.F..LDJ	KC410M	.E..LD	KC510M
N3	.F..LDJ	KC410M	.E..LD	KC510M	.E..LD	KC510M
S1-S2	.E..LD	KC725M	.S..GD	KC725M	.S..HD	KC725M
S3	.E..LD	KC725M	.S..GD	KC725M	.S..HD	KC725M
S4	.S..GD	KC725M	.S..HD	KC725M	—	—
H1	—	—	—	—	—	—

Indexable Inserts



Face Mills

HNGJ-LDJ

catalog number	D	BS	L10	Re	S	hm	cutting edges	P	M	K	N	S	H	K313	KC410M	KC510M	KC520M	KC522M	KC725M	KCK15	KCPM20	KCPK30	
HNGJ43ANFNLDJ	.472	.060	.254	.039	.176	.001	12	●	●	●	○	●	●	●	●	●	●	●	●	●	●	●	●

HNGJ-LD

catalog number	D	BS	L10	Re	S	hm	cutting edges	P	M	K	N	S	H	K313	KC410M	KC510M	KC520M	KC522M	KC725M	KCK15	KCPM20	KCPK30	
HNGJ43ANENLD	.472	.060	.254	.039	.176	.002	12	●	●	●	○	●	●	●	●	●	●	●	●	●	●	●	●
HNGJ438ANENLD	.472	—	.253	.126	.177	.002	12	●	●	●	○	●	●	●	●	●	●	●	●	●	●	●	●

HNPJ-GD

catalog number	D	BS	L10	Re	S	hm	cutting edges	P	M	K	N	S	H	K313	KC410M	KC510M	KC520M	KC522M	KC725M	KCK15	KCPM20	KCPK30	
HNPJ43ANSNGD	.472	.057	.254	.039	.175	.003	12	●	●	●	○	●	●	●	●	●	●	●	●	●	●	●	●

HNPJ-HD

catalog number	D	BS	L10	Re	S	hm	cutting edges	P	M	K	N	S	H	K313	KC410M	KC510M	KC520M	KC522M	KC725M	KCK15	KCPM20	KCPK30	
HNPJ43ANSNHD	.472	.057	.254	.039	.173	.006	12	●	●	●	○	●	●	●	●	●	●	●	●	●	●	●	●
HNPJ438ANSNHD	.472	—	.253	.126	.174	.004	12	●	●	●	○	●	●	●	●	●	●	●	●	●	●	●	●

● first choice
○ alternate choice

■ Recommended Starting Speeds [SFM]

Material Group		K313			KC410M			KC510M			KC520M			KC522M		
P	1	—	—	—	—	—	—	—	—	—	—	—	—	1300	1130	1060
	2	—	—	—	—	—	—	—	—	—	—	—	—	1080	950	790
	3	—	—	—	—	—	—	—	—	—	—	—	—	1000	840	700
	4	—	—	—	—	—	—	960	780	660	—	—	—	890	730	590
	5	—	—	—	—	—	—	—	—	—	—	—	—	730	660	590
	6	—	—	—	—	—	—	—	—	—	—	—	—	650	490	400
M	1	—	—	—	—	—	—	—	—	—	—	—	—	800	710	650
	2	—	—	—	—	—	—	—	—	—	—	—	—	730	620	520
	3	—	—	—	—	—	—	—	—	—	—	—	—	550	480	370
K	1	—	—	—	—	—	—	1150	1040	940	1060	960	850	900	820	720
	2	—	—	—	—	—	—	910	820	760	830	740	700	710	640	590
	3	—	—	—	—	—	—	770	680	620	700	620	560	590	530	480
N	1-2	3130	2740	2350	4790	4260	3920	2520	2240	2060	—	—	—	—	—	—
	3	—	—	—	4260	3920	3600	2280	2100	1920	—	—	—	—	—	—
S	1	—	—	—	—	—	—	—	—	—	—	—	—	160	140	110
	2	—	—	—	—	—	—	—	—	—	—	—	—	160	140	110
	3	—	—	—	—	—	—	—	—	—	—	—	—	200	160	110
	4	—	—	—	—	—	—	—	—	—	—	—	—	280	200	140
H	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Material Group		KCPM20			KC725M			KCK15			KCPK30		
P	1	2170	1910	1760	1030	900	840	—	—	—	1780	1560	1450
	2	1340	1210	1090	860	760	640	—	—	—	1100	1000	900
	3	1210	1090	1000	790	670	550	—	—	—	1000	900	820
	4	910	840	760	710	590	470	—	—	—	740	690	620
	5	1090	980	900	590	530	470	—	—	—	1020	910	830
	6	760	660	570	520	400	310	—	—	—	620	540	—
M	1	880	790	680	670	590	540	—	—	—	820	720	620
	2	800	700	620	610	520	430	—	—	—	730	640	550
	3	640	570	490	460	400	310	—	—	—	570	520	460
K	1	1420	1280	1150	—	—	—	1660	1510	1340	1160	1050	940
	2	1130	1010	920	—	—	—	1310	1170	1090	920	830	760
	3	950	840	780	—	—	—	1100	980	900	770	690	640
N	1-2	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—
S	1	—	—	—	140	120	100	—	—	—	—	—	—
	2	—	—	—	140	120	100	—	—	—	—	—	—
	3	—	—	—	180	140	100	—	—	—	—	—	—
	4	—	—	—	240	180	120	—	—	—	—	—	—
H	1	—	—	—	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—



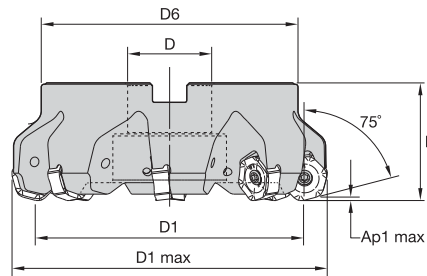
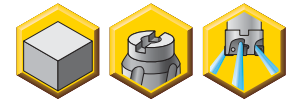
NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

■ Recommended Starting Feeds [IPT]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.F..LDJ	.004	.008	.016	.003	.006	.012	.003	.005	.010	.002	.005	.009	.002	.005	.009	.F..LDJ
.E..LD	.004	.012	.024	.003	.009	.017	.003	.008	.015	.002	.007	.014	.002	.007	.014	.E..LD
.S..GD	.008	.017	.028	.006	.013	.021	.005	.011	.018	.005	.010	.017	.005	.010	.016	.S..GD
.S..HD	.008	.020	.032	.006	.015	.023	.005	.013	.020	.005	.012	.019	.005	.012	.018	.S..HD

NOTE: Use "Light Machining" values as starting feed rate.



■ Dodeka High-Feed 75° • Shell Mills

order number	catalog number	D1	D1 max	D	D6	L	Ap1 max	Z	lbs	max RPM
4047419	KSHRHF200HN5315C3	2.000	2.746	.750	1.750	1.595	.087	4	1.13	11300
4047420	KSHRHF250HN5315C3	2.500	3.245	.750	2.144	1.595	.087	5	1.60	8900
4047421	KSHRHF300HN5315C4	3.000	3.745	1.000	2.346	1.770	.087	6	2.23	7400
4047422	KSHRHF400HN5315C5	4.000	4.744	1.250	3.819	1.770	.087	8	3.91	5800
4047583	KSHRHF500HN5315C6	5.000	6.081	1.500	3.810	2.400	.087	9	6.87	4700
4047584	KSHRHF600HN5315C8	6.000	8.081	2.000	4.880	2.400	.087	12	10.51	4000

■ Spare Parts

Face Mills



D1	insert screw	in. lbs.	wrench	socket-head cap screw	socket-head cap screw with coolant groove	coolant lock screw	coolant lock screw	coolant shower plate
2.000	193.492	31	170.025	S445	S445CG	—	—	—
2.500	193.492	31	170.025	S445	S445CG	—	—	—
3.000	193.492	31	170.025	S458	S458CG	—	—	—
4.000	193.492	31	170.025	—	—	S2162C	—	—
5.000	193.492	31	170.025	—	—	—	420.201	470.240
6.000	193.492	31	170.025	—	—	—	420.241	470.241

■ Recommended Starting Speeds [SFM]

Material Group		KC410M			KC520M			KC522M			KC725M		
P	1	—	—	—	—	—	—	1300	1130	1060	1030	900	840
	2	—	—	—	—	—	—	1080	950	790	860	760	640
	3	—	—	—	—	—	—	1000	840	700	790	670	550
	4	—	—	—	—	—	—	890	730	590	710	590	470
	5	—	—	—	—	—	—	730	660	590	590	530	470
	6	—	—	—	—	—	—	650	490	400	520	400	310
M	1	—	—	—	—	—	—	800	710	650	670	590	540
	2	—	—	—	—	—	—	730	620	520	610	520	430
	3	—	—	—	—	—	—	550	480	370	460	400	310
K	1	—	—	—	1060	960	850	900	820	720	—	—	—
	2	—	—	—	830	740	700	710	640	590	—	—	—
	3	—	—	—	700	620	560	590	530	480	—	—	—
N	1-2	4790	4260	3920	—	—	—	—	—	—	—	—	—
	3	4260	3920	3600	—	—	—	—	—	—	—	—	—
S	1	—	—	—	—	—	—	160	140	110	140	120	100
	2	—	—	—	—	—	—	160	140	110	140	120	100
	3	—	—	—	—	—	—	200	160	110	180	140	100
	4	—	—	—	—	—	—	280	200	140	240	180	120
H	1	—	—	—	—	—	—	—	—	—	—	—	—

Material Group		KCK15			KCPM20			KCPK30		
P	1	—	—	—	2170	1910	1760	1780	1560	1450
	2	—	—	—	1340	1210	1090	1100	1000	900
	3	—	—	—	1210	1090	1000	1000	900	820
	4	—	—	—	910	840	760	740	690	620
	5	—	—	—	1090	980	900	1020	910	830
	6	—	—	—	760	660	570	620	540	—
M	1	—	—	—	880	790	680	820	720	620
	2	—	—	—	800	700	620	730	640	550
	3	—	—	—	640	570	490	570	520	460
K	1	1660	1510	1340	1420	1280	1150	1160	1050	940
	2	1310	1170	1090	1130	1010	920	920	830	760
	3	1100	980	900	950	840	780	770	690	640
N	1-2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
S	1	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—	—	—
H	1	—	—	—	—	—	—	—	—	—

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

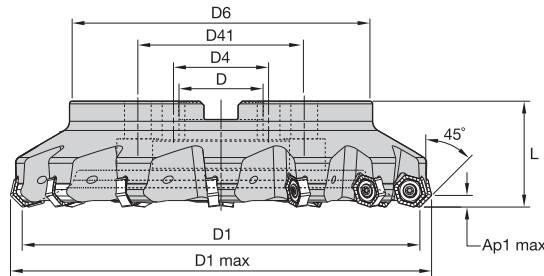
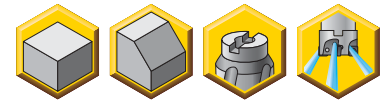
■ Recommended Starting Feeds [IPT]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.F..LDJ	.013	.027	.055	.010	.019	.039	.008	.017	.034	.008	.016	.032	.008	.015	.031	.F..LDJ
.E..LD	.013	.040	.086	.010	.029	.060	.008	.025	.051	.008	.024	.047	.008	.023	.046	.E..LD
.S..GD	.022	.058	.106	.017	.041	.072	.014	.036	.061	.013	.033	.057	.013	.032	.056	.S..GD
.S..HD	.022	.070	.121	.017	.049	.081	.014	.042	.068	.013	.040	.063	.013	.039	.062	.S..HD

NOTE: Use "Light Machining" values as starting feed rate.

- Twelve cutting edges per insert.
- Through-coolant on cutters <4" diameter.
5" diameter cutters and above do not have through-coolant.
- Soft cutting action.



■ Dodeka 45° • Shell Mills

order number	catalog number	D1	D1 max	D	D4	D41	D6	L	Ap1 max	Z	lbs	max RPM
3326850	KSHR200HN5345C3	2.000	2.434	.750	—	—	1.593	1.570	.178	4	.81	12500
3326851	KSHR200HN5345M3	2.000	2.434	.750	—	—	1.593	1.570	.178	5	.82	12500
3747124	KSHR250HN5345XC3	2.500	2.933	.750	—	—	1.986	1.570	.177	5	1.25	10000
3326852	KSHR250HN5345C3	2.500	2.933	.750	—	—	1.986	1.570	.178	6	1.32	10000
3326923	KSHR250HN5345M3	2.500	2.933	.750	—	—	1.986	1.570	.178	7	1.34	10000
3747125	KSHR300HN5345XC4	3.000	3.433	1.000	—	—	2.189	1.750	.177	5	1.86	8300
3326924	KSHR300HN5345C4	3.000	3.433	1.000	—	—	2.189	1.750	.178	6	1.79	8300
3326925	KSHR300HN5345M4	3.000	3.433	1.000	—	—	2.032	1.750	.178	9	1.97	8300
3747126	KSHR400HN5345XC5	4.000	4.232	1.250	—	—	2.722	1.750	.177	6	3.17	6300
3326926	KSHR400HN5345C5	4.000	4.432	1.250	—	—	2.722	1.750	.178	8	2.93	6300
3326927	KSHR400HN5345M5	4.000	4.432	1.250	—	—	2.722	1.750	.178	11	3.14	6300
3747127	KSHR500HN5345XC6	5.000	5.431	1.500	—	—	3.652	2.380	.177	8	6.20	5000
3326928	KSHR500HN5345C6	5.000	5.431	1.500	—	—	3.652	2.380	.178	10	5.94	5000
3326929	KSHR500HN5345M6	5.000	5.431	1.500	—	—	3.652	2.380	.178	14	6.21	5000
3747128	KSHR600HN5345XC8	6.000	6.432	2.000	—	—	4.722	2.380	.177	10	9.01	4100
3326930	KSHR600HN5345C8	6.000	6.432	2.000	—	—	4.722	2.380	.178	12	9.10	4100
3326931	KSHR600HN5345M8	6.000	6.432	2.000	—	—	4.722	2.380	.178	16	9.36	4100
3494648	KSHR800HN5345C10	8.000	8.432	2.500	4.000	—	5.118	2.380	.177	16	13.14	3130
3494649	KSHR1000HN5345C10	10.000	10.433	2.500	4.000	—	7.120	2.380	.177	20	24.52	2510
3494650	KSHR1200HN5345C10	12.000	12.433	2.500	4.000	7.000	9.016	3.150	.177	24	42.66	2090

Face Mills

■ Spare Parts



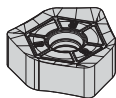
D1	insert screw	in. lbs.	wrench	socket-head cap screw	socket-head cap screw with coolant groove	coolant lock screw assembly	coolant lock screw	coolant shower plate
2.000	193.492	31	170.025	S445	S445CG	—	—	—
2.500	193.492	31	170.025	S445	S445CG	—	—	—
3.000	193.492	31	170.025	S458	S458CG	—	—	—
4.000	193.492	31	170.025	—	—	S2162C	—	—
5.000	193.492	31	170.025	—	—	—	420.201	470.240
6.000	193.492	31	170.025	—	—	—	420.241	470.241
8.000	193.492	31	170.025	—	—	—	—	470.242
10.000	193.492	31	170.025	—	—	—	—	470.243
12.000	193.492	31	170.025	—	—	—	—	470.244

NOTE: Please order all spare parts separately.

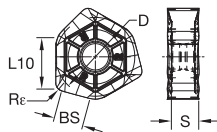
Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	.E..LD	KC725M	.S..GD	KC725M	.S..GD	KC725M
P3-P4	.E..LD	KCPK30	.S..GD	KCPK30	.S..GD	KCPK30
P5-P6	.E..LD	KCPM20	.S..GD	KCPM20	.S..HD	KCPM20
M1-M2	.E..LD	KC725M	.S..GD	KC725M	.S..GD	KC725M
M3	.S..GD	KCPK30	.S..HD	KCPK30	.S..HD	KCPK30
K1-K2	.E..LD	KCK15	.S..GD	KCK15	.S..GD	KCK15
K3	.S..GD	KCPK30	.S..HD	KCPK30	.S..HD	KCPK30
N1-N2	.F..LDJ	KC410M	.F..LDJ	KC410M	.F..LDJ	KC410M
N3	.F..LDJ	KC410M	.F..LDJ	KC410M	.F..LDJ	KC410M
S1-S2	.S..GD	KC725M	.S..GD	KC725M	.S..HD	KC725M
S3	.S..GD	KC725M	.S..HD	KC725M	.S..HD	KC725M
S4	.S..GD	KC725M	.S..HD	KC725M	—	—
H1	—	—	—	—	—	—

Indexable Inserts • Dodeka • XNGJ • Finishing



XNGJ-LDJ3W *
XNGJ-GD3W *



● first choice
○ alternate choice

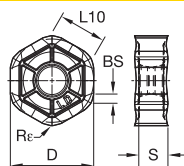
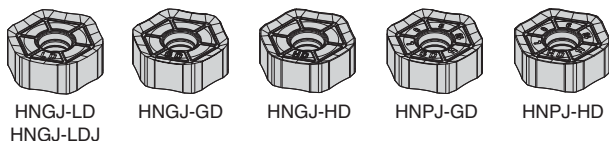
P	●	●	●	●	●
M	○	○	○	○	○
K	○	○	○	○	○
N	●	○	○	○	○
S	○	○	○	○	○
H	○	○	○	○	○
	KC410M	KC725M	KCK15	KCPM20	KCPK30

Face Mills

XNGJ-LDJ3W and -GD3W

catalog number	D	S	L10	BS	Re	cutting edges
XNGJ535ANFNLDJ3W	.625	.217	.377	.230	.063	3
XNGJ535ANSNGD3W	.625	.217	.377	.230	.063	3

* 3 left-hand (LH) and 3 right-hand (RH) wiper edges per insert.



P	●	○	○	○	○	○	○
M	●	○	○	○	○	○	○
K	●	○	○	○	○	○	○
N	●	○	○	○	○	○	○
S	●	○	○	○	○	○	○
H	●	○	○	○	○	○	○

● first choice
○ alternate choice

■ HNGJ-LD and -LDJ

catalog number	D	S	L10	BS	Rε	hm	cutting edges	KC410M	KC520M	KC522M	KC725M	KCK15	KCPM20	KCPK30
HNGJ535ANENLD	.625	.219	.338	.071	.047	.002	12		●	●	●	●	●	●
HNGJ535ANFNLDJ	.625	.219	.338	.071	.047	.001	12	●						

■ HNGJ-GD

catalog number	D	S	L10	BS	Rε	hm	cutting edges	KC410M	KC520M	KC522M	KC725M	KCK15	KCPM20	KCPK30
HNGJ535ANSNGD	.625	.219	.338	.071	.047	.002	12		●	●	●	●	●	●

■ HNGJ-HD

catalog number	D	S	L10	BS	Rε	hm	cutting edges	KC410M	KC520M	KC522M	KC725M	KCK15	KCPM20	KCPK30
HNGJ535ANSNHD	.625	.215	.338	.065	.047	.002	12		●	●	●	●	●	●
HNGJ53511ANSNHD	.625	.214	.334	—	.171	.002	12		●	●	●	●	●	●

■ HNPJ-GD

catalog number	D	S	L10	BS	Rε	hm	cutting edges	KC410M	KC520M	KC522M	KC725M	KCK15	KCPM20	KCPK30
HNPJ535ANSNGD	.625	.219	.338	.071	.047	.004	12		●	●	●	●	●	●

■ HNPJ-HD

catalog number	D	S	L10	BS	Rε	hm	cutting edges	KC410M	KC520M	KC522M	KC725M	KCK15	KCPM20	KCPK30
HNPJ535ANSNHD	.625	.215	.338	.065	.047	.007	12		●	●	●	●	●	●
HNPJ53511ANSNHD	.625	.214	.334	—	.171	.005	12		●	●	●	●	●	●



Face Mills

■ Recommended Starting Speeds [SFM]

Material Group		KC410M			KC520M			KC522M			KC725M		
P	1	—	—	—	—	—	—	1300	1130	1060	1030	900	840
	2	—	—	—	—	—	—	1080	950	790	860	760	640
	3	—	—	—	—	—	—	1000	840	700	790	670	550
	4	—	—	—	—	—	—	890	730	590	710	590	470
	5	—	—	—	—	—	—	730	660	590	590	530	470
	6	—	—	—	—	—	—	650	490	400	520	400	310
M	1	—	—	—	—	—	—	800	710	650	670	590	540
	2	—	—	—	—	—	—	730	620	520	610	520	430
	3	—	—	—	—	—	—	550	480	370	460	400	310
K	1	—	—	—	1060	960	850	900	820	720	—	—	—
	2	—	—	—	830	740	700	710	640	590	—	—	—
	3	—	—	—	700	620	560	590	530	480	—	—	—
N	1-2	4790	4260	3920	—	—	—	—	—	—	—	—	—
	3	4260	3920	3600	—	—	—	—	—	—	—	—	—
S	1	—	—	—	—	—	—	160	140	110	140	120	100
	2	—	—	—	—	—	—	160	140	110	140	120	100
	3	—	—	—	—	—	—	200	160	110	180	140	100
	4	—	—	—	—	—	—	280	200	140	240	180	120
H	1	—	—	—	—	—	—	—	—	—	—	—	—

Material Group		KCK15			KCPM20			KCPK30		
P	1	—	—	—	2170	1910	1760	1780	1560	1450
	2	—	—	—	1340	1210	1090	1100	1000	900
	3	—	—	—	1210	1090	1000	1000	900	820
	4	—	—	—	910	840	760	740	690	620
	5	—	—	—	1090	980	900	1020	910	830
	6	—	—	—	760	660	570	620	540	—
M	1	—	—	—	880	790	680	820	720	620
	2	—	—	—	800	700	620	730	640	550
	3	—	—	—	640	570	490	570	520	460
K	1	1660	1510	1340	1420	1280	1150	1160	1050	940
	2	1310	1170	1090	1130	1010	920	920	830	760
	3	1100	980	900	950	840	780	770	690	640
N	1-2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
S	1	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—	—	—
H	1	—	—	—	—	—	—	—	—	—

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

■ Recommended Starting Feeds [IPT]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.F..LDJ	.005	.010	.019	.004	.007	.014	.003	.006	.012	.003	.006	.012	.003	.006	.011	.F..LDJ
.E..LD	.005	.014	.029	.004	.011	.021	.003	.009	.019	.003	.009	.017	.003	.008	.017	.E..LD
.S..GD	.008	.020	.035	.006	.015	.026	.005	.013	.022	.005	.012	.021	.005	.012	.020	.S..GD
.S..HD	.008	.024	.039	.006	.018	.029	.005	.015	.025	.005	.014	.023	.005	.014	.023	.S..HD

NOTE: Use "Light Machining" values as starting feed rate.

Looking for a product that's not shown in this catalog?
Check the Kennametal website!

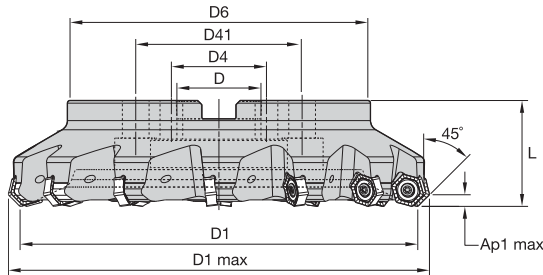
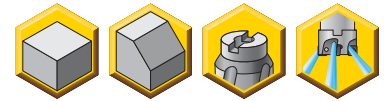


Indexable Milling

Online product catalog available 24/7

Visit <http://www.kennametal.com/milling/> to browse our electronic catalog any time you're looking for Kennametal's best tooling solutions. It's fast, free, and always available. The online e-catalog is updated weekly with products and solutions for milling, turning, holemaking, and tooling systems applications.

- Twelve cutting edges per insert.
- 25% lower cutting forces.
- Laser-hardened pocket seats.



■ Dodeka MAX 45° • Shell Mills

order number	catalog number	D1	D1 max	D	D4	D41	D6	L	Ap1 max	Z	lbs	max RPM
4057578	KSHR300HN7545M4	3.000	3.682	1.000	—	—	2.188	1.750	.315	4	2.14	8300
4057579	KSHR400HN7545M5	4.000	4.682	1.250	—	—	2.875	1.750	.315	5	3.18	6300
4057580	KSHR500HN7545M6	5.000	5.682	1.500	—	—	3.812	2.375	.315	6	6.40	5000
4057581	KSHR600HN7545M8	6.000	6.682	2.000	—	—	5.000	2.375	.315	9	9.87	4100
4057575	KSHR800HN7545C10	8.000	8.682	2.500	4.000	—	5.000	2.375	.315	10	13.51	3130
4057582	KSHR800HN7545M10	8.000	8.682	2.500	4.000	—	5.000	2.375	.315	12	13.55	3130
4057576	KSHR1000HN7545C10	10.000	10.682	2.500	4.000	—	6.963	2.375	.315	12	25.80	2510
4057583	KSHR1000HN7545M10	10.000	10.682	2.500	4.000	—	6.963	2.375	.315	14	13.55	2510
4057577	KSHR1200HN7545C10	12.000	12.681	2.500	4.000	7.000	9.016	3.150	.315	14	42.06	2090
4057584	KSHR1200HN7545M10	12.000	12.681	2.500	4.000	7.000	9.016	3.150	.315	18	42.03	2090

Face Mills

■ Spare Parts

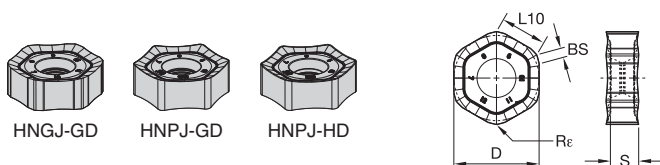


D1	insert screw	in. lbs.	Torx Plus wrench	socket-head cap screw	socket-head cap screw with coolant groove	coolant lock screw assembly	coolant lock screw	coolant shower plate
3.000	193.531	71	TTP25	S458	S458CG	—	—	—
4.000	193.531	71	TTP25	—	—	S2162C	—	—
5.000	193.531	71	TTP25	—	—	—	420.201	470.240
6.000	193.531	71	TTP25	—	—	—	420.241	470.241
8.000	193.531	71	TTP25	—	—	—	—	470.242
10.000	193.531	71	TTP25	—	—	—	—	470.243
12.000	193.531	71	TTP25	—	—	—	—	470.244

Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	.E..GD	KC725M	.S..GD	KC725M	.S..HD	KC725M
P3-P4	.E..GD	KCPK30	.S..GD	KCPK30	.S..HD	KCPK30
P5-P6	.E..GD	KCPK30	.S..GD	KCPK30	.S..HD	KCPK30
M1-M2	.E..GD	KC725M	.S..GD	KC725M	.S..HD	KC725M
M3	.E..GD	KCPK30	.S..GD	KCPK30	.S..HD	KCPK30
K1-K2	.E..GD	KCK15	.S..GD	KCK15	.S..HD	KCK15
K3	.E..GD	KCPK30	.S..GD	KCPK30	.S..HD	KCPK30
N1-N2	—	—	—	—	—	—
N3	—	—	—	—	—	—
S1-S2	.E..GD	KC725M	.S..GD	KC725M	.S..HD	KC725M
S3	.E..GD	KC725M	.S..GD	KC725M	.S..HD	KC725M
S4	.S..GD	KC725M	.S..HD	KC725M	—	—
H1	—	—	—	—	—	—

Indexable Inserts



● first choice
○ alternate choice

P	●	○	○	○
M	●	○	○	○
K	●	○	○	○
N	●	○	○	○
S	●	○	○	○
H	○	○	○	○

HNGJ-GD

catalog number	D	S	L10	BS	Re	hm	cutting edges	KC520M	KC725M	KCK15	KCPK30
HNGJ75ANENGD	.875	.292	.505	.074	.047	.002	12	●	●	●	●

HNPJ-GD

catalog number	D	S	L10	BS	Re	hm	cutting edges	KC520M	KC725M	KCK15	KCPK30
HNPJ755ANSNGD	.88	.30	.51	—	.1	.01	12	●	●	●	●

HNPJ-HD

catalog number	D	S	L10	BS	Re	hm	cutting edges	KC520M	KC725M	KCK15	KCPK30
HNPJ75ANSNHD	.875	.288	.505	.074	.047	.010	12	●	●	●	●
HNPJ755ANSNHD	.875	.292	.505	—	.079	.009	12	●	●	●	●
HNPJ759ANSNHD	.875	.289	.505	—	.138	.009	12	●	●	●	●

Face Mills

■ Recommended Starting Speeds [SFM]

Material Group		KC520M			KC725M			KCK15			KCPK30		
P	1	—	—	—	1030	900	840	—	—	—	1780	1560	1450
	2	—	—	—	860	760	640	—	—	—	1100	1000	900
	3	—	—	—	790	670	550	—	—	—	1000	900	820
	4	—	—	—	710	590	470	—	—	—	740	690	620
	5	—	—	—	590	530	470	—	—	—	1020	910	830
	6	—	—	—	520	400	310	—	—	—	620	540	—
M	1	—	—	—	670	590	540	—	—	—	820	720	620
	2	—	—	—	610	520	430	—	—	—	730	640	550
	3	—	—	—	460	400	310	—	—	—	570	520	460
K	1	1060	960	850	—	—	—	1660	1510	1340	1160	1050	940
	2	830	740	700	—	—	—	1310	1170	1090	920	830	760
	3	700	620	560	—	—	—	1100	980	900	770	690	640
N	1-2	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—
S	1	—	—	—	140	120	100	—	—	—	—	—	—
	2	—	—	—	140	120	100	—	—	—	—	—	—
	3	—	—	—	180	140	100	—	—	—	—	—	—
	4	—	—	—	240	180	120	—	—	—	—	—	—
H	1	—	—	—	—	—	—	—	—	—	—	—	—

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

■ Recommended Starting Feeds [IPT]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.E..GD	.007	.014	.027	.005	.011	.020	.004	.009	.017	.004	.009	.016	.004	.008	.016	.E..GD
.S..GD	.010	.018	.034	.007	.014	.025	.006	.012	.022	.006	.011	.020	.006	.011	.020	.S..GD
.S..HD	.010	.024	.039	.007	.018	.029	.006	.015	.025	.006	.014	.023	.006	.014	.023	.S..HD

NOTE: Use "Light Machining" values as starting feed rate.



Face Mills



KM4XTM

The Next Generation Spindle Interface for Heavy-Duty Machining!

KM4X is designed to take on your most aggressive machining jobs. This next generation KM spindle interface should be your first choice for heavy-duty machining applications. It's especially suited for large structural components, like titanium aerospace components.

We engineered these rotating and static tool adapters to handle 3x more bending capacity than similar competitive models.

What does this mean for you?

- Enables full use of machine and cutting tools for the highest productivity.
- Higher metal removal rates.
- Can retrofit to existing machines to boost throughput without buying new equipment.
- Ideal for aerospace and transportation industry machining jobs.

Experience the advantages at your Authorized Kennametal Distributor or at www.kennametal.com.

www.kennametal.com



MEGA 45° • Superior Heavy-Duty Milling

Primary Application

With four true cutting edges per heavy-duty MEGA 45° insert, you know you are getting the low cost per edge and high productivity you need and have come to expect from Kennametal. The soft cutting edge design enables 30% lower cutting forces, and the carbide shim provides protection to the cutter body. Choose MEGA 45° inserts for all of your steel and cast iron indexable milling needs.



Features and Benefits

Features

Four true cutting edges per heavy-duty MEGA 45° insert.

Soft cutting edge design.

Up to 30% increased Metal Removal Rates (MRR).

Carbide pocket shims.

Benefits

Low cost per edge and high productivity.

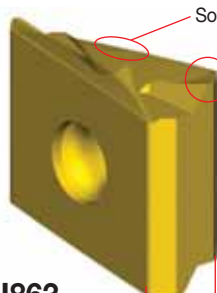
30% lower cutting forces.

Performance leader in steel and cast iron materials.

Excellent cutter body protection.



4 True Cutting Edges



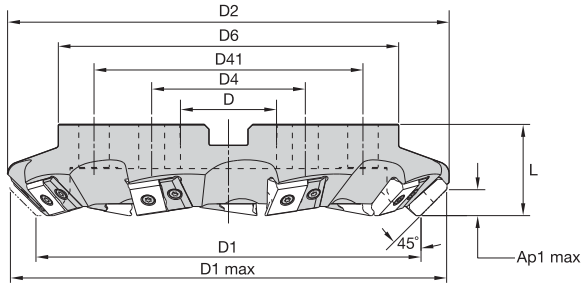
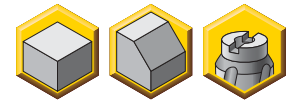
Soft cutting edge design

Integrated wiper facets for excellent floor finish

LNPU863

Strong insert for stable machining

- Four cutting edges per insert.
- Ap1 max = .675".
- Up to 30% higher metal removal rate (MRR).
- Cutter body protection with carbide shims.



MEGA45 • Shell Mills

order number	catalog number	D1	D1 max	D	D2	D4	D41	D6	L	Ap1 max	Z	lbs	max RPM
4032274	MEGA45D500LN863M6	5.000	6.391	1.500	6.700	—	—	3.810	2.375	.675	6	9.18	12520
4032276	MEGA45D600LN863M8	6.000	7.392	2.000	7.600	—	—	5.000	2.375	.675	7	12.11	11430
4105176	MEGA45D800LN863C10	8.000	9.392	2.500	9.550	4.000	—	6.500	2.375	.675	7	18.89	9890
4032277	MEGA45D800LN863M10	8.000	9.392	2.500	9.550	4.000	—	6.500	2.375	.675	9	19.86	9890
4105177	MEGA45D1000LN863C10	10.000	11.392	2.500	11.500	4.000	7.000	8.858	2.375	.675	9	28.04	8850
4032278	MEGA45D1000LN863M10	10.000	11.392	2.500	11.500	4.000	7.000	8.858	2.375	.675	11	29.05	8850
4105178	MEGA45D1200LN863C10	12.000	13.392	2.500	13.500	4.000	7.000	8.858	3.150	.675	10	47.50	8080
4032279	MEGA45D1200LN863M10	12.000	13.392	2.500	13.500	4.000	7.000	8.858	3.150	.675	13	48.82	8080

Spare Parts

Face Mills



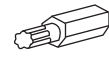
insert screw



shim



universal bit torque driver



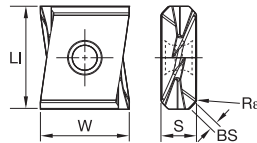
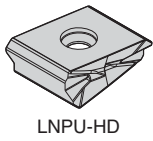
drive bit

D1	insert screw	in. lbs.	shim	universal bit torque driver	drive bit
5.000	MS1162	45	SM-906	DTQ3054	BTQT25
6.000	MS1162	45	SM-906	DTQ3054	BTQT25
8.000	MS1162	45	SM-906	DTQ3054	BTQT25
10.000	MS1162	45	SM-906	DTQ3054	BTQT25
12.000	MS1162	45	SM-906	DTQ3054	BTQT25

NOTE: Shim screw: MS1162.

Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	.S..HD	KC725M	.S..HD	KC725M	.S..HD	KCPK30
P3-P4	.S..HD	KC725M	.S..HD	KCPK30	.S..HD	KCPK30
P5-P6	.S..HD	KCPK30	.S..HD	KCPK30	.S..HD	KCPK30
M1-M2	—	—	—	—	—	—
M3	—	—	—	—	—	—
K1-K2	.S..HD	KC520M	.S..HD	KCK15	.S..HD	KCPK30
K3	.S..HD	KCK15	.S..HD	KCPK30	.S..HD	KCPK30
N1-N2	—	—	—	—	—	—
N3	—	—	—	—	—	—
S1-S2	—	—	—	—	—	—
S3	—	—	—	—	—	—
S4	—	—	—	—	—	—
H1	—	—	—	—	—	—

Indexable Inserts


- first choice
- alternate choice

beyond

P	●	●	●	●
M	●	●	●	●
K	●	●	○	○
N	●	●	●	●
S	●	●	●	●
H	●	●	●	●

LNPU-HD

catalog number	LI	BS	W	Re	S	hm	cutting edges	KC520M	KC725M	KCK15	KCPK30
LNPU863ANSRHD	1.142	.088	.985	.047	.394	.009	4	●	●	●	●

Face Mills

Recommended Starting Speeds [SFM]

Material Group		KC520M			KC725M			KCK15			KCPK30		
P	1	—	—	—	1030	900	840	—	—	—	1780	1560	1450
	2	—	—	—	860	760	640	—	—	—	1100	1000	900
	3	—	—	—	790	670	550	—	—	—	1000	900	820
	4	—	—	—	710	590	470	—	—	—	740	690	620
	5	—	—	—	590	530	470	—	—	—	1020	910	830
	6	—	—	—	520	400	310	—	—	—	620	540	—
M	1	—	—	—	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—
K	1	1060	960	850	—	—	—	1660	1510	1340	1160	1050	940
	2	830	740	700	—	—	—	1310	1170	1090	920	830	760
	3	700	620	560	—	—	—	1100	980	900	770	690	640
N	1-2	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—
S	1	—	—	—	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—	—	—	—	—	—
H	1	—	—	—	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

Recommended Starting Feeds [IPT]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.S..HD	.010	.022	.039	.007	.016	.029	.006	.014	.025	.006	.013	.023	.006	.013	.023	.S..HD

NOTE: Use "Light Machining" values as starting feed rate.

Face Mills

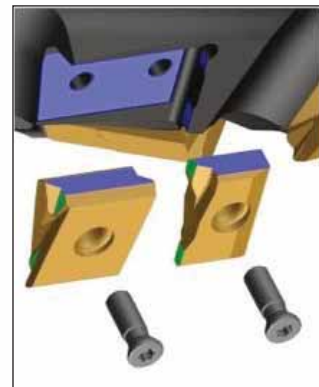


MEGA 45° Lead Angle

Can't Beat That Milling

Defined contact areas at the insert, carbide shim, and cutter body guarantees best tool life and reliability in heavy-duty conditions.

- Carbide shim for cutter body protection.
- A_{p1} max — .67".



Experience the advantages at your Authorized Kennametal Distributor or at www.kennametal.com.

www.kennametal.com

 **KENNAMETAL®**

MEGA 15, 60, and 90

Primary Application

The real performance booster in heavy-duty milling. With four true cutting edges per heavy-duty insert, you know you are getting the low cost per edge and high productivity you need and have come to expect from Kennametal. The soft cutting edge design enables 30% lower cutting forces, and the carbide shim provides protection to the cutter body. Choose MEGA 15, MEGA 60, and MEGA 90 for all of your steel and cast iron indexable milling needs.



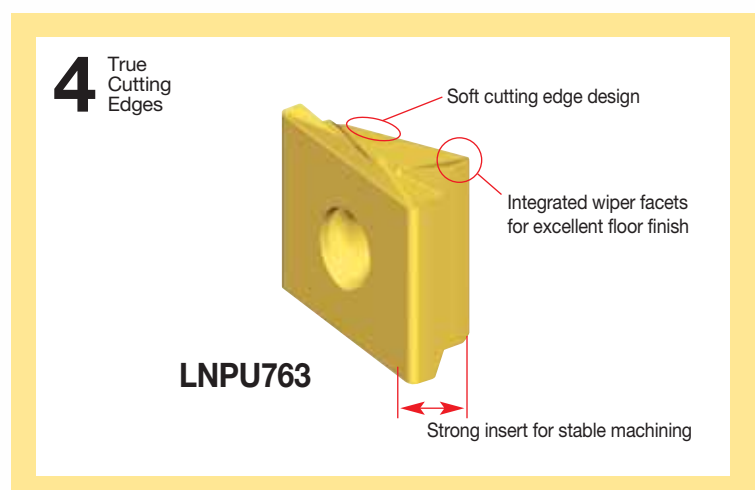
Features and Benefits

Features

- Four true cutting edges per heavy-duty insert.
- One insert style for MEGA 15, MEGA 60, and MEGA 90.
- Soft cutting edge design.
- Up to 30% increased Metal Removal Rates (MRR).
- Carbide pocket shims.

Benefits

- Low cost per edge and high productivity.
- Maximum flexibility to address application needs.
- 30% lower cutting forces.
- Performance leader in steel and cast iron materials.
- Excellent cutter body protection.

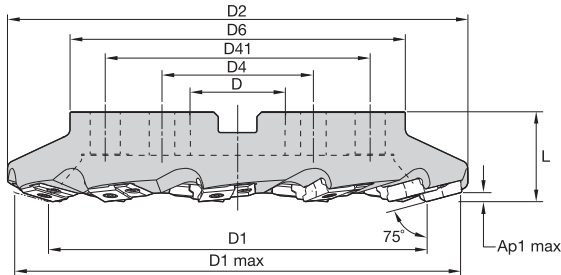
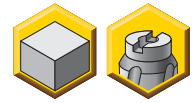




One Insert Style for MEGA 15, MEGA 60, and MEGA 90

MEGA 15	MEGA 60	MEGA 90
		
 <p>LNPU763 75° lead</p>	 <p>LNPU763 30° lead</p>	 <p>LNPU763 0° lead</p>
<p>Ap1 max = .240"</p>	<p>Ap1 max = .843"</p>	<p>Ap1 max = 1.002"</p>

- Four cutting edges per insert.
- A_{p1} max = .240".
- High-Feed capability.
- Cutter body protection with carbide shims.



MEGA15 • High-Feed • Shell Mills

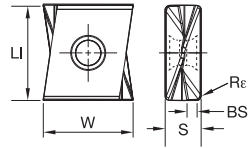
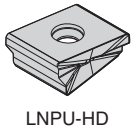
order number	catalog number	D1	D1 max	D2	D	D4	D41	D6	L	Ap1 max	Z	lbs	max RPM
4162225	MEGA15D500LN763M6	5.000	6.858	7.362	1.500	—	—	3.810	2.375	.240	6	9.32	9130
4162226	MEGA15D600LN763M8	6.000	7.855	8.346	2.000	—	—	5.000	2.375	.239	7	12.18	8330
4162227	MEGA15D800LN76M10	8.000	9.850	10.354	2.500	4.000	—	6.500	2.375	.239	9	21.10	7210
4162228	MEGA15D1000LN76M10	10.000	11.847	12.165	2.500	4.000	7.000	8.858	2.375	.238	11	30.92	6450
4162229	MEGA15D1200LN76M10	12.000	13.845	14.252	2.500	4.000	7.000	8.858	3.150	.238	13	47.73	5890

NOTE: For spare parts, see page O38.

Insert Selection Guide

Face Mills

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	.S..HD	KC725M	.S..HD	KC725M	.S..HD	KCPK30
P3-P4	.S..HD	KC725M	.S..HD	KCPK30	.S..HD	KCPK30
P5-P6	.S..HD	KCPK30	.S..HD	KCPK30	.S..HD	KCPK30
M1-M2	—	—	—	—	—	—
M3	—	—	—	—	—	—
K1-K2	.S..HD	KC520M	.S..HD	KCK15	.S..HD	KCPK30
K3	.S..HD	KCK15	.S..HD	KCPK30	.S..HD	KCPK30
N1-N2	—	—	—	—	—	—
N3	—	—	—	—	—	—
S1-S2	—	—	—	—	—	—
S3	—	—	—	—	—	—
S4	—	—	—	—	—	—
H1	—	—	—	—	—	—



P			●		●
M					
K			●		○
N					
S					
H					

● first choice
○ alternate choice

LNPU-HD

catalog number	LI	BS	W	Re	S	hm	cutting edges	KC520M	KC725M	KCK15	KCPK30
LNPU763PNSRHD	1.043	.091	.985	.047	.394	.009	4	●	●	●	●

Recommended Starting Speeds and Feeds
Recommended Starting Speeds [SFM]

Material Group		KC520M			KC725M			KCK15			KCPK30		
P	1	—	—	—	1030	900	840	—	—	—	1780	1560	1450
	2	—	—	—	860	760	640	—	—	—	1100	1000	900
	3	—	—	—	790	670	550	—	—	—	1000	900	820
	4	—	—	—	710	590	470	—	—	—	740	690	620
	5	—	—	—	590	530	470	—	—	—	1020	910	830
	6	—	—	—	520	400	310	—	—	—	620	540	—
M	1	—	—	—	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—
K	1	1060	960	850	—	—	—	1660	1510	1340	1160	1050	940
	2	830	740	700	—	—	—	1310	1170	1090	920	830	760
	3	700	620	560	—	—	—	1100	980	900	770	690	640
N	1-2	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—
S	1	—	—	—	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—	—	—	—	—	—
H	1	—	—	—	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—



Face Mills

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

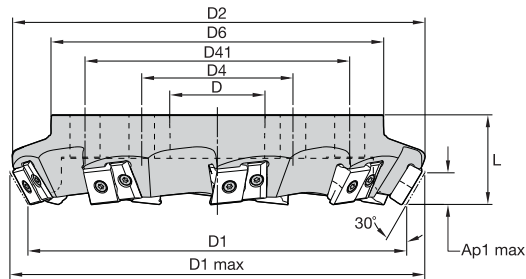
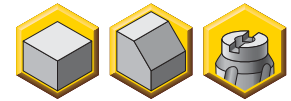
Recommended Starting Feeds [IPT]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.S..HD	.027	.062	.099	.019	.044	.067	.017	.038	.058	.016	.036	.053	.015	.035	.052	.S..HD

NOTE: Use "Light Machining" values as starting feed rate.

- Four cutting edges per insert.
- A_{p1} max = .843".
- Up to 30% higher metal removal rate (MRR).
- Cutter body protection with carbide shims.



MEGA60 • Shell Mills

order number	catalog number	D1	D1 max	D	D2	D4	D41	D6	L	Ap1 max	Z	lbs	max RPM
4147496	MEGA60D500LN76M6	5.000	5.982	1.500	6.181	—	—	3.810	2.375	.843	6	8.030	11040
4147497	MEGA60D600LN76M8	6.000	6.982	2.000	7.126	—	—	5.000	2.375	.842	7	11.070	10080
4147498	MEGA60D800LN76C10	8.000	8.981	2.500	8.976	4.000	—	6.500	2.375	.842	7	17.590	8720
4147499	MEGA60D800LN76M10	8.000	8.891	2.500	8.976	4.000	—	6.500	2.375	.842	9	17.830	8720
4147500	MEGA60D1000LN76C10	10.000	10.981	2.500	10.984	4.000	7.000	8.858	2.375	.842	9	26.830	7800
4147501	MEGA60D1000LN76M10	10.000	10.981	2.500	10.984	4.000	7.000	8.858	2.375	.842	11	27.110	7800
4147502	MEGA60D1200LN76C10	12.000	12.981	2.500	12.953	4.000	7.000	8.858	3.150	.841	10	41.680	7120
4147523	MEGA60D1200LN76M10	12.000	12.981	2.500	12.953	4.000	7.000	8.858	3.150	.841	13	41.920	7120

Spare Parts

Face Mills



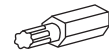
insert screw



shim



universal bit torque driver



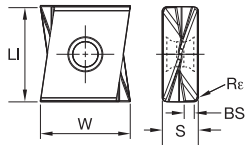
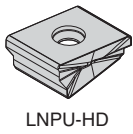
drive bit

D1	insert screw	in. lbs.	shim	universal bit torque driver	drive bit
5.000	MS1162	45	SM-906	DTQ3054	BTQT25
6.000	MS1162	45	SM-906	DTQ3054	BTQT25
8.000	MS1162	45	SM-906	DTQ3054	BTQT25
10.000	MS1162	45	SM-906	DTQ3054	BTQT25
12.000	MS1162	45	SM-906	DTQ3054	BTQT25

NOTE: Shim screw: MS1162.

Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	.S..HD	KC725M	.S..HD	KC725M	.S..HD	KCPK30
P3-P4	.S..HD	KC725M	.S..HD	KCPK30	.S..HD	KCPK30
P5-P6	.S..HD	KCPK30	.S..HD	KCPK30	.S..HD	KCPK30
M1-M2	—	—	—	—	—	—
M3	—	—	—	—	—	—
K1-K2	.S..HD	KC520M	.S..HD	KCK15	.S..HD	KCPK30
K3	.S..HD	KCK15	.S..HD	KCPK30	.S..HD	KCPK30
N1-N2	—	—	—	—	—	—
N3	—	—	—	—	—	—
S1-S2	—	—	—	—	—	—
S3	—	—	—	—	—	—
S4	—	—	—	—	—	—
H1	—	—	—	—	—	—

Indexable Inserts


- first choice
- alternate choice



P			●		●
M					
K			●		○
N					
S					
H					

LNU-HD

catalog number	LI	BS	W	Re	S	hm	cutting edges	KC520M	KC725M	KCK15	KCPK30
LNU763PNSRHD	1.043	.091	.985	.047	.394	.009	4	●	●	●	●

Face Mills

■ Recommended Starting Speeds [SFM]

Material Group		KC520M			KC725M			KCK15			KCPK30		
P	1	—	—	—	1030	900	840	—	—	—	1780	1560	1450
	2	—	—	—	860	760	640	—	—	—	1100	1000	900
	3	—	—	—	790	670	550	—	—	—	1000	900	820
	4	—	—	—	710	590	470	—	—	—	740	690	620
	5	—	—	—	590	530	470	—	—	—	1020	910	830
	6	—	—	—	520	400	310	—	—	—	620	540	—
M	1	—	—	—	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—
K	1	1060	960	850	—	—	—	1660	1510	1340	1160	1050	940
	2	830	740	700	—	—	—	1310	1170	1090	920	830	760
	3	700	620	560	—	—	—	1100	980	900	770	690	640
N	1-2	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—
S	1	—	—	—	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—	—	—	—	—	—
H	1	—	—	—	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

■ Recommended Starting Feeds [IPT]

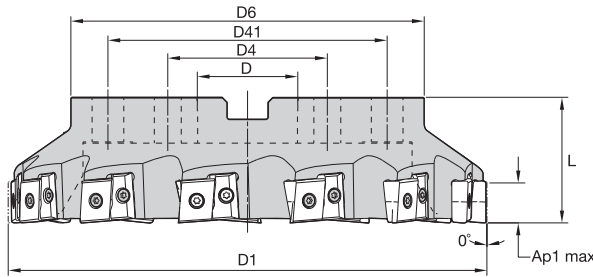
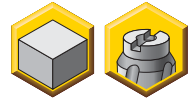
Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.S..HD	.008	.020	.032	.006	.015	.023	.005	.013	.020	.005	.012	.019	.005	.012	.018	.S..HD

NOTE: Use "Light Machining" values as starting feed rate.

Face Mills

- Four cutting edges per insert.
- $A_{p1} \text{ max} = 1"$.
- Up to 30% higher metal removal rate (MRR).
- Cutter body protection with carbide shims.



MEGA90 • Shell Mills

order number	catalog number	D1	D	D4	D41	D6	L	Ap1 max	Z	lbs	max RPM
4136381	MEGA90D500LN76M6	5.000	1.500	—	—	3.810	2.375	1.002	6	6.86	9990
4136382	MEGA90D600LN76M8	6.000	2.000	—	—	5.000	2.375	1.002	7	10.23	9120
4136383	MEGA90D800LN76C10	8.000	2.500	4.000	—	6.500	2.375	1.002	7	15.32	7890
4136384	MEGA90D800LN76M10	8.000	2.500	4.000	—	6.500	2.375	1.002	9	15.42	7890
4136385	MEGA90D1000LN76C10	10.000	2.500	4.000	—	6.500	2.375	1.002	9	22.48	7060
4136386	MEGA90D1000LN76M10	10.000	2.500	4.000	—	6.500	2.375	1.002	11	22.66	7060
4136387	MEGA90D1200LN76C10	12.000	2.500	4.000	7.000	8.858	3.150	1.002	10	38.12	6440
4136388	MEGA90D1200LN76M10	12.000	2.500	4.000	7.000	8.858	3.150	1.002	13	38.21	6440

Spare Parts



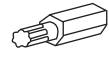
insert screw



shim



universal bit torque driver



drive bit

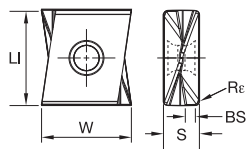
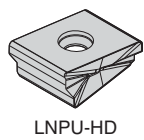
D1	insert screw	in. lbs.	shim	universal bit torque driver	drive bit
5.000	MS1162	45	SM-906	DTQ3054	BTQT25
6.000	MS1162	45	SM-906	DTQ3054	BTQT25
8.000	MS1162	45	SM-906	DTQ3054	BTQT25
10.000	MS1162	45	SM-906	DTQ3054	BTQT25
12.000	MS1162	45	SM-906	DTQ3054	BTQT25

NOTE: Shim screw: MS1162

■ Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	.S..HD	KC725M	.S..HD	KC725M	.S..HD	KCPK30
P3-P4	.S..HD	KC725M	.S..HD	KCPK30	.S..HD	KCPK30
P5-P6	.S..HD	KCPK30	.S..HD	KCPK30	.S..HD	KCPK30
M1-M2	—	—	—	—	—	—
M3	—	—	—	—	—	—
K1-K2	.S..HD	KC520M	.S..HD	KCK15	.S..HD	KCPK30
K3	.S..HD	KCK15	.S..HD	KCPK30	.S..HD	KCPK30
N1-N2	—	—	—	—	—	—
N3	—	—	—	—	—	—
S1-S2	—	—	—	—	—	—
S3	—	—	—	—	—	—
S4	—	—	—	—	—	—
H1	—	—	—	—	—	—

Indexable Inserts



P	●	●	●	●
M	●	●	●	●
K	●	●	○	○
N	●	●	●	●
S	●	●	●	●
H	●	●	●	●

● first choice
○ alternate choice

Face Mills

■ LNP-U-HD

catalog number	LI	BS	W	Rε	S	hm	cutting edges	KC520M	KC725M	KCK15	KCPK30
LNP763PNSRHD	1.043	.091	.985	.047	.394	.009	4	●	●	●	●

■ Recommended Starting Speeds [SFM]

Material Group		KC520M			KC725M			KCK15			KCPK30		
P	1	—	—	—	860	750	700	—	—	—	1485	1300	1210
	2	—	—	—	720	630	530	—	—	—	920	830	750
	3	—	—	—	660	560	460	—	—	—	830	750	680
	4	—	—	—	590	490	390	—	—	—	620	575	520
	5	—	—	—	490	440	390	—	—	—	850	760	690
	6	—	—	—	430	330	260	—	—	—	520	450	—
M	1	—	—	—	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—
K	1	880	800	710	—	—	—	1380	1255	1115	965	875	780
	2	690	620	580	—	—	—	1095	975	910	770	690	630
	3	580	520	470	—	—	—	920	815	750	645	575	530
N	1-2	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—
S	1	—	—	—	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—	—	—	—	—	—
H	1	—	—	—	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

■ Recommended Starting Feeds [IPT]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)														Insert Geometry	
	10%			20%			30%			40%			50-100%			
.S..HD	.007	.017	.028	.005	.013	.020	.004	.011	.018	.004	.010	.016	.004	.010	.016	.S..HD

NOTE: Use "Light Machining" values as starting feed rate.





Beyond BLAST™ • KSSM™ 45

More than just the right tool — the ultimate solution.

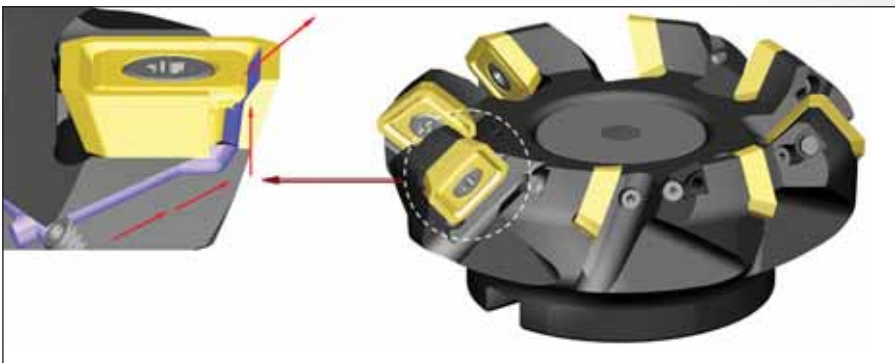


Primary Application

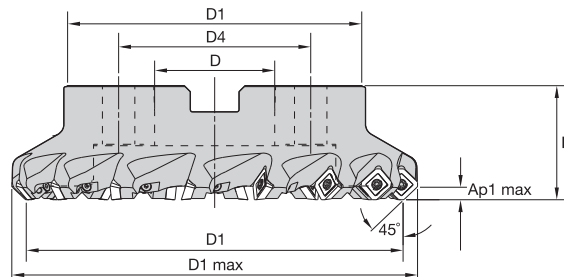
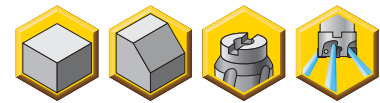
The Beyond BLAST KSSM 45° utilizes Precision Coolant Technology (PCT) to aggressively apply coolant directly to the cutting area. Not only does this reduce heat at the cutting edge, but it also assists with reducing tool and chip friction, increasing chip evacuation, and relieving shear stress. Because the Beyond BLAST technology can be applied in low-pressure conditions, there is no need to invest in additional equipment. It's so easy to convert from conventional to Beyond BLAST technology, it can be done directly on the floor — virtually eliminating costly downtime. See what the performance leader can do for your titanium machining.

Features and Benefits

Features	Benefits
PCT — Precision Coolant Technology.	Coolant delivery exactly to the cutting area.
Increased heat transfer.	Less tool/chip friction and shear stress.
Improved chip control.	True internal coolant assists chip evacuation.
Beyond BLAST also works with regular low-pressure conditions.	No need for investments in high-pressure equipment.
Easy to convert from conventional to Beyond BLAST Technology.	Shop-floor-proven handling reduces costly downtime.
Up to 100% better tool life.	Performance leader in machining titanium.



- Precision Coolant Technology (PCT).
- Coolant delivery exactly to cutting area.
- Increased heat transfer.
- Improved chip control.
- Productivity booster for machining titanium.



beyond BLAST™

■ **BB Shell Mills 45°**

order number	catalog number	D1	D1 max	D	D4	D6	L	Ap1 max	Z	lbs	max RPM
4137742	KSSISR200SE443BB45M3	2.000	2.546	.750	—	1.750	1.750	.260	4	1.04	18300
4137773	KSSISR250SE443BB45M4	2.500	3.044	1.000	—	2.188	1.750	.260	5	1.70	16300
4137774	KSSISR300SE443BB45M4	3.000	3.542	1.000	—	2.188	1.750	.260	6	2.08	14900
4137775	KSSISR400SE443BB45M5	4.000	4.540	1.250	—	2.875	2.000	.260	7	4.02	12900
4147540	KSSISR400SE443BB45F5	4.000	4.540	1.250	—	2.875	2.000	.260	10	4.10	12900
4137776	KSSISR500SE443BB45M6	5.000	5.538	1.500	—	3.812	2.380	.260	8	7.48	11500
4147541	KSSISR500SE443BB45F6	5.000	5.538	1.500	—	3.812	2.380	.260	12	7.62	11500
4137777	KSSISR600SE443BB45M8	6.000	6.537	2.000	—	5.000	2.380	.260	10	11.89	10500
4147542	KSSISR600SE443BB45F8	6.000	6.537	2.000	—	5.000	2.380	.260	14	12.04	10500
4137778	KSSISR800SE443BB45M10	8.000	8.536	2.500	4.000	6.125	2.380	.260	12	16.05	9100
4147543	KSSISR800SE443BB45F10	8.000	8.536	2.500	4.000	6.125	2.380	.260	16	16.30	9100

Face Mills

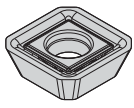
■ **Spare Parts**

D1	insert screw	in. lbs.	Torx Plus driver	socket-head cap screw	coolant lock screw assembly	coolant shower plate assembly
2.000	MS2078	35.00	DT15IP	S445	—	—
2.500	MS2078	35.00	DT15IP	S458	—	—
3.000	MS2078	35.00	DT15IP	S458	—	—
4.000	MS2078	35.00	DT15IP	—	S2162C	—
5.000	MS2078	35.00	DT15IP	—	S2163C	—
6.000	MS2078	35.00	DT15IP	—	S2192C	—
8.000	MS2078	35.00	DT15IP	—	—	MCC080001

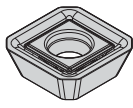
■ Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	—	—	—	—	—	—
P3-P4	—	—	—	—	—	—
P5-P6	—	—	—	—	—	—
M1-M2	—	—	—	—	—	—
M3	—	—	—	—	—	—
K1-K2	—	—	—	—	—	—
K3	—	—	—	—	—	—
N1-N2	—	—	—	—	—	—
N3	—	—	—	—	—	—
S1-S2	—	—	—	—	—	—
S3	—	—	—	—	—	—
S4	.E..GD2	KC725M	.E..GN	KC725M	.S..GN	KC725M
H1	—	—	—	—	—	—

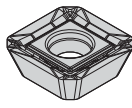
Indexable Inserts • BB KSSM 45°



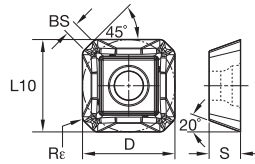
SECX-ENGN



SECX-SNGN



SECX-GD2


beyond BLAST™

P	■
M	■
K	■
N	■
S	●
H	■

- first choice
- alternate choice



Face Mills

■ SECX-GN

catalog number	D	BS	L10	Rε	S	hm	cutting edges	KC725M
SECX443AEEN7GN	.55	.07	.55	.04	.19	.0025	4	●
SECX443AESN7GN	.55	.07	.55	.04	.19	.0030	4	●

■ SECX-GD2

catalog number	D	BS	L10	Rε	S	hm	cutting edges	KC725M
SECX443AEEN7GD2	.55	.07	.55	.04	.19	.0025	4	●

■ Recommended Starting Speeds [SFM]

Material Group		KC725M		
P	1	—	—	—
	2	—	—	—
	3	—	—	—
	4	—	—	—
	5	—	—	—
	6	—	—	—
M	1	—	—	—
	2	—	—	—
	3	—	—	—
K	1	—	—	—
	2	—	—	—
	3	—	—	—
N	1-2	—	—	—
	3	—	—	—
S	1	—	—	—
	2	—	—	—
	3	—	—	—
	4	240	180	120
H	1	—	—	—
	2	—	—	—
	3	—	—	—

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

■ Recommended Starting Feeds [IPT]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.E..GD2	.007	.010	.014	.005	.008	.011	.004	.007	.009	.004	.006	.009	.004	.006	.008	.E..GD2
.E..GN	.007	.010	.014	.005	.008	.011	.004	.007	.009	.004	.006	.009	.004	.006	.008	.E..GN
.S..GN	.008	.012	.018	.006	.009	.013	.005	.008	.011	.005	.007	.011	.005	.007	.010	.S..GN

NOTE: Use "Light Machining" values as starting feed rate.

Face Mills

KSSM™ 45°

Primary Application

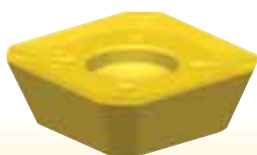
Universal face mill for conventional machining.

Features and Benefits

- Insert SE.T1404.
- $A_{p1} \text{ max} = .260"$.
- Four true cutting edges.
- Pocket seat protection with carbide shims.
- Easy handling and rapid insert change.

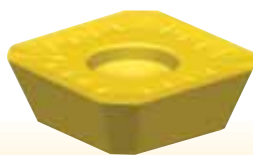


-LD2



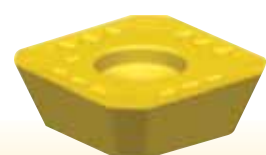
For light machining and semi-finishing,
light edge prep.

-GP2



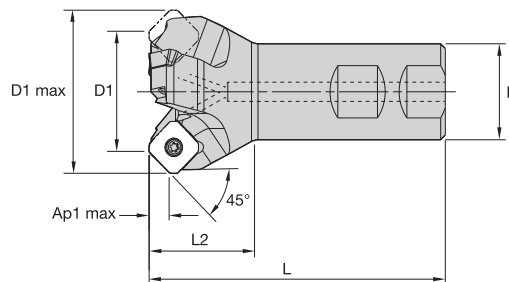
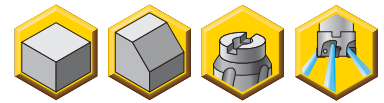
For medium roughing,
medium edge prep.

-GB2



For heavy roughing,
strongest edge protection.

- Consumes less power.
- Rapid insert changes.



■ **KSSM 45° • Weldon® End Mills**

order number	catalog number	D1	D1 max	D	L	L2	Ap1 max	Z	lbs	max RPM
1817940	KISR126SE44345M	1.260	1.812	1.250	3.855	1.575	.260	2	1.2	28000
1817941	KISR157SE44345M	1.575	2.124	1.250	3.855	1.575	.260	3	1.3	26000
1817942	KISR197SE44345M	1.969	2.515	1.250	3.855	1.575	.260	4	1.5	22500
1817953	KISR248SE44345M	2.480	3.024	1.250	3.855	1.575	.260	5	1.9	20200

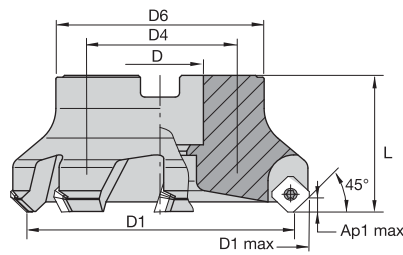
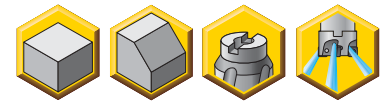
■ **Spare Parts**



D1	insert screw	in. lbs.	Torx Plus driver
1.260	MS2078	35	DT15IP
1.575	MS2078	35	DT15IP
1.969	MS2078	35	DT15IP
2.480	MS2078	35	DT15IP

Face Mills

- Consumes less power.
- Rapid insert changes.



■ KSSM 45° • Shell Mills

order number	catalog number	D1	D1 max	D	D4	D6	L	Ap1 max	Z	lbs	max RPM
1817866	KSSISR197SE44345C3	1.970	2.515	.750	—	1.750	1.575	.260	3	.9	22500
1817867	KSSISR197SE44345M3	1.970	2.515	.750	—	1.750	1.575	.260	4	.9	22500
1817868	KSSISR248SE44345C4	2.480	3.024	1.000	—	2.190	1.575	.260	4	1.3	20200
1817869	KSSISR248SE44345M4	2.480	3.024	1.000	—	2.190	1.575	.260	5	1.3	20200
1817870	KSSISR315SE44345C4	3.150	3.691	1.000	—	2.190	1.969	.260	4	2.2	18000
1817871	KSSISR315SE44345M4	3.150	3.691	1.000	—	2.190	1.969	.260	6	2.2	18000
1817872	KSSISR394SE44345C5	3.940	4.477	1.250	—	2.880	1.969	.260	5	3.6	16000
1817933	KSSISR394SE44345M5	3.940	4.477	1.250	—	2.880	1.969	.260	7	3.6	16000
1817934	KSSISR492SE44345C6	4.920	5.460	1.500	—	3.810	2.480	.260	6	6.5	14400
1817935	KSSISR492SE44345M6	4.920	5.460	1.500	—	3.810	2.480	.260	8	6.6	14400
1817936	KSSISR630SE44345C6	6.300	6.836	1.500	—	3.810	2.480	.260	7	9.9	12500
1817937	KSSISR630SE44345M6	6.300	6.836	1.500	—	3.810	2.480	.260	10	10.0	12500
1817938	KSSISR787SE44345C10	7.870	8.410	2.500	4.000	6.125	2.480	.260	8	13.2	11300
1817939	KSSISR787SE44345M10	7.870	8.410	2.500	4.000	6.125	2.480	.260	12	13.4	11300

■ Spare Parts

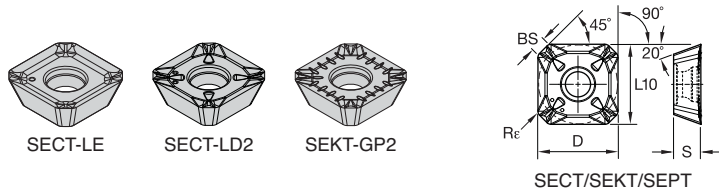


D1	insert screw	in. lbs.	Torx Plus driver	shim	shim screw	hex driver	in. lbs.	socket-head cap screw	low-head cap screw
1.970	MS2078	35.0	DT15IP	—	—	—	—	S2043	—
2.480	MS2078	35.0	DT15IP	—	—	—	—	—	S2044
3.150	MS2078	35.0	DT15IP	SM455	SRS3	DH35M	40.0	—	—
3.940	MS2078	35.0	DT15IP	SM455	SRS3	DH35M	40.0	—	—
4.920	MS2078	35.0	DT15IP	SM455	SRS3	DH35M	40.0	—	—
6.300	MS2078	35.0	DT15IP	SM455	SRS3	DH35M	40.0	—	—
7.870	MS2078	35.0	DT15IP	SM455	SRS3	DH35M	40.0	—	—

■ Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	.E..LD2	KC725M	.E..GP2	KC725M	.E..GB2	KC725M
P3-P4	.E..GP2	KCPK30	.E..GB2	KCPK30	.S..GP2	KCPK30
P5-P6	.E..GB2	KCPM20	.S..GP2	KCPM20	.S..GB2	KCPM20
M1-M2	.E..GP2	KC725M	.E..GB2	KC725M	.S..GP2	KC725M
M3	.E..GB2	KCPK30	.S..GP2	KCPK30	.S..GB2	KCPK30
K1-K2	.E..GP2	KCK15	.E..GB2	KCK15	.S..GP2	KCK15
K3	.E..GB2	KCPK30	.S..GP2	KCPK30	.S..GB2	KCPK30
N1-N2	.F..LE	KC410M	.F..LE	KC410M	.F..LE	KC410M
N3	.F..LE	KC410M	.F..LE	KC410M	.F..LE	KC410M
S1-S2	.E..LD2	KC725M	.E..GP2	KC725M	.E..GB2	KC725M
S3	.E..GP2	KC725M	.E..GB2	KC725M	.S..GP2	KC725M
S4	.S..GP2	KC725M	.S..GB2	KC725M	—	—
H1	—	—	—	—	—	—

Indexable Inserts



P	●			●	●	●
M	●			○	○	○
K	●	●	●	○	○	●
N	●					
S	●					
H						

● first choice
○ alternate choice

Face Mills

■ SECT-LE

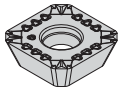
catalog number	D	S	L10	BS	Rε	hm	cutting edges	KC410M	KC520M	KC725M	KCK15	KCPM20	KCPK30	KY3500
SECT443AEFN7LE	.551	.188	.551	.104	.039	.001	4	●						

■ SECT-LD2

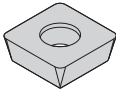
catalog number	D	S	L10	BS	Rε	hm	cutting edges	KC410M	KC520M	KC725M	KCK15	KCPM20	KCPK30	KY3500
SECT443AEEN7LD2	.551	.188	.551	.104	.039	.002	4			●		●		

■ SEKT-GP2

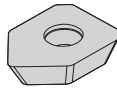
catalog number	D	S	L10	BS	Rε	hm	cutting edges	KC410M	KC520M	KC725M	KCK15	KCPM20	KCPK30	KY3500
SEKT443AEEN7GP2	.551	.188	.551	.104	.039	.002	4	●	●	●	●	●	●	●
SEKT443AESN7GP2	.551	.188	.551	.104	.039	.004	4	●	●	●	●	●	●	●



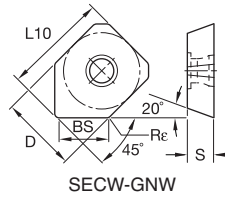
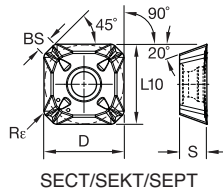
SEPT-GB2



SECW-GN



SECW-GNW



● first choice
○ alternate choice

P	●	●	●	●	●	●
M	○	○	○	○	○	○
K	●	●	●	○	○	●
N	●	○	○	○	○	○
S	○	○	○	○	○	○
H	○	○	○	○	○	○

■ SEPT-GB2

catalog number	D	S	L10	BS	Re	hm	cutting edges	KC410M	KC520M	KC725M	KCK15	KCPM20	KCPK30	KY3500
SEPT443AEEN7GB2	.551	.188	.551	.104	.039	.003	4	●	●	●	●	●	●	●
SEPT443AESN7GB2	.551	.188	.551	.104	.039	.005	4	○	○	○	○	○	○	○

■ SECW-GN

catalog number	D	S	L10	BS	Re	hm	cutting edges	KC410M	KC520M	KC725M	KCK15	KCPM20	KCPK30	KY3500
SECW443AESN7GN	.551	.188	.551	.104	.039	.006	4	○	○	○	○	○	○	●

■ SECW-GNW

catalog number	D	S	L10	BS	Re	hm	cutting edges	KC410M	KC520M	KC725M	KCK15	KCPM20	KCPK30	KY3500
SECW443AEEN22GNW	.551	.188	.325	.325	.063	.002	2	○	○	○	○	○	○	○



Face Mills

■ Recommended Starting Speeds [SFM]

Material Group		KC410M			KC520M			KC725M			KCK15		
P	1	—	—	—	—	—	—	1030	900	840	—	—	—
	2	—	—	—	—	—	—	860	760	640	—	—	—
	3	—	—	—	—	—	—	790	670	550	—	—	—
	4	—	—	—	—	—	—	710	590	470	—	—	—
	5	—	—	—	—	—	—	590	530	470	—	—	—
	6	—	—	—	—	—	—	520	400	310	—	—	—
M	1	—	—	—	—	—	—	670	590	540	—	—	—
	2	—	—	—	—	—	—	610	520	430	—	—	—
	3	—	—	—	—	—	—	460	400	310	—	—	—
K	1	—	—	—	1060	960	850	—	—	—	1660	1510	1340
	2	—	—	—	830	740	700	—	—	—	1310	1170	1090
	3	—	—	—	700	620	560	—	—	—	1100	980	900
N	1-2	4790	4260	3920	—	—	—	—	—	—	—	—	—
	3	4260	3920	3600	—	—	—	—	—	—	—	—	—
S	1	—	—	—	—	—	—	140	120	100	—	—	—
	2	—	—	—	—	—	—	140	120	100	—	—	—
	3	—	—	—	—	—	—	180	140	100	—	—	—
	4	—	—	—	—	—	—	240	180	120	—	—	—
H	1	—	—	—	—	—	—	—	—	—	—	—	—

Material Group		KCPM20			KCPK30			KY3500		
P	1	2170	1910	1760	1780	1560	1450	—	—	—
	2	1340	1210	1090	1100	1000	900	—	—	—
	3	1210	1090	1000	1000	900	820	—	—	—
	4	910	840	760	740	690	620	—	—	—
	5	1090	980	900	1020	910	830	—	—	—
	6	760	660	570	620	540	—	—	—	—
M	1	880	790	680	820	720	620	—	—	—
	2	800	700	620	730	640	550	—	—	—
	3	640	570	490	570	520	460	—	—	—
K	1	1420	1280	1150	1160	1050	940	3170	2880	2560
	2	1130	1010	920	920	830	760	2510	2240	2090
	3	950	840	780	770	690	640	2110	1870	1720
N	1-2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
S	1	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—	—	—
H	1	—	—	—	—	—	—	—	—	—

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

■ Recommended Starting Feeds [IPT]

Light Machining	General Purpose	Heavy Machining
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Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.F..LE	.005	.010	.019	.004	.007	.014	.003	.006	.012	.003	.006	.012	.003	.006	.011	.F..LE
.E..LD2	.005	.011	.020	.004	.008	.015	.003	.007	.013	.003	.006	.012	.003	.006	.012	.E..LD2
.E..GP2	.007	.011	.022	.005	.009	.016	.004	.007	.014	.004	.007	.013	.004	.007	.013	.E..GP2
.E..GB2	.008	.013	.023	.006	.010	.017	.005	.008	.015	.005	.008	.014	.005	.008	.014	.E..GB2
.S..GP2	.010	.015	.026	.007	.011	.019	.006	.010	.017	.006	.009	.016	.006	.009	.015	.S..GP2
.S..GB2	.010	.018	.028	.007	.013	.021	.006	.011	.018	.006	.011	.017	.006	.010	.016	.S..GB2
.S..GN	.010	.019	.029	.007	.014	.021	.006	.012	.019	.006	.011	.017	.006	.011	.017	.S..GN

NOTE: Use "Light Machining" values as starting feed rate.



More than just the right tool • the ultimate solution.

That's **Beyond BLAST™**



That's **Different Thinking.**

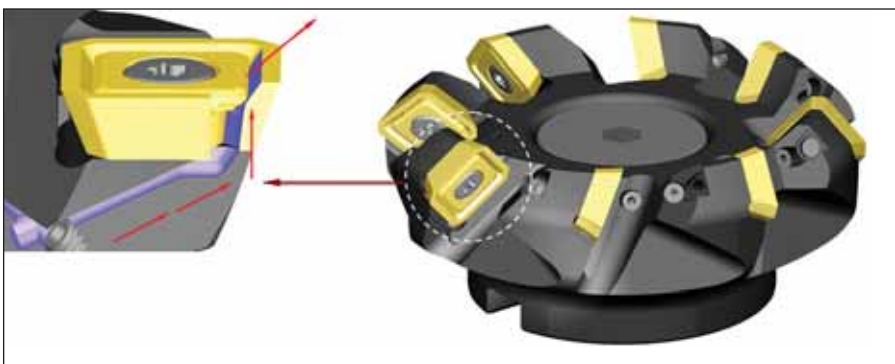
At Kennametal, innovation follows vision. Our revolutionary products and services are inspired by asking “what if?” The solutions that follow — like our Beyond BLAST through-coolant inserts — deliver remarkable results in the world’s most demanding machining environments.

A cutting-edge insert that delivers coolant precisely at the cutting edge. Now that’s Different Thinking. That’s Kennametal.

To learn more about your productivity gains using Beyond BLAST technology, visit www.kennametal.com.

Milling

- Beyond BLAST technology uses low-pressure conditions to offer many of the high-pressure performance benefits.
- Delivers superior performance on titanium, using either high- or low-pressure coolant systems.
- Effective thermal management results in reduced cutting temperatures, improved lubricity, superior chip control, and longer tool life.
- Beyond BLAST for milling increases tool life by up to 100% compared with conventional coolant delivery systems.



beyond™ BLAST™

KSOM™ Mini • KSOM™

Primary Application

Super soft cutting due to super positive rake face.



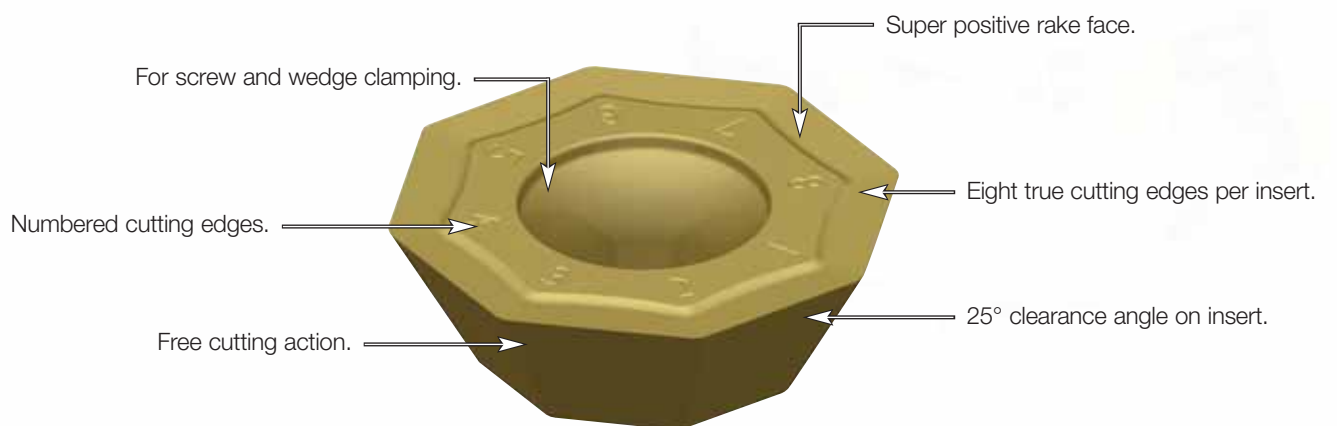
Features and Benefits

Features

- KSOM Mini: insert OFKT53/OFPT53.
- KSOM: insert OFKT64/OFPT64.
- KSOM Mini: Ap1 max = .138" (8 indexes); Ap2 max = .354" (4 indexes).
- KSOM: Ap1 max = .197" (8 indexes); Ap2 max = .461" (4 indexes).

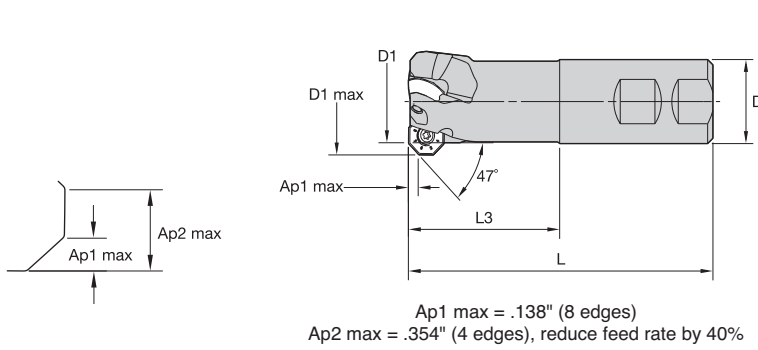
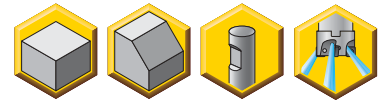
Benefits

- Low cutting forces deliver higher feed capability.
- Excellent performance in stainless steel and super alloys.
- First choice solution in machining turbochargers.



Insert OF.T53/OF.T64

- Eight cutting edges per insert.
- Super soft cutting.



■ **KSOM Mini • Weldon® End Mills**

order number	catalog number	D1	D1 max	D	L	Ap1 max	Z	max ramp angle	lbs	max RPM
3093625	KSOM125OF5345M3	1.250	1.610	.750	3.047	.138	2	11.0°	.53	20050
3093601	KSOM125OF5345F3	1.250	1.610	.750	3.047	.138	3	11.0°	.49	20050
3093624	KSOM125OF5345M5	1.250	1.610	1.250	4.530	.138	2	11.0°	1.45	20050
3093600	KSOM125OF5345F5	1.250	1.610	1.250	4.530	.138	3	11.0°	1.45	20050
3093627	KSOM150OF5345M3	1.500	1.856	.750	3.047	.138	3	8.0°	.60	16710
3093623	KSOM150OF5345F3	1.500	1.856	.750	3.047	.138	4	8.0°	.56	16710
3093626	KSOM150OF5345M5	1.500	1.856	1.250	4.530	.138	3	8.0°	1.51	16710
3093602	KSOM150OF5345F5	1.500	1.856	1.250	4.530	.138	4	8.0°	1.53	16710

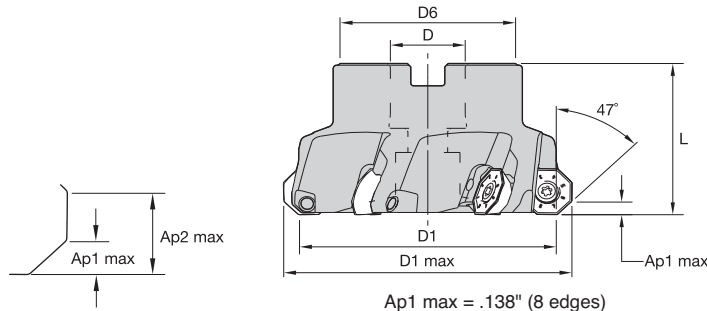
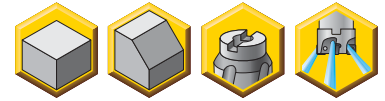
■ **Spare Parts**

Face Mills



D1	insert screw	in. lbs.	Torx Plus wrench
1.250	193.433	53	TTP15
1.500	193.433	53	TTP15

- Eight cutting edges per insert.
- Super soft cutting.



Ap1 max = .138" (8 edges)
 Ap2 max = .354" (4 edges), reduce feed rate by 40%

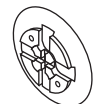


■ KSOM Mini • Shell Mills

order number	catalog number	D1	D1 max	D	D6	L	Ap1 max	Z	max ramp angle	lbs	max RPM
3093634	KSOM200F5345M3	2.000	2.350	.750	1.593	1.570	.138	4	5.2°	.85	12530
3093628	KSOM200F5345F3	2.000	2.350	.750	1.593	1.570	.138	6	5.2°	.92	12530
3093635	KSOM250F5345M3	2.500	2.846	.750	1.986	1.570	.138	5	3.8°	1.38	10030
3093629	KSOM250F5345F3	2.500	2.846	.750	1.986	1.570	.138	7	3.8°	1.48	10030
3093636	KSOM300F5345M4	3.000	3.343	1.000	2.031	1.750	.138	6	3.0°	1.88	8350
3093630	KSOM300F5345F4	3.000	3.343	1.000	2.031	1.750	.138	9	3.0°	2.00	8350
3093637	KSOM400F5345M5	4.000	4.340	1.250	2.722	1.750	.138	7	2.1°	2.77	6270
3093631	KSOM400F5345F5	4.000	4.340	1.250	2.722	1.750	.138	10	2.1°	3.21	6270
3093638	KSOM500F5345M6	5.000	5.340	1.500	3.652	2.380	.138	8	1.6°	5.63	5010
3093632	KSOM500F5345F6	5.000	5.340	1.500	3.652	2.380	.138	12	1.6°	6.07	5010
3093639	KSOM600F5345M8	6.000	6.336	2.000	4.722	2.380	.138	10	1.3°	8.75	4180
3093633	KSOM600F5345F8	6.000	6.336	2.000	4.722	2.380	.138	16	1.3°	9.19	4180

Face Mills

■ Spare Parts

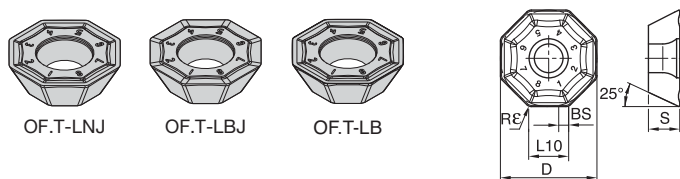


D1	insert screw	in. lbs.	Torx Plus wrench	socket-head cap screw	coolant lock screw	coolant lock screw	coolant shower plate
2.000	193.433	53	TTP15	S445	—	—	—
2.500	193.433	53	TTP15	S445	—	—	—
3.000	193.433	53	TTP15	S458	—	—	—
4.000	193.433	53	TTP15	—	S2162C	—	—
5.000	193.433	53	TTP15	—	—	420.201	470.240
6.000	193.433	53	TTP15	—	—	420.241	470.241

■ Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	.E..LB	KC725M	.E..GB	KC725M	.S..HB	KC725M
P3-P4	.E..LB	KCPK30	.E..GB	KCPK30	.S..HB	KCPK30
P5-P6	.E..GB	KCPK30	.E..GB	KCPM20	.S..HB	KCPM20
M1-M2	.E..LB	KC725M	.E..GB	KC725M	.S..HB	KC725M
M3	.E..LB	KCPK30	.E..GB	KCPK30	.S..HB	KCPK30
K1-K2	.E..LB	KCK15	.E..GB	KCK15	.S..HB	KCK15
K3	.E..LB	KCPK30	.E..GB	KCPK30	.S..HB	KCPK30
N1-N2	.F..LBJ	KC410M	.F..LBJ	KC410M	.F..LNJ	KC410M
N3	.F..LBJ	KC410M	.F..LNJ	KC410M	.E..LBJ	KC422M
S1-S2	.E..LB	KC725M	.E..GB	KC725M	.S..HB	KC725M
S3	.E..LB	KC725M	.E..GB	KC725M	.S..HB	KC725M
S4	.E..GB	KC725M	.S..HB	KC725M	—	—
H1	—	—	—	—	—	—

Indexable Inserts



beyond

P	●				○	●	●	●
M					○	●	○	○
K					○	○	○	○
N	●	●						
S					●	●		
H								

● first choice
○ alternate choice

Face Mills

■ OFKT-LNJ

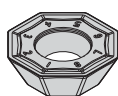
catalog number	D	S	L10	BS	Re	hm	cutting edges	KC410M	KC422M	KC520M	KC522M	KC725M	KCK15	KCPM20	KCPK30
OFKT53AFFN4LNJ	.579	.197	.236	—	.031	.001	8	●							

■ OFKT-LBJ

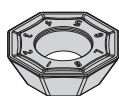
catalog number	D	S	L10	BS	Re	hm	cutting edges	KC410M	KC422M	KC520M	KC522M	KC725M	KCK15	KCPM20	KCPK30
OFKT53AFFN4LBJ	.579	.197	.236	—	.031	.001	8	●							
OFKT53AFEN4LBJ	.579	.197	.236	—	.031	.001	8		●						

■ OFKT-LB

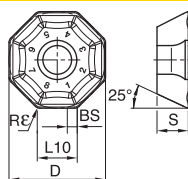
catalog number	D	S	L10	BS	Re	hm	cutting edges	KC410M	KC422M	KC520M	KC522M	KC725M	KCK15	KCPM20	KCPK30
OFKT53AFEN6LB	.579	.197	.236	.048	.031	.004	8				●	●	●		
OFKT53AFSN6LB	.579	.197	.236	.048	.031	.009	8				●	●	●	●	●



OF.T-GB



OF.T- HB



P										
M										
K										
N										
S										
H										

● first choice
 ○ alternate choice

OFKT-GB

catalog number	D	S	L10	BS	Rε	hm	cutting edges
OFKT53AFEN4GB	.579	.197	.236	—	.031	.006	8

OFKT-HB

catalog number	D	S	L10	BS	Rε	hm	cutting edges
OFKT53AFSN4HB	.579	.197	.236	—	.031	.008	8

OFPT-GB

catalog number	D	S	L10	BS	Rε	hm	cutting edges
OFPT53AFEN4GB	.579	.197	.236	—	.031	.006	8

OFPT- HB

catalog number	D	S	L10	BS	Rε	hm	cutting edges
OFPT53AFSN4HB	.579	.197	.236	—	.031	.008	8

	KC410M	KC422M	KC520M	KC522M	KC725M	KCK15	KCPM20	KCPK30
OFKT-GB			●	●	●	●	●	●
OFKT-HB			●	●	●	●	●	●
OFPT-GB			●	●	●	●	●	●
OFPT-HB			●	●	●	●	●	●



Face Mills

Recommended Starting Speeds [SFM]

Material Group		KC410M			KC422M			KC520M			KC522M		
P	1	—	—	—	—	—	—	—	—	—	1300	1130	1060
	2	—	—	—	—	—	—	—	—	—	1080	950	790
	3	—	—	—	—	—	—	—	—	—	1000	840	700
	4	—	—	—	—	—	—	—	—	—	890	730	590
	5	—	—	—	—	—	—	—	—	—	730	660	590
	6	—	—	—	—	—	—	—	—	—	650	490	400
M	1	—	—	—	—	—	—	—	—	—	800	710	650
	2	—	—	—	—	—	—	—	—	—	730	620	520
	3	—	—	—	—	—	—	—	—	—	550	480	370
K	1	—	—	—	—	—	—	1060	960	850	900	820	720
	2	—	—	—	—	—	—	830	740	700	710	640	590
	3	—	—	—	—	—	—	700	620	560	590	530	480
N	1-2	4790	4260	3920	4220	3720	3440	—	—	—	—	—	—
	3	4260	3920	3600	3720	3440	3000	—	—	—	—	—	—
S	1	—	—	—	—	—	—	—	—	—	160	140	110
	2	—	—	—	—	—	—	—	—	—	160	140	110
	3	—	—	—	—	—	—	—	—	—	200	160	110
	4	—	—	—	—	—	—	—	—	—	280	200	140
H	1	—	—	—	—	—	—	—	—	—	—	—	—

Material Group		KC725M			KCK15			KCPM20			KCPK30		
P	1	1030	900	840	—	—	—	2170	1910	1760	1780	1560	1450
	2	860	760	640	—	—	—	1340	1210	1090	1100	1000	900
	3	790	670	550	—	—	—	1210	1090	1000	1000	900	820
	4	710	590	470	—	—	—	910	840	760	740	690	620
	5	590	530	470	—	—	—	1090	980	900	1020	910	830
	6	520	400	310	—	—	—	760	660	570	620	540	—
M	1	670	590	540	—	—	—	880	790	680	820	720	620
	2	610	520	430	—	—	—	800	700	620	730	640	550
	3	460	400	310	—	—	—	640	570	490	570	520	460
K	1	—	—	—	1660	1510	1340	1420	1280	1150	1160	1050	940
	2	—	—	—	1310	1170	1090	1130	1010	920	920	830	760
	3	—	—	—	1100	980	900	950	840	780	770	690	640
N	1-2	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—
S	1	140	120	100	—	—	—	—	—	—	—	—	—
	2	140	120	100	—	—	—	—	—	—	—	—	—
	3	180	140	100	—	—	—	—	—	—	—	—	—
	4	240	180	120	—	—	—	—	—	—	—	—	—
H	1	—	—	—	—	—	—	—	—	—	—	—	—

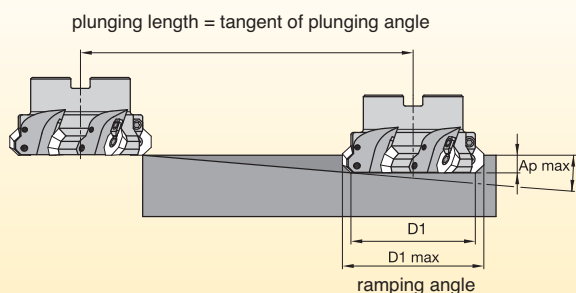
NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

Recommended Starting Feeds [IPT]

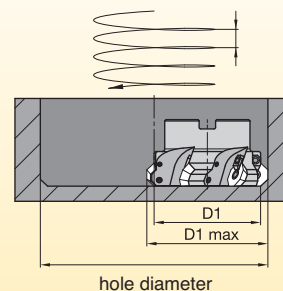
Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.F..LBJ	.005	.010	.019	.004	.007	.014	.003	.006	.012	.003	.006	.012	.003	.006	.011	.F..LBJ
.F..LNJ	.005	.010	.019	.004	.007	.014	.003	.006	.012	.003	.006	.012	.003	.006	.011	.F..LNJ
.E..LBJ	.005	.011	.020	.004	.008	.015	.003	.007	.013	.003	.007	.012	.003	.006	.012	.E..LBJ
.E..LB	.010	.014	.024	.007	.011	.017	.006	.009	.015	.006	.009	.014	.006	.009	.014	.E..LB
.S..LB	.010	.024	.037	.007	.017	.027	.006	.015	.023	.006	.014	.021	.006	.014	.021	.S..LB
.E..GB	.010	.020	.029	.007	.015	.021	.006	.013	.018	.006	.012	.017	.006	.012	.017	.E..GB
.S..HB	.010	.022	.039	.007	.017	.029	.006	.014	.025	.006	.013	.023	.006	.013	.023	.S..HB

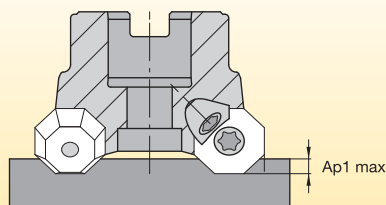
NOTE: Use "Light Machining" values as starting feed rate.

KSOM Mini Application • OF.T06L5
Ramping

Inch Version

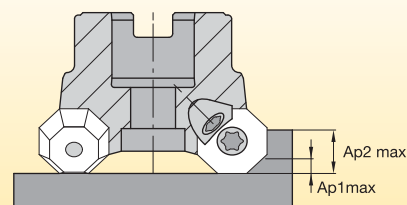
D1 inch	D1 max inch	Ap max inch	ramping angle (°)	ramping length inch
1.25	1.61	.354	11,0	1.82
1.50	1.85	.354	8,0	2.52
2.00	2.35	.354	5,2	3.89
2.50	2.85	.354	3,8	5.34
3.00	3.34	.354	3,0	6.76
4.00	4.34	.354	2,1	9.66
5.00	5.34	.354	1,6	12.69
6.00	6.34	.354	1,3	15.61

Helical Interpolation

Inch Version

D1 inch	D1 max inch	hole diameter		Ap/rev inch
		min inch	max inch	
1.25	1.61	2.41	3.20	.185
1.50	1.85	2.91	3.69	.185
2.00	2.35	3.90	4.68	.185
2.50	2.85	4.93	5.68	.185
3.00	3.34	5.89	6.68	.185
4.00	4.34	7.89	8.67	.185
5.00	5.34	9.89	10.67	.185
6.00	6.34	11.89	12.67	.185

Plunging


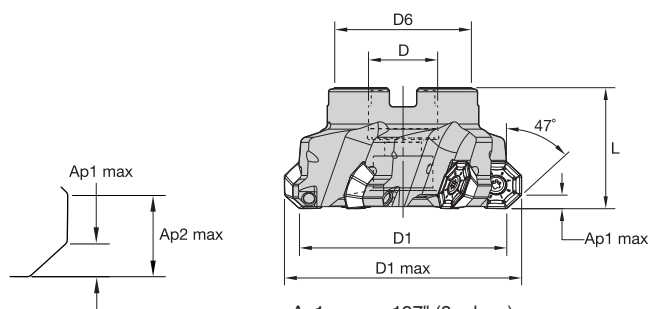
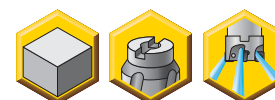
max plunging depth	inch
Ap1 max	.13

Face Milling


max DOC Ap	inch	chipload (fz)
Ap1 max	.14	1 x fz
Ap2 max	.35	0,6 x fz



- Eight cutting edges per insert.
- Super soft cutting



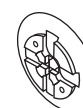
Ap1 max = .197" (8 edges)
Ap2 max = .461" (4 edges), reduce feed rate by 40%

■ **KSOM • Shell Mills**

order number	catalog number	D1	D1 max	D	D6	L	Ap1 max	Z	max ramp angle	lbs	max RPM
3093645	KSOM250OF6445M3	2.500	2.945	.750	1.986	1.750	.197	4	5.5°	1.47	10100
3093640	KSOM250OF6445F3	2.500	2.945	.750	1.986	1.750	.197	5	5.5°	1.29	10100
3093646	KSOM300OF6445M4	3.000	3.441	1.000	2.031	1.750	.197	4	4.2°	1.83	7900
3093641	KSOM300OF6445F4	3.000	3.441	1.000	2.031	1.750	.197	6	4.2°	1.68	7900
3093647	KSOM400OF6445M5	4.000	4.436	1.250	2.722	1.750	.197	5	2.9°	2.69	6300
3093642	KSOM400OF6445F5	4.000	4.436	1.250	2.722	1.750	.197	8	2.9°	2.79	6300
3093648	KSOM500OF6445M6	5.000	5.433	1.500	3.652	2.380	.197	6	2.2°	5.54	5000
3093643	KSOM500OF6445F6	5.000	5.433	1.500	3.652	2.380	.197	10	2.2°	5.94	5000
3093649	KSOM600OF6445M8	6.000	6.431	2.000	4.722	2.380	.197	7	1.8°	8.51	3900
3093644	KSOM600OF6445F8	6.000	6.431	2.000	4.722	2.380	.197	12	1.8°	8.66	3900

Face Mills

■ **Spare Parts**

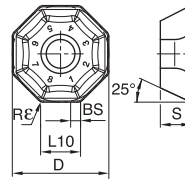
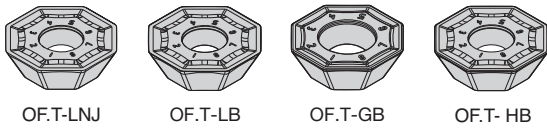


D1	insert screw	in. lbs.	Torx Plus wrench	socket-head cap screw	coolant lock screw assembly	coolant lock screw	coolant shower plate
2.500	193.409	53	TTP20	S445	—	—	—
3.000	193.409	53	TTP20	S458	—	—	—
4.000	193.409	53	TTP20	—	S2162C	—	—
5.000	193.409	53	TTP20	—	—	420.201	470.240
6.000	193.409	53	TTP20	—	—	420.241	470.241

NOTE: Coolant clamping screw and coolant cap must be purchased separately.

Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	.E..LB	KC725M	.E..GB	KC725M	.S..HB	KC725M
P3-P4	.E..LB	KCPK30	.E..GB	KCPK30	.S..HB	KCPK30
P5-P6	.E..LB	KCPK30	.E..GB	KCPK30	.S..HB	KCPK30
M1-M2	.E..LB	KC725M	.E..GB	KC725M	.S..HB	KC725M
M3	.E..LB	KCPK30	.E..GB	KCPK30	.S..HB	KCPK30
K1-K2	.E..LB	KCK15	.E..GB	KCK15	.S..HB	KCK15
K3	.E..LB	KCPK30	.E..GB	KCPK30	.S..HB	KCPK30
N1-N2	.F..LNJ	KC410M	.F..LNJ	KC410M	.F..LNJ	KC410M
N3	.F..LNJ	KC410M	.F..LNJ	KC410M	.F..LNJ	KC410M
S1-S2	.E..LB	KC725M	.E..GB	KC725M	.S..HB	KC725M
S3	.E..LB	KC725M	.E..GB	KC725M	.S..HB	KC725M
S4	.E..GB	KC725M	.S..HB	KC725M	—	—
H1	—	—	—	—	—	—

Indexable Inserts


● first choice
○ alternate choice

P	●	○	○	○	○	○
M	○	○	○	○	○	○
K	○	○	○	○	○	○
N	○	○	○	○	○	○
S	○	○	○	○	○	○
H	○	○	○	○	○	○

OFKT-LNJ

catalog number	D	S	L10	BS	Rε	hm	cutting edges												
OFKT64AFFN6LNJ	.736	.236	.295	—	.047	.001	8	●	KC410M	○	KC520M	○	KC522M	○	KC725M	○	KCK15	○	KCPK30

OFKT-LB

catalog number	D	S	L10	BS	Rε	hm	cutting edges												
OFKT64AFEN6LB	.736	.236	.295	.083	.047	.004	8	○	KC410M	○	KC520M	○	KC522M	○	KC725M	○	KCK15	○	KCPK30
OFKT64AFSN6LB	.736	.236	.295	.083	.047	.009	8	○	KC410M	○	KC520M	○	KC522M	○	KC725M	○	KCK15	○	KCPK30

OFKT-GB

catalog number	D	S	L10	BS	Rε	hm	cutting edges												
OFKT64AFEN6GB	.736	.236	.295	—	.047	.006	8	○	KC410M	○	KC520M	○	KC522M	○	KC725M	○	KCK15	○	KCPK30

OFKT-HB

catalog number	D	S	L10	BS	Rε	hm	cutting edges												
OFKT64AFSN6HB	.736	.236	.295	—	.047	.008	8	○	KC410M	○	KC520M	○	KC522M	○	KC725M	○	KCK15	○	KCPK30

OFPT-GB

catalog number	D	S	L10	BS	Rε	hm	cutting edges												
OFPT64AFEN6GB	.736	.236	.295	—	.047	.006	8	○	KC410M	○	KC520M	○	KC522M	○	KC725M	○	KCK15	○	KCPK30

OFPT-HB

catalog number	D	S	L10	BS	Rε	hm	cutting edges												
OFPT64AFSN6HB	.736	.236	.295	—	.047	.008	8	○	KC410M	○	KC520M	○	KC522M	○	KC725M	○	KCK15	○	KCPK30



Face Mills

■ Recommended Starting Speeds [SFM]

Material Group		KC410M			KC520M			KC522M		
P	1	—	—	—	—	—	—	1300	1130	1060
	2	—	—	—	—	—	—	1080	950	790
	3	—	—	—	—	—	—	1000	840	700
	4	—	—	—	—	—	—	890	730	590
	5	—	—	—	—	—	—	730	660	590
	6	—	—	—	—	—	—	650	490	400
M	1	—	—	—	—	—	—	800	710	650
	2	—	—	—	—	—	—	730	620	520
	3	—	—	—	—	—	—	550	480	370
K	1	—	—	—	1060	960	850	900	820	720
	2	—	—	—	830	740	700	710	640	590
	3	—	—	—	700	620	560	590	530	480
N	1-2	4790	4260	3920	—	—	—	—	—	—
	3	4260	3920	3600	—	—	—	—	—	—
S	1	—	—	—	—	—	—	160	140	110
	2	—	—	—	—	—	—	160	140	110
	3	—	—	—	—	—	—	200	160	110
	4	—	—	—	—	—	—	280	200	140
H	1	—	—	—	—	—	—	—	—	—

Material Group		KC725M			KCK15			KCPK30		
P	1	1030	900	840	—	—	—	1780	1560	1450
	2	860	760	640	—	—	—	1100	1000	900
	3	790	670	550	—	—	—	1000	900	820
	4	710	590	470	—	—	—	740	690	620
	5	590	530	470	—	—	—	1020	910	830
	6	520	400	310	—	—	—	620	540	—
M	1	670	590	540	—	—	—	820	720	620
	2	610	520	430	—	—	—	730	640	550
	3	460	400	310	—	—	—	570	520	460
K	1	—	—	—	1660	1510	1340	1160	1050	940
	2	—	—	—	1310	1170	1090	920	830	760
	3	—	—	—	1100	980	900	770	690	640
N	1-2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
S	1	140	120	100	—	—	—	—	—	—
	2	140	120	100	—	—	—	—	—	—
	3	180	140	100	—	—	—	—	—	—
	4	240	180	120	—	—	—	—	—	—
H	1	—	—	—	—	—	—	—	—	—

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

■ Recommended Starting Feeds [IPT]

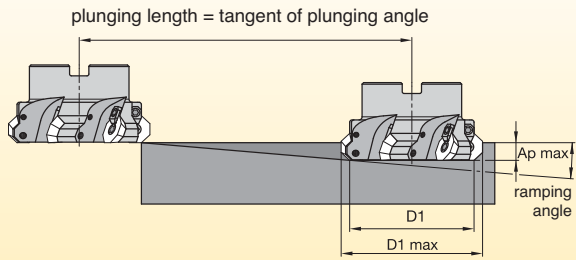
Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.F..LNJ	.005	.010	.019	.004	.007	.014	.003	.006	.012	.003	.006	.012	.003	.006	.011	.F..LNJ
.E..LB	.010	.014	.024	.007	.011	.017	.006	.009	.015	.006	.009	.014	.006	.009	.014	.E..LB
.S..LB	.010	.024	.037	.007	.017	.027	.006	.015	.023	.006	.014	.021	.006	.014	.021	.S..LB
.E..GB	.010	.020	.029	.007	.015	.021	.006	.013	.018	.006	.012	.017	.006	.012	.017	.E..GB
.S..HB	.010	.024	.039	.007	.017	.029	.006	.015	.025	.006	.014	.023	.006	.014	.023	.S..HB

NOTE: Use "Light Machining" values as starting feed rate.

KSOM Mini Application • OF.T07L6

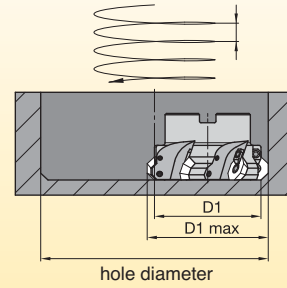
Ramping



Inch Version

D1 inch	D1 max inch	Ap max inch	ramping angle (°)	ramping length inch
2.50	2.94	.46	5.5	4.78
3.00	3.44	.46	4.2	6.27
4.00	4.43	.46	2.9	9.09
5.00	5.43	.46	2.2	11.99
6.00	6.43	.46	1.8	14.65

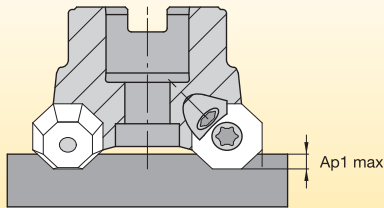
Helical Interpolation



Inch Version

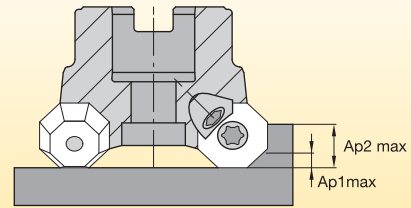
D1 inch	D1 max inch	hole diameter		Ap/rev inch
		min inch	max inch	
2.50	2.94	4.872	5.748	.248
3.00	3.44	5.868	6.744	.248
4.00	4.43	7.863	8.739	.248
5.00	5.43	9.859	10.736	.248
6.00	6.43	11.857	12.733	.248

Plunging



max plunging depth	inch
Ap1 max	.17

Face Milling



max DOC Ap	inch	chipload (fz)
Ap1 max	.20	1 x fz
Ap2 max	.46	0,6 x fz

Face Mills

Fix-Perfect™ Cast Iron Rougher and Finisher



Primary Application

Performance booster in machining cast iron materials. Based on workpiece requirements, Fix-Perfect covers all face- and shoulder-milling applications when machining cast iron materials with best-in-class productivity. Eight true cutting edges per insert deliver low cost per edge and best CPP ceramic inserts available as standard line items.

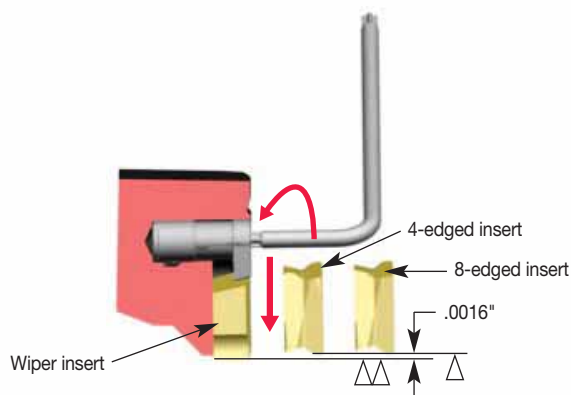
Features and Benefits

Fix-Perfect Cast Iron 20° and 0° Roughing and Finishing in One Tool

- Innovative tangential insert clamping.
- First choice for high feed rates.
- Protection of non-cutting edges.
- Adjustable element for fine finishing with wiper inserts.
- PCBN-tipped wiper inserts available for excellent floor finish.
- Micro-precise runout setup.

Fix-Perfect Cast Iron Finisher Best-in-Class Fine-Finishing Concept

- Rigid and stable cutter design.
- High-precision pocket seat.
- Perfect axial runout without insert adjustment.
- Reliable, excellent floor finish and flatness.
- Easy handling and low-cost cutter setup.





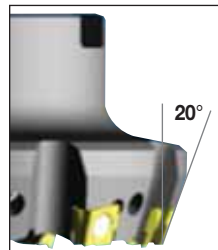
Fix-Perfect™ Finisher



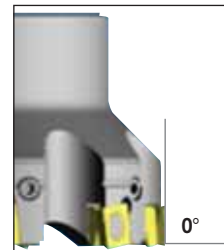
Fix-Perfect Cast Iron

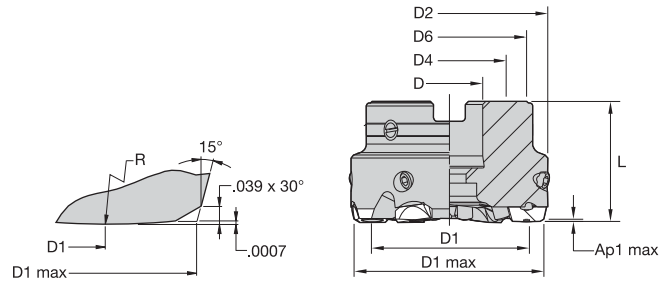
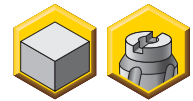
Fix-Perfect Cast Iron 20° and 0°

Fix-Perfect 20°



Fix-Perfect 0°





Finishing Face Mills • Coarse Pitch

order number	catalog number	D1	D1 max	D	D2	D4	D6	L	Ap1 max	Z	lbs	max RPM
1925488	100B08RP00MD10CUF	3.547	4.000	1.250	4.079	—	3.307	1.750	.040	8	3.70	12550
1925489	125B10RP00MD10CUF	4.547	5.000	1.500	5.079	—	4.100	2.380	.040	10	7.70	10050
1925490	160B12RP00MD10CUF	5.547	6.000	2.000	6.079	—	5.500	2.380	.040	12	12.60	8350
1925491	200C14RP00MD10CUF	7.547	8.000	2.500	8.079	4.000	7.087	2.380	.040	14	20.90	6250

Spare Parts



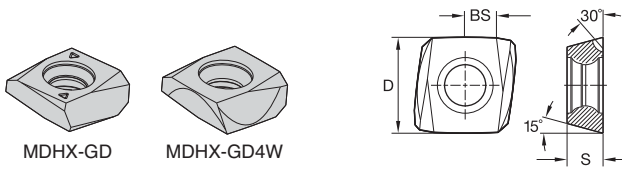
D1	clamp stud	clamp screw	in. lbs.	hex wrench	coolant lock screw assembly	coolant lock screw	coolant shower plate
4.000	410.085	420.060	45	170.003	420.162	—	—
5.000	410.085	420.060	45	170.003	—	420.201	470.240
6.000	410.085	420.060	45	170.003	—	420.241	470.241
8.000	410.085	420.060	45	170.003	—	—	470.242

NOTE: Please order spare parts separately.
Left-hand cutters are available as non-stock standards.
Torque wrench (KTW45) and 3mm hex bit (69709922164) may be purchased separately to ensure proper torque setting.

Face Mills

Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	—	—	—	—	—	—
P3-P4	—	—	—	—	—	—
P5-P6	—	—	—	—	—	—
M1-M2	—	—	—	—	—	—
M3	—	—	—	—	—	—
K1-K2	.F..GD4W	KC520M	.F..GD4W	KC520M	.F..GD4W	KC520M
K3	.E..GD4W	KC520M	.E..GD4W	KC520M	.E..GD4W	KC520M
N1-N2	—	—	—	—	—	—
N3	—	—	—	—	—	—
S1-S2	—	—	—	—	—	—
S3	—	—	—	—	—	—
S4	—	—	—	—	—	—
H1	—	—	—	—	—	—

Indexable Inserts • Fix-Perfect • MDHX1004... Right Hand


● first choice
○ alternate choice

P	■	■	■	■
M	■	■	■	■
K	●	●	○	○
N	■	■	■	■
S	■	■	■	■
H	■	■	■	■

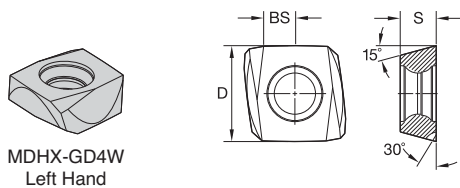
MDHX-GD • Right Hand

catalog number	D	S	BS	hm	cutting edges	K110M	KC520M	KTPK20
MDHX1004ZDERGD	.500	.187	.031	.002	4	●	●	●

MDHX-GD4W • Right Hand

catalog number	D	S	BS	hm	cutting edges	K110M	KC520M	KTPK20
MDHX1004ZDERGD4W	.500	.187	.167	.002	4	●	●	●
MDHX1004ZDFRGD4W	.500	.187	.167	.001	4	●	●	●

Face Mills



● first choice
○ alternate choice

P	■	■	■	■
M	■	■	■	■
K	●	●	○	○
N	■	■	■	■
S	■	■	■	■
H	■	■	■	■

MDHX-GD4W • Left Hand

catalog number	L10	S	BS	hm	cutting edges	K110M	KC520M
MDHX1004ZDFLGD4W	.425	.187	.167	.001	4	●	●

■ Recommended Starting Speeds [SFM]

Material Group		K110M			KC520M			KTPK20		
P	1	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—	—	—
	5	—	—	—	—	—	—	—	—	—
	6	—	—	—	—	—	—	—	—	—
M	1	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
K	1	510	480	450	1060	960	850	910	770	640
	2	450	420	390	830	740	700	720	590	520
	3	400	350	310	700	620	560	600	500	420
N	1-2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
S	1	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—	—	—
H	1	—	—	—	—	—	—	—	—	—

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

■ Recommended Starting Feeds [IPT]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.F..GD4W	.004	.005	.007	.003	.004	.005	.003	.003	.004	.003	.003	.004	.003	.003	.004	.F..GD4W
.E..GD4W	.005	.006	.008	.004	.005	.006	.003	.004	.005	.003	.004	.005	.003	.004	.005	.E..GD4W
.E..GD	.005	.006	.008	.004	.005	.006	.003	.004	.005	.003	.004	.005	.003	.004	.005	.E..GD

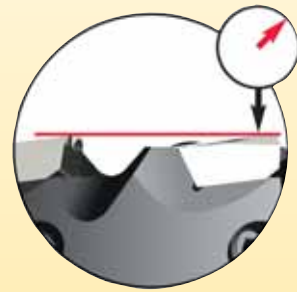
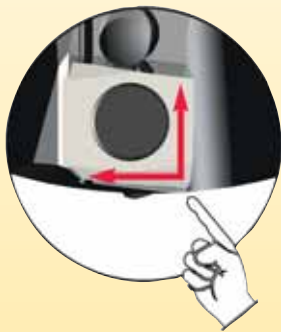
NOTE: Use "Light Machining" values as starting feed rate.



Face Mills

■ Insert Loading Procedure

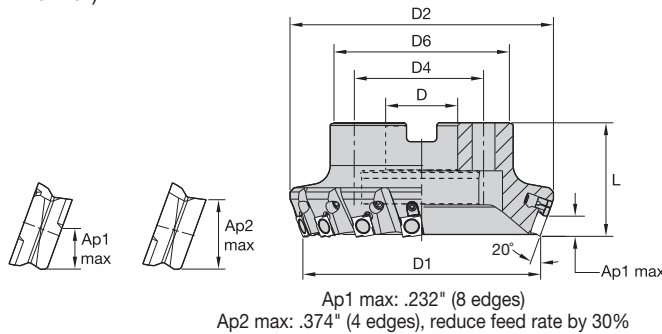
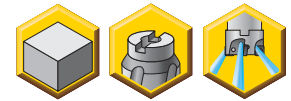
1. Clean insert and insert pocket seat.
2. Load insert — push insert against pin and axial pocket wall.
3. Tighten screw to a torque of 45 in. lbs.
4. Check the axial runout.
5. Do not exceed the maximum recommended RPM.



tool diameter (inch)	maximum axial runout	maximum RPM
4.00	.0004	12750
5.00	.0004	10200
6.00	.0015	7950
8.00	.0015	6350



- Eight cutting edges per insert.
- Rough and finish in one operation.
- Tangential mounted inserts deliver higher feed rates.
- Adjustable pockets (D1 = 3–10").

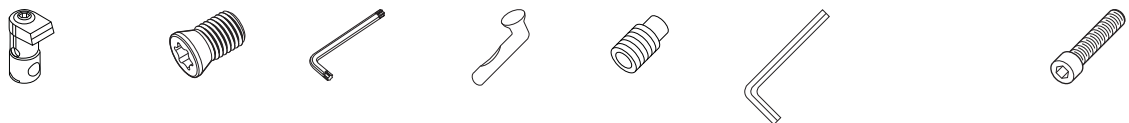


■ Fix-Perfect 20° • Shell Mills

order number	catalog number	D1	D	D2	D4	D6	L	Ap1 max	Z	Z ADJ	lbs	max RPM
1724429	50A04RP70SP12CUFP	2.000	.750	2.504	—	1.750	1.750	.232	4	0	1.24	8595
1724378	50A05RP70SP12CUFP	2.000	.750	2.504	—	1.750	1.750	.232	5	0	1.19	8595
1724430	63A05RP70SP12CUFP	2.500	.750	2.988	—	1.750	1.750	.232	5	0	1.66	6876
1724432	80A06RP70SP12C1WUFP	3.000	1.000	3.504	—	2.190	1.750	.232	6	1	2.21	5730
1724380	80A08RP70SP12C2WUFP	3.000	1.000	3.504	—	2.190	1.750	.232	8	2	2.43	5730
1724391	100B12RP70SP12C3WUFP	4.000	1.500	4.488	—	2.880	1.750	.232	12	3	3.10	4298
1532258	100B08RP70SP12C2WUFP	4.000	1.500	4.488	—	2.880	1.750	.232	8	2	3.30	4298
1532257	125B10RP70SP12C2WUFP	5.000	1.500	5.504	—	3.810	2.375	.232	10	2	6.50	3438
1724393	125B15RP70SP12C3WUFP	5.000	1.500	5.504	—	3.810	2.375	.232	15	3	6.50	3438
1724434	160B12RP70SP12C3WUFP	6.000	2.000	6.504	—	4.882	2.375	.232	12	3	10.10	2865
1724395	160B18RP70SP12C3WUFP	6.000	2.000	6.504	—	4.882	2.375	.232	18	3	10.10	2865
1532255	200C16RP70SP12C4WUFP	8.000	2.500	8.504	4.000	5.120	2.375	.232	16	4	14.10	2149
1724396	200C24RP70SP12C4WUFP	8.000	2.500	8.504	4.000	5.120	2.375	.232	24	4	15.20	2149
1532254	250C20RP70SP12C4WUFP	10.000	2.500	10.504	4.000	7.120	2.375	.232	20	4	29.30	1719

Face Mills

■ Spare Parts



D1	adjusting element	adjusting element screw	Torx wrench	clamp stud	set screw	hex wrench	in. lbs.	socket-head cap screw
2.000	—	—	—	410.081	121.612	170.003	45	S445
2.500	—	—	—	410.081	121.612	170.003	45	S445
3.000	479.100	193.300	KT9	410.081	121.612	170.003	45	S458
4.000	479.100	193.300	KT9	410.081	121.612	170.003	45	—
5.000	479.100	193.300	KT9	410.081	121.612	170.003	45	—
6.000	479.100	193.300	KT9	410.081	121.612	170.003	45	—
8.000	479.100	193.300	KT9	410.081	121.612	170.003	45	—
10.000	479.100	193.300	KT9	410.081	121.612	170.003	45	—

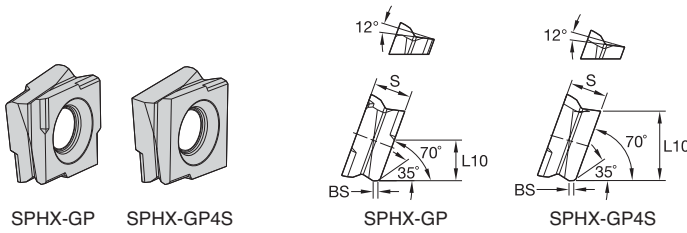
NOTE: Please order spare parts separately.

Torque wrench (KTW45) and 3mm hex bit (69709922164) may be purchased separately to ensure proper torque setting.

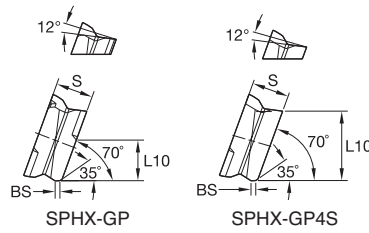
Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	—	—	—	—	—	—
P3-P4	—	—	—	—	—	—
P5-P6	—	—	—	—	—	—
M1-M2	—	—	—	—	—	—
M3	—	—	—	—	—	—
K1-K2	.E..GP	KC520M	.E..GP	KCK15	.S..GP	KCK15
K3	.E..GP	KCPK30	.S..GP	KCPK30	.S..GP	KCPK30
N-N2	—	—	—	—	—	—
N3	—	—	—	—	—	—
S1-S2	—	—	—	—	—	—
S3	—	—	—	—	—	—
S4	—	—	—	—	—	—
H1	—	—	—	—	—	—

Indexable Inserts • SPHX1205... • Roughing



SPHX-GP SPHX-GP4S



SPHX-GP SPHX-GP4S

- first choice
- alternate choice

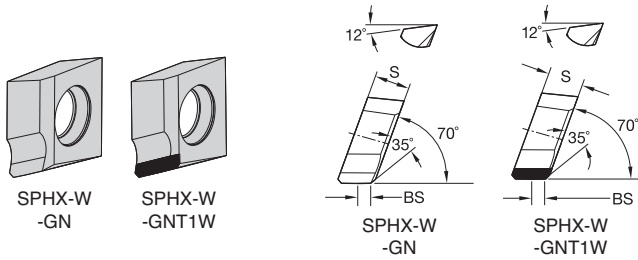
P	●					
M	●					
K	●	●	○	○	○	●
N	●					
S	●					
H						


SPHX-GP • Roughing

catalog number	L10	S	BS	hm	cutting edges	KC520M	KCK15	KTPK20	KCPK30	KY3500
SPHX1205ZCELGP	.213	.217	.028	.002	8	●	●			
SPHX1205ZCTRGP	.213	.217	.028	.009	8			●		
SPHX1205ZCTRGPK	.213	.217	.028	.009	8					●
SPHX1205ZCTLGPK	.213	.217	.028	.009	8					●
SPHX1205ZCERGP	.213	.217	.028	.002	8	●	●		●	
SPHX1205ZCSRGP	.213	.217	.028	.006	8		●		●	

SPHX-GP4S • Roughing

catalog number	L10	S	BS	hm	cutting edges	KC520M	KCK15	KTPK20	KCPK30	KY3500
SPHX1205ZCERGP4S	.395	.217	.028	.002	4	●	●			
SPHX1205ZCTRGP4SK	.396	.217	.028	.009	4					●



● first choice
○ alternate choice

P				
M				
K	●	●	●	●
N				
S				
H				

■ SPHX-W • Finishing • GN

catalog number	L10	S	BS	hm	cutting edges	KB1340	KC520M	KCK15	KY3500
SPHX1205ZCFRGN1W	.394	.217	.079	.001	1		●		
SPHX1205ZCFLGN1W	.394	.217	.079	.001	1		●		
SPHX1205ZCERGNT1W	.394	.217	.079	.001	1	●			
SPHX1205ZCFRGN1WK	.394	.217	.079	.001	1				●

■ SPHX-W • Finishing • GP

catalog number	L10	S	BS	hm	cutting edges	KB1340	KC520M	KCK15	KY3500
SPHX1205ZCER-GP1W	.394	.217	.079	.001	1		●		
SPHX1205ZCTR-GP1WK	.394	.217	—	.009	1				●

NOTE: SPHX-W: Wiper Facet BS = .08".

Face Mills

■ Recommended Starting Speeds [SFM]

Material Group		KB1340			KC520M			KCK15		
P	1	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—	—	—
	5	—	—	—	—	—	—	—	—	—
	6	—	—	—	—	—	—	—	—	—
M	1	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
K	1	5400	3600	1920	1060	960	850	1660	1510	1340
	2	—	—	—	830	740	700	1310	1170	1090
	3	—	—	—	700	620	560	1100	980	900
N	1-2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
S	1	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—	—	—
H	1	—	—	—	—	—	—	—	—	—

Material Group		KTPK20			KCPK30			KY3500		
P	1	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—	—	—
	5	—	—	—	—	—	—	—	—	—
	6	—	—	—	—	—	—	—	—	—
M	1	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
K	1	910	770	640	1160	1050	940	3170	2880	2560
	2	720	590	520	920	830	760	2510	2240	2090
	3	600	500	420	770	690	640	2110	1870	1720
N	1-2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
S	1	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—	—	—
H	1	—	—	—	—	—	—	—	—	—



NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.
KY3500™ can be used for machining of low tensile ductile irons (e.g., 65-45-12).

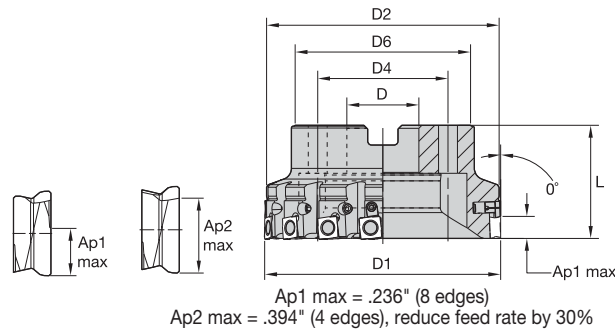
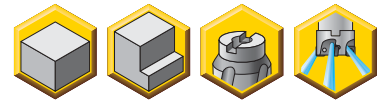
■ Recommended Starting Feeds [IPT]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.E..GP	.005	.010	.019	.004	.007	.014	.003	.007	.012	.003	.006	.011	.003	.006	.011	.E..GP
.T..GP	.007	.017	.034	.005	.013	.025	.005	.011	.021	.004	.010	.020	.004	.010	.020	.T..GP
.S..GP	.007	.016	.032	.005	.012	.023	.004	.010	.020	.004	.010	.019	.004	.009	.018	.S..GP

NOTE: Use "Light Machining" values as starting feed rate.

- Eight cutting edges per insert.
- Rough and finish in one operation.
- Tangential mounted inserts deliver higher feed rates.
- Adjustable pockets (D1 = 3–6").

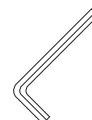


■ Fix-Perfect 0° • Shell Mills

order number	catalog number	D1	D	D2	D6	L	Ap1 max	Z	Z ADJ	lbs	max RPM
1724407	50A04RP90SP12CUFP	2.000	.750	1.929	1.750	1.750	.236	4	0	.93	8595
1514498	50A05RP90SP12CUFP	2.000	.750	1.929	1.750	1.750	.236	5	0	.93	8595
1724409	63A05RP90SP12CUFP	2.500	.750	2.433	1.750	1.750	.236	5	0	1.24	6876
1724417	80A06RP90SP12C1WUFP	3.000	1.000	2.906	2.190	1.750	.236	6	1	1.81	5730
1724339	80A08RP90SP12C2WUFP	3.000	1.000	2.906	2.190	1.750	.236	8	2	1.90	5730
1724419	100B08RP90SP12C2WUFP	4.000	1.500	3.906	2.882	1.750	.236	8	2	2.60	4298
1724351	100B12RP90SP12C3WUFP	4.000	1.500	3.906	2.882	1.750	.236	12	3	2.86	3130
1724421	125B10RP90SP12C2WUFP	5.000	1.500	4.906	3.811	2.375	.236	10	2	6.30	3438
1724353	125B15RP90SP12C3WUFP	5.000	1.500	4.906	3.811	2.375	.236	15	3	6.40	3438
1724424	160B12RP90SP12C3WUFP	6.000	2.000	5.906	4.882	2.375	.236	12	3	9.10	2865
1724355	160B18RP90SP12C3WUFP	6.000	2.000	5.906	4.882	2.375	.236	18	3	9.20	2865

■ Spare Parts

Face Mills

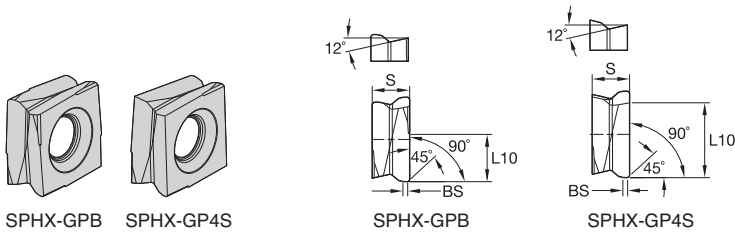


D1	adjusting element	Torx wrench	clamp stud	set screw	hex wrench	in. lbs.	socket-head cap screw
2.000	—	—	410.081	121.612	170.003	45	S446
2.500	—	—	410.081	121.612	170.003	45	S445
3.000	479.100	KT9	410.081	121.612	170.003	45	S458
4.000	479.100	KT9	410.081	121.612	170.003	45	—
5.000	479.100	KT9	410.081	121.612	170.003	45	—
6.000	479.100	KT9	410.081	121.612	170.003	45	—

NOTE: Please order spare parts separately.
 Torque wrench (KTW45) and 3mm hex bit (69709922164) can be purchased separately to ensure proper torque setting.

Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	—	—	—	—	—	—
P3-P4	—	—	—	—	—	—
P5-P6	—	—	—	—	—	—
M1-M2	—	—	—	—	—	—
M3	—	—	—	—	—	—
K1-K2	.E..GPB	KC520M	.E..GPB	KCK15	.S..GPB	KCK15
K3	.E..GPB	KCPK30	.S..GPB	KCPK30	.S..GPB	KCPK30
N1-N2	—	—	—	—	—	—
N3	—	—	—	—	—	—
S1-S2	—	—	—	—	—	—
S3	—	—	—	—	—	—
S4	—	—	—	—	—	—
H1	—	—	—	—	—	—

Indexable Inserts • SPHX1205... • Roughing


SPHX-GPB SPHX-GP4S

SPHX-GPB

SPHX-GP4S

- first choice
- alternate choice

P	●					
M	●					
K	●	●	○	○	○	●
N	●					
S	●					
H						

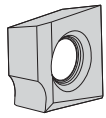
Face Mills

SPHX-GPB • Roughing

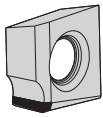
catalog number	L10	S	BS	hm	cutting edges	KC520M	KCK15	KTPK20	KCPK30	KY3500
SPHX1205PCERGPB	.259	.217	.028	.001	8	●	●		●	
SPHX1205PCTRGPBK	.259	.217	.028	.009	8					●
SPHX1205PCSRGPB	.259	.217	.028	.006	8		●		●	
SPHX1205PCTRGPB	.259	.217	.028	.009	8			●		
SPHX1205PCTLGPBK	.259	.217	.028	.009	8					●

SPHX-GP4S • Roughing

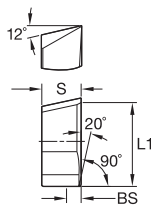
catalog number	L10	S	BS	hm	cutting edges	KC520M	KCK15	KTPK20	KCPK30	KY3500
SPHX1205PCERGP4SB	.436	.217	.028	.001	4	●	●			
SPHX1205PCTRGP4SBK	.436	.217	.028	.009	4					●



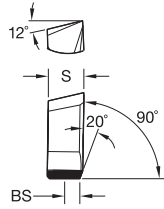
SPHX-GN1WB
SPHX-GN1WBK



SPHX-GNT1WB



SPHX-GN1WB
SPHX-GN1WBK



SPHX-GNT1WB

● first choice
○ alternate choice

P									
M									
K	●	●	●	○	○	●			
N									
S									
H									

■ SPHX-W • Finishing • GN

catalog number	L1	S	BS	hm	cutting edges	KB1340	KC520M	KCK15	KTPK20	KCPK30	KY3500
SPHX1205PCFLGN1WB	.433	.217	.079	.001	1			●			
SPHX1205PCERGN1WB	.433	.205	.079	.002	1					●	
SPHX1205PCERGNT1WB	.433	.217	.079	.001	1	●					
SPHX1205PCFRGN1WBK	.433	.205	.079	.001	1						●
SPHX1205PCFRGN1WB	.433	.205	.079	.001	1		●	●	●		

■ SPHX-W • Finishing • GP

catalog number	L1	S	hm	cutting edges	KB1340	KC520M	KCK15	KTPK20	KCPK30	KY3500
SPHX1205PCER-GP1WB	.433	.217	.001	1		●				
SPHX1205PCTR-GP1WBK	.433	.217	.009	1			●			●

NOTE: SPHX-W-GP: Wiper Facet BS = .08".

Face Mills

■ Recommended Starting Speeds [SFM]

Material Group		KB1340			KC520M			KCK15		
P	1	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—	—	—
	5	—	—	—	—	—	—	—	—	—
	6	—	—	—	—	—	—	—	—	—
M	1	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
K	1	4500	3000	1600	880	800	710	1380	1255	1115
	2	—	—	—	690	620	580	1095	975	910
	3	—	—	—	580	520	470	920	815	750
N	1-2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
S	1	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—	—	—
H	1	—	—	—	—	—	—	—	—	—

Material Group		KTPK20			KCPK30			KY3500		
P	1	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—	—	—
	5	—	—	—	—	—	—	—	—	—
	6	—	—	—	—	—	—	—	—	—
M	1	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
K	1	760	640	530	965	875	780	2640	2400	2130
	2	600	490	430	770	690	630	2090	1870	1740
	3	500	420	350	645	575	530	1760	1560	1430
N	1-2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
S	1	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—	—	—
H	1	—	—	—	—	—	—	—	—	—



NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.
KY3500™ can be used for machining of low tensile ductile irons (e.g., 65-45-12).

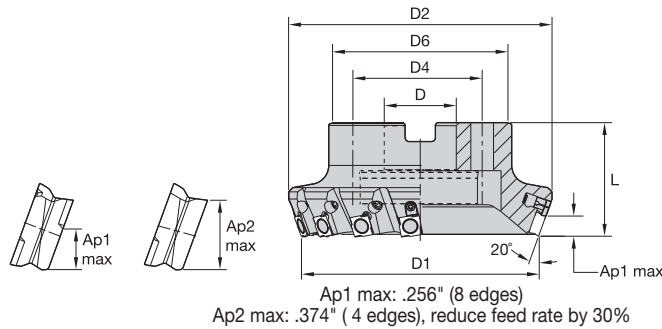
■ Recommended Starting Feeds [IPT]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.E..GPB	.003	.008	.016	.003	.006	.012	.002	.005	.010	.002	.005	.010	.002	.005	.010	.E..GPB
.T..GPB	.007	.014	.030	.005	.011	.022	.004	.009	.019	.004	.009	.018	.004	.008	.017	.T..GPB
.S..GPB	.007	.013	.027	.005	.010	.020	.004	.008	.017	.004	.008	.016	.004	.008	.016	.S..GPB

NOTE: Use "Light Machining" values as starting feed rate.

- Eight cutting edges per insert.
- Rough and finish in one operation.
- Tangential mounted inserts deliver higher feed rates.
- Adjustable pockets.



■ **Fix-Perfect 20° • Shell Mills**

order number	catalog number	D1	D	D2	D4	D6	L	Ap1 max	Z	Z ADJ	lbs	max RPM
1806847	125B08RP70SP15C2WUFP	5.000	1.500	5.559	—	3.807	2.375	.256	8	2	7.000	3500
1806848	160B10RP70SP15C2WUFP	6.000	2.000	6.559	—	4.877	2.375	.256	10	2	10.400	2800
1806849	200C12RP70SP15C2WUFP	8.000	2.500	8.555	4.000	5.117	2.375	.256	12	2	14.500	2100

■ **Spare Parts**



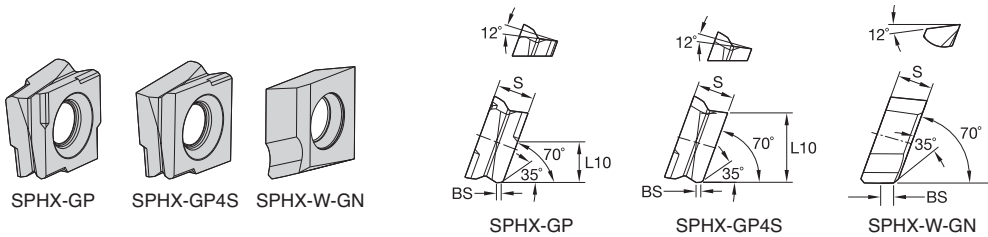
D1	adjusting element	adjusting element screw	Torx wrench	clamp stud	clamp screw	hex wrench	in. lbs.
5.000	479.100	193.300	KT9	410.084	121.616	170.003	45.000
6.000	479.100	193.300	KT9	410.084	121.616	170.003	45.000
8.000	479.100	193.300	KT9	410.084	121.616	170.003	45.000

NOTE: Please order spare parts separately.
Torque wrench (KTW45) and 3mm hex bit (69709922164) may be purchased separately to ensure proper torque setting.

Face Mills

Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	—	—	—	—	—	—
P3-P4	—	—	—	—	—	—
P5-P6	—	—	—	—	—	—
M1-M2	—	—	—	—	—	—
M3	—	—	—	—	—	—
K1-K2	.E..GP	KC520M	.E..GP	KCK15	.S..GP	KCK15
K3	.E..GP	KCPK30	.S..GP	KCPK30	.S..GP	KCPK30
N1-N2	—	—	—	—	—	—
N3	—	—	—	—	—	—
S1-S2	—	—	—	—	—	—
S3	—	—	—	—	—	—
S4	—	—	—	—	—	—
H1	—	—	—	—	—	—

Indexable Inserts • SPHX15T6...


● first choice
○ alternate choice

P							
M							
K	●	●	●	○	○	●	
N							
S							
H							

Face Mills
SPHX-GP

catalog number	L10	S	BS	hm	cutting edges
SPHX15T6ZCERGP	.257	.260	.047	.001	8
SPHX15T6ZCSRGP	.257	.260	.047	.005	8
SPHX15T6ZCTRGP	.256	.260	.047	.009	8
SPHX15T6ZCTRGPK	.256	.260	.047	.009	8

SPHX-GP4S

catalog number	L10	S	BS	hm	cutting edges
SPHX15T6ZCERGP4S	.492	.260	.047	.002	4
SPHX15T6ZCTRGP4SK	.493	.260	.047	.009	4

SPHX-W-GN • Finishing

catalog number	L10	S	hm	cutting edges
SPHX15T6ZCFRGN1W	.433	.260	.001	1
SPHX15T6ZCFRGN1WK	.433	.260	.001	1

	K110M	KC520M	KCK15	KTPK20	KCPK30	KY3500
●						
○						

■ Recommended Starting Speeds [SFM]

Material Group		K110M			KC520M			KCK15		
P	1	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—	—	—
	5	—	—	—	—	—	—	—	—	—
	6	—	—	—	—	—	—	—	—	—
M	1	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
K	1	510	480	450	1060	960	850	1660	1510	1340
	2	450	420	390	830	740	700	1310	1170	1090
	3	400	350	310	700	620	560	1100	980	900
N	1-2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
S	1	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—	—	—
H	1	—	—	—	—	—	—	—	—	—

Material Group		KTPK20			KCPK30			KY3500		
P	1	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—	—	—
	5	—	—	—	—	—	—	—	—	—
	6	—	—	—	—	—	—	—	—	—
M	1	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
K	1	910	770	640	1160	1050	940	3170	2880	2560
	2	720	590	520	920	830	760	2510	2240	2090
	3	600	500	420	770	690	640	2110	1870	1720
N	1-2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
S	1	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—	—	—
H	1	—	—	—	—	—	—	—	—	—

Face Mills

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.
KY3500™ can be used for machining of low tensile ductile irons (e.g., 65-45-12).

■ Recommended Starting Feeds [IPT]

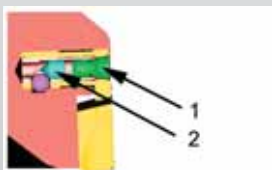
Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.E..GP	.005	.010	.019	.004	.007	.014	.003	.007	.012	.003	.006	.011	.003	.006	.011	.E..GP
.T..GP	.007	.017	.034	.005	.013	.025	.005	.011	.021	.004	.010	.020	.004	.010	.020	.T..GP
.S..GP	.007	.016	.032	.005	.012	.023	.004	.010	.020	.004	.010	.019	.004	.009	.018	.S..GP

NOTE: Use "Light Machining" values as starting feed rate.

Introduction to Fitting Cutting Bodies

	procedures:	roughing		roughing/finishing	
		fixed pocket	adjustable pocket	fixed pocket	adjustable pocket
1	Reset adjusting element T x T9	—		—	
2	Insert roughing insert Tighten SW 3 M _{AN} = 44 in. lbs.				—
3	Tighten adjusting element gently	—		—	—
4	Insert finishing insert and pre-tighten SW 3 M _{VG} = 9 in. lbs.	—	—	—	
5	The finishing insert is positioned .0016" in front of the highest roughing insert	—	—	—	
6	Tighten the finishing insert M _{AN} = 44 in. lbs.	—	—	—	



NOTE: This process must be repeated whenever an indexable insert is changed.
The ball is loose.

Changing the adjusting element

1. Remove the taper screw ①.
2. Loosen the SW 1,5 screw ②.
3. Remove the adjusting element.

ATTENTION: The maximum permissible cutting speed of the milling cutter heads is $v_c \text{ max} = 3000 \text{ SFM}$. Only use original parts when clamping the indexable inserts.

HexaCut™ Series

Primary Application

The Kennametal HexaCut face milling program is specifically engineered for rough and semi-finish face milling of cast, ductile, and compacted graphite iron. Twelve cutting edges drastically reduce your cost per edge and increase tool life. Shorter setup times and excellent cutter accuracy allow you to apply the HexaCut program to the most demanding jobs. One ceramic and eight carbide grades with six insert geometries deliver high feed rates and will enable you to reach optimum horsepower.



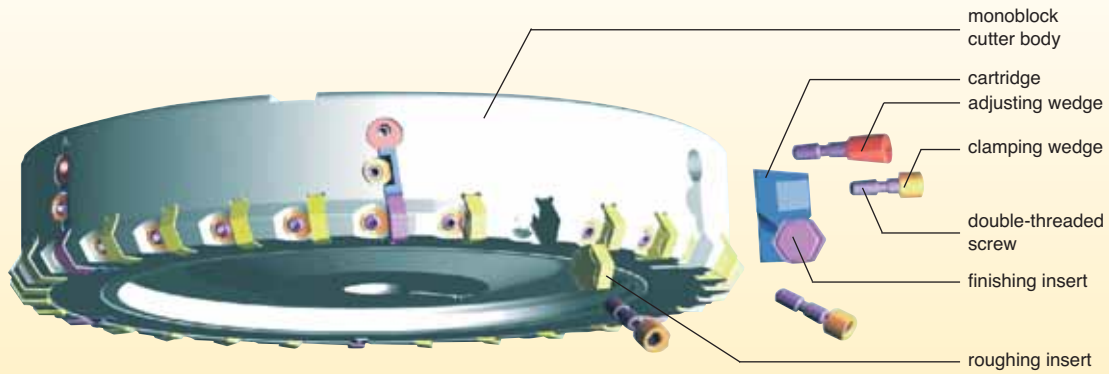
Features and Benefits

Tailor-Made Platform for Machining Automotive Components in Cast Iron Materials

- First choice for machining GCI and CGI materials.
- 45° lead cutter bodies engineered with fixed pockets for roughing applications up to $A_{p1} \text{ max} = .256"$.
- 30° lead cutter bodies engineered with fixed and adjustable pockets for roughing and combined roughing/finishing applications up to $A_{p1} \text{ max} = 8\text{mm}$.
- Fine pitch cutter density for best productivity in machining cast iron materials.
- Comprehensive standard offering of different insert geometries to match every application for light, medium, and heavy machining.
- Easy handling and cutter body setup.
- Twelve true cutting edges per insert for low cost per edge and excellent CPP.
- Split case design with adapter flange available as preferred engineered solution standard for $D1 = 10"$ and $D1 = 12"$.



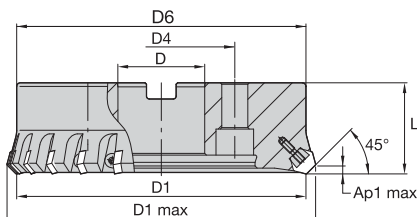
■ HexaCut 60° Cutter Body Design with Fixed and Adjustable Pocket Seats



			▼ = roughing indexable insert				▼▼ = finishing indexable insert			
Recommended combination of standard indexable inserts and geometries			HNGX 090516 -MR Z = 12	HNGX 090508 -MH Z = 12	HNGX 090520 -ML Z = 12	HNGX 090520 -MM Z = 12	HNGX 090504 -MM Z = 12	HNGF 090504 -MT Z = 6+6	HNGF 090504 -MF Z = 12	
Operation	Lead	Ap max								
▼	45°	.256"	■	OR	■	OR	■	OR	■	
▼	30°	.315"	■	OR	■	OR	■	OR	■	
▼▼	30°	.040"				■	OR	■	OR	■
▼/▼▼	30°	.315"	■	OR	■	OR	■	OR	■	

NOTE: Z = number of cutting edges

- Monoblock cutter design.
- Twelve cutting edges per insert.
- High feed rates.
- CGI milling solution.

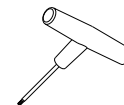


■ HexaCut Shell Mills • Monoblock Cutter Design • Right Hand

order number	catalog number	D1	D1 max	D	D4	L	Ap1 max	Z	lbs	max RPM
2402837	K315A10RF45HN09C	3.150	3.500	1.000	—	1.970	.256	10	3.50	3900
2402838	K400B14RF45HN09C	4.000	4.500	1.250	—	1.970	.256	14	5.00	3400
2402839	K500B18RF45HN09C	5.000	5.500	2.000	—	2.380	.256	18	10.00	3000
2402840	K600B22RF45HN09C	6.000	6.500	2.500	—	2.380	.256	22	16.30	2600
2402841	K800C28RF45HN09C	8.000	8.500	2.500	4.000	2.380	.256	28	32.50	2300

NOTE: Split case design with adapter flange for D1 = 10" and D1 = 12" can be ordered as preferred engineered solution standard.

■ Spare Parts



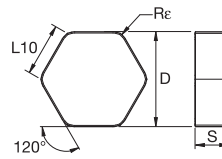
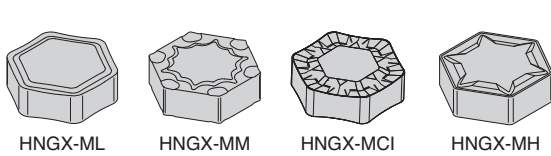
D1	wedge	wedge screw	in. lbs.	wrench
3.150	12748358200	12748600900	62	12148044900
4.000	12748358200	12748600900	62	12148044900
5.000	12748358200	12748600900	62	12148044900
6.000	12748358200	12748600900	62	12148044900
8.000	12748358200	12748600900	62	12148044900



Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	—	—	—	—	—	—
P3-P4	—	—	—	—	—	—
P5-P6	—	—	—	—	—	—
M1-M2	—	—	—	—	—	—
M3	—	—	—	—	—	—
K1-K2	...ML	KCK15	...MM	KC917M	...MR	KC917M
K3	...MM	KCK15	...MM	KCK15	...MR	KCPK30
N1-N2	—	—	—	—	—	—
N3	—	—	—	—	—	—
S1-S2	—	—	—	—	—	—
S3	—	—	—	—	—	—
S4	—	—	—	—	—	—
H1	—	—	—	—	—	—

Indexable Inserts • HexaCut • HN..0905...



HNGX/HNPX

- first choice
- alternate choice

P																				
M																				
K	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
N																				
S																				
H																				

Face Mills

HNGX-ML

catalog number	D	S	L10	Re	hm	cutting edges	KCK15	KCPK30	KC514M	KC524M	KC907M	KC914M	KC917M	KC924M	KY3500
HNGX5355ML	.638	.219	.368	.079	.002	12	●								

HNGX-MM

catalog number	D	S	L10	Re	hm	cutting edges	KCK15	KCPK30	KC514M	KC524M	KC907M	KC914M	KC917M	KC924M	KY3500
HNGX5351MM	.638	.219	.368	.016	.004	12									
HNGX5355MM	.638	.219	.368	.079	.004	12	●								
HNGX5358MM	.638	.219	.368	.118	.004	12			●	●	●	●	●		

HNGX-MCI

catalog number	D	S	L10	Re	hm	cutting edges	KCK15	KCPK30	KC514M	KC524M	KC907M	KC914M	KC917M	KC924M	KY3500
HNGX090530MCI	.638	.219	.368	.118	.004	12							●		

HNGX-MH

catalog number	D	S	L10	Re	hm	cutting edges	KCK15	KCPK30	KC514M	KC524M	KC907M	KC914M	KC917M	KC924M	KY3500
HNGX5352MH	.638	.219	.368	.032	.002	12	●	●	●	●	●	●	●	●	●

■ Recommended Starting Speeds [SFM]

Material Group		KCK15			KCPK30			KC514M			KC524M			KC907M		
P	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
M	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
K	1	1660	1510	1340	1160	1050	940	1570	1150	830	1470	1050	750	1600	1190	1000
	2	1310	1170	1090	920	830	760	1380	920	680	1280	820	620	1260	980	820
	3	1100	980	900	770	690	640	1100	850	660	980	730	520	980	820	660
N	1-2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
S	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
H	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Material Group		KC914M			KC917M			KC924M			KY3500		
P	1	—	—	—	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—	—	—	—	—	—
	5	—	—	—	—	—	—	—	—	—	—	—	—
	6	—	—	—	—	—	—	—	—	—	—	—	—
M	1	—	—	—	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—
K	1	1370	1180	980	1180	980	780	1150	900	660	3170	2880	2560
	2	1180	980	820	980	780	660	900	720	580	2510	2240	2090
	3	980	820	660	780	660	520	720	580	460	2110	1870	1720
N	1-2	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—
S	1	—	—	—	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—	—	—	—	—	—
H	1	—	—	—	—	—	—	—	—	—	—	—	—

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

■ Recommended Starting Feeds [IPT]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
...ML	.005	.008	.017	.004	.006	.013	.003	.005	.011	.003	.005	.010	.003	.005	.010	...ML
...MM	.010	.017	.026	.007	.012	.019	.006	.011	.016	.006	.010	.015	.006	.010	.015	...MM
...MR	.010	.019	.028	.007	.014	.021	.006	.012	.018	.006	.011	.017	.006	.011	.017	...MR
...MCI	.010	.019	.030	.007	.014	.022	.006	.012	.019	.006	.011	.018	.006	.011	.018	...MCI
...MH	.008	.017	.027	.006	.012	.020	.005	.011	.017	.005	.010	.016	.005	.010	.016	...MH

NOTE: Use "Light Machining" values as starting feed rate.

■ Adjustment Instructions

Before Being Used for the First Time

- The milling cutter must be carefully cleaned of anti-corrosive materials, dust, etc.
- The milling cutter should only be washed when all components have been dismantled.
- Only the double-threaded screws of the clamping or adjusting wedge should be lubricated with copper grease; all other components must have clean metallic surfaces.
- A torque wrench is recommended to tighten the double-threaded screws.
- When fitting indexable inserts on the milling cutter, ensure that they are inserted in the correct position in a clean insert seat and that they are held in position during clamping.

For 45° Roughing Mills without Anvils

- The double-threaded screws on the clamping wedges for the indexable inserts are first pre-tightened to approximately 17 in. lbs. and then tightened to a final torque of 62 in. lbs.

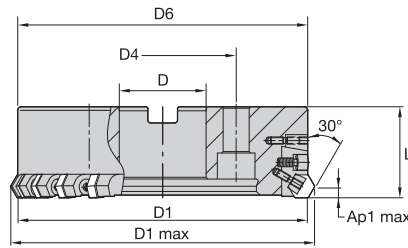
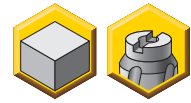
ATTENTION

At each tool adjustment, the body, indexable inserts, and spare parts must be checked and replaced, if necessary. Before each tool use, the double-threaded screws of the indexable inserts and the stops must be tightened in the specified order to a torque of 62 in. lbs. In addition, even if the cartridges have not been adjusted, the double-threaded screws of the adjusting wedges must be checked to see if these have been tightened to a torque of 26 in. lbs. If not, they must be re-tightened to this torque.

NOTE: The tools must only be used in accordance with their function. We accept no liability for their improper use. Changes of any kind and/or printing errors are not valid grounds for claims.



- Monoblock cutter design.
- Twelve cutting edges per insert.
- High feed rates.
- CGI milling solution.

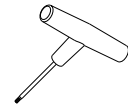


■ HexaCut Shell Mills • Monoblock Cutter Design with Adjustable Pockets • Right Hand

order number	catalog number	D1	D1 max	D	D4	D6	L	Ap1 max	Z	Z ADJ	lbs	max RPM
2430830	K315A62RF60HN09C	3.150	3.490	1.000	—	3.150	2.000	.315	8	2	3.50	3900
2430832	K400B82RF60HN09C	4.000	4.340	1.250	—	4.000	2.000	.315	10	2	8.00	3400
2430924	K500B123RF60HN09C	5.000	5.340	1.500	—	5.000	2.380	.315	15	3	10.00	3000
2430931	K600B164RF60HN09C	6.000	6.340	2.000	—	6.000	2.380	.315	20	4	15.80	2600
2430973	K800C205RF60HN09C	8.000	8.340	2.500	4.000	8.000	2.380	.315	25	5	25.00	2300

NOTE: Split case design with adapter flange for D1 = 10" and D1 = 12" can be ordered as preferred engineered solution standard.

■ Spare Parts

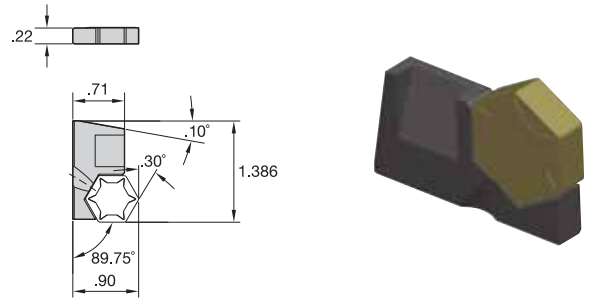


Face Mills

D1	clamp wedge	axial adjustment wedge	wedge screw	in. lbs.	wrench 3mm
3.150	12748358200	12748308500	12748600900	62	12148044900
4.000	12748358200	12748308500	12748600900	62	12148044900
5.000	12748358200	12748308500	12748600900	62	12148044900
6.000	12748358200	12748308500	12748600900	62	12148044900
8.000	12748358200	12748308500	12748600900	62	12148044900

■ **Roughing:**

For a cutting depth of $<.315"$ and an achievable surface finish of $RA >125$.
Roughing insert: HNGX090516-MR, HNGX090508-MH, HNGX090520-MM, or HNGX090520-ML in all insert seats.

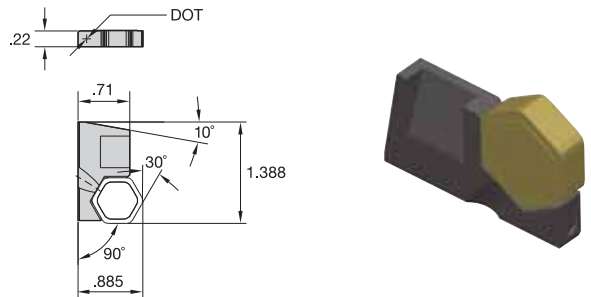


order number	catalog number
2018164	12748500200

NOTE: Cartridges need to be ordered separately. Number of adjustable pockets (Z ADJ) is related to cutting diameter.

■ **Roughing/Finishing:**

- a) For a cutting depth of $<.315"$ and an achievable surface finish of $RA 125$.
Roughing insert: HNGX090516-MR, HNGX090508-MH, HNGX090520-MM, HNGX090520-ML in the fixed insert seats.
Finishing insert: HNGF090504-MT in the finishing cartridge.
- b) For a cutting depth of $<.040"$ and an achievable surface finish of $RA 63$.
Roughing insert: HNGX090504-MM, HNGX090520-MM, or HNGX090520-ML in the fixed insert seats.
Finishing insert: HNGF090504-MF in the finishing cartridge.

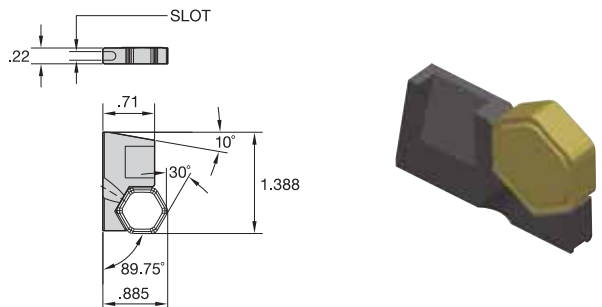


order number	catalog number
2018166	12748500400

NOTE: Cartridges need to be ordered separately. Number of adjustable pockets (Z ADJ) is related to cutting diameter.

■ **Roughing/Finishing Corrected (Reduced Axial Cutting Force):**

- a) For a cutting depth of $<.315"$ and an achievable surface finish of $RA 125$.
Roughing insert: HNGX090516-MR, HNGX090508-MH, HNGX090520-MM, or HNGX090520-ML in the fixed insert seats.
Finishing insert: HNGF090504-MT in the finishing cartridge.
- b) For a cutting depth of $<.040"$ and an achievable surface finish of $RA 63$.
Roughing insert: HNGX090504-MM, HNGX090520-MM, HNGX090520-ML, in the fixed insert seats.
Finishing insert: HNGF090504-MF in the finishing cartridge.



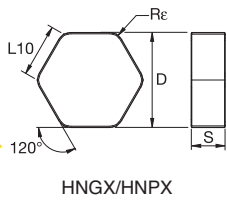
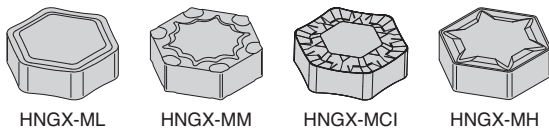
order number	catalog number
2033468	12748503400

NOTE: Cartridges need to be ordered separately. Number of adjustable pockets (Z ADJ) is related to cutting diameter.

Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	—	—	—	—	—	—
P3-P4	—	—	—	—	—	—
P5-P6	—	—	—	—	—	—
M1-M2	—	—	—	—	—	—
M3	—	—	—	—	—	—
K1-K2	...ML	KCK15	...MM	KC917M	...MR	KC917M
K3	...MM	KCK15	...MM	KCK15	...MR	KCPK30
N1-N2	—	—	—	—	—	—
N3	—	—	—	—	—	—
S1-S2	—	—	—	—	—	—
S3	—	—	—	—	—	—
S4	—	—	—	—	—	—
H1	—	—	—	—	—	—

Indexable Inserts



Face Mills

- first choice
- alternate choice

P																			
M																			
K	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
N																			
S																			
H																			

HNGX-ML

catalog number	D	S	L10	Re	hm	cutting edges	KCK15	KCPK30	KC514M	KC524M	KC907M	KC914M	KC917M	KC924M	KY3500
HNGX5355ML	.638	.219	.368	.079	.002	12	●		●	●	●	●	●	●	

HNGX-MM

catalog number	D	S	L10	Re	hm	cutting edges	KCK15	KCPK30	KC514M	KC524M	KC907M	KC914M	KC917M	KC924M	KY3500
HNGX5351MM	.638	.219	.368	.016	.004	12			●		●	●	●		
HNGX5355MM	.638	.219	.368	.079	.004	12	●				●	●	●		
HNGX5358MM	.638	.219	.368	.118	.004	12			●		●	●	●		

HNGX-MCI

catalog number	D	S	L10	Re	hm	cutting edges	KCK15	KCPK30	KC514M	KC524M	KC907M	KC914M	KC917M	KC924M	KY3500
HNGX090530MCI	.638	.219	.368	.118	.004	12			●		●	●	●		

HNGX-MH

catalog number	D	S	L10	Re	hm	cutting edges	KCK15	KCPK30	KC514M	KC524M	KC907M	KC914M	KC917M	KC924M	KY3500
HNGX5352MH	.638	.219	.368	.032	.002	12	●	●	●		●	●	●	●	

■ Recommended Starting Speeds [SFM]

Material Group		KCK15			KCPK30			KC514M			KC524M			KC907M		
P	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
M	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
K	1	1660	1510	1340	1160	1050	940	1570	1150	830	1470	1050	750	1600	1190	1000
	2	1310	1170	1090	920	830	760	1380	920	680	1280	820	620	1260	980	820
	3	1100	980	900	770	690	640	1100	850	660	980	730	520	980	820	660
N	1-2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
S	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
H	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Material Group		KC914M			KC917M			KC924M			KY3500			
P	1	—	—	—	—	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—	—	—	—	—	—	—
	5	—	—	—	—	—	—	—	—	—	—	—	—	—
	6	—	—	—	—	—	—	—	—	—	—	—	—	—
M	1	—	—	—	—	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—	—
K	1	1370	1180	980	1180	980	780	1150	900	660	3170	2880	2560	
	2	1180	980	820	980	780	660	900	720	580	2510	2240	2090	
	3	980	820	660	780	660	520	720	580	460	2110	1870	1720	
N	1-2	—	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—	—
S	1	—	—	—	—	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—	—	—	—	—	—	—
H	1	—	—	—	—	—	—	—	—	—	—	—	—	—

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

■ Recommended Starting Feeds [IPT]

Light Machining	General Purpose	Heavy Machining
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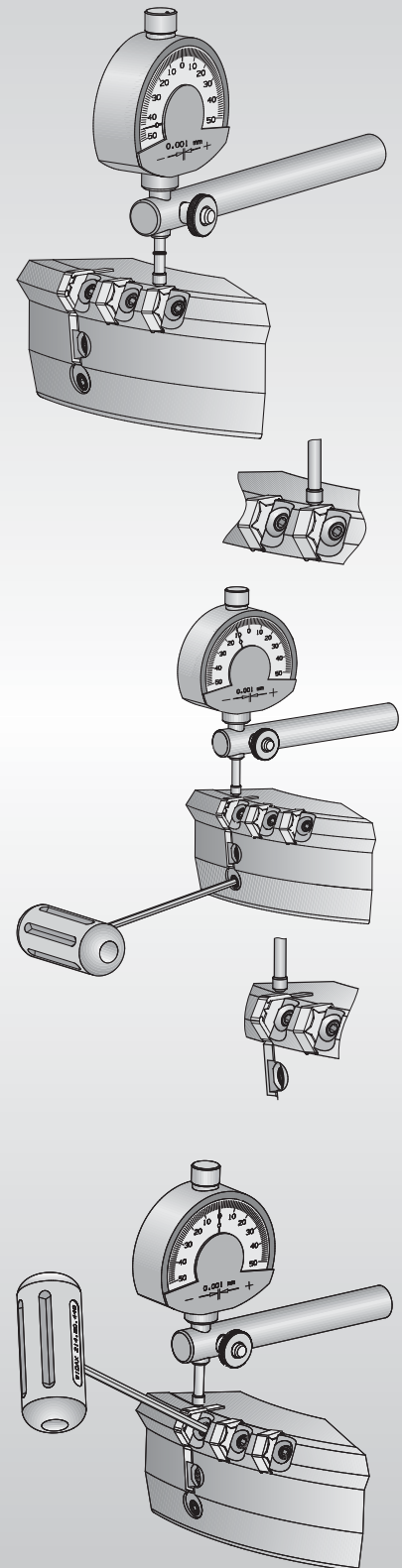
Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
...ML	.004	.007	.012	.003	.005	.009	.003	.004	.008	.003	.004	.008	.003	.004	.007	...ML
...MM	.008	.013	.018	.006	.010	.014	.005	.008	.012	.005	.008	.011	.005	.008	.011	...MM
...MR	.008	.017	.023	.006	.012	.017	.005	.011	.015	.005	.010	.014	.005	.010	.014	...MR
...MCI	.008	.017	.026	.006	.012	.019	.005	.011	.016	.005	.010	.015	.005	.010	.015	...MCI
...MH	.007	.014	.021	.005	.010	.015	.004	.009	.013	.004	.008	.012	.004	.008	.012	...MH

NOTE: Use "Light Machining" values as starting feed rate.

Insert setting procedure

This procedure is to be used on all 30° lead roughing/finishing mills using the unmarked roughing cartridge, the finishing cartridge (marked ●) and the corrected edge cartridge (marked ■). These steps must be followed when adjusting the cutters for finishing inserts.

- 1 Clean all insert pockets.
- 2 Mount all wedges and cartridges. Torque the cartridge lock wedge screw to 26 in. lbs.
- 3 Mount all inserts, making sure they are seated properly in the pocket, and torque the insert lock wedge screws to 26 in. lbs.
- 4 Torque the wedge screws for all fixed pocket inserts to 62 in. lbs.
- 5 Loosen the cartridge insert wedge screw and the cartridge lock wedge screw.
- 6 Pressing the insert into the cartridge pocket, adjust the cartridge to .008-.012" below the fixed pocket inserts.
- 7 Torque the insert lock wedge screw and the cartridge lock wedge screw to 26 in. lbs.
- 8 Adjust the axial position to .0010-.0015" above the fixed pocket inserts.
- 9 Loosen the cartridge insert lock wedge screws and then re-torque to 26 in. lbs.
- 10 Adjust the axial position to the final dimension, .0015-.0020" above the highest fixed pocket insert.
- 11 Torque the insert lock wedge screws and the cartridge lock wedge screws to 62 in. lbs.
- 12 Conduct a final check of the axial runout and position.



The NEW KSSR™ 6°

Primary Application

Kennametal's new line of KSSR 6° inserts are versatile, easy-to-use, and right- or left-hand neutral, making them ideal for automotive machining operations or any other industry that relies on transfer line manufacturing. Available in carbide and ceramic grades for applications in cast and ductile irons and alloy steels, choose KSSR 6° inserts for all your fine and coarse pitch styles.



Features and Benefits

KSSR 6° Features

- Available in metric, JIS, and inch products, diameters from 2.5–10".
- Fine and coarse pitch styles.
- Easy-to-use and to adjust with shorter setup time.
- New wiper inserts in carbide and ceramic will provide excellent surface quality.

Improved Versatility

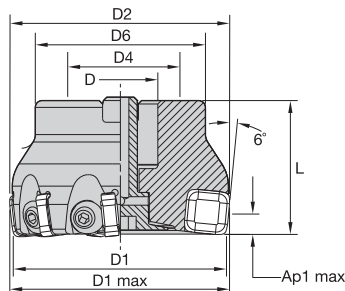
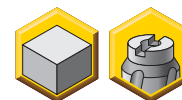
- Proven solution on the automotive segment.
- Right- and left-hand cutters, ideal for transfer lines.
- Premium grades in carbide and ceramic for applications in cast and ductile irons and alloy steels.
- Inserts are neutral and can be used for right- or left-hand cutting.



Unrivaled Benefits

- Capability: .20" maximum depth of cut.
- Excellent accuracy:
 - Radial = +/- .0001"
 - Axial = adjustable +/- .0001"
- Inserts have eight true cutting edges.

- Eight cutting edges per insert.
- Fast and easy insert indexing.
- Highest feed rates.
- CGI specialist.

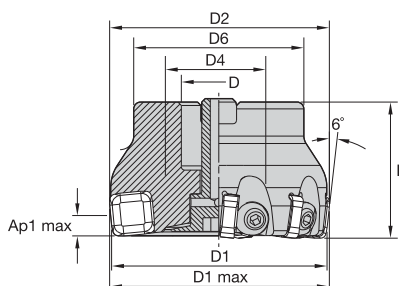
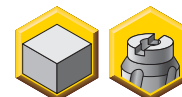


■ **KSSR 6° • Shell Mills • Right Hand**

order number	catalog number	D1	D1 max	D	D2	D4	D6	L	Ap1 max	Z	lbs	max RPM
3119002	KSSR2506SN434C3	2.500	2.579	.750	2.520	—	1.770	1.500	.200	6	1.1	7500
2476832	KSSR250SN434M3	2.500	2.579	.750	2.520	—	1.770	1.500	.200	9	1.1	7500
3119103	KSSR3008SN434C4	3.000	3.079	1.000	3.017	—	2.200	1.750	.200	8	2.0	6300
2476963	KSSR300SN434M4	3.000	3.079	1.000	3.017	—	2.200	1.750	.200	11	2.0	6300
3119104	KSSR40010SN434C5	4.000	4.079	1.250	4.014	—	2.870	1.750	.200	10	3.3	4700
2476964	KSSR400SN434M5	4.000	4.079	1.250	4.014	—	2.870	1.750	.200	15	3.1	4700
3119105	KSSR50012SN434C6	5.000	5.079	1.500	5.011	4.000	3.820	2.380	.200	12	7.5	3800
2476965	KSSR500SN434M6	5.000	5.079	1.500	5.011	—	3.820	2.380	.200	18	7.3	3800
3119106	KSSR60014SN434C8	6.000	6.079	2.000	6.010	4.000	4.880	2.380	.200	14	10.3	3100
2476966	KSSR600SN434M8	6.000	6.079	2.000	6.010	—	4.880	2.380	.200	23	10.1	3100
3119107	KSSR80020SN434C10	8.000	8.079	2.500	8.008	—	5.120	2.380	.200	20	14.1	2300
2476967	KSSR800SN434M10	8.000	8.079	2.500	8.008	4.000	5.120	2.380	.200	30	13.9	2300
3119108	KSSR100024SN434C10	10.000	10.079	2.500	10.007	—	5.120	2.380	.200	24	21.1	1900
2476968	KSSR1000SN434M10	10.000	10.079	2.500	10.007	4.000	5.120	2.380	.200	36	20.9	1900

Face Mills

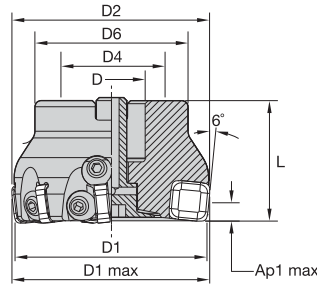
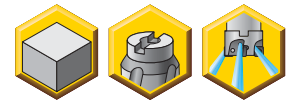
- Eight cutting edges per insert.
- Fast and easy insert indexing.
- High feed rates.
- CGI milling solution.



■ **KSSR 6° • Shell Mills • Left Hand**

order number	catalog number	D1	D1 max	D	D2	D4	D6	L	Ap1 max	Z	lbs	max RPM
3119109	KSSL2506SN434C3	2.500	2.579	.750	2.520	—	1.770	1.500	.200	6	1.10	7500
3119110	KSSL3008SN434C4	3.000	3.079	1.000	3.017	—	2.200	1.750	.200	8	1.98	6300
3119111	KSSL40010SN434C5	4.000	4.079	1.250	4.014	—	2.870	1.750	.200	10	3.30	4700
3119112	KSSL50012SN434C6	5.000	5.079	1.500	5.011	—	3.820	2.380	.200	12	7.48	3800
3119113	KSSL60014SN434C8	6.000	6.079	2.000	6.010	—	4.880	2.380	.200	14	10.34	3100
3119114	KSSL80020SN434C10	8.000	8.079	2.500	8.008	4.000	5.120	2.380	.200	20	14.08	2300
3119115	KSSL100024SN434C10	10.000	10.079	2.500	10.007	4.000	5.120	2.380	.200	24	21.12	1900

- Eight cutting edges per insert.
- New wiper inserts in carbide and ceramic.

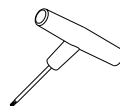


■ **KSSR 6° • Shell Mills • Adjustable Pockets • Right and Left Hand**

order number	catalog number	D1	D1 max	D	D2	D4	D6	L	Ap1 max	Z	Z ADJ	lbs	max RPM
right hand													
4005103	KSSR250SN434M3W1	2.500	2.582	.750	2.453	—	1.772	1.500	.197	9	1	1.20	7500
4005104	KSSR300SN434M4W2	3.000	3.082	1.000	2.948	—	2.205	1.750	.197	11	2	2.04	6300
4005105	KSSR400SN434M5W3	4.000	4.082	1.250	3.943	—	2.874	1.750	.197	15	3	3.27	4700
4005106	KSSR500SN434M6W3	5.000	5.082	1.500	4.940	—	3.819	2.380	.197	18	3	7.16	3800
4005107	KSSR600SN434M8W3	6.000	6.081	2.000	5.937	—	4.882	2.380	.197	23	3	10.10	3100
4005108	KSSR800SN434M10W4	8.000	8.081	2.500	7.935	4.000	5.118	2.380	.197	30	4	14.28	2300
4005109	KSSR1000SN434M10W4	10.000	10.081	2.500	9.933	4.000	5.118	2.380	.197	36	4	21.38	1900
left hand													
4005110	KSSL250SN434M3W1	2.500	2.582	.750	2.453	—	1.772	1.500	.197	9	1	1.20	7500
4005111	KSSL300SN434M4W2	3.000	3.082	1.000	2.948	—	2.205	1.750	.197	11	2	2.04	6300
4005112	KSSL400SN434M5W3	4.000	4.082	1.250	3.943	—	2.874	1.750	.197	15	3	3.27	4700
4005113	KSSL500SN434M6W3	5.000	5.082	1.500	4.940	—	3.819	2.380	.197	18	3	7.16	3800
4005114	KSSL600SN434M8W3	6.000	6.081	2.000	5.937	—	4.882	2.380	.197	23	3	10.10	3100
4005115	KSSL800SN434M10W4	8.000	8.081	2.500	7.935	4.000	5.118	2.380	.197	30	4	14.28	2300
4005116	KSSL1000SN434M10W4	10.000	10.081	2.500	9.933	4.000	5.118	2.380	.197	36	4	21.38	1900



■ **Spare Parts**



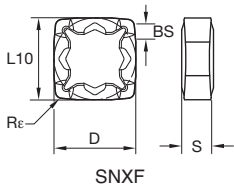
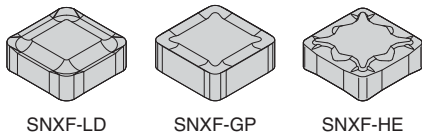
D1	clamp wedge	wedge screw	in. lbs.	wrench	coolant screw	coolant screw	coolant cap
2.500	12748358200	12748600900	62	12148044900	420.101	—	—
3.000	12748358200	12748600900	62	12148044900	420.121	—	—
4.000	12748358200	12748600900	62	12148044900	420.162	—	—
5.000	12748358200	12748600900	62	12148044900	420.201	420.201	470.232
6.000	12748358200	12748600900	62	12148044900	420.241	420.241	470.241
8.000	12748358200	12748600900	62	12148044900	—	—	470.242
10.000	12748358200	12748600900	62	12148044900	—	—	470.243

NOTE: Coolant screw and coolant cap must be ordered separately.
2466094 and 2466095 are non-stock standards.

■ Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	—	—	—	—	—	—
P3-P4	—	—	—	—	—	—
P5-P6	—	—	—	—	—	—
M1-M2	—	—	—	—	—	—
M3	—	—	—	—	—	—
K1-K2	.E..LD	KC917M	.S..GP	KC917M	.S..HE	KC524M
K3	.E..LD	KC917M	.S..GP	KC524M	.S..HE	KC524M
N1-N2	—	—	—	—	—	—
N3	—	—	—	—	—	—
S1-S2	—	—	—	—	—	—
S3	—	—	—	—	—	—
S4	—	—	—	—	—	—
H1	—	—	—	—	—	—

Indexable Inserts • KSSR • SNXF 1204...



Face Mills

- first choice
- alternate choice

P	■	□	□	□	□	□
M	■	□	□	□	□	□
K	■	●	●	●	●	●
N	■	□	□	□	□	□
S	■	□	□	□	□	□
H	■	□	□	□	□	□

■ SNXF-LD

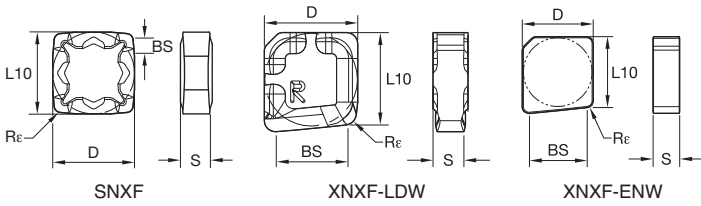
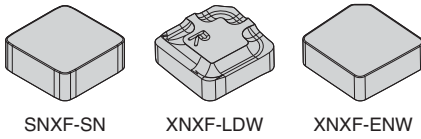
catalog number	D	S	L10	BS	Re	hm	cutting edges	KC514M	KC524M	KC914M	KC917M	KY3500
SNXF433ENLD	.500	.180	.500	—	.047	.001	8	●	●	●	●	●
SNXF433ZENLD	.500	.174	.500	—	.063	.002	8	○	○	○	○	○

■ SNXF-GP

catalog number	D	S	L10	BS	Re	hm	cutting edges	KC514M	KC524M	KC914M	KC917M	KY3500
SNXF433SNGP	.500	.184	.500	—	.047	.002	8	●	●	●	●	●
SNXF433ZNSGP	.500	.184	.500	.040	.047	.003	8	○	○	○	○	○

■ SNXF-HE

catalog number	D	S	L10	BS	Re	hm	cutting edges	KC514M	KC524M	KC914M	KC917M	KY3500
SNXF433SNHE	.500	.183	.500	—	.047	.002	8	●	●	●	●	●
SNXF433ZNSNHE	.500	.183	.500	.039	.047	.002	8	○	○	○	○	○



● first choice
○ alternate choice

P				
M				
K	●	●	●	●
N				
S				
H				

■ SNXF-SN

catalog number	D	S	L10	BS	Re	hm	cutting edges	KC907M	KC914M	KC917M	KY3500
SNXF433AMS	.500	.187	.500	—	.047	.008	8				●
SNXF433ZAMS	.500	.187	.500	.039	.047	.008	8				●

■ XNXF-LDW

catalog number	D	S	L10	BS	Re	hm	cutting edges	KC907M	KC914M	KC917M	KY3500
XNXF433ZNL	.500	.174	.500	.374	.063	.001	2	●	●	●	

■ XNXF-ENW

catalog number	D	S	L10	BS	Re	hm	cutting edges	KC907M	KC914M	KC917M	KY3500
XNXF433ZNE	.500	.188	.500	.374	.047	.008	2				●



Face Mills

■ Recommended Starting Speeds [SFM]

Material Group		KC514M			KC524M			KC907M		
P	1	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—	—	—
	5	—	—	—	—	—	—	—	—	—
	6	—	—	—	—	—	—	—	—	—
M	1	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
K	1	1570	1150	830	1470	1050	750	1600	1190	1000
	2	1380	920	680	1280	820	620	1260	980	820
	3	1100	850	660	980	730	520	980	820	660
N	1-2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
S	1	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—	—	—
H	1	—	—	—	—	—	—	—	—	—

Material Group		KC914M			KC917M			KY3500		
P	1	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—	—	—
	5	—	—	—	—	—	—	—	—	—
	6	—	—	—	—	—	—	—	—	—
M	1	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
K	1	1370	1180	980	1180	980	780	3170	2880	2560
	2	1180	980	820	980	780	660	2510	2240	2090
	3	980	820	660	780	660	520	2110	1870	1720
N	1-2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
S	1	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—	—	—
H	1	—	—	—	—	—	—	—	—	—

Face Mills

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

■ Recommended Starting Feeds [IPT]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

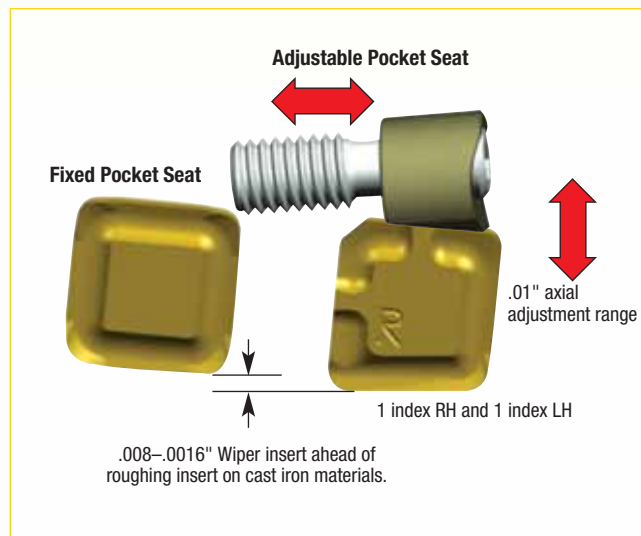
Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.E..LD	.004	.007	.012	.003	.005	.009	.002	.005	.008	.002	.004	.007	.002	.004	.007	.E..LD
.S..GP	.006	.010	.022	.005	.008	.016	.004	.007	.014	.004	.006	.013	.004	.006	.013	.S..GP
.S..HE	.006	.012	.026	.005	.009	.019	.004	.008	.017	.004	.007	.016	.004	.007	.015	.S..HE

NOTE: Use "Light Machining" values as starting feed rate.



KSSR™ 6° Adjustable Pockets

- Clamping and adjustment wedge with double thread screw.
- Eight true cutting edges.
- Wiper insert ahead of roughing insert on cast iron materials.
- Wiper insert can also be loaded into cutters with only fixed pockets.



Visit www.kennametal.com or contact your local Authorized Kennametal Distributor.

www.kennametal.com



KCMS™ Cartridge Milling System for Face, Shoulder, and Copy Milling

Primary Application

The KCMS Cartridge Milling System for face, shoulder, and copy milling offers the best-in-class flexibility for the price. The system enables roughing and finishing applications with the same tool, reducing the costly downtime associated with tool changes. The ease with which the cartridges and inserts can be changed only adds to the overall functionality of the tool and secures the KCMS Cartridge Milling System as the first choice for simplified rough and finish milling.



Features and Benefits

Features

Roughing and finishing solution with the same tool.

Easy change of cartridges with different insert styles and lead angles.

Quick cartridge stop feature.

Easy runout adjustment.

Benefits

Adjustable pockets in combination with quick cartridge stop feature.

Best-in-class flexibility for less money.

Ready to go in a minute with excellent runout and no adjustment for roughing.

For finishing operations to obtain a perfect floor finish.



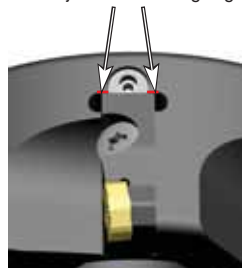
KCMS™ Key Features — Roughing and Finishing with the Same Tool



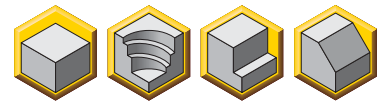
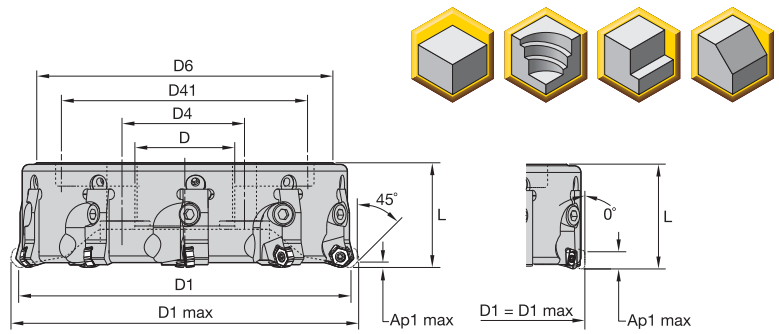
• Axial adjustment wedge.

Standard Offering
D1 = 5-12" (125-315mm)

- Quick cartridge stop.
- Ready to go in a minute with no adjustment for roughing.



- Roughing and finishing with one single tool.
- Quick cartridge stop feature.
- Easy runout adjustment.
- Easy change of cartridges with different insert styles and lead angles.



KCMS Cartridge Milling System • Shell Mills

order number	catalog number	D1	D	D4	D41	D6	L	number of cartridges	lbs
4137949	KCMS500Z06ADJ	5.000	1.500	—	—	4.252	2.480	6	8.200
4137950	KCMS500Z08ADJ	5.000	1.500	—	—	4.252	2.480	8	7.550
4137952	KCMS600Z08ADJ	6.000	2.000	—	—	5.394	2.480	8	10.610
4138283	KCMS600Z12ADJ	6.000	2.000	—	—	5.394	3.150	12	13.460
4138284	KCMS800Z10ADJ	8.000	2.500	4.000	—	7.008	2.480	10	19.280
4138285	KCMS800Z14ADJ	8.000	2.500	4.000	—	7.008	3.150	14	28.030
4138286	KCMS1000Z12ADJ	10.000	2.500	4.000	—	8.992	2.480	12	30.680
4138287	KCMS1000Z18ADJ	10.000	2.500	4.000	—	8.992	2.480	18	29.440
4138288	KCMS1200Z16ADJ	12.000	2.500	4.000	7.000	11.260	3.150	16	53.190
4138289	KCMS1200Z22ADJ	12.000	2.500	4.000	7.000	11.260	3.150	22	50.420

Spare Parts • Diameter 5.000–12.000"



cartridge screw



wedge



adjusting screw

part number	in. lbs.	part number	in. lbs.
MS1294	177	12748308500	12748600900










NOTE: Mounting screw S-391 for KCMS5800Z14ADJ (order number 4138285).









Cartridges










Face Mills

order number	catalog number	insert style	master platform *	insert screw I.D. drive size	Ap max
4160408	KCMS-AD1505CA	AD.T1505	—	T15	.551
4160406	KCMS-AP1003CA	AP.T1003	—	T8	.315
4160407	KCMS-AP1604CA	AP.T263	—	T15	.590
4160403	KCMS-ED10CA	EC10/ED10	Mill 1-10	7 IP	.393
3648533	KCMS-ED14CA	EC14/ED14	Mill 1-14	9 IP	.551
4160404	KCMS-ED18CA	EC18/ED18	Mill 1-18	15 IP	.708
4160280	KCMS-HN06CA	HN.J43/XNGJ43	Dodeka Mini	T15	.126
4160282	KCMS-HN06HDCA	HN.J43	Dodeka Mini	T15	.173
4160281	KCMS-HN06HFCA	HN.J43	Dodeka Mini	T15	.062
4160393	KCMS-HN09CA	HN.J535/XNGJ0905	Dodeka	T15	.177
4160394	KCMS-HN09HFCA	HN.J535	Dodeka	T15	.078
4160402	KCMS-MDHX10CA	MDHX1004	Fix-Perfect Finisher	T20	.028
2511343	KCMS-OF06CA	OF.T53	KSOM Mini	15 IP	.354
2245926	KCMS-OF07CA	OF.T64	KSOM	20 IP	.433
4160409	KCMS-RP1204CA	RP.T1204	KSRM Daisy	15 IP	.236
4160410	KCMS-RP1605CA	RP.T1605	KSRM Daisy	15 IP	.315
2266872	KCMS-SD12CA	SD.T43	KSSM90	15 IP	.362
4160395	KCMS-SE1203CA	SE.N42/SE.R42	—	T20	.236
4160396	KCMS-SE1204CA	SE.N43/SE.R43	—	T20	.236
2267054	KCMS-SE14CA	SE.T443/SECW443	KSSM45	15 IP	.259
4160397	KCMS-SE1504CA	SE.N53/SE.R53	—	T20	.354
4160405	KCMS-SP10CA	SP.T3125	KSSM90	9 IP	.259
4160398	KCMS-SP1203CA	SP.N42	—	T20	.354
4160399	KCMS-SP1504CA	SP.N53	—	T20	.472
4160400	KCMS-TP1603CA	TP.N32	—	T20	.472
4160401	KCMS-TP2204CA	TP.N43/TP.R43	—	T20	.708

* For all details regarding insert offering and cutting conditions, please refer to the master platforms.

									
	order number 4160402	order number 4160281	order number 4160280	order number 4160282	order number 4160394	order number 4160393	order number 2511343	order number 2245926	order number 2267054
D1	D1 max	D1 max	D1 max	D1 max	D1 max	D1 max	D1 max	D1 max	D1 max
5.000	5.000	5.433	5.307	5.157	5.665	5.354	5.256	5.354	5.472
6.000	6.000	6.811	6.685	6.535	7.043	6.732	6.634	6.732	6.850
8.000	8.000	8.386	8.260	8.110	8.618	8.307	8.209	8.307	8.425
10.000	10.000	10.354	10.228	10.079	10.587	10.276	10.177	10.276	10.394
12.000	12.000	12.913	12.787	12.638	13.146	12.835	12.736	12.835	12.953

								
	order number 4160403	order number 3648533	order number 4160404	order number 4160406	order number 4160408	order number 4160407	order number 4160405	order number 2266872
D1	D1 max	D1 max	D1 max	D1 max	D1 max	D1 max	D1 max	D1 max
5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
6.000	6.000	6.000	6.000	6.000	6.000	6.000	6.000	6.000
8.000	8.000	8.000	8.000	8.000	8.000	8.000	8.000	8.000
10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000
12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000

									
	order number 4160409	order number 4160410	order number 4160395	order number 4160396	order number 4160397	order number 4160398	order number 4160399	order number 4160400	order number 4160401
D1	D1 max	D1 max	D1 max	D1 max	D1 max	D1 max	D1 max	D1 max	D1 max
5.000	5.000	5.000	5.472	5.472	5.630	5.181	5.244	5.000	5.000
6.000	6.000	6.000	6.850	6.850	7.008	6.559	6.622	6.000	6.000
8.000	8.000	8.000	8.425	8.425	8.583	8.134	8.197	8.000	8.000
10.000	10.000	10.000	10.393	10.393	10.551	10.102	10.165	10.000	10.000
12.000	12.000	12.000	12.953	12.953	13.110	12.661	12.724	12.000	12.000

NOTE: Please order KCMS cutter bodies and cartridges separately.

KCMS-RN1204CA: Cartridge for Rodeka™, IC12 with 12 cutting edge indexes.

KCMS-WO0905CA: Cartridge for KenFeed 2X, High-Feed platform with 6 effective cutting edges per insert.

Face Mills

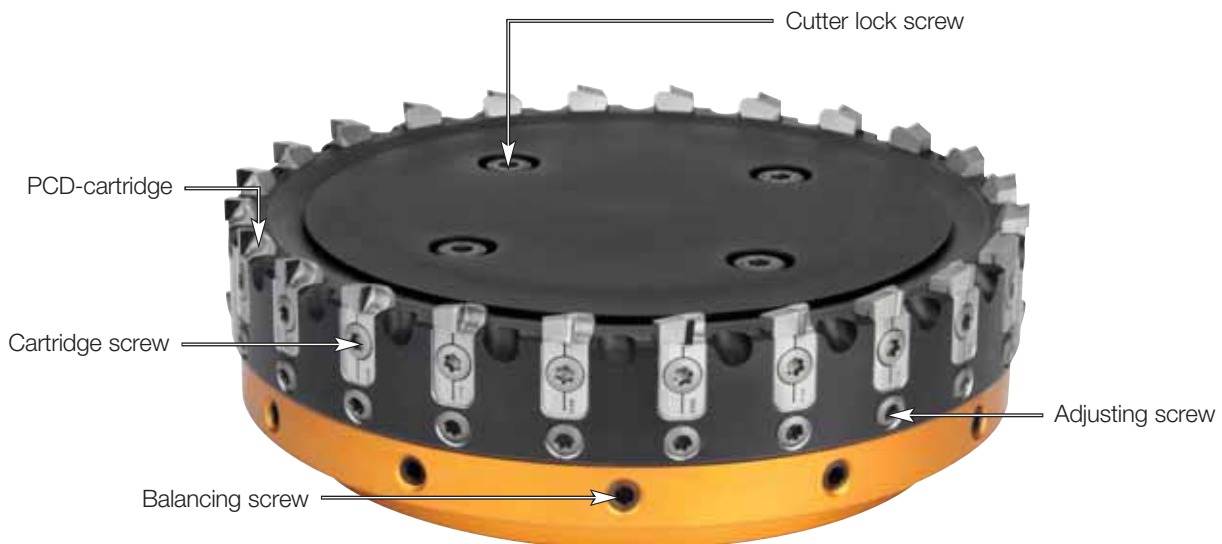
KSCM™ AluMill™

Primary Application

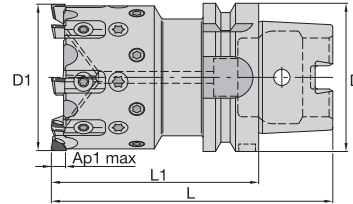
The KSCM AluMill face milling program is specifically engineered to deliver best-in-class performance in high-volume aluminum machining operations. Runs at higher speeds with no chatter while still easy to adjust. The new PCD KD1420™ grade provides long tool life, and with the Kennametal Blue Box™ program for reconditioning worn cartridges, you can reduce your inventory costs as well!

Features and Benefits

- Anti-vibration cutter design.
- Best rigidity for high feed rates.
- Unique dovetail wedge clamping design.
- No radial movement of cartridges.
- Centrifugal force protection cartridge design.
- Integrated chip gash into cartridge.
- Quick setup and easy adjust concept.
- Flexible cartridge configuration.
- No burr cartridges for fine finishing.
- Blue Box service.



- Productivity booster in aluminum face milling.
- Rough and finish in one operation.
- Precision balanceable cutter bodies produce mirror-finish surfaces.



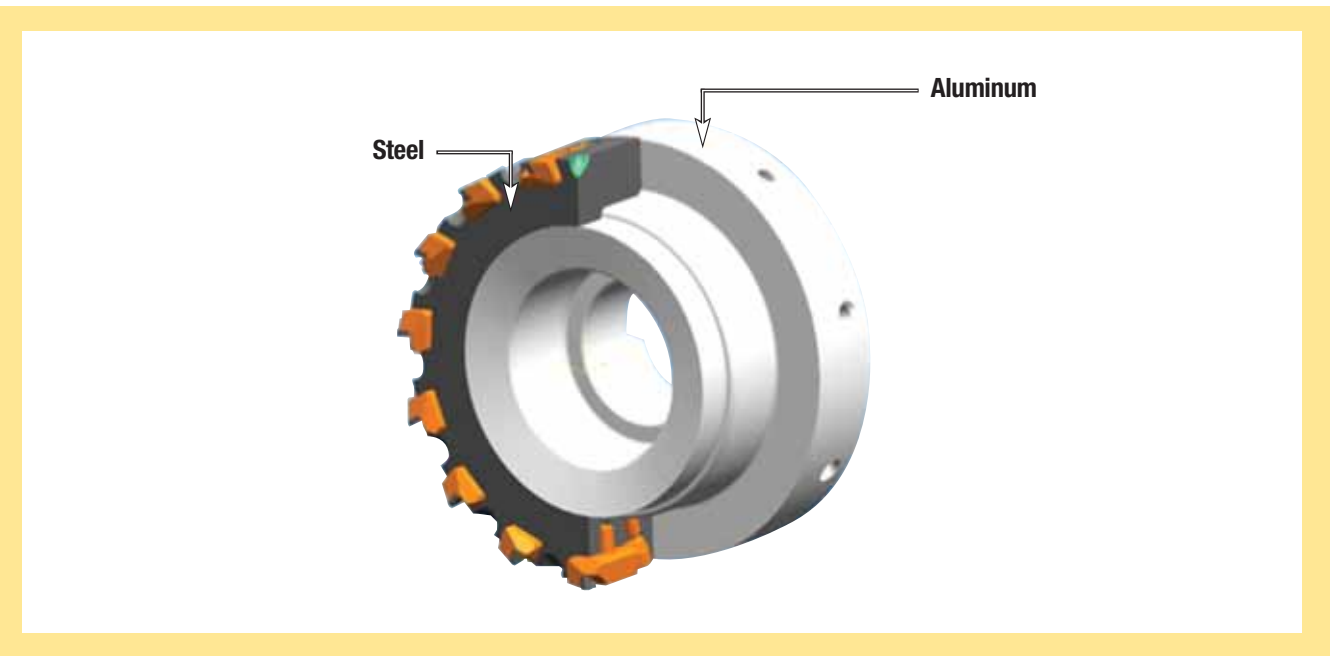
■ **KSCM AluMill • Monoblock HSK63A**

order number	catalog number	CSMS system size	D1	D	L	L1	Z	Z ADJ	lbs	max RPM
2982053	KSCM63R08CAH63A090U	HSK63A	2.500	2.480	5.000	3.750	8	8	4.3	37900

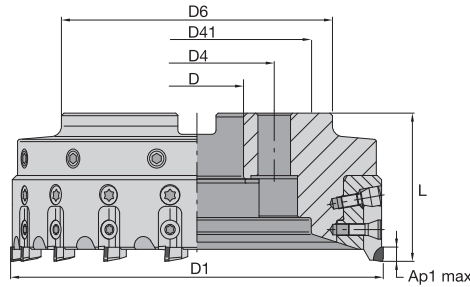
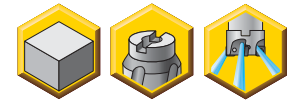
■ **Spare Parts**

D1	insert screw	insert screw	drive bit	flat point socket set screw
2.500	193.464	193.465	170.279	193.461

NOTE: Ap1 max is dependent on the cartridge configuration; see the values listed under the cartridges.



- Productivity booster in aluminum face milling.
- Rough and finish in one operation.
- Precision balanceable cutter bodies produce mirror-finish surfaces.



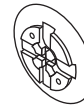
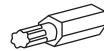
■ **KSCM AluMill • Shell Mills**

order number	catalog number	D1	D	D4	D41	D6	L	Z	Z ADJ	lbs	max RPM
2982054	KSCM80R10CAB27U	3.000	1.000	—	—	2.461	2.000	10	10	2.7	29800
2982055	KSCM100R12CAB32U	4.000	1.500	—	—	3.823	2.000	12	12	3.5	23800
2982056	KSCM125R16CAB40U	5.000	1.500	—	—	3.772	2.380	16	16	5.5	19100
2982057	KSCM160R18CAB40U	6.000	2.000	—	—	5.197	2.380	18	18	8.0	14900
2982058	KSCM200R24CAB60U	8.000	2.500	4.000	—	6.654	2.380	24	24	11.6	11900
2982059	KSCM250R30CAB60U	10.000	2.500	4.000	—	6.516	2.380	30	30	17.3	9500
2982060	KSCM315R36CAB60U	12.000	2.500	4.000	7.000	10.236	3.150	36	36	31.0	7500

NOTE: For Ap1 max values, please see O117.

■ **Spare Parts**

Face Mills

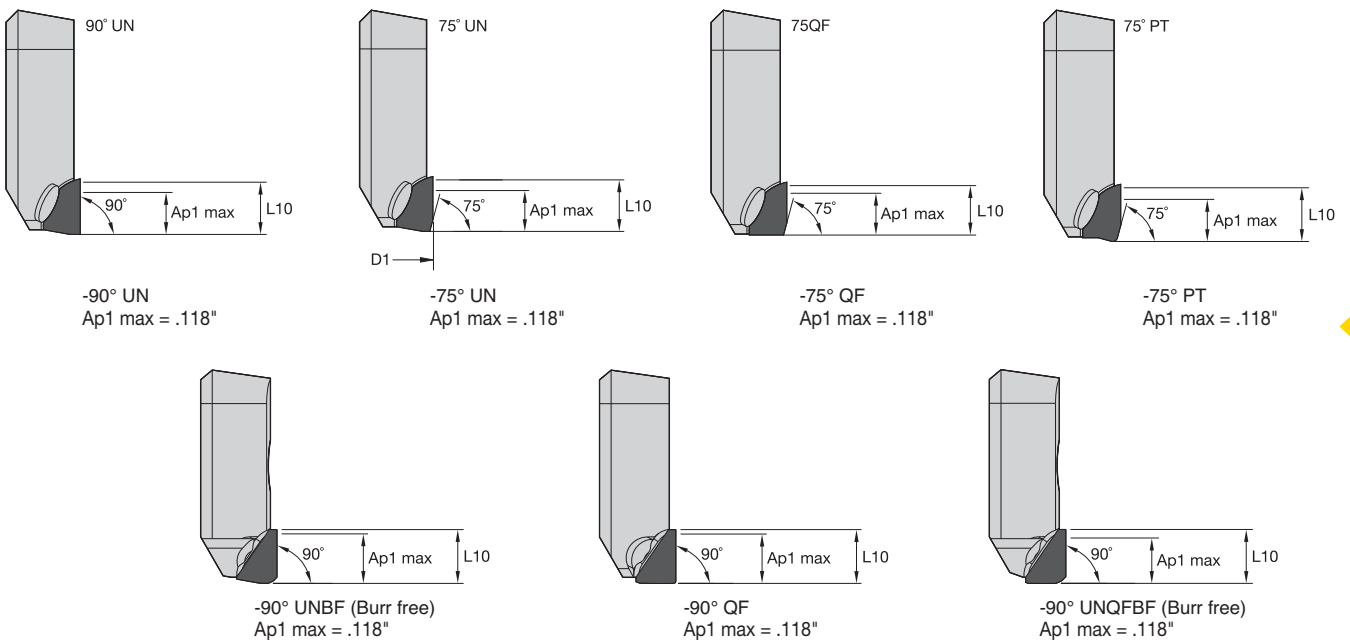


D1	cartridge screw	drive bit	coolant lock screw	coolant shower plate	balancing screw
3.000	193.465	170.279	420.020	—	193.460
4.000	193.465	170.279	420.041	—	193.461
5.000	193.465	170.279	420.042	—	193.462
6.000	193.465	170.279	420.043	470.370	193.462
8.000	193.465	170.279	—	470.371	193.462
10.000	193.465	170.279	—	470.372	193.463
12.000	193.465	170.279	—	470.373	193.463

NOTE: All cutters are bimetallic except the 3.00" diameter.
 Dependent on the cartridge configuration; see the values listed under the cartridges.
 Please order KSCM cutter bodies and cartridges separately.

Cartridge Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	—	—	—	—	—	—
P3-P4	—	—	—	—	—	—
P5-P6	—	—	—	—	—	—
M1-M2	—	—	—	—	—	—
M3	—	—	—	—	—	—
K1-K2	—	—	—	—	—	—
K3	—	—	—	—	—	—
N1-N2	..CA90..	KD1420	..CA90..	KD1420	..CA90..	KD1420
N3	..CA90..	KD1420	..CA90..	KD1420	..CA90..	KD1420
S1-S2	—	—	—	—	—	—
S3	—	—	—	—	—	—
S4	—	—	—	—	—	—
H1	—	—	—	—	—	—

Cartridges • KSCM AluMill


Face Mills

cartridge combination	ratio	max ap	surface quality
UN	—	.118	Rz 2 - Rz 4
UN + QF	3:1	.118	Rz 1,5 - Rz 2,5
PT + UN	X:1	.118	Rz 3,2 - Rz 17

- first choice
- alternate choice

P	■
M	■
K	■
N	●
S	■
H	■

order number	catalog number	KRI ANSI	L10	hm	KD1420
2884919	KSCMCA75PT	15	.240	.0008	●
2884918	KSCMCA75QF	15	.240	.0008	●
2884902	KSCMCA75UN	15	.240	.0008	●
2884915	KSCMCA90UN	0	.240	.0008	●
4170410	KSCMCA90UNBF	0	.242	.0008	●
4170408	KSCMCA90QF	0	.244	.0008	●
4170411	KSCMCA90QF	0	.244	.0008	●

NOTE: KSCMA: Blanks without PCD segment, if cutter is not fully loaded with cartridges.
 For low horsepower machines and cutter configurations with less number of effective teeth.

■ Recommended Starting Speeds [SFM]

Material Group		KD1420		
P	1	—	—	—
	2	—	—	—
	3	—	—	—
	4	—	—	—
	5	—	—	—
	6	—	—	—
M	1	—	—	—
	2	—	—	—
	3	—	—	—
K	1	—	—	—
	2	—	—	—
	3	—	—	—
N	1-2	15780	13800	11760
	3	6300	5880	5520
S	1	—	—	—
	2	—	—	—
	3	—	—	—
	4	—	—	—
H	1	—	—	—
	2	—	—	—
	3	—	—	—

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

■ Recommended Starting Feeds [IPT]

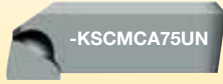
Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)														Insert Geometry	
	10%			20%			30%			40%			50-100%			
..CA75../..CA90..	.003	.007	.011	.003	.005	.008	.002	.004	.007	.002	.004	.006	.002	.004	.006	..CA75../..CA90..

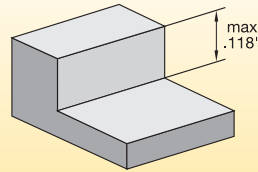
NOTE: Use "Light Machining" values as starting feed rate.

Face Mills

Tool Configuration • Universal Cartridge

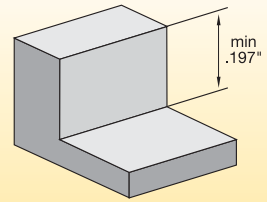


Face milling cutter fitted entirely with universal cartridges



Depth of Cut:
max .118"

Surface Quality:
Rz2 - Rz4



Contouring:
PCD cutting edge length = .197"

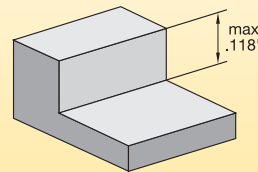
Tool Configuration • Universal Cartridge



+ Finishing Cartridge

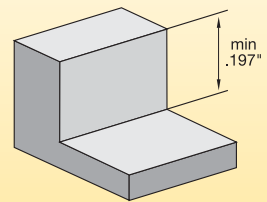


Fitting the face milling cutter with universal and finishing cartridges in a ratio of approximately 3:1



Depth of Cut:
max .118"

Surface Quality:
Rz1,5 - Rz2,5

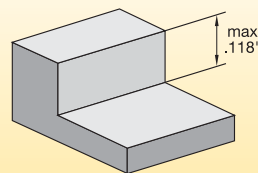


Contouring:
PCD cutting edge length = .197"

Tool Configuration • Edge Cartridge

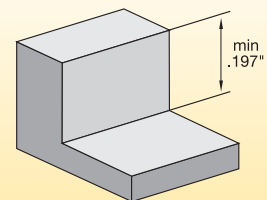


Fitting the face milling cutter entirely with edge cartridges



Depth of Cut:
max .118"

Surface Quality:
Rz2 - Rz4

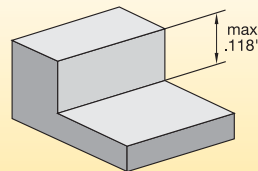


Contouring:
PCD cutting edge length = .197"

Tool Configuration • Cartridge for Defined Surfaces

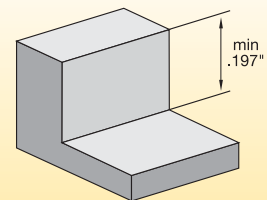


Fitting the face milling cutter entirely with cartridges for defined surfaces



Depth of Cut:
max .118"

Surface Quality:
Rz3,2 - Rz17



Contouring:
PCD cutting edge length = .197"



■ Tool Configuration • Universal Cartridge, 75° Face Milling



1. Insert cartridges into the body.
2. Screw in the clamping screws (RH), and tighten to 88 in. lbs.
3. Screw in the adjusting screws (RH), and tighten to 26 in. lbs.
4. Determine which cartridge is in the highest axial position.
5. By turning the adjusting screws to the right, adjust the remaining cartridges for even running. Max permitted runout error 3 μ m.

■ Tool Configuration • Universal Cartridge + Finishing Cartridge (Ratio Approx. 3:1), 75°



1. Insert universal cartridges at ratio of approximately 4:1 in the body. Make sure they are evenly distributed!
2. Screw in the clamping screws (RH), and tighten to 88 in. lbs.
3. Screw in the adjusting screws (RH), and tighten to 26 in. lbs.
4. Determine which cartridge is in the highest axial position.
5. By turning the adjusting screws to the right, adjust the remaining cartridges for even running. Max permitted runout error 3 μ m.
6. Insert finishing cartridges as described in Steps 1–5 but with an axial advance of .0003" + .0008". Max permitted runout error of 3 μ m with finishing cartridges.

■ Tool Configuration • Edge Cartridges, 90° Shoulder Milling



1. Insert cartridges into the body.
2. Screw in the clamping screws (RH), and tighten to 88 in. lbs.
3. Screw in the adjusting screws (RH), and tighten to 26 in. lbs.
4. Determine which cartridge is in the highest axial position.
5. By turning the adjusting screws to the right, adjust the remaining cartridges for even running. Max permitted runout error 3 μ m.

■ Tool Configuration • Cartridge for Defined Surface, 75°



1. Insert cartridges into the body.
2. Screw in the clamping screws (RH), and tighten to 7 ft. lbs.
3. Screw in the adjusting screws (RH), and tighten to 26 in. lbs.



4. Determine which cartridge is in the highest axial position.
5. By turning the adjusting screws to the right, adjust the remaining cartridges for even running. Max permitted runout error 3 μ m.



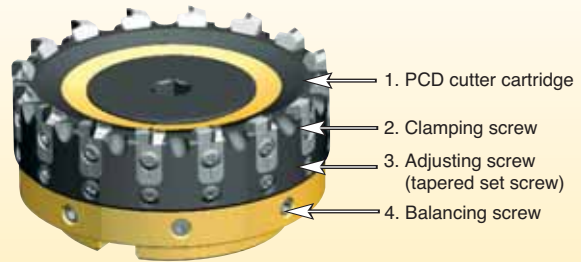
NOTE:

The process must be repeated when the cartridges are changed. To dismantle, remove the adjusting element (Part 3), clamping screw (Part 2), and cartridge (Part 1).

■ Instruction for Mounting the Face Milling Cutter on the Appropriate Toolholder

User Information:

- Tools conform to EN ISO 15641.
- Absolute cleanliness must be observed when assembling the face milling cutter.
- An optimum cutting result will only be achieved by adjusting and balancing the complete tool system (face milling cutter + toolholder).
- Balancing is achieved with the aid of the balancing screws. Quality class G2.5 DIN-ISO 1940.
- The balancing screw must not protrude above the body.
- The balancing and adjustment screws have an adhesive coating according to DIN 267, Part 28. If, after repeated use, the coating is no longer adequate to secure the screws, the screws must be replaced.
- The maximum permitted operating speed (quoted on the tool) must not be exceeded.
- The maximum permitted operating speed is only permitted with clamping systems manufactured by Kennametal in accordance with DIN 69982 Form B with enlarged plane bearing surface. Reduce the operating speed if clamping systems with increased projection length or made by other manufacturers are used.
- Tools and fittings are to be serviced and repaired by Kennametal.
- Screws sealed with lacquer have been adjusted by the manufacturer, and must not be moved.

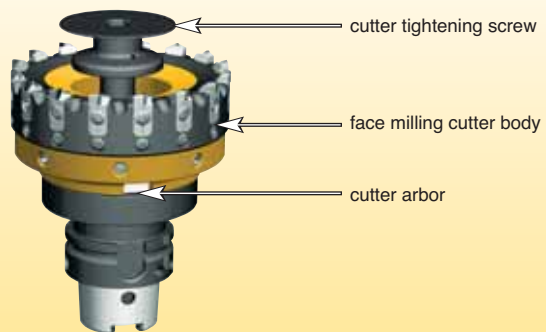


■ Instructions for Fitting the Cutter Cartridge • Tool Construction

When mounting the face milling cutter (dimensions similar to DIN 8030 Form B), place the body of the face milling cutter on the arbor. Ensure that the contact faces are clean. Screw in the cutter fastening bolt (RH) and tighten with the appropriate torque.

Tightening torque for the central cutter tightening screw:

- M20** (adapter diameter 40): **184 ft. lbs.**
- M16** (adapter diameter 32): **110 ft. lbs.**
- M12** (adapter diameter 27): **59 ft. lbs.**



■ Mounting the Face Milling Cutter (Dimensions Similar to DIN 8030 Form C)

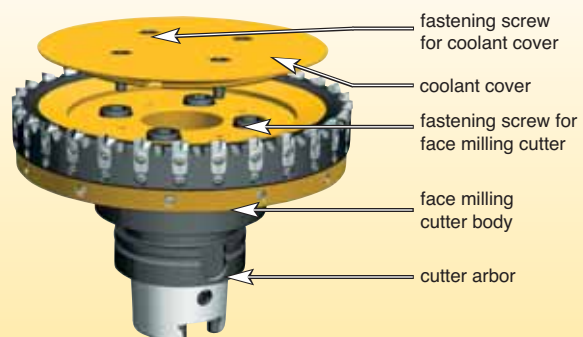
Place the body of the face milling cutter on the arbor. Ensure that the contact faces are clean. Screw in the fastening bolt (RH) and tighten with the appropriate torque. Put the aluminum coolant cover in place and fasten with the Torx fastening screws.

Tightening torque for the face milling cutter fastening screws:

- M20:** 184 ft. lbs.
- M16:** 81 ft. lbs.
- M12:** 36 ft. lbs.

Tightening torque for the coolant cover fastening screws:

- M8:** 13 ft. lbs.



KSCM AluMill Reconditioning Service



New Supply

On request, the face mill will be delivered with cartridges already mounted and adjusted.



Service Level • PCD Insert Reconditioning

Reconditioning of PCD cartridges up to three times.

- Tool diameter and length remain constant.



Face mill will be delivered with exchanged cartridges already mounted, adjusted, and balanced.



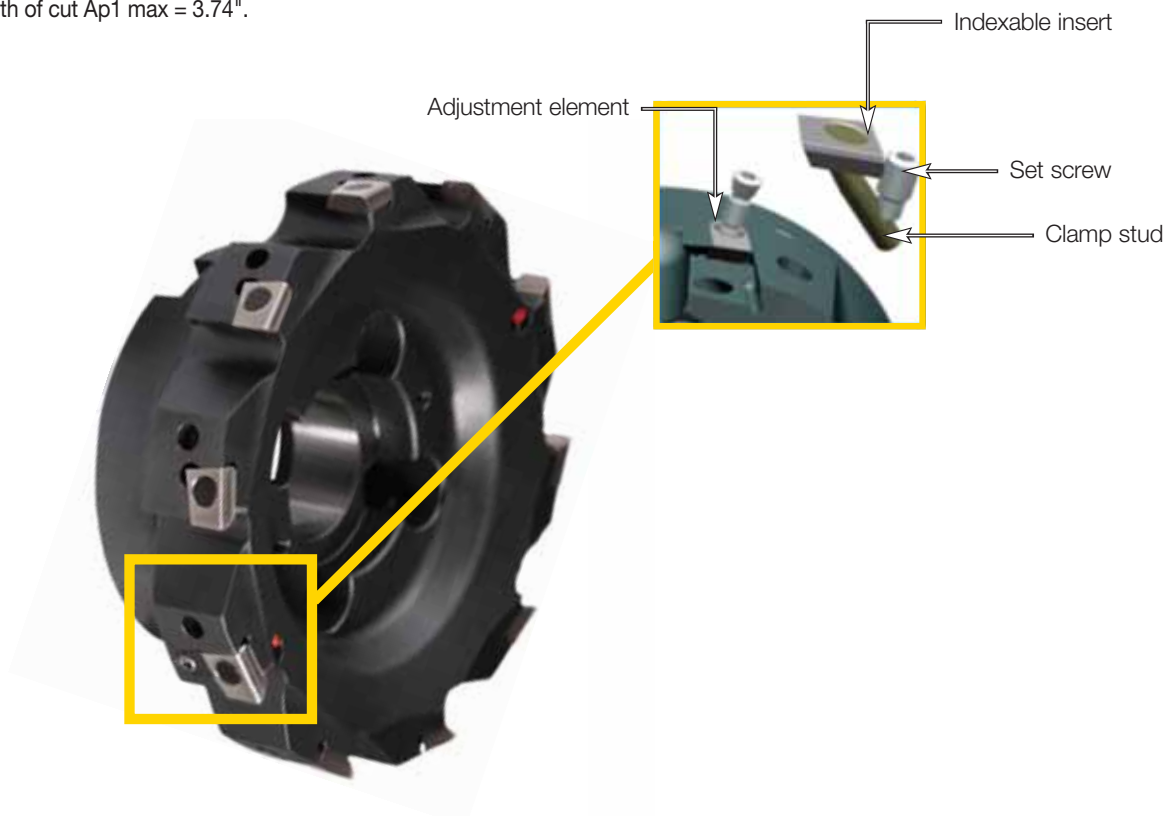
Fix-Perfect™ 0° Aluminum

Primary Application

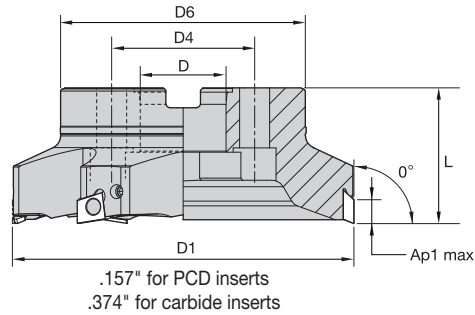
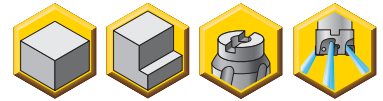
The Fix-Perfect 0° is excellent in machining aluminum and non-ferrous materials. 24° positive rake provides free cutting action while producing superior finishes and flatness.

Features and Benefits

- True 0° shoulder achievable.
- Roughing and finishing in one tool.
- Full safety first insert clamping.
- Easy adjustable pocket seats for fine finishing (PM, HPM, HSM Line).
- Achievable floor surface quality: Ra = 0.5.
- Real soft cutting action.
- Axial depth of cut Ap1 max = 3.74".



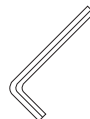
- Excellent for milling aluminum and non-ferrous materials.
- Good choice for thin-wall or poorly fixtured workpieces.
- 24° positive rake enables free cutting action.
- Produces excellent finish and flatness.
- Maximum speed is 6,500 SFM.



■ Fix-Perfect • Shell Mills • M Line • Fixed Pockets

order number	catalog number	D1	D	D4	D6	L	Ap1 max	Z	lbs	max RPM
2235052	50A03RP90BG15CUM	2.000	.750	—	1.750	1.570	.374	3	.90	12530
2235053	63A03RP90BG15CUM	2.500	.750	—	1.750	1.570	.374	3	1.10	10030
2235054	80A03RP90BG15CUM	3.000	1.000	—	2.189	1.750	.374	3	1.60	8350
2235055	100B04RP90BG15CUM	4.000	1.250	—	2.880	1.750	.374	4	2.80	6270
2235056	125B05RP90BG15CUM	5.000	1.500	—	3.810	2.380	.374	5	5.40	5010
2235057	160B06RP90BG15CUM	6.000	2.000	—	4.880	2.380	.374	6	8.50	4180

■ Spare Parts



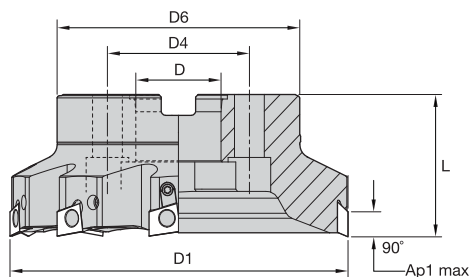
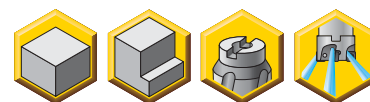
D1	clamp stud	set screw	hex wrench	in. lbs.	socket-head cap screw
2.000	410.083	420.060	170.003	45	S446
2.500	410.083	420.060	170.003	45	S445
3.000	410.083	420.060	170.003	45	S458
4.000	410.083	420.060	170.003	45	—
5.000	410.083	420.060	170.003	45	—
6.000	410.083	420.060	170.003	45	—



NOTE: Please order spare parts separately.

Torque wrench (KTW45) and 3mm hex bit (69709922164) may be purchased separately to ensure proper torque setting.

- Produces excellent surface finish and flatness.
- High-speed machining.

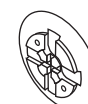


■ **Fix-Perfect • Shell Mills • PM Line • Fixed and Adjustable Pockets**

order number	catalog number	D1	D	D4	D6	L	Ap1 max	Z	Z ADJ	lbs	max RPM
1803174	40A02RP90BG15CUPM	1.500	.500	—	1.250	1.570	.375	2	0	.49	33418
1803175	50A03RP90BG15CUPM	2.000	.750	—	1.750	1.570	.375	3	0	.84	25063
1803177	63A04RP90BG15C1WUPM	2.500	.750	—	1.750	1.570	.375	4	1	1.17	22750
1803178	80A05RP90BG15C1WUPM	3.000	1.000	—	2.032	1.750	.375	5	1	1.85	16710
1805715	80A06RP90BG15C2WUPM	3.000	1.000	—	2.032	1.750	.375	6	2	1.85	16710
1803179	100B06RP90BG15C2WUPM	4.000	1.250	—	2.724	1.750	.375	6	2	3.22	12500
1805716	100B08RP90BG15C2WUPM	4.000	1.250	—	2.724	1.750	.375	8	2	3.22	12500
1806466	160B10RP90BG15C2WUPM	6.000	2.000	—	4.880	2.375	.394	10	2	9.26	8500
1806467	200C12RP90BG15C3WUPM	8.000	2.500	4.000	5.118	2.375	.375	12	3	13.03	6500

■ **Spare Parts**

Face Mills



D1	Torx wrench	clamp stud	set screw	hex wrench	in. lbs.	socket-head cap screw	coolant lock screw	coolant lock screw	coolant shower plate
1.500	KT15	410.083	420.060	170.003	45	S425	420.081	—	—
2.000	KT15	410.083	420.060	170.003	45	S446	420.101	—	—
2.500	KT15	410.083	420.060	170.003	45	S445	420.101	—	—
3.000	KT15	410.083	420.060	170.003	45	S458	420.121	—	—
4.000	KT15	410.083	420.060	170.003	45	—	420.161	—	—
6.000	KT15	410.083	420.060	170.003	45	—	—	420.241	470.241
8.000	KT15	410.083	420.060	170.003	45	—	—	—	470.242

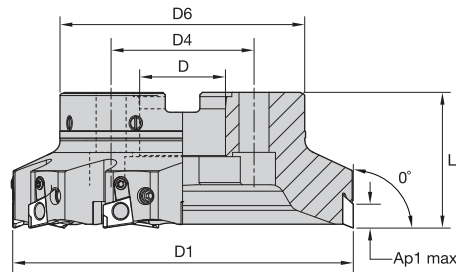
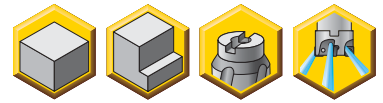
NOTE: Please order spare parts separately.

For all diameters: adjusting element screw **193.337**.

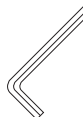
If the adjusting element needs to be replaced, please return the cutter to the Kennametal Service Center.

Torque wrench (KTW45) and 3mm hex bit (69709922164) may be purchased separately to ensure proper torque setting.

- Produces excellent surface finish and flatness.
- High-speed machining.


Fix-Perfect • Shell Mills • HPM Line • All Pockets Adjustable

order number	catalog number	D1	D	D4	D6	L	Ap1 max	Z	Z ADJ	lbs	max RPM
1805720	63A04RP90BG15C4WUHPM	2.500	.750	—	1.750	1.570	.375	4	4	1.17	20051
1805745	80A05RP90BG15C5WUHPM	3.000	1.000	—	2.190	1.750	.375	5	5	1.83	16710
1805746	100B06RP90BG15C6WUHPM	4.000	1.250	—	2.911	1.750	.375	6	6	1.30	12500

Spare Parts


D1	adjusting element screw	Torx wrench	clamp stud	set screw	hex wrench	in. lbs.	socket-head cap screw	coolant lock screw
2.500	193.326	KT15	410.083	420.060	170.003	45	S445	420.101
3.000	193.326	KT15	410.083	420.060	170.003	45	S458	420.121
4.000	193.326	KT15	410.083	420.060	170.003	45	—	420.161

NOTE: Please order spare parts separately.

For all diameters: adjusting element screw **193.326**.

If the adjusting element needs to be replaced, please return the cutter to the Kennametal Service Center.

Cutters with 4" have an aluminum body.

Torque wrench (KTW45) and 3mm hex bit (69709922164) may be purchased separately to ensure proper torque setting.

Face Mills

■ Recommended Starting Speeds [SFM]

Material Group		K110M			KC510M			KD1410			KD1415		
P	1	—	—	—	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—	—	—	—	—	—
	5	—	—	—	—	—	—	—	—	—	—	—	—
	6	—	—	—	—	—	—	—	—	—	—	—	—
M	1	—	—	—	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—
K	1	—	—	—	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—
N	1-2	1650	1550	1475	2100	1870	1720	13150	11500	9800	13150	11500	9800
	3	1350	1200	1050	1900	1750	1600	5250	4900	4600	5250	4900	4600
S	1	—	—	—	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—	—	—	—	—	—
H	1	—	—	—	—	—	—	—	—	—	—	—	—

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

■ Recommended Starting Feeds [IPT]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

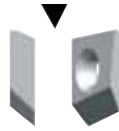
Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)														Insert Geometry	
	10%			20%			30%			40%			50-100%			
.S..LET	.003	.007	.014	.003	.005	.010	.002	.004	.009	.002	.004	.008	.002	.004	.008	.S..LET
.F..GG	.003	.007	.014	.003	.005	.010	.002	.004	.009	.002	.004	.008	.002	.004	.008	.F..GG
.E..GGT	.003	.007	.014	.003	.005	.010	.002	.004	.009	.002	.004	.008	.002	.004	.008	.E..GGT
.T..GG	.003	.007	.014	.003	.005	.010	.002	.004	.009	.002	.004	.008	.002	.004	.008	.T..GG
.T..HET	.003	.007	.014	.003	.005	.010	.002	.004	.009	.002	.004	.008	.002	.004	.008	.T..HET

NOTE: Use "Light Machining" values as starting feed rate.



Introduction to Fitting Cutting Bodies

Roughing indexable inserts
BGHX15L5PC..GG.



Finishing indexable inserts
BGHX15L5PC..GG.1W



Clean dust, grease, etc., from the insert seat, insert (1), and clamp stud (2).

PM

HPM/HSM

PM/HPM/HSM

Loosen the adjusting element (4).

Loosen the adjusting element (4).

Loosen the adjusting element (4).

1



Loosen the adjusting screw (5).

Loosen the adjusting screw (5).

Loosen the adjusting screw (5).

Insert the indexable inserts and tighten with the clamping screw (3) 44 in. lbs.

Insert the indexable inserts and pre-tighten with the clamping screw (3) 13 in. lbs.

Insert the indexable inserts and pre-tighten with the clamping screw (3) 9 in. lbs.

2



ATTENTION: Ensure that the insert is correctly positioned in the insert seat.

ATTENTION: Ensure that the insert is correctly positioned in the insert seat. Determine which cutting body is the highest on the axis.

ATTENTION: Ensure that the insert is correctly positioned in the insert seat. Determine which cutting body is the highest on the axis.

Tension the adjusting element (4) by tightening the adjusting screw (5) to the specified torque of 4.5 in. -lbs.

Extract by .0008" the insert that is axially the highest by turning the adjusting screw (5).

Adjust the finishing indexable insert(s) to the desired projection, preferably .0015" by turning the adjusting screw (5).

3



Adjust the remaining inserts to the desired runout with maximum travel of the inserts .008".

ATTENTION: Ensure that the insert is correctly positioned in the insert seat.



Adjustment element to be replaced by Kennametal Service Center only.

4

Clamp the insert by tightening the clamping screw (3) to the specified torque of 44 in. lbs.



Clamp the insert by tightening the clamping screw (3) to the specified torque of 44 in. lbs.



Chamfer Mills

Primary Application

Countersinking and external/internal chamfer milling.

Features and Benefits

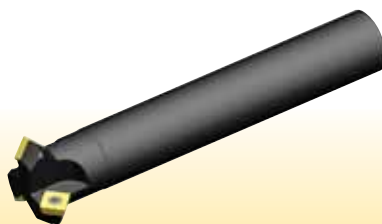
- One insert style fits into all pockets to cover 60°, 45°, and 30° chamfering.
- Soft cutting action.
- Chamfer milling front and back.



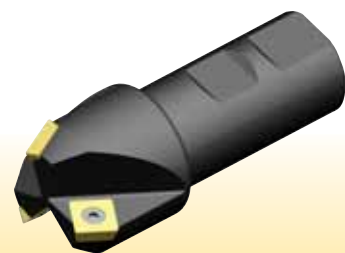
60° lead angle



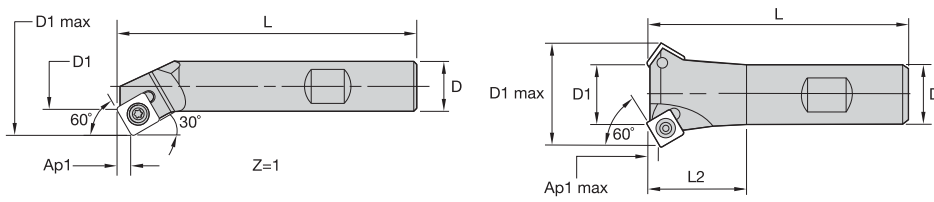
45° lead angle



30° lead angle



- Countersinking and chamfering front and back.



■ End Mills • 60° Lead

order number	catalog number	D1	D1 max	D	L	L2	Ap1 max	Z	max RPM	insert 1
1023681	KIPR046SD2660	.460	.981	.500	3.000	1.220	.136	1	11000	SDEB2.61.52
1023680	KIPR075SD2660	.750	1.271	.750	3.250	1.220	.137	2	10500	SDEB2.61.52

■ Spare Parts



insert
screw

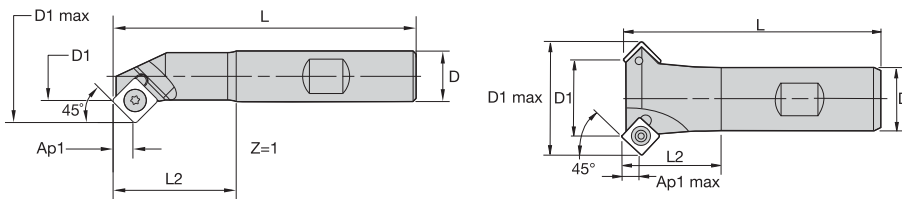


Torx
wrench

D1	insert screw	in. lbs.	Torx wrench
.460	MS1369	10	DT8
.750	MS1369	10	DT8

Face Mills

- Countersinking and chamfering front and back.



■ End Mills • 45° Lead

order number	catalog number	D1	D1 max	D	L	L2	Ap1 max	Z	max RPM	insert 1
1023679	KIPR046SD2645	.460	.897	.500	3.000	1.220	.196	1	11000	SDEB2.61.52
1023676	KIPR070SD2645	.700	1.137	.750	3.250	1.220	.195	2	10500	SDEB2.61.52
1023677	KIPR095SD2645	.950	1.387	.750	3.250	1.220	.196	2	10000	SDEB2.61.52
1023678	KIPR120SD2645	1.200	1.660	.750	3.250	1.220	.195	2	9750	SDEB2.61.52

■ Spare Parts



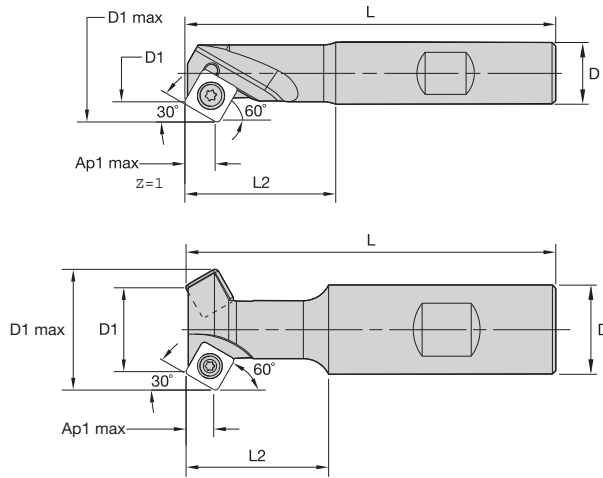
insert
screw



Torx
wrench

D1	insert screw	in. lbs.	Torx wrench
.460	MS1369	10	DT8
.700	MS1369	10	DT8
.950	MS1369	10	DT8
1.200	MS1369	10	DT8

- Countersinking and chamfering front and back.



■ End Mills • 30° Lead

order number	catalog number	D1	D1 max	D	L	L2	Ap1 max	Z	max RPM	insert 1
1023675	KIPR046SD2630	.460	.787	.500	3.000	1.220	.244	1	11000	SDEB2.61.52
1023674	KIPR075SD2630	.750	1.077	.750	3.250	1.220	.245	2	10500	SDEB2.61.52

■ Spare Parts



insert
screw



Torx
wrench

D1	insert screw	in. lbs.	Torx wrench
.460	MS1405	10	DT8
.750	MS1369	10	DT8



■ Insert Selection Guide

Chamfer Mills • 60°

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	SDEB	KC725M	SDEB	KC725M	SDEB	KCPK30
P3-P4	SDEB	KC725M	SDEB	KCPK30	SDEB	KCPK30
P5-P6	SDEB	KCPK30	SDEB	KCPK30	SDEB	KCPK30
M1-M2	SDEB	KC725M	SDEB	KC725M	SDEB	KCPK30
M3	SDEB	KC725M	SDEB	KCPK30	SDEB	KCPK30
K1-K2	SDEB	KC520M	SDEB	KC520M	SDEB	KCPK30
K3	SDEB	KC520M	SDEB	KCPK30	SDEB	KCPK30
N1-N2	—	—	—	—	—	—
N3	—	—	—	—	—	—
S1-S2	SDEB	KC725M	SDEB	KC725M	SDEB	KC725M
S3	SDEB	KC725M	SDEB	KC725M	SDEB	KC725M
S4	SDEB	KC725M	SDEB	KC725M	SDEB	KC725M
H1	—	—	—	—	—	—

Chamfer Mills • 30°

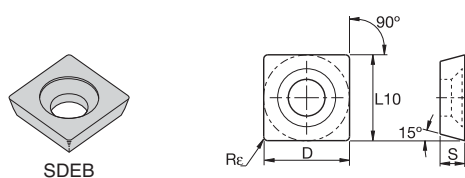
Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	SDEB	KC725M	SDEB	KC725M	SDEB	KCPK30
P3-P4	SDEB	KC725M	SDEB	KCPK30	SDEB	KCPK30
P5-P6	SDEB	KCPK30	SDEB	KCPK30	SDEB	KCPK30
M1-M2	SDEB	KC725M	SDEB	KC725M	SDEB	KCPK30
M3	SDEB	KC725M	SDEB	KCPK30	SDEB	KCPK30
K1-K2	SDEB	KC520M	SDEB	KC520M	SDEB	KCPK30
K3	SDEB	KC520M	SDEB	KCPK30	SDEB	KCPK30
N1-N2	—	—	—	—	—	—
N3	—	—	—	—	—	—
S1-S2	SDEB	KC725M	SDEB	KC725M	SDEB	KC725M
S3	SDEB	KC725M	SDEB	KC725M	SDEB	KC725M
S4	SDEB	KC725M	SDEB	KC725M	SDEB	KC725M
H1	—	—	—	—	—	—

Chamfer Mills • 45°

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	SDEB	KC725M	SDEB	KC725M	SDEB	KCPK30
P3-P4	SDEB	KC725M	SDEB	KCPK30	SDEB	KCPK30
P5-P6	SDEB	KCPK30	SDEB	KCPK30	SDEB	KCPK30
M1-M2	SDEB	KC725M	SDEB	KC725M	SDEB	KCPK30
M3	SDEB	KC725M	SDEB	KCPK30	SDEB	KCPK30
K1-K2	SDEB	KC520M	SDEB	KC520M	SDEB	KCPK30
K3	SDEB	KC520M	SDEB	KCPK30	SDEB	KCPK30
N1-N2	—	—	—	—	—	—
N3	—	—	—	—	—	—
S1-S2	SDEB	KC725M	SDEB	KC725M	SDEB	KC725M
S3	SDEB	KC725M	SDEB	KC725M	SDEB	KC725M
S4	SDEB	KC725M	SDEB	KC725M	SDEB	KC725M
H1	—	—	—	—	—	—

Face Mills

Indexable Inserts



- first choice
- alternate choice

P	●	○	○
M	●	○	○
K	●	○	○
N	○	○	○
S	●	○	○
H	○	○	○

■ SDEB

catalog number	D	S	L10	Re	hm	cutting edges	KC520M	KC725M	KCPK30
SDEB26150	.327	.094	.327	.004	.002	4	●	●	○
SDEB26151	.327	.094	.327	.016	.003	4	●	●	○
SDEB26152	.327	.094	.327	.031	.002	4	●	●	○

Recommended Starting Speeds [SFM]

Material Group		KC520M			KC725M			KCPK30		
P	1	—	—	—	1030	900	840	1780	1560	1450
	2	—	—	—	860	760	640	1100	1000	900
	3	—	—	—	790	670	550	1000	900	820
	4	—	—	—	710	590	470	740	690	620
	5	—	—	—	590	530	470	1020	910	830
	6	—	—	—	520	400	310	620	540	—
M	1	—	—	—	670	590	540	820	720	620
	2	—	—	—	610	520	430	730	640	550
	3	—	—	—	460	400	310	570	520	460
K	1	1060	960	850	—	—	—	1160	1050	940
	2	830	740	700	—	—	—	920	830	760
	3	700	620	560	—	—	—	770	690	640
N	1-2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
S	1	—	—	—	140	120	100	—	—	—
	2	—	—	—	140	120	100	—	—	—
	3	—	—	—	180	140	100	—	—	—
	4	—	—	—	240	180	120	—	—	—
H	1	—	—	—	—	—	—	—	—	—

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

Recommended Starting Feeds [IPT]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

Chamfer Mills • 60°

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
SDEB	.007	.026	.053	.005	.019	.038	.005	.016	.033	.004	.015	.031	.004	.015	.030	SDEB

Chamfer Mills • 45°

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
SDEB	.005	.018	.037	.004	.013	.027	.003	.012	.023	.003	.011	.022	.003	.011	.021	SDEB

Chamfer Mills • 30°

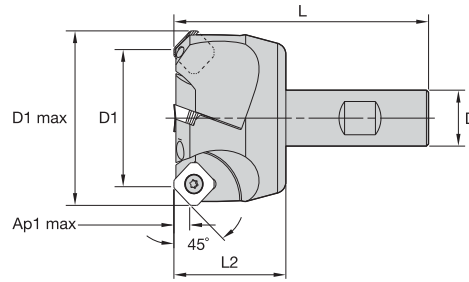
Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
SDEB	.004	.015	.030	.003	.011	.022	.003	.009	.019	.003	.009	.018	.002	.009	.017	SDEB

NOTE: Use "Light Machining" values as starting feed rate.



Face Mills

- High-shear end mills.



■ End Mills • 45° Lead

order number	catalog number	D1	D1 max	D	L	L2	Ap1 max	Z	max RPM	insert 1
1025514	KISR150SE4453	1.500	1.750	.750	3.605	1.575	.221	3	21700	SEHW43A6
1025515	KISR197SE4453	1.970	2.200	.750	3.605	1.575	.221	4	19400	SEHW43A6

■ Spare Parts



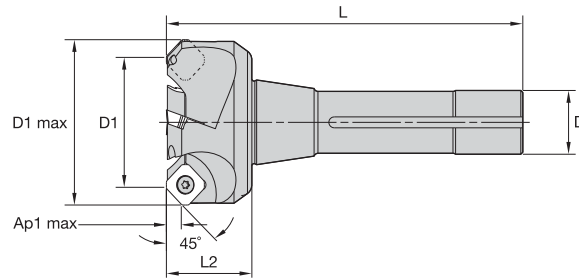
insert
screw
MS1374
MS1129



Torx
wrench
TT15
TT15

D1	in. lbs.
1.500	35
1.970	35

- Four cutting edges per insert.
- Countersinking and chamfering front and back.
- Generous chip clearance.
- Smooth, quiet cutting.



■ End Mills • Bridgeport Shank • 1/2

order number	catalog number	CSMS system size	D1	D1 max	L	L2	Ap1 max	Z	max RPM	insert 1
1025099	KISBR197SE445	R8	1.970	2.222	5.305	1.257	.221	4	19400	SEHW43A6

■ Spare Parts

D1	insert screw	in. lbs.	Torx wrench
1.970	MS1129	35	TT15



Carbide Recycling

Help preserve and protect our planet!

It's easy for your company to be environmentally conscious with the Kennametal Carbide Recycling Program.

By sending us your used carbide tools, you help preserve and protect the environment and ensure that these products are recycled responsibly. Kennametal accepts any coated or non-coated carbide items, including inserts, drills, reamers, and taps.



By using the Kennametal Carbide Recycling Program, you will receive:

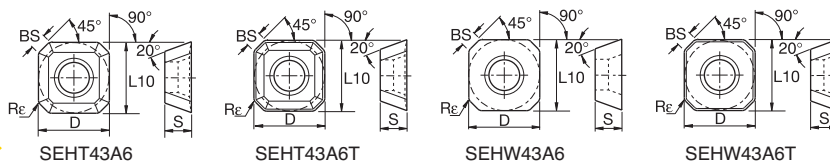
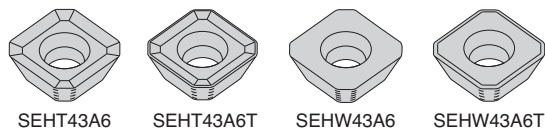
- A partner who cares about a sustainable environment.
- Easy-to-use web portal to value your used carbide.
- Access to our popular Green Box™ options for carbide collection.
- Systematic and efficient disposal of carbide materials.
- Improved profitability.

Program is not currently available in all geographical areas.
For more information, please visit www.kennametal.com/carbiderecycling.

Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	SEHT	KC725M	SEHT	KC725M	SEHT-T	KCPK30
P3-P4	SEHT	KC725M	SEHT-T	KCPK30	SEHT-T	KCPK30
P5-P6	SEHT-T	KCPK30	SEHT-T	KCPK30	SEHT-T	KCPK30
M1-M2	SEHT	KC725M	SEHT	KC725M	SEHT-T	KCPK30
M3	SEHT	KC725M	SEHT-T	KCPK30	SEHT-T	KCPK30
K1-K2	SEHW	KC520M	SEHW	KC520M	SEHW-T	KCPK30
K3	SEHW	KC520M	SEHW-T	KCPK30	SEHW-T	KCPK30
N1-N2	—	—	—	—	—	—
N3	—	—	—	—	—	—
S1-S2	SEHT	KC725M	SEHT	KC725M	SEHT-T	KC725M
S3	SEHT	KC725M	SEHT	KC725M	SEHT-T	KC725M
S4	SEHT	KC725M	SEHT-T	KC725M	SEHT-T	KC725M
H1	—	—	—	—	—	—

Indexable Inserts • KISR/KISBR



● first choice
○ alternate choice

P	●					
M	●					
K	●					
N	●					
S	●					
H						

Face Mills

SEHT

catalog number	D	S	L10	BS	Re	hm	cutting edges	KC510M	KC520M	KC725M	KCK15	KCPK30
SEHT43A6	.500	.188	.500	.106	.039	.002	4	●		●		

SEHT-T

catalog number	D	S	L10	BS	Re	hm	cutting edges	KC510M	KC520M	KC725M	KCK15	KCPK30
SEHT43A6T	.500	.188	.500	.106	.039	.006	4			●		●

SEHW

catalog number	D	S	L10	BS	Re	hm	cutting edges	KC510M	KC520M	KC725M	KCK15	KCPK30
SEHW43A6	.500	.188	.500	.106	.039	.003	4	●	●	●	●	●

SEHW-T

catalog number	D	S	L10	BS	Re	hm	cutting edges	KC510M	KC520M	KC725M	KCK15	KCPK30
SEHW43A6T	.500	.188	.500	.106	.039	.006	4	●	●	●	●	●

Recommended Starting Speeds [SFM]

Material Group		KC510M			KC520M			KC725M			KCK15			KCPK30		
P	1	—	—	—	—	—	—	1030	900	840	—	—	—	1780	1560	1450
	2	—	—	—	—	—	—	860	760	640	—	—	—	1100	1000	900
	3	—	—	—	—	—	—	790	670	550	—	—	—	1000	900	820
	4	—	—	—	—	—	—	710	590	470	—	—	—	740	690	620
	5	—	—	—	—	—	—	590	530	470	—	—	—	1020	910	830
	6	—	—	—	—	—	—	520	400	310	—	—	—	620	540	—
M	1	—	—	—	—	—	—	670	590	540	—	—	—	820	720	620
	2	—	—	—	—	—	—	610	520	430	—	—	—	730	640	550
	3	—	—	—	—	—	—	460	400	310	—	—	—	570	520	460
K	1	—	—	—	1060	960	850	—	—	—	1660	1510	1340	1160	1050	940
	2	—	—	—	830	740	700	—	—	—	1310	1170	1090	920	830	760
	3	—	—	—	700	620	560	—	—	—	1100	980	900	770	690	640
N	1-2	2520	2240	2060	—	—	—	—	—	—	—	—	—	—	—	—
	3	2280	2100	1920	—	—	—	—	—	—	—	—	—	—	—	—
S	1	—	—	—	—	—	—	140	120	100	—	—	—	—	—	—
	2	—	—	—	—	—	—	140	120	100	—	—	—	—	—	—
	3	—	—	—	—	—	—	180	140	100	—	—	—	—	—	—
	4	—	—	—	—	—	—	240	180	120	—	—	—	—	—	—
H	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

Recommended Starting Feeds [IPT]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
SEH.	.005	.018	.037	.004	.013	.027	.003	.012	.023	.003	.011	.022	.003	.011	.021	SEH.

NOTE: Use "Light Machining" values as starting feed rate.





Shoulder Mills

Mill 1-10 Platform	P2-P20
Mill 1-10, 0° Shoulder Milling Cutters	P2-P12
Mill 1-10, 0° Helical Shoulder Milling Cutters	P13-P20
Mill 1-14 Platform	P22-P44
Mill 1-14, 0° Indexable Shoulder Milling, Single Inserts Row.	P22-P32
Mill 1-14, 0° Helical Shoulder Milling Cutters	P34-P44
Mill 1-18 Platform	P46-P57
Mill 1-18, 0° Shoulder Milling Cutters, Increased Axial Depth of Cut	P46-P57
Mill 1-25 Platform	P58-P64
Mill 1-25, 0° Machining Non-Ferrous Material	P58-P64
KSSM	P66-P77, P86-P88
KSSM10, 0° Shoulder Milling Cutter, Small Depth of Cut	P66-P72
KSSM12, 0° Shoulder Milling Cutter, Medium Depth of Cut	P73-P77
KSSM15, 0° Shoulder Indexable Milling Cutter, Increased Depth of Cut	P86-P88
KSSM-KSSP, Helical Cutters	P78-P84
KSSP, 0° Helical Cutters, End Milling, Shell Mills, Integral Shank	P78-P84
KFSR Helical Platform	P90-P95
KFSR, 0° Helical Cutters, Serrated Inserts	P90-P95

Mill 1-10™ • High-Performance Shoulder Milling Platform

Primary Application

The multifunctional Mill 1-10 platform works with all tool materials in shoulder, ramp, slot, plunge, and helical milling with one insert style to improve productivity and reduce inventory and machining costs. The super positive cutting rake, soft cutting action, and low cutting forces enable higher feed rates and spindle protection. Innovative insert and cutter body designs offer improved ramping capabilities.

Features and Benefits

Versatility

- Works with all tool materials.
- Capable of shoulder, ramp, plunge, and helical milling.
- Internal coolant and air supply.

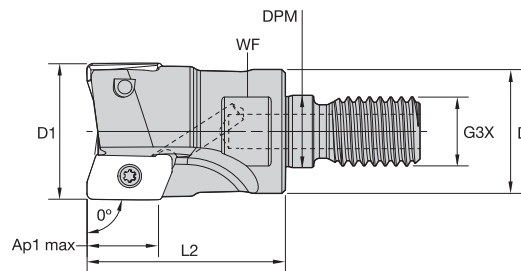
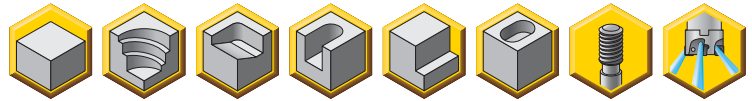
Advantages

- Optimized soft cutting edge.
- Elliptical edge generates 0° wall.
- Increased ramping capability due to state of the art insert and cutter body design.
- Innovative chip gash design for excellent chip evacuation and perfect cutter body stability.
- All pockets are machined into heat-treated materials, guaranteeing best-in-class runout and pocket strength.
- Inserts feature innovative margin along the main cutting edge, corner nose radius, and wiper facet for perfect edge stability.



To learn more, [scan here](#).
For instructions on how to scan, please see page xxix.

- Aggressive ramping rates.
- Generates superior surface finish.
- Mill 0° walls.
- High RPM capabilities.



■ End Mills • Screw-On

order number	catalog number	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	max ramp angle	lbs	max RPM
3742470	M1D062E1002CM08	.625	.512	.335	M8	1.000	.392	.396	2	9.5°	.05	53000
3742471	M1D075E1002CM10	.750	.709	.413	M10	1.100	.589	.398	2	6.5°	.09	45900
3742472	M1D075E1003CM10	.750	.709	.413	M10	1.100	.589	.398	3	6.5°	.10	45900
3742513	M1D100E1003CM12	1.000	.827	.492	M12	1.250	.667	.395	3	4.0°	.19	39700
3742514	M1D100E1004CM12	1.000	.827	.492	M12	1.250	.667	.395	4	4.0°	.18	39700
3742515	M1D125E1004CM16	1.250	1.142	.669	M16	1.500	.864	.392	4	2.5°	.38	35500
3742516	M1D125E1005CM16	1.250	1.142	.669	M16	1.500	.864	.392	5	2.5°	.38	35500
3742517	M1D150E1006CM16	1.500	1.142	.669	M16	1.500	.864	.390	6	2.0°	.46	32400

■ Spare Parts



insert screw



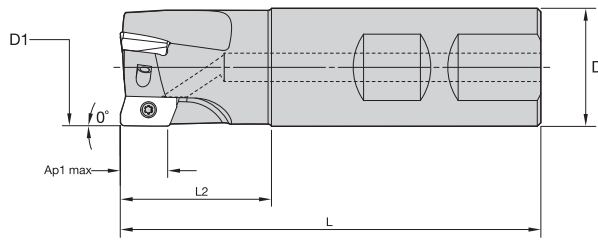
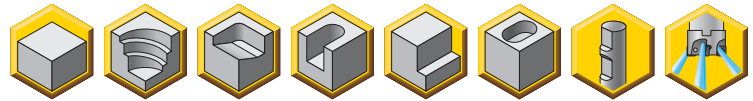
Torx Plus wrench

D1	insert screw	in. lbs.	Torx Plus wrench
.625	MS2205	9.0	F7IP
.750	MS2205	9.0	F7IP
1.000	MS2205	9.0	F7IP
1.250	MS2205	9.0	F7IP
1.500	MS2205	9.0	F7IP

NOTE: Standard milling cutters will accept insert nose radii up to .078" without modification.

Shoulder Mills

- Aggressive ramping rates.
- Generates superior surface finish.
- Mill 0° walls.
- High RPM capabilities.



■ End Mills • Weldon® Shank

order number	catalog number	D1	D	L	L2	Ap1 max	Z	max ramp angle	lbs	max RPM
3742552	M1D062E1002W075L100	.625	.750	3.030	1.000	.396	2	9.5°	.28	50300
3742553	M1D075E1002W075L110	.750	.750	3.130	1.100	.398	2	6.5°	.30	45900
3742554	M1D075E1003W075L110	.750	.750	3.130	1.100	.398	3	6.5°	.30	45900
3897781	M1D100E1003W075L125	1.000	.750	3.280	1.250	.395	3	4.0°	.40	39700
3897782	M1D100E1004W075L125	1.000	.750	3.280	1.250	.395	4	4.0°	.40	39700
3742555	M1D100E1003W100L125	1.000	1.000	3.530	1.250	.395	3	4.0°	.65	39700
3742556	M1D100E1004W100L125	1.000	1.000	3.530	1.250	.395	4	4.0°	.64	39700
3742557	M1D125E1004W125L160	1.250	1.250	3.880	1.600	.392	4	2.5°	1.12	35500
3742558	M1D125E1005W125L160	1.250	1.250	3.880	1.600	.392	5	2.5°	1.11	35500

■ Spare Parts

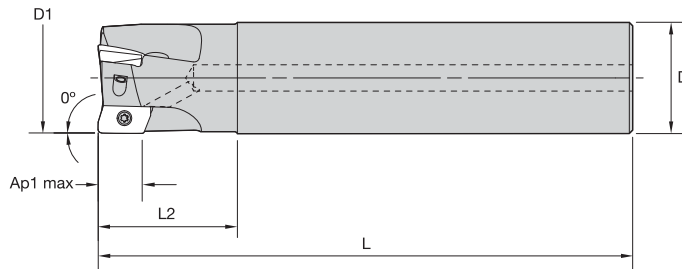
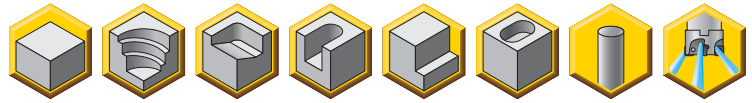


D1	insert screw	in. lbs.	Torx Plus driver
.625	MS2205	9.0	DT7IP
.750	MS2205	9.0	DT7IP
1.000	MS2205	9.0	DT7IP
1.250	MS2205	9.0	DT7IP

NOTE: Standard milling cutters will accept insert nose radii up to .078" without modification.

Shoulder Mills

- Aggressive ramping rates.
- Generates superior surface finish.
- Mill 0° walls.
- High RPM capabilities.



■ End Mills • Cylindrical Shank

order number	catalog number	D1	D	L	L2	Ap1 max	Z	max ramp angle	lbs	max RPM
3742518	M1D050E1001C062L350	.500	.625	3.500	.800	.404	1	11.5°	.25	56500
3742536	M1D062E1002C062L670	.625	.625	6.700	.999	.396	2	9.5°	.49	50300
3742519	M1D062E1002C075L400	.625	.750	4.000	1.000	.396	2	9.5°	.40	50300
3742520	M1D075E1002C075L450	.750	.750	4.500	1.100	.398	2	6.5°	.46	45900
3742538	M1D075E1002C075L670	.750	.750	6.700	1.250	.398	2	6.5°	.70	45900
3742521	M1D075E1003C075L450	.750	.750	4.500	1.100	.398	3	6.5°	.46	45900
3742540	M1D075E1003C075L670	.750	.750	6.700	1.250	.398	3	6.5°	.71	45900
3742542	M1D088E1003C075L670	.875	.750	6.700	1.250	.396	3	5.0°	.74	42600
3897779	M1D100E1003C075L480	1.000	.750	4.800	1.250	.395	3	4.0°	.58	39700
3897780	M1D100E1004C075L480	1.000	.750	4.800	1.250	.395	4	4.0°	.58	39700
3742522	M1D100E1003C100L480	1.000	1.000	4.800	1.250	.395	3	4.0°	.92	39700
3742543	M1D100E1003C100L800	1.000	1.000	8.000	1.600	.395	3	4.0°	1.59	39700
3742533	M1D100E1004C100L480	1.000	1.000	4.800	1.250	.395	4	4.0°	.92	39700
3742545	M1D100E1004C100L800	1.000	1.000	8.000	1.600	.395	4	4.0°	1.59	39700
3742547	M1D110E1004C100L800	1.100	1.000	8.000	1.600	.394	4	3.3°	1.64	38000
3742534	M1D125E1004C125L520	1.250	1.250	5.200	1.600	.392	4	2.5°	1.57	35500
3742548	M1D125E1004C125L800	1.250	1.250	8.000	1.900	.392	4	2.5°	2.48	35500
3742535	M1D125E1005C125L520	1.250	1.250	5.200	1.600	.392	5	2.5°	1.57	35500
3742550	M1D125E1005C125L800	1.250	1.250	8.000	1.900	.392	5	2.5°	2.48	35500

■ Spare Parts



insert screw



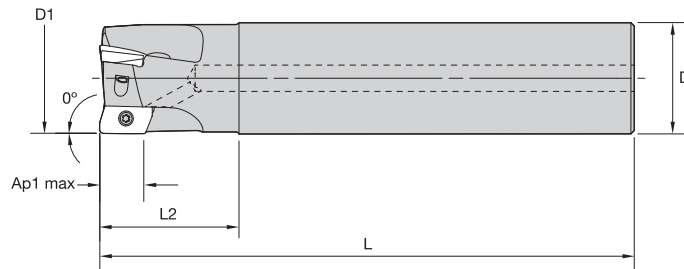
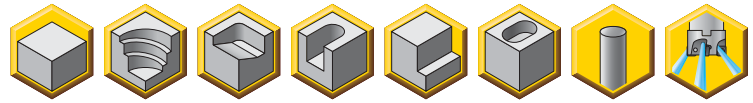
Torx Plus driver

D1	insert screw	in. lbs.	Torx Plus driver
.500	MS2205	9.0	DT7IP
.625	MS2205	9.0	DT7IP
.750	MS2205	9.0	DT7IP
.875	MS2205	9.0	DT7IP
1.000	MS2205	9.0	DT7IP
1.100	MS2205	9.0	DT7IP
1.250	MS2205	9.0	DT7IP

NOTE: Standard milling cutters will accept insert nose radii up to .078" without modification.

Shoulder Mills

- Aggressive ramping rates.
- Generates superior surface finish.
- Mill 0° walls.
- High RPM capabilities.



■ End Mills • Cylindrical Shank • Long Length

order number	catalog number	D1	D	L	L2	Ap1 max	Z	max ramp angle	lbs	max RPM
3742537	M1D062E1002C062L670R	.625	.625	6.688	.987	.396	2	8.0°	.49	50300
3742539	M1D075E1002C075L670R	.750	.750	6.689	1.239	.387	2	5.3°	.70	45900
3742541	M1D075E1003C075L670R	.750	.750	6.689	1.239	.387	3	5.3°	.71	45900
3742544	M1D100E1003C100L800R	1.000	1.000	7.989	1.589	.385	3	3.0°	1.59	39700
3742546	M1D100E1004C100L800R	1.000	1.000	7.989	1.589	.384	4	3.0°	1.59	39700
3742549	M1D125E1004C125L800R	1.250	1.250	7.989	1.889	.382	4	2.0°	2.48	35500
3742551	M1D125E1005C125L800R	1.250	1.250	7.989	1.889	.382	5	2.0°	2.48	35500

■ Spare Parts

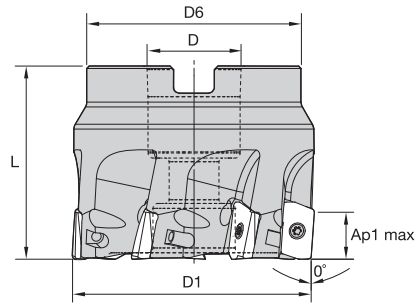
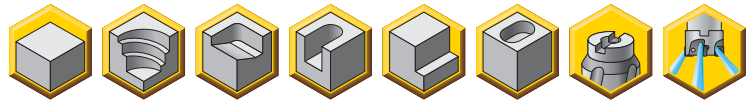


Shoulder Mills

D1	insert screw	in. lbs.	Torx Plus driver
.625	MS2205	9.0	DT7IP
.750	MS2205	9.0	DT7IP
1.000	MS2205	9.0	DT7IP
1.250	MS2205	9.0	DT7IP

NOTE: For inserts with corner nose radii 2.4 and 3.1.

- Aggressive ramping rates.
- Generates superior surface finish.
- Mill 0° walls.
- High RPM capabilities.



■ End Mills • Shell Mills

order number	catalog number	D1	D	D6	L	Ap1 max	Z	max ramp angle	lbs	max RPM
3745039	M1D150E1004S075L157	1.500	.750	1.420	1.575	.391	4	2.0°	.46	32400
3745040	M1D150E1006S075L157	1.500	.750	1.420	1.575	.391	6	2.0°	.49	32400
3745041	M1D200E1005S075L157	2.000	.750	1.750	1.575	.389	5	1.5°	.92	28100
3745042	M1D200E1008S075L157	2.000	.750	1.750	1.575	.389	8	1.5°	.89	28100
3745043	M1D250E1006S075L157	2.500	.750	1.750	1.575	.389	6	1.0°	1.29	25100
3745045	M1D250E1009S075L157	2.500	.750	1.750	1.575	.389	9	1.0°	1.26	25100
3745047	M1D300E1008S100L175	3.000	1.000	2.190	1.750	.389	8	0.80°	2.08	22900
3745048	M1D300E1010S100L175	3.000	1.000	2.190	1.750	.389	10	0.80°	2.07	22900
3745049	M1D400E1008S150L200	4.000	1.500	3.380	2.000	.389	8	0.50°	3.82	19800
3745050	M1D400E1012S150L200	4.000	1.500	3.380	2.000	.389	12	0.50°	3.81	19800

■ Spare Parts

D1	insert screw	in. lbs.	Torx Plus driver	socket-head cap screw
1.500	MS2205	9.0	DT7IP	S445
2.000	MS2205	9.0	DT7IP	S445
2.500	MS2205	9.0	DT7IP	S445
3.000	MS2205	9.0	DT7IP	S458
4.000	MS2205	9.0	DT7IP	—

NOTE: Standard milling cutters will accept insert nose radii up to .078" without modification.



■ Recommended Starting Speeds and Feeds [SFM]

Material Group		K313	KC410M	KC422M	KC510M	KC520M	KC522M
P	1	— — —	— — —	— — —	— — —	— — —	1080 940 880
	2	— — —	— — —	— — —	— — —	— — —	900 790 660
	3	— — —	— — —	— — —	— — —	— — —	830 700 580
	4	— — —	— — —	— — —	800 650 550	— — —	740 610 490
	5	— — —	— — —	— — —	— — —	— — —	610 550 490
	6	— — —	— — —	— — —	— — —	— — —	540 410 330
M	1	— — —	— — —	— — —	— — —	— — —	670 590 540
	2	— — —	— — —	— — —	— — —	— — —	610 520 430
	3	— — —	— — —	— — —	— — —	— — —	460 400 310
K	1	620 550 490	— — —	— — —	960 870 780	880 800 710	750 680 600
	2	— — —	— — —	— — —	760 680 630	690 620 580	590 530 490
	3	— — —	— — —	— — —	640 570 520	580 520 470	490 440 400
N	1-2	2610 2280 1960	3990 3550 3270	3520 3100 2870	2100 1870 1720	— — —	— — —
	3	— — —	3550 3270 3000	3100 2870 2500	— — —	— — —	— — —
S	1	— — —	— — —	— — —	— — —	— — —	130 120 90
	2	— — —	— — —	— — —	— — —	— — —	130 120 90
	3	— — —	— — —	— — —	— — —	— — —	170 130 90
	4	— — —	— — —	— — —	— — —	— — —	230 170 120
H	1	— — —	— — —	— — —	525 425 300	— — —	390 300 230

Material Group		KC725M	KCK15	KCPM20	KCPK30	KD1410
P	1	860 750 700	— — —	1810 1590 1470	1485 1300 1210	— — —
	2	720 630 530	— — —	1120 1010 910	920 830 750	— — —
	3	660 560 460	— — —	1010 910 830	830 750 680	— — —
	4	590 490 390	— — —	760 700 630	620 575 520	— — —
	5	490 440 390	— — —	910 820 750	850 760 690	— — —
	6	430 330 260	— — —	630 550 475	520 450 —	— — —
M	1	560 490 450	— — —	730 655 570	680 600 515	— — —
	2	510 430 360	— — —	670 580 520	610 530 460	— — —
	3	380 330 260	— — —	530 475 410	475 430 380	— — —
K	1	— — —	1380 1255 1115	1180 1070 960	965 875 780	— — —
	2	— — —	1095 975 910	940 840 770	770 690 630	— — —
	3	— — —	920 815 750	790 700 650	645 575 530	— — —
N	1-2	— — —	— — —	— — —	— — —	9030 8040 7400
	3	— — —	— — —	— — —	— — —	7490 5470 4440
S	1	115 100 80	— — —	— — —	— — —	— — —
	2	115 100 80	— — —	— — —	— — —	— — —
	3	150 115 80	— — —	— — —	— — —	— — —
	4	200 150 100	— — —	— — —	— — —	— — —
H	1	— — —	— — —	460 380 310	— — —	— — —

Shoulder Mills

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

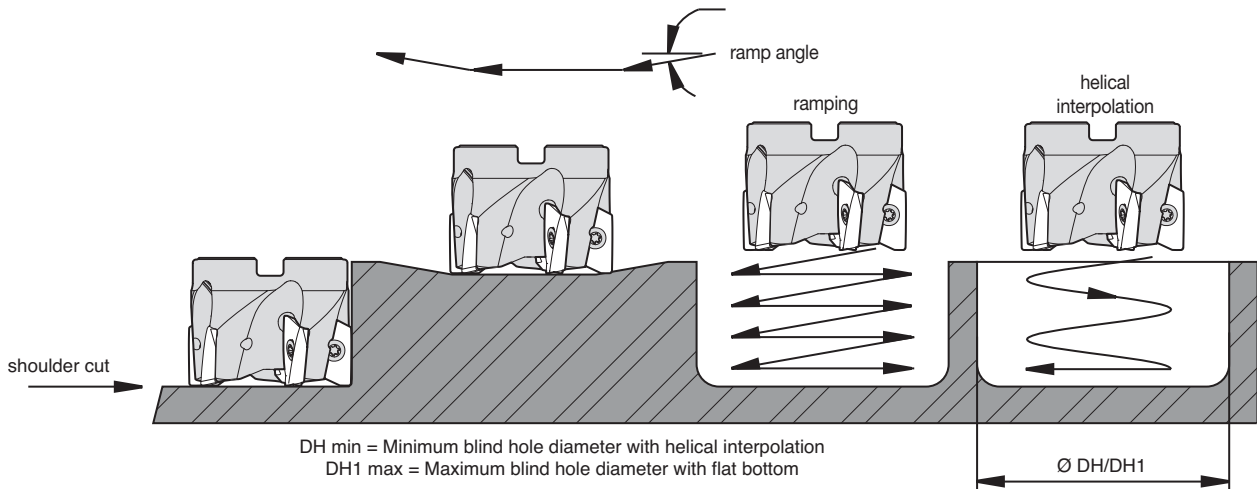
■ Recommended Starting Feeds [IPT]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.F..LDJ	.003	.005	.009	.003	.004	.007	.002	.003	.006	.002	.003	.006	.002	.003	.006	.F..LDJ
.F..PCD	.003	.007	.009	.003	.005	.007	.002	.004	.006	.002	.004	.006	.002	.004	.006	.F..PCD
.E..LDJ	.003	.007	.012	.003	.005	.009	.002	.005	.008	.002	.004	.007	.002	.004	.007	.E..LDJ
.E..LD	.004	.007	.012	.003	.005	.009	.002	.005	.008	.002	.004	.007	.002	.004	.007	.E..LD
.S..GE	.007	.008	.014	.005	.006	.010	.004	.005	.009	.004	.005	.008	.004	.005	.008	.S..GE
.S..GD	.007	.008	.014	.005	.006	.010	.004	.005	.009	.004	.005	.008	.004	.005	.008	.S..GD
.E..HD	.007	.010	.015	.005	.008	.011	.004	.007	.010	.004	.006	.009	.004	.006	.009	.E..HD

NOTE: Use "Light Machining" values as starting feed rate.

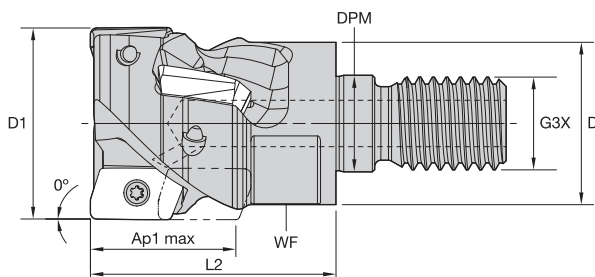
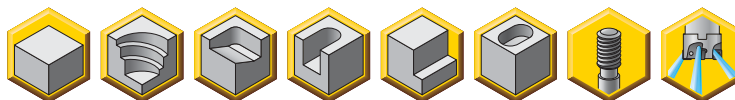
■ Application Examples



insert style	cutting diameter	max ramp angle to non-cutting corner tangent	max ramp angle to steel body interference	min hole diameter (DH min)	min flat-bottom hole diameter (DH1 min)	max diameter (no flat bottom)
Mill-1, 10mm	0.500	not recommended	not recommended	not recommended	not recommended	not recommended
Mill-1, 10mm	0.625	9.9°	12.5°	0.758	1.121	1.250
Mill-1, 10mm	0.750	6.8°	9.7°	0.998	1.367	1.500
Mill-1, 10mm	0.875	5.1°	6.8°	1.248	1.617	1.750
Mill-1, 10mm	1.000	4.1°	5.1°	1.498	1.867	2.000
Mill-1, 10mm	1.100	3.5°	4.3°	1.698	2.067	2.200
Mill-1, 10mm	1.250	2.9°	3.4°	1.999	2.367	2.500
Mill-1, 10mm	1.500	2.2°	2.4°	2.499	2.867	3.000
Mill-1, 10mm	2.000	1.2°	1.6°	3.509	3.876	4.000
Mill-1, 10mm	2.500	1.2°	1.2°	4.509	4.876	5.000
Mill-1, 10mm	3.000	0.9°	1.0°	5.509	5.876	6.000
Mill-1, 10mm	4.000	0.7°	0.7°	7.509	7.876	8.000

Shoulder Mills

- Aggressive ramping rates.
- Generates superior surface finish.
- Mill 0° walls.



■ Helical End Mills • Screw-On

order number	catalog number	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	Z U	max ramp angle	lbs	max RPM
3746104	M1HR075ED10M10Z2L110C4	.750	.698	.413	M10	1.289	.589	.745	4	2	6.5°	.09	38000
3746105	M1HR100ED10M12Z2L130C4	1.000	.827	.492	M12	1.289	.667	.740	4	2	4.0°	.16	32900
3746106	M1HR125ED10M16Z2L160C4	1.250	1.142	.669	M16	1.614	.943	.735	4	2	2.5°	.43	29400
3746107	M1HR125ED10M16Z3L160C6	1.250	1.142	.669	M16	1.614	.943	.735	6	3	2.5°	.40	29400

■ Spare Parts

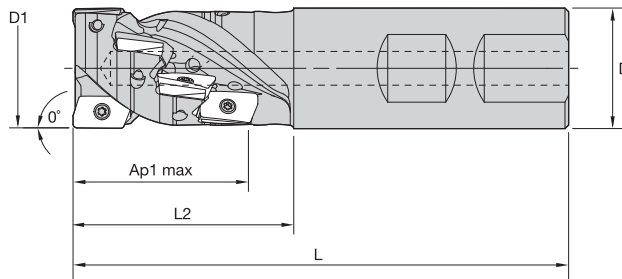
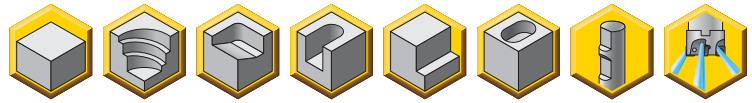
D1	insert screw	in. lbs.	Torx Plus wrench
.750	MS2205	9.0	F7IP
1.000	MS2205	9.0	F7IP
1.250	MS2205	9.0	F7IP

NOTE: Standard milling cutters will accept insert nose radii up to .078" without modification.



Shoulder Mills

- Aggressive ramping rates.
- Generates superior surface finish.
- Mill 0° walls.



■ Helical End Mills • Weldon® Shank

order number	catalog number	D1	D	L	L2	Ap1 max	Z	Z U	max ramp angle	lbs	max RPM
3746093	M1HR075ED10W075Z2L140C6	.750	.750	3.422	1.392	1.093	6	2	6.5°	.30	38000
3746097	M1HR100ED10W100Z2L180C8	1.000	1.000	4.071	1.790	1.432	8	2	4.0°	.64	32900
3746098	M1HR125ED10W125Z2L210C10	1.250	1.250	4.371	2.090	1.764	10	2	2.5°	1.16	29400
3746099	M1HR125ED10W125Z3L210C15	1.250	1.250	4.371	2.090	1.764	15	3	2.5°	1.08	29400

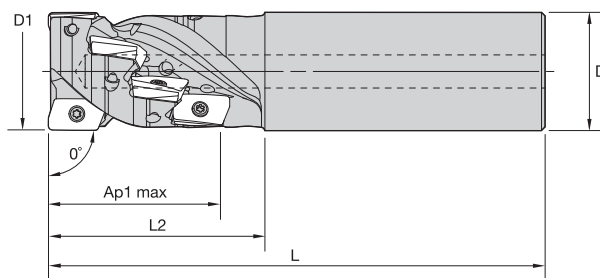
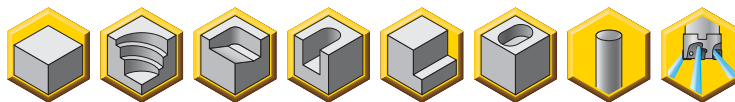
■ Spare Parts

D1	insert screw	in. lbs.	Torx Plus driver
.750	MS2205	9.0	DT7IP
1.000	MS2205	9.0	DT7IP
1.250	MS2205	9.0	DT7IP

NOTE: Standard milling cutters will accept insert nose radii up to .078" without modification.

Shoulder Mills

- Aggressive ramping rates.
- Generates superior surface finish.
- Mill 0° walls.



■ Helical End Mills • Cylindrical Shank

order number	catalog number	D1	D	L	L2	Ap1 max	Z	Z U	max ramp angle	lbs	max RPM
3746100	M1HR075ED10C075Z2L110C4	.750	.750	4.406	1.053	.745	4	2	6.5°	1.04	38000
3746101	M1HR100ED10C100Z2L110C4	1.000	1.000	4.800	1.053	.740	4	2	4.0°	.89	32900
3746102	M1HR125ED10C125Z2L110C4	1.250	1.250	5.200	1.053	.735	4	2	2.5°	1.59	29400
3746103	M1HR125ED10C125Z3L110C6	1.250	1.250	5.200	1.053	.735	6	3	2.5°	1.90	29400

■ Spare Parts

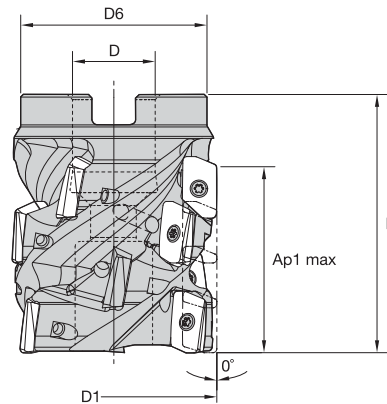
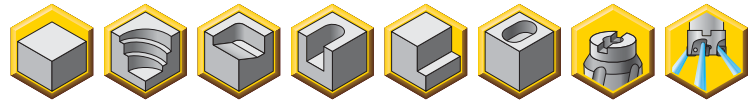
D1	insert screw	in. lbs.	Torx Plus driver
.750	MS2205	9.0	DT7IP
1.000	MS2205	9.0	DT7IP
1.250	MS2205	9.0	DT7IP

NOTE: Standard milling cutters will accept insert nose radii up to .078" without modification.



Shoulder Mills

- Aggressive ramping rates.
- Generates superior surface finish.
- Mill 0° walls.



■ Helical End Mills • Shell Mills

order number	catalog number	D1	D	D6	L	Ap1 max	Z	Z U	max ramp angle	lbs	max RPM
3746108	M1HR150ED10S075Z3L200C12	1.500	.750	1.421	2.000	1.417	12	3	2.0°	.56	26900
3746109	M1HR150ED10S075Z5L200C20	1.500	.750	1.420	2.000	1.417	20	5	2.0°	.51	26900
3746110	M1HR200ED10S075Z3L240C15	2.000	.750	1.750	2.400	1.745	15	3	1.5°	1.47	23300
3746111	M1HR200ED10S075Z5L240C25	2.000	.750	1.750	2.400	1.745	25	5	1.5°	1.31	23300

■ Spare Parts

D1	insert screw	in. lbs.	Torx Plus driver
1.500	MS2205	9.0	DT7IP
2.000	MS2205	9.0	DT7IP

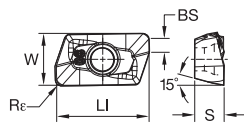
NOTE: Standard milling cutters will accept insert nose radii up to .078" without modification.

Shoulder Mills

Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	.E..LD	KC725M	.E..HD	KC725M	.S..GD	KC725M
P3-P4	.E..LD	KCPK30	.E..HD	KCPK30	.S..GD	KCPK30
P5-P6	.E..HD	KC522M	.S..GE	KCPK30	.S..GD	KCPK30
M1-M2	.E..LD	KC725M	.E..HD	KC725M	.S..GE	KC725M
M3	.E..LD	KC725M	.E..HD	KC725M	.S..GE	KC725M
K1-K2	.E..LD	KCK15	.E..HD	KCK15	.S..GD	KCK15
K3	.E..LD	KC520M	.E..HD	KC520M	.S..GD	KC520M
N1-N2	.F..LDJ	KC410M	.F..LDJ	KC410M	.E..LD	KC510M
N3	.F..LDJ	KC410M	.F..LDJ	KC410M	.E..LD	KC510M
S1-S2	.E..LD	KC522M	.E..HD	KC725M	.S..GE	KC725M
S3	.E..LD	KC522M	.E..HD	KC725M	.S..GE	KC725M
S4	.E..HD	KC725M	.S..GE	KC725M	—	—
H1	—	—	—	—	—	—

Indexable Inserts



P							○		●	●	●
M									●	●	○
K							●	●	○	●	○
N	●	●	●								●
S								●	●		
H											

- first choice
- alternate choice

EDCT-F.LDJ

catalog number	LI	W	S	BS	Rε	hm	cutting edges	K313	KC410M	KC422M	KC510M	KC520M	KC522M	KC725M	KCK15	KCPM20	KCPK30	KD1410
EC1002FLDJ	.474	.266	.148	.090	.008	.001	2	●	●									
EC1004FLDJ	.474	.266	.148	.078	.016	.001	2	●	●									
EC1008FLDJ	.474	.265	.148	.067	.031	.001	2	●	●									
EC1012FLDJ	.475	.265	.148	.051	.047	.001	2	●	●									
EC1016FLDJ	.475	.265	.148	.036	.062	.001	2	●	●									
EC1020FLDJ	.475	.265	.148	.019	.079	.001	2	●	●									
EC1024FLDJ	.475	.265	.148	.004	.094	.001	2	●	●									
EC1031FLDJ	.453	.264	.148	—	.122	.001	2	●	●									



■ Recommended Starting Speeds and Feeds [SFM]

Material Group		K313			KC410M			KC422M			KC510M			KC520M		
P	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—	—	—	800	650	550	—	—	—
	5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
M	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
K	1	620	550	490	—	—	—	—	—	—	960	870	780	880	800	710
	2	—	—	—	—	—	—	—	—	—	760	680	630	690	620	580
	3	—	—	—	—	—	—	—	—	—	640	570	520	580	520	470
N	1-2	2610	2280	1960	3990	3550	3270	3520	3100	2870	2100	1870	1720	—	—	—
	3	—	—	—	3550	3270	3000	3100	2870	2500	—	—	—	—	—	—
S	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
H	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Material Group		KC522M			KC725M			KCK15			KCPM20			KCPK30		
P	1	1080	940	880	860	750	700	—	—	—	1810	1590	1470	1485	1300	1210
	2	900	790	660	720	630	530	—	—	—	1120	1010	910	920	830	750
	3	830	700	580	660	560	460	—	—	—	1010	910	830	830	750	680
	4	740	610	490	590	490	390	—	—	—	760	700	630	620	575	520
	5	610	550	490	490	440	390	—	—	—	910	820	750	850	760	690
	6	540	410	330	430	330	260	—	—	—	630	550	475	520	450	—
M	1	670	590	540	560	490	450	—	—	—	730	655	570	680	600	515
	2	610	520	430	510	430	360	—	—	—	670	580	520	610	530	460
	3	460	400	310	380	330	260	—	—	—	530	475	410	475	430	380
K	1	750	680	600	—	—	—	1380	1255	1115	1180	1070	960	965	875	780
	2	590	530	490	—	—	—	1095	975	910	940	840	770	770	690	630
	3	490	440	400	—	—	—	920	815	750	790	700	650	645	575	530
N	1-2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
S	1	130	120	90	115	100	80	—	—	—	—	—	—	—	—	—
	2	130	120	90	115	100	80	—	—	—	—	—	—	—	—	—
	3	170	130	90	150	115	80	—	—	—	—	—	—	—	—	—
	4	230	170	120	200	150	100	—	—	—	—	—	—	—	—	—
H	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

Shoulder Mills

■ Recommended Starting Feeds [IPT]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.F..LDJ	.003	.005	.009	.003	.004	.007	.002	.003	.006	.002	.003	.006	.002	.003	.006	.F..LDJ
.E..LDJ	.003	.007	.012	.003	.005	.009	.002	.005	.008	.002	.004	.007	.002	.004	.007	.E..LDJ
.E..LD	.004	.007	.012	.003	.005	.009	.002	.005	.008	.002	.004	.007	.002	.004	.007	.E..LD
.S..GE	.007	.008	.014	.005	.006	.010	.004	.005	.009	.004	.005	.008	.004	.005	.008	.S..GE
.S..GD	.007	.008	.014	.005	.006	.010	.004	.005	.009	.004	.005	.008	.004	.005	.008	.S..GD
.E..HD	.007	.010	.015	.005	.008	.011	.004	.007	.010	.004	.006	.009	.004	.006	.009	.E..HD

NOTE: Use "Light Machining" values as starting feed rate.



LOIS™ — Mill 1-14™

**Load Optimized Insert Spacing with
an Unmatched Soft Cutting Action**

**Boost productivity in all your complex
contour milling and full slotting operations!**

- Reduced cutting forces.
- Balanced cut.
- Reduced power fluctuation.
- Coolant through tool for machining exotic materials.
- Versatile cutting strategies:
 - Slot
 - Profile
 - Plunge
 - Ramp

www.kennametal.com

 **KENNAMETAL®**

Mill 1-14™

Primary Application

Mill 1-14 is a versatile, functional cutter system for a range of cutting tasks. Mill 1-14 cutters can be used for profiling, slotting, ramping, helical interpolation, circular interpolation, and other milling applications. It's a single tool with multi-functional benefits. The Mill 1-14 inserts also are specially designed to add cutting versatility. Innovative micro-geometry features contribute greatly to enhanced performance, various rake angles, negative T-land, and small hone. Results include significantly reduced cycle times and lower cutting forces. Test results in producing 0° walls have proven excellent as well; try GD2 geometry.

Features and Benefits

Features

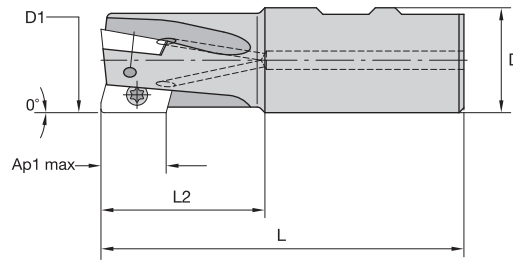
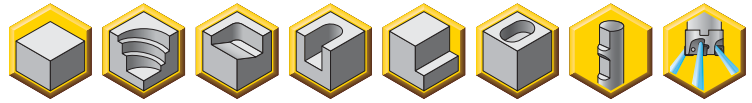
- Insert geometries and grades for most workpiece materials.
- Insert radii from .016" (0,15mm) up to .157" (4mm).
- Axial depth of cut up to .551" (14mm).
- Beyond™ grade technology.

Benefits

- Easy cutting action, kind on entry and also exiting the workpiece.
- Polished geometry for aluminum machining.
- Slotting, profiling, ramping, helical interpolation, and plunging.



- Aggressive ramping angles.
- Generates superior surface finish.
- Mill 0° walls.
- High RPM capabilities.



■ End Mills • Weldon® Shank

order number	catalog number	D1	D	L	L2	Ap1 max	Z	max ramp angle	lbs	max RPM
2624243	M1D062E1401W075L150	.625	.750	3.530	1.500	.580	1	25.0°	.31	8000
2623856	M1D075E1402W075L175	.750	.750	3.780	1.750	.580	2	18.0°	.35	49600
2624245	M1D088E1402W100L175	.875	1.000	4.030	1.750	.580	2	13.2°	.66	43500
2624189	M1D097E1403W100L175	.970	1.000	4.030	1.750	.580	3	10.9°	.69	40100
2479507	M1D100E1403W075L175	1.000	.750	3.780	1.750	.575	3	10.4°	.46	39200
2623857	M1D100E1402W100L175	1.000	1.000	4.030	1.750	.580	2	10.4°	.71	39200
2624199	M1D100E1403W100L175R	1.000	1.000	4.010	1.730	.580	3	10.4°	.70	39200
2479508	M1D100E1403W100L175	1.000	1.000	4.030	1.750	.580	3	10.4°	.71	39200
2623858	M1D125E1403W100L225	1.250	1.000	4.530	2.250	.571	3	7.2°	.94	33400
2479512	M1D125E1404W100L225	1.250	1.000	4.530	2.250	.571	4	7.2°	.97	33400
2624201	M1D125E1404W125L225R	1.250	1.250	4.510	2.230	.570	4	7.2°	1.25	33400
2479506	M1D125E1404W125L225	1.250	1.250	4.530	2.250	.570	4	7.2°	1.25	33400
2624194	M1D150E1404W125L225	1.500	1.250	4.530	2.250	.567	4	5.5°	1.49	29600
2624271	M1D150E1405W125L225R	1.500	1.250	4.510	2.230	.555	5	5.5°	1.53	29600
2623859	M1D150E1405W125L225	1.500	1.250	4.530	2.250	.567	5	5.5°	1.53	29600

■ Spare Parts



insert screw



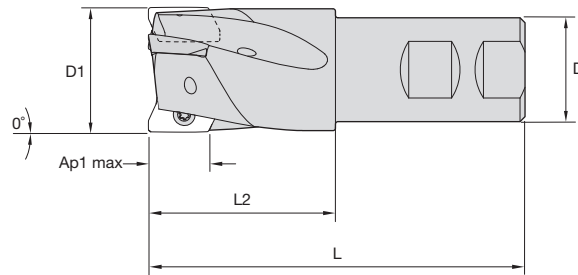
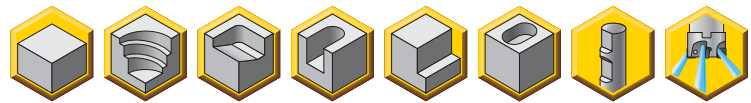
Torx Plus driver

D1	insert screw	in. lbs.	Torx Plus driver
.625	MS2167	20.0	DT9IP
.750	MS2167	20.0	DT9IP
.875	MS2166	20.0	DT9IP
.970	MS2166	20.0	DT9IP
1.000	MS2166	20.0	DT9IP
1.250	MS2166	20.0	DT9IP
1.500	MS2166	20.0	DT9IP

NOTE: Standard milling cutters will accept insert nose radii up to .078" without modification.
1 x M1D100E1403W100L175R is an example of a cutter that is relieved to accept inserts with a .122" corner radius.



- Aggressive ramping angles.
- Generates superior surface finish.
- Mill 0° walls.
- High RPM capabilities.



■ End Mills • Reduced Weldon® Shank

order number	catalog number	D1	D	L	L2	Ap1 max	Z	max ramp angle	lbs	max RPM
2479507	M1D100E1403W075L175	1.000	.750	3.780	1.750	.575	3	10.4°	.46	39200
2623858	M1D125E1403W100L225	1.250	1.000	4.530	2.250	.571	3	7.2°	.94	33400
2479512	M1D125E1404W100L225	1.250	1.000	4.530	2.250	.571	4	7.2°	.97	33400
2624194	M1D150E1404W125L225	1.500	1.250	4.530	2.250	.567	4	5.5°	1.49	29600
2624271	M1D150E1405W125L225R	1.500	1.250	4.510	2.230	.555	5	5.5°	1.53	29600
2623859	M1D150E1405W125L225	1.500	1.250	4.530	2.250	.567	5	5.5°	1.53	29600

■ Spare Parts

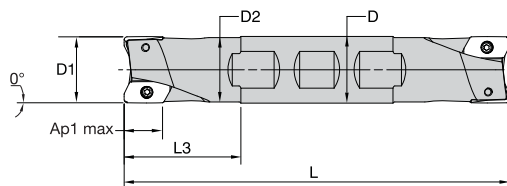
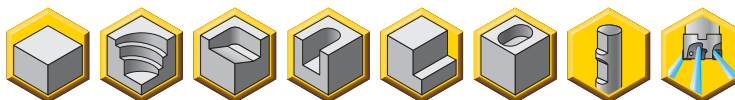


D1	insert screw	in. lbs.	Torx Plus driver
1.000	MS2166	20.0	DT9IP
1.250	MS2166	20.0	DT9IP
1.500	MS2166	20.0	DT9IP

NOTE: Standard milling cutters will accept insert nose radii up to .078" without modification.

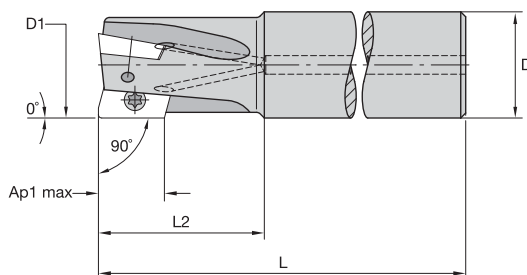
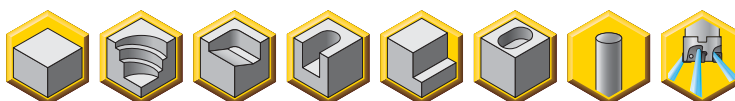
Shoulder Mills

- Aggressive ramping angles.
- Generates superior surface finish.
- Mill 0° walls.
- High RPM capabilities.



■ End Mills • Weldon® Shank • Double Ended

order number	catalog number	D1	D	D2	L	L3	Ap1 max	Z	max ramp angle	lbs	max RPM
2624188	M1D075E1402W075L175DE	.750	.750	.681	5.530	1.750	.551	2	18.0°	.53	49600
2624191	M1D100E1403W100L175DE	1.000	1.000	.965	5.780	1.750	.551	3	10.4°	1.01	39200



■ End Mills • Cylindrical Shank

order number	catalog number	D1	D	L	L2	Ap1 max	Z	max ramp angle	lbs	max RPM
2624187	M1D075E1402C075L650	.750	.750	6.500	1.750	.580	2	18.0°	.66	49600
2624197	M1D075E1402C075L800	.750	.750	8.000	1.750	.580	2	18.0°	.82	49600
2624198	M1D100E1402C100L1000	1.000	1.000	10.000	1.750	.580	2	10.4°	1.96	39200
2624190	M1D100E1403C100L750	1.000	1.000	7.500	1.750	.580	3	10.4°	1.44	39200
2624200	M1D125E1403C125L1000	1.250	1.250	10.000	2.250	.570	3	7.2°	3.07	33400
2624192	M1D125E1404C125L800	1.250	1.250	8.000	2.250	.570	4	7.2°	2.43	33400
2624202	M1D150E1404C125L1000	1.500	1.250	10.000	2.250	.570	4	5.5°	3.32	29600
2624250	M1D150E1405C125L800	1.500	1.250	8.000	2.250	.570	5	5.5°	2.70	29600

Shoulder Mills

■ Spare Parts



insert screw

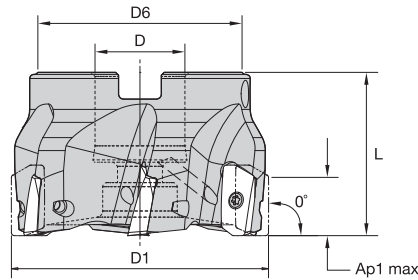
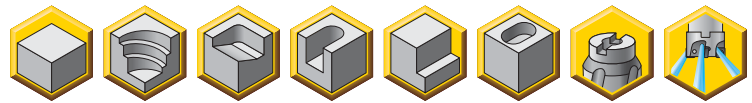


Torx Plus driver

D1	insert screw	in. lbs.	Torx Plus driver
.750	MS2167	20.0	DT9IP
1.000	MS2166	20.0	DT9IP
1.250	MS2166	20.0	DT9IP
1.500	MS2166	20.0	DT9IP

NOTE: Standard milling cutters will accept insert nose radii up to .078" without modification.

- Aggressive ramping angles.
- Generates superior surface finish.
- Mill 0° walls.
- High RPM capabilities.



■ **Shell Mills**

order number	catalog number	D1	D	D6	L	Ap1 max	Z	max ramp angle	lbs	max RPM
2479509	M1D125E1404S050L157	1.250	.500	1.204	1.575	.570	4	7.2°	.28	33400
2624255	M1D150E1405S075L157	1.500	.750	1.414	1.575	.570	5	5.5°	.38	29600
2624270	M1D200E1405S075L157	2.000	.750	1.750	1.575	.560	5	3.7°	.71	24700
2479510	M1D200E1406S075L157	2.000	.750	1.750	1.575	.560	6	3.7°	.68	24700
2624274	M1D250E1405S075L157	2.500	.750	1.750	1.575	.560	5	2.8°	1.17	21700
2624254	M1D250E1407S075L157	2.500	.750	1.750	1.575	.560	7	2.8°	1.15	21700
2624277	M1D300E1406S100L175	3.000	1.000	2.188	1.750	.560	6	2.3°	1.86	19600
2624275	M1D300E1408S100L175	3.000	1.000	2.188	1.750	.560	8	2.3°	1.92	19600
2624279	M1D400E1408S150L200	4.000	1.500	3.625	2.000	.560	8	1.6°	3.52	16700
2624278	M1D400E1410S150L200	4.000	1.500	3.625	2.000	.560	10	1.6°	3.70	16700

■ **Spare Parts**

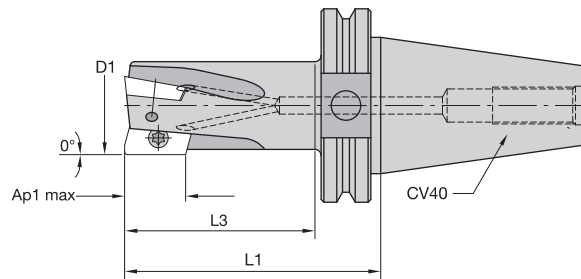
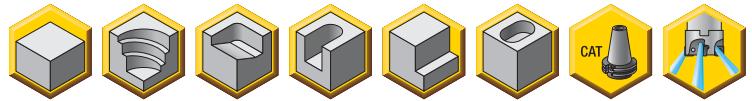


Shoulder Mills

D1	insert screw	in. lbs.	Torx Plus driver	coolant lock screw	set screw	socket-head cap screw with coolant groove
1.250	MS2166	20.0	DT9IP	—	—	S422CG
1.500	MS2166	20.0	DT9IP	—	—	S445CG
2.000	MS2166	20.0	DT9IP	—	—	S445CG
2.500	MS2166	20.0	DT9IP	—	—	S445CG
3.000	MS2166	20.0	DT9IP	—	—	S2044CG
4.000	MS2166	20.0	DT9IP	KLS15C	MS1297	—

NOTE: Standard milling cutters will accept insert nose radii up to .078" without modification.

- Aggressive ramping angles.
- Generates superior surface finish.
- Mill 0° walls.
- High RPM capabilities.



■ End Mills • Steep Taper CV40

order number	catalog number	CSMS system size	D1	L1	L3	Ap1 max	Z	max ramp angle	lbs	max RPM
2624246	M1D100E1403CV40L300	CV40	1.000	3.000	1.500	.580	3	10.4°	2.40	39200
2624248	M1D125E1404CV40L300	CV40	1.250	3.000	1.500	.570	4	7.2°	2.52	33400
2624253	M1D150E1405CV40L300	CV40	1.500	3.000	1.625	.570	5	5.5°	2.69	29600

■ Spare Parts



insert screw



Torx Plus driver

D1	insert screw	in. lbs.	Torx Plus driver
1.000	MS2166	20.0	DT9IP
1.250	MS2166	20.0	DT9IP
1.500	MS2166	20.0	DT9IP



Carbide Recycling

Help preserve and protect our planet!

It's easy for your company to be environmentally conscious with the Kennametal Carbide Recycling Program.

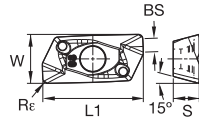
By sending us your used carbide tools, you help preserve and protect the environment and ensure that these products are recycled responsibly. Kennametal accepts any coated or non-coated carbide items, including inserts, drills, reamers, and taps.



By using the Kennametal Carbide Recycling Program, you will receive:

- A partner who cares about a sustainable environment.
- Easy-to-use web portal to value your used carbide.
- Access to our popular Green Box™ options for carbide collection.
- Systematic and efficient disposal of carbide materials.
- Improved profitability.

Program is not currently available in all geographical areas.
 For more information, please visit www.kennametal.com/carbiderecycling.



P	●				○	●		●	●
M	●					●	●		○
K	●					●	●	●	○
N	●	●							
S	●						●		
H						○			○

● first choice
○ alternate choice

■ EDCT-LD

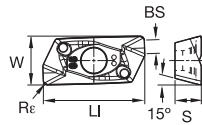
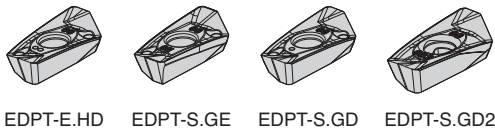
catalog number	LI	W	S	BS	Re	hm	cutting edges	KC410M	KC422M	KC520M	KC522M	KC725M	KCK15	KCPM20	KCPK30
EC1404ELD	.687	.334	.177	.116	.016	.002	2								
EC1408ELD	.688	.334	.177	.101	.031	.002	2				●				
EC1412ELD	.688	.333	.177	.085	.047	.002	2				●				
EC1416ELD	.688	.333	.177	.070	.062	.002	2				●				
EC1431ELD	.689	.331	.177	.010	.122	.002	2				●				

■ EDCT-E.GD

catalog number	LI	W	S	BS	Re	hm	cutting edges	KC410M	KC422M	KC520M	KC522M	KC725M	KCK15	KCPM20	KCPK30
EC1404EGD	.687	.334	.177	.116	.016	.002	2						●	●	
EC1408EGD	.688	.334	.177	.101	.031	.002	2						●	●	
EC1412EGD	.688	.333	.177	.085	.047	.002	2						●		
EC1416EGD	.688	.333	.177	.070	.062	.002	2						●		
EC1431EGD	.689	.331	.177	.010	.122	.002	2						●	●	



Shoulder Mills



● first choice
○ alternate choice

P	●	○	○	○	○	○	○	○	○
M	○	○	○	○	○	○	○	○	○
K	○	○	○	○	○	○	○	○	○
N	○	○	○	○	○	○	○	○	○
S	○	○	○	○	○	○	○	○	○
H	○	○	○	○	○	○	○	○	○

■ EDPT-E.HD

catalog number	LI	W	S	BS	Rε	hm	cutting edges	KC410M	KC422M	KC520M	KC522M	KC725M	KCK15	KCPM20	KCPK30
EP1404EHD	.687	.330	.177	.116	.016	.003	2			●	●	●	●		●
EP1408EHD	.688	.330	.177	.101	.031	.003	2			●	●	●	●		●
EP1412EHD	.688	.329	.177	.085	.047	.003	2			●	●	●	●		●
EP1416EHD	.688	.329	.177	.070	.062	.003	2			●	●	●	●		●
EP1420EHD	.688	.329	.177	.054	.079	.003	2			●	●	●	●		●
EP1424EHD	.689	.328	.177	.039	.094	.003	2			●	●	●	●		●
EP1431EHD	.689	.327	.177	.010	.122	.003	2			●	●	●	●		●
EP1440EHD	.651	.325	.177	—	.157	.003	2			●	●	●	●		●

■ EDPT-S.GE

catalog number	LI	W	S	BS	Rε	hm	cutting edges	KC410M	KC422M	KC520M	KC522M	KC725M	KCK15	KCPM20	KCPK30
EP1404SGE	.686	.323	.175	.110	.016	.005	2				●	●	●		●
EP1408SGE	.686	.322	.175	.094	.031	.005	2				●	●	●		●
EP1412SGE	.687	.320	.175	.078	.047	.005	2				●	●	●		●
EP1416SGE	.687	.320	.175	.062	.062	.005	2				●	●	●		●
EP1431SGE	.687	.318	.175	.005	.122	.005	2				●	●	●		●

■ EDPT-S.GD

catalog number	LI	W	S	BS	Rε	hm	cutting edges	KC410M	KC422M	KC520M	KC522M	KC725M	KCK15	KCPM20	KCPK30
EP1408SGD	.688	.330	.177	.101	.031	.004	2				●	●	●		●
EP1412SGD	.688	.329	.177	.085	.047	.004	2				●	●	●		●
EP1416SGD	.688	.329	.177	.070	.062	.004	2				●	●	●		●

■ EDPT-S.GD2

catalog number	LI	W	S	BS	Rε	hm	cutting edges	KC410M	KC422M	KC520M	KC522M	KC725M	KCK15	KCPM20	KCPK30
EP1408SGD2	.688	.330	.177	.103	.031	.004	2			●	●	●	●		●

Shoulder Mills

■ Recommended Starting Speeds and Feeds [SFM]

Material Group		KC410M			KC422M			KC520M			KC522M		
P	1	—	—	—	—	—	—	—	—	—	1080	940	880
	2	—	—	—	—	—	—	—	—	—	900	790	660
	3	—	—	—	—	—	—	—	—	—	830	700	580
	4	—	—	—	—	—	—	—	—	—	740	610	490
	5	—	—	—	—	—	—	—	—	—	610	550	490
	6	—	—	—	—	—	—	—	—	—	540	410	330
M	1	—	—	—	—	—	—	—	—	—	670	590	540
	2	—	—	—	—	—	—	—	—	—	610	520	430
	3	—	—	—	—	—	—	—	—	—	460	400	310
K	1	—	—	—	—	—	—	880	800	710	750	680	600
	2	—	—	—	—	—	—	690	620	580	590	530	490
	3	—	—	—	—	—	—	580	520	470	490	440	400
N	1-2	3990	3550	3270	3520	3100	2870	—	—	—	—	—	—
	3	3550	3270	3000	3100	2870	2500	—	—	—	—	—	—
S	1	—	—	—	—	—	—	—	—	—	130	120	90
	2	—	—	—	—	—	—	—	—	—	130	120	90
	3	—	—	—	—	—	—	—	—	—	170	130	90
	4	—	—	—	—	—	—	—	—	—	230	170	120
H	1	—	—	—	—	—	—	—	—	—	390	300	230

Material Group		KC725M			KCK15			KCPM20			KCPK30		
P	1	860	750	700	—	—	—	1810	1590	1470	1485	1300	1210
	2	720	630	530	—	—	—	1120	1010	910	920	830	750
	3	660	560	460	—	—	—	1010	910	830	830	750	680
	4	590	490	390	—	—	—	760	700	630	620	575	520
	5	490	440	390	—	—	—	910	820	750	850	760	690
	6	430	330	260	—	—	—	630	550	475	520	450	—
M	1	560	490	450	—	—	—	730	655	570	680	600	515
	2	510	430	360	—	—	—	670	580	520	610	530	460
	3	380	330	260	—	—	—	530	475	410	475	430	380
K	1	—	—	—	1380	1255	1115	1180	1070	960	965	875	780
	2	—	—	—	1095	975	910	940	840	770	770	690	630
	3	—	—	—	920	815	750	790	700	650	645	575	530
N	1-2	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—
S	1	115	100	80	—	—	—	—	—	—	—	—	—
	2	115	100	80	—	—	—	—	—	—	—	—	—
	3	150	115	80	—	—	—	—	—	—	—	—	—
	4	200	150	100	—	—	—	—	—	—	—	—	—
H	1	—	—	—	—	—	—	460	380	310	—	—	—

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

Shoulder Mills

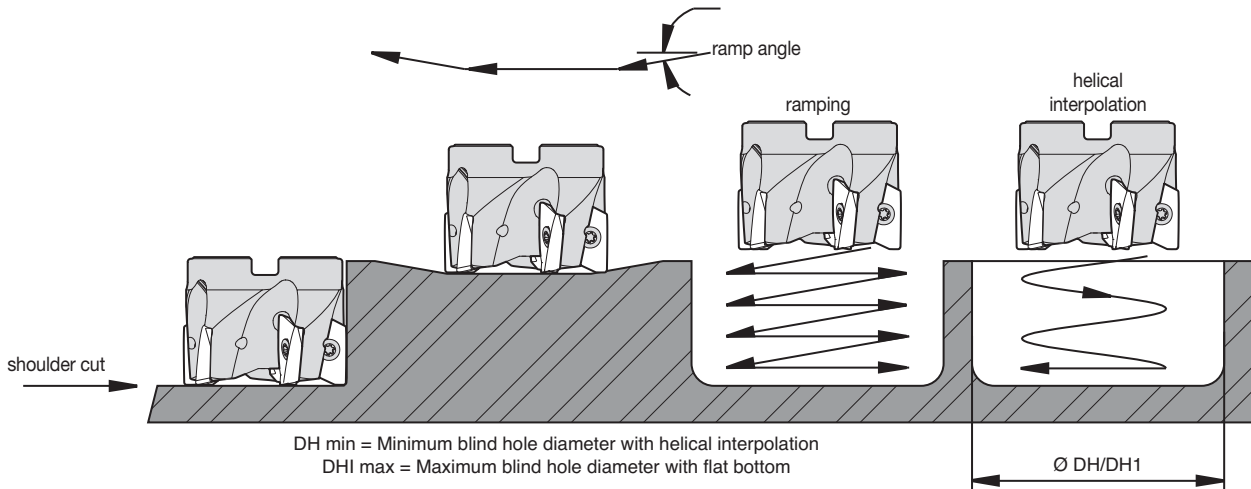
■ Recommended Starting Feeds [IPT]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.F..LDJ	.003	.007	.009	.003	.005	.007	.002	.004	.006	.002	.004	.006	.002	.004	.006	.F..LDJ
.E..LDJ	.003	.008	.014	.003	.006	.011	.002	.005	.009	.002	.005	.009	.002	.005	.008	.E..LDJ
.E..LD	.004	.008	.014	.003	.006	.010	.002	.005	.009	.002	.005	.008	.002	.005	.008	.E..LD
.E..GD	.005	.011	.017	.004	.008	.013	.003	.007	.011	.003	.007	.010	.003	.006	.010	.E..GD
.S..GE	.007	.014	.020	.005	.010	.015	.004	.009	.013	.004	.008	.012	.004	.008	.012	.S..GE
.S..GD	.007	.014	.021	.005	.010	.015	.004	.009	.013	.004	.008	.012	.004	.008	.012	.S..GD
.S..GD2	.007	.016	.024	.005	.012	.017	.004	.010	.015	.004	.010	.014	.004	.009	.014	.S..GD2
.E..HD	.007	.017	.028	.005	.013	.020	.004	.011	.018	.004	.010	.016	.004	.010	.016	.E..HD

NOTE: Use "Light Machining" values as starting feed rate.

■ Application Examples



insert style	cutting diameter	max ramp angle	min hole diameter (DH min)	max flat-bottom hole diameter (DH1 max)	max diameter (no flat bottom)
Mill-1, 14mm	.625	25°	.625	1.065	1.25
Mill-1, 14mm	.750	18°	.869	1.130	1.50
Mill-1, 14mm	.875	13°	1.113	1.562	1.75
Mill-1, 14mm	.970	11°	1.300	1.752	1.94
Mill-1, 14mm	1.000	10°	1.360	1.812	2.00
Mill-1, 14mm	1.250	7°	1.862	2.312	2.50
Mill-1, 14mm	1.500	6°	2.361	2.812	3.00
Mill-1, 14mm	1.250	7°	1.873	2.322	2.50
Mill-1, 14mm	1.500	5°	2.370	2.822	3.00
Mill-1, 14mm	2.000	4°	3.368	3.822	4.00
Mill-1, 14mm	2.500	3°	4.367	4.822	5.00
Mill-1, 14mm	3.000	2°	5.366	5.822	6.00
Mill-1, 14mm	4.000	2°	7.366	7.822	8.00

NOTE: Max ramp angle decreases as nose radius increases.

Shoulder Mills



Mill 1-10™

Carbon-Fiber's Finest

**The Kennametal Mill 1-10 Indexable Milling Series —
Face Milling, up to 100% Engagement with PCD Inserts**

Ideal for applications utilizing Carbon-Fiber Reinforced Polymer (CFRP).

- Aggressive ramping rates, high RPM capabilities, and a superior surface finish — time after time.
- Varying axial depth of cut meets a wide range of applications.
- No material breakout or burr formation upon entry or exit of the workpiece.



Choose the Mill 1-10 to mill 90° walls.

Visit www.kennametal.com or contact your local Authorized Kennametal Distributor.

www.kennametal.com

 **KENNAMETAL®**



Mill 1-14™ Helical Cutters

Primary Application

The Mill 1-14 helical cutters will increase your axial depth of cut. Designed with axial support pins for added stability, the Mill 1-14 features our essential Load-Optimized Insert Spacing™ (LOIS) technology. LOIS dramatically minimizes unwanted vibrations and fluctuations in power requirements, resulting in a much smoother-sounding cut. Up to nine different coolant nozzle diameters enable tailoring to suit each machine tool, providing remarkably consistent, focused coolant flow.

Features and Benefits

Functions

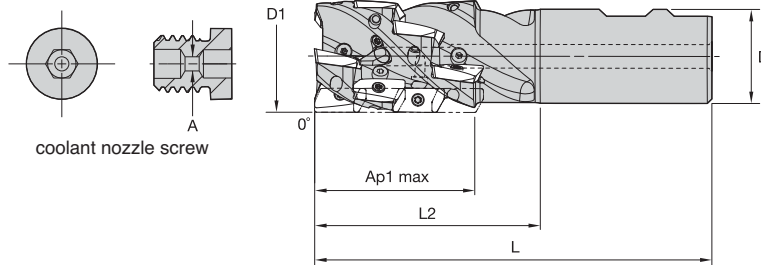
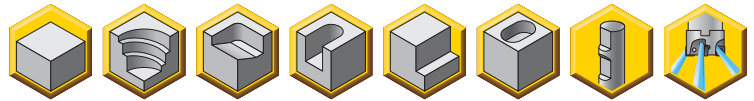
- Improves axial depth of cut better than standard end mills due to the positioning of inserts in helical configuration.
- Up to nine different coolant nozzle diameters tailored to suit each machine tool.
- One tool that offers features common to end mills, but rarely seen on a helical cutter: Helical ramping from solid, slotting, contouring, ramping, and plunging.

Benefits

- Increases depth of cut.
- Consistent, focused coolant flow.
- Built for performance, accuracy, and versatility.



- Aggressive ramping rates.
- Generates superior surface finish.
- Mill 0° walls.
- Axial support pins.
- Unique coolant nozzles.



■ **Helical End Mills • Weldon® Shank • Slot and Profile**

order number	catalog number	D1	D	L	L2	Ap1 max	Z	Z U	max ramp angle	lbs	max RPM
3732889	M1HR125E14W125Z2L200C4	1.250	1.250	4.280	2.000	1.096	4	2	5.4°	1.10	31100
3732892	M1HR150E14W125Z3L300C12	1.500	1.250	5.280	3.000	2.130	12	3	4.0°	1.41	28400
3732890	M1HR150E14W125Z3L200C6	1.500	1.250	4.280	2.000	1.089	6	3	4.0°	1.20	28400
3732891	M1HR150E14W125Z3L250C9	1.500	1.250	4.780	2.500	1.609	9	3	4.0°	1.32	28400
3732935	M1HR200E14W150Z3L300C12	2.000	1.500	5.690	3.001	2.105	12	3	2.7°	2.62	24600

■ **Spare Parts**

D1	insert screw	in. lbs.	Torx Plus driver	pin	coolant nozzle screw
1.250	MS2148	20.0	DT9IP	ASPM07001802	MS2191C20
1.500	MS2148	20.0	DT9IP	ASPM07001802	MS2191C20
2.000	MS2148	20.0	DT9IP	ASPM07001802	MS2191C20

NOTE: Standard milling cutters will accept insert nose radii up to .078" without modification.

■ **Optional Coolant Nozzle Screws**

order number	catalog number	A
3400611	MS2191C00	—
3400612	MS2191C06	.024
3400613	MS2191C08	.032
3400614	MS2191C10	.039
3400616	MS2191C12	.047
3400617	MS2191C14	.055
3400618	MS2191C16	.063
3400619	MS2191C18	.071
3400620	MS2191C20	.079



Shoulder Mills

■ **Coolant Nozzle Key**

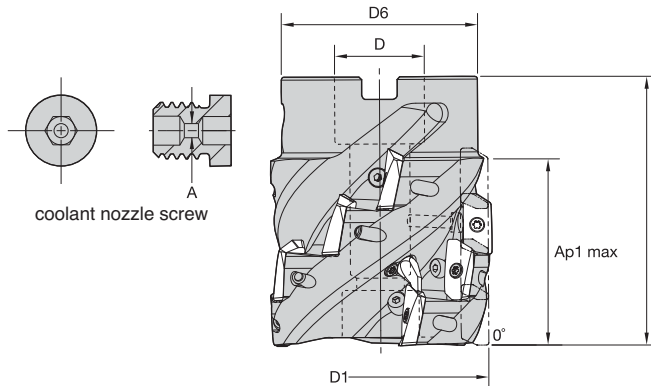
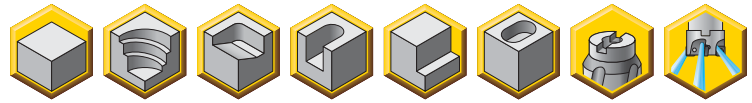
order number	catalog number	drive size
1993552	THW2M	2 MM

NOTE: Check the Spare Parts table for the coolant hole size that is incorporated in the cutters.

If you need an alternative, there are eight other variants to choose from to increase or decrease the pressure.

Example: MS2191C12 this is a .047" hole. All coolant nozzles are interchangeable with the original that is supplied with the cutter which gives flexibility with coolant flow.

- Aggressive ramping rates.
- Generates superior surface finish.
- Mill 0° walls.
- Axial support pins.
- Unique coolant nozzles.



■ Helical Shell Mills • Slot and Profile

order number	catalog number	D1	D	D6	L	Ap1 max	Z	Z U	max ramp angle	lbs	max RPM
3732933	M1HR200E14S075Z3L200C6	2.000	.750	1.750	2.000	1.077	6	3	2.7°	1.01	24600
3732934	M1HR200E14S075Z3L250C9	2.000	.750	1.750	2.500	1.591	9	3	2.7°	1.29	24600
3732936	M1HR250E14S100Z3L200C6	2.500	1.000	2.190	2.000	1.064	6	3	1.9°	1.81	22000
3732937	M1HR250E14S100Z3L250C9	2.500	1.000	2.190	2.500	1.572	9	3	1.9°	2.28	22000
3732938	M1HR250E14S100Z4L250C12	2.500	1.000	2.190	2.500	1.572	12	4	1.9°	2.10	22000
3732939	M1HR250E14S100Z3L300C12	2.500	1.000	2.190	3.000	2.080	12	3	1.9°	2.62	22000

■ Spare Parts

Shoulder Mills

order number	Z	insert screw	in. lbs.	Torx Plus driver	pin	socket-head cap screw	coolant nozzle screw
3732933	6	MS2148PKG	20.0	DT9IP	ASPM07001802	S447	MS2191C20
3732934	9	MS2148PKG	20.0	DT9IP	ASPM07001802	S449	MS2191C16
3732936	6	MS2148PKG	20.0	DT9IP	ASPM07001802	S460	MS2191C20
3732937	9	MS2148PKG	20.0	DT9IP	ASPM07001802	S462	MS2191C20
3732939	12	MS2148PKG	20.0	DT9IP	ASPM07001802	S464	MS2191C16
3732938	12	MS2148PKG	20.0	DT9IP	ASPM07001802	S462	MS2191C16

NOTE: Standard milling cutters will accept insert nose radii up to .078" without modification.

■ Helical Shell Mills • Profile Only

order number	catalog number	D1	D	D6	L	Ap1 max	Z	Z U	max ramp angle	lbs	max RPM
3786638	M1HR250E14S100Z5L300C20	2.500	1.000	2.190	3.000	2.079	20	5	1.9°	2.40	22000

■ Spare Parts • Profile Only

D1	insert screw	in. lbs.	Torx Plus driver	pin	socket-head cap screw	coolant nozzle screw
2.500	MS2148PKG	20.0	DT9IP	ASPM07001802	S464	MS2191C16

NOTE: Standard milling cutters will accept insert nose radii up to .078" without modification.

■ **Optional Coolant Nozzle Screws**

order number	catalog number	A
3400611	MS2191C00	—
3400612	MS2191C06	.024
3400613	MS2191C08	.032
3400614	MS2191C10	.039
3400616	MS2191C12	.047
3400617	MS2191C14	.055
3400618	MS2191C16	.063
3400619	MS2191C18	.071
3400620	MS2191C20	.079

■ **Coolant Nozzle Key**

order number	catalog number	drive size
1993552	THW2M	2 MM

NOTE: Check the Spare Parts column for the coolant hole size that is incorporated in the cutters.
 If you need an alternative, there are eight other variants to choose from to increase or decrease the pressure.
 Example: MS2191C12 this is a .047" (1,20mm) hole. All coolant nozzles are interchangeable with the original that is supplied with the cutter which gives flexibility with coolant flow.



Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	.E..GD	KC725M	.S..GE	KC725M	.S..GD2	KC725M
P3-P4	.S..GE	KCPK30	.S..GD2	KCPK30	.E..HD	KCPK30
P5-P6	.E..GD	KCPM20	.S..GE	KCPM20	.E..HD	KCPK30
M1-M2	.E..GD	KC725M	.S..GE	KC725M	.S..GD2	KC725M
M3	.S..GE	KCPK30	.S..GD2	KCPK30	.E..HD	KCPK30
K1-K2	.S..GD2	KC520M	.E..HD	KC520M	.E..HD	KCK15
K3	.S..GE	KCPK30	.S..GD2	KCPK30	.E..HD	KCPK30
N1-N2	.F..LDJ	KC410M	.F..LDJ	KC410M	.F..LDJ	KC410M
N3	.F..LDJ	KC410M	.E..LDJ	KC422M	.E..LDJ	KC422M
S1-S2	.E..GD	KC725M	.S..GE	KC725M	.S..GD2	KC725M
S3	.S..GE	KC725M	.S..GD2	KC725M	.E..HD	KC725M
S4	.S..GD2	KC725M	.E..HD	KC725M	—	—
H1	—	—	—	—	—	—

Indexable Inserts



P	●				○	●	●	●
M	●				●	●	○	○
K	●			●	○	●	○	○
N	●	●						
S	●				●	●		
H								

● first choice
○ alternate choice

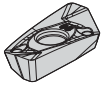
Shoulder Mills

EDCT-F.LDJ

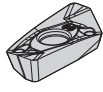
catalog number	LI	W	S	BS	Re	hm	cutting edges	KC410M	KC422M	KC520M	KC522M	KC725M	KCK15	KCPM20	KCPK30
EC1402FLDJ	.687	.334	.177	.124	.008	.001	2	●							
EC1404FLDJ	.687	.334	.177	.116	.016	.001	2	●							
EC1408FLDJ	.688	.334	.177	.101	.031	.001	2	●							
EC1412FLDJ	.688	.333	.177	.085	.047	.001	2	●							
EC1416FLDJ	.688	.333	.177	.070	.062	.001	2	●							
EC1431FLDJ	.689	.331	.177	.010	.122	.001	2	●							
EC1440FLDJ	.651	.329	.177	—	.157	.001	2	●							

EDCT-E.LDJ

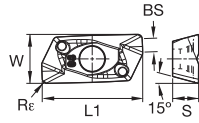
catalog number	LI	W	S	BS	Re	hm	cutting edges	KC410M	KC422M	KC520M	KC522M	KC725M	KCK15	KCPM20	KCPK30
EC1404ELDJ	.687	.334	.177	.116	.016	.001	2		●						
EC1408ELDJ	.688	.334	.177	.101	.031	.001	2		●						
EC1412ELDJ	.688	.333	.177	.085	.047	.001	2		●						
EC1416ELDJ	.688	.333	.177	.070	.062	.001	2		●						
EC1424ELDJ	.689	.332	.177	.039	.094	.001	2		●						
EC1431ELDJ	.689	.331	.177	.010	.122	.001	2		●						
EC1440ELDJ	.651	.329	.177	—	.157	.001	2		●						



EDCT-LD



EDCT-E.GD



P	■	■	■	○	●	●	●	●
M	■	■	■	○	●	●	○	○
K	■	■	○	○	●	●	○	○
N	■	■	■	■	■	■	■	■
S	■	■	■	■	■	■	■	■
H	■	■	■	■	■	■	■	■

● first choice
○ alternate choice

■ EDCT-LD

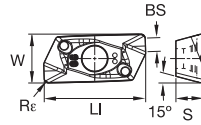
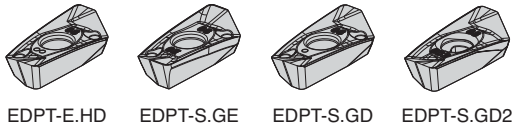
catalog number	LI	W	S	BS	Rr	hm	cutting edges	KC410M	KC422M	KC520M	KC522M	KC725M	KCK15	KCPM20	KCPK30
EC1404ELD	.687	.334	.177	.116	.016	.002	2				●				
EC1408ELD	.688	.334	.177	.101	.031	.002	2				●				
EC1412ELD	.688	.333	.177	.085	.047	.002	2				●				
EC1416ELD	.688	.333	.177	.070	.062	.002	2				●				
EC1431ELD	.689	.331	.177	.010	.122	.002	2				●				

■ EDCT-E.GD

catalog number	LI	W	S	BS	Rr	hm	cutting edges	KC410M	KC422M	KC520M	KC522M	KC725M	KCK15	KCPM20	KCPK30
EC1404EGD	.687	.334	.177	.116	.016	.002	2					●		●	
EC1408EGD	.688	.334	.177	.101	.031	.002	2					●		●	
EC1412EGD	.688	.333	.177	.085	.047	.002	2					●			
EC1416EGD	.688	.333	.177	.070	.062	.002	2					●			
EC1431EGD	.689	.331	.177	.010	.122	.002	2					●		●	



Shoulder Mills



● first choice
○ alternate choice

P	●	○	○	○	○	○	○	○	○
M	○	○	○	○	○	○	○	○	○
K	○	○	○	○	○	○	○	○	○
N	○	○	○	○	○	○	○	○	○
S	○	○	○	○	○	○	○	○	○
H	○	○	○	○	○	○	○	○	○

■ EDPT-E.HD

catalog number	LI	W	S	BS	Rε	hm	cutting edges
EP1404EHD	.687	.330	.177	.116	.016	.003	2
EP1408EHD	.688	.330	.177	.101	.031	.003	2
EP1412EHD	.688	.329	.177	.085	.047	.003	2
EP1416EHD	.688	.329	.177	.070	.062	.003	2
EP1420EHD	.688	.329	.177	.054	.079	.003	2
EP1424EHD	.689	.328	.177	.039	.094	.003	2
EP1431EHD	.689	.327	.177	.010	.122	.003	2
EP1440EHD	.651	.325	.177	—	.157	.003	2

■ EDPT-S.GE

catalog number	LI	W	S	BS	Rε	hm	cutting edges
EP1404SGE	.686	.323	.175	.110	.016	.005	2
EP1408SGE	.686	.322	.175	.094	.031	.005	2
EP1412SGE	.687	.320	.175	.078	.047	.005	2
EP1416SGE	.687	.320	.175	.062	.062	.005	2
EP1431SGE	.687	.318	.175	.005	.122	.005	2

■ EDPT-S.GD

catalog number	LI	W	S	BS	Rε	hm	cutting edges
EP1408SGD	.688	.330	.177	.101	.031	.004	2
EP1412SGD	.688	.329	.177	.085	.047	.004	2
EP1416SGD	.688	.329	.177	.070	.062	.004	2

■ EDPT-S.GD2

catalog number	LI	W	S	BS	Rε	hm	cutting edges
EP1408SGD2	.688	.330	.177	.103	.031	.004	2

	KC410M	KC422M	KC520M	KC522M	KC725M	KCK15	KCPM20	KCPK30
EP1404EHD				●	●	●	●	●
EP1408EHD			●	●	●	●	●	●
EP1412EHD			●	●	●	●	●	●
EP1416EHD			●	●	●	●	●	●
EP1420EHD			●	●	●	●	●	●
EP1424EHD			●	●	●	●	●	●
EP1431EHD			●	●	●	●	●	●
EP1440EHD			●	●	●	●	●	●
EP1404SGE				●	●	●	●	●
EP1408SGE				●	●	●	●	●
EP1412SGE				●	●	●	●	●
EP1416SGE				●	●	●	●	●
EP1431SGE				●	●	●	●	●
EP1408SGD				●	●	●	●	●
EP1412SGD				●	●	●	●	●
EP1416SGD				●	●	●	●	●
EP1408SGD2				●	●	●	●	●

Shoulder Mills

■ Recommended Starting Speeds and Feeds [SFM]

Material Group		KC410M			KC422M			KC520M			KC522M		
P	1	—	—	—	—	—	—	—	—	—	1080	940	880
	2	—	—	—	—	—	—	—	—	—	900	790	660
	3	—	—	—	—	—	—	—	—	—	830	700	580
	4	—	—	—	—	—	—	—	—	—	740	610	490
	5	—	—	—	—	—	—	—	—	—	610	550	490
	6	—	—	—	—	—	—	—	—	—	540	410	330
M	1	—	—	—	—	—	—	—	—	—	670	590	540
	2	—	—	—	—	—	—	—	—	—	610	520	430
	3	—	—	—	—	—	—	—	—	—	460	400	310
K	1	—	—	—	—	—	—	880	800	710	750	680	600
	2	—	—	—	—	—	—	690	620	580	590	530	490
	3	—	—	—	—	—	—	580	520	470	490	440	400
N	1-2	3990	3550	3270	3520	3100	2870	—	—	—	—	—	—
	3	3580	3270	3000	3100	2870	2500	—	—	—	—	—	—
S	1	—	—	—	—	—	—	—	—	—	130	120	90
	2	—	—	—	—	—	—	—	—	—	130	120	90
	3	—	—	—	—	—	—	—	—	—	170	130	90
	4	—	—	—	—	—	—	—	—	—	230	170	120
H	1	—	—	—	—	—	—	—	—	—	—	—	—

Material Group		KC725M			KCK15			KCPM20			KCPK30		
P	1	860	750	700	—	—	—	1810	1590	1470	1485	1300	1210
	2	720	630	530	—	—	—	1120	1010	910	920	830	750
	3	660	560	460	—	—	—	1010	910	830	830	750	680
	4	590	490	390	—	—	—	760	700	630	620	575	520
	5	490	440	390	—	—	—	910	820	750	850	760	690
	6	430	330	260	—	—	—	630	550	475	520	450	—
M	1	560	490	450	—	—	—	730	655	570	680	600	515
	2	510	430	360	—	—	—	670	580	520	610	530	460
	3	380	330	260	—	—	—	530	475	410	475	430	380
K	1	—	—	—	1380	1255	1115	1180	1070	960	965	875	780
	2	—	—	—	1095	975	910	940	840	770	770	690	630
	3	—	—	—	920	815	750	790	700	650	645	575	530
N	1-2	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—
S	1	115	100	80	—	—	—	—	—	—	—	—	—
	2	115	100	80	—	—	—	—	—	—	—	—	—
	3	150	115	80	—	—	—	—	—	—	—	—	—
	4	200	150	100	—	—	—	—	—	—	—	—	—
H	1	—	—	—	—	—	—	—	—	—	—	—	—

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

■ Recommended Starting Feeds [IPT]

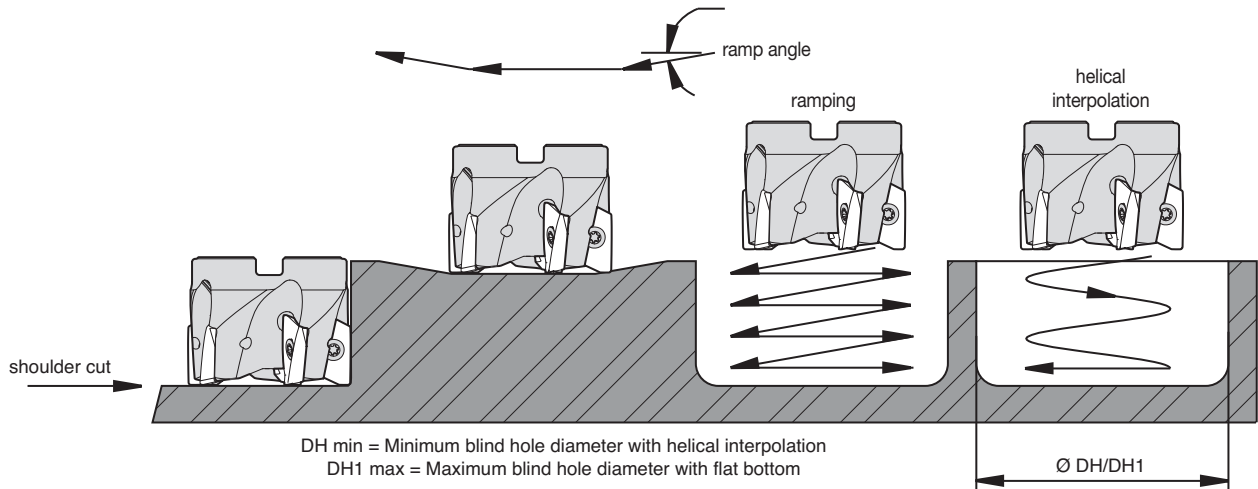
Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.F..LDJ	.003	.007	.009	.003	.005	.007	.002	.004	.006	.002	.004	.006	.002	.004	.006	.F..LDJ
.E..LDJ	.003	.008	.014	.003	.006	.011	.002	.005	.009	.002	.005	.009	.002	.005	.008	.E..LDJ
.E..LD	.004	.008	.014	.003	.006	.010	.002	.005	.009	.002	.005	.008	.002	.005	.008	.E..LD
.E..GD	.005	.011	.017	.004	.008	.013	.003	.007	.011	.003	.007	.010	.003	.008	.010	.E..GD
.S..GE	.007	.014	.020	.005	.010	.015	.004	.009	.013	.004	.008	.012	.004	.008	.012	.S..GE
.S..GD	.007	.014	.021	.005	.010	.015	.004	.009	.013	.004	.008	.012	.004	.008	.012	.S..GD
.S..GD2	.007	.016	.024	.005	.012	.017	.004	.010	.015	.004	.010	.014	.004	.009	.014	.S..GD2
.E..HD	.007	.017	.028	.005	.013	.020	.004	.011	.018	.004	.010	.016	.004	.010	.016	.E..HD

NOTE: Use "Light Machining" values as starting feed rate.



■ Application Examples



insert style	cutting diameter	max ramp angle	min hole diameter (DH min)	max flat-bottom hole diameter (DH1 max)	max diameter (no flat bottom)
Mill 1-14	1.25	5.4°	1.862	2.312	2.5
Mill 1-14	1.50	4.0°	2.370	2.822	3
Mill 1-14	2.00	2.6°	3.368	3.822	4
Mill 1-14	2.50	1.9°	4.367	4.822	5

Best Machining Practices

Shoulder Mills



Contouring/Profiling
Ae = up to 50% of cutter Ø.
This can be used with or without coolant/air blast, depending on materials being machined.



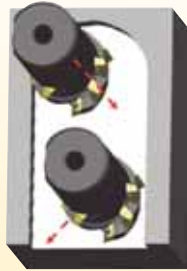
Slotting
Full width cutting or profiling over 50% of the cutter Ø. It is suggested to use coolant or air blast to evacuate chips. If necessary, reduce coolant nozzle hole size, which adds more pressure, and the chip is forced out of the chip gash.



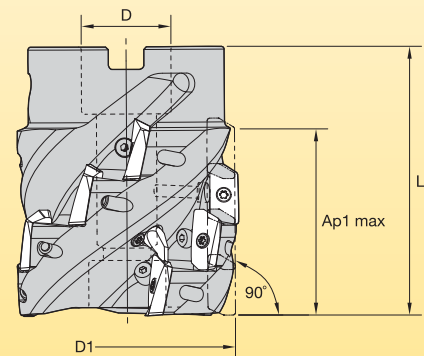
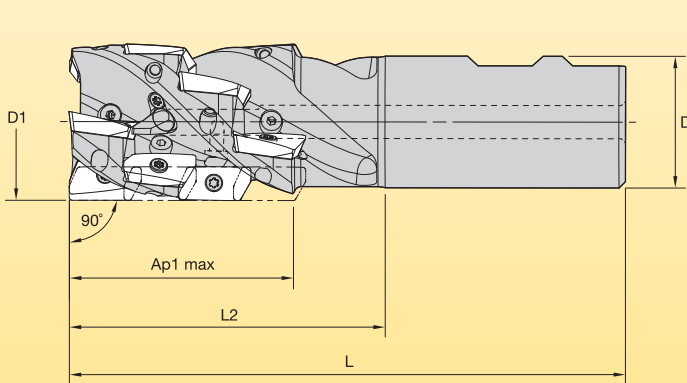
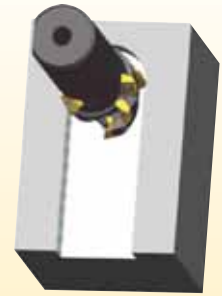
Ramping
Only machine to the depth of the first insert. Observe the ramping angles given in the catalog.

■ Slotting by Plunging

Slot with the alternate side method, alternating the cuts from side to side. This will enable the cutter to move away from the material prior to moving back up in the Z-axis. The cutter will not be in contact with the workpiece. Follow the direction of the arrows. Move 3 axes simultaneously into the center of the slot. Maximum step over .315" (8mm).



With multiple Z-axis passes, when the final depth is achieved, move straight back up in the Z-axis, then repeat at the next step over.



LOIS™ Mill 1-14 Helical End Mills

	catalog number	order number	D1	ZU ¹	Z	Mtg. ²	D	L2	L	Ap1 max	max Ra ³	max CR ⁴	max RPM
Inch Cutters	M1HR125E14W125Z2L200C4	3732889	1.25	2	4	W	1.25	2.00	4.28	1.09	5.4°	0.094	31100
	M1HR150E14W125Z3L200C6	3732890	1.50	3	6	W	1.25	2.00	4.28	1.09	4.0°	0.094	28400
	M1HR150E14W125Z3L250C9	3732891	1.50	3	9	W	1.25	2.50	4.78	1.61	4.0°	0.094	28400
	M1HR150E14W125Z3L300C12	3732892	1.50	3	12	W	1.25	3.00	5.28	2.13	4.0°	0.094	28400
	M1HR200E14S075Z3L200C6	3732933	2.00	3	6	S	0.75	—	2.00	1.07	2.6°	0.094	24600
	M1HR200E14S075Z3L250C9	3732934	2.00	3	9	S	0.75	—	2.5	1.59	2.6°	0.094	24600
	M1HR200E14W150Z3L300C12	3732935	2.00	3	12	W	1.50	3.00	5.69	2.10	2.6°	0.094	24600
	M1HR250E14S100Z3L200C6	3732936	2.50	3	6	S	1.00	—	2.00	1.06	1.9°	0.094	22000
	M1HR250E14S100Z3L250C9	3732937	2.50	3	9	S	1.00	—	2.50	1.57	1.9°	0.062	22000
	M1HR250E14S100Z4L250C12	3732938	2.50	4	12	S	1.00	—	2.50	1.57	1.9°	0.062	22000
M1HR250E14S100Z3L300C12	3732939	2.50	3	12	S	1.00	—	3.00	2.07	1.9°	0.062	22000	
⁵	M1HR250E14S100Z5L300C20	3786638	2.50	5	20	S	1.00	—	3.00	2.07	1.9°	0.062	22000
Metric Cutters	M1H32J2R50B32S90ED14C4	3742932	32	2	4	W	32	50	111	27,8	5,4°	2,4	31100
	M1H40J3R50B32S90ED14C6	3743033	40	3	6	W	32	50	111	27,6	3,8°	2,4	28400
	M1H40J3R65B32S90ED14C9	3743034	40	3	9	W	32	65	126	40,8	3,8°	2,4	28400
	M1H40J4R80B32S90ED14C12	5085631	40	4	12	W	32	80	141	40,8	3,8°	2,5	28400
	M1H40J3R80B32S90ED14C12	3743035	40	3	12	W	32	80	141	54,0	3,8°	2,4	28400
	M1H50T3R50A22S90ED14C6	3743036	50	3	6	S	22	—	50	27,3	2,7°	2,4	24600
	M1H50T3R65A22S90ED14C9	3743037	50	3	9	S	22	—	65	40,4	2,7°	2,4	24600
	M1H50J3R80B40S90ED14C12	3743038	63	3	12	W	40	80	151	53,5	1,9°	2,4	24600
	M1H63T3R50A27S90ED14C6	3743039	63	3	6	S	27	—	50	27,0	1,9°	1,6	22000
	M1H63T3R65A27S90ED14C9	3743040	63	3	9	S	27	—	65	39,9	1,9°	1,6	22000
	M1H63T4R65A27S90ED14C12	3743041	63	4	12	S	27	—	65	39,9	1,9°	1,6	22000
	M1H63T3R75A27S90ED14C12	3743042	63	3	12	S	27	—	75	52,8	1,9°	1,6	22000
	⁵	M1H63T5R75A27S90ED14C20	3831819	63	5	20	S	27	—	75	52,8	1,9°	1,6	22000

- ¹ Number of effective flutes.
- ² Mounting style: W = Weldon®; S = Shell mill.
- ³ Max ramp angle when radial depth of cut exceeds 0.31" (8mm).
- ⁴ Max insert corner radius allowed in first row without cutter body modification.
- ⁵ Recommended for profiling applications only.

Shoulder Mills

Profile, Slot, and Ramp

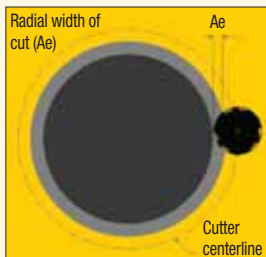
When taking a cut that equals up to 50% of the cutter diameter, you can operate without coolant, unless your material is coolant-dependent. When using more than 50% of the cutter diameter, there is a need to have coolant or an air blast through the nozzles. This will assist with chip evacuation. Please use the feed table when taking a small percentage of the cutter diameter. This will improve the volume of material removed. To achieve a superior surface finish on the base, adjust the feed to suit the finish required.

When using this cutter for plunging, the maximum suggested step over is .130" (3,30mm). Always try to move the cutter and insert away from the material when retracting in the Z-axis. This can be done when employing the alternate cut method (zig zag method). Use a 3-axis move to get all axes moving at the same time, suggest .010" (0,25mm).

When machining a conventional slot, you have to move straight up in the Z-axis.

Circular and Helical Interpolation

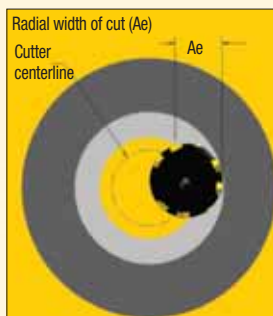
External



When profiling around the external part of a component, it is important to increase the feed rate. This will maintain the chip thickness value. The programmed feed rate needs to be calculated at the cutter centerline.

For external profiling, adjust the feed rate for feed at the cutter centerline. Increase the feed rate for external profiling.

Internal



When machining inside a component profile, the area of contact is larger. The feed rate needs to be slower and at the centerline.

For internal profiling, adjust the feed rate for feed at the cutter centerline. This will effectively reduce the feed rate as the distance traveled is less than the peripheral distance.

Cutting Data

Reference page P41 for both speed and feed data. Each insert has an average chip thickness value that will enable you to determine the feed per tooth.

Please remember when using less than 50% of the cutter diameter, the feed rate will need to be increased. Failure to do so will result in premature insert failure.

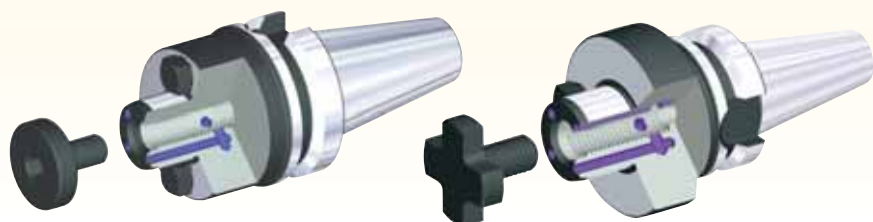
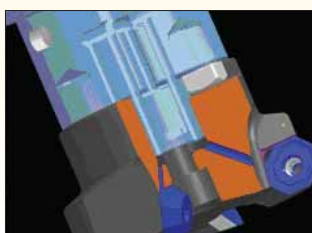
Running too slowly will reduce tool life.

Spare Parts

Please make sure all the spare parts in the cutters are fully tightened prior to using the product.

Shell mill cutters no longer have coolant grooved bolts. We now have adapters that will enable the coolant to be fed through the adapter pilot diameter.

True Through Coolant Shell Mill Adapters





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For bearing milling chucks when grip counts.
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 **KENNAMETAL®**

Mill 1-18™

Primary Application

Mill 1-18 is a versatile, functional cutter system for a range of cutting tasks. Mill 1-18 cutters can be used for profiling, slotting, ramping, helical interpolation, plunging, and other milling applications. It's a single tool with multi-functional benefits. The Mill 1-18 inserts also are specially designed to add cutting versatility, especially for larger axial depths of cut. Results include significantly reduced cycle times and lower cutting forces.

Features and Benefits

Features

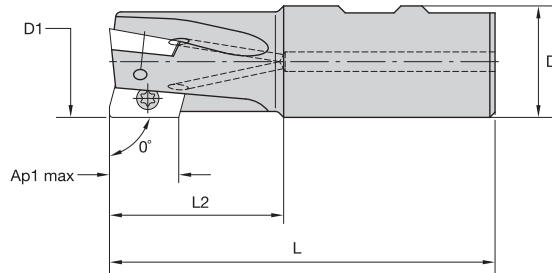
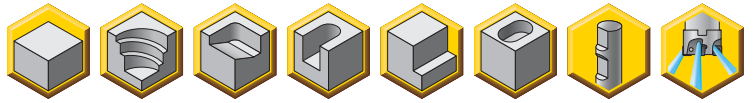
- Inserts for larger axial depth of cut.
- Inserts radii up to .250" (6,35mm).
- Axial depth of cut up to .708" (18mm).
- Cutter diameters up to 8" (160mm).
- Beyond™ grade technology.

Benefits

- Slotting, profiling, ramping, helical interpolation, and plunging.
- Angled screw for insert retention.
- Insert geometries and grades for most workpiece materials.



- Aggressive ramping angles.
- Generates superior surface finish.
- Mill 0° walls.
- High RPM capabilities.



■ End Mills • Weldon® Shank

order number	catalog number	D1	D	L	L2	Ap1 max	Z	max ramp angle	lbs	max RPM
2267545	M1D097E1802W100L175	.970	1.000	4.030	1.750	.710	2	17.5°	.67	37710
2267550	M1D100E1802W100L175R	1.000	1.000	3.968	1.688	.640	2	13.6°	.70	37000
2267546	M1D100E1802W100L175	1.000	1.000	4.030	1.750	.710	2	16.5°	.69	37000
2267552	M1D100E1802W100L375R	1.000	1.000	5.968	3.688	.640	2	13.6°	1.10	37000
2267547	M1D100E1802W100L375	1.000	1.000	6.030	3.750	.710	2	16.5°	1.09	37000
2267624	M1D125E1803W125L225R	1.250	1.250	4.468	2.188	.650	3	7.5°	1.22	32300
2267623	M1D125E1803W125L225	1.250	1.250	4.530	2.250	.710	3	10.5°	1.23	32300
2267626	M1D125E1803W125L425R	1.250	1.250	6.468	4.188	.650	3	7.5°	1.83	32300
2267625	M1D125E1803W125L425	1.250	1.250	6.530	4.250	.710	3	10.5°	1.84	32300

■ Spare Parts



insert screw



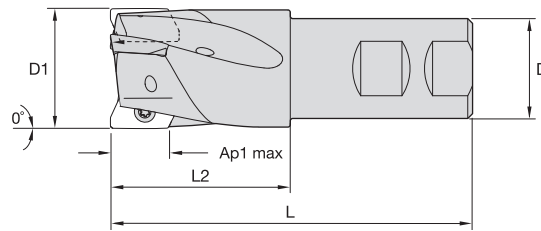
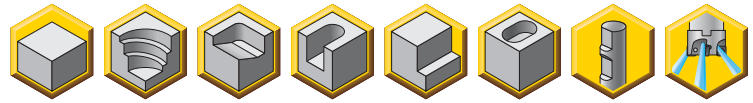
Torx Plus driver

D1	insert screw	in. lbs.	Torx Plus driver
.970	MS2126	30.0	DT15IP
1.000	MS2126	30.0	DT15IP
1.250	MS2126	30.0	DT15IP

NOTE: "R" in catalog number designates factory relieved tool for insert radii .187" and .250". For example: M1D100E1802W100L375R.
Additional insert screws may be ordered in packages of five pieces from catalog number MS2126PKG.
Standard milling cutters will accept insert nose radii up to .078" without modification.

Shoulder Mills

- Aggressive ramping angles.
- Generates superior surface finish.
- Mill 0° walls.
- High RPM capabilities.



■ End Mills • Reduced Weldon® Shank

order number	catalog number	D1	D	L	L2	Ap1 max	Z	max ramp angle	lbs	max RPM
2452372	M1D100E1802W075L175	1.000	.750	3.780	1.750	.710	2	16.5°	.45	37000
2452414	M1D125E1802W100L225	1.250	1.000	4.530	2.250	.710	2	10.5°	1.00	32300
2635710	M1D125E1803W100L225	1.250	1.000	4.530	2.250	.710	3	10.5°	.95	32300
2267627	M1D150E1803W125L225	1.500	1.250	4.530	2.250	.710	3	8.0°	1.50	29020
2267631	M1D150E1803W125L425R	1.500	1.250	6.468	4.188	.640	3	5.3°	2.40	29020
2267651	M1D150E1803W125L425	1.500	1.250	6.530	4.250	.710	3	8.0°	2.40	29020
2267628	M1D150E1804W125L225R	1.500	1.250	4.468	2.188	.640	4	5.3°	1.40	29020
2267629	M1D150E1804W125L225	1.500	1.250	4.530	2.250	.710	4	8.0°	1.40	29020
2267621	M1D200E1805W125L225	2.000	1.250	4.530	2.250	.710	5	5.0°	2.00	24670

■ Spare Parts

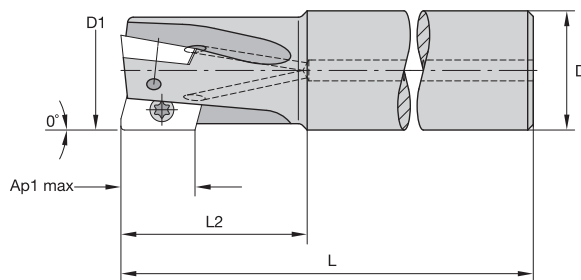
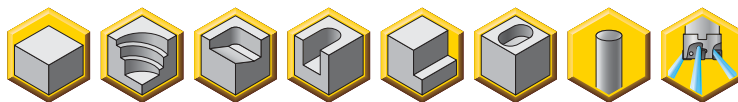


Shoulder Mills

D1	insert screw	in. lbs.	Torx Plus driver
1.000	MS2126	30.0	DT15IP
1.250	MS2126	30.0	DT15IP
1.500	MS2126	30.0	DT15IP
2.000	MS2126	30.0	DT15IP

NOTE: "R" in catalog number designates factory relieved tool for insert radii .187" and .250". For example: M1D100E1802W100L375R.
Additional insert screws may be ordered in packages of five pieces from catalog number MS2126PKG.
Standard milling cutters will accept insert nose radii up to .078" without modification.

- Aggressive ramping angles.
- Generates superior surface finish.
- Mill 0° walls.
- High RPM capabilities.



■ End Mills • Cylindrical Shank

order number	catalog number	D1	D	L	L2	Ap1 max	Z	max ramp angle	lbs	max RPM
2267534	M1D100E1802C100L800	1.000	1.000	8.000	3.750	.710	2	16.5°	1.49	37000
2267535	M1D100E1802C100L1000	1.000	1.000	10.000	3.750	.710	2	16.5°	1.91	37000
2267536	M1D125E1802C125L800	1.250	1.250	8.000	4.250	.710	2	10.5°	2.40	32300
2267537	M1D125E1802C125L1000	1.250	1.250	10.000	4.250	.710	2	10.5°	3.06	32300
2267538	M1D150E1803C125L800	1.500	1.250	8.000	4.250	.710	3	8.0°	3.00	29020
2267539	M1D150E1803C125L1000	1.500	1.250	10.000	4.250	.710	3	8.0°	3.70	29020

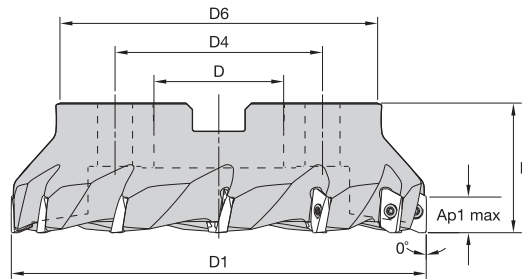
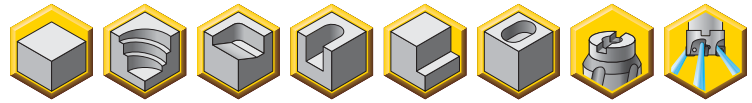
■ Spare Parts

D1	insert screw	in. lbs.	Torx Plus driver
1.000	MS2126	30.0	DT15IP
1.250	MS2126	30.0	DT15IP
1.500	MS2126	30.0	DT15IP

NOTE: Additional insert screws may be ordered in packages of five pieces from catalog number MS2126PKG. Standard milling cutters will accept insert nose radii up to .078" without modification.

Shoulder Mills

- Aggressive ramping angles.
- Generates superior surface finish.
- Mill 0° walls.
- High RPM capabilities.



■ **Shell Mills**

order number	catalog number	D1	D	D4	D6	L	Ap1 max	Z	max ramp angle	lbs	max RPM
2267542	M1D200E1803S075L157	2.000	.750	—	1.688	1.575	.700	3	5.0°	.78	24670
2267541	M1D200E1803SS75L157	2.000	.750	—	1.688	1.575	.700	3	5.0°	.81	24670
2267540	M1D200E1805SS75L157	2.000	.750	—	1.750	1.575	.700	5	5.0°	.74	24670
2267650	M1D200E1805S075L157	2.000	.750	—	1.750	1.575	.700	5	5.0°	.72	24670
2267614	M1D250E1804S075L157	2.500	.750	—	1.750	1.575	.690	4	4.0°	1.15	21820
2267632	M1D250E1806S075L157	2.500	.750	—	1.750	1.575	.690	6	4.0°	1.02	21820
2267616	M1D300E1805S100L175	3.000	1.000	—	2.188	1.750	.690	5	3.0°	1.93	19780
2267615	M1D300E1807SS100L175	3.000	1.000	—	2.188	1.750	.690	7	3.0°	1.84	19780
2267643	M1D300E1807S100L175	3.000	1.000	—	2.188	1.750	.690	7	3.0°	1.81	19780
2267617	M1D400E1806S150L200	4.000	1.500	—	3.625	2.000	.690	6	2.0°	3.72	16970
2267644	M1D400E1808S150L200	4.000	1.500	—	3.625	2.000	.690	8	2.0°	3.58	16970
2267645	M1D500E1809S150L200	5.000	1.500	—	3.750	2.000	.690	9	1.5°	5.60	15100
2267646	M1D600E1808S150L200	6.000	1.500	—	3.750	2.000	.690	8	1.2°	7.93	13740
2267618	M1D600E1808S200L200	6.000	2.000	—	4.875	2.000	.690	8	1.2°	8.54	13740
2267620	M1D800E1812S250L250	8.000	2.500	4.000	6.125	2.500	.690	12	1.0°	16.87	11850

■ **Spare Parts**

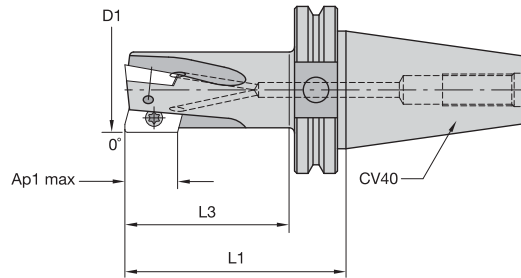
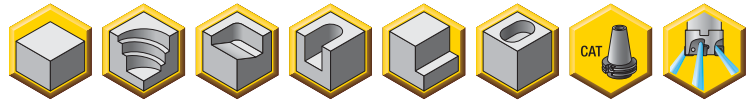
Shoulder Mills



D1	insert screw	in. lbs.	Torx Plus driver	socket-head cap screw with coolant groove	coolant lock screw	flat point socket set screw
2.000	MS2126	30.0	DT15IP	S445CG	—	—
2.000	MS2126	30.0	DT15IP	KLSS0712C	—	—
2.500	MS2126	30.0	DT15IP	S445CG	—	—
3.000	MS2126	30.0	DT15IP	KLSS1013C	—	—
3.000	MS2126	30.0	DT15IP	S2044CG	—	—
4.000	MS2126	30.0	DT15IP	—	KLS15C	MS1297
5.000	MS2126	30.0	DT15IP	—	KLS15C	MS1297
6.000	MS2126	30.0	DT15IP	—	KLS20C	MS1297
6.000	MS2126	30.0	DT15IP	—	KLS15C	MS1297
8.000	MS2126	30.0	DT15IP	—	—	—

NOTE: "Speed screw" differential lock-up system is identified by the "SS" in the catalog number. For example: M1D200E1803SS075L157. Additional insert screws may be ordered in packages of five pieces from catalog number MS2126PKG. Standard milling cutters will accept insert nose radii up to .078" without modification.

- Aggressive ramping angles.
- Generates superior surface finish.
- Mill 0° walls.
- High RPM capabilities.



■ End Mills • Steep Taper CV40

order number	catalog number	CSMS system size	D1	L1	L3	Ap1 max	Z	max ramp angle	lbs	max RPM
2267549	M1D100E1802CV40L250	CV40	1.000	2.500	1.625	.710	2	16.5°	2.04	37000
2541967	M1D100E1802CV40L450	CV40	1.000	4.500	2.625	.710	2	16.5°	2.79	37000
2267551	M1D125E1803CV40L288	CV40	1.250	2.875	2.000	.710	3	10.5°	2.26	32300
2541970	M1D125E1803CV40L488	CV40	1.250	4.875	3.000	.710	3	10.5°	3.14	32300
2267548	M1D150E1804CV40L288	CV40	1.500	2.875	2.000	.710	4	8.0°	2.43	29020
2541972	M1D150E1804CV40L488	CV40	1.500	4.875	3.000	.710	4	8.0°	3.56	29020

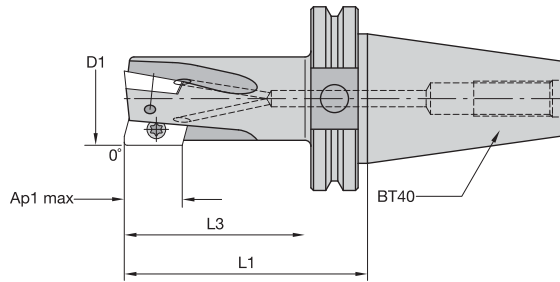
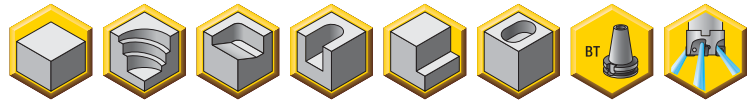
■ Spare Parts

D1	insert screw	in. lbs.	Torx Plus driver
1.000	MS2126	30.0	DT15IP
1.250	MS2126	30.0	DT15IP
1.500	MS2126	30.0	DT15IP

NOTE: Additional insert screws may be ordered in packages of five pieces from catalog number MS2126PKG. Standard milling cutters will accept insert nose radii up to .078" without modification.



- Aggressive ramping angles.
- Generates superior surface finish.
- Mill 0° walls.
- High RPM capabilities.



■ End Mills • Steep Taper BT40

order number	catalog number	CSMS system size	D1	L1	L3	Ap1 max	Z	max ramp angle	lbs	max RPM
2541969	M1D100E1802BT40L450	BT40	1.000	4.500	2.625	.710	2	16.5°	2.85	37000
2541986	M1D125E1803BT40L488	BT40	1.250	4.875	3.000	.710	3	10.5°	3.21	32300
2541984	M1D150E1804BT40L488	BT40	1.500	4.875	3.000	.710	4	8.0°	3.59	29020

■ Spare Parts

D1	insert screw	in. lbs.	Torx Plus driver
1.000	MS2126	30.0	DT15IP
1.250	MS2126	30.0	DT15IP
1.500	MS2126	30.0	DT15IP

NOTE: Additional insert screws may be ordered in packages of five pieces from catalog number MS2126PKG. Standard milling cutters will accept insert nose radii up to .078" without modification.

■ Recommended Starting Speeds and Feeds [SFM]

Material Group		KC410M			KC422M			KC520M			KC522M			KC525M		
P	1	—	—	—	—	—	—	—	—	—	1080	940	880	720	660	590
	2	—	—	—	—	—	—	—	—	—	900	790	660	590	520	490
	3	—	—	—	—	—	—	—	—	—	830	700	580	520	490	460
	4	—	—	—	—	—	—	—	—	—	740	610	490	460	430	390
	5	—	—	—	—	—	—	—	—	—	610	550	490	490	460	430
	6	—	—	—	—	—	—	—	—	—	540	410	330	430	390	360
M	1	—	—	—	—	—	—	—	—	—	670	590	540	490	460	430
	2	—	—	—	—	—	—	—	—	—	610	520	430	430	390	360
	3	—	—	—	—	—	—	—	—	—	460	400	310	300	260	230
K	1	—	—	—	—	—	—	880	800	710	750	680	600	—	—	—
	2	—	—	—	—	—	—	690	620	580	590	530	490	—	—	—
	3	—	—	—	—	—	—	580	520	470	490	440	400	—	—	—
N	1-2	3990	3550	3270	3520	3100	2870	—	—	—	—	—	—	—	—	—
	3	3550	3270	3000	3100	2870	2500	—	—	—	—	—	—	—	—	—
S	1	—	—	—	—	—	—	—	—	—	130	120	90	200	180	160
	2	—	—	—	—	—	—	—	—	—	130	120	90	200	180	160
	3	—	—	—	—	—	—	—	—	—	170	130	90	160	150	130
	4	—	—	—	—	—	—	—	—	—	230	170	120	200	160	130
H	1	—	—	—	—	—	—	—	—	—	390	300	230	—	—	—

Material Group		KC725M			KCK15			KCPM20			KCPK30		
P	1	860	750	700	—	—	—	1810	1590	1470	1485	1300	1210
	2	720	630	530	—	—	—	1120	1010	910	920	830	750
	3	660	560	460	—	—	—	1010	910	830	830	750	680
	4	590	490	390	—	—	—	760	700	630	620	575	520
	5	490	440	390	—	—	—	910	820	750	850	760	690
	6	430	330	260	—	—	—	630	550	475	520	450	—
M	1	560	490	450	—	—	—	730	655	570	680	600	515
	2	510	430	360	—	—	—	670	580	520	610	530	460
	3	380	330	260	—	—	—	530	475	410	475	430	380
K	1	—	—	—	1380	1255	1115	1180	1070	960	965	875	780
	2	—	—	—	1095	975	910	940	840	770	770	690	630
	3	—	—	—	920	815	750	790	700	650	645	575	530
N	1-2	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—
S	1	115	100	80	—	—	—	—	—	—	—	—	—
	2	115	100	80	—	—	—	—	—	—	—	—	—
	3	150	115	80	—	—	—	—	—	—	—	—	—
	4	200	150	100	—	—	—	—	—	—	—	—	—
H	1	—	—	—	—	—	—	460	380	310	—	—	—

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

Shoulder Mills

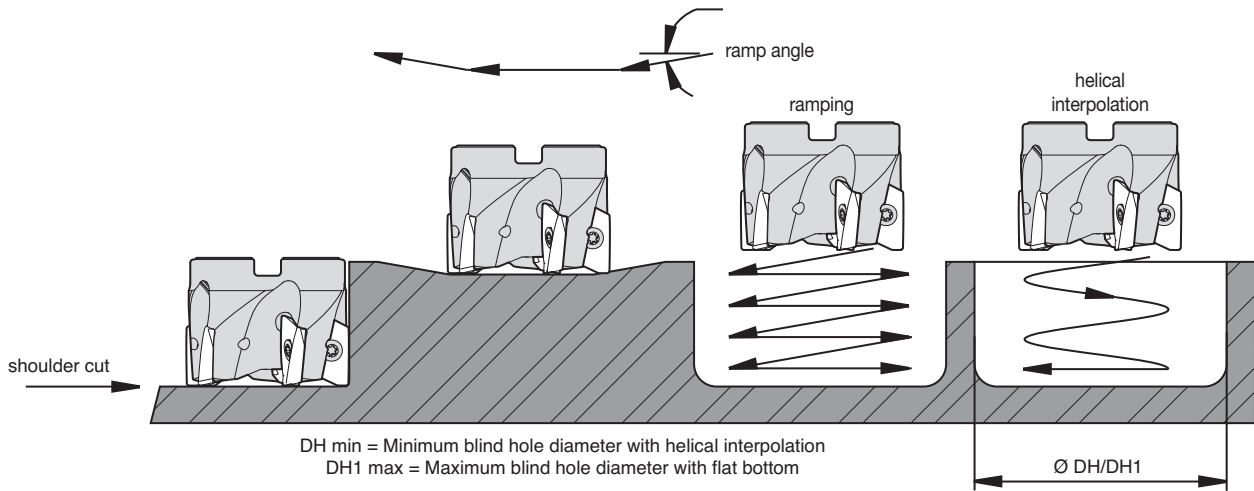
■ Recommended Starting Feeds [IPT]

Light Machining	General Purpose	Heavy Machining
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Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.F..LDJ	.003	.007	.009	.003	.005	.007	.002	.004	.006	.002	.004	.006	.002	.004	.006	.F..LDJ
.E..LDJ	.003	.008	.014	.003	.006	.011	.002	.005	.009	.002	.005	.009	.002	.005	.008	.E..LDJ
.E..LD	.005	.011	.019	.004	.008	.014	.003	.007	.012	.003	.007	.011	.003	.006	.011	.E..LD
.E..GD	.007	.012	.021	.005	.009	.015	.004	.008	.013	.004	.007	.013	.004	.007	.012	.E..GD
.S..GE	.007	.014	.023	.005	.010	.017	.004	.009	.015	.004	.008	.014	.004	.008	.014	.S..GE
.S..GD	.007	.015	.026	.005	.011	.019	.004	.010	.016	.004	.009	.015	.004	.009	.015	.S..GD
.E..HD	.007	.017	.028	.005	.013	.020	.004	.011	.018	.004	.010	.016	.004	.010	.016	.E..HD

NOTE: Use "Light Machining" values as starting feed rate.

Application Examples



insert style	cutting diameter	max ramp angle	min hole diameter (DH min)	max flat-bottom hole diameter (DH1 max)	max diameter (no flat bottom)
Mill-1, 18mm	.970	18°	1.124	1.776	1.94
Mill-1, 18mm	1.000	17°	1.182	1.836	2.00
Mill-1, 18mm	1.250	11°	1.686	2.336	2.50
Mill-1, 18mm	1.500	8°	2.182	2.836	3.00
Mill-1, 18mm	2.000	5°	3.180	3.836	4.00
Mill-1, 18mm	1.500	8°	2.180	2.836	3.00
Mill-1, 18mm	2.000	5°	3.176	3.862	4.00
Mill-1, 18mm	2.500	4°	4.174	4.862	5.00
Mill-1, 18mm	3.000	3°	5.174	5.862	6.00
Mill-1, 18mm	4.000	2°	7.174	7.862	8.00
Mill-1, 18mm	5.000	2°	9.172	9.862	10.00
Mill-1, 18mm	6.000	1°	11.172	11.862	12.00
Mill-1, 18mm	8.000	1°	15.172	15.862	16.00

Shoulder Mills

Mill 1-25™

Primary Application

Also known as Mill1 Max, the Mill 1-25 cutter is made specifically for aluminum machining but is also useful when machining cast iron. High-Feed capabilities enable routing applications with an axial depth of cut of up to .98" (25mm).

Features and Benefits

Functions

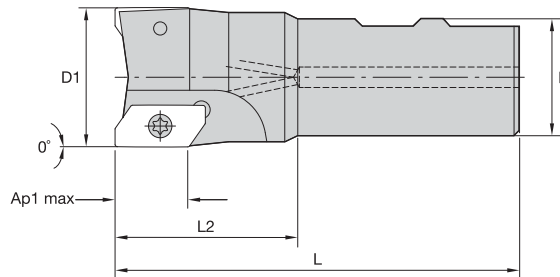
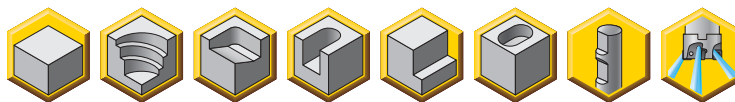
- Strong, thick inserts over .200" (5,2mm) thick.
- Axial depth of cut up to .98" (25mm).
- Cylindrical, monoblock/HSK63A, CV50, and shell mills.

Benefits

- Made for machining aluminum, but also useful for machining cast iron.
- High-Feed capability for routing applications.
- Balanced-by-design — if running over 10,000 RPM, balance the cutter assembly.



- For aluminum machining.
- High-speed capability.
- Insert screws should be changed when inserts are changed.



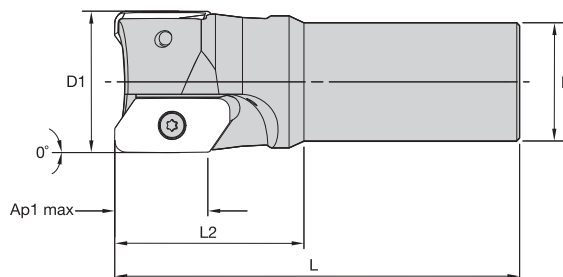
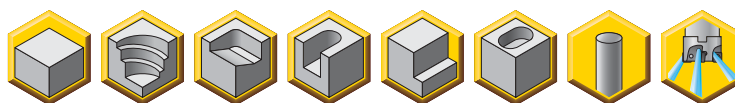
■ End Mills • Weldon® Shank

order number	catalog number	D1	D	L	L2	Ap1 max	Z	max ramp angle	lbs	max RPM
2530317	M1D150K2502W125L200	1.500	1.250	4.280	2.000	.980	2	16.5°	1.21	25200

■ Spare Parts

D1	insert screw	in. lbs.	Torx driver
1.500	MS1374	35.0	DT15

NOTE: Standard milling cutters will accept insert nose radii up to .078" without modification.



Shoulder Mills

■ End Mills • Cylindrical Shank

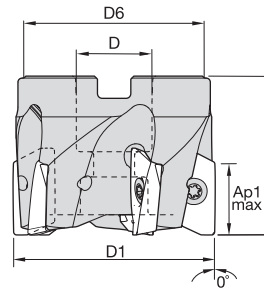
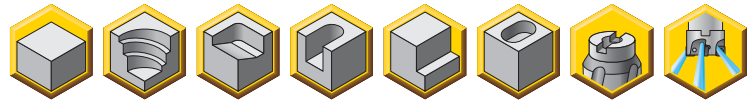
order number	catalog number	D1	D	L	L2	Ap1 max	Z	max ramp angle	lbs	max RPM
2530318	M1D150K2502C125L200	1.500	1.250	4.280	2.000	.980	2	16.5°	1.23	25200
2530319	M1D150K2502C125L300	1.500	1.250	5.280	3.000	.980	2	16.5°	1.65	25200
2530320	M1D150K2502C125L400	1.500	1.250	6.280	4.000	.980	2	16.5°	2.07	25200
2530322	M1D200K2503C125L200	2.000	1.250	4.155	2.000	.976	3	10.0°	1.54	20300

■ Spare Parts

D1	insert screw	in. lbs.	Torx driver
1.500	MS1374	35.0	DT15
2.000	MS1374	35.0	DT15

NOTE: Standard milling cutters will accept insert nose radii up to .078" without modification.

- For aluminum machining.
- High-speed capability.
- Insert screws should be changed when inserts are changed.



■ **Shell Mills**

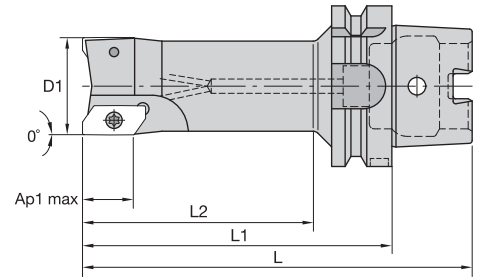
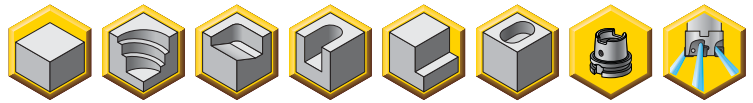
order number	catalog number	D1	D	D6	L	Ap1 max	Z	max ramp angle	lbs	max RPM
2581445	M1D200K2502S075L200	2.000	.750	1.750	2.000	.980	2	10.0°	.87	20300
2581447	M1D250K2503S100L225	2.500	1.000	2.190	2.250	.970	3	7.0°	1.49	17500
2496869	M1D300K2503S100L225	3.000	1.000	2.190	2.250	.970	3	5.0°	2.33	15600
2581449	M1D400K2504S125L225	4.000	1.250	2.880	2.250	.970	4	3.5°	3.05	13100

■ **Spare Parts**

D1	insert screw	in. lbs.	Torx driver	coolant lock screw assembly	socket-head cap screw with coolant groove
2.000	MS1374	35.0	DT15	—	S445CG
2.500	MS1374	35.0	DT15	—	S459CG
3.000	MS1374	35.0	DT15	—	S458CG
4.000	MS1374	35.0	DT15	S2164C	—

NOTE: Standard milling cutters will accept insert nose radii up to .078" without modification.

- For aluminum machining.
- High-speed capability.
- All integral shank tools are balanced to G2.5 at 10,000 RPM.
- Insert screws should be changed when inserts are changed.



■ Monoblocks • HSK63A

order number	catalog number	shank taper	D1	L	L1	L3	Ap1 max	Z	max ramp angle	lbs	max RPM
2530357	M1D150K2502HSK63L477	HSK63A	1.500	6.028	4.772	3.500	.984	2	16.5°	2.60	25200

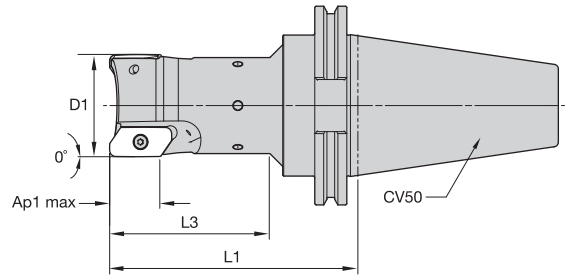
■ Spare Parts

D1	insert screw	in. lbs.	Torx driver	balancing screw
1.500	MS1374	35.0	DT15	KUAM27

NOTE: Standard milling cutters will accept insert nose radii up to .078" without modification.



Shoulder Mills



■ Monoblocks • CV50

order number	catalog number	shank taper	D1	L1	L3	Ap1 max	Z	max ramp angle	lbs	max RPM
2530374	M1D200K2503CV50L700	CV50	2.000	7.000	5.375	.976	3	10.0°	10.62	20300

■ Spare Parts

D1	insert screw	in. lbs.	Torx driver	balancing screw
2.000	MS1374	35.0	DT15	KUAM27

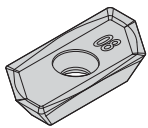


Shoulder Mills

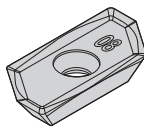
■ Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	—	—	—	—	—	—
P3-P4	—	—	—	—	—	—
P5-P6	—	—	—	—	—	—
M1-M2	—	—	—	—	—	—
M3	—	—	—	—	—	—
K1-K2	—	—	—	—	—	—
K3	—	—	—	—	—	—
N1-N2	.F..LNJ	K313	.E..LDJ	KC410M	.E..LDJ	KC410M
N3	.E..LDJ	KC410M	.E..LDJ	KC410M	.E..LDJ	KC410M
S1-S2	—	—	—	—	—	—
S3	—	—	—	—	—	—
S4	—	—	—	—	—	—
H1	—	—	—	—	—	—

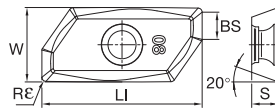
Indexable Inserts • KE..25L5..



KEGT-LDJ



KEGT-LDJ2



- first choice
- alternate choice

P	■
M	■
K	■
N	●
S	■
H	■

■ KEGT-LDJ

catalog number	LI	W	S	BS	Rε	hm	cutting edges	KC410M
KG2508ELDJ	1.239	.575	.205	.210	.031	.001	2	●
KG2512ELDJ	1.239	.575	.205	.195	.047	.001	2	●
KG2516ELDJ	1.239	.575	.205	.179	.063	.001	2	●
KG2520ELDJ	1.239	.575	.205	.164	.079	.001	2	●
KG2524ELDJ	1.239	.575	.205	.149	.094	.001	2	●
KG2531ELDJ	1.239	.575	.205	.120	.122	.001	2	●
KG2540ELDJ	1.239	.575	.205	.085	.157	.001	2	●
KG2547ELDJ	1.239	.575	.205	.055	.188	.001	2	●
KG2550ELDJ	1.239	.575	.205	.045	.197	.001	2	●
KG2560ELDJ	1.239	.575	.205	.005	.236	.001	2	●
KG2564ELDJ	1.181	.575	.205	—	.252	.001	2	●

■ KEGT-LDJ2

catalog number	LI	W	S	BS	Rε	hm	cutting edges	KC410M
KEGT25L508PEERLDJ2	31,39	14,59	5,21	7,30	0,8	—	2	●

Shoulder Mills

■ Recommended Starting Speeds and Feeds [SFM]

Material Group		K313			KC410M		
P	1	—	—	—	—	—	—
	2	—	—	—	—	—	—
	3	—	—	—	—	—	—
	4	—	—	—	—	—	—
	5	—	—	—	—	—	—
	6	—	—	—	—	—	—
M	1	—	—	—	—	—	—
	2	—	—	—	—	—	—
	3	—	—	—	—	—	—
K	1	620	550	490	—	—	—
	2	—	—	—	—	—	—
	3	—	—	—	—	—	—
N	1-2	2610	2280	1960	3990	3550	3270
	3	—	—	—	—	—	—
S	1	—	—	—	—	—	—
	2	—	—	—	—	—	—
	3	—	—	—	—	—	—
	4	—	—	—	—	—	—
H	1	—	—	—	—	—	—

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

■ Recommended Starting Feeds [IPT]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.F..LNJ	.003	.014	.028	.003	.010	.020	.002	.009	.018	.002	.008	.016	.002	.008	.016	.F..LNJ
.E..LDJ	.003	.017	.031	.003	.013	.023	.002	.011	.020	.002	.010	.018	.002	.010	.018	.E..LDJ

NOTE: Use "Light Machining" values as starting feed rate.



Shoulder Mills



More than just the right tool • the ultimate solution for titanium machining

That's **Beyond BLAST™** 
That's **Different Thinking.**

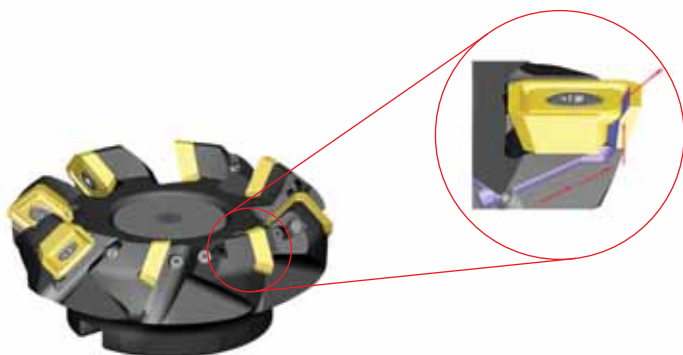
At Kennametal, innovation follows vision. Our revolutionary products and services are inspired by asking “what if?” The solutions that follow — like our Beyond BLAST through-coolant inserts — deliver remarkable results in the world’s most demanding machining environments.

A cutting-edge insert that delivers coolant precisely at the cutting edge. Now that’s Different Thinking. That’s Kennametal.

To learn more about your productivity gains using Beyond BLAST technology, visit www.kennametal.com.

Milling

- Beyond BLAST technology uses low-pressure conditions to offer many of the high-pressure performance benefits.
- Delivers superior performance on titanium, using either high- or low-pressure coolant systems.
- Effective thermal management results in reduced cutting temperatures, improved lubricity, superior chip control, and longer tool life.
- Beyond BLAST for milling increases tool life by up to 100% compared with conventional coolant delivery systems.



beyond™ BLAST™

KSSM™ • Platform

Primary Application

The Kennametal KSSM platform is a versatile solution providing three insert sizes that cover a wide range of applications: face milling, shoulder milling, slotting, profiling, and Z-axis (plunge milling).

Features and Benefits

KSSM IC10

- Four cutting edges.
- Excellent surface finishes.
- Low power requirements.

KSSM IC12

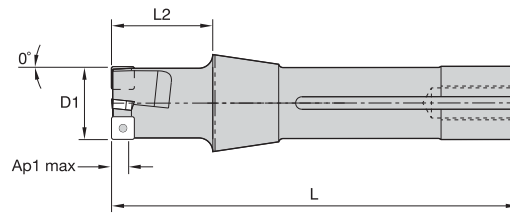
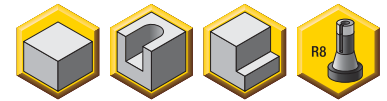
- Four cutting edges.
- Excellent surface finishes.
- Low power requirements.
- Increased depth of cut.

KSSM IC15

- Four cutting edges.
- Excellent surface finish.
- Low power consumption.
- Economical cutting solution.



- Four cutting edges per insert.
- Excellent surface finishes.
- Low power requirements.

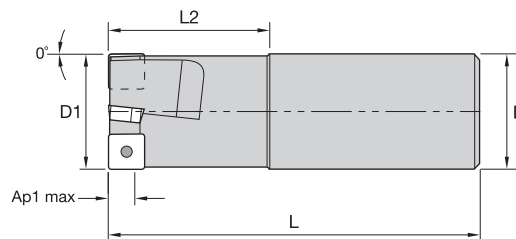
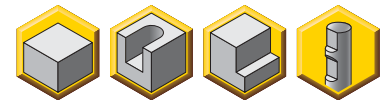


■ End Mills • Bridgeport Shank • R8

order number	catalog number	D1	L	L2	Ap1 max	Z	lbs	max RPM
1229112	KISBR150SP10T30F	1.500	5.180	1.250	.259	4	1.20	30300
1229113	KISBR200SP10T30F	2.000	5.180	1.250	.259	5	1.50	26300

■ Spare Parts

D1	insert screw	in. lbs.	Torx Plus driver
1.500	MS2148	10.0	DT9IP
2.000	MS2148	10.0	DT9IP



Shoulder Mills

■ End Mills • Weldon® Shank

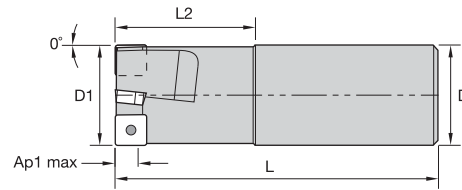
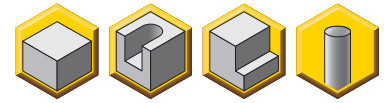
order number	catalog number	D1	D	L	L2	Ap1 max	Z	lbs	max RPM
1229091	KISR075SP10T30F	.750	.750	3.500	1.470	.259	1	.40	42900
1229092	KISR100SP10T30F	1.000	1.000	3.500	1.220	.259	2	.60	37100
1229095	KISR125SP10T30F	1.250	1.250	4.030	1.750	.259	3	1.10	33200
1229096	KISR150SP10T30F	1.500	1.500	4.030	1.340	.259	4	1.63	30300

■ Spare Parts

D1	insert screw	in. lbs.	Torx Plus driver
.750	MS2148	10.0	DT9IP
1.000	MS2148	10.0	DT9IP
1.250	MS2148	10.0	DT9IP
1.500	MS2148	10.0	DT9IP

NOTE: Standard milling cutters will accept insert nose radii up to .078" without modification.

- Four cutting edges per insert.
- Excellent surface finishes.
- Low power requirements.



■ End Mills • Cylindrical Shank

order number	catalog number	D1	D	L	L2	Ap1 max	Z	lbs	max RPM
1229102	KISR100SP10T30FS4	1.000	1.000	3.500	1.220	.259	2	.60	37100

■ Spare Parts

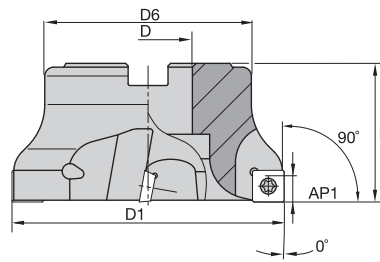
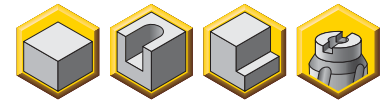
D1	insert screw	in. lbs.	Torx Plus driver
1.000	MS2148	10.0	DT91P

NOTE: Standard milling cutters will accept insert nose radii up to .078" without modification.



Shoulder Mills

- Four cutting edges per insert.
- Excellent surface finishes.
- Low power requirements.



■ End Mills • Shell Mills

order number	catalog number	D1	D	D6	L	Ap1 max	Z	lbs	max RPM
1229047	KSSR150SP10T30F2	1.500	.500	1.355	1.250	.258	4	.30	30300
1229078	KSSR200SP10T30F3	2.000	.750	1.625	1.750	.258	5	.60	26300
1229079	KSSR250SP10T30F4	2.500	1.000	2.065	1.750	.258	6	.90	23500
1229080	KSSR300SP10T30F4	3.000	1.000	2.065	1.750	.258	8	1.30	21450
1229081	KSSR400SP10T30F5	4.000	1.250	2.755	2.000	.258	10	2.50	18600
1229082	KSSR400SP10T30F6	4.000	1.500	3.567	2.000	.258	10	3.10	18600

■ Spare Parts

D1	insert screw	in. lbs.	Torx Plus driver	socket-head cap screw
1.500	MS2148	10.0	DT9IP	S422
2.000	MS2148	10.0	DT9IP	S445
2.500	MS2148	10.0	DT9IP	—
3.000	MS2148	10.0	DT9IP	—
4.000	MS2148	10.0	DT9IP	—

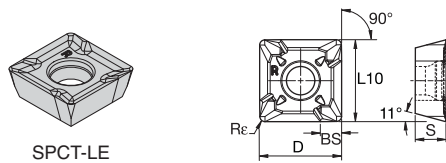
NOTE: Standard milling cutters will accept insert nose radii up to .078" without modification.



■ Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	.E..LD2	KC725M	.E..GB2	KC725M	.S..GB2	KC725M
P3-P4	.E..GB2	KC725M	.E..GB2	KCPK30	.S..GB2	KCPK30
P5-P6	.E..GB2	KCPK30	.E..GB2	KCPM20	.S..GB2	KCPM20
M1-M2	.E..LD2	KC725M	.E..GB2	KC725M	.S..GB2	KC725M
M3	.E..GB2	KC725M	.E..GB2	KCPK30	.S..GB2	KCPK30
K1-K2	.E..LD2	KC520M	.E..GB2	KCK15	.S..GB2	KCK15
K3	.E..GB2	KC520M	.E..GB2	KCPK30	.S..GB2	KCPK30
N1-N2	.F..LE	KC410M	.F..LE	KC410M	.F..LE	KC410M
N3	.F..LE	KC410M	.F..LE	KC410M	.F..LE	KC410M
S1-S2	.E..LD2	KC725M	.E..GB2	KC725M	.S..GB2	KC725M
S3	.E..LD2	KC725M	.E..GB2	KC725M	.S..GB2	KC725M
S4	.E..GB2	KC725M	.S..GB2	KC725M	—	—
H1	—	—	—	—	—	—

Indexable Inserts • SP.T10T3



beyond

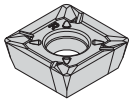
P	●	●	●	●	●
M	●	●	○	○	○
K	●	●	●	○	○
N	●	●	●	○	○
S	●	●	○	○	○
H	○	○	○	○	○

- first choice
- alternate choice

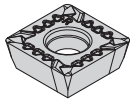
▶▶ SPCT-LE

Shoulder Mills

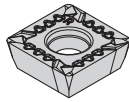
catalog number	D	S	L10	BS	Re	hm	cutting edges	KC410M	KC520M	KC725M	KCK15	KCPM20	KCPK30
SPCT31251PPFR8LE	.394	.156	.394	.106	.016	.001	4	●					
SPCT3125PPFR8LE	.394	.156	.394	.106	.031	.001	4	●					
SPCT31253PPFR8LE	.394	.156	.394	.106	.047	.001	4	●					
SPCT31254FNLE	.394	.156	.394	—	.063	.001	4	●					
SPCT31255FNLE	.394	.156	.394	—	.078	.001	4	●					



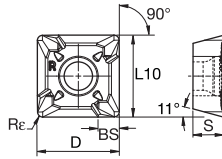
SPCT-LD2



SPET-GB2



SPPT-GB2



P	●				●		●	
M	●				●		○	○
K	●	●			●		○	○
N	●							
S	●							
H								

● first choice
○ alternate choice

■ SPCT-LD2

catalog number	D	S	L10	BS	Re	hm	cutting edges	KC410M	KC520M	KC725M	KCK15	KCPM20	KCPK30
SPCT31251PPER8LD2	.394	.156	.394	.106	.016	.002	4						
SPCT3125PPER8LD2	.394	.156	.394	.106	.031	.002	4		●	●		●	
SPCT31253PPER8LD2	.394	.156	.394	.106	.047	.002	4			●			
SPCT31254ENLD2	.394	.156	.394	—	.063	.002	4			●			
SPCT31255ENLD2	.394	.156	.394	—	.078	.002	4			●			

■ SPET-GB2

catalog number	D	S	L10	BS	Re	hm	cutting edges	KC410M	KC520M	KC725M	KCK15	KCPM20	KCPK30
SPET31251PPER8GB2	.394	.156	.394	.106	.016	.003	4						
SPET3125PPER8GB2	.394	.156	.394	.106	.031	.003	4		●	●	●		●
SPET3125PPSR8GB2	.394	.156	.394	.106	.031	.005	4		●	●	●		●

■ SPPT-GB2

catalog number	D	S	L10	BS	Re	hm	cutting edges	KC410M	KC520M	KC725M	KCK15	KCPM20	KCPK30
SPPT3125PPER8GB2	.394	.156	.394	.106	.031	.003	4						
SPPT3125PPSR8GB2	.394	.156	.394	.106	.031	.005	4				●	●	●



Shoulder Mills

■ Recommended Starting Speeds and Feeds [SFM]

Material Group		KC410M	KC520M	KC725M	KCK15	KCPM20	KCPK30
P	1	— — —	— — —	860 750 700	— — —	1810 1590 1470	1485 1300 1210
	2	— — —	— — —	720 630 530	— — —	1120 1010 910	920 830 750
	3	— — —	— — —	660 560 460	— — —	1010 910 830	830 750 680
	4	— — —	— — —	590 490 390	— — —	760 700 630	620 575 520
	5	— — —	— — —	490 440 390	— — —	910 820 750	850 760 690
	6	— — —	— — —	430 330 260	— — —	630 550 475	520 450 —
M	1	— — —	— — —	560 490 450	— — —	730 655 570	680 600 515
	2	— — —	— — —	510 430 360	— — —	670 580 520	610 530 460
	3	— — —	— — —	380 330 260	— — —	530 475 410	475 430 380
K	1	— — —	880 800 710	— — —	1380 1255 1115	1180 1070 960	965 875 780
	2	— — —	690 620 580	— — —	1095 975 910	940 840 770	770 690 630
	3	— — —	580 520 470	— — —	920 815 750	790 700 650	645 575 530
N	1-2	3990 3550 3270	— — —	— — —	— — —	— — —	— — —
	3	— — —	— — —	— — —	— — —	— — —	— — —
S	1	— — —	— — —	115 100 80	— — —	— — —	— — —
	2	— — —	— — —	115 100 80	— — —	— — —	— — —
	3	— — —	— — —	150 115 80	— — —	— — —	— — —
	4	— — —	— — —	200 150 100	— — —	— — —	— — —
H	1	— — —	— — —	— — —	— — —	— — —	— — —

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

■ Recommended Starting Feeds [IPT]

Light Machining	General Purpose	Heavy Machining
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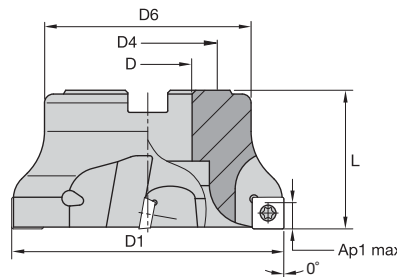
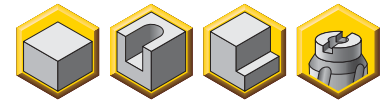
Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.F..LE	.003	.007	.014	.003	.005	.010	.002	.004	.009	.002	.004	.008	.002	.004	.008	.F..LE
.E..LD2	.004	.010	.020	.003	.008	.015	.002	.007	.013	.002	.006	.012	.002	.006	.012	.E..LD2
.E..GB2	.007	.014	.025	.005	.011	.018	.004	.009	.016	.004	.009	.015	.004	.008	.014	.E..GB2
.S..GB2	.007	.017	.028	.005	.013	.020	.004	.011	.018	.004	.010	.016	.004	.010	.016	.S..GB2

NOTE: Use "Light Machining" values as starting feed rate.



Shoulder Mills

- Four cutting edges per insert.
- Excellent surface finishes.
- Low power requirements.



■ End Mills • Shell Mills

order number	catalog number	D1	D	D4	D6	L	Ap1 max	Z	lbs	max RPM
1024970	KSSISR200SD430C3	2.000	.750	—	1.625	1.750	.361	3	.79	20450
1024972	KSSISR200SD430M3	2.000	.750	—	1.625	1.750	.361	4	.75	20450
1024994	KSSISR200SD430F3	2.000	.750	—	1.625	1.750	.361	5	.77	20450
1024998	KSSISR250SD430M4	2.500	1.000	—	2.065	1.750	.361	5	1.20	18290
1025000	KSSISR250SD430F4	2.500	1.000	—	2.065	1.750	.361	6	1.23	18290
1024930	KSSISR300SD430C4	3.000	1.000	—	2.065	1.750	.361	4	1.42	16700
1024931	KSSISR300SD430M4	3.000	1.000	—	2.065	1.750	.361	6	1.38	16700
1024932	KSSISR300SD430F4	3.000	1.000	—	2.065	1.750	.361	7	1.38	16700
1025025	KSSISR400SD430C5	4.000	1.250	—	2.755	2.000	.361	5	3.05	14460
1025029	KSSISR400SD430M5	4.000	1.250	—	2.755	2.000	.361	7	3.03	14460
1025033	KSSISR400SD430F5	4.000	1.250	—	2.755	2.000	.361	8	3.01	14460
1025027	KSSISR400SD430C6	4.000	1.500	—	3.685	2.000	.361	5	3.58	14460
1025031	KSSISR400SD430M6	4.000	1.500	—	3.685	2.000	.361	7	3.57	14460
1025065	KSSISR400SD430F6	4.000	1.500	—	3.685	2.000	.361	8	3.62	14460
1024933	KSSISR500SD430C6	5.000	1.500	—	3.685	2.380	.361	6	5.82	12940
1024964	KSSISR500SD430M6	5.000	1.500	—	3.685	2.380	.361	8	5.91	12940
1024965	KSSISR500SD430F6	5.000	1.500	—	3.685	2.380	.361	10	5.96	12940
1024966	KSSISR600SD430C6	6.000	1.500	—	3.685	2.380	.361	8	8.52	11800
1024967	KSSISR600SD430M6	6.000	1.500	—	3.685	2.380	.361	10	8.58	11800
1024968	KSSISR600SD430F6	6.000	1.500	—	3.685	2.380	.361	12	8.60	11800
1025071	KSSISR600SD430C8	6.000	2.000	—	4.875	2.380	.361	8	7.37	11800
1025094	KSSISR600SD430M8	6.000	2.000	—	4.875	2.380	.361	10	7.44	11800
1025097	KSSISR600SD430F8	6.000	2.000	—	4.875	2.380	.361	12	7.47	11800
1025102	KSSISR800SD430C10	8.000	2.500	4.000	6.125	2.380	.361	10	15.40	10230
1025134	KSSISR800SD430M10	8.000	2.500	4.000	6.125	2.380	.361	12	15.40	10230
1025136	KSSISR800SD430F10	8.000	2.500	4.000	6.125	2.380	.361	14	15.30	10230
1025138	KSSISR1000SD430C10	10.000	2.500	4.000	8.125	2.380	.361	12	24.20	9150
1025140	KSSISR1000SD430M10	10.000	2.500	4.000	8.125	2.380	.361	16	25.90	9150
1025142	KSSISR1000SD430F10	10.000	2.500	4.000	8.125	2.380	.361	18	24.40	9150

Shoulder Mills

■ Spare Parts



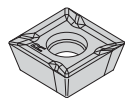
D1	insert screw	in. lbs.	Torx Plus driver	shim	shim screw	in. lbs.	hex driver	socket-head cap screw
2.000	MS2078	35.0	DT15IP	—	—	40.0	—	S445
2.500	MS2078	35.0	DT15IP	SM449	SRS3	40.0	DH35M	S458
3.000	MS2078	35.0	DT15IP	SM449	SRS3	40.0	DH35M	—
4.000	MS2078	35.0	DT15IP	SM449	SRS3	40.0	DH35M	—
5.000	MS2078	35.0	DT15IP	SM449	SRS3	40.0	DH35M	—
6.000	MS2078	35.0	DT15IP	SM449	SRS3	40.0	DH35M	—
8.000	MS2078	35.0	DT15IP	SM449	SRS3	40.0	DH35M	—
10.000	MS2078	35.0	DT15IP	SM449	SRS3	40.0	DH35M	—

NOTE: Standard milling cutters will accept insert nose radii up to .078" without modification.
 2" cutter does not have shims.
 2", 2.5", and 3" fine-pitch cutters do not have shims.

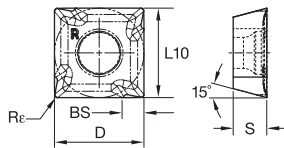
■ Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	.E..LD2	KC725M	.E..GB2	KC725M	.S..GB2	KC725M
P3-P4	.E..GB2	KCPK30	.S..GB2	KCPK30	.S..GB2	KCPK30
P5-P6	.E..GB2	KCPK30	.E..GB2	KCPM20	.S..GB2	KCPM20
M1-M2	.E..LD2	KC725M	.E..GB2	KC725M	.S..GB2	KC725M
M3	.E..GB2	KCPK30	.S..GB2	KCPK30	.S..GB2	KCPK30
K1-K2	.E..LD2	KC520M	.E..GB2	KCK15	.S..GB2	KCK15
K3	.E..GB2	KCPK30	.S..GB2	KCPK30	.S..GB	KCPK30
N1-N2	.F..LE	KC410M	.F..LE	KC410M	.F..LE	KC410M
N3	.F..LE	KC410M	.F..LE	KC410M	.F..LE	KC410M
S1-S2	.E..LD2	KC725M	.E..GB2	KC725M	.S..GB2	KC725M
S3	.E..GB2	KC725M	.S..GB2	KC725M	.S..GB	KC725M
S4	.S..GB2	KC725M	.S..GB	KC725M	—	—
H1	.S..GB2	KCPM20	.S..GB	KCPK30	—	—

Indexable Inserts • SD.T1204



SDCT-LE



P	●	○	○	○	○	○	○	○	○	○
M	●	○	○	○	○	○	○	○	○	○
K	●	○	○	○	○	○	○	○	○	○
N	●	○	○	○	○	○	○	○	○	○
S	●	○	○	○	○	○	○	○	○	○
H	○	○	○	○	○	○	○	○	○	○

● first choice
○ alternate choice

■ SDCT-LE

Shoulder Mills

catalog number	D	S	L10	BS	Rε	hm	cutting edges	KC410M	KC520M	KC522M	KC725M	KCK15	KCPM20	KCPK30	KY3500
SDCT431PDR8LE	.500	.188	.500	.106	.016	.001	4	●							
SDCT43PDR8LE	.500	.188	.500	.106	.031	.001	4	●							
SDCT433PDR8LE	.500	.188	.500	.106	.047	.001	4	●							
SDCT434FNLE	.500	.188	.500	—	.063	.001	4	●							
SDCT435FNLE	.500	.188	.500	—	.078	.001	4	●							
SDCT436FNLE	.500	.188	.500	—	.094	.001	4	●							
SDCT438FNLE	.500	.188	.500	—	.125	.001	4	●							

■ Recommended Starting Speeds and Feeds [SFM]

Material Group		KC410M			KC520M			KC522M			KC725M		
P	1	—	—	—	—	—	—	1080	940	880	860	750	700
	2	—	—	—	—	—	—	900	790	660	720	630	530
	3	—	—	—	—	—	—	830	700	580	660	560	460
	4	—	—	—	—	—	—	740	610	490	590	490	390
	5	—	—	—	—	—	—	610	550	490	490	440	390
	6	—	—	—	—	—	—	540	410	330	430	330	260
M	1	—	—	—	—	—	—	670	590	540	560	490	450
	2	—	—	—	—	—	—	610	520	430	510	430	360
	3	—	—	—	—	—	—	460	400	310	380	330	260
K	1	—	—	—	880	800	710	750	680	600	—	—	—
	2	—	—	—	690	620	580	590	530	490	—	—	—
	3	—	—	—	580	520	470	490	440	400	—	—	—
N	1-2	3990	3550	3270	—	—	—	—	—	—	—	—	—
	3	3550	3270	3000	—	—	—	—	—	—	—	—	—
S	1	—	—	—	—	—	—	130	120	90	115	100	80
	2	—	—	—	—	—	—	130	120	90	115	100	80
	3	—	—	—	—	—	—	170	130	90	150	115	80
	4	—	—	—	—	—	—	230	170	120	200	150	100
H	1	—	—	—	—	—	—	390	300	230	—	—	—

Material Group		KCK15			KCPM20			KCPK30			KY3500		
P	1	—	—	—	1810	1590	1470	1485	1300	1210	—	—	—
	2	—	—	—	1120	1010	910	920	830	750	—	—	—
	3	—	—	—	1010	910	830	830	750	680	—	—	—
	4	—	—	—	760	700	630	620	575	520	—	—	—
	5	—	—	—	910	820	750	850	760	690	—	—	—
	6	—	—	—	630	550	475	520	450	—	—	—	—
M	1	—	—	—	730	655	570	680	600	515	—	—	—
	2	—	—	—	670	580	520	610	530	460	—	—	—
	3	—	—	—	530	475	410	475	430	380	—	—	—
K	1	1380	1255	1115	1180	1070	960	965	875	780	2640	2400	2130
	2	1095	975	910	940	840	770	770	690	630	2090	1870	1740
	3	920	815	750	790	700	650	645	575	530	1760	1560	1430
N	1-2	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—
S	1	—	—	—	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—	—	—	—	—	—
H	1	—	—	—	460	380	310	—	—	—	—	—	—

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

■ Recommended Starting Feeds [IPT]

Light Machining	General Purpose	Heavy Machining
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Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.F..LE	.003	.007	.014	.003	.005	.010	.002	.004	.009	.002	.004	.008	.002	.004	.008	.F..LE
.E..LD2	.004	.010	.020	.003	.007	.015	.002	.006	.013	.002	.006	.012	.002	.006	.012	.E..LD2
.E..GB	.007	.014	.024	.005	.011	.018	.004	.009	.015	.004	.009	.014	.004	.008	.014	.E..GB
.E..GB2	.007	.014	.024	.005	.011	.018	.004	.009	.015	.004	.009	.014	.004	.008	.014	.E..GB2
.S..GB	.007	.015	.025	.005	.011	.018	.004	.010	.016	.004	.009	.015	.004	.009	.015	.S..GB
.S..GB2	.007	.015	.025	.005	.011	.019	.004	.010	.016	.004	.009	.015	.004	.009	.015	.S..GB2
.S..GN	.007	.017	.028	.005	.013	.020	.004	.011	.018	.004	.010	.016	.004	.010	.016	.S..GN

NOTE: Use "Light Machining" values as starting feed rate.



KSSM-KSSP Helical

Primary Application

The KSSM-KSSP helical cutters were originally developed and proven for the aerospace industry but are now available for all industries. The proprietary variable rake design minimizes vibration and chatter.

Features and Benefits

Features

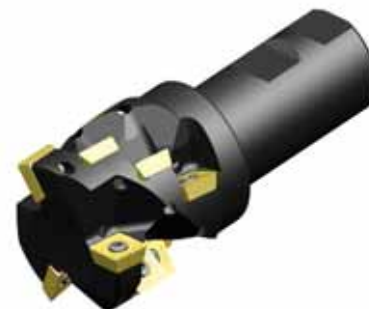
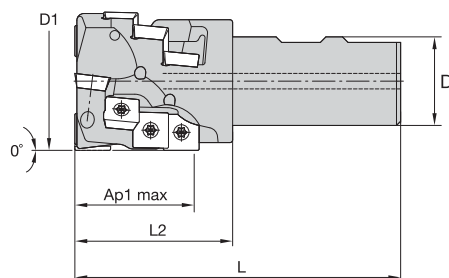
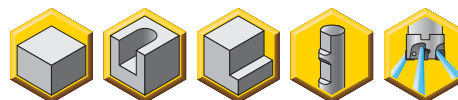
- Patented HARVI™ technology.
- Progressive helical rakes.
- Unique coolant supply.

Benefits

- Increased tool life in titanium.
- Increased metal removal rates.
- Lower power consumption.
- Ensures chip evacuation, even on exotic materials.



- Four cutting edges per insert.
- Excellent surface finishes.
- Low power requirements.



■ End Mills • Weldon® Shank

order number	catalog number	D1	D	L	L2	Ap1 max	Z	Z U	lbs	max RPM
2528269	KSSP200R3SD43W125L169	2.000	1.250	4.530	2.250	1.691	12	3	1.73	16300

■ Spare Parts



insert
screw
MS1273



Torx
wrench
TT15

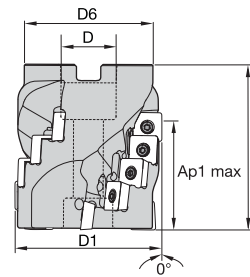
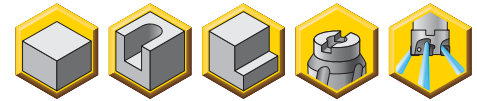
D1	in. lbs.
2.000	35.0

NOTE: Maximum nose radii of lead insert is .094" for a 2"-diameter cutter.
All subsequent inserts up the flute should have a maximum nose radius of .031" to avoid lap lines.



Shoulder Mills

- Four cutting edges per insert.
- Excellent surface finishes.
- Low power requirements.



■ Shell Mills

order number	catalog number	D1	D	D6	L	Ap1 max	Z	Z U	lbs	max RPM
2400680	KSSP200R3SD43L168	2.000	.750	1.750	2.250	1.691	12	3	1.02	16300
3045090	KSSP200R3SD43L200HC	2.000	.750	1.913	3.000	2.072	15	3	1.42	16300
2601012	KSSP200R3SD43L125	2.000	.750	1.750	1.875	1.275	9	3	.87	16300
2400681	KSSP250R3SD43L200	2.500	1.000	2.190	2.750	2.005	15	3	2.34	14550
2400682	KSSP300R4SD43L240	3.000	1.250	2.750	3.250	2.427	24	4	4.07	13300
2977923	KSSP300R5SD43L400HC	3.000	1.250	2.900	5.000	4.110	55	5	5.74	13300

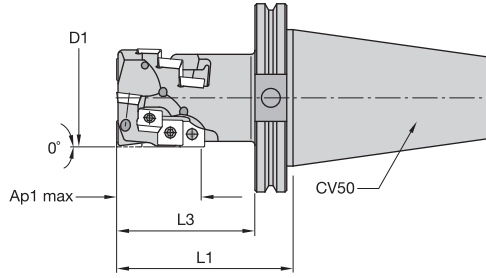
■ Spare Parts

order number	D1	insert screw	in. lbs.	Torx wrench	Torx Plus wrench
3045090	2.000	MS2085	35.0	—	TTP15
2400680	2.000	MS1273	35.0	TT15	—
2601012	2.000	MS1273	35.0	TT15	—
2400681	2.500	MS1273	35.0	TT15	—
2400682	3.000	MS1273	35.0	TT15	—
2977923	3.000	MS2085	35.0	—	TTP15

NOTE: ZU = Effective number of flutes.
Maximum nose radii of lead insert is .094" for 2" diameter cutters and .125" for 2.50" diameter cutters and above.
All subsequent inserts up the flutes should have a maximum nose radius of .031" to avoid lap lines.

Shoulder Mills

- Four cutting edges per insert.
- Excellent surface finishes.
- Low power requirements.



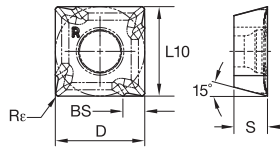
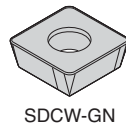
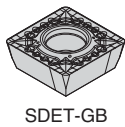
■ End Mills • Integral Shank CV50

order number	catalog number	shank taper	D1	L3	L1	Ap1 max	Z	Z U	lbs	max RPM
2528270	KSSP200R3SD43CV50L169	CV50	2.000	2.250	3.000	1.691	12	3	6.68	16300

■ Spare Parts

D1	insert screw	in. lbs.	Torx wrench	set screw
2.000	MS1273	35.0	TT15	MS1276

NOTE: Maximum nose radii of lead insert is .094" for 2" diameter cutter.
All subsequent inserts up the flutes should have a maximum nose radius of .031" to avoid lap lines.



beyond

P	●	○	○	○	○	○	○	○	○
M	○	○	○	○	○	○	○	○	○
K	○	○	○	○	○	○	○	○	○
N	○	○	○	○	○	○	○	○	○
S	○	○	○	○	○	○	○	○	○
H	○	○	○	○	○	○	○	○	○

● first choice
○ alternate choice

■ SDET-GB2

catalog number	D	S	L10	BS	Rε	hm	cutting edges	KC410M	KC520M	KC522M	KC725M	KCK15	KCPM20	KCPK30	KY3500
SDET43PDER8GB2	.500	.188	.500	.130	.031	.003	4		●		●	●	●	●	
SDET43PDSR8GB2	.500	.188	.500	.130	.031	.005	4		●		●	●	●	●	
SDET433PDER8GB2	.500	.188	.500	.120	.047	.003	4		●		●	●	●	●	
SDET434SNGB2	.500	.188	.500	—	.063	.005	4		●		●	●	●	●	
SDET435SNGB2	.500	.188	.500	—	.078	.005	4		●		●	●	●	●	
SDET436SNGB2	.500	.188	.500	—	.094	.005	4		●		●	●	●	●	
SDET438XENGB2	.500	.188	.500	—	.125	.003	2				●	●	●	●	
SDET438SNGB2	.500	.188	.500	—	.125	.005	4		●		●	●	●	●	
SDET4316SNGB2	.500	.188	.500	—	.250	.005	2					●	●	●	

■ SDET-GB

catalog number	D	S	L10	BS	Rε	hm	cutting edges	KC410M	KC520M	KC522M	KC725M	KCK15	KCPM20	KCPK30	KY3500
SDET43PDER8GB	.500	.188	.500	.132	.031	.003	4		●		●	●	●	●	
SDET43PDSR8GB	.500	.188	.500	.132	.031	.006	4				●	●	●	●	
SDET433PDER8GB	.500	.188	.500	.132	.047	.003	4				●	●	●	●	
SDET4316SNGB	.500	.188	.500	—	.250	.006	2						●	●	

■ SDPT-GB2

catalog number	D	S	L10	BS	Rε	hm	cutting edges	KC410M	KC520M	KC522M	KC725M	KCK15	KCPM20	KCPK30	KY3500
SDPT43PDER8GB2	.500	.188	.500	.106	.031	.003	4				●	●	●	●	
SDPT43PDSR8GB2	.500	.188	.500	.106	.031	.005	4				●	●	●	●	

■ SDCW-GN

catalog number	D	S	L10	BS	Rε	hm	cutting edges	KC410M	KC520M	KC522M	KC725M	KCK15	KCPM20	KCPK30	KY3500
SDCW43PDSR8GN	.500	.188	.500	.131	.031	.006	4				●	●	●	●	
SDCW43EDSR8GN	.500	.188	.500	.132	.031	.006	4				●	●	●	●	
SDCW433PDSR8GN	.500	.188	.500	.120	.047	.006	4				●	●	●	●	



■ Recommended Starting Speeds and Feeds [SFM]

Material Group		KC410M			KC520M			KC522M			KC725M		
P	1	—	—	—	—	—	—	1080	940	880	860	750	700
	2	—	—	—	—	—	—	900	790	660	720	630	530
	3	—	—	—	—	—	—	830	700	580	660	560	460
	4	—	—	—	—	—	—	740	610	490	590	490	390
	5	—	—	—	—	—	—	610	550	490	490	440	390
	6	—	—	—	—	—	—	540	410	330	430	330	260
M	1	—	—	—	—	—	—	670	590	540	560	490	450
	2	—	—	—	—	—	—	610	520	430	510	430	360
	3	—	—	—	—	—	—	460	400	310	380	330	260
K	1	—	—	—	880	800	710	750	680	600	—	—	—
	2	—	—	—	690	620	580	590	530	490	—	—	—
	3	—	—	—	580	520	470	490	440	400	—	—	—
N	1-2	3990	3550	3270	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—
S	1	—	—	—	—	—	—	130	120	90	115	100	80
	2	—	—	—	—	—	—	130	120	90	115	100	80
	3	—	—	—	—	—	—	170	130	90	150	115	80
	4	—	—	—	—	—	—	230	170	120	200	150	100
H	1	—	—	—	—	—	—	—	—	—	—	—	—

Material Group		KCK15			KCPM20			KCPK30		
P	1	—	—	—	1810	1590	1470	1485	1300	1210
	2	—	—	—	1120	1010	910	920	830	750
	3	—	—	—	1010	910	830	830	750	680
	4	—	—	—	760	700	630	620	575	520
	5	—	—	—	910	820	750	850	760	690
	6	—	—	—	630	550	475	520	450	—
M	1	—	—	—	730	655	570	680	600	515
	2	—	—	—	670	580	520	610	530	460
	3	—	—	—	530	475	410	475	430	380
K	1	1380	1255	1115	1180	1070	960	965	875	780
	2	1095	975	910	940	840	770	770	690	630
	3	920	815	750	790	700	650	645	575	530
N	1-2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
S	1	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—	—	—
H	1	—	—	—	—	—	—	—	—	—

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

■ Recommended Starting Feeds [IPT]

Light Machining	General Purpose	Heavy Machining
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Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)														Insert Geometry	
	10%			20%			30%			40%			50-100%			
.F..LE	.003	.007	.014	.003	.005	.010	.002	.004	.009	.002	.004	.008	.002	.004	.008	.F..LE
.E..LD2	.004	.010	.020	.003	.007	.015	.002	.006	.013	.002	.006	.012	.002	.006	.012	.E..LD2
.E..GB	.007	.014	.024	.005	.011	.018	.004	.009	.015	.004	.009	.014	.004	.008	.014	.E..GB
.E..GB2	.007	.014	.024	.005	.011	.018	.004	.009	.015	.004	.009	.014	.004	.008	.014	.E..GB2
.S..GB	.007	.015	.025	.005	.011	.018	.004	.010	.016	.004	.009	.015	.004	.009	.015	.S..GB
.S..GB2	.007	.015	.025	.005	.011	.019	.004	.010	.016	.004	.009	.015	.004	.009	.015	.S..GB2
.S..GN	.007	.017	.028	.005	.013	.020	.004	.011	.018	.004	.010	.016	.004	.010	.016	.S..GN

NOTE: Use "Light Machining" values as starting feed rate.



Beyond BLAST™ • KSSM™ 45°

**More than just the right tool —
the ultimate solution for titanium machining**

Features and Benefits

- PCT — Precision Coolant Technology.
- Coolant delivery exactly to the cutting area.
- Increased heat transfer.
- Less tool/chip friction and shear stress.
- Improved chip control.
- True internal coolant assists chip evacuation.
- Beyond BLAST also works with regular low-pressure conditions.
- No need for investments in high-pressure equipment.
- Easy to convert from conventional to Beyond BLAST technology.
- Shop-floor-proven handling reduces costly downtime.
- Up to 100% better tool life.
- Performance leader in machining titanium.

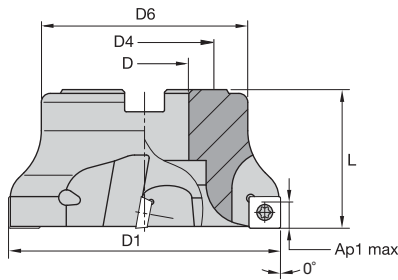
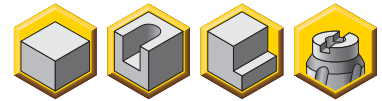
beyond™ BLAST™

Experience the advantages at your Authorized Kennametal Distributor or at www.kennametal.com.

www.kennametal.com

 **KENNAMETAL®**

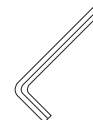
- Four cutting edges per insert.
- Excellent surface finishes.
- Low power requirements.



■ End Mills • Shell Mills

order number	catalog number	D1	D	D4	D6	L	Ap1 max	Z	lbs	max RPM
1025167	KSSISR200SD530M3	2.000	.750	—	1.625	1.750	.484	4	.60	17940
1025165	KSSISR200SD530C3	2.000	.750	—	1.625	1.750	.484	3	.70	17940
1025171	KSSISR250SD530M4	2.500	1.000	—	2.065	1.750	.484	5	1.20	16050
1025173	KSSISR300SD530C4	3.000	1.000	—	2.065	1.750	.484	4	1.40	14650
1025205	KSSISR300SD530M4	3.000	1.000	—	2.065	1.750	.484	6	1.40	14650
1025212	KSSISR400SD530M5	4.000	1.250	—	2.755	2.000	.484	6	2.90	12690
1025244	KSSISR400SD530M6	4.000	1.500	—	3.685	2.000	.484	6	3.80	12690
1025275	KSSISR600SD530M6	6.000	1.500	—	3.685	2.380	.484	10	10.50	10360
1025281	KSSISR800SD530M10	8.000	2.500	4.000	6.125	2.380	.484	12	15.40	8970
1025279	KSSISR800SD530C10	8.000	2.500	4.000	6.125	2.380	.484	10	15.70	8970

■ Spare Parts

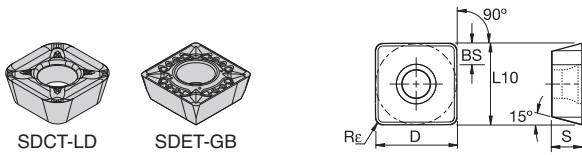


Shoulder Mills

D1	insert screw	in. lbs.	Torx Plus driver	shim	shim screw	in. lbs.	hex driver	socket-head cap screw
2.000	MS2079	35.0	DT15IP	—	—	40.0	—	S1960PKG
2.500	MS2079	35.0	DT15IP	SM450	SRS4	40.0	DH4M	S458
3.000	MS2079	35.0	DT15IP	SM450	SRS4	40.0	DH4M	—
4.000	MS2079	35.0	DT15IP	SM450	SRS4	40.0	DH4M	—
6.000	MS2079	35.0	DT15IP	SM450	SRS4	40.0	DH4M	—
8.000	MS2079	35.0	DT15IP	SM450	SRS4	40.0	DH4M	—

Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	.E..LD	KC725M	.E..GB	KC725M	.S..GB	KC725M
P3-P4	.E..GB	KC725M	.E..GB	KCPK30	.S..GB	KCPK30
P5-P6	.E..GB	KCPK30	.S..GB	KCPK30	.S..GB	KCPK30
M1-M2	.E..LD	KC725M	.E..GB	KC725M	.S..GB	KC725M
M3	.E..GB	KC725M	.E..GB	KCPK30	.S..GB	KCPK30
K1-K2	.E..GB	KCPK30	.E..GB	KCPK30	.S..GB	KCPK30
K3	.E..GB	KCPK30	.S..GB	KCPK30	.S..GB	KCPK30
N1-N2	.F..LD	KC510M	.F..LD	KC510M	.F..LD	KC510M
N3	.F..LD	KC510M	.F..LD	KC510M	.F..LD	KC510M
S1-S2	.E..LD	KC725M	.E..GB	KC725M	.S..GB	KC725M
S3	.E..LD	KC725M	.E..GB	KC725M	.S..GB	KC725M
S4	.E..GB	KC725M	.S..GB	KC725M	—	—
H1	—	—	—	—	—	—

Indexable Inserts • KSSM SDCT and SDET


● first choice
○ alternate choice

P	●	○	○	○
M	○	○	○	○
K	●	○	○	○
N	○	○	○	○
S	○	○	○	○
H	○	○	○	○

SDCT-LD

catalog number	D	S	L10	BS	Rε	hm	cutting edges	KC510M	KC725M	KCK15	KCPK30
SDCT53PDFR8LD	.625	.188	.625	.132	.031	.001	4	●	○	○	○
SDCT53PDER8LD	.625	.188	.625	.132	.031	.002	4	○	○	○	○
SDCT533PDFR8LD	.625	.188	.625	.132	.047	.001	4	○	○	○	○
SDCT533PDER8LD	.625	.188	.625	.132	.047	.002	4	○	○	○	○

SDET-GB

catalog number	D	S	L10	BS	Rε	hm	cutting edges	KC510M	KC725M	KCK15	KCPK30
SDET53PDER8GB	.625	.188	.625	.132	.031	.003	4	○	○	○	○
SDET53PDSR8GB	.625	.188	.625	.132	.031	.004	4	○	○	○	○
SDET533PDER8GB	.625	.188	.625	.132	.047	.003	4	○	○	○	○
SDET533PDSR8GB	.625	.188	.625	.132	.047	.004	4	○	○	○	○



■ Recommended Starting Speeds and Feeds [SFM]

Material Group		KC510M			KC725M			KCK15			KCPK30		
P	1	—	—	—	860	750	700	—	—	—	1485	1300	1210
	2	—	—	—	720	630	530	—	—	—	920	830	750
	3	—	—	—	660	560	460	—	—	—	830	750	680
	4	800	650	550	590	490	390	—	—	—	620	575	520
	5	—	—	—	490	440	390	—	—	—	850	760	690
	6	—	—	—	430	330	260	—	—	—	520	450	—
M	1	—	—	—	560	490	450	—	—	—	680	600	515
	2	—	—	—	510	430	360	—	—	—	610	530	460
	3	—	—	—	380	330	260	—	—	—	475	430	380
K	1	960	870	780	—	—	—	1380	1255	1115	965	875	780
	2	760	680	630	—	—	—	1095	975	910	770	690	630
	3	640	570	520	—	—	—	920	815	750	645	575	530
N	1-2	2100	1870	1720	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—
S	1	—	—	—	115	100	80	—	—	—	—	—	—
	2	—	—	—	115	100	80	—	—	—	—	—	—
	3	—	—	—	150	115	80	—	—	—	—	—	—
	4	—	—	—	200	150	100	—	—	—	—	—	—
H	1	—	—	—	—	—	—	—	—	—	—	—	—

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

■ Recommended Starting Feeds [IPT]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%		50-100%				
.F..LD	.003	.007	.014	.003	.005	.010	.002	.004	.009	.002	.004	.008	.002	.004	.008	.F..LD
.E..LD	.004	.013	.026	.003	.009	.019	.002	.008	.016	.002	.008	.015	.002	.008	.015	.E..LD
.E..GB	.007	.017	.028	.005	.013	.020	.004	.011	.018	.004	.010	.016	.004	.010	.016	.E..GB
.S..GB	.007	.017	.028	.005	.013	.020	.004	.011	.018	.004	.010	.016	.004	.010	.016	.S..GB

NOTE: Use "Light Machining" values as starting feed rate.



Shoulder Mills



Screw-On Milling Cutter Adapters

The Complete Solution to Milling

Features and Benefits

- High metal removal rates.
- High runout accuracy.
- Maximum performance capability.
- Optimizing productivity with long reach and short overhang to support all types of applications.
- Cutter is kept on centre for precision and maximum performance compared to Weldon® shank system.
- Ability to extend with standard offering extensions and reducers.
- Ground face contact for rigidity and accuracy.

NOTE: Consult the Kennametal Tooling Systems catalog for information on holders.

www.kennametal.com

 **KENNAMETAL®**

KFSR™ Heavy-Duty Cutter

Primary Application

The KFSR heavy-duty cutter is specifically engineered for heavy-duty milling of steel and cast iron — with unparalleled chip control and large axial depth of cut. Engineered for applications requiring higher cutting speeds and feed rates with low cutting forces, it is ideally suited for the automotive, heavy automotive, rail, shipbuilding, construction vehicles, and general engineering industries.

Features and Benefits

Features

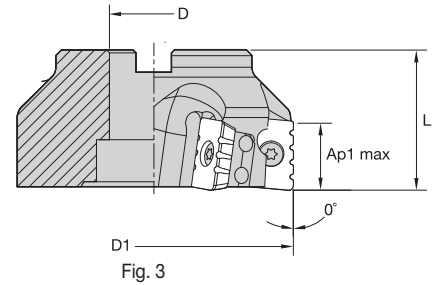
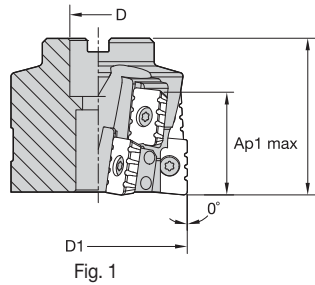
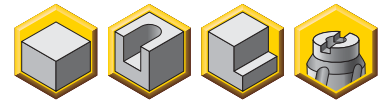
- Enables heavy machining with low cutting forces and less vibration.
- Uses less horsepower with increased metal removal rates.
- Inserts with three and four serrations generate small chips for easy evacuation.
- Cutter design alternates the two insert styles to provide better overall chip control.
- Inserts stacked in helical rows.
- Replaceable shim provides pocket protection for leading insert. (NOTE: 63mm cutters do not contain a shim).

Notching

- Cutter design alternates two insert styles (G3 and G4) to provide better overall chip control.
- Insert serrations reduce cutting forces.
- Special chipbreaker generates small, controllable chips for easy evacuation.



- Lower cutting forces with serrated inserts.
- Small chips for ease of evacuation.
- Improved metal removal rates.
- **IMPORTANT:** Load the inserts in the correct position; see additional details below.



■ Shell Mill

order number	catalog number	D1	D	L	Ap1 max	Z	Z U	figure	lbs
3578346	KFSR300R1AP25	3.000	1.000	1.970	.925	4	4	FIG 3	2.66
3578347	KFSR300R2AP25	3.000	1.000	2.760	1.770	8	4	FIG 1	3.85
3578349	KFSR400R2AP25	4.000	1.250	2.760	1.770	12	6	FIG 1	4.53
3578348	KFSR400R1AP25	4.000	1.250	1.970	.925	6	6	FIG 3	3.37

Insert pocket detail:

- If insert pocket is marked with number “3”, use insert AP ER-G3.
- If insert pocket is marked with number “4”, use insert AP ER-G4.
- It is very important to use the correct insert in position 3 or 4. Failure to do this will result in damage to the cutter body.
- Only use inserts with nose radii greater than .030" in the first row.

■ Spare Parts

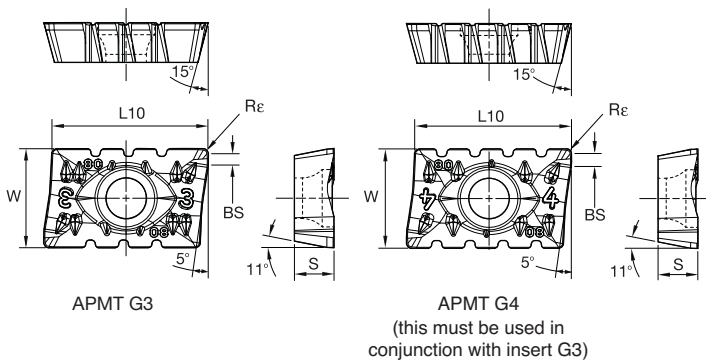
D1	insert screw	Torx wrench	shim screw	Torx driver	shim	socket-head cap screw
3.000	MS2209	TT25	MS2210	DT15	SM904	S459
4.000	MS2209	TT25	MS2210	DT15	SM904	—

Shoulder Mills

■ Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	.E..L	KC720M	.E..L	KC720M	.E..L	KC730M
P3-P4	.E..G	KC720M	.E..G	KC720M	.E..G	KC730M
P5-P6	—	—	—	—	—	—
M1-M2	—	—	—	—	—	—
M3	—	—	—	—	—	—
K1-K2	.E..L	KC505M	.E..L	KC505M	.E..G	KC505M
K3	.E..L	KC505M	.E..G	KC505M	.E..G	KC505M
N1-N2	—	—	—	—	—	—
N3	—	—	—	—	—	—
S1-S2	—	—	—	—	—	—
S3	—	—	—	—	—	—
S4	—	—	—	—	—	—
H1	—	—	—	—	—	—

Indexable Insert • Heavy-Duty Cutters



Shoulder Mills

■ APMT G3

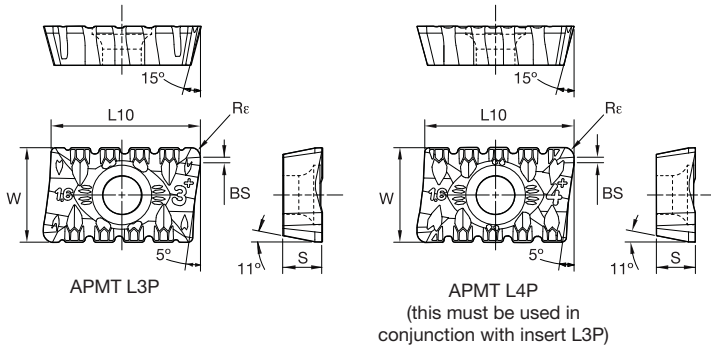
catalog number	S	L10	BS	Rε	W	hm	cutting edges	Material Selection Matrix			
APMT250608ERG3	.250	.984	.071	.031	.625	.003	2	●	●	●	●
APMT250616ERG3	.250	.984	.039	.063	.625	.003	2	●	●	●	●
APMT250640ERG3	.250	.984	.004	.156	.625	.003	2	●	●	●	●

■ APMT G4

catalog number	S	L10	BS	Rε	W	hm	cutting edges	Material Selection Matrix			
APMT250608ERG4	.250	.984	.071	.031	.625	.003	2	●	●	●	●
APMT250616ERG4	.250	.984	.039	.063	.625	.003	2	●	●	●	●
APMT250640ERG4	.250	.984	.004	.156	.625	.003	2	●	●	●	●

P	●	●	●	●
M	●	●	●	●
K	●	●	●	●
N	●	●	●	●
S	●	●	●	●
H	●	●	●	●

● first choice
○ alternate choice



● first choice
○ alternate choice

P	●	●	●
M	●	●	●
K	●	●	●
N	●	●	●
S	●	●	●
H	●	●	●

■ APMT L3P

catalog number	S	L10	BS	Rε	W	hm	cutting edges	KC505M	KC720M	KC730M
APMT250616ERL3P	.250	.984	.039	.063	.625	.003	2	●	●	●

■ APMT L4P

catalog number	S	L10	BS	Rε	W	hm	cutting edges	KC505M	KC720M	KC730M
APMT250616ERL4P	.250	.984	.039	.063	.625	.003	2	●	●	●



Shoulder Mills

■ Recommended Starting Speeds and Feeds [SFM]

Material Group		KC505M			KC720M			KC730M		
P	1	—	—	—	720	660	590	420	400	330
	2	—	—	—	660	590	525	400	360	340
	3	—	—	—	590	525	460	360	330	300
	4	—	—	—	525	490	460	330	300	270
	5	—	—	—	460	390	330	300	270	250
	6	—	—	—	330	260	260	270	250	235
M	1	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
K	1	630	560	490	—	—	—	—	—	—
	2	570	510	440	—	—	—	—	—	—
	3	370	310	240	—	—	—	—	—	—
N	1-2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
S	1	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—	—	—
H	1	—	—	—	—	—	—	—	—	—

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

■ Recommended Starting Feeds [IPT]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.E..L	.007	.014	.029	.005	.011	.021	.004	.009	.018	.004	.009	.017	.004	.008	.017	.E..L
.E..G	.007	.017	.035	.005	.013	.025	.004	.011	.022	.004	.010	.020	.004	.010	.020	.E..G

NOTE: Use "Light Machining" values as starting feed rate.



Shoulder Mills

■ APMT L3P

					(R-1) = one high KFSR400R1AP25		(R-2) = two high KFSR400R2AP25	
material	overhang	recommended condition (vc * fz)	RPM	table feed	DOC (Ap x Ae)	MRR (inch ³ /min)	DOC (Ap x Ae)	MRR (inch ³ /min)
steel	less 4.00"	SFM = 490 fz = .008	478	22.6	.787 x 3.150	56	1.575 x 1.575	56
	4.0"–8.0"	SFM = 490 fz = .008	573	22.6	.787 x 1.575	28	1.575 x .787	28
	over 8.0"	SFM = 330 fz = .008	318	15.3	.787 x 1.181	14	1.575 x .787	18.7
cast iron	less 4.00"	SFM = 590 fz = .008	573	27.1	.787 x 3.150	67.2	1.575 x 1.575	67.2
	4.0"–8.0"	SFM = 590 fz = .008	478	27.1	.787 x 1.575	33.6	1.575 x .787	33.6
	over 8.0"	SFM = 395 fz = .008	382	18.3	.787 x 1.181	16.1	1.575 x .787	21.4
stainless steel	not recommended							
aluminum/copper	not recommended							
high-temp alloys	not recommended							



Shoulder Mills



Slotting Cutters

KTMS • T-Slot Platform	Q2-Q6
KVNS • Very Narrow Slotting Cutter Platform	Q8-Q13
SN • Popular Square Inserted Cutter	Q14-Q17
LN • Adjustable Width Cutter System	Q18-Q25
KSSM10 • Neutral and Right- and Left-Hand Cutters, 10mm I/C	Q26-Q38
KSSM12 • Neutral and Right- and Left-Hand Cutters, 12mm I/C	Q39-Q54

KTMS™ Slotting Cutter

Primary Application

KTMS slotting cutter produces “T” slots in machine beds as well as small radial depths of cut for machining shallow radial slots. There is always a need to prepare the slot before using this type of cutter — preparation is the key to success. See the technical information for information about the pre-machining on page Q6. Please note that all of these cutters have metric diameters, speeds, and feeds.

Features and Benefits

- Only available in metric dimensions.
- Slot widths from 9–22mm.
- Three different insert sizes.
- Preparing the component before slotting is the key to success.
- Prepare workpiece with a slot.
- Honed insert edges.
- Feed rates between 0,10–0,15mm; lower feed rates will induce vibration.
- Use air flow to evacuate chips.
- Always start the cutting process with a new cutting edge.



- Prepare workpiece with a slot.
- Honed insert edges.
- Feed rates between 0,10–0,15mm; lower feed rates will induce vibration.
- Use air flow to evacuate chips.
- Always start the cutting process with a new cutting edge.

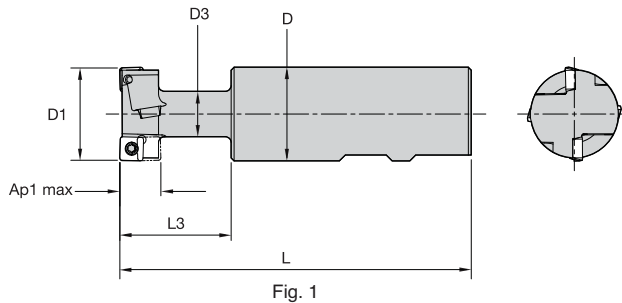
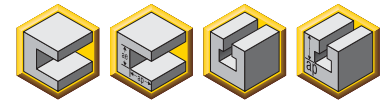


Fig. 1

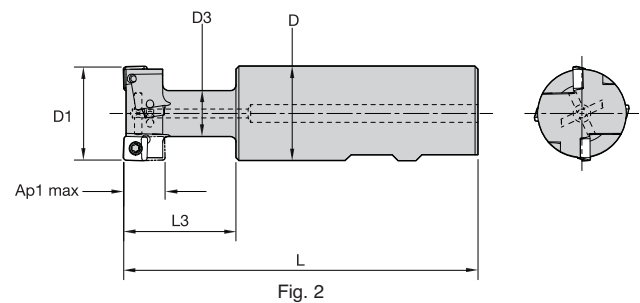


Fig. 2

■ KTMS • T-Slot Cutter • Metric

order number	catalog number	D1	D	D3	L	L3	Ap1 max	Z	Z U	figure	insert 1	kg
3577118	KTMS21S25SD06	21	25	11	109	29	9	2	1	FIG 1	SDMT060304EGG	0,37
3577120	KTMS25S25SD06	25	25	13	112	32	11	4	2	FIG 1	SDMT060304EGG	0,38
3577122	KTMS32S32SD08	32	32	16	120	38	14	4	2	FIG 1	SDMT080308EGG	0,62
3577134	KTMS40S32SD12	40	32	21	130	50	18	4	2	FIG 1	SDMT120408EGG	0,69
3577136	KTMS50S32SD12	50	32	27	140	60	22	4	2	FIG 1	SDMT120408EGG	0,88

■ KTMS • T-Slot Cutter • Metric

order number	catalog number	D1	D	D3	L	L3	Ap1 max	Z	Z U	figure	insert 1	kg
3577119	KTMS21S25SD06H	21	25	11	109	29	9	2	1	FIG 2	SDMT060304EGG	0,35
3577121	KTMS25S25SD06H	25	25	13	112	32	11	4	2	FIG 2	SDMT060304EGG	0,36
3577133	KTMS32S32SD08H	32	32	16	120	38	14	4	2	FIG 2	SDMT080308EGG	0,60
3577135	KTMS40S32SD12H	40	32	21	130	50	18	4	2	FIG 2	SDMT120408EGG	0,66
3577137	KTMS50S32SD12H	50	32	27	140	60	22	4	2	FIG 2	SDMT120408EGG	0,85

■ Spare Parts

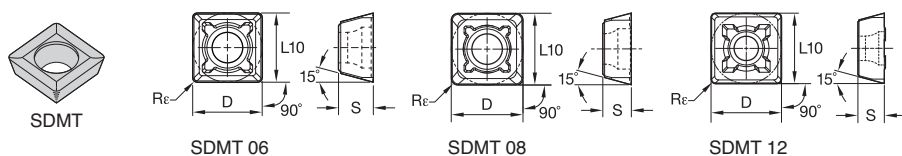
D1	insert screw	Nm	Torx driver	anti-seize lube
21	MS2206	1	DT8	ASL3GT
25	MS2206	1	DT8	ASL3GT
32	MS2207	2	DT10	ASL3GT
40	MS2208	4	DT15	ASL3GT
50	MS2208	4	DT15	ASL3GT

Slotting Cutters

■ Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	.E..GG	KC730M	.E..GG	KC730M	.E..GG	KC735M
P3-P4	.E..GG	KC730M	.E..GG	KC730M	.E..GG	KC735M
P5-P6	.E..GG	KC730M	.E..GG	KC735M	.E..GG	KC735M
M1-M2	—	—	—	—	—	—
M3	—	—	—	—	—	—
K1-K2	.E..GG	K110M	.E..GG	K110M	.E..GG	KC505M
K3	.E..GG	K110M	.E..GG	KC505M	.E..GG	KC505M
N1-N2	—	—	—	—	—	—
N3	—	—	—	—	—	—
S1-S2	—	—	—	—	—	—
S3	—	—	—	—	—	—
S4	—	—	—	—	—	—
H1	—	—	—	—	—	—

Indexable Inserts • T-Slot Cutters



● first choice
○ alternate choice

P	●				●
M	○				○
K	●	●			○
N	○				○
S	○				○
H	○				○

■ SDMT

catalog number	D	S	L10	Re	hm	cutting edges	K110M	KC505M	KC730M	KC735M
SDMT060304EGG	6,35	3,18	6,35	0,40	0,06	4	●	●	●	●
SDMT080308EGG	8,00	3,18	8,00	0,80	0,06	4	●	●	●	●
SDMT120408EGG	12,70	4,76	12,70	0,80	0,06	4	●	●	●	●

Slotting Cutters

Recommended Starting Speeds [SFM]

Material Group		KC110M			KC505M			KC730M			KC735M		
P	1	—	—	—	—	—	—	420	400	330	490	460	430
	2	—	—	—	—	—	—	400	360	340	460	430	390
	3	—	—	—	—	—	—	360	330	300	430	390	360
	4	—	—	—	—	—	—	330	300	270	390	360	330
	5	—	—	—	—	—	—	300	270	250	360	290	260
	6	—	—	—	—	—	—	270	250	235	290	260	230
M	1	—	—	—	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—
K	1	425	400	375	490	460	390	—	—	—	—	—	—
	2	375	350	325	460	390	340	—	—	—	—	—	—
	3	330	295	260	340	310	260	—	—	—	—	—	—
N	1-2	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—
S	1	—	—	—	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—	—	—	—	—	—
H	1	—	—	—	—	—	—	—	—	—	—	—	—

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

Recommended Starting Feeds [IPT]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.E..GG	.006	.012	.020	.004	.009	.015	.004	.008	.013	.003	.007	.012	.003	.007	.012	.E..GG

NOTE: Use "Light Machining" values as starting feed rate.



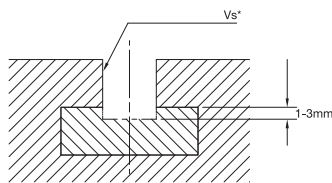


Fig. 1

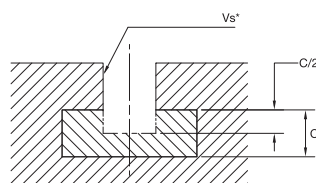


Fig. 2

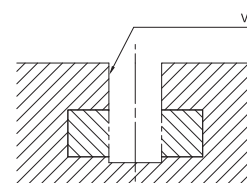
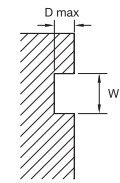


Fig. 3



Side Slotting

■ Steel

- Machining a vertical slot, depth to be kept at a minimum as shown in Figure 1.
- If the depth is greater than Figure 1, chip evacuation problems could occur.
- Vibrations could occur when the T-slot cutter diameter increases; use Figure 1 as the starting point.
- If chattering is a concern, adopt the Figure 2 solution.

■ Cast Iron

- Fewer problems with chip evacuation and reduced cutting forces enable deeper vertical slots as shown in Figures 2 and 3.
- Air blast is recommended to disperse the chips; this can be used for steel and cast iron.

■ Cutting Data Table • Slotting

	material type	catalog number	cutting conditions vc (m/min)	feed per tooth (mm)	Vs*
P	carbon steel/ alloy steel	KTMS21S25SD06H	120	0,10	Figure 1
		KTMS25S25SD06H	120	0,10	Figure 1
		KTMS32S32SD08H	100	0,10	Figure 1
		KTMS40S32SD12H	80	0,15	Figure 2
		KTMS50S32SD12H	not recommended due to frequent chattering		
K	cast iron	KTMS21S25SD06H	120	0,12	Figures 1, 2, 3
		KTMS25S25SD06H	120	0,12	Figures 1, 2, 3
		KTMS32S32SD08H	120	0,12	Figures 1, 2, 3
		KTMS40S32SD12H	120	0,15	Figures 2,3
		KTMS50S32SD12H	120	0,15	Figure 3

*Vs = Vertical Slot Preparation for T-slot.

■ Side Slot Machining

Slotting Cutters

side slot dimension catalog number	W -0.1/-0.3 (mm)	D max (mm)
KTMS21S25SD06H	9	4,4
KTMS25S25SD06H	11	5,4
KTMS32S32SD08H	14	6,9
KTMS40S32SD12H	18	8,9
KTMS50S32SD12H	22	10,9

NOTE: KTMS T-slot is available to side slot as per drawing.

■ Cutting Data Table • Side Machining

	material type	catalog number	cutting conditions vc (m/min)	n (RPM)	feed per tooth (mm)
P	carbon steel/ alloy steel	KTMS21S25SD06H	120	1820	0,10
		KTMS25S25SD06H	120	1530	0,10
		KTMS32S32SD08H	120	1190	0,10
		KTMS40S32SD12H	120	960	0,10
		KTMS50S32SD12H	120	760	0,10
K	cast iron	KTMS21S25SD06H	150	2270	0,12
		KTMS25S25SD06H	150	1910	0,12
		KTMS32S32SD08H	150	1490	0,12
		KTMS40S32SD12H	150	1190	0,15
		KTMS50S32SD12H	150	960	0,15



KSRM™

Multipurpose Milling Cutters

Specially developed for machining titanium and stainless steel. KSRM platform enables you to pocket, profile, ramp, and plunge with up to .039" (1mm) fz with consistent performance, providing outstanding metal removal rates with the lowest cutting forces in roughing applications.

- Anti-rotation feature with eight indexes.
- High positive topography with strong cutting edges.
- High clearance on the cutters and inserts.
- Wide cutter offering with internal coolant.
- Ground and PSTS inserts.
- Provides more stability and reliability.
- Lower cutting forces generated.
- Cutters can run with higher feed rates and better ramping capacities.
- Cover extensive workpiece materials.
- Superior productivity and better insert utilization/cost per edge.
- Able to convert all milling applications.
- Improve tool life and chip evacuation.
- Superior overall performance.

Experience the advantages at your Authorized Kennametal Distributor or at www.kennametal.com.

www.kennametal.com

 **KENNAMETAL®**

KVNS™ Slotting Cutter

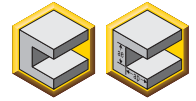
Primary Application

The KVNS slotting cutter enables diameters from 2.50–10" and insert widths from .063–.245". It is a perfect solution for small groove widths, grades, and geometries and suits most materials. Drive rings and support rings are available; use these items to get the maximum support for the cutter body.

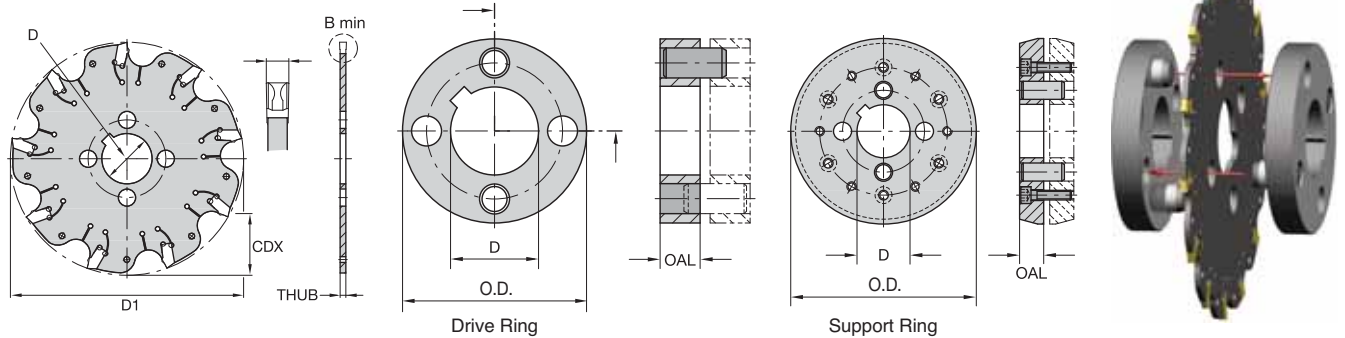
Features and Benefits

- Slot widths from .063–.245".
- Grades and geometries to suit most workpiece materials.
- Drive rings and support rings available, must be ordered separately (in pairs).
- Self clamping inserts.
- .063–.245" slot width range.
- Positive chipforming inserts are standard.
- Self-clamping insert seat with fixed stop.
- Excellent for all flat-bottom slotting and cut-off operations.
- Two drive hubs required for each cutter body, except when using two drive supports (must be ordered separately, in pairs).





- .063-.245" slot width range.
- Positive chipforming inserts are standard.
- Self-clamping insert seat with fixed stop.
- Excellent for all flat-bottom slotting and cut-off operations.
- Two drive rings required for each cutter body, except when using two drive supports (must be ordered separately, in pairs).



■ KVNS • Cutting Width .063"

order number	catalog number	D1	D	B min	CDX	THUB	Z	max RPM	insert 1	lbs
1247698	KVNS02063OD	2.500	.625	.063	.625	.051	5	5100	OD_1063_	<2.00
1247710	KVNS03063OD	3.000	.625	.063	.875	.051	7	4000	OD_1063_	<2.00
1247725	KVNS04063OD	4.000	1.000	.063	1.063	.051	9	3200	OD_1063_	<2.00
1247738	KVNS05063OD	5.000	1.250	.063	1.375	.051	11	2600	OD_1063_	<2.00

■ KVNS • Cutting Width .087"

order number	catalog number	D1	D	B min	CDX	THUB	Z	max RPM	insert 1	lbs
1247712	KVNS03087OD	3.000	.625	.089	.875	.071	7	4000	OD_2087_	<2.00
1247727	KVNS04087OD	4.000	1.000	.089	1.063	.071	9	3200	OD_2087_	<2.00
1247740	KVNS05087OD	5.000	1.250	.089	1.375	.071	11	2600	OD_2087_	<2.00
1247753	KVNS06087OD	6.000	1.250	.089	1.438	.071	14	2000	OD_2087_	<2.00

■ KVNS • Cutting Width .118"

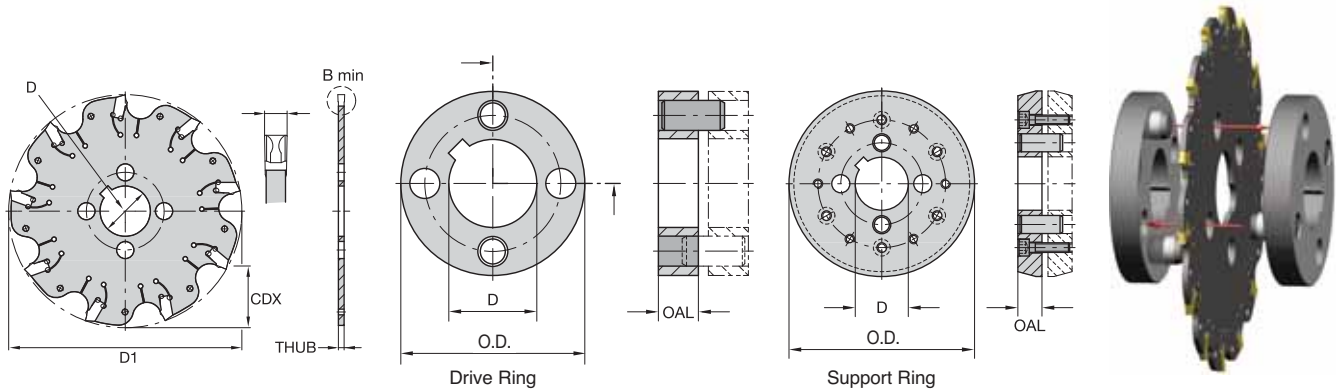
order number	catalog number	D1	D	B min	CDX	THUB	Z	max RPM	insert 1	lbs
1247704	KVNS02118OD	2.500	.625	.126	.625	.095	4	5100	OD_3125_	<2.00
1247716	KVNS03118OD	3.000	.625	.126	.875	.095	6	4000	OD_3125_	<2.00
1247730	KVNS04118OD	4.000	1.000	.126	1.063	.095	9	3200	OD_3125_	<2.00
1247742	KVNS05118OD	5.000	1.250	.126	1.375	.095	11	2600	OD_3125_	<2.00
1247757	KVNS06118OD	6.000	1.250	.126	1.438	.095	14	2000	OD_3125_	<2.00
1247768	KVNS08118OD	8.000	2.000	.126	2.250	.095	19	1600	OD_3125_	<2.00
1247778	KVNS10118OD	10.000	2.000	.126	3.250	.095	24	1300	OD_3125_	<2.00

■ KVNS • Cutting Width .158"

order number	catalog number	D1	D	B min	CDX	THUB	Z	max RPM	insert 1	lbs
1247718	KVNS03158OD	3.000	.625	.164	.875	.134	6	4000	OD_4158_	<2.00
1247732	KVNS04158OD	4.000	1.000	.164	1.063	.134	9	3200	OD_4158_	<2.00
1247746	KVNS05158OD	5.000	1.250	.164	1.375	.134	11	2600	OD_4158_	<2.00

■ KVNS • Cutting Width .197"

order number	catalog number	D1	D	B min	CDX	THUB	Z	max RPM	insert 1	lbs
1247721	KVNS03197OD	3.000	.625	.206	.875	.173	5	4000	OD_5197_	<2.00



■ **KVNS • Cutting Width .236"**

order number	catalog number	D1	D	B min	CDX	THUB	Z	max RPM	insert 1	lbs
1247722	KVNS03236OD	3.000	.625	.245	.875	.213	5	4000	OD_6236__	lt/>2.00
1247735	KVNS04236OD	4.000	1.000	.245	1.063	.213	8	3200	OD_6236__	lt/>2.00
1247785	KVNS10236OD	10.000	2.000	.245	3.250	.213	24	1300	OD_6236__	lt/>2.00

NOTE: Insert wrench 170.183 (order number 1124601) must be ordered separately.

■ **Drive Rings**

order number	D1	O.D.	OAL	bore size	drive ring	lbs
1247650	2.500	1.250	.315	.625	KAP1250632	.07
1247675	3.000	1.250	.315	.625	KAP1250764	.11
1247652	2.500	1.250	.315	.625	KAP1250634	.08
1247660	4.000	1.875	.394	1.000	KAP1871004	.20
1247666	6.000	3.125	.472	1.250	KAP3121254	.75
1247663	5.000	2.250	.394	1.250	KAP2251254	.26
1247668	10.000	3.500	.472	2.000	KAP3502004	.75

NOTE: KAP1250634 is for use with KVNS020630D.
KAP1250632 is for use with KVNS021180D.

■ **Support Rings**

order number	catalog number	D1	O.D.	OAL	bore size	lbs
1247669	KAP5502004	8.000	5.500	.472	2.000	2.53
1247669	KAP5502004	10.000	7.500	.472	2.000	5.17
1247673	KAP7502004	12.000	7.500	.472	2.000	5.17

■ **Spare Parts**

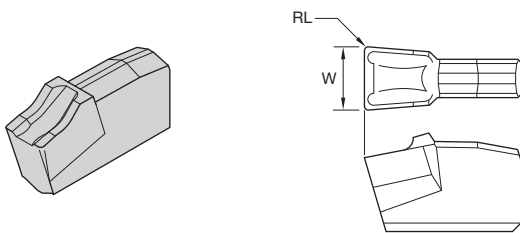
D1	support ring screw
8.000	125.616
10.000	125.616
12.000	125.616

Slotting Cutters

Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	.S..GD	KCPK30	.S..GD	KCPK30	.S..GB	KCPK30
P3-P4	.S..GD	KCPK30	.S..GD	KCPK30	.S..GB	KCPK30
P5-P6	.S..GD	KCPK30	.S..GB	KC735M	.S..GB	KCPK30
M1-M2	.S..GD	KC735M	.S..GD	KCPK30	.S..GB	KC735M
M3	.S..GD	KCPK30	.S..GB	KC735M	.S..GB	KCPK30
K1-K2	.S..GD	KCPK30	.S..GD	KCPK30	.S..GB	KCPK30
K3	.S..GD	KCPK30	.S..GB	KCPK30	.S..GB	KCPK30
N1-N2	.E..GD	KMF	.E..GD	KMF	.E..GD	KMF
N3	.E..GD	KMF	.E..GD	KMF	.E..GD	KMF
S1-S2	.E..GD	KMF	.E..GD	KMF	.E..GD	KMF
S3	.E..GD	KMF	.E..GD	KMF	.E..GD	KMF
S4	.E..GD	KMF	.E..GD	KMF	—	—
H1	—	—	—	—	—	—

Indexable Inserts • KVNS



● first choice
○ alternate choice

P	●	○	○	○
M	●	○	○	○
K	●	○	○	○
N	○	○	○	○
S	●	○	○	○
H	○	○	○	○

.063"

catalog number	W	RL	hm	KC735M	KCPK30	KMF
ODG1063ISGB	.063	.006	.003	●	●	○
ODG1063ISGD	.063	.006	.003	●	●	○
ODC1063IEGD	.063	.006	.003	○	○	●

.087"

catalog number	W	RL	hm	KC735M	KCPK30	KMF
ODG2087ISGB	.087	.008	.003	●	●	○
ODG2087ISGD	.087	.008	.003	●	●	○
ODC2087IEGD	.087	.008	.003	○	○	●

.118"

catalog number	W	RL	hm	KC735M	KCPK30	KMF
ODC3125IEGD	.119	.008	.003	○	○	●
ODG3125ISGD	.120	.008	.003	●	●	○
ODG3125ISGB	.120	.008	.003	●	●	○

.158"

catalog number	W	RL	hm	KC735M	KCPK30	KMF
ODC4158IEGD	.159	.008	.003	○	○	●
ODG4158ISGB	.160	.008	.003	●	●	○
ODG4158ISGD	.160	.008	.003	●	●	○

.197"

catalog number	W	RL	hm	KC735M	KCPK30	KMF
ODG5197ISGB	.199	.012	.003	●	●	○

.236"

catalog number	W	RL	hm	KC735M	KCPK30	KMF
ODG6236ISGB	.238	.012	.003	●	●	○

Slotting Cutters

■ Recommended Starting Speeds [SFM]

Material Group		KC735M			KCPK30			KMF		
P	1	—	—	—	1485	1300	1210	—	—	—
	2	—	—	—	920	830	750	—	—	—
	3	—	—	—	830	750	680	—	—	—
	4	—	—	—	620	575	520	—	—	—
	5	—	—	—	850	760	690	—	—	—
	6	—	—	—	520	450	—	—	—	—
M	1	340	290	270	680	600	515	—	—	—
	2	310	280	250	610	530	460	—	—	—
	3	230	200	—	475	430	380	—	—	—
K	1	—	—	—	965	875	780	—	—	—
	2	—	—	—	770	690	630	—	—	—
	3	—	—	—	645	575	530	—	—	—
N	1-2	—	—	—	—	—	—	1100	980	890
	3	—	—	—	—	—	—	720	650	560
S	1	—	—	—	—	—	—	100	80	65
	2	—	—	—	—	—	—	100	80	65
	3	—	—	—	—	—	—	100	80	65
	4	—	—	—	—	—	—	80	80	80
H	1	—	—	—	—	—	—	—	—	—

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

■ Recommended Starting Feeds [IPT]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

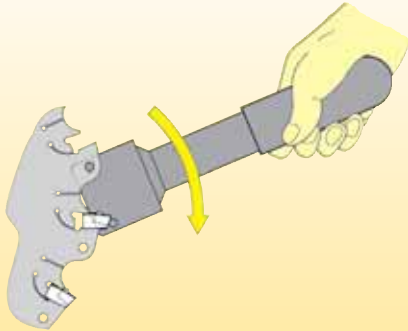
Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)														Insert Geometry	
	10%			20%			30%			40%			50-100%			
.E..GD	.007	.010	.014	.005	.008	.011	.004	.007	.009	.004	.006	.009	.004	.006	.008	.E..GD
.S..GD	.007	.013	.017	.005	.009	.013	.004	.008	.011	.004	.008	.010	.004	.008	.010	.S..GD
.S..GB	.007	.017	.020	.005	.013	.015	.004	.011	.013	.004	.010	.012	.004	.010	.012	.S..GB

NOTE: Use "Light Machining" values as starting feed rate.

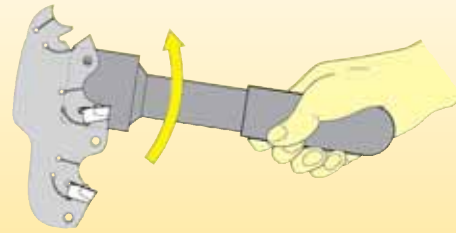


Slotting Cutters

■ **Secure Clamping • Self-Clamping Insert Seat for Maximum Machining Safety**



Using the assembly wrench:
Fitting the insert



Removing the insert

- Exact position of the insert guaranteed by the positive stop.
- Maximum possible insert repeatability with dual positive prism clamping.
- Powerful, secure clamping guarantees high peripheral speeds.



Carbide Recycling

Help preserve and protect our planet!

It's easy for your company to be environmentally conscious with the Kennametal Carbide Recycling Program.

By sending us your used carbide tools, you help preserve and protect the environment and ensure that these products are recycled responsibly. Kennametal accepts any coated or non-coated carbide items, including inserts, drills, reamers, and taps.



By using the Kennametal Carbide Recycling Program, you will receive:

- A partner who cares about a sustainable environment.
- Easy-to-use web portal to value your used carbide.
- Access to our popular Green Box™ options for carbide collection.
- Systematic and efficient disposal of carbide materials.
- Improved profitability.

Program is not currently available in all geographical areas.
For more information, please visit www.kennametal.com/carbiderecycling.

SN Slotting Cutter

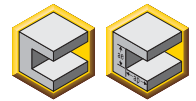
Primary Application

SN slotting cutters are perfect for deeper applications that require the cutting load to be shared from one insert to the other. Provides groove widths from .161–.187" and cutter diameters from 4–6" as well as an economical way to achieve balanced cutting.

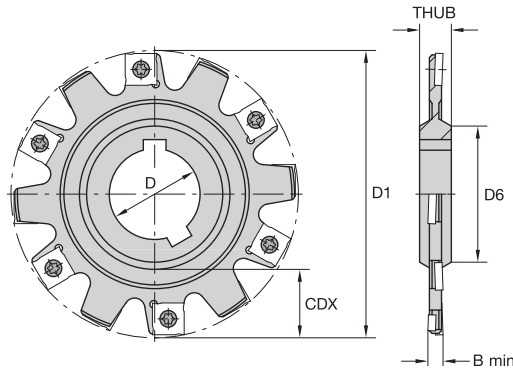
Features and Benefits

- Cutters available in arbor mount.
- Inserts with four indexes.
- Staggered key ways in mounting bore, used for multiple ganged cutters.
- Slot width .161–.187".
- Three insert geometries available: -GP, -GE, and -T.
- Requires only one spare part.
- Economical to use.





- .161-.187" slotting width range.
- Four indexes per insert.
- Three chipformers available.
- Two keyways for staggered mounting.
- Requires only one spare part.
- Economical to use.



■ SN • Cutting Width .161"

order number	catalog number	D1	D	D6	B min	CDX	THUB	Z	Z U	max RPM	insert 1	lbs
1247681	KS426SNH1102	4.000	1.000	1.620	.161	1.120	.500	12	6	9530	SNHX1102T	<2.00
1247684	KS526SNH1102	5.000	1.250	1.880	.161	1.500	.500	14	7	8520	SNHX1102T	<2.00

■ SN • Cutting Width .187"

order number	catalog number	D1	D	D6	B min	CDX	THUB	Z	Z U	max RPM	insert 1	lbs
1247686	KS333SNH1103	3.000	1.000	1.620	.187	.620	.500	10	5	10000	SNHX1103T	<2.00
1247688	KS433SNH1103	4.000	1.000	1.620	.187	1.120	.500	12	6	8660	SNHX1103T	<2.00
1247691	KS533SNH1103	5.000	1.250	1.880	.187	1.500	.500	14	7	7745	SNHX1103T	<2.00
1247694	KS633SNH1103	6.000	1.250	1.880	.187	2.000	.500	18	9	7070	SNHX1103T	2.00

■ Spare Parts



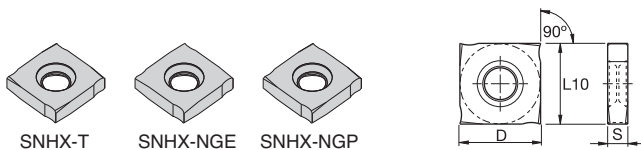
D1	insert screw	in. lbs.	Torx driver
3.000	MS1883PKG	10	DT7
4.000	MS1883PKG	10	DT7
5.000	MS1883PKG	10	DT7
6.000	MS1883PKG	10	DT7

NOTE: Torque value for insert screw is 10 in. lbs.
Slot width tolerance is +/- .003" over standard insert.
Bottom slot angle is 2°.

Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	.T..GP	KC725M	.T..GP	KC725M	.T..	KC725M
P3-P4	.T..GP	KC725M	.T..GP	KCPK30	.T..	KCPK30
P5-P6	.T..GP	KCPK30	.T..	KC735M	.T..	KCPK30
M1-M2	.T..GP	KC725M	.T..GP	KC725M	.T..	KC725M
M3	.T..GP	KC725M	.T..GP	KCPK30	.T..	KCPK30
K1-K2	.F..GE	K110M	.T..GP	KCPK30	.T..	KCPK30
K3	.T..GP	KCPK30	.T..	KCPK30	.T..	KCPK30
N1-N2	.F..GE	K110M	.F..GE	K110M	.F..GE	KC510M
N3	.F..GE	K110M	.F..GE	KC510M	.T..GP	K110M
S1-S2	.T..GP	KC725M	.T..GP	KC725M	.T..	KC725M
S3	.T..GP	KC725M	.T..GP	KC725M	.T..	KC725M
S4	.T..GP	KC725M	.T..	KC725M	—	—
H1	—	—	—	—	—	—

Indexable Inserts • SNHX



P									
M									
K									
N									
S									
H									

● first choice
○ alternate choice

SNHX-T

catalog number	D	S	L10	hm	cutting edges	K110M	KC510M	KC520M	KC725M	KC735M	KCPK30
SNHX1102T	.433	.094	.433	.006	4						
SNHX1103T	.433	.106	.433	.006	4						
SNHX1203T	.500	.126	.500	.006	4						
SNHX1204T	.500	.157	.500	.004	4						
SNHX12045T	.500	.177	.500	.004	4						
SNHX1205T	.500	.213	.500	.004	4						

SNHX-NGE

catalog number	D	S	L10	hm	cutting edges	K110M	KC510M	KC520M	KC725M	KC735M	KCPK30
SNHX1102PZFNGE	.433	.091	.433	.001	4						
SNHX11T3PZFNGE	.433	.106	.433	.002	4						
SNHX1203PZFNGE	.500	.126	.500	.002	4						
SNHX12L5PZFNGE	.500	.213	.500	.002	4						

SNHX-NGP

catalog number	D	S	L10	hm	cutting edges	K110M	KC510M	KC520M	KC725M	KC735M	KCPK30
SNHX1102PZTNGP	.433	.091	.433	.006	4						
SNHX11T3PZTNGP	.433	.106	.433	.006	4						
SNHX1203PZTNGP	.500	.126	.500	.006	4						
SNHX12L4PZTNGP	.500	.177	.500	.006	4						
SNHX12L5PZTNGP	.500	.213	.500	.006	4						

Slotting Cutters

■ Recommended Starting Speeds [SFM]

Material Group		KC110M			KC510M			KC520M		
P	1	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—	—	—
	5	—	—	—	—	—	—	—	—	—
	6	—	—	—	—	—	—	—	—	—
M	1	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
K	1	425	400	375	960	870	780	880	800	710
	2	375	350	325	760	680	630	690	620	580
	3	330	295	260	640	570	520	580	520	470
N	1-2	1650	1550	1475	2100	1870	1720	—	—	—
	3	1350	1200	1050	—	—	—	—	—	—
S	1	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—	—	—
H	1	—	—	—	—	—	—	—	—	—

Material Group		KC725M			KC735M			KCPK30		
P	1	860	750	700	—	—	—	1485	1300	1210
	2	720	630	530	—	—	—	920	830	750
	3	660	560	460	—	—	—	830	750	680
	4	590	490	390	—	—	—	620	575	520
	5	490	440	390	—	—	—	850	760	690
	6	430	330	260	—	—	—	520	450	—
M	1	560	490	450	340	290	270	680	600	515
	2	510	430	360	310	280	250	610	530	460
	3	380	330	260	230	200	—	475	430	380
K	1	—	—	—	—	—	—	965	875	780
	2	—	—	—	—	—	—	770	690	630
	3	—	—	—	—	—	—	645	575	530
N	1-2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
S	1	115	100	80	—	—	—	—	—	—
	2	115	100	80	—	—	—	—	—	—
	3	150	115	80	—	—	—	—	—	—
	4	200	150	100	—	—	—	—	—	—
H	1	—	—	—	—	—	—	—	—	—

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

■ Recommended Starting Feeds [IPT]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.F..GE	.003	.007	.014	.003	.005	.010	.002	.004	.009	.002	.004	.008	.002	.004	.008	.F..GE
.T..GP	.007	.014	.020	.005	.010	.015	.004	.009	.013	.004	.008	.012	.004	.008	.012	.T..GP
.T..	.007	.017	.024	.005	.013	.017	.004	.011	.015	.004	.010	.014	.004	.010	.014	.T..

NOTE: Use "Light Machining" values as starting feed rate.

LN Slotting Cutter

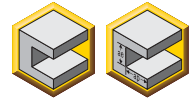
Primary Application

LN slotting cutters offer arbor and shell mill cutter options, groove widths from .250–.539", and cutter diameters from 3–8". Easy to adjust radially in .020" increments.

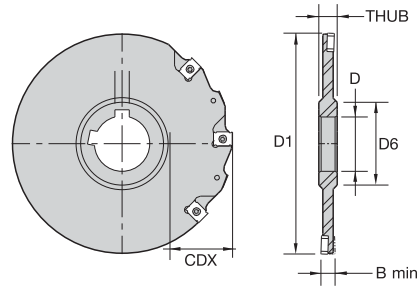
Features and Benefits

- Cutter available in arbor and shell mounts.
- Groove width .250–.500".
- Groove width can be changed by consulting additional chart; this involves changing insert and insert screw.
- Staggered internal keys.
- Positive chip grooves.
- Easy width adjustment through insert thickness.
- Full side and face cutting.
- Neutral and positive chipforming inserts are standard.
- Four insert cutting edges.
- Requires only one spare part.

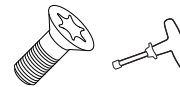




- .250-.500" slot width range.
- Easy width adjustment through insert thickness.
- Full side and face cutting.
- Neutral and positive chipforming inserts are standard.
- Four insert cutting edges.
- Two keyways for staggered mounting.
- Requires only one spare part.

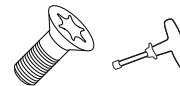


■ LN • Cutting Width .250"



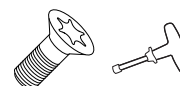
order number	catalog number	D1	D	D6	B min	CDX	THUB	Z	Z U	max RPM	insert screw	Torx wrench	in. lbs.	insert 1	lbs
1025930	KS34LNE1240	3.000	1.000	1.620	.250	.620	.500	8	4	9470	MS1281	TT15	35	LNE_1240__	<2.00
1025931	KS44LNE1240	4.000	1.250	1.880	.250	1.000	.500	10	5	8200	MS1281	TT15	35	LNE_1240__	<2.00
1025895	KS54LNE1240	5.000	1.250	1.880	.250	1.500	.500	12	6	7330	MS1281	TT15	35	LNE_1240__	<2.00
1025932	KS64LNE1240	6.000	1.500	2.250	.250	1.750	.500	16	8	6700	MS1281	TT15	35	LNE_1240__	2.00
1025933	KS84LNE1240	8.000	1.500	2.250	.250	2.750	.500	18	9	5800	MS1281	TT15	35	LNE_1240__	3.00

■ LN • Cutting Width .312"



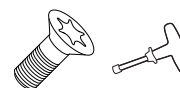
order number	catalog number	D1	D	D6	B min	CDX	THUB	Z	Z U	max RPM	insert screw	Torx wrench	in. lbs.	insert 1	lbs
1025964	KS45LNE1245	4.000	1.250	1.880	.312	1.000	.500	10	5	7400	MS1282	TT15	35	LNE_1245__	<2.00
1025896	KS55LNE1245	5.000	1.250	1.880	.312	1.500	.500	12	6	6600	MS1282	TT15	35	LNE_1245__	<2.00
1025965	KS65LNE1245	6.000	1.500	2.250	.312	1.750	.500	16	8	6000	MS1282	TT15	35	LNE_1245__	2.10
1025897	KS85LNE1245	8.000	1.500	2.250	.312	2.750	.500	18	9	5200	MS1282	TT15	35	LNE_1245__	3.50

■ LN • Cutting Width .375"



order number	catalog number	D1	D	D6	B min	CDX	THUB	Z	Z U	max RPM	insert screw	Torx wrench	in. lbs.	insert 1	lbs
1025966	KS46LNE1245	4.000	1.250	1.880	.375	1.000	.500	9	3	7400	MS1282	TT15	35	LNE_1245__	<2.00
1025898	KS56LNE1245	5.000	1.250	1.880	.375	1.500	.500	12	4	6600	MS1282	TT15	35	LNE_1245__	2.00
1025967	KS66LNE1245	6.000	1.500	2.250	.375	1.750	.500	15	5	6000	MS1282	TT15	35	LNE_1245__	2.70
1025968	KS86LNE1245	8.000	1.500	2.250	.375	2.750	.500	18	6	5200	MS1282	TT15	35	LNE_1245__	5.00

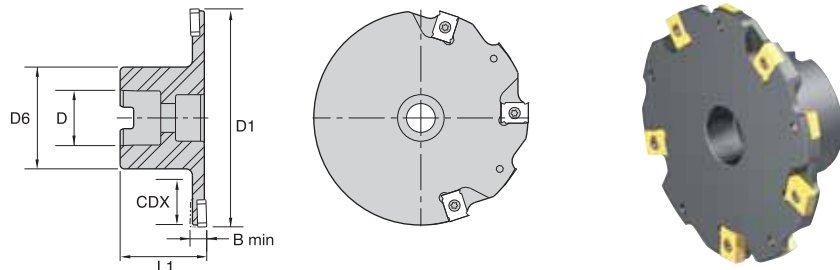
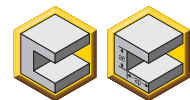
■ LN • Cutting Width .500"



order number	catalog number	D1	D	D6	B min	CDX	THUB	Z	Z U	max RPM	insert screw	Torx wrench	in. lbs.	insert 1	lbs
1025969	KS48LNE1255	4.000	1.250	1.880	.500	1.000	.500	9	3	4900	MS1284	TT15	35	LNE_1255__	<2.00
1025899	KS58LNE1255	5.000	1.250	1.880	.500	1.500	.500	12	4	4400	MS1284	TT15	35	LNE_1255__	2.40
1025970	KS68LNE1255	6.000	1.500	2.250	.500	1.750	.500	15	5	4000	MS1284	TT15	35	LNE_1255__	3.00
1025971	KS88LNE1255	8.000	1.500	2.250	.500	2.750	.500	18	6	3500	MS1284	TT15	35	LNE_1255__	5.50

NOTE: Slot width tolerance is +/- .003" over standard insert.

- .250-.500" slot width range.
- Easy width adjustment through insert thickness.
- Full side and face cutting versions.
- Neutral and positive chipforming inserts are standard.
- Four insert cutting edges.
- Requires only one spare part.



■ LN • Cutting Width .250"



order number	catalog number	D1	D	D6	B min	CDX	L1	Z	Z U	max RPM	insert screw	Torx wrench	in. lbs.	flat-head cap screw	socket-head cap screw	insert 1
1067765	KS254BLNE1240	2.500	.750	1.580	.250	.550	1.875	6	3	10400	MS1281	TT15	35	S1903	—	LNE_1240__
1025861	KS44BLNE1240	4.000	1.000	1.880	.250	.940	1.570	10	5	8200	MS1281	TT15	35	—	S458	LNE_1240__

■ LN • Cutting Width .312"



order number	catalog number	D1	D	D6	B min	CDX	L1	Z	Z U	max RPM	insert screw	Torx wrench	in. lbs.	flat-head cap screw	socket-head cap screw	insert 1
1067766	KS255BLNE1245	2.500	.750	1.580	.312	.550	1.875	6	3	9400	MS1282	TT15	35	S1903	—	LNE_1245__
1025862	KS45BLNE1245	4.000	1.000	1.880	.312	.940	1.570	10	5	7400	MS1282	TT15	35	—	S458	LNE_1245__

■ LN • Cutting Width .375"



order number	catalog number	D1	D	D6	B min	CDX	L1	Z	Z U	max RPM	insert screw	Torx wrench	in. lbs.	socket-head cap screw	insert 1
1025863	KS46BLNE1245	4.000	1.000	1.880	.375	.940	1.570	9	3	7400	MS1282	TT15	35	S458	LNE_1245__

■ LN • Cutting Width .500"



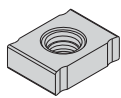
order number	catalog number	D1	D	D6	B min	CDX	L1	Z	Z U	max RPM	insert screw	Torx wrench	in. lbs.	socket-head cap screw	insert 1
1025894	KS48BLNE1255	4.000	1.000	1.880	.500	.940	2.000	9	3	4900	MS1284	TT15	35	S458	LNE_1255__

NOTE: Slot width tolerance is +/- .003" over standard insert.
 2.50" diameter cutters are supplied with S-1903 (3/8-24 x 1.75 long) flat-head socket cap screw.

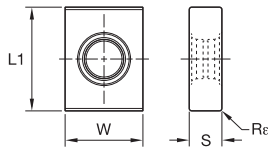
Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	—	KC725M	—	KC725M	.S..GP	KC725M
P3-P4	—	KC725M	—	KCPK30	.S..GP	KC725M
P5-P6	—	KC735M	—	KCPK30	.S..GP	KC735M
M1-M2	—	KC725M	—	KC725M	.S..GP	KC725M
M3	—	KC735M	—	KCPK30	.S..GP	KC725M
K1-K2	—	KC520M	—	KCK15	—	KCPK30
K3	—	KCK15	—	KCPK30	—	KCPK30
N1-N2	—	—	—	—	—	—
N3	—	—	—	—	—	—
S1-S2	—	KC725M	—	KC725M	.S..GP	KC725M
S3	—	KC735M	.S..GP	KC735M	.S..GP	KC725M
S4	—	KC725M	.S..GP	KC725M	—	—
H1	—	—	—	—	—	—

Indexable Inserts • 0° LN • LNEU/LNEQ



LNEU-R



● first choice
○ alternate choice

P	●	●	●	●	●
M	●	○	○	○	○
K	●	○	○	○	○
N	●	○	○	○	○
S	●	○	○	○	○
H	○	○	○	○	○

LNEU-R

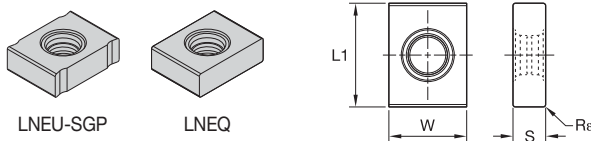
catalog number	L1	W	S	Re	hm	cutting edges	KC520M	KC725M	KC735M	KCK15	KCPK30
LNEU1235R03 4	.500	.378	.138	.012	.002	4	●	●	●	○	○
LNEU1240R03 4	.500	.378	.158	.012	.002	4	●	●	●	○	○
LNEU1240R08 4	.500	.378	.158	.031	.002	4	●	●	○	○	○
LNEU1240R16 4	.500	.378	.158	.062	.002	4	●	●	○	○	○
LNEU1245R04	.500	.378	.177	.016	.003	4	●	●	●	○	○
LNEU1245R08	.500	.378	.177	.031	.002	4	●	●	○	○	○
LNEU1245R16	.500	.378	.177	.062	.002	4	●	●	○	○	○
LNEU1245R32	.500	.378	.177	.125	.002	4	●	●	○	○	○
LNEU1250R04	.500	.378	.197	.016	.002	4	●	●	○	○	○
LNEU1250R08	.500	.378	.197	.031	.002	4	●	●	○	○	○
LNEU1255R04	.500	.378	.217	.016	.002	4	●	●	○	○	○
LNEU1255R08	.500	.378	.217	.031	.002	4	●	●	○	○	○
LNEU1255R16	.500	.378	.217	.062	.002	4	●	●	○	○	○
LNEU1255R32	.500	.378	.217	.125	.002	4	●	●	○	○	○
LNEU1260R04	.500	.378	.236	.016	.002	4	●	●	○	○	○

Slotting Cutters

Insert Selection Guide

Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	—	KC725M	—	KC725M	.S..GP	KC725M
P3-P4	—	KC725M	—	KCPK30	.S..GP	KC725M
P5-P6	—	KC735M	—	KCPK30	.S..GP	KC735M
M1-M2	—	KC725M	—	KC725M	.S..GP	KC725M
M3	—	KC735M	—	KCPK30	.S..GP	KC725M
K1-K2	—	KC520M	—	KCK15	—	KCPK30
K3	—	KCK15	—	KCPK30	—	KCPK30
N1-N2	—	—	—	—	—	—
N3	—	—	—	—	—	—
S1-S2	—	KC725M	—	KC725M	.S..GP	KC725M
S3	—	KC735M	.S..GP	KC735M	.S..GP	KC725M
S4	—	KC725M	.S..GP	KC725M	—	—
H1	—	—	—	—	—	—

Indexable Inserts • 0° LN • LNEU/LNEQ



● first choice
○ alternate choice

P	●	●	●	●	●
M	●	●	○	○	○
K	●	○	○	○	○
N	●	○	○	○	○
S	●	○	○	○	○
H	○	○	○	○	○

LNEU-SGP

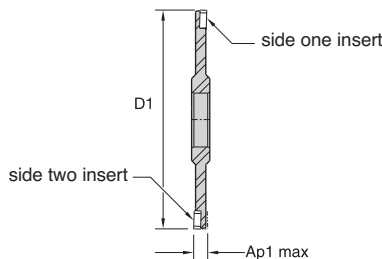
catalog number	L1	W	S	Re	hm	cutting edges	KC520M	KC725M	KC735M	KCK15	KCPK30
LNEU1235R03SGP 4	.500	.378	.138	.012	.004	4	●	●	○	○	○
LNEU1240R03SGP 4	.500	.378	.157	.012	.004	4	●	●	○	○	○
LNEU1245R04SGP	.500	.378	.177	.016	.003	4	●	●	○	○	○
LNEU1245R08SGP	.500	.378	.177	.031	.004	4	●	●	○	○	○
LNEU1245R16SGP	.500	.378	.177	.063	.004	4	●	●	○	○	○
LNEU1250R04SGP	.500	.378	.197	.016	.004	4	●	●	○	○	○
LNEU1250R08SGP	.500	.378	.197	.031	.004	4	●	●	○	○	○

LNEQ

catalog number	L1	W	S	BS	Re	hm	cutting edges	KC520M	KC725M	KC735M	KCK15	KCPK30
LNEQ1235R03 4	.500	.375	.138	—	.012	.002	4	●	●	○	○	○
LNEQ1240 4	.500	.375	.158	.012	—	.002	4	●	●	○	○	○
LNEQ1240R03 4	.500	.375	.158	—	.012	.002	4	●	●	○	○	○
LNEQ1245R04	.500	.375	.177	—	.016	.002	4	●	●	○	○	○
LNEQ1250R04	.500	.375	.197	—	.016	.002	4	●	●	○	○	○
LNEQ1255	.500	.375	.217	.016	—	.002	4	●	●	○	○	○
LNEQ1255R04	.500	.375	.217	—	.016	.002	4	●	●	○	○	○
LNEQ1260R04	.500	.375	.236	—	.016	.002	4	●	●	○	○	○

Slotting Cutters

- Utilizes wider inserts in standard cutter bodies.
- Cutting width of the unique LNE insert style for narrow slotting cutters can be varied by using an insert one size thicker.
- The width can be increased in .0195" and .039" increments.
- Refer to the insert combination table below for insert selection.



cutter catalog number	D1	Ap1 max	Ap1 max (new)	side one insert *	screw **	side two insert *	screw **
KS43LNE	3.000	.250	.270	LNE1240	MS-1281	LNE1245	MS-1282
KS44LNE	4.000	.250	.270	LNE1240	MS-1281	LNE1245	MS-1282
KS54LNE	5.000	.250	.289	LNE1245	MS-1282	LNE1245	MS-1282
KS64LNE	6.000	.250	.289	LNE1245	MS-1282	LNE1245	MS-1282
KS84LNE	8.000	.250	.289	LNE1245	MS-1282	LNE1245	MS-1282
KS45LNE	4.000	.312	.332	LNE1245	MS-1282	LNE1250	MS-1283
KS55LNE	5.000	.312	.332	LNE1245	MS-1282	LNE1250	MS-1283
KS65LNE	6.000	.312	.351	LNE1250	MS-1283	LNE1250	MS-1283
KS85LNE	8.000	.312	.351	LNE1250	MS-1283	LNE1250	MS-1283
KS46LNE	4.000	.375	.395	LNE1245	MS-1282	LNE1250	MS-1283
KS56LNE	5.000	.375	.395	LNE1245	MS-1282	LNE1250	MS-1283
KS66LNE	6.000	.375	.414	LNE1250	MS-1283	LNE1250	MS-1283
KS86LNE	8.000	.375	.414	LNE1250	MS-1283	LNE1250	MS-1283
KS48LNE	4.000	.500	.520	LNE1255	MS-1284	LNE1260	MS-1285
KS58LNE	5.000	.500	.520	LNE1255	MS-1284	LNE1260	MS-1285
KS68LNE	6.000	.500	.539	LNE1260	MS-1285	LNE1260	MS-1285
KS88LNE	8.000	.500	.539	LNE1260	MS-1285	LNE1260	MS-1285

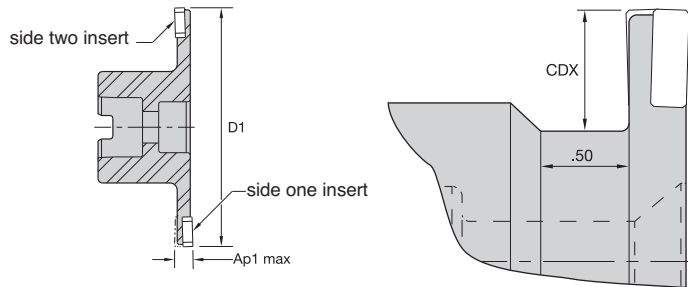
cutter width of .289"							
cutter catalog number	D1	Ap1 max (new)	side one insert *	screw **	side two insert *	screw **	
KS43LNE	3.000	.289	LNE1245	MS-1282	LNE1245	MS-1282	

* Caution variation in cutting width range is limited to one size (thickness) greater than the standard insert thickness.

** When changing to wider insert thickness, use the necessary longer screw.

NOTE: When using inserts that employ a radius of .094" or .125", the corner radius under the insert on the cutter body must be modified to a .10" radius or an optional .10" x 45° chamfer; see chart for detail.

- Utilizes wider inserts in standard cutter bodies.
- Cutting width of the unique LNE insert style for narrow slotting cutters can be varied by using an insert one size thicker.
- The width can be increased in .0195" and .039" increments.
- Refer to the insert combination table below for insert selection.



cutter catalog number	D1	Ap1 max	Ap1 max (new)	side one insert *	screw **	side two insert *	screw **
KS254BLNE1240	2.500	.250	.270	LNE1240	MS-1281	LNE1245	MS-1282
KS44BLNE1240	4.000	.250	.289	LNE1245	MS-1282	LNE1245	MS-1282
KS255BLNE1245	2.500	.312	.332	LNE1245	MS-1282	LNE1250	MS-1283
KS45BLNE1245	4.000	.312	.351	LNE1250	MS-1283	LNE1250	MS-1283
KS46BLNE1245	4.000	.375	.395	LNE1245	MS-1282	LNE1250	MS-1283
KS46BLNE1245	4.000	.375	.414	LNE1250	MS-1283	LNE1250	MS-1283
KS48BLNE1255	4.000	.500	.520	LNE1255	MS-1284	LNE1260	MS-1285
KS48BLNE1255	4.000	.500	.539	LNE1260	MS-1285	LNE1260	MS-1285

* Caution variation in cutting width range limited to one size (thickness) greater than the standard insert thickness.

** When changing to wider insert thickness, use the necessary longer screw.

NOTE: When using inserts with a radius of .094" or .125", the corner radius under the insert on the cutter body must be modified to a .10" radius or an optional .10" x 45° chamfer.



■ Recommended Starting Speeds [SFM]

Material Group		KC520M			KC725M			KC735M			KCK15			KCPK30		
P	1	—	—	—	860	750	700	—	—	—	—	—	—	1485	1300	1210
	2	—	—	—	720	630	530	—	—	—	—	—	—	920	830	750
	3	—	—	—	660	560	460	—	—	—	—	—	—	830	750	680
	4	—	—	—	590	490	390	—	—	—	—	—	—	620	575	520
	5	—	—	—	490	440	390	—	—	—	—	—	—	850	760	690
	6	—	—	—	430	330	260	—	—	—	—	—	—	520	450	—
M	1	—	—	—	560	490	450	340	290	270	—	—	—	680	600	515
	2	—	—	—	510	430	360	310	280	250	—	—	—	610	530	460
	3	—	—	—	380	330	260	230	200	—	—	—	—	475	430	380
K	1	880	800	710	—	—	—	—	—	—	1380	1255	1115	965	875	780
	2	690	620	580	—	—	—	—	—	—	1095	975	910	770	690	630
	3	580	520	470	—	—	—	—	—	—	920	815	750	645	575	530
N	1-2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
S	1	—	—	—	115	100	80	—	—	—	—	—	—	—	—	—
	2	—	—	—	115	100	80	—	—	—	—	—	—	—	—	—
	3	—	—	—	150	115	80	—	—	—	—	—	—	—	—	—
	4	—	—	—	200	150	100	—	—	—	—	—	—	—	—	—
H	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

■ Recommended Starting Feeds [IPT]

Light Machining	General Purpose	Heavy Machining
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Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
...	.005	.014	.020	.004	.010	.015	.003	.009	.013	.003	.008	.012	.003	.008	.012	...
.S..GP	.007	.016	.024	.005	.012	.017	.004	.010	.015	.004	.009	.014	.004	.009	.014	.S..GP

NOTE: Use "Light Machining" values as starting feed rate.

KSSM™ Slotting Cutter

Primary Application

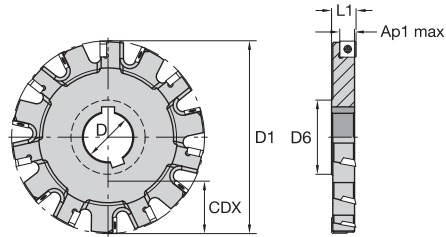
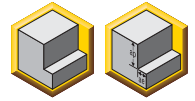
With insert grades and geometries for most materials, the KSSM fixed-width slotting cutters are a cost effective solution for the general engineering market. Very precise adjustments to achieve consistent widths are possible with the variable width and enables customers to change the tool from right hand to left hand with a change of cartridge.

Features and Benefits

- Cutters available in arbor and shell mounts.
- Cutters right and left hand and full slotting have fixed widths.
- Groove widths: Fixed .614"; Adjustable .551–.917".
- Rapid adjustment mechanism.
- Large insert selection — grades and geometries.
- Wiper inserts.
- Insert radii from .016–.250".
- Right-hand and left-hand cutters with .359" depth of cut.
- Diameter range is 4–12".
- Large selection of insert geometries and grades to cut most workpiece materials.
- Four insert cutting edges.
- Five insert radii available.
- Faceted inserts for superior surface finishes.



- Right-hand and left-hand cutters with .359" width of cut.
- Large selection of insert geometries and grades to cut most workpiece materials.
- Four insert cutting edges.
- Insert radii available.
- Faceted inserts for superior surface finishes.



■ Arbor Mount • 10mm IC • Right Hand

order number	catalog number	D1	D	D6	CDX	L1	Ap1 max	Z	Z S	max RPM	lbs
2629770	KSSS400ASP10R625	4.000	1.250	1.880	1.038	.625	.359	10	10	17100	1.22
2629773	KSSS500ASP10R625	5.000	1.500	2.250	1.353	.625	.359	11	11	15300	1.98
2629776	KSSS600ASP10R625	6.000	1.500	2.250	1.853	.625	.359	11	11	14000	3.13
2629779	KSSS800ASP10R625	8.000	2.000	2.880	2.538	.625	.359	13	13	12100	5.78

NOTE: For superior surface finish, use right-hand inserts.

■ Arbor Mount • 10mm IC • Left Hand

order number	catalog number	D1	D	D6	CDX	L1	Ap1 max	Z	Z S	max RPM	lbs
2629769	KSSS400ASP10L625	4.000	1.250	1.880	1.038	.625	.359	10	10	17100	1.22
2629772	KSSS500ASP10L625	5.000	1.500	2.250	1.353	.625	.359	11	11	15300	1.98
2629775	KSSS600ASP10L625	6.000	1.500	2.250	1.853	.625	.359	11	11	14000	3.13
2629778	KSSS800ASP10L625	8.000	2.000	2.880	2.538	.625	.359	13	13	12100	5.78

NOTE: For superior surface finish, use left-hand inserts.

■ Spare Parts



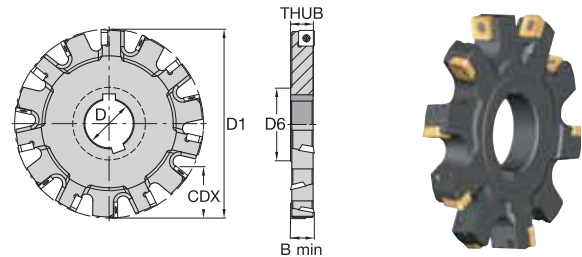
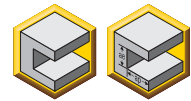
D1	insert screw	in. lbs.	Torx Plus driver
4.000	MS2148	17	DT9IP
5.000	MS2148	17	DT9IP
6.000	MS2148	17	DT9IP
8.000	MS2148	17	DT9IP

NOTE: Insert radii $\geq .062$ " (1,6mm) has no facet.



Slotting Cutters

- Neutral slot width (B min) is .614" + .010".
- Large selection of insert geometries and grades to cut most workpiece materials.
- Four insert cutting edges.
- Wide selection of insert radii.
- Faceted inserts for superior surface finishes.



Arbor Mount • 10mm IC • Neutral (Full Slotting)

order number	catalog number	D1	D	D6	B min	CDX	THUB	Z	Z S	max RPM	lbs
2629768	KSSS400ASP10N625	4.000	1.250	1.880	.614	1.042	.542	10	5	17100	1.05
2629794	KSSS500ASP10N625	5.000	1.500	2.250	.614	1.357	.542	12	6	15300	1.75
2629774	KSSS600ASP10N625	6.000	1.500	2.250	.614	1.857	.542	12	6	14000	2.78
2629777	KSSS800ASP10N625	8.000	2.000	2.880	.614	2.542	.542	14	7	12100	5.09

Spare Parts

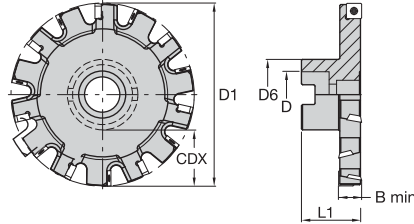
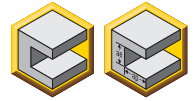


D1	insert screw	in. lbs.	Torx Plus driver
4.000	MS2148	17	DT9IP
5.000	MS2148	17	DT9IP
6.000	MS2148	17	DT9IP
8.000	MS2148	17	DT9IP



Slotting Cutters

- Neutral slot width (B min) is .614" + .010".
- Neutral cutting.
- Large selection of insert geometries and grades to cut most workpiece materials.
- Four insert cutting edges.
- Wide selection of insert radii.
- Faceted inserts for superior surface finishes.



■ Shell Mount • 10mm IC • Neutral (Full Slotting)

order number	catalog number	D1	D	D6	B min	CDX	L1	Z	Z S	max RPM	lbs
2629780	KSSS400BSP10N625	4.000	1.000	2.132	.614	.887	1.500	10	5	17100	2.12
2629781	KSSS500BSP10N625	5.000	1.250	2.880	.614	.995	1.750	12	6	15300	3.89
2629782	KSSS600BSP10N625	6.000	1.500	3.810	.614	1.030	2.000	12	6	14000	5.95
2629783	KSSS800BSP10N625	8.000	1.500	3.810	.614	2.030	2.000	14	7	12100	8.80

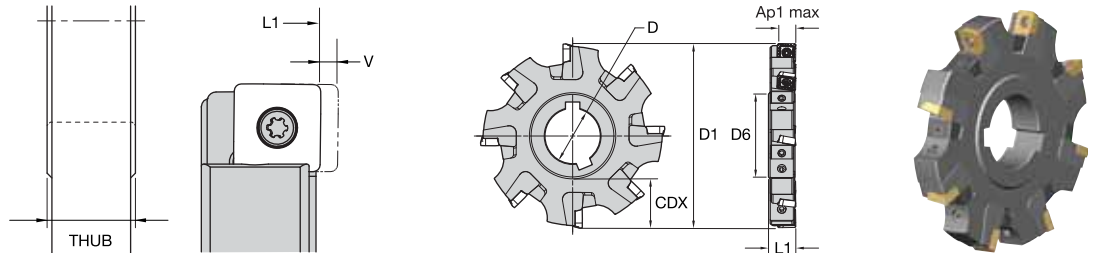
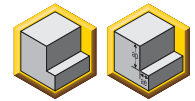
■ Spare Parts



D1	insert screw	in. lbs.	Torx Plus driver	socket-head cap screw
4.000	MS2148	17	DT9IP	S2044
5.000	MS2148	17	DT9IP	S467
6.000	MS2148	17	DT9IP	—
8.000	MS2148	17	DT9IP	—



- Rapid adjustment and setting via unique cam adjustment mechanism.
- Large selection of insert geometries and grades to cut most workpiece materials.
- Four insert cutting edges.
- Large selection of insert radii.
- Two keyways for staggered mounting.
- Wiper insert facets for superior surface finishes.



■ Arbor Mount • Half-Side Cutting • Right Hand

order number	catalog number	D1	D	D6	CDX	L1	THUB	V	Ap1 max	Z	Z S	max RPM	lbs
2268623	KSSS400ASP10R551-630	4.000	1.250	1.880	1.030	.548	.545	.040	.359	6	6	17100	1.17
2268629	KSSS500ASP10R551-630	5.000	1.500	2.250	1.345	.548	.545	.040	.359	8	8	15300	1.94
2268641	KSSS600ASP10R551-630	6.000	1.500	2.250	1.845	.548	.545	.040	.359	10	10	14000	2.97
2268653	KSSS800ASP10R551-630	8.000	2.000	2.880	2.530	.548	.545	.040	.359	14	14	12100	5.53

■ Spare Parts



D1	right-hand cartridge	wedge	cam pin wrench	insert screw	in. lbs.	Torx Plus wrench	cam pin	wedge wrench	wedge screw
4.000	KSSC551-630R	KSSW551-630	MW25	MS2148	17	TTP9	KSSCP551-709	THW3M	STCM32
5.000	KSSC551-630R	KSSW551-630	MW25	MS2148	17	TTP9	KSSCP551-709	THW3M	STCM11
6.000	KSSC551-630R	KSSW551-630	MW25	MS2148	17	TTP9	KSSCP551-709	THW3M	STCM11
8.000	KSSC551-630R	KSSW551-630	MW25	MS2148	17	TTP9	KSSCP551-709	THW3M	STCM11

■ Arbor Mount • Half-Side Cutting • Right Hand

order number	catalog number	D1	D	D6	CDX	L1	THUB	V	Ap1 max	Z	Z S	max RPM	lbs
2268635	KSSS500ASP10R630-709	5.000	1.500	2.250	1.345	.627	.624	.040	.359	8	8	15300	2.27
2268647	KSSS600ASP10R630-709	6.000	1.500	2.250	1.845	.627	.624	.040	.359	10	10	14000	3.50
2268659	KSSS800ASP10R630-709	8.000	2.000	2.880	2.530	.627	.624	.040	.259	14	14	12100	6.48
2268665	KSSS1000ASP10R630-709	10.000	2.000	2.880	3.530	.627	.624	.040	.359	18	18	10800	10.67
2268671	KSSS1200ASP10R630-709	12.000	2.000	2.880	4.530	.627	.624	.040	.359	20	20	9900	15.96

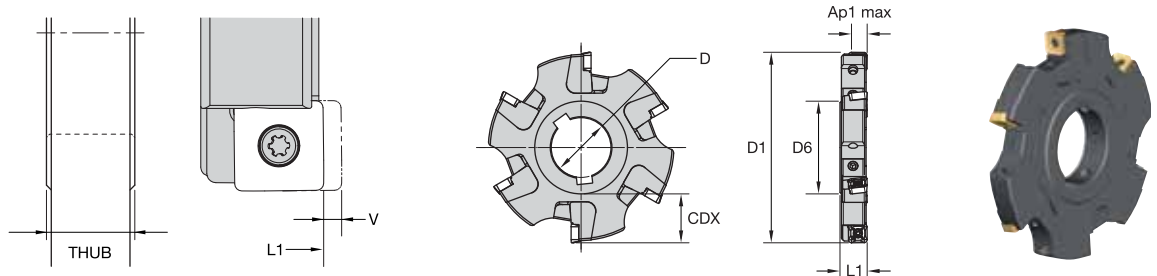
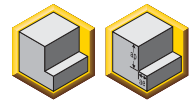
■ Spare Parts



D1	right-hand cartridge	wedge	cam pin wrench	insert screw	in. lbs.	Torx Plus wrench	cam pin	wedge wrench	wedge screw
5.000	KSSC630-709R	KSSW630-709	MW25	MS2148	17	TTP9	KSSCP551-709	THW3M	STCM11
6.000	KSSC630-709R	KSSW630-709	MW25	MS2148	17	TTP9	KSSCP551-709	THW3M	STCM11
8.000	KSSC630-709R	KSSW630-709	MW25	MS2148	17	TTP9	KSSCP551-709	THW3M	STCM11
10.000	KSSC630-709R	KSSW630-709	MW25	MS2148	17	TTP9	KSSCP551-709	THW3M	STCM11
12.000	KSSC630-709R	KSSW630-709	MW25	MS2148	17	TTP9	KSSCP551-709	THW3M	STCM11

Slotting Cutters

- Rapid adjustment and setting via unique cam adjustment mechanism.
- Large selection of insert geometries and grades to cut most workpiece materials.
- Four insert cutting edges.
- Large selection of insert radii.
- Two keyways for staggered mounting.
- Wiper insert facets for superior surface finishes.



■ Arbor Mount • Half-Side Cutting • Left Hand

order number	catalog number	D1	D	D6	CDX	L1	THUB	V	Ap1 max	Z	Z S	max RPM	lbs
2268624	KSSS400ASP10L551-630	4.000	1.250	1.880	1.030	.548	.545	.040	.359	6	6	17100	1.17
2268630	KSSS500ASP10L551-630	5.000	1.500	2.250	1.345	.548	.545	.040	.359	8	8	15300	1.94
2268642	KSSS600ASP10L551-630	6.000	1.500	2.250	1.845	.548	.545	.040	.359	10	10	14000	2.97
2268654	KSSS800ASP10L551-630	8.000	2.000	2.880	2.530	.548	.545	.040	.359	14	14	12100	5.53

■ Spare Parts



D1	left-hand cartridge	wedge	cam pin wrench	insert screw	in. lbs.	Torx Plus wrench	cam pin	wedge wrench	wedge screw
4.000	KSSC551-630L	KSSW551-630	MW25	MS2148	17	TTP9	KSSCP551-709	THW3M	STCM32
5.000	KSSC551-630L	KSSW551-630	MW25	MS2148	17	TTP9	KSSCP551-709	THW3M	STCM11
6.000	KSSC551-630L	KSSW551-630	MW25	MS2148	17	TTP9	KSSCP551-709	THW3M	STCM11
8.000	KSSC551-630L	KSSW551-630	MW25	MS2148	17	TTP9	KSSCP551-709	THW3M	STCM11

■ Arbor Mount • Half-Side Cutting • Left Hand

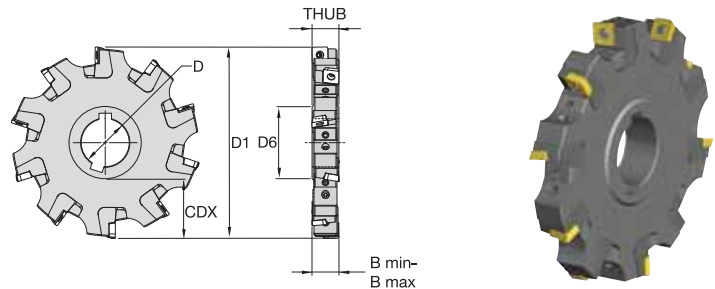
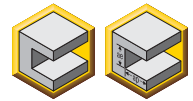
order number	catalog number	D1	D	D6	CDX	L1	THUB	V	Ap1 max	Z	Z S	max RPM	lbs
2268636	KSSS500ASP10L630-709	5.000	1.500	2.250	1.345	.627	.624	.040	.359	8	8	15300	2.27
2268648	KSSS600ASP10L630-709	6.000	1.500	2.250	1.845	.627	.624	.040	.359	10	10	14000	3.50
2268660	KSSS800ASP10L630-709	8.000	2.000	2.880	2.530	.627	.624	.040	.359	14	14	12100	6.48
2268666	KSSS1000ASP10L630-709	10.000	2.000	2.880	3.530	.627	.624	.040	.359	18	18	10800	10.67
2268672	KSSS1200ASP10L630-709	12.000	2.000	2.880	4.530	.627	.624	.040	.359	20	20	9900	15.96

■ Spare Parts



D1	left-hand cartridge	wedge	cam pin wrench	insert screw	in. lbs.	Torx Plus wrench	cam pin	wedge wrench	wedge screw
5.000	KSSC630-709L	KSSW630-709	MW25	MS2148	17	TTP9	KSSCP551-709	THW3M	STCM11
6.000	KSSC630-709L	KSSW630-709	MW25	MS2148	17	TTP9	KSSCP551-709	THW3M	STCM11
8.000	KSSC630-709L	KSSW630-709	MW25	MS2148	17	TTP9	KSSCP551-709	THW3M	STCM11
10.000	KSSC630-709L	KSSW630-709	MW25	MS2148	17	TTP9	KSSCP551-709	THW3M	STCM11
12.000	KSSC630-709L	KSSW630-709	MW25	MS2148	17	TTP9	KSSCP551-709	THW3M	STCM11

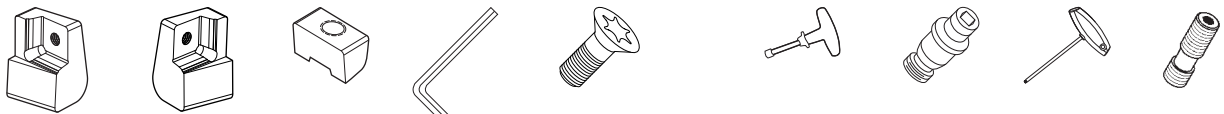
- Rapid adjustment and setting via unique cam adjustment mechanism.
- Large selection of insert geometries and grades to cut most workpiece materials.
- Four insert cutting edges.
- Large selection of insert radii.
- Two keyways for staggered mounting.
- Wiper insert facets for superior surface finishes.



Arbor Mount • Slotting Cutter • .551–.630" Adjustment Range

order number	catalog number	D1	D	D6	B min	B max	CDX	THUB	Z	Z S	max RPM	lbs
2268052	KSSS400ASP10N551-630	4.000	1.250	1.880	.551	.630	1.030	.545	6	3	17100	1.17
2268628	KSSS500ASP10N551-630	5.000	1.500	2.250	.551	.630	1.345	.545	8	4	15300	1.94
2268640	KSSS600ASP10N551-630	6.000	1.500	2.250	.551	.630	1.845	.545	10	5	14000	2.97
2268652	KSSS800ASP10N551-630	8.000	2.000	2.880	.551	.630	2.530	.545	14	7	12100	5.53

Spare Parts

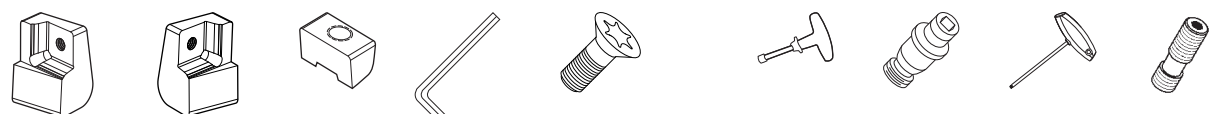


D1	right-hand cartridge	left-hand cartridge	wedge	cam pin wrench	insert screw	in. lbs.	Torx Plus wrench	cam pin	wedge wrench	wedge screw
4.000	KSSC551-630R	KSSC551-630L	KSSW551-630	MW25	MS2148	17	TTP9	KSSCP551-709	THW3M	STCM32
5.000	KSSC551-630R	KSSC551-630L	KSSW551-630	MW25	MS2148	17	TTP9	KSSCP551-709	THW3M	STCM11
6.000	KSSC551-630R	KSSC551-630L	KSSW551-630	MW25	MS2148	17	TTP9	KSSCP551-709	THW3M	STCM11
8.000	KSSC551-630R	KSSC551-630L	KSSW551-630	MW25	MS2148	17	TTP9	KSSCP551-709	THW3M	STCM11

Arbor Mount • Slotting Cutter • .630–.709" Adjustment Range

order number	catalog number	D1	D	D6	B min	B max	CDX	THUB	Z	Z S	max RPM	lbs
2268634	KSSS500ASP10N630-709	5.000	1.500	2.250	.630	.709	1.345	.624	8	4	15300	2.27
2268646	KSSS600ASP10N630-709	6.000	1.500	2.250	.630	.709	1.845	.624	10	5	14000	3.50
2268658	KSSS800ASP10N630-709	8.000	2.000	2.880	.630	.709	2.530	.624	14	7	12100	6.48
2268664	KSSS1000ASP10N630-709	10.000	2.000	2.880	.630	.709	3.530	.624	18	9	10800	10.67
2268670	KSSS1200ASP10N630-709	12.000	2.000	2.880	.630	.709	4.530	.624	20	10	9900	15.96

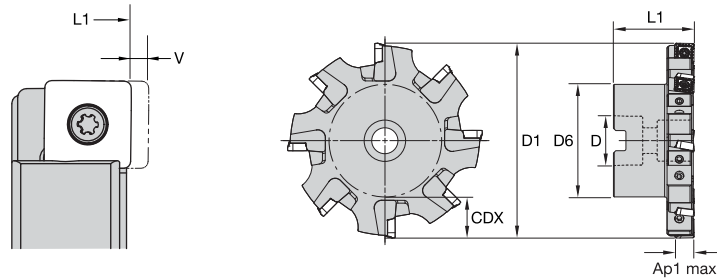
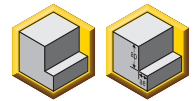
Spare Parts



D1	right-hand cartridge	left-hand cartridge	wedge	cam pin wrench	insert screw	in. lbs.	Torx Plus wrench	cam pin	wedge wrench	wedge screw
5.000	KSSC630-709R	KSSC630-709L	KSSW630-709	MW25	MS2148	17	TTP9	KSSCP551-709	THW3M	STCM11
6.000	KSSC630-709R	KSSC630-709L	KSSW630-709	MW25	MS2148	17	TTP9	KSSCP551-709	THW3M	STCM11
8.000	KSSC630-709R	KSSC630-709L	KSSW630-709	MW25	MS2148	17	TTP9	KSSCP551-709	THW3M	STCM11
10.000	KSSC630-709R	KSSC630-709L	KSSW630-709	MW25	MS2148	17	TTP9	KSSCP551-709	THW3M	STCM11
12.000	KSSC630-709R	KSSC630-709L	KSSW630-709	MW25	MS2148	17	TTP9	KSSCP551-709	THW3M	STCM11

Slotting Cutters

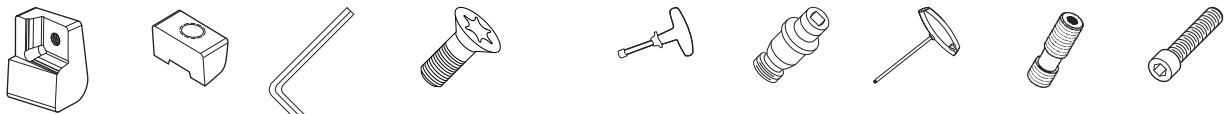
- Rapid adjustment and setting via unique cam adjustment mechanism.
- Large selection of insert geometries and grades to cut most workpiece materials.
- Four insert cutting edges.
- Large selection of insert radii.
- Wiper insert facets for superior surface finishes.



Shell Mount • Half-Side Cutting • Right Hand

order number	catalog number	D1	D	D6	CDX	L1	V	Ap1 max	Z	Z S	max RPM	lbs
2268626	KSSS400BSP10R551-630	4.000	1.000	2.132	.872	2.033	.040	.359	6	6	17100	2.49
2268632	KSSS500BSP10R551-630	5.000	1.250	2.880	.997	2.033	.040	.359	8	8	15300	4.35
2268644	KSSS600BSP10R551-630	6.000	1.500	3.810	1.032	2.033	.040	.359	10	10	14000	6.01
2268656	KSSS800BSP10R551-630	8.000	1.500	3.810	2.032	2.033	.040	.359	14	14	12100	8.74

Spare Parts

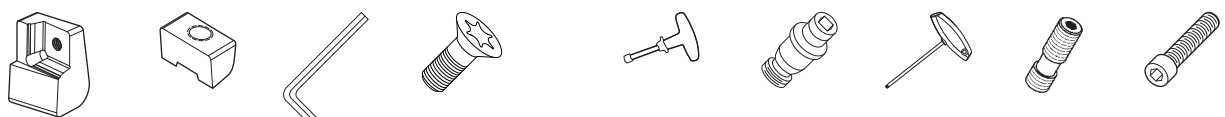


D1	right-hand cartridge	wedge	cam pin wrench	insert screw	in. lbs.	Torx Plus wrench	cam pin	wedge wrench	wedge screw	socket-head cap screw
4.000	KSSC551-630R	KSSW551-630	MW25	MS2148	17	TTP9	KSSCP551-709	THW3M	STCM11	S458
5.000	KSSC551-630R	KSSW551-630	MW25	MS2148	17	TTP9	KSSCP551-709	THW3M	STCM11	S467
6.000	KSSC551-630R	KSSW551-630	MW25	MS2148	17	TTP9	KSSCP551-709	THW3M	STCM11	—
8.000	KSSC551-630R	KSSW551-630	MW25	MS2148	17	TTP9	KSSCP551-709	THW3M	STCM11	—

Shell Mount • Half-Side Cutting • Right Hand

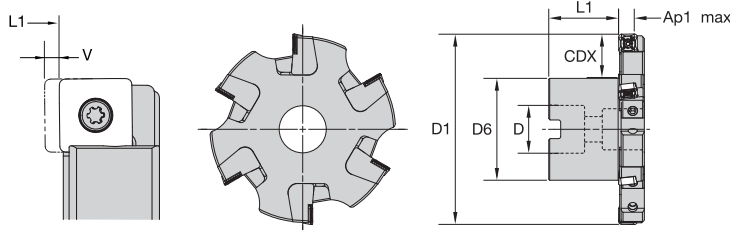
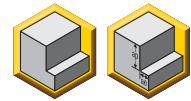
order number	catalog number	D1	D	D6	CDX	L1	V	Ap1 max	Z	Z S	max RPM	lbs
2268638	KSSS500BSP10R630-709	5.000	1.250	2.880	.997	2.033	.040	.359	8	8	15300	4.60
2268650	KSSS600BSP10R630-709	6.000	1.500	3.810	1.032	2.033	.040	.359	10	10	14000	6.32
2268662	KSSS800BSP10R630-709	8.000	1.500	3.810	2.032	2.033	.040	.359	14	14	12100	9.51
2268668	KSSS1000BSP10R630-709	10.000	2.500	5.250	2.312	2.033	.040	.359	18	18	10800	13.56
2268674	KSSS1200BSP10R630-709	12.000	2.500	5.250	3.312	2.033	.040	.359	20	20	9900	18.84

Spare Parts



D1	right-hand cartridge	wedge	cam pin wrench	insert screw	in. lbs.	Torx Plus wrench	cam pin	wedge wrench	wedge screw	socket-head cap screw
5.000	KSSC630-709R	KSSW630-709	MW25	MS2148	17	TTP9	KSSCP551-709	THW3M	STCM11	S467
6.000	KSSC630-709R	KSSW630-709	MW25	MS2148	17	TTP9	KSSCP551-709	THW3M	STCM11	—
8.000	KSSC630-709R	KSSW630-709	MW25	MS2148	17	TTP9	KSSCP551-709	THW3M	STCM11	—
10.000	KSSC630-709R	KSSW630-709	MW25	MS2148	17	TTP9	KSSCP551-709	THW3M	STCM11	—
12.000	KSSC630-709R	KSSW630-709	MW25	MS2148	17	TTP9	KSSCP551-709	THW3M	STCM11	—

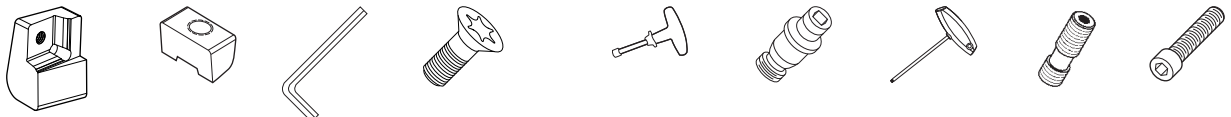
- Rapid adjustment and setting via unique cam adjustment mechanism.
- Large selection of insert geometries and grades to cut most workpiece materials.
- Four insert cutting edges.
- Large selection of insert radii.
- Wiper insert facets for superior surface finishes.



■ Shell Mount • Half-Side Cutting • Left Hand

order number	catalog number	D1	D	D6	CDX	L1	V	Ap1 max	Z	Z S	max RPM	lbs
2268627	KSSS400BSP10L551-630	4.000	1.000	2.132	.872	1.482	.040	.359	6	6	17100	2.49
2268633	KSSS500BSP10L551-630	5.000	1.250	2.880	.997	1.482	.040	.359	8	8	15300	4.35
2268645	KSSS600BSP10L551-630	6.000	1.500	3.810	1.032	1.482	.040	.359	10	10	14000	6.01
2268657	KSSS800BSP10L551-630	8.000	1.500	3.810	2.032	1.482	.040	.359	14	14	12100	8.74

■ Spare Parts

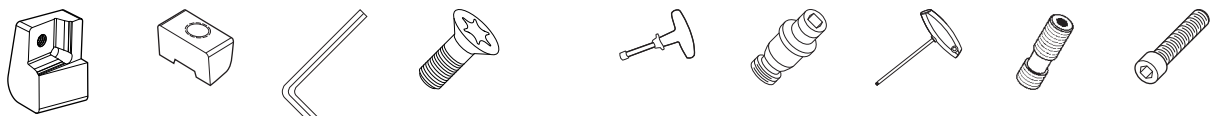


D1	left-hand cartridge	wedge	cam pin wrench	insert screw	in. lbs.	Torx Plus wrench	cam pin	wedge wrench	wedge screw	socket-head cap screw
4.000	KSSC551-630L	KSSW551-630	MW25	MS2148	17	TTP9	KSSCP551-709	THW3M	STCM11	S458
5.000	KSSC551-630L	KSSW551-630	MW25	MS2148	17	TTP9	KSSCP551-709	THW3M	STCM11	S467
6.000	KSSC551-630L	KSSW551-630	MW25	MS2148	17	TTP9	KSSCP551-709	THW3M	STCM11	—
8.000	KSSC551-630L	KSSW551-630	MW25	MS2148	17	TTP9	KSSCP551-709	THW3M	STCM11	—

■ Shell Mount • Half-Side Cutting • Left Hand

order number	catalog number	D1	D	D6	CDX	L1	V	Ap1 max	Z	Z S	max RPM	lbs
2268639	KSSS500BSP10L630-709	5.000	1.250	2.880	.997	1.403	.040	.359	8	8	15300	4.60
2268651	KSSS600BSP10L630-709	6.000	1.500	3.810	1.032	1.403	.040	.359	10	10	14000	6.32
2268663	KSSS800BSP10L630-709	8.000	1.500	3.810	2.032	1.403	.040	.359	14	14	12100	9.51
2268669	KSSS1000BSP10L630-709	10.000	2.500	5.250	2.312	1.403	.040	.359	18	18	10800	13.56
2268675	KSSS1200BSP10L630-709	12.000	2.500	5.250	3.312	1.403	.040	.359	20	20	9900	18.84

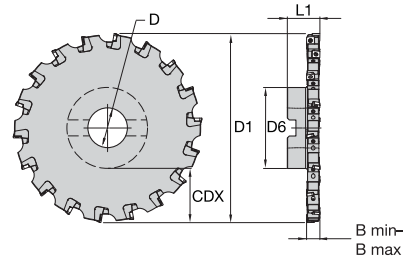
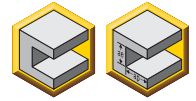
■ Spare Parts



D1	left-hand cartridge	wedge	cam pin wrench	insert screw	in. lbs.	Torx Plus wrench	cam pin	wedge wrench	wedge screw	socket-head cap screw
5.000	KSSC630-709L	KSSW630-709	MW25	MS2148	17	TTP9	KSSCP551-709	THW3M	STCM11	S467
6.000	KSSC630-709L	KSSW630-709	MW25	MS2148	17	TTP9	KSSCP551-709	THW3M	STCM11	—
8.000	KSSC630-709L	KSSW630-709	MW25	MS2148	17	TTP9	KSSCP551-709	THW3M	STCM11	—
10.000	KSSC630-709L	KSSW630-709	MW25	MS2148	17	TTP9	KSSCP551-709	THW3M	STCM11	—
12.000	KSSC630-709L	KSSW630-709	MW25	MS2148	17	TTP9	KSSCP551-709	THW3M	STCM11	—

Slotting Cutters

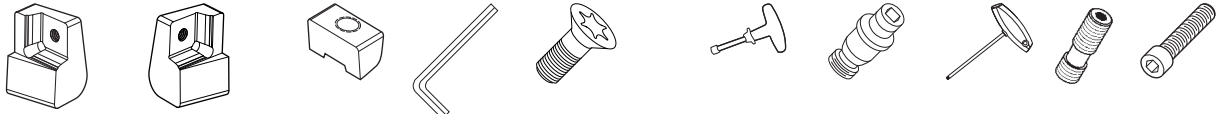
- Rapid adjustment and setting via unique cam adjustment mechanism.
- Large selection of insert geometries and grades to cut most workpiece materials.
- Four insert cutting edges.
- Large selection of insert radii.
- Wiper insert facets for superior surface finishes.



Shell Mount • Slotting Cutting • .551–.630" Adjustment Range

order number	catalog number	D1	D	D6	B min	B max	CDX	L1	Z	Z S	max RPM	lbs
2268625	KSSS400BSP10N551-630	4.000	1.000	2.132	.551	.630	.872	2.072	6	3	17100	2.49
2268631	KSSS500BSP10N551-630	5.000	1.250	2.880	.551	.630	.997	2.072	8	4	15300	4.35
2268643	KSSS600BSP10N551-630	6.000	1.500	3.810	.551	.630	1.032	2.072	10	5	14000	6.01
2268655	KSSS800BSP10N551-630	8.000	1.500	3.810	.551	.630	2.032	2.072	14	7	12100	8.74

Spare Parts

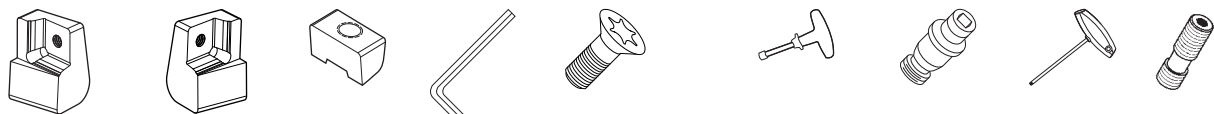


D1	right-hand cartridge	left-hand cartridge	wedge	cam pin wrench	insert screw	in. lbs.	Torx Plus wrench	cam pin	wedge wrench	wedge screw	socket-head cap screw
4.000	KSSC551-630R	KSSC551-630L	KSSW551-630	MW25	MS2148	17	TTP9	KSSCP551-709	THW3M	STCM11	S458
5.000	KSSC551-630R	KSSC551-630L	KSSW551-630	MW25	MS2148	17	TTP9	KSSCP551-709	THW3M	STCM11	—
6.000	KSSC551-630R	KSSC551-630L	KSSW551-630	MW25	MS2148	17	TTP9	KSSCP551-709	THW3M	STCM11	—
8.000	KSSC551-630R	KSSC551-630L	KSSW551-630	MW25	MS2148	17	TTP9	KSSCP551-709	THW3M	STCM11	—

Shell Mount • Slotting Cutting • .630–.709" Adjustment Range

order number	catalog number	D1	D	D6	B min	B max	CDX	L1	Z	Z S	max RPM	lbs
2268637	KSSS500BSP10N630-709	5.000	1.250	2.880	.630	.709	.997	2.072	8	4	15300	4.60
2268649	KSSS600BSP10N630-709	6.000	1.500	3.810	.630	.709	1.032	2.072	10	5	14000	6.32
2268661	KSSS800BSP10N630-709	8.000	1.500	3.810	.630	.709	2.032	2.072	14	7	12100	9.51
2268667	KSSS1000BSP10N630-709	10.000	2.500	5.250	.630	.709	2.312	2.072	18	9	10800	13.56
2268673	KSSS1200BSP10N630-709	12.000	2.500	5.250	.630	.709	3.312	2.072	20	10	9900	18.84

Spare Parts

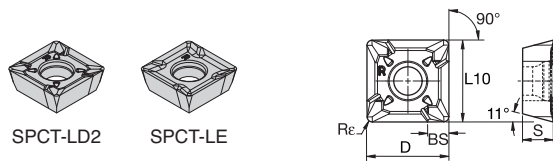


D1	right-hand cartridge	left-hand cartridge	wedge	cam pin wrench	insert screw	in. lbs.	Torx Plus wrench	cam pin	wedge wrench	wedge screw
5.000	KSSC630-709R	KSSC630-709L	KSSW630-709	MW25	MS2148	17	TTP9	KSSCP551-709	THW3M	STCM11
6.000	KSSC630-709R	KSSC630-709L	KSSW630-709	MW25	MS2148	17	TTP9	KSSCP551-709	THW3M	STCM11
8.000	KSSC630-709R	KSSC630-709L	KSSW630-709	MW25	MS2148	17	TTP9	KSSCP551-709	THW3M	STCM11
10.000	KSSC630-709R	KSSC630-709L	KSSW630-709	MW25	MS2148	17	TTP9	KSSCP551-709	THW3M	STCM11
12.000	KSSC630-709R	KSSC630-709L	KSSW630-709	MW25	MS2148	17	TTP9	KSSCP551-709	THW3M	STCM11

■ Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	.E..LD2	KC725M	.E..GB2	KC725M	.S..GB2	KC725M
P3-P4	.E..GB2	KC725M	.E..GB2	KCPK30	.S..GB2	KCPK30
P5-P6	.E..GB2	KCPK30	.E..GB2	KCPM20	.S..GB2	KCPM20
M1-M2	.E..LD2	KC725M	.E..GB2	KC725M	.S..GB2	KC725M
M3	.E..GB2	KC725M	.E..GB2	KCPK30	.S..GB2	KCPK30
K1-K2	.E..LD2	KC520M	.E..GB2	KCK15	.S..GB2	KCK15
K3	.E..GB2	KC520M	.E..GB2	KCPK30	.S..GB2	KCPK30
N1-N2	.F..LE	KC410M	.F..LE	KC410M	.F..LE	KC410M
N3	.F..LE	KC410M	.F..LE	KC410M	.F..LE	KC410M
S1-S2	.E..LD2	KC725M	.E..GB2	KC725M	.S..GB2	KC725M
S3	.E..LD2	KC725M	.E..GB2	KC725M	.S..GB2	KC725M
S4	.E..GB2	KC725M	.S..GB2	KC725M	—	—
H1	—	—	—	—	—	—

Indexable Inserts • KSSM SP.T10T3...



● first choice
○ alternate choice

P	●	○	○	○	○	○
M	○	○	○	○	○	○
K	●	○	○	○	○	○
N	●	○	○	○	○	○
S	○	○	○	○	○	○
H	○	○	○	○	○	○

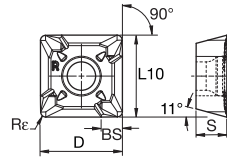
■ SPCT-LD2

catalog number	D	S	L10	BS	Re	hm	cutting edges	KC410M	KC520M	KC725M	KCK15	KCPM20	KCPK30
SPCT31251PPFL8LD2	.394	.156	.394	.106	.016	.002	4			●			
SPCT31251PPFR8LD2	.394	.156	.394	.106	.016	.002	4			○			
SPCT31253PPFR8LD2	.394	.156	.394	.106	.031	.002	4		●			●	
SPCT31253PPFL8LD2	.394	.156	.394	.106	.031	.002	4			●			
SPCT31253PPFR8LD2	.394	.156	.394	.106	.047	.002	4			●			
SPCT31253PPFL8LD2	.394	.156	.394	.106	.047	.002	4			●			
SPCT31254ENLD2	.394	.156	.394	—	.063	.002	4			●			
SPCT31255ENLD2	.394	.156	.394	—	.078	.002	4			●			

■ SPCT-LE

catalog number	D	S	L10	BS	Re	hm	cutting edges	KC410M	KC520M	KC725M	KCK15	KCPM20	KCPK30
SPCT31251PPFL8LE	.394	.156	.394	.106	.016	.001	4	●					
SPCT31251PPFR8LE	.394	.156	.394	.106	.016	.001	4	●					
SPCT31253PPFR8LE	.394	.156	.394	.106	.031	.001	4	●					
SPCT31253PPFL8LE	.394	.156	.394	.106	.031	.001	4	●					
SPCT31253PPFR8LE	.394	.156	.394	.106	.047	.001	4	●					
SPCT31253PPFL8LE	.394	.156	.394	.106	.047	.001	4	●					
SPCT31254FNLE	.394	.156	.394	—	.063	.001	4	●					
SPCT31255FNLE	.394	.156	.394	—	.078	.001	4	●					

Slotting Cutters



P	●	●	●	●	●	●
M	●	●	●	●	●	●
K	●	●	●	●	●	●
N	●	●	●	●	●	●
S	●	●	●	●	●	●
H	●	●	●	●	●	●

● first choice
○ alternate choice

■ SPET-GB2

catalog number	D	S	L10	BS	Re	hm	cutting edges	KC410M	KC520M	KC725M	KCK15	KCPM20	KCPK30
SPET31251PPER8GB2	.394	.156	.394	.106	.016	.003	4				●	●	●
SPET31251PPEL8GB2	.394	.156	.394	.106	.016	.003	4			●	●	●	●
SPET3125PPER8GB2	.394	.156	.394	.106	.031	.003	4		●	●	●	●	●
SPET3125PEL8GB2	.394	.156	.394	.106	.031	.003	4		●	●	●	●	●
SPET3125PPSL8GB2	.394	.156	.394	.106	.031	.005	4			●	●	●	●
SPET3125PPSR8GB2	.394	.156	.394	.106	.031	.005	4			●	●	●	●

■ SPPT-GB2

catalog number	D	S	L10	BS	Re	hm	cutting edges	KC410M	KC520M	KC725M	KCK15	KCPM20	KCPK30
SPPT3125PPER8GB2	.394	.156	.394	.106	.031	.003	4				●	●	●
SPPT3125PPSR8GB2	.394	.156	.394	.106	.031	.005	4				●	●	●



■ Recommended Starting Speeds [SFM]

Material Group		KC410M			KC520M			KC725M		
P	1	—	—	—	—	—	—	860	750	700
	2	—	—	—	—	—	—	720	630	530
	3	—	—	—	—	—	—	660	560	460
	4	—	—	—	—	—	—	590	490	390
	5	—	—	—	—	—	—	490	440	390
	6	—	—	—	—	—	—	430	330	260
M	1	—	—	—	—	—	—	560	490	450
	2	—	—	—	—	—	—	510	430	360
	3	—	—	—	—	—	—	380	330	260
K	1	—	—	—	880	800	710	—	—	—
	2	—	—	—	690	620	580	—	—	—
	3	—	—	—	580	520	470	—	—	—
N	1-2	3990	3550	3270	—	—	—	—	—	—
	3	3550	3270	3000	—	—	—	—	—	—
S	1	—	—	—	—	—	—	115	100	80
	2	—	—	—	—	—	—	115	100	80
	3	—	—	—	—	—	—	150	115	80
	4	—	—	—	—	—	—	200	150	100
H	1	—	—	—	—	—	—	—	—	—

Material Group		KCK15			KCPM20			KCPK30		
P	1	—	—	—	1810	1590	1470	1485	1300	1210
	2	—	—	—	1120	1010	910	920	830	750
	3	—	—	—	1010	910	830	830	750	680
	4	—	—	—	760	700	630	620	575	520
	5	—	—	—	910	820	750	850	760	690
	6	—	—	—	630	550	475	520	450	—
M	1	—	—	—	730	655	570	680	600	515
	2	—	—	—	670	580	520	610	530	460
	3	—	—	—	530	475	410	475	430	380
K	1	1380	1255	1115	1180	1070	960	965	875	780
	2	1095	975	910	940	840	770	770	690	630
	3	920	815	750	790	700	650	645	575	530
N	1-2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
S	1	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—	—	—
H	1	—	—	—	—	—	—	—	—	—

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

Slotting Cutters

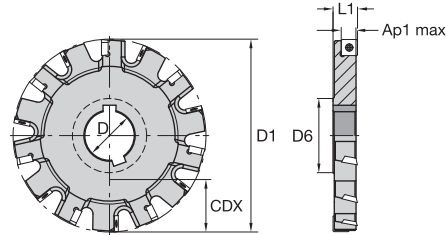
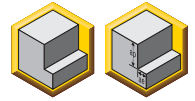
■ Recommended Starting Feeds [IPT]

Light Machining	General Purpose	Heavy Machining
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Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.F..LE	.003	.007	.014	.003	.005	.010	.002	.004	.009	.002	.004	.008	.002	.004	.008	.F..LE
.E..LD2	.004	.010	.020	.003	.008	.015	.002	.007	.013	.002	.006	.012	.002	.006	.012	.E..LD2
.E..GB2	.007	.014	.025	.005	.011	.018	.004	.009	.016	.004	.009	.015	.004	.008	.014	.E..GB2
.S..GB2	.007	.017	.028	.005	.013	.020	.004	.011	.018	.004	.010	.016	.004	.010	.016	.S..GB2

NOTE: Use "Light Machining" values as starting feed rate.

- Right- and left-hand cutters available.
- Large selection of insert geometries and grades to cut most workpiece materials.
- Four insert cutting edges.
- Large selection of insert radii.
- Faceted inserts for superior surface finishes.



■ Arbor Mount • 1/2" IC • Right Hand

order number	catalog number	D1	D	D6	CDX	L1	Ap1 max	Z	Z S	max RPM	lbs
2618969	KSSS600ASD43R750	6.000	1.500	2.250	1.851	.750	.461	12	12	9400	3.73
2629787	KSSS800ASD43R750	8.000	2.000	2.880	2.536	.750	.461	14	14	8150	6.86
2629790	KSSS1000ASD43R750	10.000	2.000	2.880	3.536	.750	.461	16	16	7250	11.44

■ Arbor Mount • 1/2" IC • Left Hand

order number	catalog number	D1	D	D6	CDX	L1	Ap1 max	Z	Z S	max RPM	lbs
2629784	KSSS600ASD43L750	6.000	1.500	2.250	1.851	.750	.461	12	12	9400	3.73
2629786	KSSS800ASD43L750	8.000	2.000	2.880	2.536	.750	.461	14	14	8150	6.86
2629789	KSSS1000ASD43L750	10.000	2.000	2.880	3.536	.750	.461	16	16	7250	11.44

■ Spare Parts

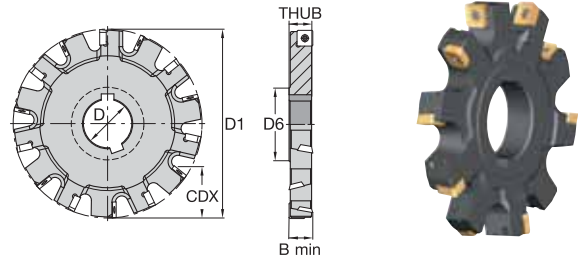
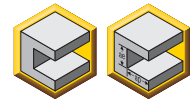


D1	insert screw	in. lbs.	Torx Plus driver
6.000	MS2078	35	DT15IP
8.000	MS2078	35	DT15IP
10.000	MS2078	35	DT15IP

NOTE: For superior surface finish, use left-hand inserts.

Slotting Cutters

- Neutral slot width (B min) is .739" + .010" wide.
- Large selection of insert geometries and grades to cut most workpiece materials.
- Four insert cutting edges.
- Large selection of insert radii.
- Faceted inserts for superior surface finishes.



■ **Arbor Mount • 1/2" IC • Neutral (Full Slotting)**

order number	catalog number	D1	D	D6	B min	CDX	THUB	Z	Z S	max RPM	lbs
2618967	KSSS600ASD43N750	6.000	1.500	2.250	.739	1.857	.666	14	7	9400	3.49
2629785	KSSS800ASD43N750	8.000	2.000	2.880	.739	2.542	.666	18	9	8150	6.58
2629788	KSSS1000ASD43N750	10.000	2.000	2.880	.739	3.542	.666	22	11	7250	11.02

■ **Spare Parts**



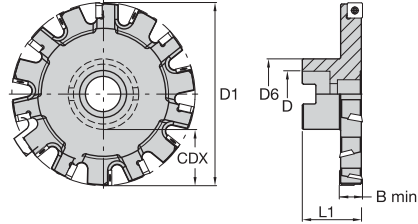
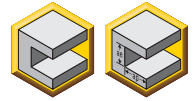
D1	insert screw	in. lbs.	Torx Plus driver
6.000	MS2078	35	DT15IP
8.000	MS2078	35	DT15IP
10.000	MS2078	35	DT15IP

NOTE: For superior surface finish, use right-hand and left-hand inserts.



Slotting Cutters

- Neutral slot width (Bmin) is .739" + .010" wide.
- Large selection of insert geometries and grades to cut most workpiece materials.
- Four insert cutting edges.
- Large selection of insert radii.
- Faceted inserts for superior surface finishes.



■ Shell Mount • 1/2" IC • Neutral (Full Slotting)

order number	catalog number	D1	D	D6	B min	CDX	L1	Z	Z S	max RPM	lbs
2629791	KSSS600BSD43N750	6.000	1.500	3.810	.739	1.029	2.000	14	7	9400	6.28
2629792	KSSS800BSD43N750	8.000	1.500	3.810	.739	2.029	2.000	18	9	8150	9.90
2629793	KSSS1000BSD43N750	10.000	2.500	5.250	.739	2.309	2.000	22	11	7250	14.22

■ Spare Parts

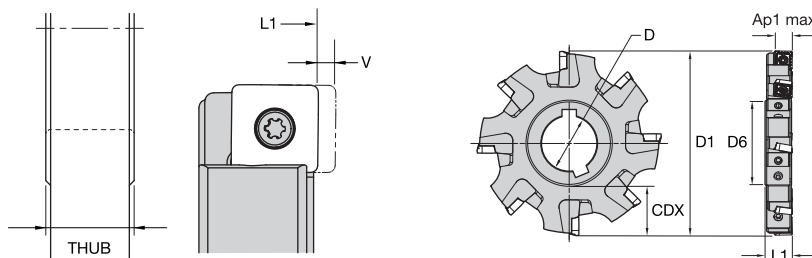
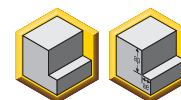


D1	insert screw	in. lbs.	Torx Plus driver
6.000	MS2078	35	DT15IP
8.000	MS2078	35	DT15IP
10.000	MS2078	35	DT15IP

NOTE: For superior surface finish, use right-hand and left-hand inserts.



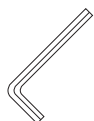
- Rapid adjustment and setting via unique cam adjustment mechanism.
- Large selection of insert geometries and grades to cut most workpiece materials.
- Four insert cutting edges.
- Large selection of insert radii.
- Two keyways for staggered mounting.
- Wiper insert facets for superior surface finishes.



Arbor Mount • Half-Side Cutting • Right Hand

order number	catalog number	D1	D	D6	CDX	L1	THUB	V	Ap1 max	Z	Z S	max RPM	lbs
2268677	KSSS500ASD43R709-813	5.000	1.500	2.250	1.331	.712	.716	.052	.461	8	8	10300	2.33
2268689	KSSS600ASD43R709-813	6.000	1.500	2.250	1.831	.712	.716	.052	.461	10	10	9400	3.62
2268701	KSSS800ASD43R709-813	8.000	2.000	2.880	2.516	.712	.716	.052	.461	14	14	8150	6.85
2268713	KSSS1000ASD43R709-813	10.000	2.000	2.880	3.516	.712	.716	.052	.461	16	16	7250	11.51
2268725	KSSS1200ASD43R709-813	12.000	2.000	2.880	4.516	.712	.716	.052	.461	18	18	6650	17.30

Spare Parts



D1	right-hand cartridge	wedge	cam pin wrench	insert screw	in. lbs.	Torx Plus wrench	cam pin	wedge wrench	wedge screw
5.000	KSSC709-813R	KSSW709-813	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11
6.000	KSSC709-813R	KSSW709-813	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11
8.000	KSSC709-813R	KSSW709-813	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11
10.000	KSSC709-813R	KSSW709-813	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11
12.000	KSSC709-813R	KSSW709-813	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11

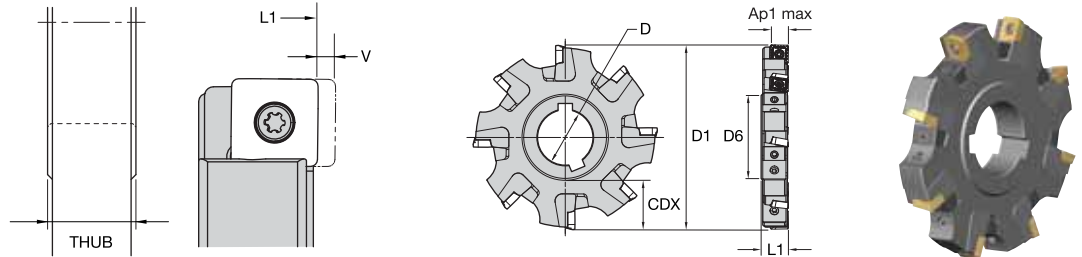
Right-Hand Cartridge • Larger Insert Radii

order number	catalog number
3663324	KSSC709813RX

NOTE: Use right-hand cartridge for right-hand cutters. Fits all larger radii cutters.

Slotting Cutters

- Rapid adjustment and setting via unique cam adjustment mechanism.
- Large selection of insert geometries and grades to cut most workpiece materials.
- Four insert cutting edges.
- Large selection of insert radii.
- Two keyways for staggered mounting.
- Wiper insert facets for superior surface finishes.



■ Arbor Mount • Half-Side Cutting • Right Hand

order number	catalog number	D1	D	D6	CDX	L1	THUB	V	Ap1 max	Z	Z S	max RPM	lbs
2268683	KSSS500ASD43R813-917	5.000	1.500	2.250	1.331	.816	.820	.052	.461	8	8	10300	2.72
2268695	KSSS600ASD43R813-917	6.000	1.500	2.250	1.831	.816	.820	.052	.461	10	10	9400	4.23
2268707	KSSS800ASD43R813-917	8.000	2.000	2.880	2.516	.816	.820	.052	.461	14	14	8150	7.99
2268719	KSSS1000ASD43R813-917	10.000	2.000	2.880	3.516	.816	.820	.052	.461	16	16	7250	13.16
2268731	KSSS1200ASD43R813-917	12.000	2.000	2.880	4.516	.816	.820	.052	.461	18	18	6650	20.20

■ Spare Parts



D1	right-hand cartridge	wedge	cam pin wrench	insert screw	in. lbs.	Torx Plus wrench	cam pin	wedge wrench	wedge screw
5.000	KSSC813-917R	KSSW813-917	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11
6.000	KSSC813-917R	KSSW813-917	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11
8.000	KSSC813-917R	KSSW813-917	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11
10.000	KSSC813-917R	KSSW813-917	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11
12.000	KSSC813-917R	KSSW813-917	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11

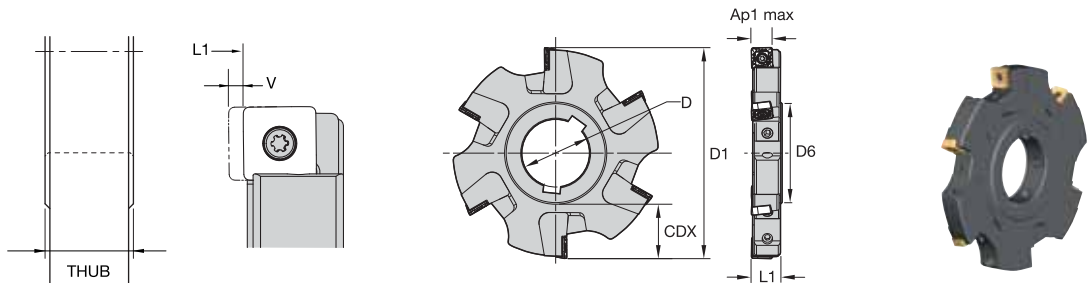
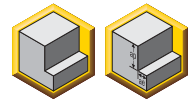
■ Right-Hand Cartridge • Larger Insert Radii

order number	catalog number
3663326	KSSC813917RX

NOTE: Use right-hand cartridge for right-hand cutters. Fits all larger radii cutters.

Slotting Cutters

- Rapid adjustment and setting via unique cam adjustment mechanism.
- Large selection of insert geometries and grades to cut most workpiece materials.
- Four insert cutting edges.
- Large selection of insert radii.
- Two keyways for staggered mounting.
- Wiper insert facets for superior surface finishes.



Arbor Mount • Half-Side Cutting • Left Hand

order number	catalog number	D1	D	D6	CDX	L1	THUB	V	Ap1 max	Z	Z S	max RPM	lbs
2268678	KSSS500ASD43L709-813	5.000	1.500	2.250	1.331	.712	.716	.052	.461	8	8	10300	2.33
2268690	KSSS600ASD43L709-813	6.000	1.500	2.250	1.831	.712	.716	.052	.461	10	10	9400	3.62
2268702	KSSS800ASD43L709-813	8.000	2.000	2.880	2.516	.712	.716	.052	.461	14	14	8150	6.85
2268714	KSSS1000ASD43L709-813	10.000	2.000	2.880	3.516	.712	.716	.052	.461	16	16	7250	11.51
2268726	KSSS1200ASD43L709-813	12.000	2.000	2.880	4.516	.712	.716	.052	.461	18	18	6650	17.30

Spare Parts



D1	left-hand cartridge	wedge	cam pin wrench	insert screw	in. lbs.	Torx Plus wrench	cam pin	wedge wrench	wedge screw
5.000	KSSC709-813L	KSSW709-813	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11
6.000	KSSC709-813L	KSSW709-813	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11
8.000	KSSC709-813L	KSSW709-813	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11
10.000	KSSC709-813L	KSSW709-813	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11
12.000	KSSC709-813L	KSSW709-813	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11

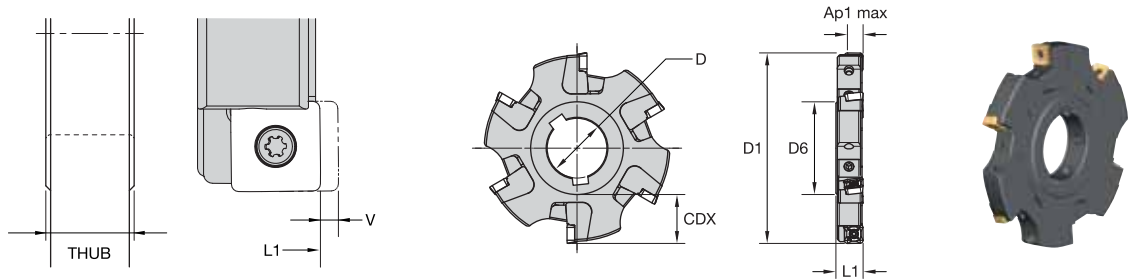
Left-Hand Cartridge • Larger Insert Radii

order number	catalog number
3663325	KSSC709813LX

NOTE: Use left-hand cartridge for left-hand cutters. Fits all larger radii inserts.

Slotting Cutters

- Rapid adjustment and setting via unique cam adjustment mechanism.
- Large selection of insert geometries and grades to cut most workpiece materials.
- Four insert cutting edges.
- Large selection of insert radii.
- Two keyways for staggered mounting.
- Wiper insert facets for superior surface finishes.



■ Arbor Mount • Half-Side Cutting • Left Hand

order number	catalog number	D1	D	D6	CDX	L1	THUB	V	Ap1 max	Z	Z S	max RPM	lbs
2268684	KSSS500ASD43L813-917	5.000	1.500	2.250	1.331	.816	.820	.052	.461	8	8	10300	2.72
2268696	KSSS600ASD43L813-917	6.000	1.500	2.250	1.831	.816	.820	.052	.461	10	10	9400	4.23
2268708	KSSS800ASD43L813-917	8.000	2.000	2.880	2.516	.816	.820	.052	.461	14	14	8150	7.99
2268720	KSSS1000ASD43L813-917	10.000	2.000	2.880	3.516	.816	.820	.052	.461	16	16	7250	13.16
2268732	KSSS1200ASD43L813-917	12.000	2.000	2.880	4.516	.816	.820	.052	.461	18	18	6650	20.20

■ Spare Parts



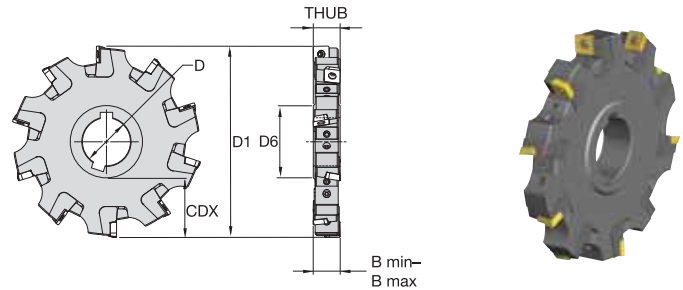
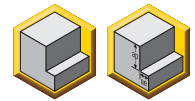
D1	left-hand cartridge	wedge	cam pin wrench	insert screw	in. lbs.	Torx Plus wrench	cam pin wrench	wedge wrench	wedge screw
5.000	KSSC813-917L	KSSW813-917	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11
6.000	KSSC813-917L	KSSW813-917	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11
8.000	KSSC813-917L	KSSW813-917	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11
10.000	KSSC813-917L	KSSW813-917	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11
12.000	KSSC813-917L	KSSW813-917	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11

■ Left-Hand Cartridge • Larger Insert Radii

order number	catalog number
3663327	KSSC813917LX

NOTE: Use left-hand cartridge for left-hand cutters. Fits all larger radii inserts.

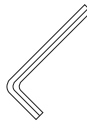
- Rapid adjustment and setting via unique cam adjustment mechanism.
- Large selection of insert geometries and grades to cut most workpiece materials.
- Four insert cutting edges.
- Large selection of insert radii.
- Two keyways for staggered mounting.
- Wiper insert facets for superior surface finishes.



Arbor Mount • Slotting Cutter • .709-.813" Adjustment Range

order number	catalog number	D1	D	D6	B min	B max	CDX	THUB	Z	Z S	max RPM	lbs
2268676	KSSS500ASD43N709-813	5.000	1.500	2.250	.709	.813	1.331	.716	8	4	10300	2.33
2268688	KSSS600ASD43N709-813	6.000	1.500	2.250	.709	.813	1.831	.716	10	5	9400	3.62
2268700	KSSS800ASD43N709-813	8.000	2.000	2.880	.709	.813	2.516	.716	14	7	8150	6.85
2268712	KSSS1000ASD43N709-813	10.000	2.000	2.880	.709	.813	3.516	.716	16	8	7250	11.51
2268724	KSSS1200ASD43N709-813	12.000	2.000	2.880	.709	.813	4.516	.716	18	9	6650	17.30

Spare Parts



D1	right-hand cartridge	left-hand cartridge	wedge	cam pin wrench	insert screw	in. lbs.	Torx Plus wrench	cam pin	wedge wrench	wedge screw
5.000	KSSC709-813R	KSSC709-813L	KSSW709-813	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11
6.000	KSSC709-813R	KSSC709-813L	KSSW709-813	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11
8.000	KSSC709-813R	KSSC709-813L	KSSW709-813	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11
10.000	KSSC709-813R	KSSC709-813L	KSSW709-813	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11
12.000	KSSC709-813R	KSSC709-813L	KSSW709-813	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11

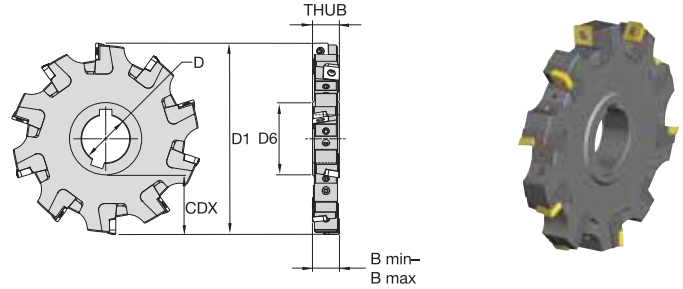
Cartridges • Larger Insert Radii

order number	catalog number
3663324	KSSC709813RX
3663325	KSSC709813LX

NOTE: Use left- or right-hand cartridges for neutral cutters. Fits all larger radii inserts.

Slotting Cutters

- Rapid adjustment and setting via unique cam adjustment mechanism.
- Large selection of insert geometries and grades to cut most workpiece materials.
- Four insert cutting edges.
- Large selection of insert radii.
- Two keyways for staggered mounting.
- Wiper insert facets for superior surface finishes.



■ Arbor Mount • Slotting Cutter • .813-.917" Adjustment Range

order number	catalog number	D1	D	D6	B min	B max	CDX	THUB	Z	Z S	max RPM	lbs
2268682	KSSS500ASD43N813-917	5.000	1.500	2.250	.813	.917	1.331	.820	8	4	10300	2.72
2268694	KSSS600ASD43N813-917	6.000	1.500	2.250	.813	.917	1.831	.820	10	5	9400	4.23
2268706	KSSS800ASD43N813-917	8.000	2.000	2.880	.813	.917	2.516	.820	14	7	8150	7.99
2268718	KSSS1000ASD43N813-917	10.000	2.000	2.880	.813	.917	3.516	.820	16	8	7250	13.16
2268730	KSSS1200ASD43N813-917	12.000	2.000	2.880	.813	.917	4.516	.820	18	9	6650	20.20

■ Spare Parts

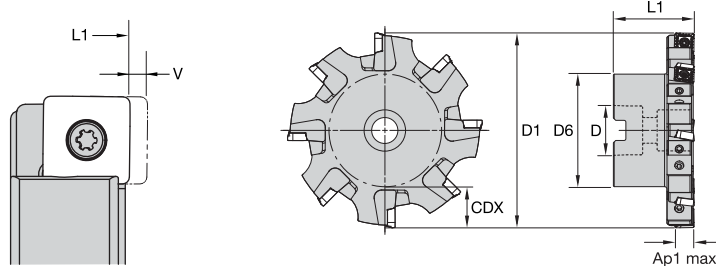
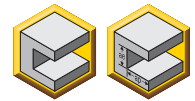
D1	right-hand cartridge	left-hand cartridge	wedge	cam pin wrench	insert screw	in. lbs.	Torx Plus wrench	cam pin	wedge wrench	wedge screw
5.000	KSSC813-917R	KSSC813-917L	KSSW813-917	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11
6.000	KSSC813-917R	KSSC813-917L	KSSW813-917	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11
8.000	KSSC813-917R	KSSC813-917L	KSSW813-917	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11
10.000	KSSC813-917R	KSSC813-917L	KSSW813-917	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11
12.000	KSSC813-917R	KSSC813-917L	KSSW813-917	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11

■ Cartridges • Larger Insert Radii

order number	catalog number
3663326	KSSC813917RX
3663327	KSSC813917LX

NOTE: Use left- or right-hand cartridges for neutral cutters. Fits all larger radii inserts.

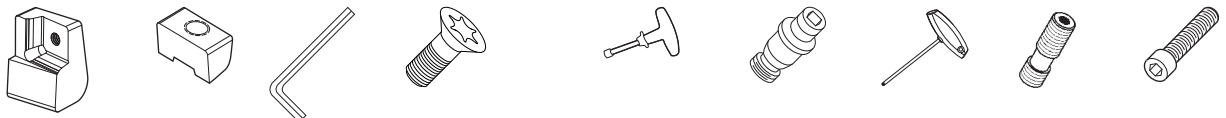
- Rapid adjustment and setting via unique cam adjustment mechanism.
- Large selection of insert geometries and grades to cut most workpiece materials.
- Four insert cutting edges.
- Large selection of insert radii.
- Wiper insert facets for superior surface finishes.



■ Shell Mount • Half-Side Cutting • Right Hand

order number	catalog number	D1	D	D6	CDX	L1	V	Ap1 max	Z	Z S	max RPM	lbs
2268680	KSSS500BSD43R709-813	5.000	1.250	2.880	.997	2.041	.052	.461	8	8	10300	4.55
2268692	KSSS600BSD43R709-813	6.000	1.500	3.810	1.032	2.041	.052	.461	10	10	9400	6.26
2268704	KSSS800BSD43R709-813	8.000	1.500	3.810	2.032	2.041	.052	.461	14	14	8150	9.72
2268716	KSSS1000BSD43R709-813	10.000	2.500	5.250	2.312	2.041	.052	.461	16	16	7250	14.04
2268728	KSSS1200BSD43R709-813	12.000	2.500	5.250	3.312	2.041	.052	.461	18	18	6650	19.83

■ Spare Parts

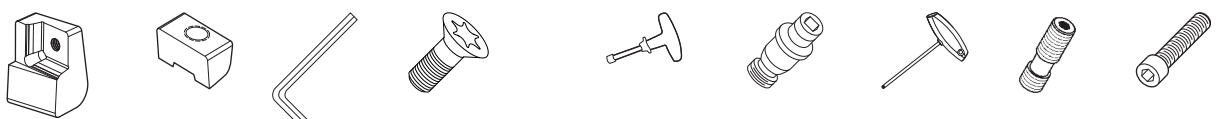


D1	right-hand cartridge	wedge	cam pin wrench	insert screw	in. lbs.	Torx Plus wrench	cam pin	wedge wrench	wedge screw	socket-head cap screw
5.000	KSSC709-813R	KSSW709-813	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11	S467
6.000	KSSC709-813R	KSSW709-813	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11	—
8.000	KSSC709-813R	KSSW709-813	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11	—
10.000	KSSC709-813R	KSSW709-813	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11	—
12.000	KSSC709-813R	KSSW709-813	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11	—

■ Shell Mount • Half-Side Cutting • Right Hand

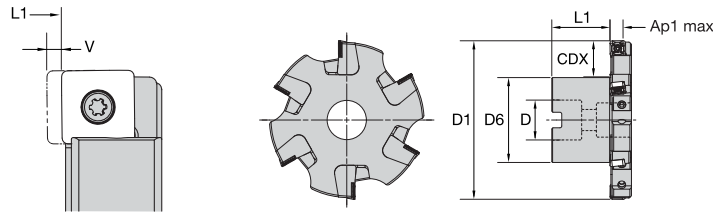
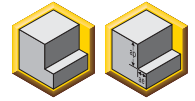
order number	catalog number	D1	D	D6	CDX	L1	V	Ap1 max	Z	Z S	max RPM	lbs
2268686	KSSS500BSD43R813-917	5.000	1.250	2.880	.997	2.041	.052	.461	8	8	10300	4.80
2268698	KSSS600BSD43R813-917	6.000	1.500	3.810	1.032	2.041	.052	.461	10	10	9400	6.58
2268710	KSSS800BSD43R813-917	8.000	1.500	3.810	2.032	2.041	.052	.461	14	14	8150	10.62
2268722	KSSS1000BSD43R813-917	10.000	2.500	5.200	2.312	2.041	.052	.461	16	16	7250	15.42
2268734	KSSS1200BSD43R813-917	12.000	2.500	5.200	3.312	2.041	.052	.461	18	18	6650	21.19

■ Spare Parts



D1	right-hand cartridge	wedge	cam pin wrench	insert screw	in. lbs.	Torx Plus wrench	cam pin	wedge wrench	wedge screw	socket-head cap screw
5.000	KSSC813-917R	KSSW813-917	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11	S467
6.000	KSSC813-917R	KSSW813-917	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11	—
8.000	KSSC813-917R	KSSW813-917	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11	—
10.000	KSSC813-917R	KSSW813-917	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11	—
12.000	KSSC813-917R	KSSW813-917	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11	—

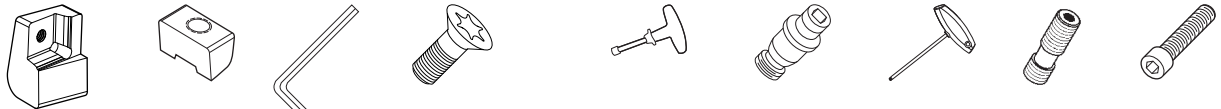
- Rapid adjustment and setting via unique cam adjustment mechanism.
- Large selection of insert geometries and grades to cut most workpiece materials.
- Four insert cutting edges.
- Large selection of insert radii.
- Wiper insert facets for superior surface finishes.



■ Shell Mount • Half-Side Cutting • Left Hand

order number	catalog number	D1	D	D6	CDX	L1	V	Ap1 max	Z	Z S	max RPM	lbs
2268681	KSSS500BSD43L709-813	5.000	1.250	2.880	.997	1.332	.052	.461	8	8	10300	4.55
2268693	KSSS600BSD43L709-813	6.000	1.500	3.810	1.032	1.332	.052	.461	10	10	9400	6.26
2268705	KSSS800BSD43L709-813	8.000	1.500	3.810	2.032	1.332	.052	.461	14	14	8150	9.72
2268717	KSSS1000BSD43L709-813	10.000	2.500	5.250	2.312	1.332	.052	.461	16	16	7250	14.04
2268729	KSSS1200BSD43L709-813	12.000	2.500	5.250	3.312	1.332	.052	.461	18	18	6650	19.83

■ Spare Parts

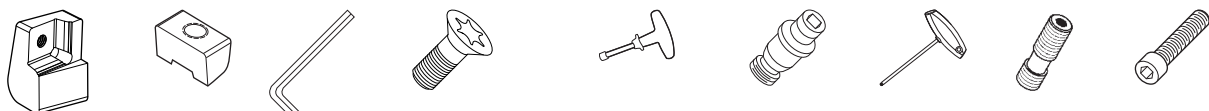


D1	left-hand cartridge	wedge	cam pin wrench	insert screw	in. lbs.	Torx Plus wrench	cam pin	wedge wrench	wedge screw	socket-head cap screw
5.000	KSSC709-813L	KSSW709-813	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11	S467
6.000	KSSC709-813L	KSSW709-813	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11	—
8.000	KSSC709-813L	KSSW709-813	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11	—
10.000	KSSC709-813L	KSSW709-813	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11	—
12.000	KSSC709-813L	KSSW709-813	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11	—

■ Shell Mount • Half-Side Cutting • Left Hand

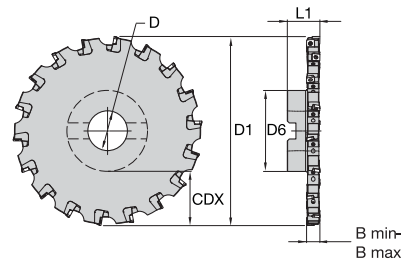
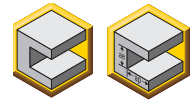
order number	catalog number	D1	D	D6	CDX	L1	V	Ap1 max	Z	Z S	max RPM	lbs
2268687	KSSS500BSD43L813-917	5.000	1.250	2.880	.997	1.228	.052	.461	8	8	10300	4.80
2268699	KSSS600BSD43L813-917	6.000	1.500	3.810	1.032	1.228	.052	.461	10	10	9400	6.58
2268711	KSSS800BSD43L813-917	8.000	1.500	3.810	2.032	1.228	.052	.461	14	14	8150	10.62
2268723	KSSS1000BSD43L813-917	10.000	2.500	5.200	2.312	1.228	.052	.461	16	16	7250	15.42
2268735	KSSS1200BSD43L813-917	12.000	2.500	5.200	3.312	1.228	.052	.461	18	18	6650	21.19

■ Spare Parts



D1	left-hand cartridge	wedge	cam pin wrench	insert screw	in. lbs.	Torx Plus wrench	cam pin	wedge wrench	wedge screw	socket-head cap screw
5.000	KSSC813-917L	KSSW813-917	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11	S467
6.000	KSSC813-917L	KSSW813-917	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11	—
8.000	KSSC813-917L	KSSW813-917	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11	—
10.000	KSSC813-917L	KSSW813-917	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11	—
12.000	KSSC813-917L	KSSW813-917	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11	—

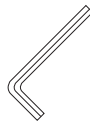
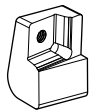
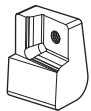
- Rapid adjustment and setting via unique cam adjustment mechanism.
- Large selection of insert geometries and grades to cut most workpiece materials.
- Four insert cutting edges.
- Large selection of insert radii.
- Wiper insert facets for superior surface finishes.



■ Shell Mount • Slotting Cutting • .709-.813" Adjustment Range

order number	catalog number	D1	D	D6	B min	B max	CDX	L1	Z	Z S	max RPM	lbs
2268679	KSSS500BSD43N709-813	5.000	1.250	2.880	.709	.813	.997	2.093	8	4	10300	4.55
2268691	KSSS600BSD43N709-813	6.000	1.500	3.810	.709	.813	1.032	2.093	10	5	9400	6.26
2268703	KSSS800BSD43N709-813	8.000	1.500	3.810	.709	.813	2.032	2.093	14	7	8150	9.72
2268715	KSSS1000BSD43N709-813	10.000	2.500	5.250	.709	.813	2.312	2.093	16	8	7250	14.04
2268727	KSSS1200BSD43N709-813	12.000	2.500	5.250	.709	.813	3.312	2.093	18	9	6650	19.83

■ Spare Parts

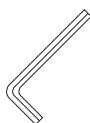
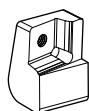


D1	right-hand cartridge	left-hand cartridge	wedge	cam pin wrench	insert screw	in. lbs.	Torx Plus wrench	cam pin	wedge wrench	wedge screw	socket-head cap screw
5.000	KSSC709-813R	KSSC709-813L	KSSW709-813	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11	S467
6.000	KSSC709-813R	KSSC709-813L	KSSW709-813	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11	—
8.000	KSSC709-813R	KSSC709-813L	KSSW709-813	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11	—
10.000	KSSC709-813R	KSSC709-813L	KSSW709-813	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11	—
12.000	KSSC709-813R	KSSC709-813L	KSSW709-813	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11	—

■ Shell Mount • Slotting Cutting • .813-.917" Adjustment Range

order number	catalog number	D1	D	D6	B min	B max	CDX	L1	Z	Z S	max RPM	lbs
2268685	KSSS500BSD43N813-917	5.000	1.250	2.880	.813	.917	.997	2.093	8	4	10300	4.80
2268697	KSSS600BSD43N813-917	6.000	1.500	3.810	.813	.917	1.032	2.093	10	5	9400	6.58
2268709	KSSS800BSD43N813-917	8.000	1.500	3.810	.813	.917	2.032	2.093	14	7	8150	10.62
2268721	KSSS1000BSD43N813-917	10.000	2.500	5.200	.813	.917	2.312	2.093	16	8	7250	15.42
2268733	KSSS1200BSD43N813-917	12.000	2.500	5.200	.813	.917	3.312	2.093	18	9	6650	21.19

■ Spare Parts



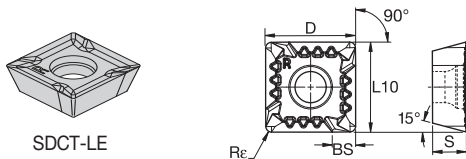
D1	right-hand cartridge	left-hand cartridge	wedge	cam pin wrench	insert screw	in. lbs.	Torx Plus wrench	cam pin	wedge wrench	wedge screw	socket-head cap screw
5.000	KSSC813-917R	KSSC813-917L	KSSW813-917	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11	S467
6.000	KSSC813-917R	KSSC813-917L	KSSW813-917	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11	—
8.000	KSSC813-917R	KSSC813-917L	KSSW813-917	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11	—
10.000	KSSC813-917R	KSSC813-917L	KSSW813-917	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11	—
12.000	KSSC813-917R	KSSC813-917L	KSSW813-917	MW3	MS2077	35	TTP15	KSSCP709-917	THW3M	STCM11	—

Slotting Cutters

Insert Selection Guide

Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	.E..LD2	KC725M	.E..GB2	KC725M	.S..GB2	KC725M
P3-P4	.E..GB2	KCPK30	.S..GB2	KCPK30	.S..GB	KCPK30
P5-P6	.E..GB2	KCPM20	.S..GB2	KCPM20	.S..GB	KCPK30
M1-M2	.E..LD2	KC725M	.E..GB2	KC725M	.S..GB2	KC725M
M3	.E..GB2	KCPK30	.S..GB2	KCPK30	.S..GB	KCPK30
K1-K2	.E..LD	KCK15	.E..GB2	KCK15	.S..GB2	KCK15
K3	.E..GB2	KCPK30	.S..GB2	KCPK30	.S..GB	KCPK30
N1-N2	.F..LE	KC410M	.F..LE	KC410M	.F..LE	KC410M
N3	.F..LE	KC410M	.F..LE	KC410M	.F..LE	KC410M
S1-S2	.E..LD2	KC725M	.E..GB2	KC725M	.S..GB2	KC725M
S3	.E..GB2	KC725M	.S..GB2	KC725M	.S..GB	KC725M
S4	.S..GB2	KC725M	.S..GB	KC725M	—	—
H1	—	—	—	—	—	—

Indexable Inserts • KSSM SD.T1204...



SDCT-LE

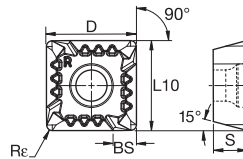
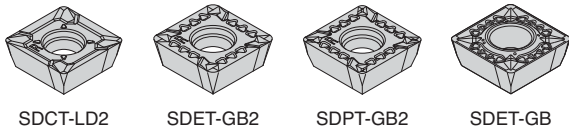
 ● first choice
 ○ alternate choice

P	●	○	○	○	○	○	○
M	●	○	○	○	○	○	○
K	●	○	○	○	○	○	○
N	●	○	○	○	○	○	○
S	●	○	○	○	○	○	○
H	○	○	○	○	○	○	○

SDCT-LE (Ground) 20° Rake Face

catalog number	D	S	L10	BS	Rε	hm	cutting edges	KC410M	KC520M	KC522M	KC725M	KCK15	KCPK30	KCPM20
SDCT431PDFL8LE	.500	.188	.500	.106	.016	.001	4	●						
SDCT431PDFR8LE	.500	.188	.500	.106	.016	.001	4	●						
SDCT43PDFL8LE	.500	.188	.500	.106	.031	.001	4	●						
SDCT43PDFR8LE	.500	.188	.500	.106	.031	.001	4	●						
SDCT433PDFL8LE	.500	.188	.500	.106	.047	.001	4	●						
SDCT433PDFR8LE	.500	.188	.500	.106	.047	.001	4	●						
SDCT434FNLE	.500	.188	.500	—	.063	.001	4	●						
SDCT435FNLE	.500	.188	.500	—	.078	.001	4	●						
SDCT436FNLE	.500	.188	.500	—	.094	.001	4	●						
SDCT438FNLE	.500	.188	.500	—	.125	.001	4	●						

Slotting Cutters



P	■	■	■	○	■	■	■	■
M	■	■	■	■	■	■	○	○
K	■	■	■	○	■	■	○	○
N	■	■	■	■	■	■	■	■
S	■	■	■	■	■	■	■	■
H	■	■	■	■	■	■	■	■

● first choice
○ alternate choice

■ SDCT-LD2 (Ground) 15° Rake Face

catalog number	D	S	L10	BS	Re	hm	cutting edges	KC410M	KC520M	KC522M	KC725M	KCK15	KCPK30	KCPM20
SDCT431PDEL8LD2	.500	.188	.500	.106	.016	.002	4							
SDCT431PDER8LD2	.500	.188	.500	.115	.016	.002	4							
SDCT43PDEL8LD2	.500	.188	.500	.130	.031	.002	4							
SDCT43PDER8LD2	.500	.188	.500	.130	.031	.002	4		●					
SDCT433PDEL8LD2	.500	.188	.500	.120	.047	.002	4							
SDCT433PDER8LD2	.500	.188	.500	.120	.047	.002	4							
SDCT434ENLD2	.500	.188	.500	—	.063	.002	4							
SDCT435ENLD2	.500	.188	.500	—	.078	.002	4							
SDCT436ENLD2	.500	.188	.500	—	.094	.002	4							
SDCT438ENLD2	.500	.188	.500	—	.125	.002	4							
SDCT4316ENLD2	.500	.188	.500	—	.250	.002	2							

■ SDET-GB2 (Ground) 5° Rake Face

catalog number	D	S	L10	BS	Re	hm	cutting edges	KC410M	KC520M	KC522M	KC725M	KCK15	KCPK30	KCPM20
SDET43PDEL8GB2	.500	.188	.500	.130	.031	.003	4							
SDET43PDER8GB2	.500	.188	.500	.130	.031	.003	4							
SDET43PDSL8GB2	.500	.188	.500	.130	.031	.005	4							
SDET43PDSR8GB2	.500	.188	.500	.130	.031	.005	4							
SDET433PDEL8GB2	.500	.188	.500	.120	.047	.003	4							
SDET433PDER8GB2	.500	.188	.500	.120	.047	.003	4							
SDET434SNGB2	.500	.188	.500	—	.063	.005	4							
SDET435SNGB2	.500	.188	.500	—	.078	.005	4							
SDET436SNGB2	.500	.188	.500	—	.094	.005	4							
SDET438SNGB2	.500	.188	.500	—	.125	.005	4							
SDET438XENGB2	.500	.188	.500	—	.125	.003	2							
SDET4316SNGB2	.500	.188	.500	—	.250	.005	2							

■ SDPT-GB2

catalog number	D	S	L10	BS	Re	hm	cutting edges	KC410M	KC520M	KC522M	KC725M	KCK15	KCPK30	KCPM20
SDPT43PDER8GB2	.500	.188	.500	.106	.031	.003	4							
SDPT43PDSR8GB2	.500	.188	.500	.106	.031	.005	4							

■ SDET-GB (Ground) 5° Rake Face

catalog number	D	S	L10	BS	Re	hm	cutting edges	KC410M	KC520M	KC522M	KC725M	KCK15	KCPK30	KCPM20
SDET43PDER8GB	.500	.188	.500	.132	.031	.003	4							
SDET43PDSR8GB	.500	.188	.500	.132	.031	.006	4							
SDET433PDER8GB	.500	.188	.500	.132	.047	.003	4							
SDET4316SNGB	.500	.188	.500	—	.250	.006	2							

Slotting Cutters

■ Recommended Starting Speeds [SFM]

Material Group		KC410M			KC520M			KC522M			KC725M		
P	1	—	—	—	—	—	—	1080	940	880	860	750	700
	2	—	—	—	—	—	—	900	790	660	720	630	530
	3	—	—	—	—	—	—	830	700	580	660	560	460
	4	—	—	—	—	—	—	740	610	490	590	490	390
	5	—	—	—	—	—	—	610	550	490	490	440	390
	6	—	—	—	—	—	—	540	410	330	430	330	260
M	1	—	—	—	—	—	—	670	590	540	560	490	450
	2	—	—	—	—	—	—	610	520	430	510	430	360
	3	—	—	—	—	—	—	460	400	310	380	330	260
K	1	—	—	—	880	800	710	750	680	600	—	—	—
	2	—	—	—	690	620	580	590	530	490	—	—	—
	3	—	—	—	580	520	470	490	440	400	—	—	—
N	1-2	3990	3550	3270	—	—	—	—	—	—	—	—	—
	3	3550	3270	3000	—	—	—	—	—	—	—	—	—
S	1	—	—	—	—	—	—	130	120	90	115	100	80
	2	—	—	—	—	—	—	130	120	90	115	100	80
	3	—	—	—	—	—	—	170	130	90	150	115	80
	4	—	—	—	—	—	—	230	170	120	200	150	100
H	1	—	—	—	—	—	—	—	—	—	—	—	—

Material Group		KCK15			KCPK30			KCPM20		
P	1	—	—	—	1485	1300	1210	1810	1590	1470
	2	—	—	—	920	830	750	1120	1010	910
	3	—	—	—	830	750	680	1010	910	830
	4	—	—	—	620	575	520	760	700	630
	5	—	—	—	850	760	690	910	820	750
	6	—	—	—	520	450	—	630	550	475
M	1	—	—	—	680	600	515	730	655	570
	2	—	—	—	610	530	460	670	580	520
	3	—	—	—	475	430	380	530	475	410
K	1	1380	1255	1115	965	875	780	1180	1070	960
	2	1095	975	910	770	690	630	940	840	770
	3	920	815	750	645	575	530	790	700	650
N	1-2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
S	1	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—	—	—
H	1	—	—	—	—	—	—	—	—	—

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

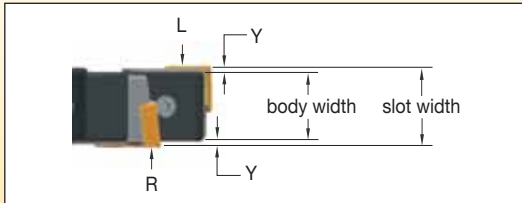
■ Recommended Starting Feeds [IPT]

Light Machining	General Purpose	Heavy Machining
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Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.F..LE	.003	.007	.014	.003	.005	.010	.002	.004	.009	.002	.004	.008	.002	.004	.008	.F..LE
.E..LD	.004	.010	.020	.003	.007	.015	.002	.006	.013	.002	.006	.012	.002	.006	.012	.E..LD
.E..LD2	.004	.010	.020	.003	.007	.015	.002	.006	.013	.002	.006	.012	.002	.006	.012	.E..LD2
.E..GB	.007	.014	.024	.005	.011	.018	.004	.009	.015	.004	.009	.014	.004	.008	.014	.E..GB
.E..GB2	.007	.014	.024	.005	.011	.018	.004	.009	.015	.004	.009	.014	.004	.008	.014	.E..GB2
.S..GB	.007	.017	.025	.005	.013	.019	.004	.011	.016	.004	.010	.015	.004	.010	.015	.S..GB
.S..GB2	.007	.017	.025	.005	.013	.019	.004	.011	.016	.004	.010	.015	.004	.010	.015	.S..GB2

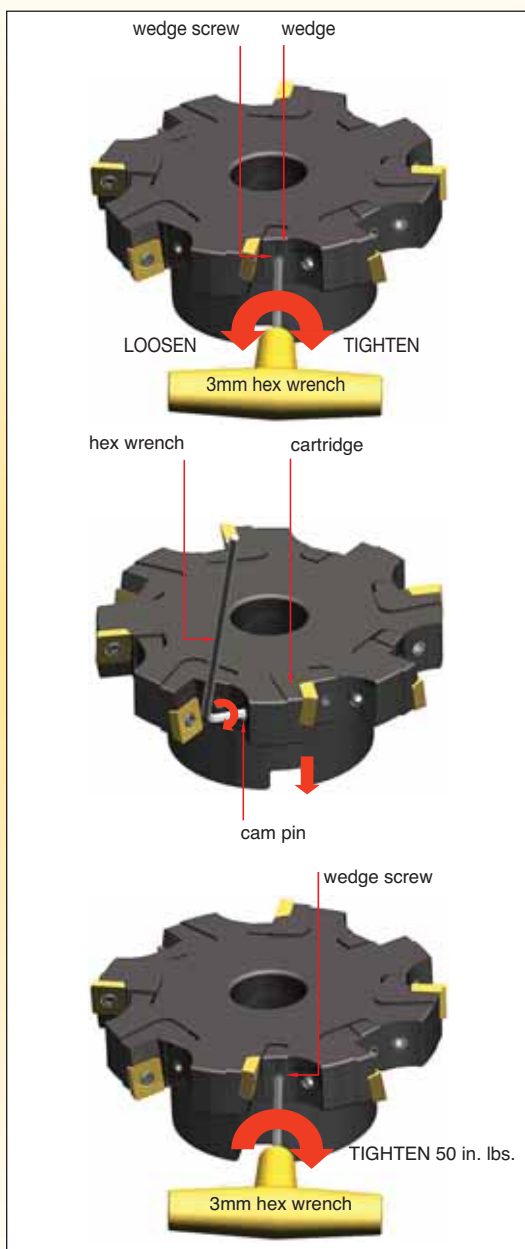
NOTE: Use "Light Machining" values as starting feed rate.

■ KSSM Slot Width Adjustment Instructions



1. Measure body width at pocket 1 (per stamp on tool body) behind cartridge.
2. Zero tool presetter at pocket 1 behind cartridge.
3. Move presetter over the insert and set distance Y.
 $Y = (\text{Desired Slot Width} - \text{Body Width}) / 2$.
4. Zero over insert at starting pocket (pocket 1).
5. Adjust remaining cartridges on the same side.
6. Return to starting pocket and start with step 2 for opposite side of cutter.

■ KSSM Cartridge Adjustment Instructions



1. Insert 3mm hex wrench into STCM Screw.
2. Rotate 3mm hex wrench counter-clockwise to loosen wedge.
3. Rotate 3mm hex wrench clockwise to lightly tighten STCM screw to approximately 9 in. lbs., so the wedge is touching the cartridge and cutter body. This creates some slight resistance against the cartridge during the adjustment.

4. Insert hex wrench into cam pin behind cartridge.
5. Rotate wrench to adjust cartridge to desired position.
6. For best accuracy, back cam pin off, so you can feel it is not touching the sides of the slot in the back of the cartridge.
7. Remove wrench from cam pin.

8. Insert 3mm hex wrench into STCM screw
9. Tighten STCM screw to 55 in. lbs. prior to using the cutter. Kennametal torque wrench KTW45 or alternate torque wrench should be used.
10. Double check cartridge position to assure no movement.



Beyond BLAST™ KSSM 45°

beyond™ BLAST™

More than just the right tool — the ultimate solutions

The Beyond BLAST KSSM 45° utilizes Precision Coolant Technology (PCT) to aggressively apply coolant directly to the cutting area. Not only does this reduce heat at the cutting edge, but it also assists with reducing tool and chip friction, increasing chip evacuation, and relieving shear stress. Because the Beyond BLAST technology can be applied in low-pressure conditions, there is no need to invest in additional equipment. It's so easy to convert from conventional to Beyond BLAST technology, it can be done directly on the floor — virtually eliminating costly downtime. See what the performance leader can do for your titanium machining.

- Easy to convert from conventional to Beyond BLAST technology.
- Up to 100% better tool life.
- Less tool/chip friction and shear stress.
- Beyond BLAST also works with regular low-pressure conditions.
- Performance leader in machining titanium.

Experience the advantages at your Authorized Kennametal Distributor or at www.kennametal.com.

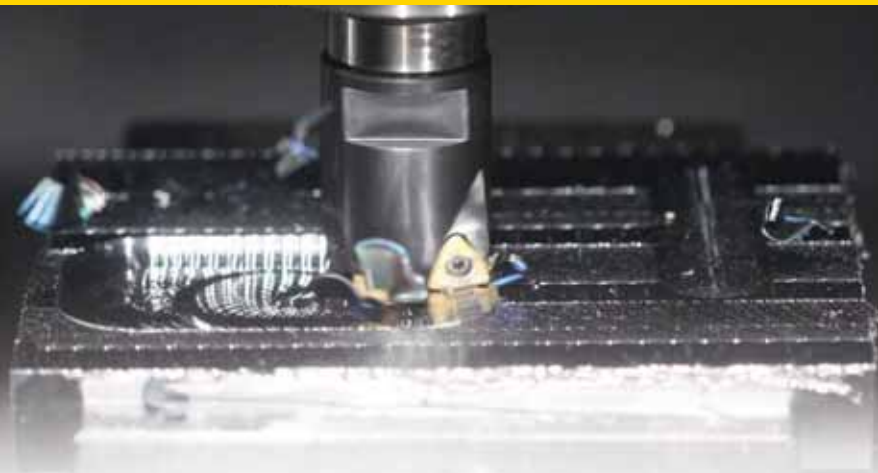
www.kennametal.com





Copy Mills

KenFeed 2X • Double-Sided High-Feed Milling Cutters	R2-R7
KenFeed Mini • Single-Sided Insert, Small High-Feed Milling Cutters	R8-R11
Rodeka • Double-Sided Round Insert, IC12	R12-R19
Rodeka IC12, 12 Cutting Edges	R13-R17
Rodeka 8, IC12 Turbine Blade Version	R18-R19
KDM Platform • Round Inserts, Particularly for the Die and Mold Industry	R20-R37
RD.X07	R21-R24
RD.X10	R25-R29
RD.X12	R30-R34
RD.X16	R35-R37
KSRM Platform • Round Inserts, Specially Developed for Titanium and Stainless Steel	R38-R59
RP.T1204	R39-R44
RP.T1605	R45-R50
RCGT64	R51-R55
RCGT86	R56-R59
Beyond BLAST KSRM Platform • New Generation Round Inserts with Through Coolant	R60-R69
RCGX64	R61-R65
RCGX86	R66-R69
KDMB and KDMT Platforms • Indexable Ball Nose and Toroidal Inserts for Complex Parts ...	R70-R91
KDMB • Ball Nose Inserts	R71-R86
KDMT • Toroidal and High-Feed Inserts	R87-R91
Z-Axis • Plunge Milling Cutters	R92-R100
KDMR • Multifunction Cutters	R102-R106
KIPR and KSSR • Round Ceramic Milling Cutters	R108-R117
RPG2150, RPG32, RPG43 • Positive Insert Style	R109-R114
RNG45 • Negative Insert Style, Double Sided	R115-R117

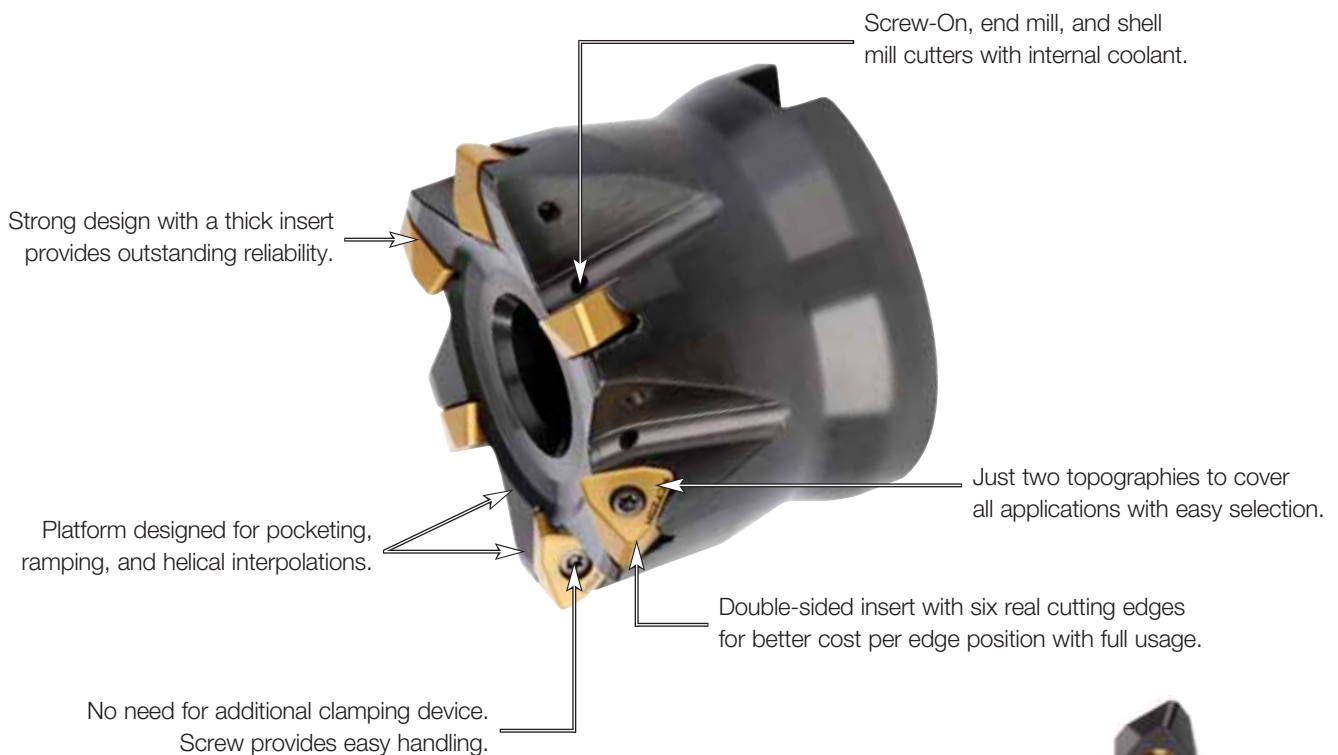


KenFeed™ 2X • The Ultimate and Innovative Concept for Applying the Latest High-Feed Milling Strategies

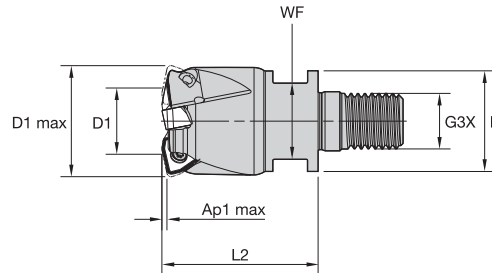
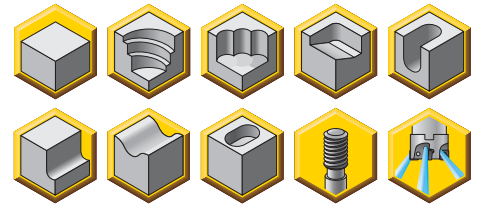
Primary Application

KenFeed 2X is a double-sided trigon insert with six cutting edges engineered to provide you a superior MRR and productivity through high-feed rates for roughing operations.

Features and Benefits

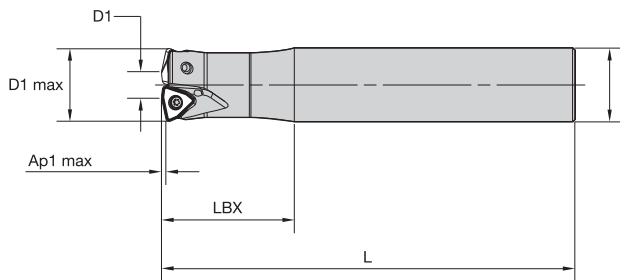
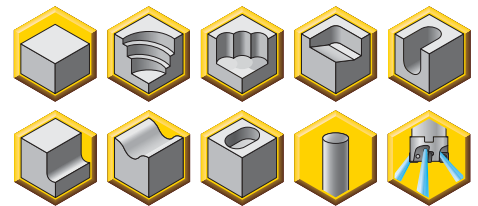


- Dramatically improves MRR using the latest milling strategies.
- Engineered to run up to 0,1 IPT.
- Ideal for pocketing, ramping, and helical interpolations. Z-plunge capabilities.
- First choice for deep cavities or from 3 x D.



■ Screw-On End Mills • Inch

order number	catalog number	D1 max	D1	D	WF	G3X	L2	Ap1 max	Z	max RPM	insert 1	lbs
4109575	KF2X100W0902M12L138	1.000	.350	.827	.667	M12	1.380	.059	2	36600	WOEJ090512__	.20
4109576	KF2X125W0902M16L169	1.250	.622	1.142	.864	M16	1.690	.059	2	31000	WOEJ090512__	.46
4109577	KF2X125W0903M16L169	1.250	.622	1.142	.864	M16	1.690	.059	3	31000	WOEJ090512__	.45
4109578	KF2X150W0903M16L169	1.500	.869	1.142	.864	M16	1.691	.059	3	27500	WOEJ090512__	.52
4109579	KF2X150W0904M16L169	1.500	.869	1.142	.866	M16	1.691	.059	4	27400	WOEJ090512__	.51



■ End Mills • Inch

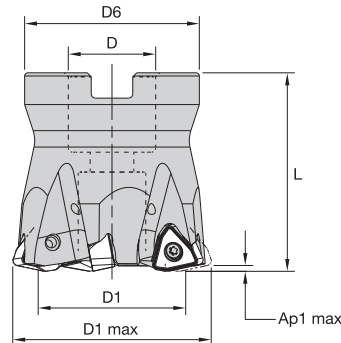
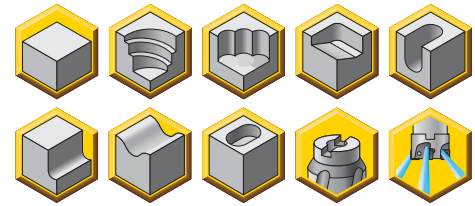
order number	catalog number	D1 max	D1	D	L	LBX	Ap1 max	Z	max RPM	insert 1	lbs
4109580	KF2X100W0902C100L600	1.000	.350	1.000	6.000	1.780	.059	2	36600	WOEJ090512__	1.15
4109581	KF2X100W0902C100L800	1.000	.350	1.000	8.000	1.780	.059	2	36600	WOEJ090512__	1.58
4109582	KF2X125W0903C125L600	1.250	.619	1.250	6.000	1.690	.059	3	31000	WOEJ090512__	1.84
4109593	KF2X125W0903C125L800	1.250	.622	1.250	8.000	1.690	.059	3	31000	WOEJ090512__	2.53
4109594	KF2X150W0903C125L600	1.500	.869	1.250	6.000	1.691	.059	3	27400	WOEJ090512__	1.94
4109595	KF2X150W0903C125L800	1.500	.869	1.250	8.000	1.691	.059	3	27400	WOEJ090512__	2.61

■ Spare Parts



D1 max	insert screw	in. lbs.	Torx Plus driver
1.000	MS2235	15	DT8IP
1.250	MS2235	15	DT8IP
1.500	MS2235	15	DT8IP

- Dramatically improves MRR using the latest milling strategies.
- Engineered to run up to 0,1 IPT.
- Ideal for pocketing, ramping, and helical interpolations. Z-plunge capabilities.
- First choice for deep cavities or from 3 x D.



■ **Face Mills • Inch**

order number	catalog number	D1 max	D1	D	D6	L	Ap1 max	Z	max RPM	insert 1	lbs
4109596	KF2X150W0904S050L157	1.500	.869	.500	1.417	1.571	.059	4	27400	WOEJ090512__	.40
4109597	KF2X200W0905S075L157	2.000	1.363	.750	1.772	1.575	.059	5	22900	WOEJ090512__	.71
4109598	KF2X200W0906S075L157	2.000	1.366	.750	1.732	1.570	.059	6	22900	WOEJ090512__	.69
4109599	KF2X250W0906S075L175	2.500	1.864	.750	1.732	1.750	.059	6	20000	WOEJ090512__	1.16
4109600	KF2X300W0907S100L175	3.000	2.362	1.000	2.189	1.750	.059	7	18000	WOEJ090512__	1.77

■ **Spare Parts**

D1 max	insert screw	in. lbs.	Torx Plus driver	socket-head cap screw
1.500	MS2235	15.00	DT8IP	S424
2.000	MS2235	15.00	DT8IP	S445
2.500	MS2235	15.00	DT8IP	S445
3.000	MS2235	15.00	DT8IP	S458



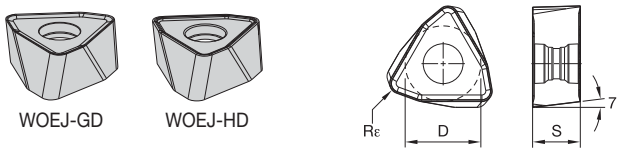
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Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	.S..GD	KC522M	.S..GD	KCPK30	.S..GD	KCPK30
P3-P4	.S..HD	KC522M	.S..HD	KCPK30	.S..HD	KCPK30
P5-P6	.S..HD	KC522M	.S..HD	KCPK30	.S..HD	KCPK30
M1-M2	.S..GD	KC522M	.S..GD	KC725M	.S..GD	KC725M
M3	.S..GD	KC725M	.S..GD	KCPK30	.S..HD	KCPK30
K1-K2	.S..HD	KCK15	.S..HD	KCK15	.S..HD	KCPK30
K3	.S..HD	KCK15	.S..HD	KCK15	.S..HD	KCPK30
N1-N2	—	—	—	—	—	—
N3	—	—	—	—	—	—
S1-S2	.S..GD	KC522M	.S..GD	KC725M	—	—
S3	.S..GD	KC725M	.S..GD	KC725M	—	—
S4	.S..GD	KC725M	.S..GD	KC725M	—	—
H1	.S..HD	KC522M	—	—	—	—

Indexable Inserts • WOEJ09....

- Double-sided insert with six cutting edges.
- Unique and strong insert design that enables high-feed conditions, up to 0,1 IPT.
- HD geometry is the first choice for steels, high-strength steels, and cast iron.
- GD provides lower cutting forces, first choice for soft materials.


WOEJ-GD

catalog number	D	Re	S	cutting edges	KC522M	KC725M	KCK15	KCPK30
WOEJ090512SRGD	.350	.048	.213	6	●	●	●	●

WOEJ-HD

catalog number	D	Re	S	cutting edges	KC522M	KC725M	KCK15	KCPK30
WOEJ090512SRHD	.351	.048	.215	6	●	●	●	●

● first choice
○ alternate choice

P	○	●	○	○
M	●	●	○	○
K	○	○	●	○
N	○	○	○	○
S	○	●	○	○
H	○	○	○	○

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■ Recommended Starting Speeds [SFM]

Group		KC522M			KC725M			KCK15			KCPK30		
P	1	1300	1130	1060	1030	900	840	—	—	—	1780	1560	1450
	2	1080	950	790	860	760	640	—	—	—	1100	1000	900
	3	1000	840	700	790	670	550	—	—	—	1000	900	820
	4	890	730	590	710	590	470	—	—	—	740	690	620
	5	730	660	590	590	530	470	—	—	—	1020	910	830
	6	650	490	400	520	400	310	—	—	—	620	540	—
M	1	800	710	650	670	590	540	—	—	—	820	720	620
	2	730	620	520	610	520	430	—	—	—	730	640	550
	3	550	480	370	460	400	310	—	—	—	570	520	460
K	1	900	820	720	—	—	—	1660	1510	1340	1160	1050	940
	2	710	640	590	—	—	—	1310	1170	1090	920	830	760
	3	590	530	480	—	—	—	1100	980	900	770	690	640
N	1	—	—	—	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—	—	—	—
S	1	160	140	110	140	120	100	—	—	—	—	—	—
	2	160	140	110	140	120	100	—	—	—	—	—	—
	3	200	160	110	180	140	100	—	—	—	—	—	—
	4	280	200	140	240	180	120	—	—	—	—	—	—
H	1	470	360	280	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

■ Recommended Starting Feeds [IPT]

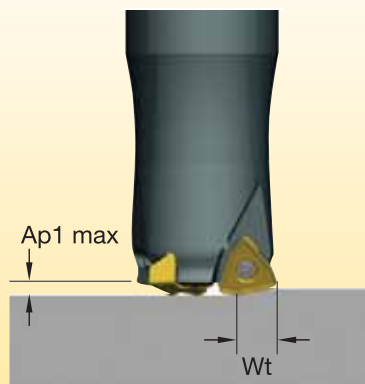
Light Machining	General Purpose	Heavy Machining
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Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.S..GD	.033	.065	.148	.024	.046	.095	.021	.040	.080	.020	.037	.074	.019	.036	.072	.S..GD
.S..HD	.033	.090	.162	.024	.062	.102	.021	.053	.085	.020	.049	.079	.019	.048	.077	.S..HD

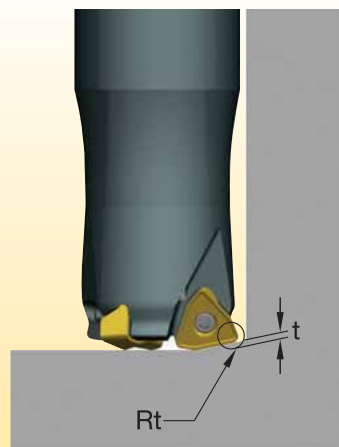
NOTE: Use "Light Machining" values as starting feed rate.

General Programming Information for Applying KenFeed 2X • IC09

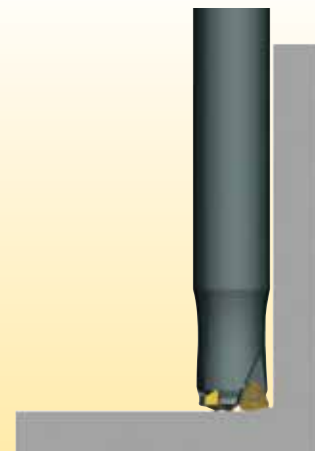
Rt	Wt	t
.110	.312	.045



Small Ap1 values and higher feed rates generate lower cutting forces versus traditional milling strategies.

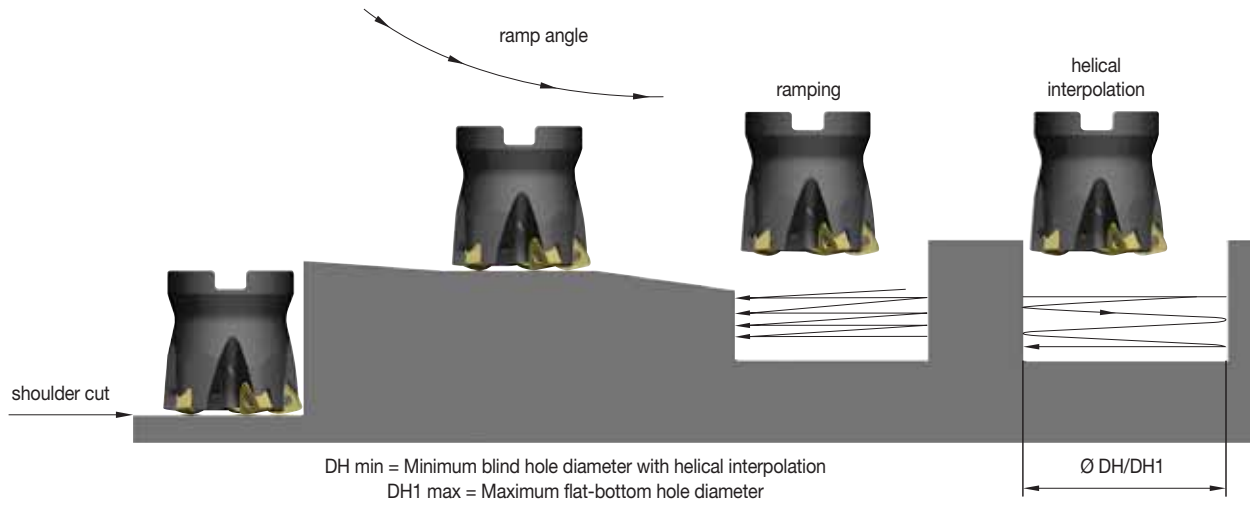


For CAM programming, the loads can be programmed as a toroidal tool type by using the Rt value as the insert radius.



Recommended when long overhang is necessary due to lower radial forces. Maximum L/D ratio of 10 x D.

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Maximum Linear Ramping and Helical Interpolation from Solid


cutter type	catalog number	recommended ramping angle (for continuous ramping process)	max ramp angle when Ap max (not for continuous ramping process)	max ramp angle for 360° helical interpolation	min hole diameter (DH min)	max flat-bottom hole diameter (DH1 max)	max diameter (no flat bottom)
Screw-On	KF2X100W0902M12L138	3.5°	5.2°	3.1°	1.291	1.35	2.0
	KF2X125W0902M16L169	1.9°	2.8°	1.7°	1.813	1.87	2.5
	KF2X125W0903M16L169	1.9°	2.8°	1.7°	1.813	1.87	2.5
	KF2X150W0903M16L169	1.4°	2.1°	1.2°	2.310	2.37	3.0
End Mills	KF2X150W0904M16L169	1.4°	2.1°	1.2°	2.310	2.37	3.0
	KF2X100W0902C100L600	3.5°	5.2°	3.1°	1.291	1.35	2.0
	KF2X100W0902C100L800	3.5°	5.2°	3.1°	1.291	1.35	2.0
	KF2X125W0903C125L600	1.9°	2.8°	1.7°	1.813	1.87	2.5
	KF2X125W0903C125L800	1.9°	2.8°	1.7°	1.813	1.87	2.5
	KF2X150W0903C125L600	1.4°	2.1°	1.2°	2.310	2.37	3.0
Face Mills	KF2X150W0903C125L800	1.4°	2.1°	1.2°	2.310	2.37	3.0
	KF2X150W0904S050L157	1.4°	2.1°	1.2°	2.310	2.37	3.0
	KF2X200W0905S075L157	1.0°	1.4°	0.8°	3.307	3.37	4.0
	KF2X200W0906S075L157	1.0°	1.4°	0.8°	3.307	3.37	4.0
	KF2X250W0906S075L175	0.7°	1.1°	0.6°	4.305	4.36	5.0
	KF2X300W0907S100L175	0.6°	1.0°	0.5°	5.303	5.36	6.0



Copy Mills



KenFeed™ Mini • Small High-Feed Milling Cutters for Machining Small and Medium Components

Primary Application

Roughing operations through the latest milling strategies up to 55 HRC. Specially suited for small parts or machines with lower power capacity. **The KenFeed Mini delivers higher productivity with reduced tooling costs.**

Features and Benefits

Platform designed for pocketing, ramping, and helical interpolations.

Screw-On and shell mill cutters with internal coolant. Coolant holes: better chip evacuation and higher the tool life.

Excellent runout accuracy increases general performance and higher tool life.

Strong design capacity to support higher cutting forces and unstable situations.

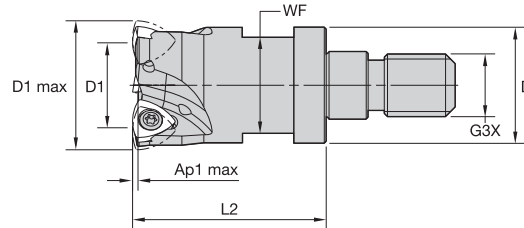
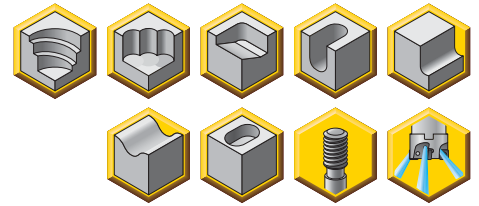
Just two topographies to cover all applications with easy selection.



Insert and body design with superior copy milling capabilities enable us to run the cutter with true ramping, profiling, and pocketing capabilities.

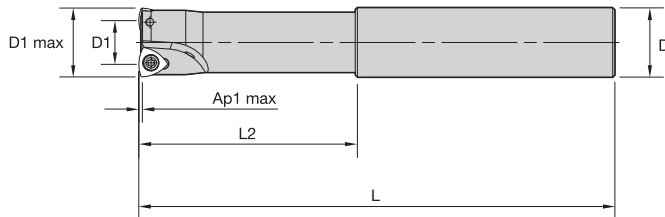
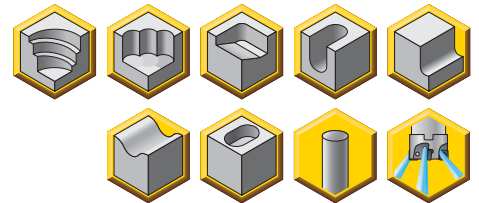


- Engineered to use with small machines and/or components using high-feed milling strategies.
- Fine-pitch cutters boost productivity; able to run up to 0,05 IPT.
- Pocketing, ramping, and helical interpolations.
- First choice above 3 x D applications.



■ Screw-On End Mills • Inch

order number	catalog number	D1 max	D1	D	WF	G3X	L2	Ap1 max	Z	max ramp angle	max RPM	insert 1	lbs
3652852	KF063WP0302M08100	.625	.398	.512	.386	M8	1.000	.033	2	8.5°	25055	WP..0302..	.06
4138464	KF075WP0303M10118	.750	.490	.699	.589	M10	1.180	.040	3	5.3°	16700	WP..0302..	.12
4138465	KF100WP0304M12138	1.000	.708	.827	.667	M12	1.378	.040	4	3.0°	12500	WP..0302..	.21



■ End Mills • Inch

order number	catalog number	D1 max	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	insert 1	lbs
3652893	KF063WP0302C063L100	.625	.393	.625	3.362	1.000	.033	2	8.5°	20050	WP..0302..	.25
4138466	KF075WP0303C075L150	.750	.492	.750	4.500	1.391	.040	3	5.3°	16700	WP..0302..	.48
4138467	KF075WP0303C075L250	.750	.461	.750	6.000	2.394	.040	3	5.3°	16700	WP..0302..	.65
4138468	KF100WP0304C100L150	1.000	.740	1.000	4.800	1.391	.040	4	5.3°	12500	WP..0302..	.95
4138469	KF100WP0304C100L250	1.000	.740	1.000	6.000	2.359	.040	4	3.0°	12500	WP..0302..	1.18

■ Spare Parts



insert screw



Torx wrench

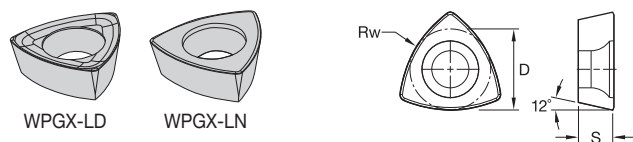
D1 max	insert screw	in. lbs.	Torx wrench
.625	192.416	8	FT7
.750	192.416	8	FT7
1.000	192.416	8	FT7

■ Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	.LD..	KC522M	.LD..	KCPK30	.LD..	KCPK30
P3-P4	.LD..	KC522M	.LD..	KCPK30	.LD..	KCPK30
P5-P6	.LD..	KCPK30	.LD..	KCPM20	—	—
M1-M2	.LD..	KC522M	.LD..	KC725M	—	—
M3	.LD..	KC522M	.LD..	KC725M	—	—
K1-K2	.LN..	KC510M	.LD..	KCPK30	—	—
K3	.LN..	KC510M	.LD..	KCPK30	—	—
N1-N2	—	—	—	—	—	—
N3	—	—	—	—	—	—
S1-S2	.LD..	KC522M	.LD..	KC725M	—	—
S3	.LD..	KC725M	.LD..	KC725M	—	—
S4	.LD..	KC522M	.LD..	KC725M	—	—
H1	.LN..	KC510M	.LN..	KC510M	—	—

Indexable Insert • WPGX03...

- Positive single-sided insert for lower cutting forces for high-feed milling process.
- Engineered to run up to 0,05 IPT. Boost productivity in small machines and/or components.
- LD first choice for majority of materials, providing lower cutting forces.
- LN geometry is the first choice for high-strength steel and hard machining up to 55 HRC.



● first choice
○ alternate choice

P	●	○	○	●	●	●
M	●	○	○	○	○	○
K	○	○	○	○	○	○
N	○	○	○	○	○	○
S	○	○	○	○	○	○
H	○	○	○	○	○	○

■ WPGX-LD and -LN

Copy Mills

catalog number	D	S	RW	cutting edges	KC510M	KC522M	KC725M	KCPM20	KCPK30
WPGX030204LD080	.217	.094	.315	3	○	○	○	○	○
WPGX030204LN080	.217	.094	.315	3	●	○	○	○	○

■ Recommended Starting Speeds [SFM]

Material Group		KC510M			KC522M			KC725M			KCPM20			KCPK30		
P	1	—	—	—	1300	1130	1060	1030	900	840	2170	1910	1760	1780	1560	1450
	2	—	—	—	1080	950	790	860	760	640	1340	1210	1090	1100	1000	900
	3	—	—	—	1000	840	700	790	670	550	1210	1090	1000	1000	900	820
	4	960	780	660	890	730	590	710	590	470	910	840	760	740	690	620
	5	—	—	—	730	660	590	590	530	470	1090	980	900	1020	910	830
	6	—	—	—	650	490	400	520	400	310	760	660	570	620	540	—
M	1	—	—	—	800	710	650	670	590	540	880	790	680	820	720	620
	2	—	—	—	730	620	520	610	520	430	800	700	620	730	640	550
	3	—	—	—	550	480	370	460	400	310	640	570	490	570	520	460
K	1	1150	1040	940	900	820	720	—	—	—	1420	1280	1150	1160	1050	940
	2	910	820	760	710	640	590	—	—	—	1130	1010	920	920	830	760
	3	770	680	620	590	530	480	—	—	—	950	840	780	770	690	640
N	1	2520	2240	2060	—	—	—	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
S	1	—	—	—	160	140	110	140	120	100	—	—	—	—	—	—
	2	—	—	—	160	140	110	140	120	100	—	—	—	—	—	—
	3	—	—	—	200	160	110	180	140	100	—	—	—	—	—	—
	4	—	—	—	280	200	140	240	180	120	—	—	—	—	—	—
H	1	600	500	370	470	360	280	—	—	—	550	460	370	—	—	—
	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

■ Recommended Starting Feeds [IPT]

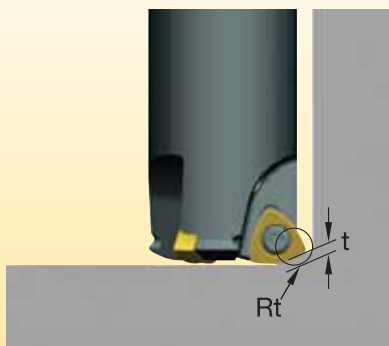
Light Machining	General Purpose	Heavy Machining
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Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.LD..	.027	.070	.121	.019	.049	.081	.017	.042	.068	.016	.040	.063	.015	.039	.062	.LD..
.LN..	.027	.070	.121	.019	.049	.081	.017	.042	.068	.016	.040	.063	.015	.039	.062	.LN..

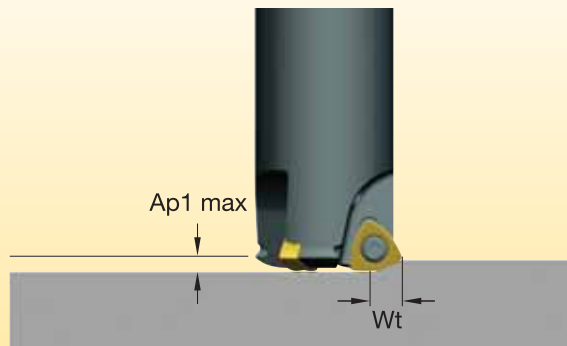
NOTE: Use "Light Machining" values as starting feed rate.

General Programming Information for Applying KenFeed Mini

Rt	Wt	t
.039	.094	.016



For CAM programming, the loads can be programmed as a toroidal tool type by using the Rt value as the insert radius.



Small Ap1 values and higher feed rates generate lower cutting forces versus traditional milling strategies.

Copy Mills



Rodeka™ • The New Round Insert Generation

Primary Application

Kennametal introduces a new and revolutionary double-sided round milling insert capable to run in multiple types of milling operations and workpiece materials, providing the latest double-sided insert technology to boost your productivity with the most efficient cost per edge.

Features and Benefits

Double-sided insert with up to 12 cutting edges for a more productive cutting process.

Screw-On, end mill, and shell mill cutters with internal coolant.

Higher clearance in bodies to permit pocketing, profiling, and 5-axis machining.

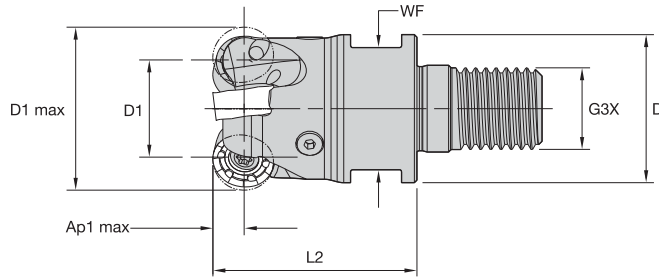
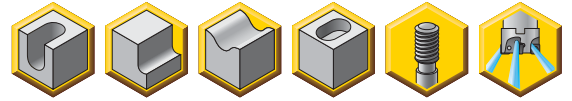
Unique anti-rotation feature for excellent stability with higher feed rates and cutting forces. User-friendly insert rotation.

Three insert and topography styles to cover any type of component and application.



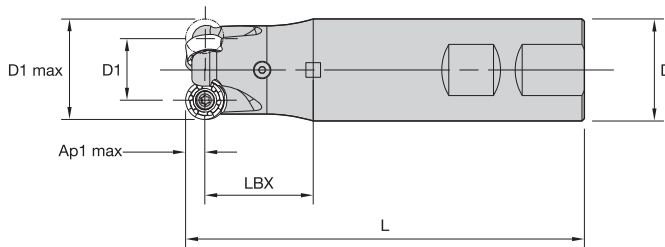
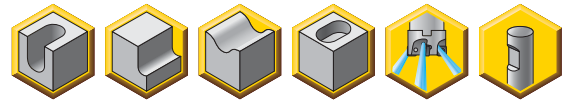
To learn more, *scan here*.
For instructions on how to scan, please see page xxix.

- Double-sided round insert with 12 indexable positions.
- Anti-rotation features enable higher cutting data and extra stability.
- Pocketing and profiling capabilities.



■ Screw-On End Mills

order number	catalog number	D1 max	D1	D	WF	G3X	L2	Ap1 max	Z lbs	max RPM	insert 1
4178114	KDR125R1203M16L150	1.25	.778	1.142	.94	M16	1.50	.117	3 .37	39310	RN_J1204M0_
4178115	KDR150R1203M16L150	1.50	1.028	1.142	.94	M16	1.50	.117	3 .42	35890	RN_J1204M0_
4178116	KDR150R1204M16L150	1.50	1.028	1.142	.94	M16	1.50	.117	4 .42	35890	RN_J1204M0_



■ Weldon End Mills

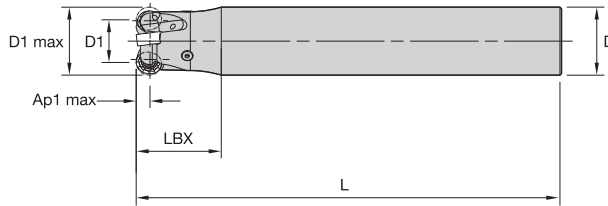
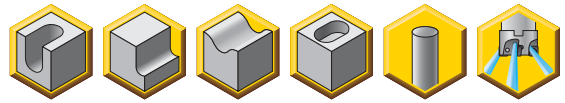
order number	catalog number	D1 max	D1	D	L	LBX	Ap1 max	Z lbs	max RPM	insert 1
4178119	KDR125R1202W100L200	1.25	.778	1.00	4.28	2.00	.117	2 .86	39310	RN_J1204M0_

■ Spare Parts

D1 max	insert screw	in. lbs.	wrench
1.25	193.492	35	170.025
1.50	193.492	35	170.025



- Double-sided round insert with 12 indexable positions.
- Anti-rotation features enable higher cutting data and extra stability.
- Pocketing and profiling capabilities.



■ Cylindrical End Mills

order number	catalog number	D1 max	D1	D	L	LBX	Ap1 max	Z	lbs	max RPM	insert 1
4178120	KDR125R1202C125L900	1.25	.778	1.25	9.00	1.50	.117	2	2.79	39310	RN_J1204M0_
4178121	KDR150R1203C150L900	1.50	1.028	1.50	9.00	1.50	.117	3	4.03	35890	RN_J1204M0_

■ Spare Parts



insert
screw



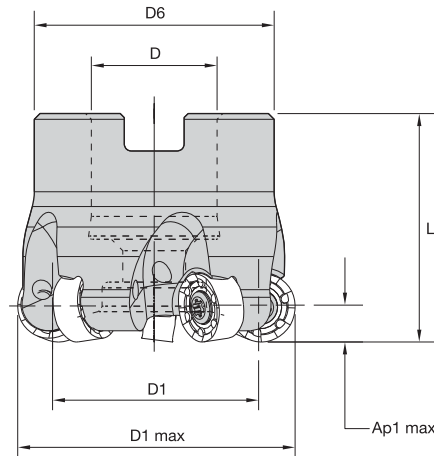
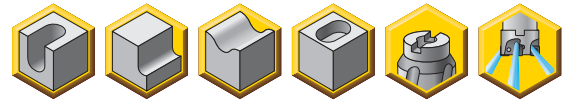
wrench

D1 max	insert screw	in. lbs.	wrench
1.25	193.492	35	170.025
1.50	193.492	35	170.025



Copy Mills

- Double-sided round insert with 12 indexable positions.
- Anti-rotation features enable higher cutting data and extra stability.
- Pocketing and profiling capabilities.



Shell Mills

order number	catalog number	D1 max	D1	D	D6	L	Ap1 max	Z	lbs	max RPM	insert 1
4178122	KDR150R1204S050L157	1.50	1.028	.50	1.300	1.57	.117	4	.40	35890	RN_J1204M0__
4178123	KDR200R1204S075L200	2.00	1.528	.75	1.750	2.00	.117	4	1.01	31080	RN_J1204M0__
4178124	KDR200R1205S075L200	2.00	1.528	.75	1.750	2.00	.117	5	.97	31080	RN_J1204M0__
4178125	KDR250R1207S075L200	2.50	2.028	.75	1.750	2.00	.117	7	1.42	27800	RN_J1204M0__
4178126	KDR300R1208S100L200	3.00	2.528	1.00	2.189	2.00	.117	8	2.01	25370	RN_J1204M0__
4178127	KDR400R1209S150L200	4.00	3.528	1.50	3.380	2.00	.117	9	3.95	21970	RN_J1204M0__

Spare Parts

D1 max	insert screw	in. lbs.	socket-head cap screw	socket-head cap screw with coolant groove	wrench
1.50	193.492	35	S422	S422CG	170.025
2.00	193.492	35	S445	S445CG	170.025
2.50	193.492	35	S445	S445CG	170.025
3.00	193.492	35	S458	S458CG	170.025
4.00	193.492	35	—	—	170.025



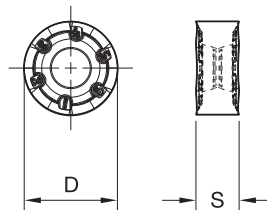
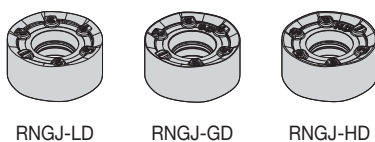
Copy Mills

■ Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	.E..LD	KCPK30	.S..GD	KCPK30	.S..HD	KCPK30
P3-P4	.S..GD	KC522M	.S..HD	KCPM20	.S..HD	KCPK30
P5-P6	.S..GD	KC522M	.S..GD	KCPK30	.S..HD	KCPM20
M1-M2	.E..LD	KC522M	.E..LD	KC522M	.S..GD	KC725M
M3	.E..LD	KC522M	.S..GD	KCPK30	.S..HD	KCPK30
K1-K2	.S..HD	KCK15	.S..HD	KCK15	.S..HD	KCPK30
K3	.S..HD	KCK15	.S..HD	KCK15	.S..HD	KCPK30
N1-N2	.F..LDJ	KC422M	.F..LDJ	KC422M	—	—
N3	.F..LDJ	KC422M	.F..LDJ	KC422M	—	—
S1-S2	.E..LD	KC725M	.S..GD	KC725M	.S..HD	KC725M
S3	.E..LD	KC725M	.S..GD	KC725M	.S..HD	KC725M
S4	.E..LD	KC725M	.E..LD	KC725M	.S..GD	KC725M
H1	.S..GD	KC522M	.S..HD	KCPM20	—	—

Indexable Inserts • RNGJ12....

- -FLDJ geometry is for non-ferrous metals.
- -LD geometry is the first choice for stainless steel and titanium machining at lower cutting forces.
- -GD geometry is for general use in steel and for stainless steel.
- -HD geometry is the first choice for heavy machining high-strength steel and cast iron.



● first choice
○ alternate choice

P	●	○	○	○	○	○
M	●	○	○	○	○	○
K	○	○	○	○	○	○
N	●	○	○	○	○	○
S	○	○	○	○	○	○
H	○	○	○	○	○	○

■ RNGJ-LD

catalog number	D	S	hm	cutting edges	KC422M	KC522M	KC725M	KCK15	KCPM20	KCPK30
RNGJ1204M0ELD	.472	.187	.0015	12	○	●	○	○	○	○
RNGJ1204M0FLDJ	.472	.187	.0015	12	●	○	○	○	○	○

■ RNGJ-GD

catalog number	D	S	hm	cutting edges	KC422M	KC522M	KC725M	KCK15	KCPM20	KCPK30
RNGJ1204M0SGD	.472	.187	.0034	12	○	●	○	○	○	○

■ RNGJ-HD

catalog number	D	S	hm	cutting edges	KC422M	KC522M	KC725M	KCK15	KCPM20	KCPK30
RNGJ1204M0SHD	.472	.187	.007	12	○	○	○	○	○	○

Copy Mills

■ Recommended Starting Speeds [SFM]

Material Group		KC422M	KC522M	KC725M	KCK15	KCPM20	KCPK30
P	1	— — —	1300 1130 1060	1030 900 840	— — —	2170 1910 1760	1780 1560 1450
	2	— — —	1080 950 790	860 760 640	— — —	1340 1210 1090	1100 1000 900
	3	— — —	1000 840 700	790 670 550	— — —	1210 1090 1000	1000 900 820
	4	— — —	890 730 590	710 590 470	— — —	910 840 760	740 690 620
	5	— — —	730 660 590	590 530 470	— — —	1090 980 900	1020 910 830
	6	— — —	650 490 400	520 400 310	— — —	760 660 570	620 540 —
M	1	— — —	800 710 650	670 590 540	— — —	880 790 680	820 720 620
	2	— — —	730 620 520	610 520 430	— — —	800 700 620	730 640 550
	3	— — —	550 480 370	460 400 310	— — —	640 570 490	570 520 460
K	1	— — —	900 820 720	— — —	1660 1510 1340	1420 1280 1150	1160 1050 940
	2	— — —	710 640 590	— — —	1310 1170 1090	1130 1010 920	920 830 760
	3	— — —	590 530 480	— — —	1100 980 900	950 840 780	770 690 640
N	1-2	4220 3720 3440	— — —	— — —	— — —	— — —	— — —
	3	3720 3440 3000	— — —	— — —	— — —	— — —	— — —
S	1	— — —	160 140 110	140 120 100	— — —	— — —	— — —
	2	— — —	160 140 110	140 120 100	— — —	— — —	— — —
	3	— — —	200 160 110	180 140 100	— — —	— — —	— — —
	4	— — —	280 200 140	240 180 120	— — —	— — —	— — —
H	1	— — —	470 360 280	— — —	— — —	550 460 370	— — —

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness value increases, the speed should be decreased.

■ Recommended Starting Feeds [IPT]

Light Machining	General Purpose	Heavy Machining
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At .118 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.F..LDJ	.004	.007	.012	.003	.005	.009	.003	.005	.008	.003	.004	.007	.002	.004	.007	.F..LDJ
.E..LD	.004	.007	.012	.003	.005	.009	.003	.005	.008	.003	.004	.007	.002	.004	.007	.E..LD
.S..GD	.009	.016	.028	.007	.012	.021	.006	.010	.018	.006	.010	.017	.006	.009	.016	.S..GD
.S..HD	.015	.023	.035	.011	.017	.026	.010	.015	.022	.009	.014	.021	.009	.014	.020	.S..HD

At .059 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.F..LDJ	.005	.009	.016	.004	.007	.012	.004	.006	.010	.003	.006	.010	.003	.005	.010	.F..LDJ
.E..LD	.005	.009	.016	.004	.007	.012	.004	.006	.010	.003	.006	.010	.003	.005	.010	.E..LD
.S..GD	.012	.021	.038	.009	.016	.027	.008	.013	.024	.007	.013	.022	.007	.012	.022	.S..GD
.S..HD	.020	.031	.047	.015	.023	.034	.013	.020	.029	.012	.018	.027	.012	.018	.027	.S..HD

At .030 Axial Depth of Cut (ap)

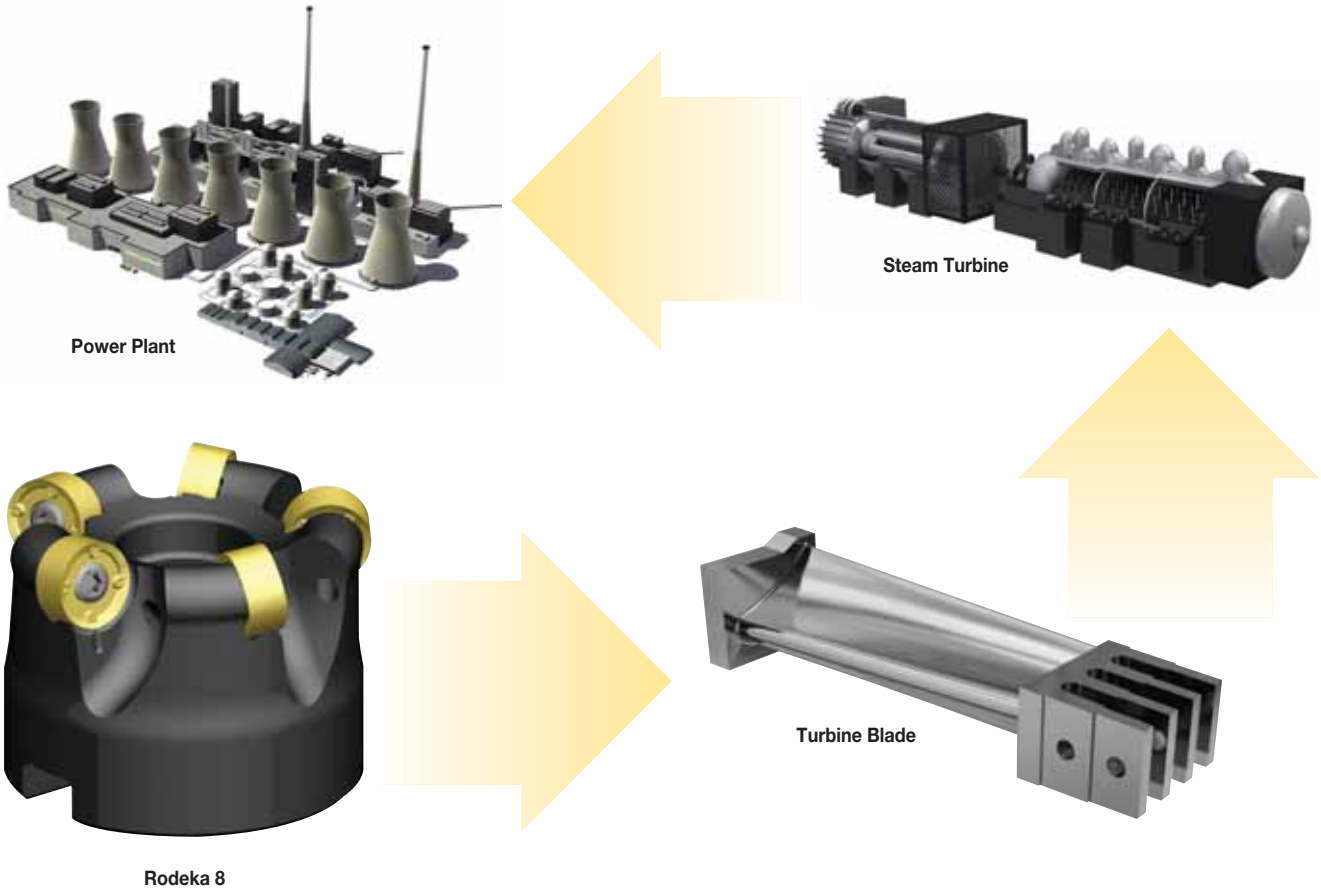
Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.F..LDJ	.007	.013	.022	.005	.009	.016	.005	.008	.014	.004	.008	.013	.004	.007	.013	.F..LDJ
.E..LD	.007	.013	.022	.005	.009	.016	.005	.008	.014	.004	.008	.013	.004	.007	.013	.E..LD
.S..GD	.017	.029	.052	.012	.021	.038	.011	.018	.032	.010	.017	.030	.010	.017	.029	.S..GD
.S..HD	.028	.043	.066	.021	.031	.047	.018	.027	.040	.017	.025	.037	.016	.024	.037	.S..HD

NOTE: Use "Light Machining" values as starting feed rate.

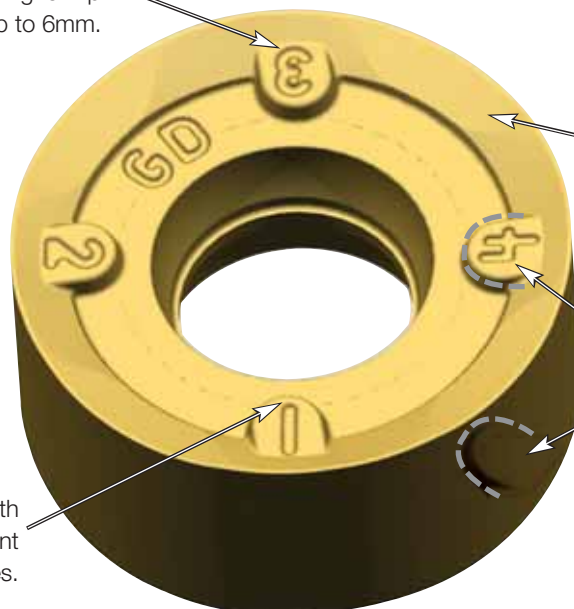
Copy Mills

Rodeka 8 Turbine Blade Version

Revolutionary double-sided round insert engineered for turbine blade machining. Special geometries, insert styles, and dedicated cutter bodies have been developed to serve this demanding application.



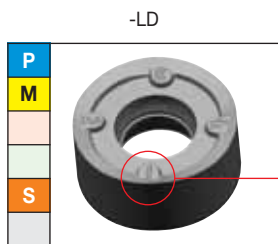
Four indexes per side, in total eight cutting edges. With higher A_p capabilities, up to 6mm.



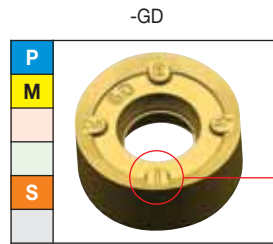
Specific high positive geometries with improved chip forming and higher tool life.

Insert location twisted by 45° between top and bottom side for equal performance over all eight cutting edges.

Unique anti-rotation feature with higher contact area for excellent stability, allowing higher feed rates.



Light/Medium Machining
 First choice for stainless steel
 and titanium machining.



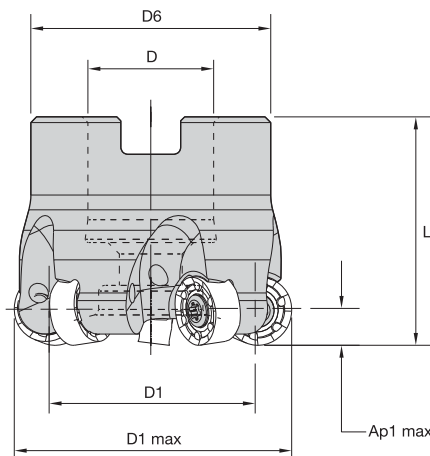
Medium/Heavy Machining
 First choice for medium/heavy
 operations. Forged blades
 or "bad skin".

● first choice
 ○ alternate choice

P	●	●	●
M	●	●	●
K			
N			
S	●	●	○
H			
		KC522M	KC725M
		●	●
			KCMP30
		●	●
			●

Indexable Inserts

catalog number	KC522M	KC725M	KCMP30
RNGJ1204M0ENLDJX	●	●	
RNGJ1204M0ENLDX		●	●
RNGJ1204M0SNGDJX	●	●	
RNGJ1204M0SNGDX			●



Shell Mills

MM#	catalog number	D1 max	D1	D	D6	L	Ap1 max	Z
5104420	KDR40Z04S16RN12X	40	28	16	38	40	6	4
5104421	KDR50Z05S22RN12X	50	38	22	42	40	6	5
5104422	KDR50Z05S22RN12XL	50	38	22	49	40	6	5
5104423	KDR52Z05S22RN12X	52	40	22	42	40	6	5
5104424	KDR63Z06S22RN12X	63	51	22	49	40	6	6
5104425	KDR66Z06S27RN12X	66	54	27	60	40	6	6
5104426	KDR80Z07S27RN12X	80	68	27	60	50	6	7

KDM • Strong, Flexible, and Highly Accurate

Primary Application

Roughing and finishing milling operations on complex parts. First choice for die and mold industry up to 55 HRC.

Features and Benefits

Platform Features

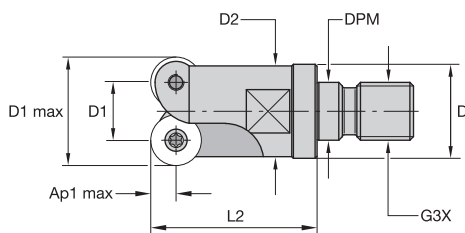
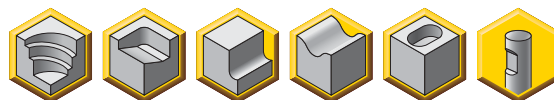
- Big draft clearance angle to improve the pocketing operations performance.
- Big clearance area in the bottom, superior ramping, and helical values.
- High accuracy and tight runout.

Value Proposition

- Real HSM capabilities: more teeth and close accuracy.
- Strongest and most rigid design for roughing operations.
- Addressed to the die and mold and general engineering markets, mainly.
- PSTS and ground inserts are offered through different inserts sizes.
- Shell mill, Weldon® and straight shank, and Screw-On body cutters.
- Multiple grades available; wide range of workpieces and applications.



- Engineered for maximum performance.
- High runout accuracy.
- Suitable for die and mold manufacturing.



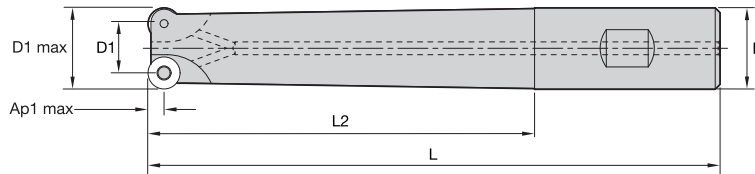
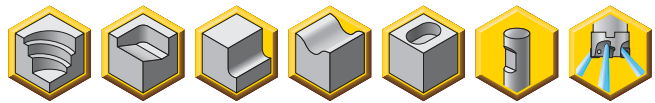
■ **Screw-On End Mills • RD.X07 Inserts**

order number	catalog number	D1 max	D1	D	D2	DPM	G3X	L2	Ap1 max	Z	max ramp angle	lbs	insert 1
2511327	KDM050RD0702M08075	.500	.224	.512	.453	.335	M8	1.102	.138	2	10.0°	.08	RD.X07T1..
2511345	KDM063RD0702M08100	.625	.349	.512	.559	.335	M8	1.000	.138	2	7.0°	.08	RD.X0702..
2511346	KDM063RD0703M08100	.625	.349	.512	.559	.335	M8	1.000	.138	3	7.0°	.08	RD.X0702..
2511347	KDM075RD0703M10118	.750	.474	.709	.740	.413	M10	1.180	.138	4	6.0°	.15	RD.X0702..
2511348	KDM100RD0703M12138	1.000	.724	.827	.929	.492	M12	1.380	.138	3	5.0°	.27	RD.X0702..
2511349	KDM100RD0705M12138	1.000	.724	.827	.929	.492	M12	1.380	.138	5	5.0°	.26	RD.X0702..

■ **Spare Parts**

D1 max	insert screw	in. lbs.	Torx wrench
.500	193.364	10	FT7
.625	193.341	10	FT7
.750	193.341	10	FT7
1.000	193.341	10	FT7

- Engineered for maximum performance.
- High runout accuracy.
- Suitable for die and mold manufacturing.



■ End Mills with Weldon® Shank • RD.X07 Inserts

order number	catalog number	D1 max	D1	D	L	L2	Ap1 max	Z	max ramp angle	lbs	insert 1
2251715	KDM050RD07W200	.500	.224	.625	3.970	2.000	.138	1	10.0°	.26	RD.X07.
2251716	KDM063RD07W200	.625	.349	.625	3.970	2.000	.138	2	7.0°	.31	RD.X07.
2251717	KDM075RD07W200	.750	.474	.750	4.050	2.000	.138	3	6.0°	.44	RD.X07.
2251718	KDM075RD07W400	.750	.474	1.000	6.280	4.000	.138	3	4.0°	.90	RD.X07.
2251719	KDM100RD07W200	1.000	.724	1.000	4.280	2.000	.138	4	5.0°	.79	RD.X07.
2251720	KDM100RD07W400	1.000	.724	1.000	6.280	4.000	.138	4	3.0°	1.25	RD.X07.

■ Spare Parts



insert screw



Torx wrench

D1 max	insert screw	in. lbs.	Torx wrench
.500	193.364	10	FT7
.625	193.364	10	FT7
.750	193.364	10	FT7
1.000	193.364	10	FT7

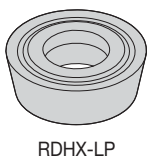


Copy Mills

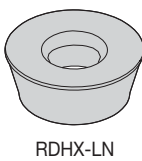
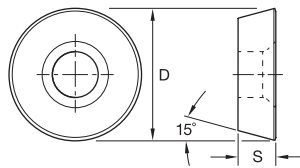
Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	.F..LP	KC522M	.F..LP	KC725M	.S..LN	KC725M
P3-P4	.S..LN	KCPM20	.S..LN	KC522M	.S..LN	KC725M
P5-P6	.S..LN	KC522M	.S..LN	KCPM20	.S..LN	KCPM20
M1-M2	.F..LP	KC522M	.F..LP	KC725M	—	—
M3	.F..LP	KC725M	—	—	—	—
K1-K2	.F..LP	KC510M	.S..LN	KC510M	.S..LN	KC510M
K3	.S..LN	KC510M	.S..LN	KC510M	.S..LN	KC510M
N1-N2	.F..LP	KC510M	.F..LP	KC510M	.F..LP	KC510M
N3	.F..LP	KC510M	.F..LP	KC510M	.F..LP	KC510M
S1-S2	.F..LP	KC522M	.F..LP	KC725M	—	—
S3	.F..LP	KC725M	—	—	—	—
S4	.F..LP	KC725M	—	—	—	—
H1	.S..LN	KC510M	.S..LN	KC510M	.S..LN	KCPM20

Indexable Inserts • RD.X07...



RDHX-LP


 RDHX-LN
RDPX-LN


P	●	○	○	○	○
M	●	○	○	○	○
K	●	○	○	○	○
N	○	○	○	○	○
S	●	○	○	○	○
H	●	○	○	○	○

● first choice
○ alternate choice

RDHX-LP

catalog number	D	S	hm	KC510M	KC522M	KC725M	KCPM20	KTPK20
RDHX0702M0FLP	.276	.094	.001	●	●	●	○	○

RDHX-LN

catalog number	D	S	hm	KC510M	KC522M	KC725M	KCPM20	KTPK20
RDHX07T1M0SLN	.276	.078	.002	●	○	○	○	○
RDHX0702M0SLN	.276	.094	.003	●	●	●	○	○
RDHX0702M0TLN	.276	.094	.003	○	○	○	○	●

RDPX-LN

catalog number	D	S	hm	KC510M	KC522M	KC725M	KCPM20	KTPK20
RDPX0702M0SLN	.275	.094	.002	○	○	○	●	○



■ Recommended Starting Speeds [SFM]

Material Group		KC510M			KC522M			KC725M			KCPM20			KTPK20		
P	1	—	—	—	1300	1130	1060	1030	900	840	2170	1910	1760	1440	1180	1010
	2	—	—	—	1080	950	790	860	760	640	1340	1210	1090	890	740	620
	3	—	—	—	1000	840	700	790	670	550	1210	1090	1000	800	670	560
	4	960	780	660	890	730	590	710	590	470	910	840	760	600	520	430
	5	—	—	—	730	660	590	590	530	470	1090	980	900	830	680	580
	6	—	—	—	650	490	400	520	400	310	760	660	570	500	410	—
M	1	—	—	—	800	710	650	670	590	540	880	790	680	940	770	650
	2	—	—	—	730	620	520	610	520	430	800	700	620	850	720	600
	3	—	—	—	550	480	370	460	400	310	640	570	490	640	530	—
K	1	1150	1040	940	900	820	720	—	—	—	1420	1280	1150	910	770	640
	2	910	820	760	710	640	590	—	—	—	1130	1010	920	720	590	520
	3	770	680	620	590	530	480	—	—	—	950	840	780	600	500	420
N	1-2	2520	2240	2060	—	—	—	—	—	—	—	—	—	—	—	—
	3	2280	2100	1920	—	—	—	—	—	—	—	—	—	—	—	—
S	1	—	—	—	160	140	110	140	120	100	—	—	—	—	—	—
	2	—	—	—	160	140	110	140	120	100	—	—	—	—	—	—
	3	—	—	—	200	160	110	180	140	100	—	—	—	—	—	—
	4	—	—	—	280	200	140	240	180	120	—	—	—	—	—	—
H	1	630	510	360	470	360	280	—	—	—	550	460	370	—	—	—

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

■ Recommended Starting Feeds [IPT]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

At .138 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.F..LP	.003	.005	.014	.003	.004	.010	.002	.003	.009	.002	.003	.008	.002	.003	.008	.F..LP
.S..LN	.006	.016	.028	.004	.012	.020	.004	.010	.018	.003	.010	.016	.003	.010	.016	.S..LN
.T..LN	.007	.017	.028	.005	.013	.020	.004	.011	.018	.004	.010	.016	.004	.010	.016	.T..LN

At .069 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.F..LP	.004	.006	.016	.003	.005	.012	.003	.004	.010	.002	.004	.009	.002	.004	.009	.F..LP
.S..LN	.007	.019	.032	.005	.014	.023	.004	.012	.020	.004	.011	.019	.004	.011	.018	.S..LN
.T..LN	.008	.020	.032	.006	.015	.023	.005	.013	.020	.005	.012	.019	.005	.012	.018	.T..LN

At .034 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.F..LP	.005	.008	.021	.004	.006	.015	.003	.005	.013	.003	.005	.012	.003	.005	.012	.F..LP
.S..LN	.009	.025	.042	.006	.018	.031	.006	.016	.027	.005	.015	.025	.005	.015	.024	.S..LN
.T..LN	.010	.026	.042	.008	.019	.031	.007	.017	.027	.006	.015	.025	.006	.015	.024	.T..LN

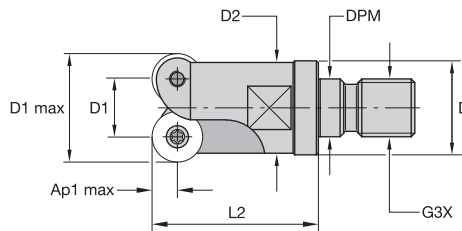
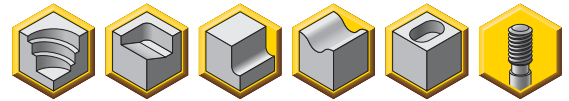
At .017 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.F..LP	.007	.011	.028	.005	.008	.021	.005	.007	.018	.004	.007	.017	.004	.007	.017	.F..LP
.S..LN	.012	.034	.059	.009	.025	.042	.008	.022	.036	.007	.020	.034	.007	.020	.033	.S..LN
.T..LN	.014	.036	.059	.010	.026	.042	.009	.023	.036	.008	.021	.034	.008	.021	.033	.T..LN

NOTE: Use "Light Machining" values as starting feed rate.

Copy Mills

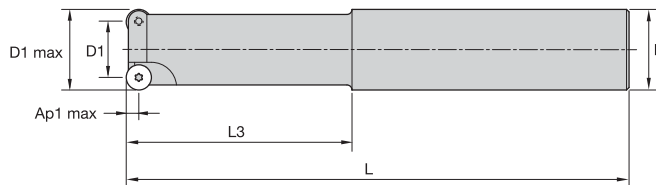
- Engineered for maximum performance.
- High runout accuracy.
- Suitable for die and mold manufacturing.



■ Screw-On End Mills • RD.X10 Inserts

order number	catalog number	D1 max	D1	D	D2	DPM	G3X	L2	Ap1 max	Z	max ramp angle	lbs	insert 1
2511350	KDM075RD1002M10118	.750	.356	.709	.768	.413	M10	1.180	.197	2	10.0°	1.59	RD.X1003M0S
2511351	KDM100RD1002M12138	1.000	.606	.827	.937	.492	M12	1.375	.197	2	6.0°	.26	RD.X1003M0S
2511352	KDM100RD1003M12138	1.000	.606	.827	.937	.492	M12	1.375	.197	3	6.0°	.25	RD.X1003M0S
2511463	KDM150RD1004M16169	1.500	1.106	1.142	1.319	.669	M16X2.0	1.690	.197	4	4.0°	.63	RD.X1003M0S

- Suitable for die and mold manufacturing.



■ End Mills with Weldon® Shank • RD.X10 Inserts

order number	catalog number	D1 max	D1	D	L	L3	Ap1 max	Z	max ramp angle	lbs	insert 1
2251721	KDM075RD10W275	.750	.356	.750	4.480	2.750	.197	2	10.0°	.53	RD.X10.
2251722	KDM075RD10W475	.750	.356	1.000	7.030	4.750	.197	2	10.0°	1.17	RD.X10.
2251753	KDM100RD10W300	1.000	.606	1.000	5.280	2.750	.197	2	6.0°	1.06	RD.X10.
2251754	KDM100RD10W475	1.000	.606	1.000	7.030	4.750	.197	2	6.0°	1.39	RD.X10.
2251755	KDM125RD10W275	1.250	.856	1.250	5.030	2.750	.197	3	4.0°	1.56	RD.X10.
2251756	KDM125RD10W475	1.250	.856	1.250	7.030	4.750	.197	3	4.0°	2.20	RD.X10.

■ Spare Parts



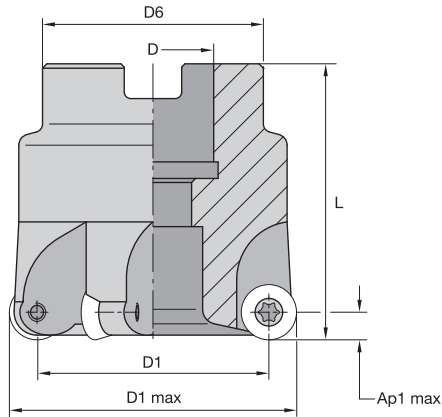
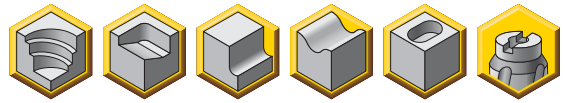
insert screw



Torx wrench

D1 max	insert screw	in. lbs.	Torx wrench
.750	193.342	30	FT15
1.000	193.342	30	FT15
1.250	193.342	30	FT15
1.500	193.342	30	FT15

- Engineered for maximum performance.
- High runout accuracy.
- Suitable for die and mold manufacturing.



■ Shell Mills • RD.X10 Inserts

order number	catalog number	D1 max	D1	D	D6	L	Ap1 max	Z	max ramp angle	lbs	insert 1
2251762	KDM150RD10S050F	1.500	1.106	.500	1.360	1.500	.197	5	4.0°	.66	RD..1003..
2251763	KDM200RD10S075F	2.000	1.606	.750	1.650	1.970	.197	7	4.0°	.99	RD..1003..

■ Spare Parts

D1 max	insert screw	in. lbs.	Torx wrench	socket-head cap screw
1.500	193.342	30	FT15	S424
2.000	193.342	30	FT15	S445



Copy Mills

Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	.F..LP	KC725M	.S..HP	KC725M	.S..HP	KC725M
P3-P4	.S..HP	KC522M	.S..HP	KCPK30	.S..HP	KCPK30
P5-P6	.S..HP	KC522M	.S..HP	KCPM20	.S..HN	KCPM20
M1-M2	.F..LP	KC725M	.S..HP	KC725M	—	—
M3	.S..HP	KC522M	.S..HP	KC725M	—	—
K1-K2	.S..GN	KC510M	.S..HP	KCPK30	.S..HP	KCPK30
K3	.S..GN	KC510M	.S..HP	KCPK30	.S..HP	KCPK30
N1-N2	.F..LP	K110M	.F..LP	K110M	.F..LP	KC510M
N3	.F..LP	K110M	.F..LP	KC510M	.F..LP	KC510M
S1-S2	—	—	.S..HP	KC725M	—	—
S3	—	—	.S..HP	KC725M	—	—
S4	—	—	.S..HP	KC725M	—	—
H1	.S..HN	KC510M	.S..HN	KC510M	.S..HN	KCPM20

Indexable Inserts • RD.X10...



● first choice
○ alternate choice

P	●	○	○	○	○	○	○	○	○	○
M	○	○	○	○	○	○	○	○	○	○
K	○	○	○	○	○	○	○	○	○	○
N	○	○	○	○	○	○	○	○	○	○
S	○	○	○	○	○	○	○	○	○	○
H	○	○	○	○	○	○	○	○	○	○

RDHX-FLP

catalog number	D	S	hm	K110M	KC510M	KC522M	KC725M	KCPM20	KCPK30	KTPK20
RDHX1003M0FLP	.394	.125	.001	●	●	●	●	○	○	○

RDHX-GN

catalog number	D	S	hm	K110M	KC510M	KC522M	KC725M	KCPM20	KCPK30	KTPK20
RDHX1003M0SGN	.394	.125	.003	○	○	○	○	○	○	○
RDHX1003M0TGN	.394	.125	.004	○	○	○	○	○	○	●

RDPX-HP

catalog number	D	S	hm	K110M	KC510M	KC522M	KC725M	KCPM20	KCPK30	KTPK20
RDPX1003M0SHP	.394	.125	.004	○	○	○	○	○	○	○

RDPX-HN

catalog number	D	S	hm	K110M	KC510M	KC522M	KC725M	KCPM20	KCPK30	KTPK20
RDPX1003M0SHN	.394	.125	.005	○	○	○	○	○	○	○

Copy Mills

■ Recommended Starting Speeds [SFM]

Material Group		KC110M			KC510M			KC522M			KC725M		
P	1	—	—	—	—	—	—	1300	1130	1060	1030	900	840
	2	—	—	—	—	—	—	1080	950	790	860	760	640
	3	—	—	—	—	—	—	1000	840	700	790	670	550
	4	—	—	—	960	780	660	890	730	590	710	590	470
	5	—	—	—	—	—	—	730	660	590	590	530	470
	6	—	—	—	—	—	—	650	490	400	520	400	310
M	1	—	—	—	—	—	—	800	710	650	670	590	540
	2	—	—	—	—	—	—	730	620	520	610	520	430
	3	—	—	—	—	—	—	550	480	370	460	400	310
K	1	510	480	450	1150	1040	940	900	820	720	—	—	—
	2	450	420	390	910	820	760	710	640	590	—	—	—
	3	400	350	310	770	680	620	590	530	480	—	—	—
N	1-2	1980	1860	1770	2520	2240	2060	—	—	—	—	—	—
	3	1620	1440	1260	—	—	—	—	—	—	—	—	—
S	1	—	—	—	—	—	—	160	140	110	140	120	100
	2	—	—	—	—	—	—	160	140	110	140	120	100
	3	—	—	—	—	—	—	200	160	110	180	140	100
	4	—	—	—	—	—	—	280	200	140	240	180	120
H	1	—	—	—	630	510	360	470	360	280	—	—	—

Material Group		KCPM20			KCPK30			KTPK20		
P	1	2170	1910	1760	1780	1560	1450	1440	1180	1010
	2	1340	1210	1090	1100	1000	900	890	740	620
	3	1210	1090	1000	1000	900	820	800	670	560
	4	910	840	760	740	690	620	600	520	430
	5	1090	980	900	1020	910	830	830	680	580
	6	760	660	570	620	540	—	500	410	—
M	1	880	790	680	820	720	620	940	770	650
	2	800	700	620	730	640	550	850	720	600
	3	640	570	490	570	520	460	640	530	—
K	1	1420	1280	1150	1160	1050	940	910	770	640
	2	1130	1010	920	920	830	760	720	590	520
	3	950	840	780	770	690	640	600	500	420
N	1-2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
S	1	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—	—	—
H	1	550	460	370	—	—	—	—	—	—

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.



Copy Mills

■ Recommended Starting Feeds [IPT]

Light Machining	General Purpose	Heavy Machining
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At .197 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.F..LP	.003	.007	.014	.003	.005	.010	.002	.004	.009	.002	.004	.008	.002	.004	.008	.F..LP
.S..GN	.007	.016	.028	.005	.012	.020	.004	.010	.018	.004	.009	.016	.004	.009	.016	.S..GN
.T..GN	.007	.017	.028	.005	.013	.020	.004	.011	.018	.004	.010	.016	.004	.010	.016	.T..GN
.S..HP	.007	.017	.028	.005	.013	.020	.004	.011	.018	.004	.010	.016	.004	.010	.016	.S..HP
.S..HN	.007	.017	.028	.005	.013	.020	.004	.011	.018	.004	.010	.016	.004	.010	.016	.S..HN

At .098 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.F..LP	.004	.008	.016	.003	.006	.012	.003	.005	.010	.002	.005	.009	.002	.005	.009	.F..LP
.F..GN	.004	.008	.016	.003	.006	.012	.003	.005	.010	.002	.005	.009	.002	.005	.009	.F..GN
.T..GN	.008	.020	.032	.006	.015	.023	.005	.013	.020	.005	.012	.019	.005	.012	.018	.T..GN
.S..GN	.008	.020	.032	.006	.015	.023	.005	.013	.020	.005	.012	.019	.005	.012	.018	.S..GN
.S..HP	.008	.020	.032	.006	.015	.023	.005	.013	.020	.005	.012	.019	.005	.012	.018	.S..HP

At .049 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.F..LP	.005	.010	.021	.004	.008	.015	.003	.007	.013	.003	.006	.012	.003	.006	.012	.F..LP
.S..GN	.010	.024	.042	.008	.018	.031	.007	.015	.027	.006	.014	.025	.006	.014	.024	.S..GN
.T..GN	.010	.026	.042	.008	.019	.031	.007	.017	.027	.006	.015	.025	.006	.015	.024	.T..GN
.S..HP	.010	.026	.042	.008	.019	.031	.007	.017	.027	.006	.015	.025	.006	.015	.024	.S..HP
.S..HN	.010	.026	.042	.008	.019	.031	.007	.017	.027	.006	.015	.025	.006	.015	.024	.S..HN

At .025 Axial Depth of Cut (ap)

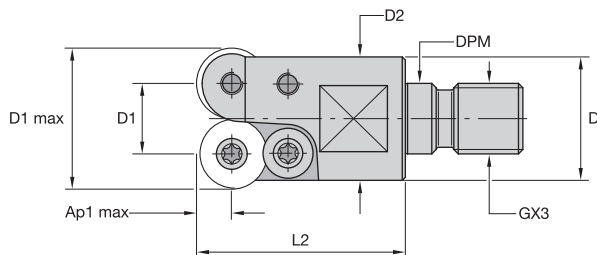
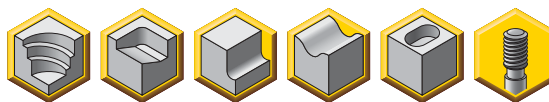
Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.F..LP	.007	.014	.028	.005	.010	.021	.005	.009	.018	.004	.008	.017	.004	.008	.017	.F..LP
.S..GN	.014	.033	.059	.010	.024	.042	.009	.021	.036	.008	.020	.034	.008	.019	.033	.S..GN
.T..GN	.014	.036	.059	.010	.026	.042	.009	.023	.036	.008	.021	.034	.008	.021	.033	.T..GN
.S..HP	.014	.036	.059	.010	.026	.042	.009	.023	.036	.008	.021	.034	.008	.021	.033	.S..HP
.S..HN	.014	.036	.059	.010	.026	.042	.009	.023	.036	.008	.021	.034	.008	.021	.033	.S..HN

NOTE: Use "Light Machining" values as starting feed rate.



Copy Mills

- Engineered for maximum performance.
- High runout accuracy.
- Suitable for die and mold manufacturing.



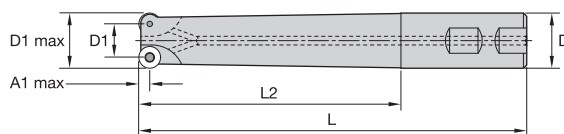
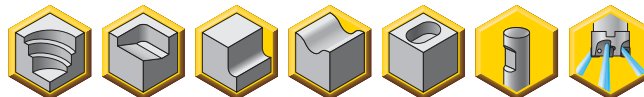
■ Screw-On End Mills • RD.X12 Inserts

order number	catalog number	D1 max	D1	D	D2	DPM	G3X	L2	Ap1 max	Z	max ramp angle	lbs	insert 1
2511464	KDM100RD1202M12138	1.000	.528	.827	.906	.492	M12	1.375	.236	2	10.0°	.24	RD.X12T3..
2511465	KDM125RD1203M16169	1.250	.778	1.142	1.327	.669	M16	1.690	.236	3	8.0°	.49	RD.X12T3..
2511466	KDM150RD1204M16169	1.500	1.028	1.142	1.591	.669	M16	1.690	.236	4	7.0°	.60	RD.X12T3..

■ Spare Parts

D1 max	insert screw	in. lbs.	Torx wrench	clamp screw
1.000	193.342	30	FT15	193.338
1.250	193.342	30	FT15	193.338
1.500	193.342	30	FT15	193.338

- Suitable for die and mold manufacturing.



■ End Mills with Weldon® Shank • RD.X12 Inserts

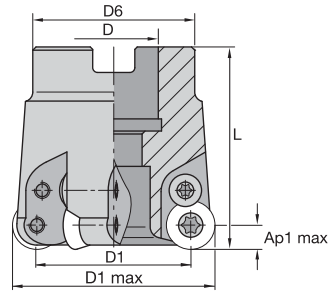
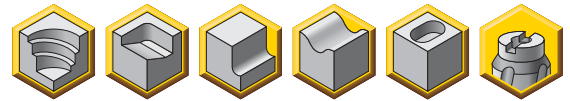
order number	catalog number	D1 max	D1	D	L	L2	Ap1 max	Z	max ramp angle	lbs	insert 1
2251757	KDM100RD12W275	1.000	.528	1.250	5.030	2.750	.236	2	10.0°	.99	RD.X12T3..
2251758	KDM100RD12W475	1.000	.528	1.250	7.030	4.750	.236	2	10.0°	1.65	RD.X12T3..
2251759	KDM125RD12W375	1.250	.778	1.250	6.030	3.750	.236	3	8.0°	1.87	RD.X12T3..
2251760	KDM150RD12W275	1.500	1.028	1.500	5.510	2.750	.236	3	7.0°	2.42	RD.X12T3..
2251761	KDM150RD12W475	1.500	1.028	1.500	7.506	4.750	.236	3	7.0°	3.31	RD.X12T3..

■ Spare Parts

D1 max	insert screw	in. lbs.	Torx wrench
1.000	193.342	30	FT15
1.250	193.342	30	FT15
1.500	193.342	30	FT15

Copy Mills

- Engineered for maximum performance.
- High runout accuracy.
- Suitable for die and mold manufacturing.



■ Shell Mills • RD.X12 Inserts

order number	catalog number	D1 max	D1	D	D6	L	Ap1 max	Z	max ramp angle	lbs	insert 1
2251774	KDM200RD12S075C	2.000	1.528	.750	1.650	1.970	.236	3	5.0°	.99	RD.X12T3..
2251764	KDM200RD12S075F	2.000	1.528	.750	1.650	1.970	.236	5	5.0°	.99	RD.X12T3..
2251765	KDM250RD12S100F	2.500	2.028	1.000	2.070	1.970	.236	6	4.0°	1.39	RD.X12T3..
2251766	KDM300RD12S100C	3.000	2.528	1.000	2.070	1.970	.236	5	3.0°	2.20	RD.X12T3..
2251775	KDM300RD12S100F	3.000	2.528	1.000	2.070	1.970	.236	7	3.0°	2.20	RD.X12T3..
2251767	KDM400RD12S125C	4.000	3.528	1.250	2.750	1.970	.236	5	1.5°	3.75	RD.X12T3..
2251776	KDM400RD12S125F	4.000	3.528	1.250	2.750	1.970	.236	8	1.5°	3.75	RD.X12T3..

■ Spare Parts



D1 max	insert screw	in. lbs.	Torx wrench	clamp screw	socket-head cap screw
2.000	193.342	30	FT15	193.338	S445
2.500	193.342	30	FT15	193.338	S458
3.000	193.342	30	FT15	193.338	—
4.000	193.342	30	FT15	193.338	—

■ Recommended Starting Speeds [SFM]

Material Group		KC110M			KC510M			KC522M			KC525M		
P	1	—	—	—	—	—	—	1300	1130	1060	860	790	710
	2	—	—	—	—	—	—	1080	950	790	710	620	590
	3	—	—	—	—	—	—	1000	840	700	620	590	550
	4	—	—	—	960	780	660	890	730	590	550	520	470
	5	—	—	—	—	—	—	730	660	590	590	550	520
	6	—	—	—	—	—	—	650	490	400	520	470	430
M	1	—	—	—	—	—	—	800	710	650	590	550	520
	2	—	—	—	—	—	—	730	620	520	520	470	430
	3	—	—	—	—	—	—	550	480	370	360	310	280
K	1	510	480	450	1150	1040	940	900	820	720	—	—	—
	2	450	420	390	910	820	760	710	640	590	—	—	—
	3	400	350	310	770	680	620	590	530	480	—	—	—
N	1-2	1980	1860	1770	2520	2240	2060	—	—	—	—	—	—
	3	1620	1440	1260	—	—	—	—	—	—	—	—	—
S	1	—	—	—	—	—	—	160	140	110	240	220	190
	2	—	—	—	—	—	—	160	140	110	240	220	190
	3	—	—	—	—	—	—	200	160	110	190	180	160
	4	—	—	—	—	—	—	280	200	140	240	190	160
H	1	—	—	—	630	510	360	470	360	280	—	—	—

Material Group		KC725M			KCPM20			KCPK30			KTPK20		
P	1	1030	900	840	2170	1910	1760	1780	1560	1450	1440	1180	1010
	2	860	760	640	1340	1210	1090	1100	1000	900	890	740	620
	3	790	670	550	1210	1090	1000	1000	900	820	800	670	560
	4	710	590	470	910	840	760	740	690	620	600	520	430
	5	590	530	470	1090	980	900	1020	910	830	830	680	580
	6	520	400	310	760	660	570	620	540	—	500	410	—
M	1	670	590	540	880	790	680	820	720	620	940	770	650
	2	610	520	430	800	700	620	730	640	550	850	720	600
	3	460	400	310	640	570	490	570	520	460	640	530	—
K	1	—	—	—	1420	1280	1150	1160	1050	940	910	770	640
	2	—	—	—	1130	1010	920	920	830	760	720	590	520
	3	—	—	—	950	840	780	770	690	640	600	500	420
N	1-2	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—
S	1	140	120	100	—	—	—	—	—	—	—	—	—
	2	140	120	100	—	—	—	—	—	—	—	—	—
	3	180	140	100	—	—	—	—	—	—	—	—	—
	4	240	180	120	—	—	—	—	—	—	—	—	—
H	1	—	—	—	550	460	370	—	—	—	—	—	—

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.



Copy Mills

■ Recommended Starting Feeds [IPT]

Light Machining	General Purpose	Heavy Machining
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At .236 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.F..LP	.003	.007	.014	.003	.005	.010	.002	.004	.009	.002	.004	.008	.002	.004	.008	.F..LP
.F..GN	.003	.007	.014	.003	.005	.010	.002	.004	.009	.002	.004	.008	.002	.004	.008	.F..GN
.T..GN	.007	.017	.028	.005	.013	.020	.004	.011	.018	.004	.010	.016	.004	.010	.016	.T..GN
.S..GN	.007	.017	.028	.005	.013	.020	.004	.011	.018	.004	.010	.016	.004	.010	.016	.S..GN
.S..HP	.007	.017	.028	.005	.013	.020	.004	.011	.018	.004	.010	.016	.004	.010	.016	.S..HP
.S..HN	.007	.017	.028	.005	.013	.020	.004	.011	.018	.004	.010	.016	.004	.010	.016	.S..HN

At .118 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.F..LP	.004	.008	.016	.003	.006	.012	.003	.005	.010	.002	.005	.009	.002	.005	.009	.F..LP
.F..GN	.004	.008	.016	.003	.006	.012	.003	.005	.010	.002	.005	.009	.002	.005	.009	.F..GN
.T..GN	.008	.020	.032	.006	.015	.023	.005	.013	.020	.005	.012	.019	.005	.012	.018	.T..GN
.S..GN	.008	.020	.032	.006	.015	.023	.005	.013	.020	.005	.012	.019	.005	.012	.018	.S..GN
.S..HP	.008	.020	.032	.006	.015	.023	.005	.013	.020	.005	.012	.019	.005	.012	.018	.S..HP
.S..HN	.008	.020	.032	.006	.015	.023	.005	.013	.020	.005	.012	.019	.005	.012	.018	.S..HN

At .059 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.F..LP	.005	.010	.021	.004	.008	.015	.003	.007	.013	.003	.006	.012	.003	.006	.012	.F..LP
.F..GN	.005	.010	.021	.004	.008	.015	.003	.007	.013	.003	.006	.012	.003	.006	.012	.F..GN
.T..GN	.010	.026	.042	.008	.019	.031	.007	.017	.027	.006	.015	.025	.006	.015	.024	.T..GN
.S..GN	.010	.026	.042	.008	.019	.031	.007	.017	.027	.006	.015	.025	.006	.015	.024	.S..GN
.S..HP	.010	.026	.042	.008	.019	.031	.007	.017	.027	.006	.015	.025	.006	.015	.024	.S..HP
.S..HN	.010	.026	.042	.008	.019	.031	.007	.017	.027	.006	.015	.025	.006	.015	.024	.S..HN

At .030 Axial Depth of Cut (ap)

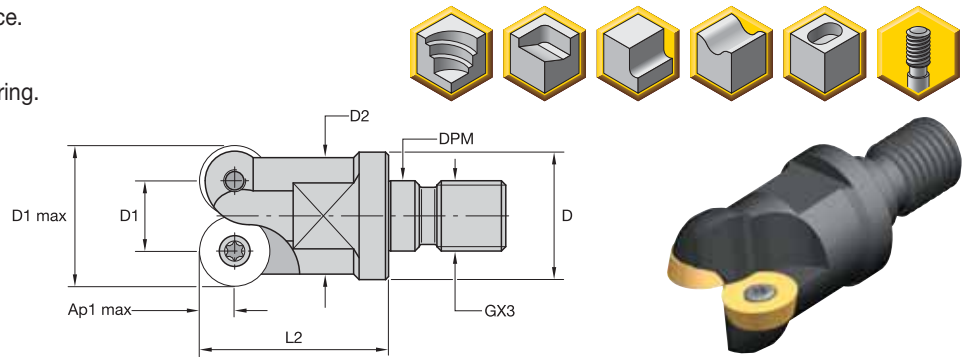
Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.F..LP	.007	.014	.028	.005	.010	.021	.005	.009	.018	.004	.008	.017	.004	.008	.017	.F..LP
.F..GN	.007	.014	.028	.005	.010	.021	.005	.009	.018	.004	.008	.017	.004	.008	.017	.F..GN
.T..GN	.014	.036	.059	.010	.026	.042	.009	.023	.036	.008	.021	.034	.008	.021	.033	.T..GN
.S..GN	.014	.036	.059	.010	.026	.042	.009	.023	.036	.008	.021	.034	.008	.021	.033	.S..GN
.S..HP	.014	.036	.059	.010	.026	.042	.009	.023	.036	.008	.021	.034	.008	.021	.033	.S..HP
.S..HN	.014	.036	.059	.010	.026	.042	.009	.023	.036	.008	.021	.034	.008	.021	.033	.S..HN

NOTE: Use "Light Machining" values as starting feed rate.



Copy Mills

- Engineered for maximum performance.
- High runout accuracy.
- Suitable for die and mold manufacturing.

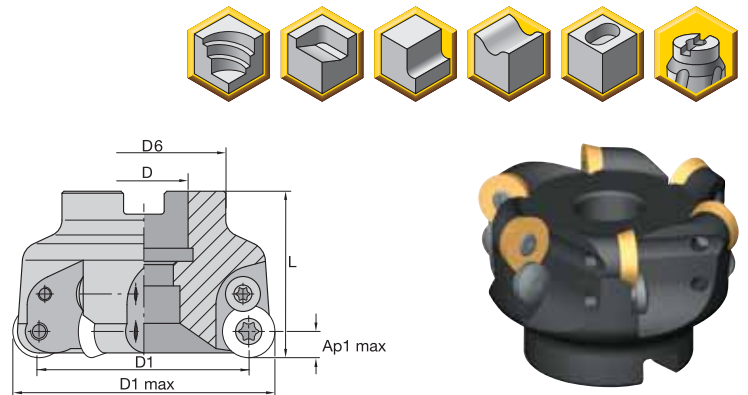


■ **Screw-On End Mills • RD.X16 Inserts**

order number	catalog number	D1 max	D1	D	D2	DPM	G3X	L2	Ap1 max	Z	max ramp angle	lbs	insert 1
2511467	KDM125RD1602M16169	1.250	.620	1.142	1.102	.669	M16	1.690	.315	2	15.0°	.45	RD.X1604..

■ **Spare Parts**

D1 max	insert screw	in. lbs.	Torx wrench
1.250	193.343	30	FT20



■ **Shell Mills • RD.X16 Inserts**

order number	catalog number	D1 max	D1	D	D6	L	Ap1 max	Z	max ramp angle	lbs	insert 1
2251768	KDM200RD16S075F	2.000	1.370	.750	1.650	1.970	.315	4	8.0°	.99	RD.X1604..
2251769	KDM250RD16S100F	2.500	1.870	1.000	2.070	1.970	.315	5	6.0°	1.61	RD.X1604..
2251770	KDM300RD16S100F	3.000	2.370	1.000	2.070	1.970	.315	6	4.0°	2.20	RD.X1604..
2251771	KDM400RD16S125F	4.000	3.370	1.250	2.750	2.170	.315	7	1.5°	4.30	RD.X1604..
2251772	KDM500RD16S150F	5.000	4.370	1.500	3.690	2.170	.315	8	—	7.28	RD.X1604..
2251773	KDM600RD16S150F	6.000	5.370	1.500	3.690	2.170	.315	9	—	9.92	RD.X1604..

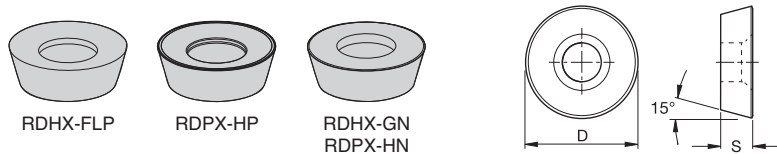
■ **Spare Parts**

D1 max	insert screw	in. lbs.	Torx wrench	clamp screw	socket-head cap screw
2.000	193.343	30	FT20	193.383	S445
2.500	193.343	30	FT20	193.383	S458
3.000	193.343	30	FT20	193.383	—
4.000	193.343	30	FT20	193.383	—
5.000	193.343	30	FT20	193.383	—
6.000	193.343	30	FT20	193.383	—

■ Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	.F..LP	KC725M	.S..GN	KC725M	.S..HP	KC725M
P3-P4	.S..HP	KC522M	.S..HP	KCPK30	.S..HN	KC725M
P5-P6	.S..HP	KC522M	.S..HP	KCPM20	.S..HN	KCPM20
M1-M2	—	—	.S..HP	KC725M	—	—
M3	—	—	.S..HP	KC725M	—	—
K1-K2	.S..HN	KC510M	.S..HP	KCPK30	.S..HP	KCPK30
K3	.S..HN	KC510M	.S..HP	KCPK30	.S..HP	KCPK30
N1-N2	.F..LP	KC510M	.F..LP	KC510M	.F..LP	KC510M
N3	.F..LP	KC510M	.F..LP	KC510M	.F..LP	KC510M
S1-S2	—	—	.S..HP	KC725M	—	—
S3	—	—	.S..HP	KC725M	—	—
S4	—	—	.S..HP	KC725M	—	—
H1	.S..GN	KC510M	.S..HN	KC510M	.S..HN	KCPM20

Indexable Round Inserts • KDM RD.X16...



● first choice
○ alternate choice

P	●	○	○	○	○
M	○	○	○	○	○
K	●	○	○	○	○
N	○	○	○	○	○
S	○	○	○	○	○
H	○	○	○	○	○

■ RDHX-FLP

catalog number	D	S	hm	KC510M	KC522M	KC725M	KCPM20	KCPK30
RDHX1604M0FLP	.630	.188	.001	●	●	●	○	○

■ RDHX-GN

catalog number	D	S	hm	KC510M	KC522M	KC725M	KCPM20	KCPK30
RDHX1604M0SGN	.630	.188	.008	●	●	●	○	○

■ RDPX-HP

catalog number	D	S	hm	KC510M	KC522M	KC725M	KCPM20	KCPK30
RDPX1604M0SHP	.630	.187	.005	○	●	●	●	●

■ RDPX-HN

catalog number	D	S	hm	KC510M	KC522M	KC725M	KCPM20	KCPK30
RDPX1604M0SHN	.630	.187	.008	●	●	●	●	●

Copy Mills

Recommended Starting Speeds [SFM]

Material Group		KC510M			KC522M			KC725M			KCPM20			KCPK30		
P	1	—	—	—	1300	1130	1060	1030	900	840	2170	1910	1760	1780	1560	1450
	2	—	—	—	1080	950	790	860	760	640	1340	1210	1090	1100	1000	900
	3	—	—	—	1000	840	700	790	670	550	1210	1090	1000	1000	900	820
	4	960	780	660	890	730	590	710	590	470	910	840	760	740	690	620
	5	—	—	—	730	660	590	590	530	470	1090	980	900	1020	910	830
	6	—	—	—	650	490	400	520	400	310	760	660	570	620	540	—
M	1	—	—	—	800	710	650	670	590	540	880	790	680	820	720	620
	2	—	—	—	730	620	520	610	520	430	800	700	620	730	640	550
	3	—	—	—	550	480	370	460	400	310	640	570	490	570	520	460
K	1	1150	1040	940	900	820	720	—	—	—	1420	1280	1150	1160	1050	940
	2	910	820	760	710	640	590	—	—	—	1130	1010	920	920	830	760
	3	770	680	620	590	530	480	—	—	—	950	840	780	770	690	640
N	1-2	2520	2240	2060	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
S	1	—	—	—	160	140	110	140	120	100	—	—	—	—	—	—
	2	—	—	—	160	140	110	140	120	100	—	—	—	—	—	—
	3	—	—	—	200	160	110	180	140	100	—	—	—	—	—	—
	4	—	—	—	280	200	140	240	180	120	—	—	—	—	—	—
H	1	630	510	360	470	360	280	—	—	—	550	460	370	—	—	—

NOTE: FIRST choice starting speeds are in bold type.
As the average chip thickness increases, the speed should be decreased.

Recommended Starting Feeds [IPT]

Light Machining	General Purpose	Heavy Machining
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At .315 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)														Insert Geometry	
	10%			20%			30%			40%		50-100%				
.F..LP	.003	.007	.014	.003	.005	.010	.002	.004	.009	.002	.004	.008	.002	.004	.008	.F..LP
.S..GN	.007	.017	.028	.005	.013	.020	.004	.011	.018	.004	.010	.016	.004	.010	.016	.S..GN
.S..HP	.007	.017	.028	.005	.013	.020	.004	.011	.018	.004	.010	.016	.004	.010	.016	.S..HP
.S..HN	.007	.017	.028	.005	.013	.020	.004	.011	.018	.004	.010	.016	.004	.010	.016	.S..HN

At .157 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)														Insert Geometry	
	10%			20%			30%			40%		50-100%				
.F..LP	.004	.008	.016	.003	.006	.012	.003	.005	.010	.002	.005	.009	.002	.005	.009	.F..LP
.S..GN	.008	.020	.032	.006	.015	.023	.005	.013	.020	.005	.012	.019	.005	.012	.018	.S..GN
.S..HP	.008	.020	.032	.006	.015	.023	.005	.013	.020	.005	.012	.019	.005	.012	.018	.S..HP
.S..HN	.008	.020	.032	.006	.015	.023	.005	.013	.020	.005	.012	.019	.005	.012	.018	.S..HN

At .079 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)														Insert Geometry	
	10%			20%			30%			40%		50-100%				
.F..LP	.005	.010	.021	.004	.008	.015	.003	.007	.013	.003	.006	.012	.003	.006	.012	.F..LP
.S..GN	.010	.026	.042	.008	.019	.031	.007	.017	.027	.006	.015	.025	.006	.015	.024	.S..GN
.S..HP	.010	.026	.042	.008	.019	.031	.007	.017	.027	.006	.015	.025	.006	.015	.024	.S..HP
.S..HN	.010	.026	.042	.008	.019	.031	.007	.017	.027	.006	.015	.025	.006	.015	.024	.S..HN

At .039 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)														Insert Geometry	
	10%			20%			30%			40%		50-100%				
.F..LP	.007	.014	.028	.005	.010	.021	.005	.009	.018	.004	.008	.017	.004	.008	.017	.F..LP
.S..GN	.014	.036	.059	.010	.026	.042	.009	.023	.036	.008	.021	.034	.008	.021	.033	.S..GN
.S..HP	.014	.036	.059	.010	.026	.042	.009	.023	.036	.008	.021	.034	.008	.021	.033	.S..HP
.S..HN	.014	.036	.059	.010	.026	.042	.009	.023	.036	.008	.021	.034	.008	.021	.033	.S..HN

NOTE: Use "Light Machining" values as starting feed rate.



KSRM™ • Multipurpose Milling Cutters

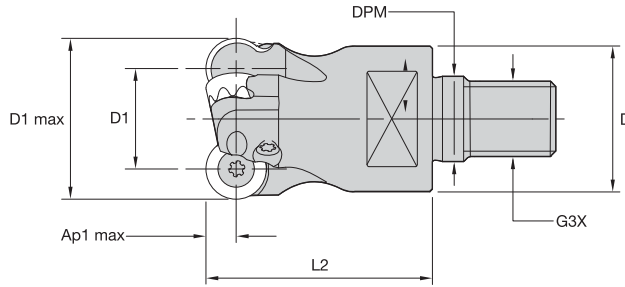
Primary Application

Specially developed for machining titanium and stainless steel. KSRM platform enables you to pocket, profile, ramp, and plunge with up to .039" (1mm) fz with consistent performance, providing outstanding metal removal rates with the lowest cutting forces in roughing applications.

Features and Benefits



- Engineered for titanium and stainless steel machining.
- Anti-rotation components feature eight indexable positions.
- Pocketing, ramping, plunging, and helical interpolation capabilities.

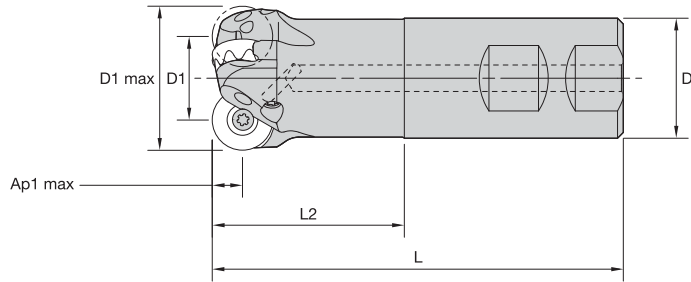


■ **Screw-On End Mills**

order number	catalog number	D1 max	D1	D	DPM	G3X	L2	Ap1 max	Z	max ramp angle	max RPM	lbs	insert 1
4042688	BMD125R1203M16L150	1.250	.778	1.142	.670	M16	1.500	.236	3	5.7°	43500	.35	RP..T1204M0...
4042690	BMD150R1204M16L150	1.500	1.028	1.142	.670	M16	1.500	.236	4	9.2°	39700	.41	RP..T1204M0...

■ **Spare Parts**

D1 max	insert screw	in. lbs.	anti-rotation screw	Torx Plus driver
1.250	MS2077	20	MS-2225	DT15IP
1.500	MS2077	20	MS-2225	DT15IP



■ **Weldon End Mills**

order number	catalog number	D1 max	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	lbs	insert 1
4042691	BMD125R1203W125L200	1.250	.778	1.250	4.280	2.000	.236	3	5.7°	43500	1.17	RP..T1204M0...
3891915	BMD150R1204W150L200	1.500	1.028	1.500	4.690	2.000	.236	4	9.2°	39700	1.94	RP..T1204M0...

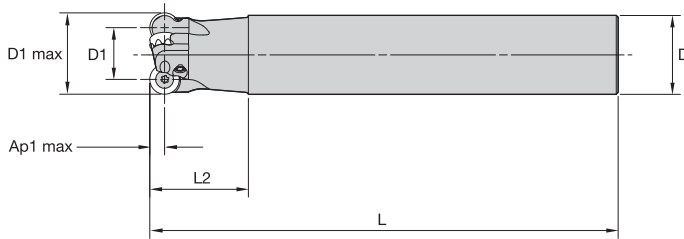
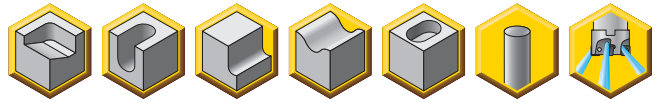
■ **Spare Parts**

D1 max	insert screw	in. lbs.	anti-rotation screw	Torx Plus driver
1.250	MS2077	20	MS-2225	DT15IP
1.500	MS2077	20	MS-2225	DT15IP



Copy Mills

- Engineered for titanium and stainless steel machining.
- Anti-rotation components feature eight indexable positions.
- Pocketing, ramping, plunging, and helical interpolation capabilities.



■ Cylindrical End Mills

order number	catalog number	D1 max	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	lbs	insert 1
4042692	BMD125R1203C125L700	1.250	.778	1.250	7.000	1.575	.236	3	5.7°	43500	2.11	RP..T1204M0...
4042713	BMD150R1203C125L800	1.500	1.028	1.250	8.000	1.575	.236	3	9.8°	39700	2.54	RP..T1204M0...

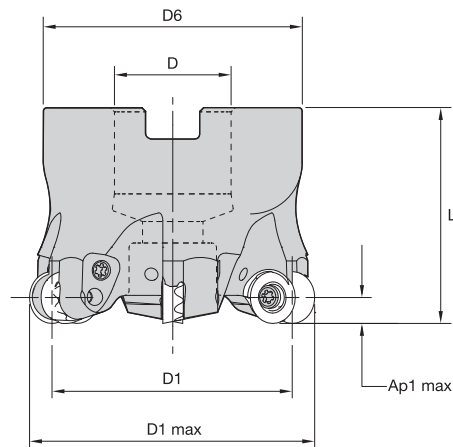
■ Spare Parts

D1 max	insert screw	in. lbs.	anti-rotation screw	Torx Plus driver
1.250	MS2077	20	MS-2225	DT15IP
1.500	MS2077	20	MS-2225	DT15IP



Copy Mills

- Engineered for titanium and stainless steel machining.
- Anti-rotation components feature eight indexable positions.
- Pocketing, ramping, plunging, and helical interpolation capabilities.



Face Mills

order number	catalog number	D1 max	D1	D	D6	L	Ap1 max	Z	max ramp angle	max RPM	lbs	insert 1
3891882	BMD150R1204S050L158	1.500	1.028	.500	1.440	1.575	.236	4	9.2°	39700	.47	RP..T1204M0...
4042714	BMD200R1203S075L200	2.000	1.528	.750	1.752	2.000	.236	3	10.5°	34400	1.02	RP..T1204M0...
4042715	BMD200R1205S075L200	2.000	1.528	.750	1.752	2.000	.236	5	7.7°	34400	1.01	RP..T1204M0...
4042716	BMD250R1207S100L200	2.500	2.028	1.000	2.190	2.000	.236	7	4.1°	30800	1.61	RP..T1204M0...
3885499	BMD300R1206S100L200	3.000	2.528	1.000	2.752	2.000	.236	6	5.7°	28100	2.44	RP..T1204M0...
4042717	BMD300R1208S100L200	3.000	2.528	1.000	2.752	2.000	.236	8	3.5°	28100	2.57	RP..T1204M0...
4042718	BMD400R1207S125L200	4.000	3.528	1.250	2.878	2.000	.236	7	3.3°	23800	3.23	RP..T1204M0...
4002349	BMD400R1209S125L200	4.000	3.528	1.250	2.878	2.000	.236	9	3.0°	23800	3.20	RP..T1204M0...

Spare Parts



D1 max	insert screw	in. lbs.	anti-rotation screw	socket-head cap screw	socket-head cap screw with coolant groove *	coolant lock screw assembly	T-handle hex wrench	Torx Plus driver
1.500	MS2077	20	MS-2225	S424	S422CG	—	—	DT15IP
2.000	MS2077	20	MS-2225	S446	S446CG	—	—	DT15IP
2.500	MS2077	20	MS-2225	S459	S459CG	—	—	DT15IP
3.000	MS2077	20	MS-2225	S459	S459CG	—	—	DT15IP
4.000	MS2077	20	MS-2225	—	—	S2162C	THW2M	DT15IP

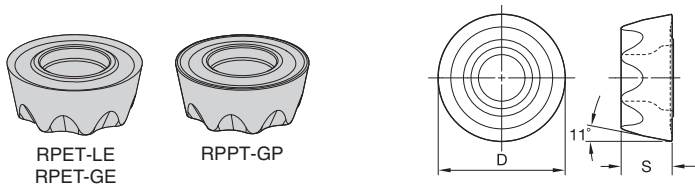
* Socket head cap screw with coolant groove sold separately as a spare part.

■ Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	.E..LE	KC725M	.S..GE	KC725M	.S..GP	KC725M
P3-P4	.E..LE	KCPK30	.S..GE	KCPK30	.S..GP	KCPK30
P5-P6	.S..GE	KCPK30	.S..GP	KCPK30	.S..GP	KCPM20
M1-M2	.E..LE	KC725M	.E..LE	KC725M	.S..GE	KC725M
M3	.E..LE	KCPK30	.E..LE	KCPK30	.S..GE	KCPK30
K1-K2	—	—	.S..GP	KCPK30	—	—
K3	—	—	.S..GP	KCPK30	—	—
N1-N2	.E..LEJ	KC422M	.E..LEJ	KC422M	.E..LEJ	KC422M
N3	.E..LEJ	KC422M	.E..LEJ	KC422M	.E..LEJ	KC422M
S1-S2	.E..LE	KC725M	.S..GE	KC725M	.S..GP	KC725M
S3	.E..LE	KC725M	.S..GE	KC725M	.S..GP	KC725M
S4	.E..LE	KC725M	.E..LE	KC725M	.S..GE	KC725M
H1	—	—	—	—	—	—

Indexable Round Inserts • KSRM

- SGE and ELE are the first choice for titanium machining.
- SGE geometry is the first choice for medium and heavy applications.
- ELE is the first choice for lower cutting forces to avoid built-up edge.



● first choice
○ alternate choice

P	●	○	○	○	○
M	○	○	○	○	○
K	○	○	○	○	○
N	○	○	○	○	○
S	○	○	○	○	○
H	○	○	○	○	○

■ RPET-LE

catalog number	.D	S	hm	cutting edges	KC422M	KC522M	KC725M	KCPM20	KCPK30
RPET1204M0ELEJ	.472	.188	.001	8	●	●	●	●	●
RPET1204M0ELE	.472	.188	.002	8	○	○	○	○	○

■ RPET-GE

catalog number	D	S	hm	cutting edges	KC422M	KC522M	KC725M	KCPM20	KCPK30
RPET1204M0SGE	.472	.188	.004	8	○	○	○	○	○
RPET1204M0SGEJ	.472	.188	.005	8	○	○	○	○	○

■ RPPT-GP

catalog number	D	S	hm	cutting edges	KC422M	KC522M	KC725M	KCPM20	KCPK30
RPPT1204M0SGP	.472	.188	.005	8	○	○	○	○	○

Copy Mills

Recommended Starting Speeds [SFM]

Material Group		KC422M			KC522M			KC725M			KCPM20			KCPK30		
P	1	—	—	—	1300	1130	1060	1030	900	840	2170	1910	1760	1780	1560	1450
	2	—	—	—	1080	950	790	860	760	640	1340	1210	1090	1100	1000	900
	3	—	—	—	1000	840	700	790	670	550	1210	1090	1000	1000	900	820
	4	—	—	—	890	730	590	710	590	470	910	840	760	740	690	620
	5	—	—	—	730	660	590	590	530	470	1090	980	900	1020	910	830
	6	—	—	—	650	490	400	520	400	310	760	660	570	620	540	—
M	1	—	—	—	800	710	650	670	590	540	880	790	680	820	720	620
	2	—	—	—	730	620	520	610	520	430	800	700	620	730	640	550
	3	—	—	—	550	480	370	460	400	310	640	570	490	570	520	460
K	1	—	—	—	900	820	720	—	—	—	1420	1280	1150	1160	1050	940
	2	—	—	—	710	640	590	—	—	—	1130	1010	920	920	830	760
	3	—	—	—	590	530	480	—	—	—	950	840	780	770	690	640
N	1-2	4220	3720	3440	—	—	—	—	—	—	—	—	—	—	—	—
	3	3720	3440	3000	—	—	—	—	—	—	—	—	—	—	—	—
S	1	—	—	—	160	140	110	140	120	100	—	—	—	—	—	—
	2	—	—	—	160	140	110	140	120	100	—	—	—	—	—	—
	3	—	—	—	200	160	110	180	140	100	—	—	—	—	—	—
	4	—	—	—	280	200	140	240	180	120	—	—	—	—	—	—
H	1	—	—	—	470	360	280	—	—	—	550	460	370	—	—	—

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness value increases, the speed should be decreased.

Recommended Starting Feeds [IPT]

Light Machining	General Purpose	Heavy Machining
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At .236 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)														Insert Geometry	
	10%			20%			30%			40%			50-100%			
.E..LEJ	.003	.005	.008	.003	.004	.006	.002	.003	.005	.002	.003	.005	.002	.003	.005	.E..LEJ
.E..LE	.005	.008	.014	.004	.006	.010	.003	.005	.009	.003	.005	.008	.003	.005	.008	.E..LE
.S..GE	.007	.017	.028	.005	.013	.020	.004	.011	.018	.004	.010	.016	.004	.010	.016	.S..GE
.S..GP	.007	.017	.028	.005	.013	.020	.004	.011	.018	.004	.010	.016	.004	.010	.016	.S..GP

At .118 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)														Insert Geometry	
	10%			20%			30%			40%			50-100%			
.E..LEJ	.004	.006	.009	.003	.004	.007	.003	.004	.006	.002	.004	.006	.002	.003	.006	.E..LEJ
.E..LE	.005	.010	.016	.004	.007	.012	.004	.006	.010	.003	.006	.009	.003	.006	.009	.E..LE
.S..GE	.008	.020	.032	.006	.015	.023	.005	.013	.020	.005	.012	.019	.005	.012	.018	.S..GE
.S..GP	.008	.020	.032	.006	.015	.023	.005	.013	.020	.005	.012	.019	.005	.012	.018	.S..GP

At .059 Axial Depth of Cut (ap)

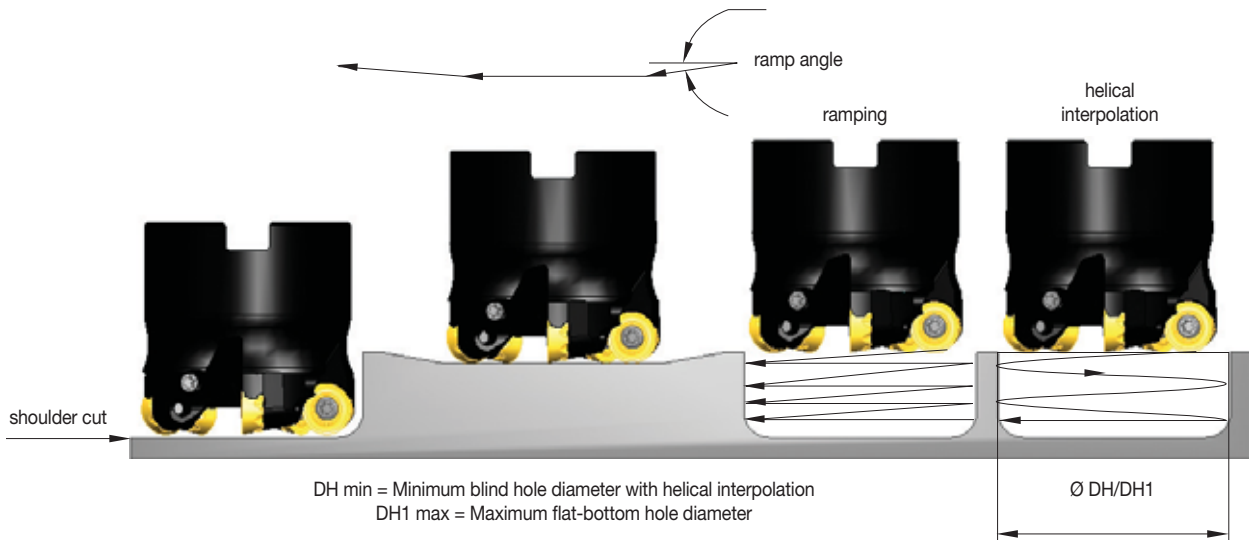
Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)														Insert Geometry	
	10%			20%			30%			40%			50-100%			
.E..LEJ	.005	.008	.012	.004	.006	.009	.003	.005	.008	.003	.005	.007	.003	.005	.007	.E..LEJ
.E..LE	.007	.013	.021	.005	.009	.015	.005	.008	.013	.004	.008	.012	.004	.008	.012	.E..LE
.S..GE	.010	.026	.042	.008	.019	.031	.007	.017	.027	.006	.015	.025	.006	.015	.024	.S..GE
.S..GP	.010	.026	.042	.008	.019	.031	.007	.017	.027	.006	.015	.025	.006	.015	.024	.S..GP

At .030 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)														Insert Geometry	
	10%			20%			30%			40%			50-100%			
.E..LEJ	.007	.010	.017	.005	.008	.012	.005	.007	.011	.004	.006	.010	.004	.006	.010	.E..LEJ
.E..LE	.010	.018	.028	.007	.013	.021	.006	.011	.018	.006	.011	.017	.006	.010	.017	.E..LE
.S..GE	.014	.036	.059	.010	.026	.042	.009	.023	.036	.008	.021	.034	.008	.021	.033	.S..GE
.S..GP	.014	.036	.059	.010	.026	.042	.009	.023	.036	.008	.021	.034	.008	.021	.033	.S..GP

NOTE: Use "Light Machining" values as starting feed rate.

■ Maximum Linear Ramping and Helical Interpolation from Solid

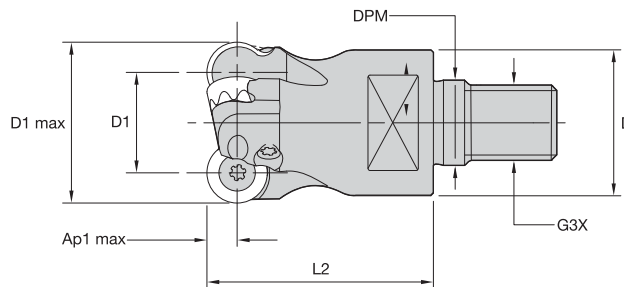
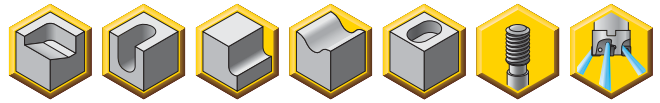


catalog number	max ramp angle	max plunging depth	min hole diameter (DH min)	max flat-bottom hole diameter (DH1 max)	max diameter (no flat bottom)
BMD125R1203M16L150	5.7°	0.061	1.719	2.028	2.5
BMD150R1204M16L150	9.2°	0.130	2.112	2.528	3.0
BMD125R1203W125L200	5.7°	0.061	1.719	2.028	2.5
BMD150R1204W150L200	9.2°	0.130	2.112	2.528	3.0
BMD125R1203C125L700	5.7°	0.061	1.719	2.028	2.5
BMD150R1203C125L800	9.8°	0.138	2.104	2.528	3.0
BMD150R1204S050L158	9.2°	0.130	2.112	2.528	3.0
BMD200R1203S075L200	10.5°	0.236	3.058	3.528	4.0
BMD200R1205S075L200	7.7°	0.173	3.074	3.528	4.0
BMD250R1207S100L200	4.1°	0.130	4.114	4.528	5.0
BMD300R1206S100L200	5.7°	0.228	5.048	5.528	6.0
BMD300R1208S100L200	3.5°	0.138	5.078	5.528	6.0
BMD400R1207S125L200	3.3°	0.189	7.068	7.528	8.0
BMD400R1209S125L200	3.0°	0.173	7.525	7.528	8.0



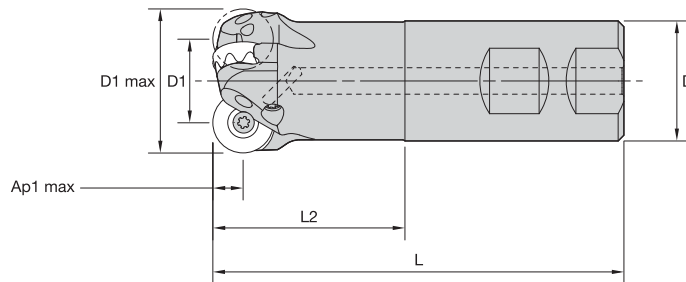
Copy Mills

- Engineered for titanium and stainless steel machining.
- Anti-rotation components feature eight indexable positions.
- Pocketing, ramping, plunging, and helical interpolation capabilities.



■ Screw-On End Mills

order number	catalog number	D1 max	D1	D	DPM	G3X	L2	Ap1 max	Z	max ramp angle	max RPM	lbs	insert 1
4043037	BMD150R1603M16	1.500	.870	1.142	.670	M16	1.500	.315	3	9.9°	28000	.35	RP..T1605M0...



■ Weldon End Mills

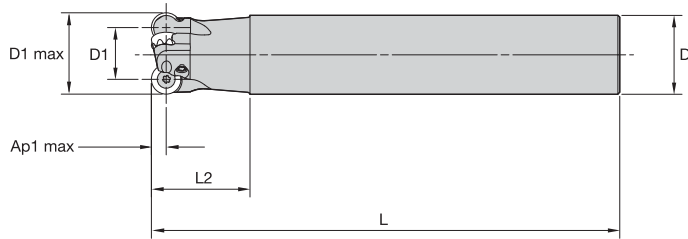
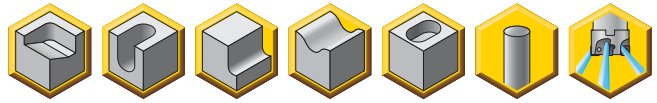
order number	catalog number	D1 max	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	lbs	insert 1
4043038	BMD150R1603W125L200	1.500	.870	1.250	4.280	2.000	.315	3	9.9°	28000	1.24	RP..T1605M0...

■ Spare Parts

D1 max	insert screw	in. lbs.	anti-rotation screw	Torx Plus driver
1.500	MS-2071	35	MS-2225	DT15IP

Copy Mills

- Engineered for titanium and stainless steel machining.
- Anti-rotation components feature eight indexable positions.
- Pocketing, ramping, plunging, and helical interpolation capabilities.



■ **Cylindrical End Mills**

order number	catalog number	D1 max	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	lbs	insert 1
4043039	BMD150R1602C125L800	1.500	.870	1.250	8.000	1.500	.315	2	11.1°	28000	2.48	RP..T1605M0...

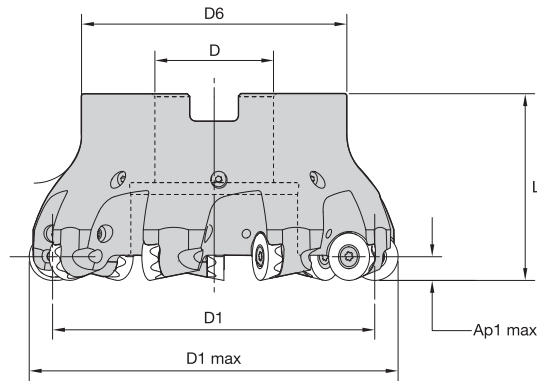
■ **Spare Parts**

				
D1 max	insert screw	in. lbs.	anti-rotation screw	Torx Plus driver
1.500	MS-2071	35	MS-2225	DT15IP



Copy Mills

- Engineered for titanium and stainless steel machining.
- Anti-rotation components feature eight indexable positions.
- Pocketing, ramping, plunging, and helical interpolation capabilities.



■ Face Mills

order number	catalog number	D1 max	D1	D	D6	L	Ap1 max	Z	max ramp angle	max RPM	lbs	insert 1
4043040	BMD200R1603S075L200	2.000	1.370	.750	1.752	2.000	.315	3	11.7°	24200	.82	RP..T1605M0...
4043041	BMD200R1604S075L200	2.000	1.370	.750	1.752	2.000	.315	4	9.7°	24200	.83	RP..T1605M0...
4043042	BMD250R1605S100L200	2.500	1.870	1.000	2.189	2.000	.315	5	11.7°	21700	1.43	RP..T1605M0...
4043053	BMD300R1605S100L200	3.000	2.370	1.000	2.750	2.000	.315	5	8.8°	19800	2.37	RP..T1605M0...
3997748	BMD300R1607S100L200	3.000	2.370	1.000	2.750	2.000	.315	7	6.8°	19800	2.38	RP..T1605M0...
4043054	BMD400R1608S125L200	4.000	3.370	1.250	2.875	2.000	.315	8	4.6°	16600	2.79	RP..T1605M0...
4043055	BMD500R1609S150L250	5.000	4.370	1.500	3.811	2.500	.315	9	4.2°	14500	5.86	RP..T1605M0...
4043056	BMD600R1610S150L250	6.000	5.370	1.500	3.811	2.500	.315	10	3.4°	13100	7.86	RP..T1605M0...

■ Spare Parts



D1 max	insert screw	in. lbs.	anti-rotation screw	socket-head cap screw	socket-head cap screw with coolant groove *	coolant lock screw assembly	T-handle hex wrench	Torx Plus driver
2.000	MS-2071	35	MS-2225	S446	S446CG	—	—	DT15IP
2.500	MS-2071	35	MS-2225	S459	S459CG	—	—	DT15IP
3.000	MS-2071	35	MS-2225	S459	S459CG	—	—	DT15IP
4.000	MS-2071	35	MS-2225	—	—	S2162C	THW2M	DT15IP
5.000	MS-2071	35	MS-2225	—	—	S2163C	THW2M	DT15IP
6.000	MS-2071	35	MS-2225	—	—	S2163C	THW2M	DT15IP

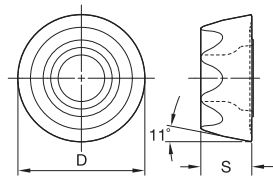
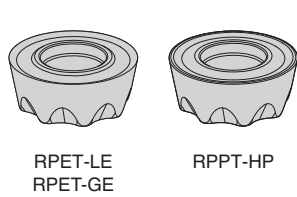
* Socket head cap screw with coolant groove sold separately as a spare part.

■ Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	.E..LE	KC725M	.S..GE	KC725M	.S..HP	KC725M
P3-P4	.E..LE	KCPK30	.S..GE	KCPK30	.S..HP	KCPK30
P5-P6	.S..GE	KCPK30	.S..HP	KCPK30	.S..HP	KCPM20
M1-M2	.E..LE	KC725M	.E..LE	KC725M	.S..GE	KC725M
M3	.E..LE	KCPK30	.E..LE	KCPK30	.S..GE	KCPK30
K1-K2	—	—	.S..HP	KCPK30	—	—
K3	—	—	.S..HP	KCPK30	—	—
N1-N2	.E..LEJ	KC422M	.E..LEJ	KC422M	.E..LEJ	KC422M
N3	.E..LEJ	KC422M	.E..LEJ	KC422M	.E..LEJ	KC422M
S1-S2	.E..LE	KC725M	.S..GE	KC725M	.S..HP	KC725M
S3	.E..LE	KC725M	.S..GE	KC725M	.S..HP	KC725M
S4	.E..LE	KC725M	.S..GE	KC725M	.S..GE	KC725M
H1	—	—	—	—	—	—

Indexable Round Inserts • KSRM

- SGE and ELE are the first choice for titanium machining.
- SGE geometry is the first choice for medium and heavy applications.
- ELE is the first choice for lower cutting forces to avoid built-up edge.



● first choice
○ alternate choice

P	●	○	○	○	○
M	●	○	○	○	○
K	○	○	○	○	○
N	●	○	○	○	○
S	○	○	○	○	○
H	○	○	○	○	○

■ RPET-LE

catalog number	D	S	hm	cutting edges	KC422M	KC522M	KC725M	KCPM20	KCPK30
RPET1605M0ELEJ	.630	.219	.001	8	●	●	●	○	○
RPET1605M0ELE	.630	.219	.002	8	○	○	○	○	○

■ RPET-GE

catalog number	D	S	hm	cutting edges	KC422M	KC522M	KC725M	KCPM20	KCPK30
RPET1605M0SGE	.630	.219	.004	8	○	○	○	○	○
RPET1605M0SGEJ	.630	.219	.005	8	○	○	○	○	○

■ RPPT-HP

catalog number	D	S	hm	cutting edges	KC422M	KC522M	KC725M	KCPM20	KCPK30
RPPT1605M0SHP	.630	.219	.007	8	○	○	○	○	○

Copy Mills

■ Recommended Starting Speeds [SFM]

Material Group		KC422M			KC522M			KC725M			KCPM20			KCPK30		
P	1	—	—	—	1300	1130	1060	1030	900	840	2170	1910	1760	1780	1560	1450
	2	—	—	—	1080	950	790	860	760	640	1340	1210	1090	1100	1000	900
	3	—	—	—	1000	840	700	790	670	550	1210	1090	1000	1000	900	820
	4	—	—	—	890	730	590	710	590	470	910	840	760	740	690	620
	5	—	—	—	730	660	590	590	530	470	1090	980	900	1020	910	830
	6	—	—	—	650	490	400	520	400	310	760	660	570	620	540	—
M	1	—	—	—	800	710	650	670	590	540	880	790	680	820	720	620
	2	—	—	—	730	620	520	610	520	430	800	700	620	730	640	550
	3	—	—	—	550	480	370	460	400	310	640	570	490	570	520	460
K	1	—	—	—	900	820	720	—	—	—	1420	1280	1150	1160	1050	940
	2	—	—	—	710	640	590	—	—	—	1130	1010	920	920	830	760
	3	—	—	—	590	530	480	—	—	—	950	840	780	770	690	640
N	1-2	4220	3720	3440	—	—	—	—	—	—	—	—	—	—	—	—
	3	3720	3440	3000	—	—	—	—	—	—	—	—	—	—	—	—
S	1	—	—	—	160	140	110	140	120	100	—	—	—	—	—	—
	2	—	—	—	160	140	110	140	120	100	—	—	—	—	—	—
	3	—	—	—	200	160	110	180	140	100	—	—	—	—	—	—
	4	—	—	—	280	200	140	240	180	120	—	—	—	—	—	—
H	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

■ Recommended Starting Feeds [IPT]

Light Machining	General Purpose	Heavy Machining
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At .315 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.E..LEJ	.003	.006	.009	.003	.005	.007	.002	.004	.006	.002	.004	.006	.002	.004	.005	.E..LEJ
.E..LE	.005	.010	.015	.004	.008	.011	.003	.007	.010	.003	.006	.009	.003	.006	.009	.E..LE
.S..GE	.007	.017	.028	.005	.013	.020	.004	.011	.018	.004	.010	.016	.004	.010	.016	.S..GE
.S..HP	.007	.017	.028	.005	.013	.020	.004	.011	.018	.004	.010	.016	.004	.010	.016	.S..HP

At .157 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.E..LEJ	.004	.007	.011	.003	.005	.008	.003	.005	.007	.002	.004	.006	.002	.004	.006	.E..LEJ
.E..LE	.005	.012	.018	.004	.009	.013	.004	.008	.011	.003	.007	.011	.003	.007	.010	.E..LE
.S..GE	.008	.020	.032	.006	.015	.023	.005	.013	.020	.005	.012	.019	.005	.012	.018	.S..GE
.S..HP	.008	.020	.032	.006	.015	.023	.005	.013	.020	.005	.012	.019	.005	.012	.018	.S..HP

At .079 Axial Depth of Cut (ap)

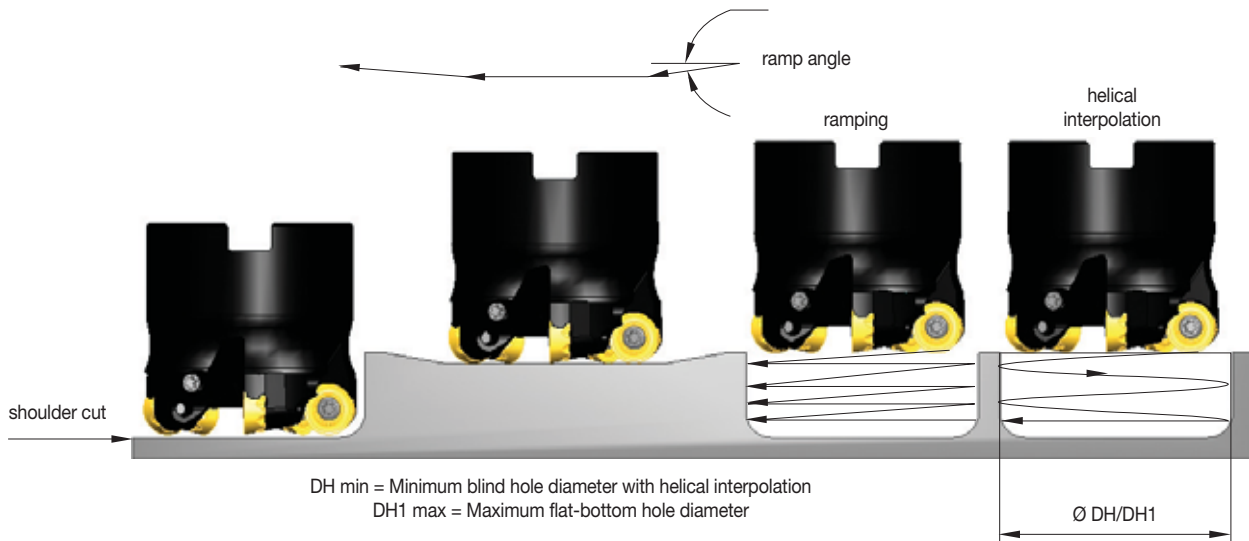
Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.E..LEJ	.005	.009	.014	.004	.007	.010	.003	.006	.009	.003	.006	.008	.003	.005	.008	.E..LEJ
.E..LE	.007	.015	.023	.005	.011	.017	.005	.010	.015	.004	.009	.014	.004	.009	.014	.E..LE
.S..GE	.010	.026	.042	.008	.019	.031	.007	.017	.027	.006	.015	.025	.006	.015	.024	.S..GE
.S..HP	.010	.026	.042	.008	.019	.031	.007	.017	.027	.006	.015	.025	.006	.015	.024	.S..HP

At .039 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.E..LEJ	.007	.013	.019	.005	.009	.014	.005	.008	.012	.004	.008	.011	.004	.007	.011	.E..LEJ
.E..LE	.010	.021	.032	.007	.016	.023	.006	.014	.020	.006	.013	.019	.006	.012	.019	.E..LE
.S..GE	.014	.036	.059	.010	.026	.042	.009	.023	.036	.008	.021	.034	.008	.021	.033	.S..GE
.S..HP	.014	.036	.059	.010	.026	.042	.009	.023	.036	.008	.021	.034	.008	.021	.033	.S..HP

NOTE: Use "Light Machining" values as starting feed rate.

■ Maximum Linear Ramping and Helical Interpolation from Solid

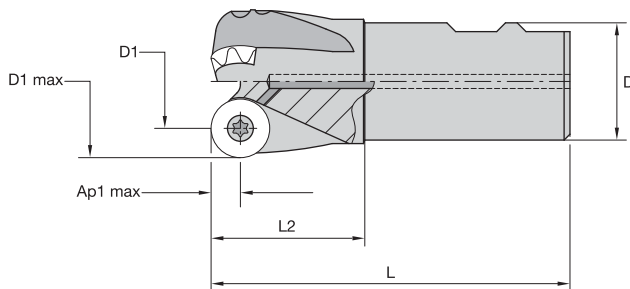


catalog number	max ramp angle	max plunging depth	min hole diameter (DH min)	max flat-bottom hole diameter (DH1 max)	max diameter (no flat bottom)
BMD150R1603M16L150	9.9°	0.106	1.904	2.37	3.0
BMD150R1603W125L200	9.9°	0.106	1.904	2.37	3.0
BMD150R1602C125L800	11.0°	0.117	1.888	2.37	3.0
BMD200R1603S075L200	11.7°	0.217	2.776	3.37	4.0
BMD200R1604S075L200	9.7°	0.181	2.81	3.37	4.0
BMD250R1605S100L200	11.7°	0.315	3.744	4.37	5.0
BMD300R1605S100L200	8.8°	0.315	4.738	5.37	6.0
BMD300R1607S100L200	6.8°	0.245	4.768	5.37	6.0
BMD400R1608S125L200	4.6°	0.245	6.762	7.37	8.0
BMD500R1609S150L250	4.2°	0.295	8.744	9.37	10.0
BMD600R1610S150L250	3.4°	0.295	10.744	11.37	12.0



Copy Mills




- Engineered for roughing with large depths of cut through positive geometries.
- Anti-rotation feature with six indexable positions.
- Excellent for long overhangs.



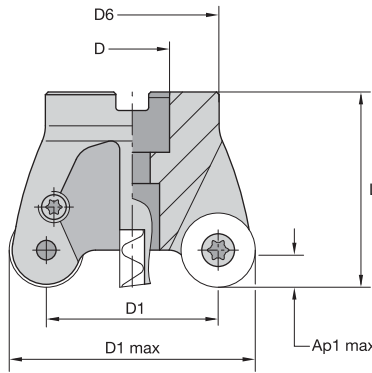
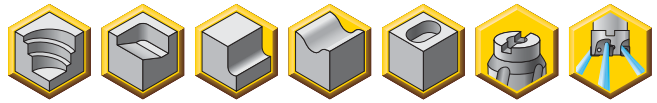
■ **Weldon • End Mills**

order number	catalog number	D1 max	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	lbs	insert 1
2610667	BMD200R6403W150L200	2.000	1.250	1.500	4.690	2.000	.375	3	0.60°	29000	2.15	RCG_64_

■ **Spare Parts**

			
D1 max	insert screw	anti-rotation screw	Torx wrench
2.000	MS1162	S2160	TT25
	in. lbs.		
	45		

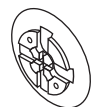
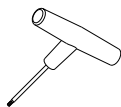
- Engineered for roughing with large depths of cut through positive geometry inserts.
- Anti-rotation feature with six indexable positions.
- Excellent for long overhangs.



■ Shell Mills

order number	catalog number	D1 max	D1	D	D6	L	Ap1 max	Z	max ramp angle	max RPM	lbs	insert 1
2610668	BMD250R6404S075L200	2.500	1.750	.750	1.750	2.000	.375	4	0.60°	26000	1.16	RCG_64__
2610670	BMD300R6405S100L200	3.000	2.250	1.000	2.190	2.000	.375	5	0.70°	22000	1.78	RCG_64__
2610672	BMD400R6405S125L200	4.000	3.250	1.250	2.875	2.000	.375	5	0.70°	18000	3.17	RCG_64__
2610683	BMD400R6406S125L200	4.000	3.250	1.250	2.875	2.000	.375	6	0.60°	18000	3.15	RCG_64__
2610684	BMD500R6406S150L250	5.000	4.250	1.500	3.810	2.500	.375	6	0.80°	15000	7.08	RCG_64__
2610685	BMD500R6408S150L250	5.000	4.250	1.500	3.810	2.500	.375	8	0.70°	15000	7.07	RCG_64__
2610686	BMD600R6407S150L250	6.000	5.250	1.500	3.810	2.500	.375	7	0.70°	14000	9.48	RCG_64__
2610687	BMD600R6408S150L250	6.000	5.250	1.500	3.810	2.500	.375	8	0.70°	14000	9.52	RCG_64__
2610688	BMD800R6409S250L250	8.000	7.250	2.500	5.000	2.500	.375	9	0.60°	12500	13.08	RCG_64__

■ Spare Parts



D1 max	insert screw	in. lbs.	Torx wrench	anti-rotation screw	coolant lock screw assembly	socket-head cap screw with coolant groove	coolant cap assembly
2.500	MS1162	45	TT25	S2160	—	S445CG	—
3.000	MS1162	45	TT25	S2160	—	S458CG	—
4.000	MS1162	45	TT25	S2160	S2162C	—	—
5.000	MS1162	45	TT25	S2160	S2163C	—	—
6.000	MS1162	45	TT25	S2160	S2163C	—	—
8.000	MS1162	45	TT25	S2160	—	—	MCC080001



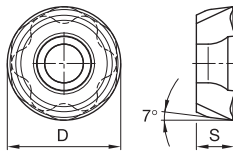
Copy Mills

Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	.E..LF	KC725M	.S..GF	KC725M	.S..HF	KC725M
P3-P4	.E..LF	KC522M	.S..GF	KC725M	.S..HF	KCPK30
P5-P6	.E..LF	KC522M	.S..HF	KCPK30	.S..HF	KCPK30
M1-M2	.E..LF	KC725M	.S..GF	KC725M	.S..HF	KC725M
M3	.E..LF	KCPK30	.S..GF	KC725M	.S..HF	KCPK30
K1-K2	—	—	.S..HF	KCPK30	—	—
K3	—	—	.S..HF	KCPK30	—	—
N1-N2	—	—	—	—	—	—
N3	—	—	—	—	—	—
S1-S2	.E..LF	KC725M	.S..GF	KC725M	.S..HF	KC725M
S3	.E..LF	KC725M	.S..GF	KC725M	.S..HF	KC725M
S4	.E..LF	KC725M	.S..GF	KC725M	.S..HF	KC725M
H1	—	—	—	—	—	—

Indexable Round Inserts • KSRM

- ELF is the first choice for lower cutting forces to avoid built-up edge.
- SGF geometry for general purpose in roughing applications.
- SHF is the first choice for heavy duty applications.


 RCGT-LF
RCGT-GF
RCGT-HF


- first choice
- alternate choice

P	●	○	○	○
M	●	○	○	○
K	○	○	○	○
N	○	○	○	○
S	○	○	○	○
H	○	○	○	○

RCGT-LF

catalog number	D	S	hm	cutting edges	KC522M	KC715M	KC725M	KCPK30
RCGT64ELF	.750	.250	.002	6	●	●	●	●

RCGT-GF

catalog number	D	S	hm	cutting edges	KC522M	KC715M	KC725M	KCPK30
RCGT64SGF	.750	.250	.004	6	●	○	●	○

RCGT-HF

catalog number	D	S	hm	cutting edges	KC522M	KC715M	KC725M	KCPK30
RCGT64SHF	.750	.250	.010	6	○	○	○	●

Copy Mills

■ Recommended Starting Speeds [SFM]

Material Group		KC522M			KC715M			KC725M			KCPK30		
P	1	1300	1130	1060	1340	1180	1090	1030	900	840	1780	1560	1450
	2	1080	950	790	830	740	670	860	760	640	1100	1000	900
	3	1000	840	700	740	670	610	790	670	550	1000	900	820
	4	890	730	590	560	520	470	710	590	470	740	690	620
	5	730	660	590	770	680	620	590	530	470	1020	910	830
	6	650	490	400	470	410	—	520	400	310	620	540	—
M	1	800	710	650	880	770	710	670	590	540	820	720	620
	2	730	620	520	—	—	—	610	520	430	730	640	550
	3	550	480	370	—	—	—	460	400	310	570	520	460
K	1	900	820	720	—	—	—	—	—	—	1160	1050	940
	2	710	640	590	—	—	—	—	—	—	920	830	760
	3	590	530	480	—	—	—	—	—	—	770	690	640
N	1-2	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—
S	1	160	140	110	—	—	—	140	120	100	—	—	—
	2	160	140	110	—	—	—	140	120	100	—	—	—
	3	200	160	110	—	—	—	180	140	100	—	—	—
	4	280	200	140	—	—	—	240	180	120	—	—	—
H	1	—	—	—	—	—	—	—	—	—	—	—	—

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

■ Recommended Starting Feeds [IPT]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

At .375 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.E..LF	.004	.007	.013	.003	.005	.009	.002	.004	.008	.002	.004	.008	.002	.004	.008	.E..LF
.S..GF	.007	.017	.028	.005	.013	.020	.004	.011	.018	.004	.010	.016	.004	.010	.016	.S..GF
.S..HF	.007	.017	.028	.005	.013	.020	.004	.011	.018	.004	.010	.016	.004	.010	.016	.S..HF

At .188 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.E..LF	.004	.008	.015	.003	.006	.011	.003	.005	.009	.003	.005	.009	.002	.005	.009	.E..LF
.S..GF	.008	.020	.032	.006	.015	.023	.005	.013	.020	.005	.012	.019	.005	.012	.018	.S..GF
.S..HF	.008	.020	.032	.006	.015	.023	.005	.013	.020	.005	.012	.019	.005	.012	.018	.S..HF

At .094 Axial Depth of Cut (ap)

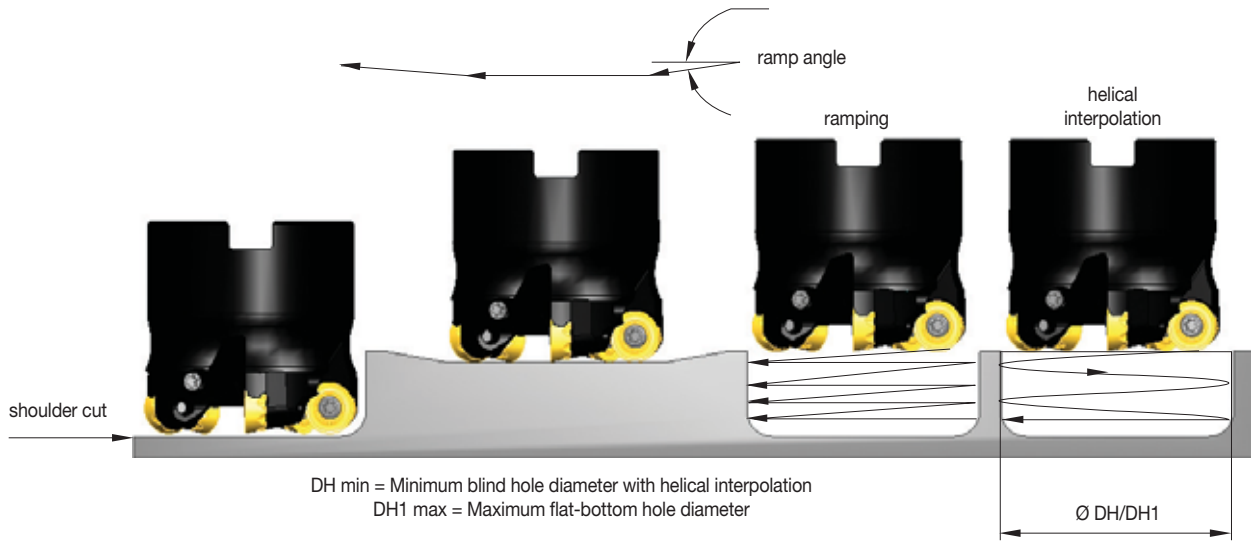
Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.E..LF	.005	.010	.019	.004	.008	.014	.004	.007	.012	.003	.006	.012	.003	.006	.011	.E..LF
.S..GF	.010	.026	.042	.008	.019	.031	.007	.017	.027	.006	.015	.025	.006	.015	.024	.S..GF
.S..HF	.010	.026	.042	.008	.019	.031	.007	.017	.027	.006	.015	.025	.006	.015	.024	.S..HF

At .047 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.E..LF	.007	.014	.027	.005	.011	.020	.005	.009	.017	.004	.009	.016	.004	.008	.015	.E..LF
.S..GF	.014	.036	.059	.010	.026	.042	.009	.023	.036	.008	.021	.034	.008	.021	.033	.S..GF
.S..HF	.014	.036	.059	.010	.026	.042	.009	.023	.036	.008	.021	.034	.008	.021	.033	.S..HF

NOTE: Use "Light Machining" values as starting feed rate.

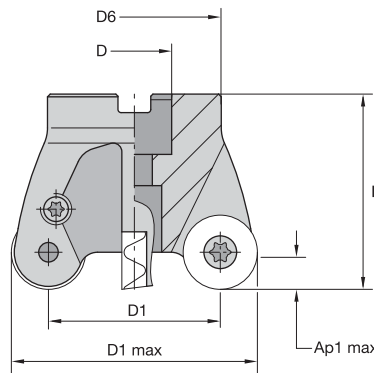
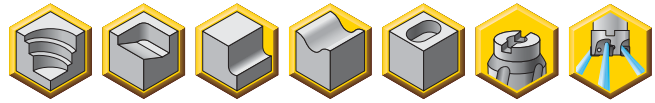
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insert IC	catalog number	max ramp angle (ra) when hx = .005"	max ramp angle (ra) when hx = .020"	max plunge radial depth (ae) when hx = .020"	min hole diameter	max flat-bottom hole diameter	max hole diameter (no flat bottom)
RCGX64	BMD200R6403W150L200	1.27°	0.70°	0.509	3.040	3.253	4.000
RCGX64	BMD250R6404S075L200	1.27°	0.59°	0.516	4.006	4.253	5.000
RCGX64	BMD300R6405S100L200	1.22°	0.70°	0.529	4.955	5.253	6.000
RCGX64	BMD400R6405S125L200	1.12°	0.67°	0.547	6.911	7.253	8.000
RCGX64	BMD400R6406S125L200	0.73°	0.64°	0.544	6.920	7.253	8.000
RCGX64	BMD500R6406S150L250	1.00°	0.75°	0.578	8.851	9.253	10.000
RCGX64	BMD500R6408S150L250	0.98°	0.68°	0.575	8.867	9.253	10.000
RCGX64	BMD600R6407S150L250	0.90°	0.69°	0.590	10.827	11.253	12.000
RCGX64	BMD600R6408S150L250	0.90°	0.67°	0.586	10.834	11.253	12.000
RCGX64	BMD800R6409S250L250	0.74°	0.59°	0.603	14.798	15.253	16.000



- Engineered for roughing with large depths of cut through positive geometry inserts.
- Anti-rotation feature with six indexable positions.
- Excellent for long overhangs.



■ Shell Mills

order number	catalog number	D1 max	D1	D	D6	L	Ap1 max	Z	max ramp angle	max RPM	lbs	insert 1
2610689	BMD300R8603S075L200	3.000	2.000	.750	1.750	2.000	.500	3	0.90°	15500	1.22	RCGT86__
2610691	BMD400R8605S125L250	4.000	3.000	1.250	2.875	2.500	.500	5	0.80°	12000	4.01	RCGT86__
2610697	BMD500R8606S150L250	5.000	4.000	1.500	3.810	2.500	.500	6	0.80°	9000	6.62	RCGT86__
2610694	BMD600R8607S150L250	6.000	5.000	1.500	3.810	2.500	.500	7	0.80°	8800	8.63	RCGT86__
2610696	BMD800R8608S250L250	8.000	7.000	2.500	5.000	2.500	.500	8	0.70°	8500	11.81	RCGT86__

■ Spare Parts

D1 max	insert screw	in. lbs.	Torx wrench	anti-rotation screw	coolant lock screw assembly	coolant cap assembly	socket-head cap screw with coolant groove
3.000	MS1162	45	TT25	S2160	—	—	S445CG
4.000	MS1162	45	TT25	S2160	S2164C	—	—
5.000	MS1162	45	TT25	S2160	S2163C	—	—
6.000	MS1162	45	TT25	S2160	S2163C	—	—
8.000	MS1162	45	TT25	S2160	—	MCC080001	—



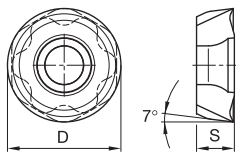
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Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	.E..LF	KC725M	.S..GF	KC725M	.S..HF	KC725M
P3-P4	.S..GF	KC522M	.S..GF	KC725M	.S..HF	KCPK30
P5-P6	.S..GF	KC522M	.S..HF	KCPK30	.S..HF	KCPK30
M1-M2	.E..LF	KC725M	.S..GF	KC725M	.S..HF	KC725M
M3	.E..LF	KC725M	.S..GF	KC725M	.S..HF	KCPK30
K1-K2	—	—	.S..HF	KCPK30	—	—
K3	—	—	.S..HF	KCPK30	—	—
N1-N2	—	—	—	—	—	—
N3	—	—	—	—	—	—
S1-S2	.E..LF	KC725M	.S..GF	KC725M	.S..HF	KC725M
S3	.E..LF	KC725M	.S..GF	KC725M	.S..HF	KC725M
S4	.E..LF	KC725M	.S..GF	KC725M	.S..HF	KC725M
H1	—	—	—	—	—	—

Indexable Round Inserts • KSRM

- ELF is the first choice for lower cutting forces to avoid built-up edge.
- SGF geometry for general purpose in roughing applications.
- SHF is the first choice for heavy duty applications.


 RCGT-LF
 RCGT-GF
 RCGT-HF


- first choice
- alternate choice

P	○	●	●	●
M	●	○	○	○
K	○	○	○	○
N	○	○	○	○
S	○	○	○	○
H	○	○	○	○

RCGT-LF

catalog number	D	S	hm	cutting edges	KC522M	KC715M	KC725M	KCPK30
RCGT86ELF	1.000	.375	.002	6	●	●	●	●

RCGT-GF

catalog number	D	S	hm	cutting edges	KC522M	KC715M	KC725M	KCPK30
RCGT86SGF	1.000	.375	.004	6	●	○	○	○

RCGT-HF

catalog number	D	S	hm	cutting edges	KC522M	KC715M	KC725M	KCPK30
RCGT86SHF	1.000	.375	.010	6	○	○	○	○



■ Recommended Starting Speeds [SFM]

Material Group		KC522M			KC715M			KC725M			KCPK30		
P	1	1300	1130	1060	1340	1180	1090	1030	900	840	1780	1560	1450
	2	1080	950	790	830	740	670	860	760	640	1100	1000	900
	3	1000	840	700	740	670	610	790	670	550	1000	900	820
	4	890	730	590	560	520	470	710	590	470	740	690	620
	5	730	660	590	770	680	620	590	530	470	1020	910	830
	6	650	490	400	470	410	—	520	400	310	620	540	—
M	1	800	710	650	880	770	710	670	590	540	820	720	620
	2	730	620	520	—	—	—	610	520	430	730	640	550
	3	550	480	370	—	—	—	460	400	310	570	520	460
K	1	900	820	720	—	—	—	—	—	—	1160	1050	940
	2	710	640	590	—	—	—	—	—	—	920	830	760
	3	590	530	480	—	—	—	—	—	—	770	690	640
N	1-2	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—
S	1	160	140	110	—	—	—	140	120	100	—	—	—
	2	160	140	110	—	—	—	140	120	100	—	—	—
	3	200	160	110	—	—	—	180	140	100	—	—	—
	4	280	200	140	—	—	—	240	180	120	—	—	—
H	1	—	—	—	—	—	—	—	—	—	—	—	—

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

■ Recommended Starting Feeds [IPT]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

At .500 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)														Insert Geometry	
	10%			20%			30%			40%			50-100%			
.E..LF	.004	.007	.013	.003	.005	.009	.002	.004	.008	.002	.004	.008	.002	.004	.008	.E..LF
.S..GF	.007	.017	.028	.005	.013	.020	.004	.011	.018	.004	.010	.016	.004	.010	.016	.S..GF
.S..HF	.007	.017	.028	.005	.013	.020	.004	.011	.018	.004	.010	.016	.004	.010	.016	.S..HF

At .250 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)														Insert Geometry	
	10%			20%			30%			40%			50-100%			
.E..LF	.004	.008	.015	.003	.006	.011	.003	.005	.009	.003	.005	.009	.002	.005	.009	.E..LF
.S..GF	.008	.020	.032	.006	.015	.023	.005	.013	.020	.005	.012	.019	.005	.012	.018	.S..GF
.S..HF	.008	.020	.032	.006	.015	.023	.005	.013	.020	.005	.012	.019	.005	.012	.018	.S..HF

At .125 Axial Depth of Cut (ap)

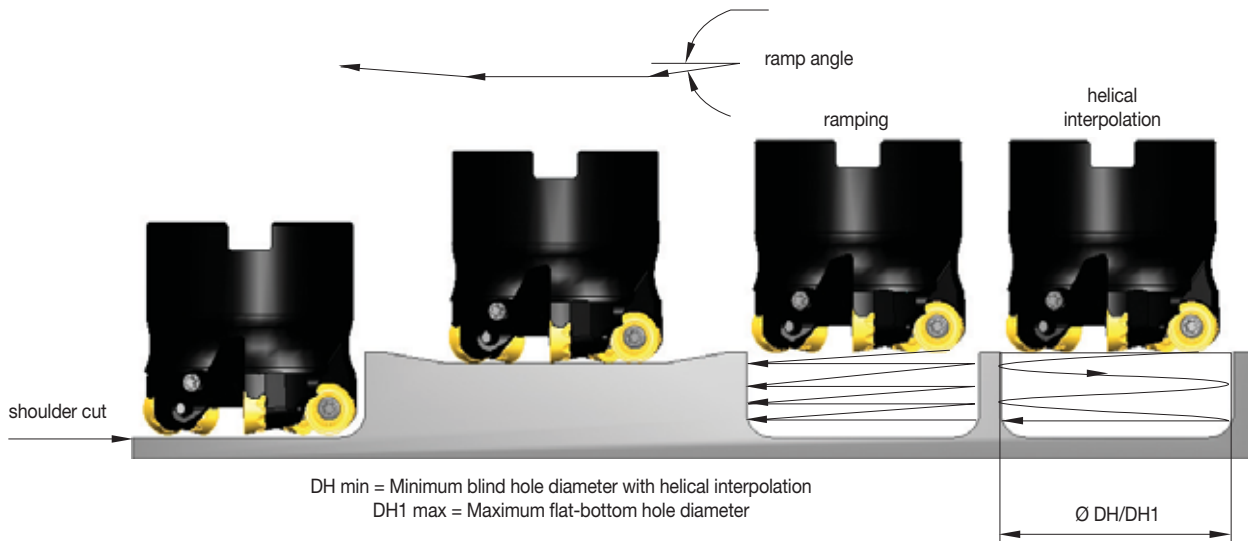
Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)														Insert Geometry	
	10%			20%			30%			40%			50-100%			
.E..LF	.005	.010	.019	.004	.008	.014	.004	.007	.012	.003	.006	.012	.003	.006	.011	.E..LF
.S..GF	.010	.026	.042	.008	.019	.031	.007	.017	.027	.006	.015	.025	.006	.015	.024	.S..GF
.S..HF	.010	.026	.042	.008	.019	.031	.007	.017	.027	.006	.015	.025	.006	.015	.024	.S..HF

At .063 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)														Insert Geometry	
	10%			20%			30%			40%			50-100%			
.E..LF	.007	.014	.027	.005	.011	.020	.005	.009	.017	.004	.009	.016	.004	.008	.015	.E..LF
.S..GF	.014	.036	.059	.010	.026	.042	.009	.023	.036	.008	.021	.034	.008	.021	.033	.S..GF
.S..HF	.014	.036	.059	.010	.026	.042	.009	.023	.036	.008	.021	.034	.008	.021	.033	.S..HF

NOTE: Use "Light Machining" values as starting feed rate.

Copy Mills



insert IC	catalog number	max ramp angle (ra) when hx = .005"	max ramp angle (ra) when hx = .020"	max plunge radial depth (ae) when hx = .020"	min hole diameter	max flat-bottom hole diameter	max hole diameter (no flat bottom)
RCGX86	BMD300R8603S075L200	1.35°	0.89°	0.690	4.622	5.004	6.000
RCGX86	BMD400R8605S125L250	1.27°	0.83°	0.721	6.576	7.004	8.000
RCGX86	BMD500R8606S150L250	1.17°	0.80°	0.741	8.526	9.004	10.000
RCGX86	BMD600R8607S150L250	1.08°	0.78°	0.762	10.485	11.004	12.000
RCGX86	BMD800R8608S250L250	0.92°	0.73°	0.790	14.424	15.004	16.000





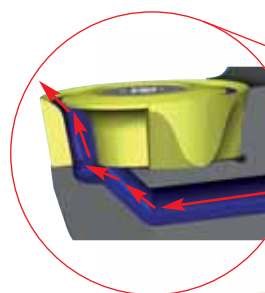
Beyond BLAST™ KSRM™ • Next Generation Round Inserts with Through Coolant

Primary Application

Specially developed for machining titanium. Beyond BLAST KSRM platform boosts your productivity with its new and revolutionary technology, PCT (Precision Coolant Technology), enabling consistent performance and providing outstanding metal removal rates and longer tool life.

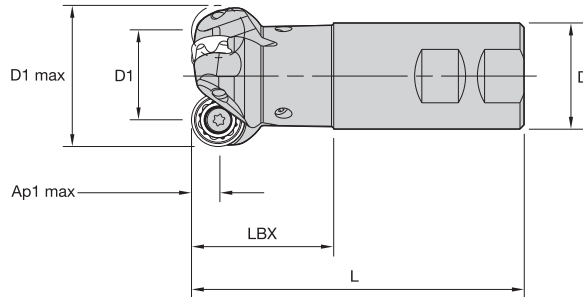
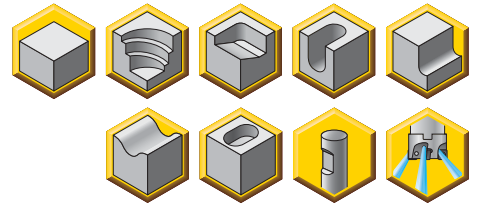
Features and Benefits

Platform Features	Benefits
Channeling coolant through the insert.	Increase productivity, tool life, and chip control.
Anti-rotation feature with six indexes.	Superior productivity and better insert utilization/cost per edge.
High positive topography with strong cutting edges.	Long tool life and better MRR.
High clearance on the cutters and inserts.	Able to convert all milling applications.



To learn more, [scan here](#).
For instructions on how to scan, please see page xxix.

- Use PCT technology, coolant through the insert.
- Engineered to provide the maximum performance in titanium machining.
- Anti-rotation feature enables up to six indexables rotations.
- Pocketing, ramping, plunging, and helical interpolations capabilities.



beyond BLAST™

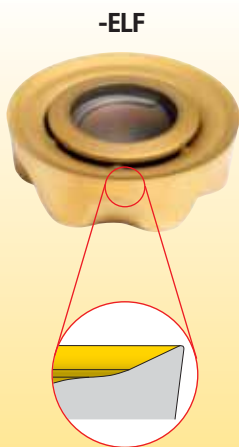
■ Weldon End Mills • Inch

order number	catalog number	D1 max	D1	D	L	LBX	Ap1 max	Z	max RPM	insert 1	lbs
4109182	KSRM200R64BB03W150L200	2.000	1.250	1.500	4.690	2.000	.375	3	20100	RCGX64_	2.06

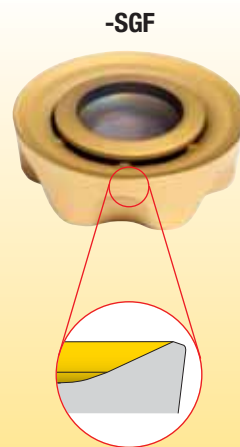
■ Spare Parts

D1 max	insert screw	in. lbs.	universal bit torque driver	drive bit
2.000	MS1162	45	KPTW45	BT25L50

Best-in-Class Performance Booster in Machining Titanium



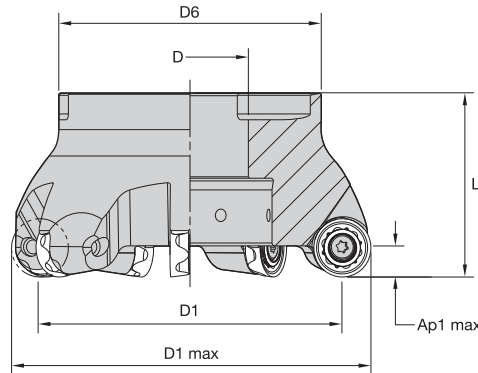
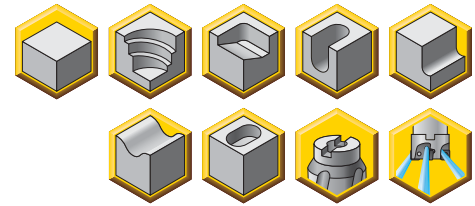
Geometry for light and medium machining



Geometry for medium and heavy machining

Copy Mills

- Use PCT technology, coolant through the insert.
- Engineered to provide the maximum performance in titanium machining.
- Anti-rotation feature enables up to six indexables rotations.
- Pocketing, ramping, plunging, and helical interpolations capabilities.

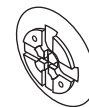
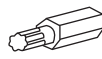


beyond BLAST™

■ Face Mills • Inch

order number	catalog number	D1 max	D1	D	D6	L	Ap1 max	Z	max RPM	insert 1	lbs
4109183	KSRM250R64BB04S075L200	2.500	1.750	.750	1.750	2.000	.375	4	17000	RCGX64_	1.08
4109184	KSRM300R64BB05S100L200	3.000	2.250	1.000	2.750	2.000	.375	5	15000	RCGX64_	2.24
4109185	KSRM400R64BB05S125L200	4.000	3.250	1.250	2.875	2.000	.375	5	12400	RCGX64_	3.20
4109186	KSRM400R64BB06S125L200	4.000	3.250	1.250	2.875	2.000	.375	6	12400	RCGX64_	3.23
4109187	KSRM500R64BB06S150L250	5.000	4.250	1.500	3.811	2.500	.375	6	10900	RCGX64_	6.77
4109188	KSRM500R64BB08S150L250	5.000	4.250	1.500	3.811	2.500	.375	8	10900	RCGX64_	6.80
4109189	KSRM600R64BB07S150L250	6.000	5.250	1.500	3.811	2.500	.375	7	9800	RCGX64_	9.28
4109190	KSRM600R64BB08S150L250	6.000	5.250	1.500	3.811	2.500	.375	8	9800	RCGX64_	9.22
4109191	KSRM800R64BB09S250L250	8.000	7.250	2.500	5.000	2.500	.375	9	8300	RCGX64_	12.08

■ Spare Parts



D1 max	insert screw	in. lbs.	universal bit torque driver	drive bit	coolant lock screw assembly	coolant shower plate assembly	socket-head cap screw with coolant groove
2.500	MS1162	45	KPTW45	BT25L50	—	—	S445CG
3.000	MS1162	45	KPTW45	BT25L50	—	—	S458CG
4.000	MS1162	45	KPTW45	BT25L50	S2162C	—	—
5.000	MS1162	45	KPTW45	BT25L50	S2163C	—	—
6.000	MS1162	45	KPTW45	BT25L50	S2163C	—	—
8.000	MS1162	45	KPTW45	BT25L50	—	MCC080001	—

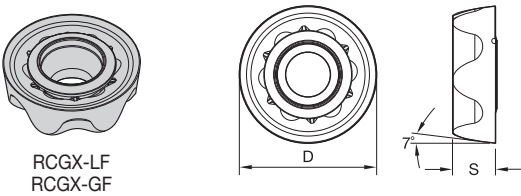
Copy Mills

■ Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	—	—	—	—	—	—
P3-P4	—	—	—	—	—	—
P5-P6	—	—	—	—	—	—
M1-M2	—	—	—	—	—	—
M3	—	—	—	—	—	—
K1-K2	—	—	—	—	—	—
K3	—	—	—	—	—	—
N1-N2	—	—	—	—	—	—
N3	—	—	—	—	—	—
S1-S2	—	—	—	—	—	—
S3	—	—	—	—	—	—
S4	.E..LF	KC725M	.S..GF	KC725M	.S..GF	KC725M
H1	—	—	—	—	—	—

Indexable Ground Insert • BB KSRM

- ELF geometry for lower cutting forces to avoid built-up edge.
- SGF in the first choice for higher chip load and heavy applications.



beyond BLAST™

- first choice
- alternate choice

P	■	■
M	■	■
K	■	■
N	■	■
S	■	●
H	■	■

■ RCGX-LF and -GF

catalog number	D	S	hm	cutting edges	
RCGX64ELF	.750	.250	.003	6	● KC725M
RCGX64SGF	.750	.250	.004	6	● KC725M

Copy Mills

■ Recommended Starting Speeds [SFM]

Material Group		KC725M		
P	1	—	—	—
	2	—	—	—
	3	—	—	—
	4	—	—	—
	5	—	—	—
	6	—	—	—
M	1	—	—	—
	2	—	—	—
	3	—	—	—
K	1	—	—	—
	2	—	—	—
	3	—	—	—
N	1	—	—	—
	2	—	—	—
S	1	—	—	—
	2	—	—	—
	3	—	—	—
	4	240	180	120
H	1	—	—	—
	2	—	—	—
	3	—	—	—

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

■ Recommended Starting Feeds [IPT]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

At .375 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.E..LF	.007	.014	.020	.005	.010	.015	.004	.009	.013	.004	.008	.012	.004	.008	.012	.E..LF
.S..GF	.007	.017	.028	.005	.013	.020	.004	.011	.018	.004	.010	.016	.004	.010	.016	.S..GF

At .188 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.E..LF	.008	.016	.024	.006	.012	.017	.005	.010	.015	.005	.010	.014	.005	.009	.014	.E..LF
.S..GF	.008	.020	.032	.006	.015	.023	.005	.013	.020	.005	.012	.019	.005	.012	.018	.S..GF

At .094 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.E..LF	.010	.021	.031	.008	.015	.023	.007	.013	.020	.006	.013	.019	.006	.012	.018	.E..LF
.S..GF	.010	.026	.042	.008	.019	.031	.007	.017	.027	.006	.015	.025	.006	.015	.024	.S..GF

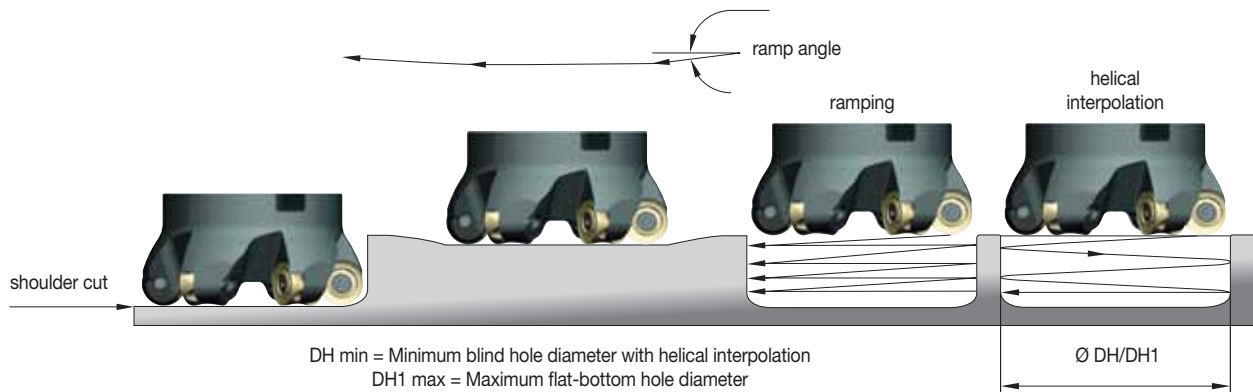
At .047 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.E..LF	.014	.029	.043	.010	.021	.031	.009	.018	.027	.008	.017	.025	.008	.017	.025	.E..LF
.S..GF	.014	.036	.059	.010	.026	.042	.009	.023	.036	.008	.021	.034	.008	.021	.033	.S..GF

NOTE: Use "Light Machining" values as starting feed rate.

Copy Mills

■ Ramping and Helical Interpolation Values from Solid

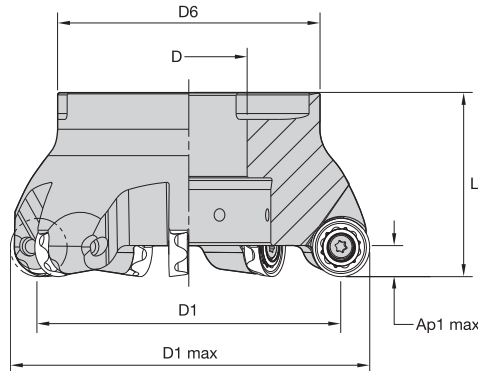
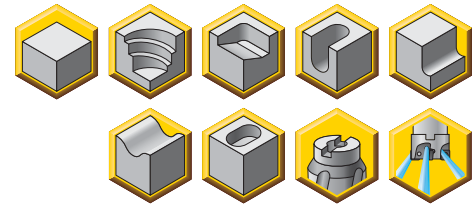


■ Round Insert RCGX64

insert IC	catalog number	max ramp angle	max ramp depth	max plunging depth	min hole diameter (DH min)	max flat-bottom hole diameter (DH1 max)	max diameter (no flat bottom)
RCGX64	KSRM200R64BB03W150L200	1.27°	0.025	0.045	2.989	3.253	4.000
RCGX64	KSRM250R64BB04S075L200	1.27°	0.035	0.058	3.939	4.253	5.000
RCGX64	KSRM300R64BB05S100L200	1.22°	0.044	0.068	4.904	5.253	6.000
RCGX64	KSRM400R64BB05S125L200	1.12°	0.060	0.084	6.850	7.253	8.000
RCGX64	KSRM400R64BB06S125L200	0.73°	0.039	0.083	6.921	7.253	8.000
RCGX64	KSRM500R64BB06S150L250	1.00°	0.071	0.094	8.818	9.253	10.000
RCGX64	KSRM500R64BB08S150L250	0.98°	0.069	0.092	8.823	9.253	10.000
RCGX64	KSRM600R64BB07S150L250	0.90°	0.079	0.101	10.795	11.253	12.000
RCGX64	KSRM600R64BB08S150L250	0.90°	0.079	0.100	10.796	11.253	12.000
RCGX64	KSRM800R64BB09S250L250	0.74°	0.091	0.111	14.766	15.253	16.000



- Use PCT technology, coolant through the insert.
- Engineered to provide the maximum performance in titanium machining.
- Anti-rotation feature enables up to six indexables rotations.
- Pocketing, ramping, plunging, and helical interpolations capabilities.

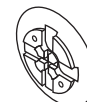
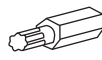


beyond BLAST™

■ Face Mills • Inch

order number	catalog number	D1 max	D1	D	D6	L	Ap1 max	Z	max RPM	insert 1	lbs
4109138	KSRM300R86BB03S075L200	3.000	2.000	.750	1.750	2.000	.500	3	15500	RCGX86_	1.30
4109139	KSRM400R86BB05S125L250	4.000	3.000	1.250	2.875	2.500	.500	5	12000	RCGX86_	3.76
4109140	KSRM500R86BB06S150L250	5.000	4.000	1.500	3.812	2.500	.500	6	9000	RCGX86_	6.22
4109141	KSRM600R86BB07S150L250	6.000	5.000	1.500	3.812	2.500	.500	7	8800	RCGX86_	8.47
4109142	KSRM800R86BB08S250L250	8.000	7.000	2.500	5.000	2.500	.500	8	8500	RCGX86_	11.21

■ Spare Parts



D1 max	insert screw	in. lbs.	universal bit torque driver	drive bit	coolant lock screw assembly	coolant shower plate assembly	socket-head cap screw with coolant groove
3.000	MS1162	45	KPTW45	BT25L50	—	—	S445CG
4.000	MS1162	45	KPTW45	BT25L50	S2164C	—	—
5.000	MS1162	45	KPTW45	BT25L50	S2163C	—	—
6.000	MS1162	45	KPTW45	BT25L50	S2163C	—	—
8.000	MS1162	45	KPTW45	BT25L50	—	MCC080001	—

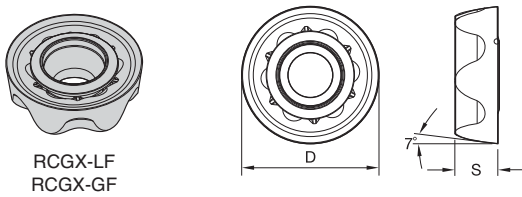
Copy Mills

■ Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	—	—	—	—	—	—
P3-P4	—	—	—	—	—	—
P5-P6	—	—	—	—	—	—
M1-M2	—	—	—	—	—	—
M3	—	—	—	—	—	—
K1-K2	—	—	—	—	—	—
K3	—	—	—	—	—	—
N1-N2	—	—	—	—	—	—
N3	—	—	—	—	—	—
S1-S2	—	—	—	—	—	—
S3	—	—	—	—	—	—
S4	.E..LF	KC725M	.S..GF	KC725M	.S..GF	KC725M
H1	—	—	—	—	—	—

Indexable Ground Insert • BB KSRM RCGX86...

- ELF geometry for lower cutting forces to avoid built-up edge.
- SGF in the first choice for higher chip load and heavy applications.



beyond BLAST™

- first choice
- alternate choice

P	■
M	■
K	■
N	■
S	●
H	■

■ RCGX-LF and -GF

catalog number	D	S	hm	cutting edges	
RCGX86ELF	1.000	.375	.003	6	●
RCGX86SGF	1.000	.375	.004	6	●

KC725M

Copy Mills

■ Recommended Starting Speeds [SFM]

Material Group		KC725M		
P	1	—	—	—
	2	—	—	—
	3	—	—	—
	4	—	—	—
	5	—	—	—
	6	—	—	—
M	1	—	—	—
	2	—	—	—
	3	—	—	—
K	1	—	—	—
	2	—	—	—
	3	—	—	—
N	1	—	—	—
	2	—	—	—
S	1	—	—	—
	2	—	—	—
	3	—	—	—
	4	240	180	120
H	1	—	—	—
	2	—	—	—
	3	—	—	—

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

■ Recommended Starting Feeds [IPT]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

At .500 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)														Insert Geometry	
	10%			20%			30%			40%			50-100%			
.E..LF	.007	.014	.020	.005	.010	.015	.004	.009	.013	.004	.008	.012	.004	.008	.012	.E..LF
.S..GF	.007	.017	.028	.005	.013	.020	.004	.011	.018	.004	.010	.016	.004	.010	.016	.S..GF

At .250 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)														Insert Geometry	
	10%			20%			30%			40%			50-100%			
.E..LF	.008	.016	.024	.006	.012	.017	.005	.010	.015	.005	.010	.014	.005	.009	.014	.E..LF
.S..GF	.008	.020	.032	.006	.015	.023	.005	.013	.020	.005	.012	.019	.005	.012	.018	.S..GF

At .125 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)														Insert Geometry	
	10%			20%			30%			40%			50-100%			
.E..LF	.010	.021	.031	.008	.015	.023	.007	.013	.020	.006	.013	.019	.006	.012	.018	.E..LF
.S..GF	.010	.026	.042	.008	.019	.031	.007	.017	.027	.006	.015	.025	.006	.015	.024	.S..GF

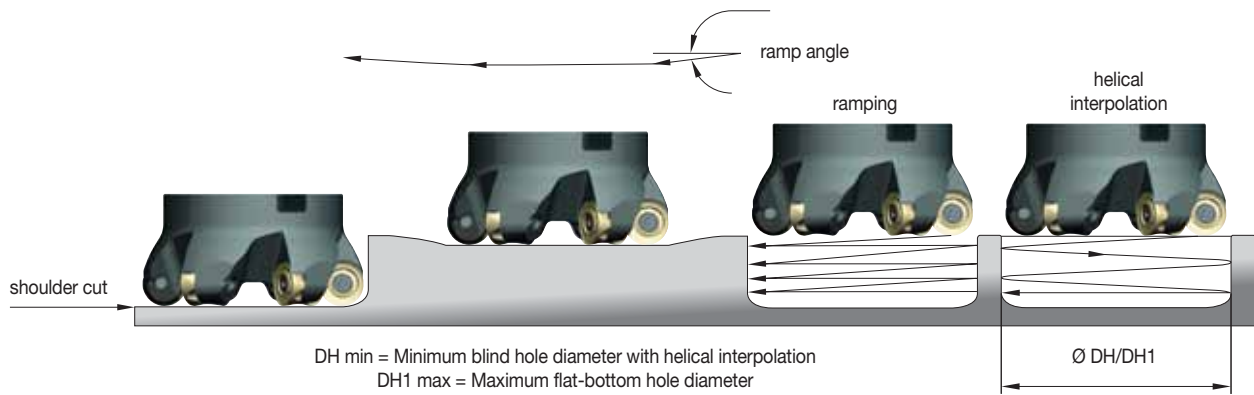
At .063 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)														Insert Geometry	
	10%			20%			30%			40%			50-100%			
.E..LF	.014	.029	.043	.010	.021	.031	.009	.018	.027	.008	.017	.025	.008	.017	.025	.E..LF
.S..GF	.014	.036	.059	.010	.026	.042	.009	.023	.036	.008	.021	.034	.008	.021	.033	.S..GF

NOTE: Use "Light Machining" values as starting feed rate.

Copy Mills

■ Ramping and Helical Interpolation Values from Solid



■ Round Insert RCGX86

insert IC	catalog number	max ramp angle	max ramp depth	max plunging depth	min hole diameter (DH min)	max flat-bottom hole diameter (DH1 max)	max diameter (no flat bottom)
RCGX86	KSRM300R86BB03S075L200	1.35°	0.043	0.072	4.606	5.004	6.000
RCGX86	KSRM400R86BB05S125L250	1.27°	0.062	0.093	6.528	7.004	8.000
RCGX86	KSRM500R86BB06S150L250	1.17°	0.076	0.108	8.477	9.004	10.000
RCGX86	KSRM600R86BB07S150L250	1.08°	0.089	0.120	10.438	11.004	12.000
RCGX86	KSRM800R86BB08S250L250	0.92°	0.108	0.136	10.388	11.004	12.000





KDMB™ and KDMT™ • Indexable Copy Insert Platform

Primary Application

Ball nose and toroidal styles for roughing and finishing operations. Engineered with the ultimate technologies and supported with a wide range of diameters and insert styles, this platform provides exceptional performance and productivity. The new High-Feed insert style provides the highest metal removal rates for roughing applications.

Features and Benefits

Longer Tool Life and Improved Geometries

- Longer tool life for finishing operations, up to 63 HRC.
- High-accuracy inserts and holders: overall runout .0004".
- Improved geometries for roughing and finishing operations.
- Smaller diameters from .25" to replace SCEM, setting a more productive machining process.

Superior Productivity

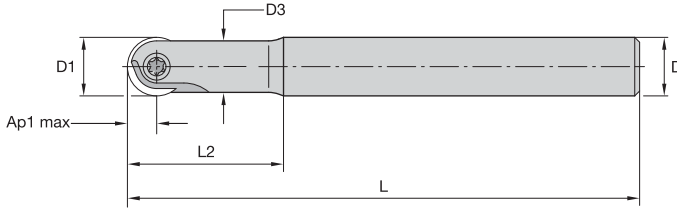
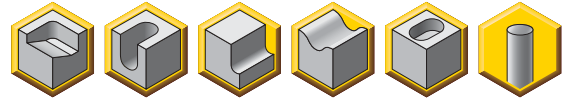
- Due to the new helical geometry, we obtain better surface quality.
- New ultra-grain grade for outstanding tool life.
- Diameters .250" and .312" natural replacement for SEM tools.
- Better cost per edge.

Usability and Flexibility

- Wide diameter range enables it to be applied across a wide range of machining conditions.
- Many workpiece materials are possible — from hardened steel to aluminum.
- Large holder style offering: screw-on, cylindrical, and tapered steel and carbide holders.



- Cutting diameter ranges from .375–1.250".
- Ball nose finishers for 3-dimensional applications.
- Suitable for roughing and finishing operations.



Necked End Mills • Steel Shank

order number	catalog number	D1	D	D3	L	L2	Ap1 max	Z	Z U	max ramp angle	max RPM	lbs	insert 1
2877812	KDMB0375R354A038SN	.375	.500	.335	3.543	1.378	.188	1	2	3.0°	40000	.07	KDMB0375..
2878434	KDMB0500R512A050SN	.500	.500	.413	5.120	1.260	.250	1	2	3.0°	40000	.22	KDMB0500..
2878433	KDMB0500R591A050SN	.500	.500	.413	5.906	1.810	.250	1	2	3.0°	40000	.22	KDMB0500..
2878435	KDMB0625R551A063SN	.625	.625	.551	5.512	1.420	.313	1	2	3.0°	40000	.44	KDMB0625..
2878436	KDMB0625R630A063SN	.625	.625	.551	6.299	2.090	.313	1	2	3.0°	40000	.44	KDMB0625..
2878437	KDMB0750R630A075SN	.750	.750	.709	6.281	1.753	.375	1	2	3.0°	40000	.88	KDMB0750..
2878438	KDMB0750R689A075SN	.750	.750	.709	6.890	2.362	.375	1	2	3.0°	40000	.88	KDMB0750..
2878439	KDMB0750R827A075SN	.750	.750	.709	8.268	2.360	.375	1	2	3.0°	40000	.99	KDMB0750..
2878440	KDMB1000R630A100SN	1.000	1.000	.882	6.299	1.770	.500	1	2	3.0°	40000	1.32	KDMB1000..
2878441	KDMB1000R748A100SN	1.000	1.000	.882	7.480	2.760	.500	1	2	3.0°	40000	1.54	KDMB1000..
2878442	KDMB1250R689A125SN	1.250	1.250	1.126	6.890	2.205	.625	1	2	3.0°	40000	2.20	KDMB1250..
2878443	KDMB1250R827A125SN	1.250	1.250	1.126	8.268	3.150	.625	1	2	3.0°	40000	2.57	KDMB1250..

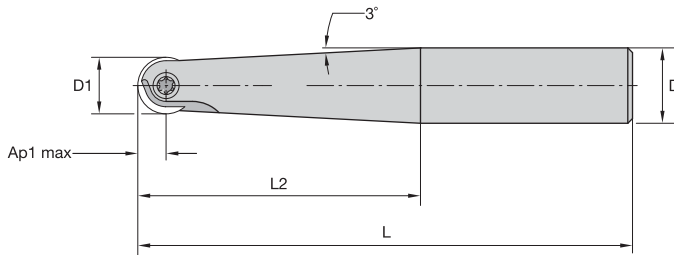
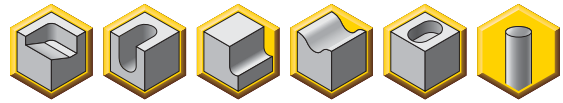
Spare Parts



D1	insert screw	in. lbs.	Torx wrench
.375	193.394	27	KT15
.500	193.393	35	KT20
.625	193.392	44	KT20
.750	193.391	53	KT20
1.000	193.390	58	KT30
1.250	193.389	58	KT30

Copy Mills

- Cutting diameter ranges from .312–1.250".
- Ball nose finishers for 3-dimensional milling applications.
- Suitable for roughing and finishing operations.
- Tapered version ideal for 5-axis applications.



■ Tapered End Mills • Steel Shank

order number	catalog number	D1	D	L	L2	Ap1 max	Z	Z U	max ramp angle	max RPM	lbs	insert 1
2878444	KDMB0312R551A031ST	.312	.500	5.510	1.970	.156	1	2	3.0°	40000	.25	KDMB0312..
2878445	KDMB0375R591A038ST	.375	.500	5.910	1.380	.188	1	2	3.0°	40000	.29	KDMB0375..
2878446	KDMB0500R630A050ST	.500	.625	6.300	2.360	.250	1	2	3.0°	40000	.47	KDMB0500..
2878447	KDMB0625R689A063ST	.625	.750	6.890	2.640	.313	1	2	3.0°	40000	.76	KDMB0625..
2878448	KDMB0750R748A075ST	.750	1.000	7.480	3.150	.375	1	2	3.0°	40000	1.41	KDMB0750..
2878449	KDMB1000R827A100ST	1.000	1.476	8.270	3.940	.500	1	2	3.0°	40000	2.45	KDMB1000..
2878450	KDMB1250R945A125ST	1.250	1.500	9.450	4.840	.625	1	2	3.0°	40000	3.82	KDMB1250..

■ Spare Parts



insert screw



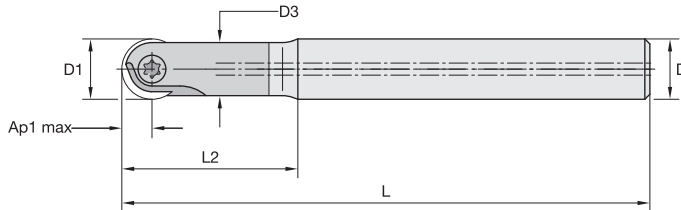
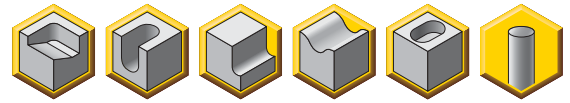
Torx wrench

D1	insert screw	in. lbs.	Torx wrench
.313	193.395	18	KT8
.375	193.394	27	KT15
.500	193.393	35	KT20
.625	193.392	44	KT20
.750	193.391	53	KT20
1.000	193.390	58	KT30
1.250	193.389	58	KT30



Copy Mills

- Cutting diameter ranges from .250–1.250".
- Ball nose finishers for 3-dimensional milling applications.
- Suitable for roughing and finishing operations.



Necked End Mills • Carbide Shank

order number	catalog number	D1	D	D3	L	L2	Ap1 max	Z Z U	coolant supply	max ramp angle	max RPM	insert 1
4177170	KDMB025R394A025HN	.250	.250	.211	3.937	1.575	.125	1 2	No	3.0°	40000	KDMB0250..
4177171	KDMB025R591A025HN	.250	.250	.211	5.906	2.756	.125	1 2	No	3.0°	40000	KDMB0250..
4177172	KDMB025R788A025HN	.250	.250	.211	7.874	3.937	.125	1 2	No	3.0°	40000	KDMB0250..
4177243	KDMB025R788A025HNS	.250	.250	.211	7.874	.551	.125	1 2	No	3.0°	40000	KDMB0250..
4177167	KDMB025R394A038HN	.250	.375	.213	3.937	1.599	.125	1 2	No	3.0°	40000	KDMB0250..
4177244	KDMB0312R788A031HN	.312	.312	.276	7.874	3.955	.156	1 2	No	3.0°	40000	KDMB0312..
4177168	KDMB0312R394A038HN	.312	.375	.276	3.937	1.032	.156	1 2	No	3.0°	40000	KDMB0312..
4177169	KDMB0312R591A038HN	.312	.375	.276	5.906	1.623	.156	1 2	No	3.0°	40000	KDMB0312..
2879403	KDMB0375R472A038HNC	.375	.375	.350	4.730	1.310	.375	1 2	Yes	3.0°	30000	KDMB0375..
2879404	KDMB0375R591A038HNC	.375	.375	.350	5.910	1.900	.188	1 2	Yes	3.0°	30000	KDMB0375..
2879405	KDMB0500R472A050HNC	.500	.500	.420	4.730	1.392	.188	1 2	Yes	3.0°	40000	KDMB0500..
2879406	KDMB0500R630A050HNC	.500	.500	.420	6.300	1.982	.313	1 2	Yes	3.0°	40000	KDMB0500..
2879407	KDMB0625R551A063HNC	.625	.625	.560	5.520	1.572	.313	1 2	Yes	3.0°	40000	KDMB0625..
2879408	KDMB0625R689A063HNC	.625	.625	.560	6.890	2.163	.250	1 2	Yes	3.0°	40000	KDMB0625..
2879409	KDMB0750R551A075HNC	.750	.750	.710	5.520	1.950	.250	1 2	Yes	3.0°	40000	KDMB0750..
2879410	KDMB0750R827A075HNC	.750	.750	.710	8.270	2.362	.500	1 2	Yes	3.0°	40000	KDMB0750..
2879411	KDMB1000R630A100HNC	1.000	1.000	.890	6.307	2.370	.375	1 2	Yes	3.0°	30000	KDMB1000..
2879412	KDMB1000R906A100HNC	1.000	1.000	.890	8.270	3.539	.500	1 2	Yes	3.0°	30000	KDMB1000..
2879413	KDMB1250R748A125HNC	1.250	1.250	1.130	7.480	2.554	.625	1 2	Yes	3.0°	30000	KDMB1250..
2879414	KDMB1250R945A125HNC	1.250	1.250	1.130	9.450	4.129	.625	1 2	Yes	3.0°	30000	KDMB1250..

Spare Parts


 insert
screw

 Torx
wrench

D1	insert screw	in. lbs.	Torx wrench
.250	MS2236	18	KT6
.312	193.395	18	KT8
.375	193.394	27	KT15
.500	193.393	35	KT20
.625	193.392	44	KT20
.750	193.391	53	KT20
1.000	193.390	58	KT30
1.250	193.389	58	KT30

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■ Insert Selection Guide

KDDB Ball Nose Platform • .250"

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	.E..GP	KC515M	.E..GP	KC515M	.E..GP	KC515M
P3-P4	.E..GP	KC515M	.E..GP	KC515M	.E..GP	KC515M
P5-P6	.E..GP	KC515M	.E..GP	KC515M	.E..GP	KC515M
M1-M2	.E..GP	KC515M	.E..GP	KC515M	—	—
M3	.E..GP	KC515M	.E..GP	KC515M	—	—
K1-K2	.E..GP	KC515M	.E..GP	KC515M	—	—
K3	.E..GP	KC515M	.E..GP	KC515M	—	—
N1-N2	.E..LD	K115M	.E..LD	K115M	—	—
N3	.E..LD	K115M	.E..LD	K115M	—	—
S1-S2	—	—	—	—	—	—
S3	—	—	—	—	—	—
S4	—	—	.E..GP	KC515M	—	—
H1	.E..GP	KC515M	.E..GP	KC515M	—	—

KDDB Ball Nose Platform • .312"

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	.E..GP	KC515M	.E..GP	KC515M	.E..GP	KC515M
P3-P4	.E..GP	KC505M	.E..GP	KC515M	.E..GP	KC515M
P5-P6	.E..GP	KC505M	.E..GP	KC515M	.E..GP	KC515M
M1-M2	.E..GP	KC515M	.E..GP	KC515M	—	—
M3	.E..GP	KC515M	.E..GP	KC515M	—	—
K1-K2	.E..GP	KC515M	—	—	—	—
K3	.E..GP	KC515M	—	—	—	—
N1-N2	.E..LD	K115M	.E..LD	K115M	—	—
N3	.E..LD	K115M	.E..LD	K115M	—	—
S1-S2	—	—	—	—	—	—
S3	—	—	—	—	—	—
S4	.E..LD	K115M	.E..GP	KC515M	—	—
H1	.E..GP	KC505M	.E..GP	KC505M	.E..GP	KC515M

KDDB Ball Nose Platform • .375"

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	.E..GP	KC515M	.E..GP	KC515M	.E..GP	KC515M
P3-P4	.E..GP	KC505M	.E..GP	KC515M	.E..GP	KC515M
P5-P6	.E..GP	KC505M	.E..GP	KC515M	.E..GP	KC515M
M1-M2	.E..GP	KC515M	.E..GP	KC515M	—	—
M3	.E..GP	KC515M	.E..GP	KC515M	—	—
K1-K2	.E..GP	KC515M	.E..GP	KC515M	—	—
K3	.E..GP	KC515M	.E..GP	KC515M	—	—
N1-N2	.E..LD	K115M	.E..LD	K115M	—	—
N3	.E..LD	K115M	.E..LD	K115M	—	—
S1-S2	—	—	—	—	—	—
S3	—	—	—	—	—	—
S4	.E..LD	K115M	.E..GP	KC515M	—	—
H1	.E..GP	KC505M	.E..GP	KC505M	.E..GP	KC515M

KDDB Ball Nose Platform • .500"

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	.E..GP	KC515M	.E..GP	KC515M	.E..HC	KC530M
P3-P4	.E..GP	KC505M	.E..GP	KC515M	.E..HC	KC530M
P5-P6	.E..GP	KC505M	.E..GP	KC515M	.E..HC	KC530M
M1-M2	.E..GP	KC515M	.E..HC	KC530M	.E..HC	KC530M
M3	.E..GP	KC515M	.E..HC	KC530M	.E..HC	KC530M
K1-K2	.E..GP	KC515M	.E..GN	KC515M	.E..GN	KC515M
K3	.E..GP	KC515M	.E..GN	KC515M	.E..GN	KC515M
N1-N2	.E..LD	K115M	.E..LD	K115M	—	—
N3	.E..LD	K115M	.E..LD	K115M	—	—
S1-S2	—	—	—	—	—	—
S3	—	—	—	—	—	—
S4	.E..LD	K115M	.E..GP	KC515M	.E..HC	KC530M
H1	.E..GP	KC505M	.E..GP	KC505M	.E..GN	KC515M

KDDB Ball Nose Platform • .625"

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	.E..GP	KC515M	.E..GP	KC515M	.E..HC	KC530M
P3-P4	.E..GP	KC505M	.E..GP	KC515M	.E..HC	KC530M
P5-P6	.E..GP	KC505M	.E..GP	KC515M	.E..HC	KC530M
M1-M2	.E..GP	KC515M	.E..HC	KC530M	.E..HC	KC530M
M3	.E..GP	KC515M	.E..HC	KC530M	.E..HC	KC530M
K1-K2	.E..GP	KC515M	.E..GP	KC515M	—	—
K3	.E..GP	KC515M	.E..GP	KC515M	—	—
N1-N2	.E..LD	K115M	.E..LD	K115M	—	—
N3	.E..LD	K115M	.E..LD	K115M	—	—
S1-S2	—	—	—	—	—	—
S3	—	—	—	—	—	—
S4	.E..LD	K115M	.E..GP	KC515M	.E..HC	KC530M
H1	.E..GP	KC505M	.E..GP	KC505M	.E..GP	KC515M

KDDB Ball Nose Platform • .750"

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	.E..GP	KC515M	.E..GP	KC515M	.E..HC	KC530M
P3-P4	.E..GP	KC505M	.E..GP	KC515M	.E..HC	KC530M
P5-P6	.E..GP	KC505M	.E..GP	KC515M	.E..HC	KC530M
M1-M2	.E..GP	KC515M	.E..HC	KC530M	.E..HC	KC530M
M3	.E..GP	KC515M	.E..HC	KC530M	.E..HC	KC530M
K1-K2	.E..GP	KC515M	.E..GN	KC515M	.E..GN	KC515M
K3	.E..GP	KC515M	.E..GN	KC515M	.E..GN	KC515M
N1-N2	.E..LD	K115M	.E..LD	K115M	—	—
N3	.E..LD	K115M	.E..LD	K115M	—	—
S1-S2	—	—	—	—	—	—
S3	—	—	—	—	—	—
S4	.E..LD	K115M	.E..GP	KC515M	.E..HC	KC530M
H1	.E..GP	KC505M	.E..GP	KC505M	.E..GN	KC515M

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Insert Selection Guide
KDMB Ball Nose Platform • 1.00"

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	.E..GP	KC515M	.E..GP	KC515M	.E..HC	KC530M
P3-P4	.E..GP	KC505M	.E..GP	KC515M	.E..HC	KC530M
P5-P6	.E..GP	KC505M	.E..GP	KC515M	.E..HC	KC530M
M1-M2	.E..GP	KC515M	.E..HC	KC530M	.E..HC	KC530M
M3	.E..GP	KC515M	.E..HC	KC530M	.E..HC	KC530M
K1-K2	.E..GP	KC515M	.E..GN	KC515M	.E..GN	KC515M
K3	.E..GP	KC515M	.E..GN	KC515M	.E..GN	KC515M
N1-N2	.E..LD	K115M	.E..LD	K115M	—	—
N3	.E..LD	K115M	.E..LD	K115M	—	—
S1-S2	—	—	—	—	—	—
S3	—	—	—	—	—	—
S4	.E..LD	K115M	.E..GP	KC515M	.E..HC	KC530M
H1	.E..GP	KC505M	.E..GP	KC505M	.E..GN	KC515M

KDMB Ball Nose Platform • 1.25"

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	.E..GP	KC515M	.E..GP	KC515M	.E..GP	KC515M
P3-P4	.E..GP	KC505M	.E..GP	KC515M	.E..GP	KC515M
P5-P6	.E..GP	KC505M	.E..GP	KC515M	.E..GP	KC515M
M1-M2	.E..GP	KC515M	.E..GP	KC515M	—	—
M3	.E..GP	KC515M	.E..GP	KC515M	—	—
K1-K2	.E..GP	KC515M	—	—	—	—
K3	.E..GP	KC515M	—	—	—	—
N1-N2	.E..LD	K115M	.E..LD	K115M	—	—
N3	.E..LD	K115M	.E..LD	K115M	—	—
S1-S2	—	—	—	—	—	—
S3	—	—	—	—	—	—
S4	.E..LD	K115M	.E..GP	KC515M	—	—
H1	.E..GP	KC505M	.E..GP	KC505M	.E..GP	KC515M

Insert Style
HC Geometry:

PSTS geometry with chipbreaker for roughing. Semi-finishing and rest material of steel, cast steel, and high-temperature alloys.

GP Geometry:

High-precision insert with helical geometry for semi-finishing and finishing of steel up to 63 HRC, cast steel, and high-temperature alloys.

GN Geometry:

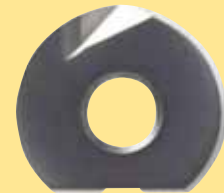
Geometry with extremely solid cutting edge for roughing cast steel, high-temperature alloys, and hardened steel up to 60 HRC.



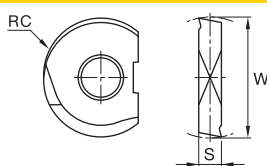
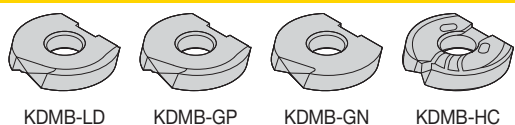
roughing, rest material



semi-finishing, finishing



finishing



● first choice
○ alternate choice

P	●	●	●	●
M	○	○	○	○
K	○	○	○	○
N	○	○	○	○
S	○	○	○	○
H	○	○	○	○

■ **KDMB-LD • High-Precision Positive Geometry • Non-Ferrous and Titanium**

catalog number	W	S	RC	hm	K115M	KC505M	KC515M	KC530M
KDMB0250M0ERLD	.250	.063	.125	.002	●			
KDMB0312M0ERLD	.313	.079	.156	.002	●			
KDMB0375M0ERLD	.375	.098	.188	.002	●			
KDMB0500M0ERLD	.500	.098	.250	.002	●			
KDMB0625M0ERLD	.625	.118	.313	.002	●			
KDMB0750M0ERLD	.750	.118	.375	.002	●			
KDMB1000M0ERLD	1.000	.158	.500	.002	●			
KDMB1250M0ERLD	1.250	.197	.625	.002	●			

■ **KDMB-GP • High-Precision Helical Geometry and Lower Cutting Forces**

catalog number	W	S	RC	hm	K115M	KC505M	KC515M	KC530M
KDMB0250M0ERGP	.250	.063	.125	.002			●	
KDMB0312M0ERGP	.312	.079	.156	.002		●		
KDMB0375M0ERGP	.375	.098	.188	.002		●	●	
KDMB0500M0ERGP	.500	.098	.250	.002		●	●	
KDMB0625M0ERGP	.625	.118	.313	.002		●	●	
KDMB0750M0ERGP	.750	.118	.375	.002		●	●	
KDMB1000M0ERGP	1.000	.158	.500	.002		●	●	
KDMB1250M0ERGP	1.250	.197	.625	.002		●	●	

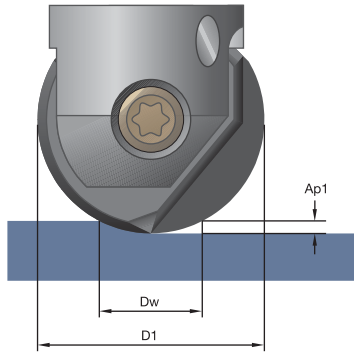
■ **KDMB-GN • High Precision • Extremely Solid Cutting Edge**

catalog number	W	S	RC	hm	K115M	KC505M	KC515M	KC530M
KDMB0500M0ERGN	.500	.098	.250	.003			●	
KDMB0750M0ERGN	.750	.118	.375	.003			●	
KDMB1000M0ERGN	1.000	.158	.500	.003			●	

■ **KDMB-HC • PSTS Insert Developed • Roughing and Rest Material Operations**

catalog number	W	S	RC	hm	K115M	KC505M	KC515M	KC530M
KDMB0500M0ERHC	.500	.098	.250	.004				●
KDMB0625M0ERHC	.625	.118	.313	.004				●
KDMB0750M0ERHC	.750	.118	.375	.004				●
KDMB1000M0ERHC	1.000	.158	.500	.004				●

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■ KDMB Ball Nose • .250"

D1 max	Working Diameter (Dw) at Axial Depth of Cut (ap)			
	0.125	0.050	0.025	0.013
0.250	0.250	0.200	0.150	0.109

■ KDMB Ball Nose • .312"

D1 max	Working Diameter (Dw) at Axial Depth of Cut (ap)			
	0.156	0.047	0.031	0.016
0.313	0.313	0.223	0.188	0.136

■ KDMB Ball Nose • .375"

D1 max	Working Diameter (Dw) at Axial Depth of Cut (ap)			
	0.188	0.056	0.038	0.019
0.375	0.375	0.268	0.225	0.163

■ KDMB Ball Nose • .500"

D1 max	Working Diameter (Dw) at Axial Depth of Cut (ap)			
	0.250	0.075	0.050	0.025
0.500	0.500	0.357	0.300	0.218

■ KDMB Ball Nose • .625"

D1 max	Working Diameter (Dw) at Axial Depth of Cut (ap)			
	0.313	0.094	0.063	0.031
0.625	0.625	0.446	0.375	0.272

■ KDMB Ball Nose • .750"

D1 max	Working Diameter (Dw) at Axial Depth of Cut (ap)			
	0.375	0.113	0.075	0.038
0.750	0.750	0.536	0.450	0.327

■ KDMB Ball Nose • 1.00"

D1 max	Working Diameter (Dw) at Axial Depth of Cut (ap)			
	0.500	0.150	0.100	0.050
1.000	1.000	0.714	0.600	0.436

■ KDMB Ball Nose • 1.25"

D1 max	Working Diameter (Dw) at Axial Depth of Cut (ap)			
	0.625	0.188	0.125	0.063
1.250	1.250	0.893	0.750	0.545

NOTE: Working diameter (Dw) or effective diameter has to be considered when calculating appropriate RPM.

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■ Recommended Starting Speeds [SFM]

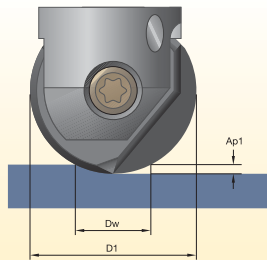
Material Group		K115M			KC505M			KC515M			KC530M		
P	1	—	—	—	—	—	—	1080	960	840	900	780	660
	2	—	—	—	—	—	—	1020	900	780	780	660	540
	3	—	—	—	—	—	—	900	780	660	660	600	540
	4	—	—	—	1180	860	710	780	660	540	600	540	480
	5	—	—	—	1180	860	710	660	540	420	540	480	420
	6	—	—	—	1140	780	620	540	420	360	420	360	300
M	1	—	—	—	—	—	—	1080	900	780	900	720	600
	2	—	—	—	—	—	—	900	720	540	600	480	420
	3	—	—	—	—	—	—	720	600	480	480	420	360
K	1	720	600	480	—	—	—	1440	1080	720	—	—	—
	2	600	480	360	—	—	—	1080	840	600	—	—	—
	3	360	300	240	—	—	—	480	360	240	—	—	—
N	1-2	1440	1080	720	—	—	—	—	—	—	—	—	—
	3	960	720	600	—	—	—	—	—	—	—	—	—
S	1	—	—	—	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—
	4	300	230	160	—	—	—	—	—	—	260	200	170
H	1	—	—	—	860	670	550	550	400	310	260	200	170

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

Calculating Working Diameter and Resulting Surface Speed

Case 1:

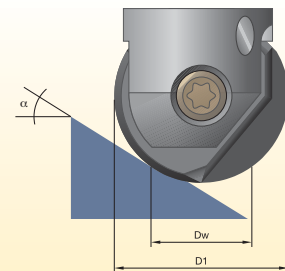
It is important to consider the effective diameter (Dw) when using light depths of cut in order to properly calculate RPM values. Use the following formula when machining flat surfaces or inclinations of 10° or less to find the Dw value. Then, use this for RPM calculations, as opposed to using the overall insert diameter (D1).



$$Dw = \sqrt{D1^2 - (D1 - 2Ap1)^2}$$

Case 2:

When machining inclinations between 11° and 55°, further modification of vc is required. Apply factor “k” from the given formula to calculate the correct vc (vceff). This corrected value is then used to calculate the proper RPM for the tool.



$$k = \frac{1}{\sin [\alpha + \arccos (1 - (2 (Ap1/D1)))]}$$

$$vceff = vc \times k$$



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■ Recommended Starting Feeds [IPT] • Ball Nose Insert Size .250"

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

At .125 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.E..LD	.005	.007	.012	.004	.005	.009	.003	.004	.008	.003	.004	.007	.003	.004	.007	.E..LD
.E..GP	.005	.007	.012	.004	.005	.009	.003	.004	.008	.003	.004	.007	.003	.004	.007	.E..GP

At .050 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.E..LD	.006	.008	.015	.004	.006	.011	.004	.005	.010	.004	.005	.009	.004	.005	.009	.E..LD
.E..GP	.006	.008	.015	.004	.006	.011	.004	.005	.010	.004	.005	.009	.004	.005	.009	.E..GP

At .025 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.E..LD	.008	.011	.020	.006	.008	.015	.005	.007	.013	.005	.007	.012	.005	.007	.012	.E..LD
.E..GP	.008	.011	.020	.006	.008	.015	.005	.007	.013	.005	.007	.012	.005	.007	.012	.E..GP

At .013 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.E..LD	.011	.016	.028	.008	.012	.020	.007	.010	.018	.007	.009	.016	.006	.009	.016	.E..LD
.E..GP	.011	.016	.028	.008	.012	.020	.007	.010	.018	.007	.009	.016	.006	.009	.016	.E..GP

NOTE: Use "Light Machining" values as starting feed rate.



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■ Recommended Starting Feeds [IPT] • Ball Nose Insert Size .312"

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

At .156 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.E..LD	.005	.007	.012	.004	.005	.009	.003	.004	.008	.003	.004	.007	.003	.004	.007	.E..LD
.E..GP	.005	.007	.012	.004	.005	.009	.003	.004	.008	.003	.004	.007	.003	.004	.007	.E..GP

At .047 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.E..LD	.007	.009	.017	.005	.007	.012	.004	.006	.011	.004	.006	.010	.004	.006	.010	.E..LD
.E..GP	.007	.009	.017	.005	.007	.012	.004	.006	.011	.004	.006	.010	.004	.006	.010	.E..GP

At .031 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.E..LD	.008	.011	.020	.006	.008	.015	.005	.007	.013	.005	.007	.012	.005	.007	.012	.E..LD
.E..GP	.008	.011	.020	.006	.008	.015	.005	.007	.013	.005	.007	.012	.005	.007	.012	.E..GP

At .016 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.E..LD	.011	.016	.028	.008	.012	.020	.007	.010	.018	.007	.009	.016	.006	.009	.016	.E..LD
.E..GP	.011	.016	.028	.008	.012	.020	.007	.010	.018	.007	.009	.016	.006	.009	.016	.E..GP

NOTE: Use "Light Machining" values as starting feed rate.



Copy Mills

■ Recommended Starting Feeds [IPT] • Ball Nose Insert Size .375"

Light Machining	General Purpose	Heavy Machining
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At .188 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.E..LD	.005	.007	.012	.004	.005	.009	.003	.004	.008	.003	.004	.007	.003	.004	.007	.E..LD
.E..GP	.005	.007	.012	.004	.005	.009	.003	.004	.008	.003	.004	.007	.003	.004	.007	.E..GP

At .056 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.E..LD	.007	.009	.017	.005	.007	.012	.004	.006	.011	.004	.006	.010	.004	.006	.010	.E..LD
.E..GP	.007	.009	.017	.005	.007	.012	.004	.006	.011	.004	.006	.010	.004	.006	.010	.E..GP

At .038 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.E..LD	.008	.011	.020	.006	.008	.015	.005	.007	.013	.005	.007	.012	.005	.007	.012	.E..LD
.E..GP	.008	.011	.020	.006	.008	.015	.005	.007	.013	.005	.007	.012	.005	.007	.012	.E..GP

At .019 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.E..LD	.011	.016	.028	.008	.012	.020	.007	.010	.018	.007	.009	.016	.006	.009	.016	.E..LD
.E..GP	.011	.016	.028	.008	.012	.020	.007	.010	.018	.007	.009	.016	.006	.009	.016	.E..GP

NOTE: Use "Light Machining" values as starting feed rate.



Copy Mills

■ Recommended Starting Feeds [IPT] • Ball Nose Insert Size .500"

Light Machining	General Purpose	Heavy Machining
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At .250 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.E..LD	.005	.007	.012	.004	.005	.009	.003	.004	.008	.003	.004	.007	.003	.004	.007	.E..LD
.E..GP	.005	.007	.012	.004	.005	.009	.003	.004	.008	.003	.004	.007	.003	.004	.007	.E..GP
.E..GN	.007	.010	.018	.005	.008	.013	.004	.007	.011	.004	.006	.011	.004	.006	.011	.E..GN
.E..HC	.007	.014	.024	.005	.010	.018	.004	.009	.015	.004	.008	.014	.004	.008	.014	.E..HC

At .075 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.E..LD	.007	.009	.017	.005	.007	.012	.004	.006	.011	.004	.006	.010	.004	.006	.010	.E..LD
.E..GP	.007	.009	.017	.005	.007	.012	.004	.006	.011	.004	.006	.010	.004	.006	.010	.E..GP
.E..GN	.009	.014	.025	.007	.011	.019	.006	.009	.016	.006	.009	.015	.006	.008	.015	.E..GN
.E..HC	.009	.019	.034	.007	.014	.025	.006	.012	.021	.006	.011	.020	.006	.011	.020	.E..HC

At .050 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.E..LD	.008	.011	.020	.006	.008	.015	.005	.007	.013	.005	.007	.012	.005	.007	.012	.E..LD
.E..GP	.008	.011	.020	.006	.008	.015	.005	.007	.013	.005	.007	.012	.005	.007	.012	.E..GP
.E..GN	.011	.017	.030	.008	.013	.022	.007	.011	.019	.007	.010	.018	.007	.010	.018	.E..GN
.E..HC	.011	.023	.041	.008	.017	.030	.007	.015	.026	.007	.014	.024	.007	.013	.023	.E..HC

At .025 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.E..LD	.011	.016	.028	.008	.012	.020	.007	.010	.018	.007	.009	.016	.006	.009	.016	.E..LD
.E..GP	.011	.016	.028	.008	.012	.020	.007	.010	.018	.007	.009	.016	.006	.009	.016	.E..GP
.E..GN	.016	.024	.042	.012	.017	.031	.010	.015	.026	.009	.014	.025	.009	.014	.024	.E..GN
.E..HC	.016	.032	.057	.012	.023	.041	.010	.020	.035	.009	.019	.033	.009	.018	.032	.E..HC

NOTE: Use "Light Machining" values as starting feed rate.



Copy Mills

■ Recommended Starting Feeds [IPT] • Ball Nose Insert Size .625"

Light Machining	General Purpose	Heavy Machining
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At .313 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.E..LD	.005	.007	.012	.004	.005	.009	.003	.004	.008	.003	.004	.007	.003	.004	.007	.E..LD
.E..GP	.005	.007	.012	.004	.005	.009	.003	.004	.008	.003	.004	.007	.003	.004	.007	.E..GP
.E..HC	.007	.014	.024	.005	.010	.018	.004	.009	.015	.004	.008	.014	.004	.008	.014	.E..HC

At .094 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.E..LD	.007	.009	.017	.005	.007	.012	.004	.006	.011	.004	.006	.010	.004	.006	.010	.E..LD
.E..GP	.007	.009	.017	.005	.007	.012	.004	.006	.011	.004	.006	.010	.004	.006	.010	.E..GP
.E..HC	.009	.019	.034	.007	.014	.025	.006	.012	.021	.006	.011	.020	.006	.011	.020	.E..HC

At .063 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.E..LD	.008	.011	.020	.006	.008	.015	.005	.007	.013	.005	.007	.012	.005	.007	.012	.E..LD
.E..GP	.008	.011	.020	.006	.008	.015	.005	.007	.013	.005	.007	.012	.005	.007	.012	.E..GP
.E..HC	.011	.023	.041	.008	.017	.030	.007	.015	.026	.007	.014	.024	.007	.013	.023	.E..HC

At .031 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.E..LD	.011	.016	.028	.008	.012	.020	.007	.010	.018	.007	.009	.016	.006	.009	.016	.E..LD
.E..GP	.011	.016	.028	.008	.012	.020	.007	.010	.018	.007	.009	.016	.006	.009	.016	.E..GP
.E..HC	.016	.032	.057	.012	.023	.041	.010	.020	.035	.009	.019	.033	.009	.018	.032	.E..HC

NOTE: Use "Light Machining" values as starting feed rate.



Copy Mills

■ Recommended Starting Feeds [IPT] • Ball Nose Insert Size .750"

Light Machining	General Purpose	Heavy Machining
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At .375 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.E..LD	.005	.007	.012	.004	.005	.009	.003	.004	.008	.003	.004	.007	.003	.004	.007	.E..LD
.E..GP	.005	.007	.012	.004	.005	.009	.003	.004	.008	.003	.004	.007	.003	.004	.007	.E..GP
.E..GN	.007	.010	.018	.005	.008	.013	.004	.007	.011	.004	.006	.011	.004	.006	.011	.E..GN
.E..HC	.007	.014	.024	.005	.010	.018	.004	.009	.015	.004	.008	.014	.004	.008	.014	.E..HC

At .113 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.E..LD	.007	.009	.017	.005	.007	.012	.004	.006	.011	.004	.006	.010	.004	.006	.010	.E..LD
.E..GP	.007	.009	.017	.005	.007	.012	.004	.006	.011	.004	.006	.010	.004	.006	.010	.E..GP
.E..GN	.009	.014	.025	.007	.011	.019	.006	.009	.016	.006	.009	.015	.006	.008	.015	.E..GN
.E..HC	.009	.019	.034	.007	.014	.025	.006	.012	.021	.006	.011	.020	.006	.011	.020	.E..HC

At .075 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.E..LD	.008	.011	.020	.006	.008	.015	.005	.007	.013	.005	.007	.012	.005	.007	.012	.E..LD
.E..GP	.008	.011	.020	.006	.008	.015	.005	.007	.013	.005	.007	.012	.005	.007	.012	.E..GP
.E..GN	.011	.017	.030	.008	.013	.022	.007	.011	.019	.007	.010	.018	.007	.010	.018	.E..GN
.E..HC	.011	.023	.041	.008	.017	.030	.007	.015	.026	.007	.014	.024	.007	.013	.023	.E..HC

At .038 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.E..LD	.011	.016	.028	.008	.012	.020	.007	.010	.018	.007	.009	.016	.006	.009	.016	.E..LD
.E..GP	.011	.016	.028	.008	.012	.020	.007	.010	.018	.007	.009	.016	.006	.009	.016	.E..GP
.E..GN	.016	.024	.042	.012	.017	.031	.010	.015	.026	.009	.014	.025	.009	.014	.024	.E..GN
.E..HC	.016	.032	.057	.012	.023	.041	.010	.020	.035	.009	.019	.033	.009	.018	.032	.E..HC

NOTE: Use "Light Machining" values as starting feed rate.



Copy Mills

■ Recommended Starting Feeds [IPT] • Ball Nose Insert Size 1.00"

Light Machining	General Purpose	Heavy Machining
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At .500 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.E..LD	.005	.007	.012	.004	.005	.009	.003	.004	.008	.003	.004	.007	.003	.004	.007	.E..LD
.E..GP	.005	.007	.012	.004	.005	.009	.003	.004	.008	.003	.004	.007	.003	.004	.007	.E..GP
.E..GN	.007	.010	.018	.005	.008	.013	.004	.007	.011	.004	.006	.011	.004	.006	.011	.E..GN
.E..HC	.007	.014	.024	.005	.010	.018	.004	.009	.015	.004	.008	.014	.004	.008	.014	.E..HC

At .150 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.E..LD	.007	.009	.017	.005	.007	.012	.004	.006	.011	.004	.006	.010	.004	.006	.010	.E..LD
.E..GP	.007	.009	.017	.005	.007	.012	.004	.006	.011	.004	.006	.010	.004	.006	.010	.E..GP
.E..GN	.009	.014	.025	.007	.011	.019	.006	.009	.016	.006	.009	.015	.006	.008	.015	.E..GN
.E..HC	.009	.019	.034	.007	.014	.025	.006	.012	.021	.006	.011	.020	.006	.011	.020	.E..HC

At .100 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.E..LD	.008	.011	.020	.006	.008	.015	.005	.007	.013	.005	.007	.012	.005	.007	.012	.E..LD
.E..GP	.008	.011	.020	.006	.008	.015	.005	.007	.013	.005	.007	.012	.005	.007	.012	.E..GP
.E..GN	.011	.017	.030	.008	.013	.022	.007	.011	.019	.007	.010	.018	.007	.010	.018	.E..GN
.E..HC	.011	.023	.041	.008	.017	.030	.007	.015	.026	.007	.014	.024	.007	.013	.023	.E..HC

At .050 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.E..LD	.011	.016	.028	.008	.012	.020	.007	.010	.018	.007	.009	.016	.006	.009	.016	.E..LD
.E..GP	.011	.016	.028	.008	.012	.020	.007	.010	.018	.007	.009	.016	.006	.009	.016	.E..GP
.E..GN	.016	.024	.042	.012	.017	.031	.010	.015	.026	.009	.014	.025	.009	.014	.024	.E..GN
.E..HC	.016	.032	.057	.012	.023	.041	.010	.020	.035	.009	.019	.033	.009	.018	.032	.E..HC

NOTE: Use "Light Machining" values as starting feed rate.



Copy Mills

■ Recommended Starting Feeds [IPT] • Ball Nose Insert Size 1.25"

Light Machining	General Purpose	Heavy Machining
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At .625 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.E..LD	.005	.007	.012	.004	.005	.009	.003	.004	.008	.003	.004	.007	.003	.004	.007	.E..LD
.E..GP	.005	.007	.012	.004	.005	.009	.003	.004	.008	.003	.004	.007	.003	.004	.007	.E..GP

At .188 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.E..LD	.007	.009	.017	.005	.007	.012	.004	.006	.011	.004	.006	.010	.004	.006	.010	.E..LD
.E..GP	.007	.009	.017	.005	.007	.012	.004	.006	.011	.004	.006	.010	.004	.006	.010	.E..GP

At .125 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.E..LD	.008	.011	.020	.006	.008	.015	.005	.007	.013	.005	.007	.012	.005	.007	.012	.E..LD
.E..GP	.008	.011	.020	.006	.008	.015	.005	.007	.013	.005	.007	.012	.005	.007	.012	.E..GP

At .063 Axial Depth of Cut (ap)

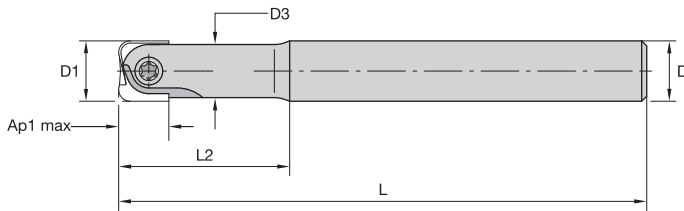
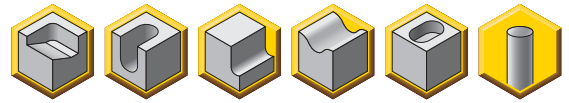
Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.E..LD	.011	.016	.028	.008	.012	.020	.007	.010	.018	.007	.009	.016	.006	.009	.016	.E..LD
.E..GP	.011	.016	.028	.008	.012	.020	.007	.010	.018	.007	.009	.016	.006	.009	.016	.E..GP

NOTE: Use "Light Machining" values as starting feed rate.



Copy Mills

- Cutting diameter ranges from .500–1.000".
- High precision and runout accuracy.
- Can be used with the heat shrink technology, h6 shank tolerance.
- Suitable for roughing and finishing operations.
- Works with toroidal and High-Feed inserts.



■ Necked End Mills • Cylindrical Shank • Steel

order number	catalog number	D1	D	D3	L	L2	Ap1 max	Z	Z U	max ramp angle	max RPM	lbs	insert 1
2957828	KDMT0500R512A050SN	.500	.500	.420	5.120	1.339	.118	1	2	3.0°	40000	.22	KDMT0500..
2957829	KDMT0500R591A050SN	.500	.500	.420	5.909	1.890	.118	1	2	3.0°	40000	.22	KDMT0500..
2957830	KDMT0625R551A063SN	.625	.625	.560	5.510	1.496	.157	1	2	3.0°	40000	.44	KDMT0625..
2957831	KDMT0625R630A063SN	.625	.625	.560	6.300	2.165	.157	1	2	3.0°	40000	.44	KDMT0625..
2957832	KDMT0750R630A075SN	.750	.750	.710	6.300	1.850	.197	1	2	3.0°	40000	.88	KDMT0750..
2958143	KDMT0750R827A075SN	.750	.750	.710	8.270	2.362	.197	1	2	3.0°	40000	.88	KDMT0750..
2958144	KDMT1000R630A100SN	1.000	1.000	.890	6.300	1.850	.236	1	2	3.0°	40000	1.32	KDMT1000..
2958145	KDMT1000R748A100SN	1.000	1.000	.890	7.480	2.835	.236	1	2	3.0°	40000	1.54	KDMT1000..
2958146	KDMT1000R906A100SN	1.000	1.000	.890	9.059	3.150	.236	1	2	3.0°	40000	1.76	KDMT1000..

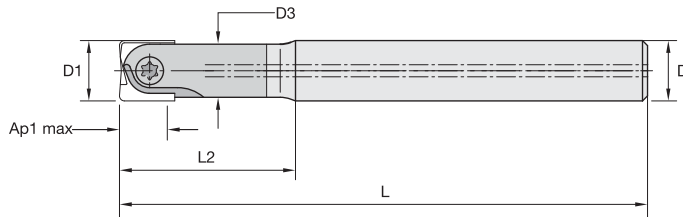
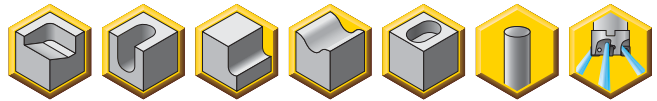
■ Spare Parts


insert screw

Torx wrench

D1	insert screw	in. lbs.	Torx wrench
.500	193.393	35	KT20
.625	193.392	44	KT20
.750	193.391	53	KT20
1.000	193.390	58	KT30

- Cutting diameter ranges from .500–1.000".
- High precision and runout accuracy.
- Can be used with the heat shrink technology, h6 shank tolerance.
- Suitable for roughing and finishing operations.
- Works with toroidal and High-Feed inserts.



■ Necked End Mills • Carbide Shank with Through Coolant

order number	catalog number	D1	D	D3	L	L2	Ap1 max	Z	Z U	max ramp angle	max RPM	lbs	insert 1
2878452	KDMT0500R472A050HNC	.500	.500	.420	4.803	1.457	.118	1	2	3.0°	40000	.39	KDMT0500..
2878733	KDMT0500R630A050HNC	.500	.500	.420	6.378	2.047	.118	1	2	3.0°	40000	.53	KDMT0500..
2878734	KDMT0625R551A063HNC	.625	.625	.560	5.590	1.496	.157	1	2	3.0°	40000	.43	KDMT0625..
2878735	KDMT0625R689A063HNC	.625	.625	.560	6.969	2.244	.157	1	2	3.0°	40000	.89	KDMT0625..
2878736	KDMT0750R551A075HNC	.750	.750	.710	5.590	2.047	.197	1	2	3.0°	40000	1.03	KDMT0750..
2878737	KDMT0750R748A075HNC	.750	.750	.710	7.559	3.032	.197	1	2	3.0°	40000	1.46	KDMT0750..
2878738	KDMT1000R630A100HNC	1.000	1.000	.890	6.378	2.441	.236	1	2	3.0°	30000	2.01	KDMT1000..
2878739	KDMT1000R827A100HNC	1.000	1.000	.890	8.347	3.622	.236	1	2	3.0°	30000	2.68	KDMT1000..

■ Spare Parts



D1	insert screw	in. lbs.	Torx wrench
.500	193.393	35	KT20
.625	193.392	44	KT20
.750	193.391	53	KT20
1.000	193.390	58	KT30

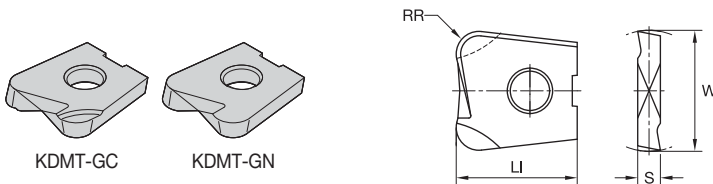


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Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	.E..GC	KC515M	.E..GC	KC515M	.E..GN	KC515M
P3-P4	.E..GN	KC515M	.E..GN	KC515M	.E..GN	KC515M
P5-P6	.E..GN	KC515M	.E..GN	KC515M	.E..GN	KC515M
M1-M2	—	—	.E..GN	KC515M	—	—
M3	—	—	.E..GN	KC515M	—	—
K1-K2	.E..GN	KC515M	.E..GN	KC515M	.E..GN	KC515M
K3	.E..GN	KC515M	.E..GN	KC515M	.E..GN	KC515M
N1-N2	—	—	—	—	—	—
N3	—	—	—	—	—	—
S1-S2	—	—	—	—	—	—
S3	—	—	—	—	—	—
S4	—	—	—	—	—	—
H1	—	—	.E..GN	KC515M	—	—

Indexable Inserts • KDMS... • KDMT...


 ● first choice
 ○ alternate choice

P	●
M	○
K	○
N	○
S	○
H	○

KDMT-GC • High-Tolerance Helical Geometry • Finishing Lower Cutting Force

catalog number	LI	W	S	RR	hm	KC515M
KDMT05004ERGC	.550	.500	.098	.063	.003	●
KDMT05002ERGC	.550	.500	.098	.032	.003	●
KDMT06254ERGC	.625	.625	.118	.063	.003	●
KDMT06252ERGC	.625	.625	.118	.032	.003	●
KDMT07502ERGC	.700	.750	.118	.032	.003	●
KDMT07504ERGC	.700	.750	.118	.063	.003	●
KDMT10004ERGC	.925	1.000	.157	.063	.003	●
KDMT10008ERGC	.925	1.000	.157	.125	.003	●
KDMT10002ERGC	.925	1.000	.157	.032	.003	●

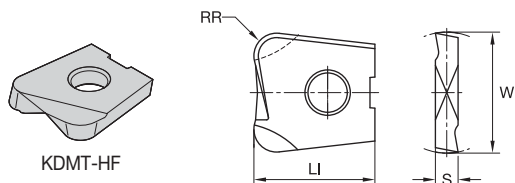
NOTE: Ap1 max = RR

KDMT-GN • High-Precision Insert • Semi-Finishing and Finishing

catalog number	LI	W	S	RR	hm	KC515M
KDMT05004ERGN	.550	.500	.098	.063	.003	●
KDMT05002ERGN	.550	.500	.098	.032	.003	●
KDMT06252ERGN	.625	.625	.118	.032	.003	●
KDMT06254ERGN	.625	.625	.118	.063	.003	●
KDMT07502ERGN	.700	.750	.118	.032	.003	●
KDMT07504ERGN	.700	.750	.118	.063	.003	●
KDMT10004ERGN	.925	1.000	.157	.063	.003	●
KDMT10008ERGN	.925	1.000	.157	.125	.003	●
KDMT10002ERGN	.925	1.000	.157	.032	.003	●

NOTE: Ap1 max = RR

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P	●
M	○
K	○
N	○
S	○
H	●

● first choice
○ alternate choice

■ KDMT-HF • Geometry Developed • High-Feed Machining up to 55 HRC

catalog number	LI	W	S	RT	hm	KC515M
KDMT0500SRHF	.550	.500	.098	.045	.003	●
KDMT0625SRHF	.630	.625	.118	.050	.003	●
KDMT0750SRHF	.710	.750	.118	.080	.003	●

NOTE: RT = Programming Radius

Recommended Starting Speeds and Feeds

■ Recommended Starting Speeds [SFM]

Material Group		KC515M		
P	1	1080	960	840
	2	1020	900	780
	3	900	780	660
	4	780	660	540
	5	660	540	420
	6	540	420	360
M	1	1080	900	780
	2	900	720	540
	3	720	600	480
K	1	1440	1080	720
	2	1080	840	600
	3	480	360	240
N	1-2	—	—	—
	3	—	—	—
S	1	—	—	—
	2	—	—	—
	3	—	—	—
	4	—	—	—
H	1	550	400	310

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

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■ Recommended Starting Feeds [IPT]

Light Machining	General Purpose	Heavy Machining
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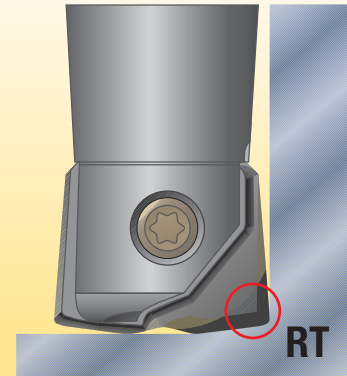
Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.E..GC	.007	.010	.014	.005	.008	.010	.004	.007	.009	.004	.006	.008	.004	.006	.008	.E..GC
.E..GN	.007	.010	.014	.005	.008	.010	.004	.007	.009	.004	.006	.008	.004	.006	.008	.E..GN

NOTE: Use "Light Machining" values as starting feed rate.
For plunging in Z-axis, use the 50-100% values (no chip thinning).

■ Application Advice for KDMT-HF Insert Style

For CAM programming, the tools can be programmed as a toroidal tool type requiring the diameter and the RT values only.

insert type	inch			
	Ap max	diameter	RT	max fz
KDMT0500SRHF	0.025	0.500	0.045	0.050
KDMT0625SRHF	0.030	0.625	0.050	0.050
KDMT0750SRHF	0.040	0.750	0.080	0.050



■ Data for Face Milling, Pocketing, and Profiling Operations

Starting Values

tool diameter	Ø.500"	Ø.625"	Ø.750"
Ap max (mm)	0.024	0.031	0.039
fz recommended for 45 HRC (approximately)	0.020	0.022	0.026
fz recommended for 55 HRC (approximately)	0.016	0.020	0.022
fz recommended for general purpose	0.026	0.028	0.031

NOTE: Use two effective teeth for feed calculations.
For materials above 45 HRC, we recommend to adjust the Ae max to 55% of cutting diameter.
Steel shanks for roughing operations are recommended.





Z-Axis Plunge Mill

Primary Application

Specifically engineered to eliminate vibration and improve metal removal rates in roughing applications. Ideally suited for rough slotting applications in aerospace, general engineering, die and mold, and power generation.

Features and Benefits

Platform Features

- Nine coolant nozzle sizes enable customized flow by machine tool.
- Unique design is unmatched for chip evacuation.
- Improved performance at a reduced cost per cutting edge.
- Positive geometry lowers cutting force and reduces power requirements, enabling higher feed rates.
- Chip control when slotting.
- Fast and easy insert indexing.

Chip gash serrations
— Improved chip flow.

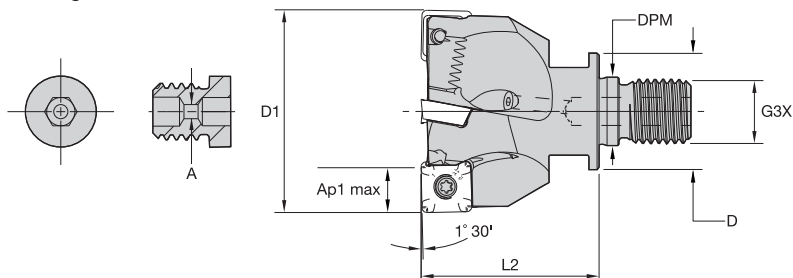
Linear movement clearance
— Clearance allowed for
.04 IPT ($f_z=1\text{mm}$) when
plunging or face milling.

Dropped cutting edge
— Improved chip flow.

Coolant nozzles
— Precise coolant delivery
to all pockets.



- Most stable cutting due to force directions.
- Excellent for long reach applications.
- Extended tool life.
- Suitable for a wide variety of workpiece materials.
- Up to .433" stepover.
- Unique coolant delivery.
- Chip control when slotting.



Screw-On End Mills

order number	catalog number	D1	D	DPM	G3X	L2	Ap1 max	Z	max RPM	lbs	insert 1
3449167	KTSZR125SD430CM16A02	1.250	1.142	.669	M16	1.750	.433	2	25800	.33	SD_T43_PD_N_Z
3449168	KTSZR150SD430CM16A03	1.500	1.142	.669	M16	1.750	.433	3	23550	.40	SD_T43_PD_N_Z
3449169	KTSZR200SD430CM16A04	2.000	1.142	.669	M16	1.750	.433	4	20400	.62	SD_T43_PD_N_Z

Spare Parts



D1	insert screw	in. lbs.	Torx Plus driver	coolant nozzle screw	T-handle hex wrench
1.250	MS2197	35	DT15IP	MS2191C20	THW2M
1.500	MS2197	35	DT15IP	MS2191C20	THW2M
2.000	MS2197	35	DT15IP	MS2191C20	THW2M

Coolant Screw Detail

order number	catalog number	A
3400611	MS2191C00	—
3400612	MS2191C06	.024
3400613	MS2191C08	.032
3400614	MS2191C10	.039
3400616	MS2191C12	.047
3400617	MS2191C14	.055
3400618	MS2191C16	.063
3400619	MS2191C18	.071
3400620	MS2191C20	.079

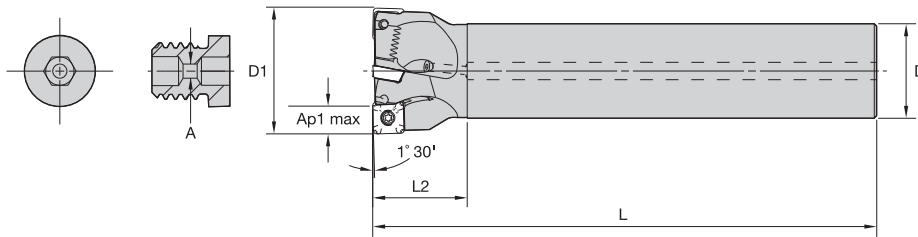
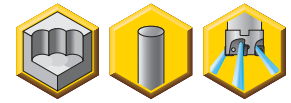


Coolant Nozzle Key

order number	catalog number	drive size
1993552	THW2M	2 MM

NOTE: Check the Spare Parts table for the coolant hole size that is incorporated in the cutters. If you need an alternative, there are eight other variants to choose from to increase or decrease the pressure. Example: MS2191C12 is a .047" (1,20mm) hole. All coolant nozzles are interchangeable with the original that is supplied with the cutter, which gives flexibility with coolant flow.

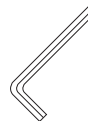
- Most stable cutting due to force directions.
- Excellent for long reach applications.
- Extended tool life.
- Suitable for a wide variety of workpiece materials.
- Up to .433" stepover.
- Unique coolant delivery.
- Chip control when slotting.



End Mills

order number	catalog number	D1	D	L	L2	Ap1 max	Z	max RPM	lbs	insert 1
3064601	KISZR125SD430C4A02	1.250	1.000	8.000	1.500	.433	2	25800	1.59	SD_T43_PD_N_Z
3107215	KISZR150SD430C5A03	1.500	1.250	8.000	1.500	.433	3	23550	2.47	SD_T43_PD_N_Z
3107216	KISZR200SD430C6A04	2.000	1.500	8.000	1.500	.433	4	20450	3.72	SD_T43_PD_N_Z

Spare Parts



D1	insert screw	in. lbs.	Torx Plus driver	T-handle hex wrench	coolant nozzle screw
1.250	MS2197	35	DT15IP	THW2M	MS2191C20
1.500	MS2197	35	DT15IP	THW2M	MS2191C20
2.000	MS2197	35	DT15IP	THW2M	MS2191C20

Coolant Screw Detail

order number	catalog number	A
3400611	MS2191C00	—
3400612	MS2191C06	.024
3400613	MS2191C08	.032
3400614	MS2191C10	.039
3400616	MS2191C12	.047
3400617	MS2191C14	.055
3400618	MS2191C16	.063
3400619	MS2191C18	.071
3400620	MS2191C20	.079

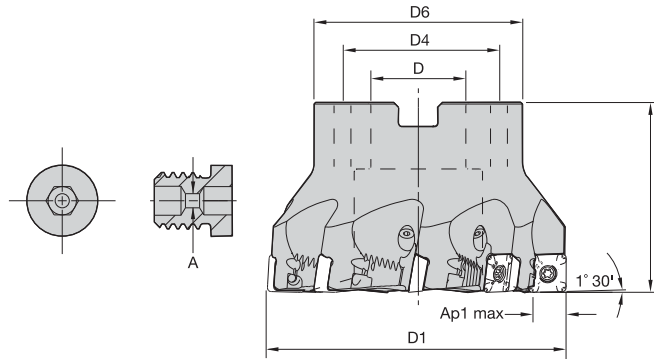
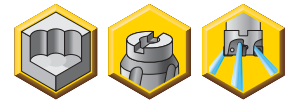
Coolant Nozzle Key

order number	catalog number	drive size
1993552	THW2M	2 MM

NOTE: Check the Spare Parts table for the coolant hole size that is incorporated in the cutters. If you need an alternative, there are eight other variants to choose from to increase or decrease the pressure. Example: MS2191C12 is a .047" (1,20mm) hole. All coolant nozzles are interchangeable with the original that is supplied with the cutter, which gives flexibility with coolant flow.

Copy Mills

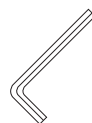
- Easy cutting.
- Four cutting edges.
- Consumes less power.
- Suitable for a wide variety of workpiece materials.
- Up to .433" stepover.
- Fast and easy insert indexing.
- Unique coolant delivery.
- Chip control when slotting.



Shell Mills

order number	catalog number	D1	D	D6	L	Ap1 max	Z	max RPM	lbs	insert 1
3054849	KSSZR200SD430C3A04	2.000	.750	1.664	1.750	.433	4	20450	.66	SD_T43_PD_N_Z
3064755	KSSZR200SD430M3A05	2.000	.750	1.664	1.750	.433	5	20450	.72	SD_T43_PD_N_Z
3448592	KSSZR250SD430C3A05	2.500	.750	1.664	1.750	.433	5	18290	.98	SD_T43_PD_N_Z
3448913	KSSZR250SD430M3A06	2.500	.750	1.664	1.750	.433	6	18290	1.03	SD_T43_PD_N_Z
3064493	KSSZR300SD430C4A05	3.000	1.000	2.190	2.000	.433	5	16700	1.94	SD_T43_PD_N_Z
3064602	KSSZR300SD430M4A06	3.000	1.000	2.190	2.000	.433	6	16700	1.96	SD_T43_PD_N_Z
3064902	KSSZR300SD430F4A07	3.000	1.000	2.190	2.000	.433	7	16700	1.97	SD_T43_PD_N_Z
3448914	KSSZR400SD430C5A07	4.000	1.250	2.880	2.500	.433	7	14460	4.23	SD_T43_PD_N_Z
3448915	KSSZR400SD430M5A08	4.000	1.250	2.880	2.500	.433	8	14460	4.34	SD_T43_PD_N_Z
3066674	KSSZR400SD430F5A09	4.000	1.250	2.880	2.500	.433	9	14460	4.41	SD_T43_PD_N_Z
3448916	KSSZR400SD430C6A07	4.000	1.500	3.375	2.500	.433	7	14460	4.51	SD_T43_PD_N_Z
3448917	KSSZR400SD430M6A08	4.000	1.500	3.375	2.500	.433	8	14460	4.64	SD_T43_PD_N_Z
3448918	KSSZR400SD430F6A09	4.000	1.500	3.375	2.500	.433	9	14460	4.72	SD_T43_PD_N_Z
3448919	KSSZR500SD430C6A08	5.000	1.500	3.810	2.500	.433	8	12940	7.23	SD_T43_PD_N_Z
3448920	KSSZR500SD430M6A09	5.000	1.500	3.810	2.500	.433	9	12940	7.40	SD_T43_PD_N_Z
3448921	KSSZR500SD430F6A10	5.000	1.500	3.810	2.500	.433	10	12940	7.43	SD_T43_PD_N_Z
3066673	KSSZR600SD430C6A09	6.000	1.500	3.810	2.500	.433	9	11800	9.09	SD_T43_PD_N_Z
3448922	KSSZR600SD430M6A10	6.000	1.500	3.810	2.500	.433	10	11800	9.17	SD_T43_PD_N_Z
3448923	KSSZR600SD430F6A12	6.000	1.500	3.810	2.500	.433	12	11800	9.36	SD_T43_PD_N_Z

Spare Parts



D1	insert screw	in. lbs.	Torx Plus wrench	coolant nozzle screw	T-handle hex wrench	coolant lock screw assembly	socket-head cap screw with coolant groove
2.000	MS2197	35.0	DT15IP	MS2191C10	THW2M	—	S445CG
2.000	MS2197	35.0	DT15IP	MS2191C12	THW2M	—	S445CG
2.500	MS2197	35.0	DT15IP	MS2191C10	THW2M	—	S445CG
3.000	MS2197	35.0	DT15IP	MS2191C10	THW2M	—	S458CG
3.000	MS2197	35.0	DT15IP	MS2191C08	THW2M	—	S458CG
4.000	MS2197	35.0	DT15IP	MS2191C10	THW2M	S2162C	—
4.000	MS2197	35.0	DT15IP	MS2191C10	THW2M	S2163C	—
5.000	MS2197	35.0	DT15IP	MS2191C10	THW2M	S2163C	—
5.000	MS2197	35.0	DT15IP	MS2191C08	THW2M	S2163C	—
6.000	MS2197	35.0	DT15IP	MS2191C08	THW2M	S2163C	—
6.000	MS2197	35.0	DT15IP	MS2191C10	THW2M	S2163C	—

■ **Coolant Screw Detail**

order number	catalog number	A
3400611	MS2191C00	—
3400612	MS2191C06	.024
3400613	MS2191C08	.032
3400614	MS2191C10	.039
3400616	MS2191C12	.047
3400617	MS2191C14	.055
3400618	MS2191C16	.063
3400619	MS2191C18	.071
3400620	MS2191C20	.079

■ **Coolant Nozzle Key**

order number	catalog number	drive size
1993552	THW2M	2 MM

NOTE: Check the Spare Parts table for the coolant hole size that is incorporated in the cutters.
If you need an alternative, there are eight other variants to choose from to increase or decrease the pressure.
Example: MS2191C12 is a .047" (1,20mm) hole. All coolant nozzles are interchangeable with the original that is supplied with the cutter, which gives flexibility with coolant flow.

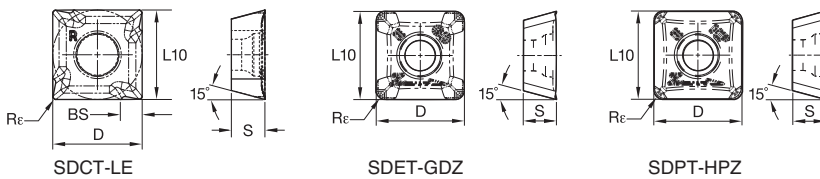


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Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	.E..GDZ	KC725M	.S..GDZ	KC725M	.E..HPZ	KC725M
P3-P4	.S..GDZ	KCPK30	.E..HPZ	KCPK30	.S..HPZ	KCPK30
P5-P6	.S..GDZ	KCPK30	.E..HPZ	KCPM20	.S..HPZ	KCPM20
M1-M2	.E..GDZ	KC725M	.S..GDZ	KC725M	.E..HPZ	KC725M
M3	.S..GDZ	KCPK30	.E..HPZ	KCPK30	.S..HPZ	KCPK30
K1-K2	.E..GDZ	KCPK30	.S..GDZ	KCPK30	.E..HPZ	KCPK30
K3	.S..GDZ	KCPK30	.E..HPZ	KCPK30	.S..HPZ	KCPK30
N1-N2	.F..LE	KC410M	.F..LE	KC410M	.F..LE	KC410M
N3	.F..LE	KC410M	.F..LE	KC410M	.F..LE	KC410M
S1-S2	.E..GDZ	KC725M	.S..GDZ	KC725M	.E..HPZ	KC725M
S3	.S..GDZ	KC725M	.E..HPZ	KC725M	.S..HPZ	KC725M
S4	.E..HPZ	KC725M	.S..HPZ	KC725M	—	—
H1	—	—	—	—	—	—

Indexable Inserts • KSSZR 90° • Z-Axis



● first choice
○ alternate choice

P	●	○	○	○	○
M	○	○	○	○	○
K	○	○	○	○	○
N	○	○	○	○	○
S	○	○	○	○	○
H	○	○	○	○	○

SDCT-LE

catalog number	L10	S	BS	Re	hm	cutting edges	KC410M	KC522M	KC725M	KCPM20	KCPK30
SDCT433PDFR8LE	.500	.188	.106	.047	.001	4	●	○	○	○	○
SDCT433PDFL8LE	.500	.188	.106	.047	.001	4	○	○	○	○	○

SDET-GDZ

catalog number	L10	S	Re	hm	cutting edges	KC410M	KC522M	KC725M	KCPM20	KCPK30
SDET433PDENGDZ	.500	.188	.047	.003	4	○	○	○	○	○
SDET433PDSNGDZ	.500	.188	.047	.005	4	○	○	○	○	○

SDPT-HPZ

catalog number	D	L10	S	Re	hm	cutting edges	KC410M	KC522M	KC725M	KCPM20	KCPK30
SDPT433PDENHPZ	.500	.500	.188	.047	.003	4	○	○	○	○	○
SDPT433PDSNHPZ	.500	.500	.188	.047	.006	4	○	○	○	○	○



■ Recommended Starting Speeds [SFM]

Material Group		KC410M			KC522M			KC725M			KCPM20			KCPK30		
P	1	—	—	—	1300	1130	1060	1030	900	840	2170	1910	1760	1780	1560	1450
	2	—	—	—	1080	950	790	860	760	640	1340	1210	1090	1100	1000	900
	3	—	—	—	1000	840	700	790	670	550	1210	1090	1000	1000	900	820
	4	—	—	—	890	730	590	710	590	470	910	840	760	740	690	620
	5	—	—	—	730	660	590	590	530	470	1090	980	900	1020	910	830
	6	—	—	—	650	490	400	520	400	310	760	660	570	620	540	—
M	1	—	—	—	800	710	650	670	590	540	880	790	680	820	720	620
	2	—	—	—	730	620	520	610	520	430	800	700	620	730	640	550
	3	—	—	—	550	480	370	460	400	310	640	570	490	570	520	460
K	1	510	480	450	900	820	720	—	—	—	1420	1280	1150	1160	1050	940
	2	450	420	390	710	640	590	—	—	—	1130	1010	920	920	830	760
	3	400	350	310	590	530	480	—	—	—	950	840	780	770	690	640
N	1-2	1980	1860	1770	—	—	—	—	—	—	—	—	—	—	—	—
	3	1620	1440	1260	—	—	—	—	—	—	—	—	—	—	—	—
S	1	—	—	—	160	140	110	140	120	100	—	—	—	—	—	—
	2	—	—	—	160	140	110	140	120	100	—	—	—	—	—	—
	3	—	—	—	200	160	110	180	140	100	—	—	—	—	—	—
	4	—	—	—	280	200	140	240	180	120	—	—	—	—	—	—
H	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

■ Recommended Starting Feeds [IPT]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
.F..LE	—	—	—	—	—	—	—	—	—	—	—	—	.002	.004	.008	.F..LE
.E..GDZ	—	—	—	—	—	—	—	—	—	—	—	—	.004	.010	.016	.E..GDZ
.S..GDZ	—	—	—	—	—	—	—	—	—	—	—	—	.004	.010	.016	.S..GDZ
.E..HPZ	—	—	—	—	—	—	—	—	—	—	—	—	.004	.010	.016	.E..HPZ
.S..HPZ	—	—	—	—	—	—	—	—	—	—	—	—	.004	.010	.016	.S..HPZ

NOTE: Use "Light Machining" values as starting feed rate.
For plunging in Z-Axis, use the 50-100% values (no chip thinning).



Copy Mills

■ Z-Axis

Best Machining Practices

When finishing a workpiece, you sometimes have to use a Z-axis solution versus a conventional end mill solution to get the best results.

When the length-to-diameter ratio protrudes farther than 3:1, you will need to use a Z-axis solution. This is when the end mill starts to vibrate and the surface finish and noise are unacceptable.

When vibration occurs, the feed rates are compromised, which normally slows down the production of the workpiece.

Programming

At this point, there is very little software for this type of application on the market. We suggest that a simple macro is created for this type of application, which can be recalled and the "X" and "Y" movement changed.

The process can be repeated, so the cutter can be removed from the workpiece in the rapid (G00) movement. Tool life will be improved by not allowing the insert to rub on the retract path.

Slotting:

There are several differing ways to machine a slot in a component using the Z-axis cutter solution.

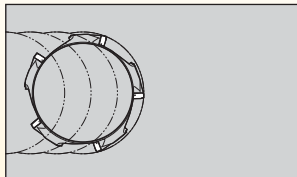


Figure 1

This shows the typical way of machining a slot. The movements are feeding down and straight back up (Z+) in the same axis and will have a negative impact on the insert radii (cutting edge) that could lead to premature failure of the nose radii. When looking at the component, it will show the rapid travel in the Z+ direction. This will highlight the spiral of the insert/cutter operating at a high feed. It looks similar to an oil groove spiraling upwards.

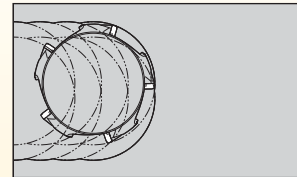


Figure 2

Using a cutter that is smaller than the slot width allows the insert/cutter to be removed from the material when (G00) rapid motion is retracting from the component. Because this type of cutter can be used across various types of machines, assume a 2.00" (50mm) diameter cutter is being used to machine a slot of 2.50" (63mm) wide on a vertical 3-axis machine.

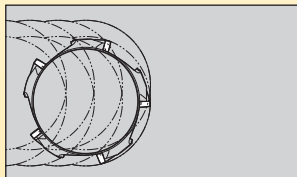


Figure 3

Align the cutter with the center of the slot on the component and define the stepover that's required. Move the Y-axis into a position for the first cut, take the first pass to a depth in the Z-axis, and when it reaches the bottom of the slot, program a 2-axis move to retract the cutting edge for the workpiece.

The 2-axis move will move the Z-axis in a positive direction at 45° (.010") away from the component, and the Y-axis will move away from the workpiece by the same amount at the same angle. Now the cutter can be retracted from the component, and the insert will not rub on the retract move.

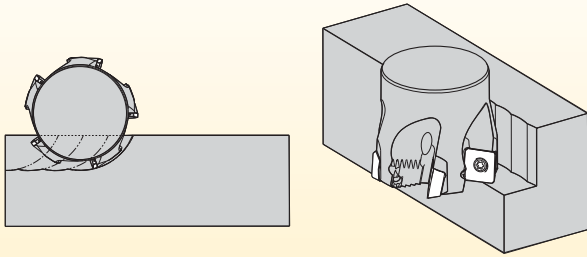
Move the cutter to the left of the slot to define the new position and make the cut. When reaching the base, a 3-axis move will need to be made. Again, the Z-axis will be in a positive direction at 45° (.010"), and the corresponding Y-axis will move away the same respective amount from the wall.

The insert/cutter has now moved away from the workpiece, and the rapid Z+ can take place. Repeat the process on the other side of the slot, remembering the X-axis move needs to be moving the other way.

NOTE: When starting the process, it's better to start at the center of the slot. After the slot has been defined, you no longer need to put the cutter on the center path. Passes from both sides create the slot width and enable clearance for the subsequent moves, so the insert/cutter can be moved away from the side walls of the material.

(continued)

■ **Z-Axis (continued)**

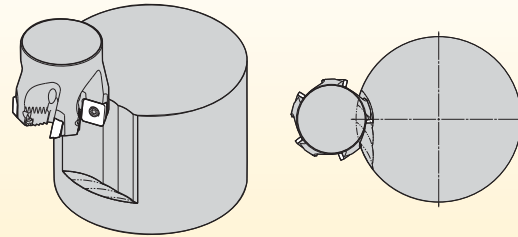


Linear Plunge Milling

Entering the cutter along a parallel axis, the radial width of cut needs to be defined because the cutter might need to move away from the workpiece material.

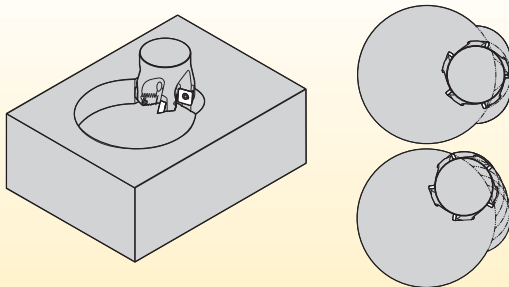
If the radial width of cut takes more than 60% of the cutter diameter, it is more difficult to remove the insert/cutter because the machine program wants to move the cutter upwards to (G00) Z+. When taking more than 60% of the cutter diameter, the material is enveloping the cutter and is difficult to remove because a cusp has been created.

It is suggested to make the radial width of cut 50% of the cutter diameter to allow the insert/cutter to be removed without any problems.



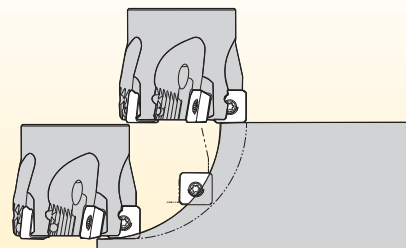
External Profiling

This artwork represents the typical application for this type of process. Move into the cut and follow the external profile of the workpiece. When moving the cutter back to the start position, it's always advisable to move the insert from contacting the workpiece. This should be done with a 2- or 3-axis move (use .010") at 0,25mm. All axes moving in a Z+ direction will stop the rubbing in the retract move.



Internal Profiling

When taking the first pass of a depth, there is also a need to move the insert/cutter away from the material on the retract motion. Each of the passes that follow should adopt the same method on the retract move. Follow the cutter path until the component has been finished.



Machining Around a Radii

This artwork shows the cutter taking a larger radial width of cut. When moving down in the Z-axis, the insert could start to take a larger radial width of cut. Typical application could be the manufacture of a turbine blade from a rectangular piece of material. Always remember that it's advisable to move the insert/cutter away from the material on the retract motion.



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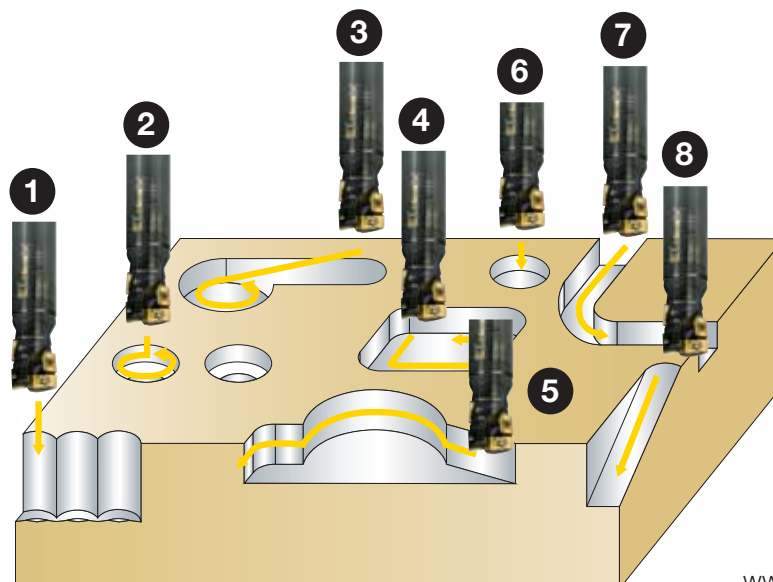
Features and Benefits

Platform Features

- Just two grades needed for a wide variety of materials.
- Reduced shank for machining down a side wall.
- Metric and inch sizes available.
- Reduced shank diameters for access down long side walls.
- Extensive product portfolio.
- Use compressed air when drilling for improved chip evacuation.
- Full two-edge line with improved stability.
- Lower cutting resistance and long shank types are available.
- New grade provides stability and longer tool life.
- Good chip evacuation, even when slant milling and drilling.



- 1 Vertical Milling/Plunging
- 2 Helical Milling
- 3 Ramping and Helical Milling
- 4 Pocketing
- 5 Shouldering/Profiling
- 6 Drilling
- 7 Slotting
- 8 Ramping



- Low cutting forces.
- Reduced shank diameters for access down long side walls.
- Excellent chip evacuation, even machining on an angle.
- When drilling use (1) as the effective number of teeth (ZU).
- Milling to the maximum axial depth of (Ap2), we have (2) effective teeth.

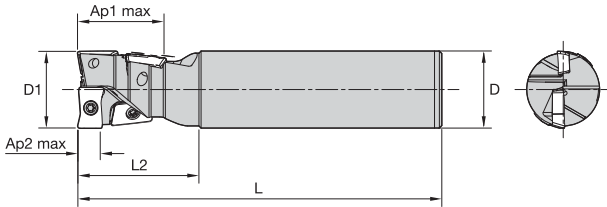
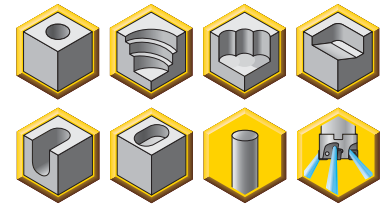


Fig. 3

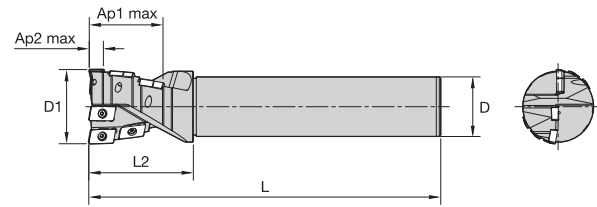


Fig. 4

Standard Length

order number	catalog number	D1	D	L	L2	Ap1 max	Ap2 max	Z	Z U	figure	lbs	insert 1	insert 2
3578351	KDMR625S625MT08	.630	.625	4.699	1.195	.748	.177	4	2	FIG 3	.49	GOMT08T208ERLD	JOMT08T208ERLF
3578352	KDMR787S750MT10	.787	.750	5.091	1.350	.866	.236	4	2	FIG 3	.82	GOMT100308ERLD	JOMT100308ERLF
3578443	KDMR1000S100MT13	1.000	1.000	5.486	1.549	1.102	.295	4	2	FIG 3	1.15	GOMT13T308ERLD	JOMT13T308ERLF
3578444	KDMR1250S125MT16	1.250	1.250	5.858	1.921	1.417	.374	4	2	FIG 3	1.80	GOMT160408ERLD	JOMT160408ERLF
3578445	KDMR1500S125MT13	1.500	1.250	6.260	2.126	1.654	.295	7	2	FIG 4	2.25	GOMT13T308ERLD	JOMT13T308ERLF
3578446	KDMR2000S150MT16	1.984	1.500	6.649	2.712	2.126	.374	7	2	FIG 4	3.86	GOMT160408ERLD	JOMT160408ERLF

Spare Parts

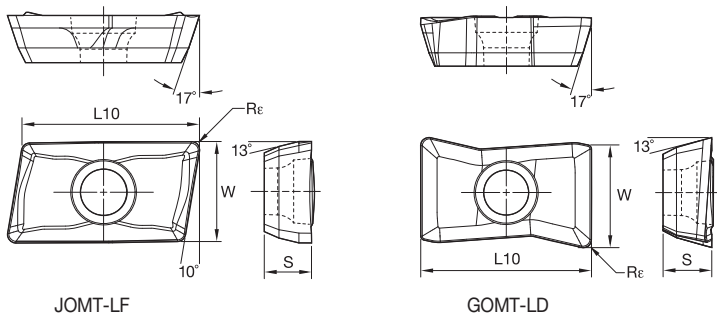
D1	insert screw	Torx driver	anti-seize lube
.630	MS2211	DT6	ASL3GT
.787	MS2212	DT8	ASL3GT
1.000	MS2213	DT10	ASL3GT
1.250	MS2214	DT15	ASL3GT
1.500	MS2213	DT10	ASL3GT
1.984	MS2214	DT15	ASL3GT

NOTE: Axial depth of cut above (Ap2) value, use (1) as the effective number of teeth.
 See separate chart for drilling depths.
 Use compressed air when drilling for improved chip evacuation.

■ Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	.LD/.LF	KC720M	.LD/.LF	KC720M	.LD/.LF	KC720M
P3-P4	.LD/.LF	KC720M	.LD/.LF	KC720M	.LD/.LF	KC720M
P5-P6	.LD/.LF	KC720M	.LD/.LF	KC720M	.LD/.LF	KC720M
M1-M2	.LD/.LF	KC720M	.LD/.LF	KC720M	.LD/.LF	KC720M
M3	.LD/.LF	KC720M	.LD/.LF	KC720M	.LD/.LF	KC720M
K1-K2	.LD/.LF	KC505M	.LD/.LF	KC505M	.LD/.LF	KC505M
K3	.LD/.LF	KC505M	.LD/.LF	KC505M	.LD/.LF	KC505M
N1-N2	—	—	—	—	—	—
N3	—	—	—	—	—	—
S1-S2	—	—	—	—	—	—
S3	—	—	—	—	—	—
S4	—	—	—	—	—	—
H1	—	—	—	—	—	—

Indexable Insert • KDMR • JOMT-LF • GOMT-LD



● first choice
○ alternate choice

P	●	○	○
M	●	○	○
K	●	○	○
N	○	○	○
S	○	○	○
H	○	○	○

■ JOMT • Side Insert

catalog number	S	W	L10	Rε	hm	cutting edges	KC505M	KC720M
JOMT08T208ERLF	.109	.202	.335	.031	.002	2	●	●
JOMT100308ERLF	.125	.253	.402	.031	.002	2	●	●
JOMT160408ERLF	.188	.381	.657	.031	.002	2	●	●
JOMT13T308ERLF	.146	.317	.520	.031	.002	2	●	●

■ GOMT • Center Insert

catalog number	S	W	L10	Rε	hm	cutting edges	KC505M	KC720M
GOMT13T308ERLD	.152	.329	.520	.031	.002	2	●	●
GOMT08T208ERLD	.109	.205	.343	.031	.002	2	●	●
GOMT100308ERLD	.130	.258	.421	.031	.002	2	●	●
GOMT160408ERLD	.188	.395	.657	.031	.002	2	●	●

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Recommended Starting Speeds [SFM]

Material Group		KC505M			KC720M		
P	1	—	—	—	860	790	710
	2	—	—	—	790	710	630
	3	—	—	—	710	630	550
	4	1180	860	710	630	590	550
	5	1180	860	710	550	470	400
	6	1140	780	620	400	310	310
M	1	—	—	—	780	710	630
	2	—	—	—	630	550	470
	3	—	—	—	470	400	310
K	1	620	560	490	—	—	—
	2	575	510	440	—	—	—
	3	375	310	245	—	—	—
N	1-2	—	—	—	—	—	—
	3	—	—	—	—	—	—
S	1	—	—	—	—	—	—
	2	—	—	—	—	—	—
	3	—	—	—	—	—	—
	4	—	—	—	—	—	—
H	1	—	—	—	—	—	—

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

Recommended Starting Feeds [IPT]

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)														Insert Geometry	
	10%			20%			30%			40%			50-100%			
.LD/LF	.006	.014	.020	.004	.010	.015	.004	.009	.013	.003	.008	.012	.002	.008	.012	.LD/LF

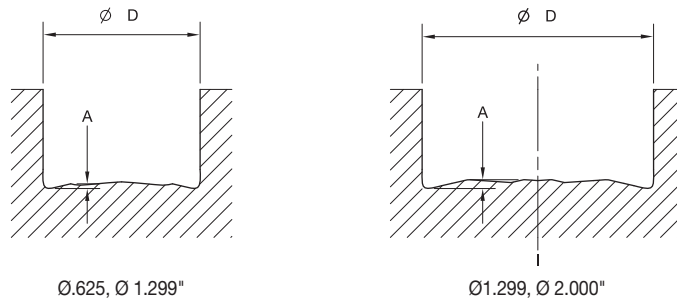
NOTE: Use "Light Machining" values as starting feed rate.

Insert Cross Reference

end mill	applicable insert for each cutter diameter			
	side insert	quantity	center insert	quantity
.630	JOMT08T208ERLF	3	GOMT08T208ERLD	1
.787	JOMT100308ERLF	3	GOMT100308ERLD	1
1.000	JOMT13T308ERLF	3	GOMT13T308ERLD	1
1.250	JOMT160408ERLF	3	GOMT160408ERLD	1
1.500	JOMT13T308ERLF	6	GOMT13T308ERLD	1
1.984	JOMT160408ERLF	6	GOMT160408ERLD	1

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■ Drilled Hole Bottom Shape



drilled hole bottom shape						
cutting diameter	$\phi .630''$	$\phi .787''$	$\phi 1.000''$	$\phi 1.250''$	$\phi 1.500''$	$\phi 1.984''$
A (inch)	.020"	.027"	.034"	.045"	.061"	.065"

■ Drilling

- Calculate the drilling feeds based on (1) effective tooth.
- Use compressed air during drilling routine.
- When drilling sticky materials, use the peck drill routine.
- For stainless steel machining, use coolant.

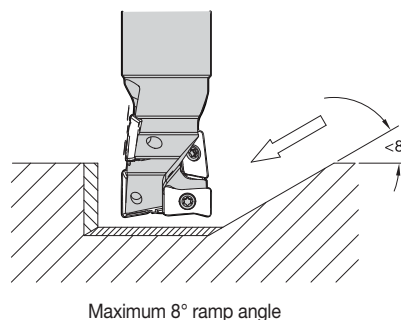
drilling	
cutting diameter	maximum depth (inch)
$\phi .630$	.511
$\phi .787$	.511
$\phi 1.000$	.866
$\phi 1.250$	1.000
$\phi 1.500$	1.000
$\phi 1.984$	1.000

■ Recommended Cutting Data by Operation and Workpiece Material

workpiece material	feed rates (in/tooth)		grade
	drilling	profile/slotting	
steel	.003~.005	.002~.010	KC720M
stainless steel	.003~.006	.002~.006	KC720M
cast iron	.002~.008	.002~.010	KC505M

■ Ramping

- Ramping angle not to exceed 8°.
- Ramping axial depth of cut not to exceed 50% of the cutter diameter.
- When machining, use compressed air for chip evacuation.



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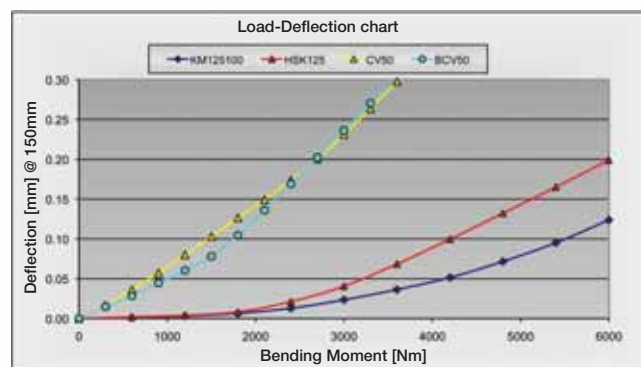


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The Kennametal ceramic milling platform has been specifically engineered to machine high-temperature alloys, PH series, stainless steel, and hardened materials. With excellent productivity through the massive reduction of machining time, Kennametal ceramics can run more than 10 times faster than comparable carbide grades.

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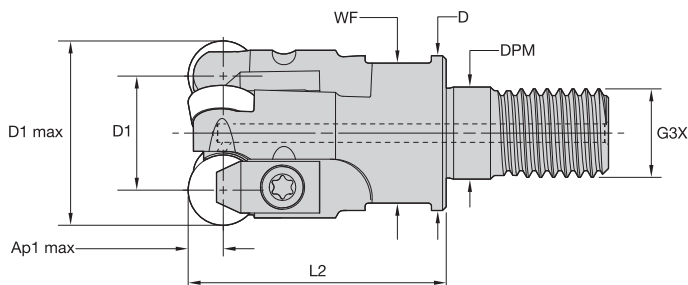
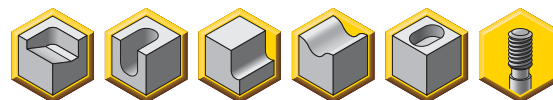
- Engineering to provide outstanding metal removal rates and productivity in nickel-based and/or cobalt-based alloys, stellites, stainless steel, and PH series through HSM.
- High axial and radial runout accuracy.
- Improved insert clearance and thickness tolerance to increase overall performance.
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- Three grades and three insert sizes available to cover a wide range of applications.
- Wide diameter range with shell mills, end mills, and Screw-On cutters, from diameter .625".
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- Through-coolant option in all the cutters. Only for air use.



- For machining high-temp alloys, PH stainless, stainless steels, and hardened materials.
- Excellent productivity through massive reduction of machining time.
- Face milling, pocketing, and ramping capabilities.
- Through-body coolant delivery for internal air supply only.



■ Screw-On End Mills

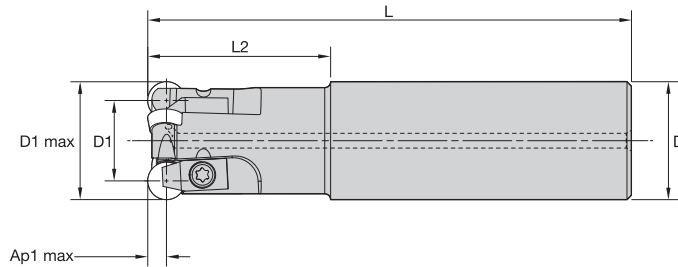
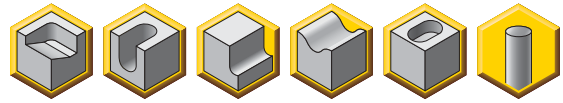
order number	catalog number	D1 max	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	max ramp angle	max RPM	lbs	insert 1
3760369	KIPR100RP32M1203	1.000	.625	.827	.492	M12	1.250	.709	.188	3	8.0°	20450	.17	RP_32_
3760370	KIPR125RP43M1603	1.250	.750	1.142	.669	M16	1.500	.866	.250	3	2.5°	21000	.32	RP_43_

■ Spare Parts



D1 max	clamp	clamp screw	in. lbs.	Torx driver	Torx Plus wrench
1.000	KCI2	191.725	31	DT15	—
1.250	KCI3M	193.409	53	—	TTP20

- For machining high-temp alloys, PH stainless, stainless steels, and hardened materials.
- Excellent productivity through massive reduction of machining time.
- Face milling, pocketing, and ramping capabilities.
- Through-body coolant delivery for internal air supply only.



■ Cylindrical End Mills

order number	catalog number	D1 max	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	lbs	insert 1
3759533	KIPR062RP21229	.625	.375	.625	2.950	1.021	.125	2	12.0°	37400	.21	RP_2150_
3759534	KIPR075RP21332	.750	.500	.750	3.200	1.192	.125	3	10.0°	34150	.33	RP_2150_
3759535	KIPR100RP32438	1.000	.625	1.000	3.800	1.556	.188	3	8.0°	20450	.70	RP_32_
1873486	KIPR125RP43540	1.250	.761	1.250	4.000	1.610	.249	3	4.3°	21000	1.09	RP_43_
1775726	KIPR125RP43555	1.250	.761	1.250	5.500	3.110	.249	3	4.3°	21000	1.54	RP_43_
1775728	KIPR150RP43655	1.500	1.009	1.500	5.500	3.500	.249	3	3.0°	19500	2.28	RP_43_

■ Spare Parts

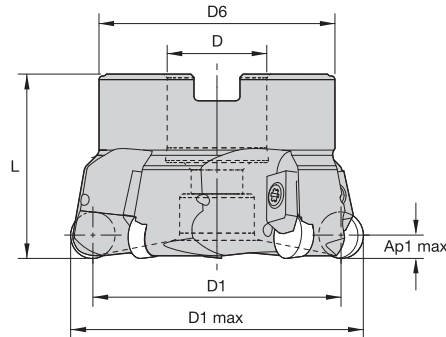
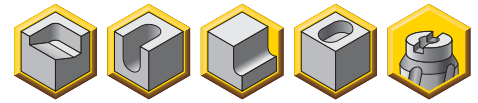


D1 max	clamp	clamp screw	in. lbs.	Torx driver	Torx Plus wrench
.625	KCI1	191.924	17	DT9	—
.750	KCI1	191.924	17	DT9	—
1.000	KCI2	191.725	31	DT15	—
1.250	KCI3M	193.409	55	—	TTP20
1.500	KCI3M	193.409	55	—	TTP20



Copy Mills

- For machining high-temp alloys, PH stainless, stainless steels, and hardened materials.
- Excellent productivity through massive reduction of machining time.
- Face milling, pocketing, and ramping capabilities.
- Through-body coolant delivery for internal air supply only.



■ Shell Mills

order number	catalog number	D1 max	D1	D	D6	L	Ap1 max	Z	max ramp angle	max RPM	lbs	insert 1
1942350	KSSR200RP430C3	2.000	1.505	.750	1.750	2.000	.249	3	3.0°	16000	.96	RP_43_
1942586	KSSR200RP430F3	2.000	1.505	.750	1.750	2.000	.249	4	3.0°	16000	.89	RP_43_
1942587	KSSR250RP430C3	2.500	2.003	.750	1.750	2.000	.249	4	2.0°	14500	1.31	RP_43_
1942589	KSSR300RP430C4	3.000	2.501	1.000	2.190	2.000	.249	5	2.0°	13500	1.92	RP_43_
1942607	KSSR400RP430C5	4.000	3.501	1.250	2.880	2.000	.249	6	1.5°	11500	3.53	RP_43_

■ Spare Parts



D1 max	clamp	clamp screw	in. lbs.	Torx Plus wrench
2.000	KCI3M	193.409	55	TTP20
2.500	KCI3M	193.409	55	TTP20
3.000	KCI3M	193.409	55	TTP20
4.000	KCI3M	193.409	55	TTP20

■ Insert Selection Guide

RPG2150... High Temp

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	—	—	—	—	—	—
P3-P4	—	—	—	—	—	—
P5-P6	..E	KYSP30	..E	KYSP30	..E	KYSP30
M1-M2	—	—	—	—	—	—
M3	..E	KYSM10	..E	KYSM10	..E	KYSM10
K1-K2	—	—	—	—	—	—
K3	—	—	—	—	—	—
N1-N2	—	—	—	—	—	—
N3	—	—	—	—	—	—
S1-S2	..E	KYS30	..E	KYS30	..E	KYS30
S3	..E	KYS30	..E	KYS30	..E	KYS30
S4	—	—	—	—	—	—
H1	..E	KYHS10	..E	KYHS10	—	—

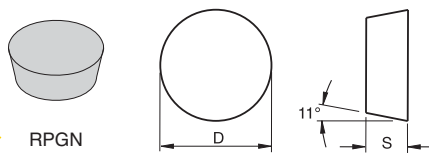
RPG32... High Temp

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	—	—	—	—	—	—
P3-P4	—	—	—	—	—	—
P5-P6	..E	KYSP30	..E	KYSP30	..E	KYSP30
M1-M2	—	—	—	—	—	—
M3	..E	KYSM10	..E	KYSM10	..E	KYSM10
K1-K2	—	—	—	—	—	—
K3	—	—	—	—	—	—
N1-N2	—	—	—	—	—	—
N3	—	—	—	—	—	—
S1-S2	..E	KYS30	..E	KYS30	..T	KYS30
S3	..E	KYS30	..T	KYS30	..T	KYS30
S4	—	—	—	—	—	—
H1	..E	KYHS10	..E	KYHS10	—	—

RPG43... High Temp

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	—	—	—	—	—	—
P3-P4	—	—	—	—	—	—
P5-P6	..E	KYSP30	..E	KYSP30	..E	KYSP30
M1-M2	—	—	—	—	—	—
M3	..E	KYSM10	..E	KYSM10	..E	KYSM10
K1-K2	—	—	—	—	—	—
K3	—	—	—	—	—	—
N1-N2	—	—	—	—	—	—
N3	—	—	—	—	—	—
S1-S2	..E	KYS30	..E	KYS30	..T	KYS30
S3	..E	KYS30	..T	KYS30	..T	KYS30
S4	—	—	—	—	—	—
H1	..E	KYHS10	..E	KYHS10	—	—

Indexable Ceramic Inserts • KIPR-RP • KSSR-RP



● first choice
○ alternate choice

P	●	○	○	○
M	●	○	○	○
K	●	○	○	○
N	●	○	○	○
S	●	○	○	○
H	●	○	○	○

Copy Mills

■ RPGN

catalog number	D	S	KYS30	KYSP30	KYSM10	KYHS10
RPG2150E	.250	.094	●	●	●	●
RPG32E	.375	.125	●	●	●	●
RPG32T0420	.375	.125	●	○	○	○
RPG43E	.500	.188	●	●	●	●
RPG43T0420	.500	.188	●	○	○	○

NOTE: A — Use these tools with the appropriate equipment/machines. Machines have to be covered for safety reasons: Hot flowing chips and loud noise are involved, which is common during the milling process.

- B — Use only air flow as coolant method.
- C — Higher RPMs are involved; use balanced toolholder for higher tool life and safer operation.
- D — Consider increasing the fz in hard machining when smaller ap are applied.

■ Recommended Starting Speeds [SFM]

Material Group		KYHS10			KYSM10			KYSP30			KYS30		
P	1	—	—	—	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—	—	—	—	—	—
	5	—	—	—	3960	3200	2380	3000	2400	1800	—	—	—
	6	—	—	—	3960	3200	2380	3000	2400	1800	—	—	—
M	1	—	—	—	3960	3200	2380	—	—	—	—	—	—
	2	—	—	—	3740	3000	—	—	—	—	—	—	—
	3	—	—	—	2760	2400	—	—	—	—	—	—	—
K	1	—	—	—	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—
N	1-2	—	—	—	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—	—	—	—
S	1	1680	1320	960	3490	2860	2220	2640	2160	1680	2640	2160	1680
	2	1680	1320	960	3490	2860	2220	2640	2160	1680	2640	2160	1680
	3	2400	2040	1680	5080	4130	3180	3840	3120	2400	3840	3120	2400
	4	—	—	—	—	—	—	—	—	—	—	—	—
H	1	1200	1020	780	—	—	—	—	—	—	—	—	—

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

■ Recommended Starting Feeds [IPT] • RPG2150...

Light Machining	General Purpose	Heavy Machining
-----------------	-----------------	-----------------

At .125 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
..E	.005	.005	.007	.004	.004	.005	.003	.003	.004	.003	.003	.004	.003	.003	.004	..E

At .063 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
..E	.005	.006	.008	.004	.004	.006	.004	.004	.005	.003	.004	.005	.003	.004	.005	..E

At .031 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
..E	.007	.008	.010	.005	.006	.008	.005	.005	.007	.004	.005	.006	.004	.005	.006	..E

At .016 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
..E	.010	.011	.014	.007	.008	.010	.006	.007	.009	.006	.007	.008	.006	.006	.008	..E

NOTE: Use "Light Machining" values as starting feed rate.



■ Recommended Starting Feeds [IPT] • RPG32...

Light Machining	General Purpose	Heavy Machining
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At .188 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
..E	.005	.005	.007	.004	.004	.005	.003	.003	.004	.003	.003	.004	.003	.003	.004	..E
..T	.007	.008	.010	.005	.006	.008	.004	.005	.007	.004	.005	.006	.004	.005	.006	..T

At .094 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
..E	.005	.006	.008	.004	.004	.006	.004	.004	.005	.003	.004	.005	.003	.004	.005	..E
..T	.008	.009	.012	.006	.007	.009	.005	.006	.008	.005	.006	.007	.005	.006	.007	..T

At .047 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
..E	.007	.008	.010	.005	.006	.008	.005	.005	.007	.004	.005	.006	.004	.005	.006	..E
..T	.010	.012	.015	.008	.009	.011	.007	.008	.010	.006	.007	.009	.006	.007	.009	..T

At .023 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
..E	.010	.011	.014	.007	.008	.010	.006	.007	.009	.006	.007	.008	.006	.006	.008	..E
..T	.014	.017	.021	.010	.012	.016	.009	.011	.014	.008	.010	.013	.008	.010	.012	..T

■ Recommended Starting Feeds [IPT] • RPG43...

At .250 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
..E	.005	.005	.007	.004	.004	.005	.003	.003	.004	.003	.003	.004	.003	.003	.004	..E
..T	.007	.010	.011	.005	.008	.009	.004	.007	.007	.004	.006	.007	.004	.006	.007	..T

At .125 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
..E	.005	.006	.008	.004	.004	.006	.004	.004	.005	.003	.004	.005	.003	.004	.005	..E
..T	.008	.012	.013	.006	.009	.010	.005	.008	.009	.005	.007	.008	.005	.007	.008	..T

At .063 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
..E	.007	.008	.010	.005	.006	.008	.005	.005	.007	.004	.005	.006	.004	.005	.006	..E
..T	.010	.016	.017	.008	.012	.013	.007	.010	.011	.006	.010	.010	.006	.009	.010	..T

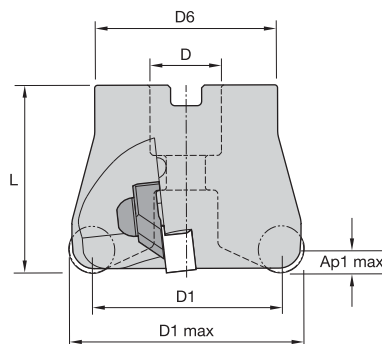
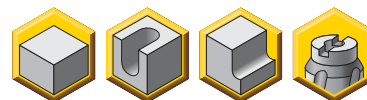
At .031 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
..E	.010	.011	.014	.007	.008	.010	.006	.007	.009	.006	.007	.008	.006	.006	.008	..E
..T	.014	.022	.024	.010	.016	.018	.009	.014	.015	.008	.013	.014	.008	.013	.014	..T

NOTE: Use "Light Machining" values as starting feed rate.

Copy Mills

- First choice for face milling high-temp alloys and hard or hardened materials up to 60 HRC.
- Excellent productivity through massive reduction of machining time.



■ Shell Mills • RNGN 1207

order number	catalog number	D1 max	D1	D	D6	L	Ap1 max	Z	max RPM	lbs	insert 1
1775730	KDNR200RN40C3	2.000	1.501	.750	44,450	2.000	.249	3	13700	.90	RNG45__
1775731	KDNR250RN40C3	2.500	2.000	.750	49,530	2.000	.249	4	12300	1.20	RNG45__
1775753	KDNR300RN40C4	3.000	2.499	1.000	66,680	2.000	.249	5	11200	1.80	RNG45__
1775754	KDNR400RN40C5	4.000	3.496	1.250	73,150	2.000	.249	6	9700	3.50	RNG45__

■ Spare Parts



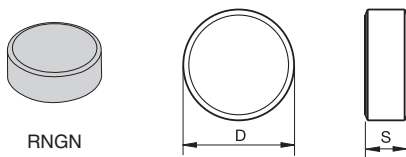
D1 max	clamp	clamp screw	washer	in. lbs.	Torx wrench
2.000	KCI4	MS1221	191.279	65	TT25
2.500	KCI4	MS1221	191.279	65	TT25
3.000	KCI4	MS1221	191.279	65	TT25
4.000	KCI4	MS1221	191.279	65	TT25



■ Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	—	—	—	—	—	—
P3-P4	—	—	—	—	—	—
P5-P6	—	—	..T..	KY2100 / KYSM10	—	—
M1-M2	—	—	—	—	—	—
M3	..T..	KY2100 / KYSM10	..T..	KY2100 / KYSM10	..T..	KY2100 / KYSM10
K1-K2	—	—	—	—	—	—
K3	—	—	—	—	—	—
N1-N2	—	—	—	—	—	—
N3	—	—	—	—	—	—
S1-S2	..E	KY4300 / KYHS10	..T..	KYS30	..T..	KY2100 / KYSM10
S3	..T..	KYS30	..T..	KYS30	..T..	KY4300 / KYHS10
S4	—	—	—	—	—	—
H1	..E	KY4300 / KYHS10	..T..	KY4300 / KYHS10	—	—

Indexable Ceramic Inserts • KIPR-RP • KSSR-RP • KSSR-RN



● first choice
○ alternate choice

P	●	○	○
M	○	○	○
K	○	○	○
N	○	○	○
S	○	○	○
H	○	○	○

■ RNGN

catalog number	D	S	KYS30	KY2100	KY4300
RNG45E	.500	.313	○	○	○
RNG45T0420	.500	.313	●	●	●

NOTE: A — Use these tools with the appropriate equipment/machines. Machines have to be covered for safety reasons: Hot flowing chips and loud noise are involved, which is common during the milling process.

- B — Use only air flow as coolant method.
- C — Higher RPMs are involved; use balanced toolholder for higher tool life and safer operation.
- D — Consider increasing the fz in hard machining when smaller ap are applied.



Copy Mills

■ Recommended Starting Speeds [SFM]

Material Group		KYS30			KY2100			KY4300		
P	1	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—	—	—
	5	—	—	—	3960	3200	2380	—	—	—
	6	—	—	—	3960	3200	2380	—	—	—
M	1	—	—	—	3960	3200	2380	—	—	—
	2	—	—	—	3740	3000	—	—	—	—
	3	—	—	—	2760	2400	—	—	—	—
K	1	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
N	1-2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
S	1	2640	2160	1680	3490	2860	2220	1680	1320	960
	2	2640	2160	1680	3490	2860	2220	1680	1320	960
	3	3840	3120	2400	5080	4130	3180	2400	2040	1680
	4	—	—	—	—	—	—	—	—	—
H	1	—	—	—	—	—	—	1200	1020	780

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

■ Recommended Starting Feeds [IPT] • RNGN45..

Light Machining	General Purpose	Heavy Machining
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At .250 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
..E	.004	.004	.005	.003	.003	.003	.002	.003	.003	.002	.003	.003	.002	.002	.003	..E
..T..	.007	.010	.011	.005	.008	.009	.004	.007	.007	.004	.006	.007	.004	.006	.007	..T..

At .125 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
..E	.004	.005	.005	.003	.004	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003	..E
..T..	.008	.012	.013	.006	.009	.010	.005	.008	.009	.005	.007	.008	.005	.007	.008	..T..

At .063 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
..E	.006	.006	.007	.004	.005	.005	.004	.004	.004	.003	.004	.004	.003	.004	.004	..E
..T..	.010	.016	.017	.008	.012	.013	.007	.010	.011	.006	.010	.010	.006	.009	.010	..T..

At .031 Axial Depth of Cut (ap)

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	10%			20%			30%			40%			50-100%			
..E	.008	.009	.009	.006	.006	.007	.005	.006	.006	.005	.005	.006	.005	.005	.006	..E
..T..	.014	.022	.024	.010	.016	.018	.009	.014	.015	.008	.013	.014	.008	.013	.014	..T..

NOTE: Use "Light Machining" values as starting feed rate.

Copy Mills



Thread Mills

Tool Selection • ISO Internal Threads .....	.S2
Tool Selection • UN Internal Threads .....	.S3
Indexable End Mills	
Weldon Shank • TM25 • Double Sided .....	.S4
Conical Thread • TMT25 • Single Sided • NPT/BSPT .....	.S5
Mini Thread Mills • STN .....	.S9
Tapered Thread • STN .....	.S10
Indexable Inserts .....	.S6, S11–S12
Application and Technical Information .....	.S8, S13–S19

■ Internal Threads • Insert and Holder Recommendations

thread	tap hole fl (mm)	indexable insert	largest milling cutter
M11 x 0,75	10,19	STN10075ISO-I	9X1R .. STN10M
M12	10,11	STN10175ISO-I-C	9X1R015B20-STN10C
M12 x 1,00	10,92	STN10100ISO-I	9X1R .. STN10M
M14	11,84	STN11200ISO-I-C	11X1R .. STN11N
M16	13,84	STN11200ISO-I-C	11X1R .. STN11N
M20	17,29	STN16250ISO-I-C	15X1R020B16-STN16C
M20 x 1,50	18,38	STN11150ISO-I	11X1R .. STN11N
M20 x 1,00	18,92	STN11100ISO-I	11X1R .. STN11N
M24	20,75	STN22300ISO-I-C	18X1R030B25-STN22C
M24 x 2,00	21,84	STN16200ISO-I	17X1R022B16-STN16N
M24 x 1,50	22,38	STN11150ISO-I	11X1R .. STN11N
M24 x 1,50	22,38	STN16150ISO-I	17X1R022B16-STN16N
M27	23,75	STN22300ISO-I-C	18X1R030B25-STN22C
M30	26,21	STN27350ISO-I-C	25X1R040B25-STN27C
M30 x 2,00	27,84	STN16200ISO-I	22X1R025B25-STN16L
M33	29,21	STN27350ISO-I-C	25X1R040B25-STN27C
M33 x 2,00	30,84	STN16200ISO-I	22X1R025B25-STN16L
M33 x 1,50	31,38	STN16150ISO-I	22X1R025B25-STN16L
M35 x 1,50	33,38	STN16150ISO-I	22X1R025B25-STN16L
M36 x 2,00	33,84	STN16200ISO-I	22X1R025B25-STN16L
M42 x 2,00	39,84	STN27200ISO-I	30X1R052B25-STN27N
M45 x 2,00	42,84	STN27200ISO-I	37X1R .. STN27N or L
M48 x 2,00	45,84	STN27200ISO-I	37X1R058B32-STN27N or L
M55 x 2,00	52,84	STN27200ISO-I	37X1R .. STN27N or L
M56 x 2,00	53,84	STN27200ISO-I	37X1R .. STN27N or L
M72 x 2,00	69,84	STN27200ISO-I	37X1R .. STN27N or L

Internal Threads • Insert and Holder Recommendations

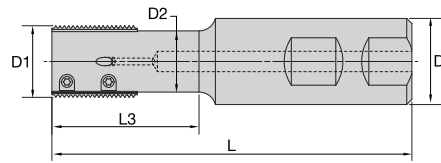
thread	tap hole fl (mm)	indexable insert	largest milling cutter
9/16 - 18UNF	12,76	STN1018UN-I	9X1R .. STN10M
5/8 - 24UNEF	14,73	STN1124UN-I	11X1R .. STN11N
5/8 - 18UNF	14,35	STN1118UN-I	11X1R .. STN11N
3/4 - 20UNEF	17,68	STN1120UN-I	11X1R .. STN11N
3/4 - 16UNF	17,33	STN1116UN-I	11X1R .. STN11N
7/8 - 14UNF	20,26	STN1114UN-I	11X1R .. STN11N
1 - 16UN	23,68	STN1616UN-I	18X1R030B25-STN22C
1 - 12UNF	23,11	STN1612UN-I	17X1R .. STN16N
1 1/8 - 12UNF	26,28	STN1612UN-I	22X1R .. STN16L
1 1/4 - 12UNF	29,46	STN1612UN-I	22X1R .. STN16L
1 3/8 - 12UNF	32,63	STN1612UN-I	22X1R .. STN16L

Whitworth Pipe Thread (Internal) to DIN 259

thread	tap hole fl (mm)	indexable insert	largest milling cutter
R 5/8	20,59	STN1614BSW	17X1R022B16-STN16N
R 3/4	24,12	STN1614BSW	20X1R043B20-STN16N
R 7/8	27,88	STN1614BSW	22X1R025B25-STN16L
R 1	30,29	STN1611BSW	22X1R025B25-STN16L



- .670–1.180" cutting diameter range.
- For internal and external threading on most types of workpiece materials.
- One tool is used for both right- and left-hand threads.
- All cutters have through-coolant capability.
- Utilizes inserts with various profiles and pitches.



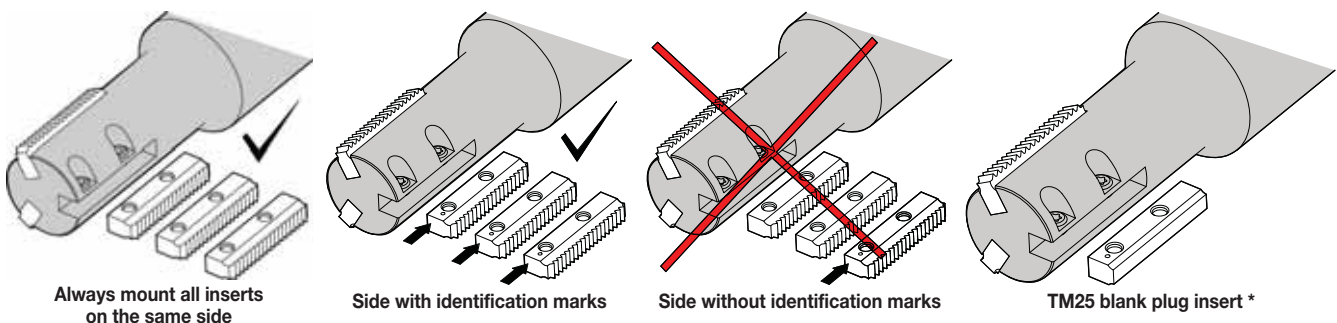
Thread Mill • Weldon Shank



order number	catalog number	D1	D	D2	L	L3	Z	insert screw	in. lbs.	Torx Plus driver
3031706	TM25D067L110Z2	.670	1.000	.550	3.500	1.100	2	TM25INSERTSCREW	35	DT8IP
3031707	TM25D067L145Z2	.670	1.000	.550	3.860	1.450	2	TM25INSERTSCREW	35	DT8IP
3031709	TM25D081L150Z3	.810	1.000	.650	3.900	1.500	3	TM25INSERTSCREW	35	DT8IP
3031710	TM25D081L175Z3	.810	1.000	.650	4.150	1.750	3	TM25INSERTSCREW	35	DT8IP
3031713	TM25D087L220Z3	.870	1.000	.710	4.600	2.200	3	TM25INSERTSCREW	35	DT8IP
3031711	TM25D087L170Z3	.870	1.000	.710	4.090	1.700	3	TM25INSERTSCREW	35	DT8IP
3031716	TMC25D118L315Z4	1.180	1.000	1.100	5.510	3.150	4	TM25INSERTSCREW	35	DT8IP
3031714	TM25D118L220Z5	1.180	1.000	1.100	4.530	2.200	5	TM25INSERTSCREW	35	DT8IP

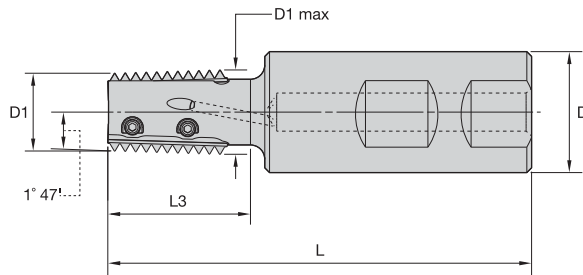
toolholder	D1 inch	ISO (coarse)	Thread Application per Toolholder min thread Ø			
			ISO (fine)	UNC	UN/UNF/UNEF/UNS	BSF
TM25D067L110Z2 TM25D067L145Z2	0.67	M20 x 2.5	M19 x 1; M19 x 1.5; M20 x 2.		7/8-10UNS; 13/16-12UN; 7/8-14UNF; 3/4-16UNF; 3/4-18UNS; 3/4-20UNEF;	7/8-11; 7/8-12; 7/8-14; 7/8-16
TM25D081L150Z3 TM25D081L175Z3	0.81	M24 x 3.0	M22 x 1; M23 x 1.5; M23 x 2; M23.5 x 2.5	1-8	15/16-9UN; 1.0-10UNS; 15/16-12UN 1.0-14UNS; 15/16-16UN; 7/8-18UNS; 7/8-20UNEF;	1.-11; 1.-12; 1.-14; 1.-16
TM25D087L170Z3 TM25D087L220Z3	0.87	M27 x 3.0	M24 x 1; M24 x 1.5; M25 x 2; M25 x 2.5		11/16-8UN; 1.0-9UN; 1.0-10UNS; 1.0-12UNF 1.0-14UNS; 1.0-16UN; 1.0-18UN; 15/16-20UNEF	1.-11; 1.-12; 1.-14; 1.-16
TM25D118L220Z5 TMC25D118L315Z4	1.18		M32 x 1; M32 x 1.5; M33 x 2; M33 x 2.5; M34 x 3		1 3/8-8UN; 1 3/8-9UN; 1 3/8-10UN; 1 5/16-12UN; 1 3/8-14UNS; 1 5/16-16UN; 1 5/16-18UNEF; 1 5/16-20UN	1 3/8-11; 1 3/8-12; 1 3/8-14; 1 3/8-16

Thread Mills



* When not using an insert in each pocket, protect the pocket by using a TM25 blank.

- .550–1.100" cutting diameter range.
- For internal and external threading on most types of workpiece materials.
- One tool is used for both right- and left-hand threads.
- All cutters have through-coolant capability.
- Utilizes inserts with various profiles and pitches.

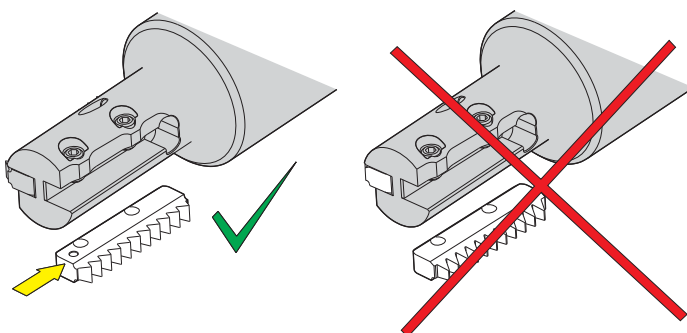


■ **Thread Mill • Normal Shank**

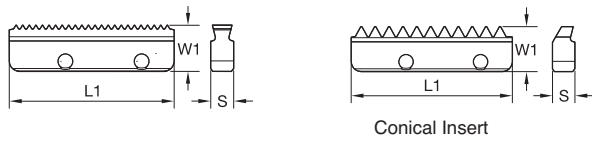
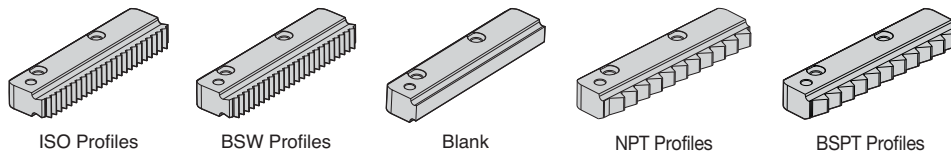
order number	catalog number	D1	D	D1 max	L	L3	Z	insert screw	in. lbs.	Torx Plus driver
3031708	TMT25D067L110Z2	.550	1.000	.670	3.500	1.100	2	TM25INSERTSCREW	35	DT8IP
3031712	TMT25D087L170Z3	.710	1.000	.870	4.090	1.700	3	TM25INSERTSCREW	35	DT8IP
3031715	TMT25D110L170Z4	1.100	1.000	1.100	4.060	1.700	4	TM25INSERTSCREW	35	DT8IP



toolholder	D1 max	Thread Application per Toolholder min thread Ø		
		NPT	NPTF	BSPT
TMT25D067L110Z2	.670	1/2-14; 3/4-14; 1-11.5; 2-11.5	1/2-14; 3/4-14; 1-11.5; 2-11.5	1/2-14; 3/4-14; 1-11; 1 1/4-11; 1 1/2-11; 2-11
TMT25D087L170Z3	.870	3/4-14; 1-11.5; 2-11.5	3/4-14; 1-11.5; 2-11.5	3/4-14; 1-11; 1 1/4-11; 1 1/2-11; 2-11; 2 1/2-11; 3-11; 4-11; 5-11; 6-11
TMT25D110L170Z4	1.100	1-11.5; 2-11.5	1-11.5; 2-11.5	1-11; 1 1/4-11; 1 1/2-11; 2-11; 2 1/2-11; 3-11; 4-11; 5-11; 6-11



NOTE: On conical inserts, the identification mark must be face up.



● first choice
○ alternate choice

P	●	○
M	○	●
K	●	○
N	○	●
S	●	○
H	○	●

■ ISO Profiles • Internal

ISO catalog number	ANSI catalog number	thread pitch mm	L1	W1	S	KC610M	KC635M
TM25N100ISO	TM25N100ISO	1,0	.984	.300	.140	●	●
TM25N150ISO	TM25N150ISO	1,5	.984	.300	.140	●	●
TM25N200ISO	TM25N200ISO	2,0	.984	.300	.140	●	●
TM25N250ISO	TM25N250ISO	2,5	.984	.300	.140	●	●
TM25N300ISO	TM25N300ISO	3,0	.984	.300	.140	●	●

■ UN Profiles • Internal

ISO catalog number	ANSI catalog number	TPI	L1	W1	S	KC610M	KC635M
TM25N8UN	TM25N8UN	8	.984	.300	.140	●	●
TM25N9UN	TM25N9UN	9	.984	.300	.140	●	●
TM25N10UN	TM25N10UN	10	.984	.300	.140	●	●
TM25N12UN	TM25N12UN	12	.984	.300	.140	●	●
TM25N14UN	TM25N14UN	14	.984	.300	.140	●	●
TM25N16UN	TM25N16UN	16	.984	.300	.140	●	●
TM25N18UN	TM25N18UN	18	.984	.300	.140	●	●
TM25N20UN	TM25N20UN	20	.984	.300	.140	●	●

■ Whitworth Profiles • Internal/External

ISO catalog number	ANSI catalog number	TPI	L1	W1	S	KC610M	KC635M
TM25EN11W	TM25EN11W	11	.984	.300	.140	●	●
TM25EN12W	TM25EN12W	12	.984	.300	.140	●	●
TM25EN14W	TM25EN14W	14	.984	.300	.140	●	●

■ NPT Profiles • Internal/External

ISO catalog number	ANSI catalog number	TPI	L1	W1	S	KC610M	KC635M
TM25EN115NPT	TM25EN115NPT	11.5	.984	.300	.140	●	●
TM25EN14NPT	TM25EN14NPT	14	.984	.300	.140	●	●

■ BSPT Profiles • Internal/External

ISO catalog number	ANSI catalog number	internal TPI	L1	W1	S	KC610M	KC635M
TM25EN11BSPT	TM25EN11BSPT	11	.984	.300	.140	●	●
TM25EN14BSPT	TM25EN14BSPT	14	.984	.300	.140	●	●

■ Blank Insert Form

ISO catalog number	ANSI catalog number	L	W1	S
TM25BLANK	TM25BLANK	.988	.220	.140

Thread Mills

■ Kennametal Thread Mill (TM Insert) – SFM

materials	Brinell	surface speeds		indexable inserts
steel	HB	KC610M	KC635M	feed fz (IPT)
P1	125	325–675	290–590	.002–.008
P2	180	290–550	290–520	.002–.008
P3	225	200–425	225–375	.002–.008
P4	250	250–490	250–500	.002–.008
P5	275	250–425	250–500	.002–.006
P6	325	225–350	200–325	.002–.004
stainless steel				
M1	180	325–550	375–590	.002–.004
M2	250	225–450	325–450	.002–.004
M3	330	225–375	325–375	.002–.004
cast iron				
K1	180	200–425	325–450	.001–.003
K2	220	200–390	250–325	.002–.006
K3	260	160–290	200–275	.002–.004
non-ferrous				
N1	60–100	325–820	—	.002–.010
high-temp alloys				
S1	200	65–140	65–130	.002–.004
S2	250	65–90	65–90	.001–.002
S3	280	50–65	50–65	.001–.002
S4	350	30–50	30–50	.001–.002
hardened steel				
H1	55HRc	65–140	65–140	.0004–.001

www.kennametal.com/en-US/customer_support/metalworking/software_download_reference_tools.jhtml
 Kennametal thread mill software: TM - CNC Generator



Carbide Recycling

Help preserve and protect our planet!

It's easy for your company to be environmentally conscious with the Kennametal Carbide Recycling Program.

By sending us your used carbide tools, you help preserve and protect the environment and ensure that these products are recycled responsibly. Kennametal accepts any coated or non-coated carbide items, including inserts, drills, reamers, and taps.



By using the Kennametal Carbide Recycling Program, you will receive:

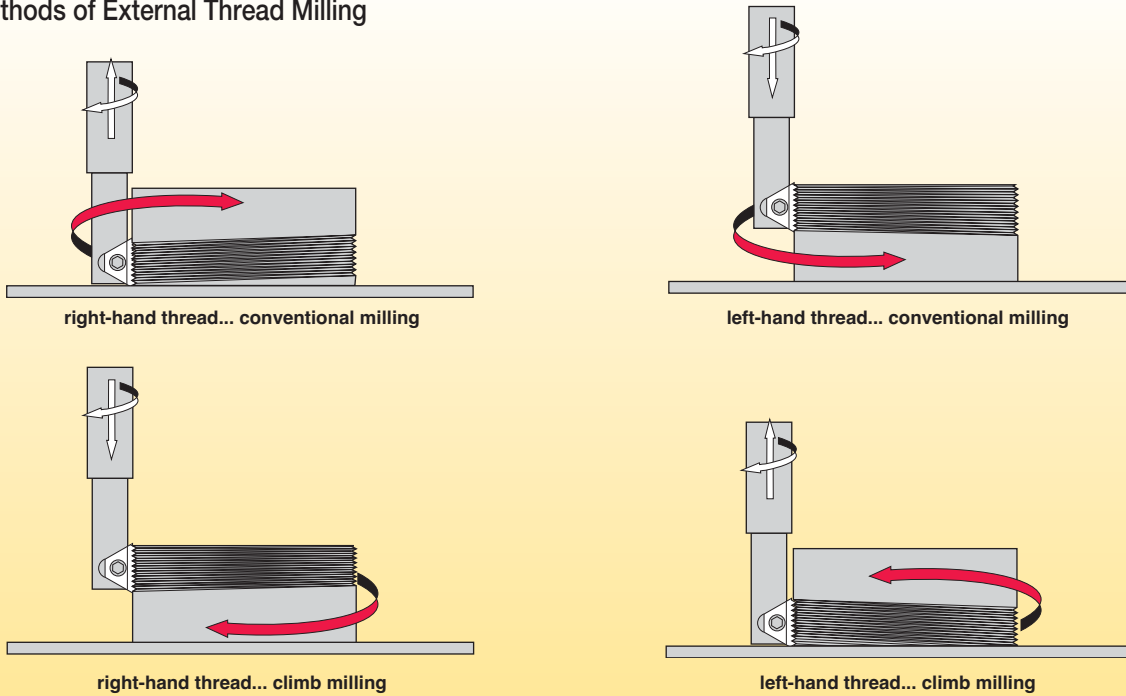
- A partner who cares about a sustainable environment.
- Easy-to-use web portal to value your used carbide.
- Access to our popular Green Box™ options for carbide collection.
- Systematic and efficient disposal of carbide materials.
- Improved profitability.

Program is not currently available in all geographical areas.
 For more information, please visit www.kennametal.com/carbiderecycling.

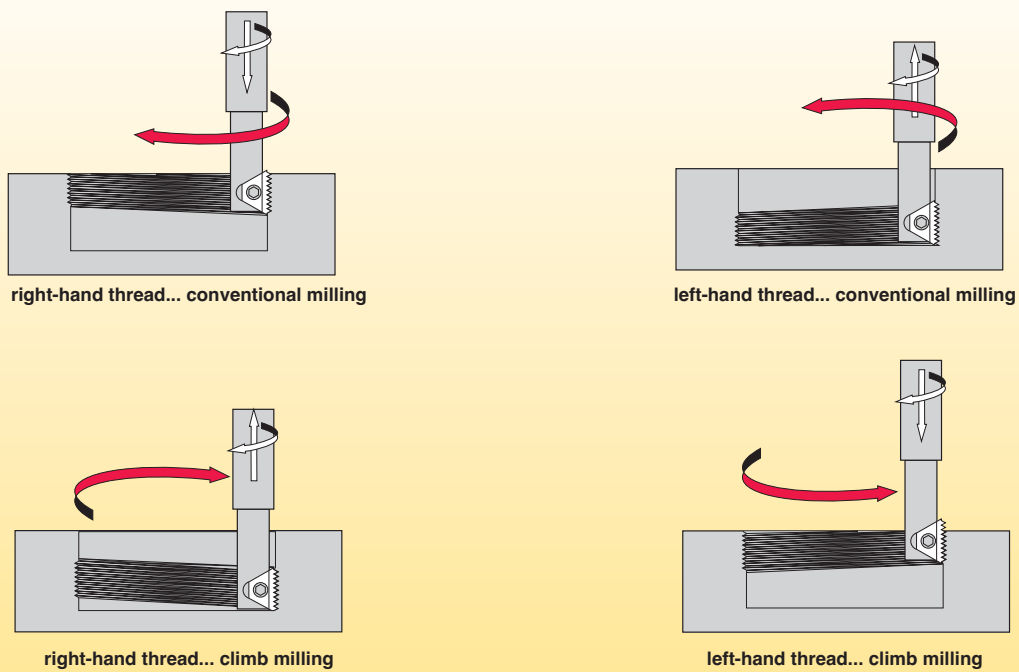
The Following Are a Few Thread Milling Methods (Work Directions)

NOTE: Climb milling results in lower cutting forces, better chip development, higher thread surface quality, and longer insert life. Therefore, it should be used whenever possible. However, in the case of some hardened materials, or when milling certain difficult-to-machine exotic materials, conventional milling may be preferred.

■ Methods of External Thread Milling

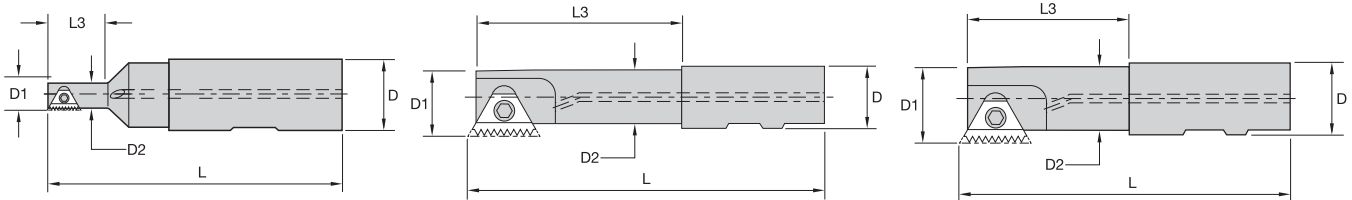
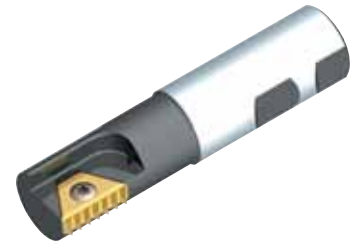


■ Methods of Internal Thread Milling



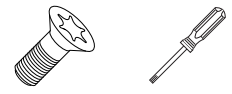
Thread Mills

- For internal and external threading on most types workpiece materials.
- One tool is used for both right- and left-hand threads.
- All cutters have through-coolant capability.
- Utilizes inserts with various profiles and pitches.



■ **Thread Mill • Mini**

order number	catalog number	D1	D	D2	L	L3	Z	max RPM	insert 1	insert screw	Torx driver
1280476	K035TM1RW050STN10M	.354	.500	.264	2.720	.472	1	39935	STN10	SN7T	DT7
1280477	K035TM1RW075STN10M	.354	.750	.264	3.300	.669	1	39935	STN10	SN7T	DT7



■ **Thread Mill • Normal Shank • STN11**

order number	catalog number	D1	D	D2	L	L3	Z	max RPM	insert 1	insert screw	Torx driver
1280481	K045TM1RW050STN11N	.450	.500	.350	2.750	.470	1	36825	STN11	SN2TPKG	DT8
1280483	K045TM1RW075STN11N	.450	.750	.350	3.500	.790	1	36825	STN11	SN2TPKG	DT8



■ **Thread Mill • Normal Shank • STN16**

order number	catalog number	D1	D	D2	L	L3	Z	max RPM	insert 1	insert screw	Torx driver
1280493	K067TM1RW062STN16N	.670	.625	.537	3.560	.870	1	25750	STN16	SN3TM	DT10
1192237	K079TM1RW075STN16N	.790	.750	.650	3.750	1.680	1	23330	STN16	SN3TPKG	DT10



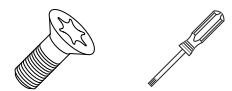
■ **Thread Mill • Normal Shank • STN27**

order number	catalog number	D1	D	D2	L	L3	Z	max RPM	insert 1	insert screw	Torx driver
1280548	K118TM1RW100STN27N	1.180	1.000	.945	4.380	2.030	1	12900	STN27	SN5TM	TT25
1280581	K146TM1RW125STN27N	1.460	1.250	1.220	4.750	2.410	1	11600	STN27	SN5TM	TT25



■ **Thread Mill • Long Shank • STN16**

order number	catalog number	D1	D	D2	L	L3	Z	max RPM	insert 1	insert screw	Torx driver
1280501	K087TM1RW100STN16L	.870	1.000	.728	5.000	1.000	1	22230	STN16	SN3TPKG	DT10



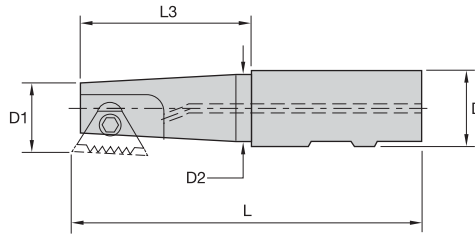
■ **Thread Mill • Long Shank • STN27**

order number	catalog number	D1	D	D2	L	L3	Z	max RPM	insert 1	insert screw	Torx driver
1280546	K118TM1RW100STN27L	1.180	1.000	.945	5.880	3.530	1	12900	STN27	SN5TM	TT25
1280579	K146TM1RW125STN27L	1.460	1.250	1.220	6.330	4.000	1	11600	STN27	SN5TMPKG	TT25



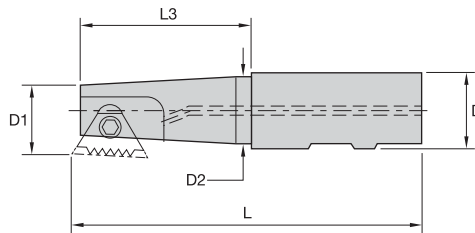
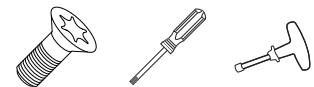
Thread Mills

- For internal and external threading on most types of workpiece materials.
- One tool is used for both right- and left-hand threads.
- All cutters have through-coolant capability.
- Uses inserts with various profiles and pitches.



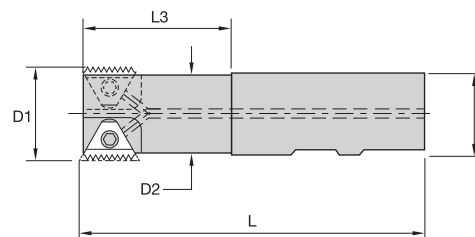
■ Thread Mill • Tapered Thread • Right Hand

order number	catalog number	D1	D	D2	L	L3	Z	max RPM	insert 1	insert screw	Torx driver	Torx wrench
1280478	K039TM1RW075STN11T	.390	.750	.290	3.120	.610	1	36500	STN11	SN2TPKG	DT8	—
1280491	K061TM1RW062STN16T	.610	.625	.494	3.560	.870	1	26550	STN16	SN3TPKG	DT10	—
1280497	K075TM1RW075STN16T	.750	.750	.591	3.380	.910	1	24350	STN16	SN3TM	DT10	—
1280549	K118TM1RW100STN27T	1.180	1.000	.945	4.380	2.030	1	12900	STN27	SN5TM	—	TT25



■ Thread Mill • Tapered Thread • Left Hand

order number	catalog number	D1	D	D2	L	L3	Z	max RPM	insert 1	insert screw	Torx driver
1280490	K061TM1LW062STN16T	.610	.625	.494	3.560	.870	1	26550	STN16	SN3TPKG	DT10
1280496	K075TM1LW075STN16T	.750	.750	.591	3.380	.910	1	24350	STN16	SN3TM	DT10

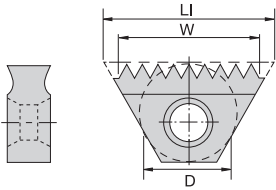


■ Thread Mill • Double Insert

order number	catalog number	D1	D	D2	L	L3	Z	max RPM	insert 1	insert screw	Torx driver	Torx wrench
1280494	K067TM2RW075STN11D	.670	.750	.537	3.420	1.340	2	30275	STN11	SN2TPKG	DT8	—
1280517	K102TM2RW100STN16D	1.024	1.000	.891	4.020	1.690	2	20530	STN16	SN3TPKG	DT10	—
1280598	K165TM2RW125STN27D	1.654	1.250	1.417	4.650	1.770	2	10900	STN27	SN5TM	—	TT25



Thread Mills



● first choice
○ alternate choice

P	●	○	○
M	○	●	●
K	●	●	●
N	●	●	●
S	●	●	●
H	●	●	●

Internal • UN Thread

ISO catalog number	ANSI catalog number	TPI	D	LI	W	KC610M	KC620M	KC635M
STN1020UNI	STN1020UNI	20	.2362	.410	.350			●
STN1018UNI	STN1018UNI	18	.2362	.410	.330			●
STN1128UNI	STN1128UNI	28	1/4	.430	.390			●
STN1124UNI	STN1124UNI	24	1/4	.430	.380			●
STN1120UNI	STN1120UNI	20	1/4	.430	.400			●
STN1118UNI	STN1118UNI	18	1/4	.430	.390			●
STN1116UNI	STN1116UNI	16	1/4	.430	.380			●
STN1114UNI	STN1114UNI	14	1/4	.430	.360			●
STN1632UNI	STN1632UNI	32	3/8	.630	.590			●
STN1627UNI	STN1627UNI	27	3/8	.630	.560			●
STN1624UNI	STN1624UNI	24	3/8	.630	.580			●
STN1616UNI	STN1616UNI	16	3/8	.630	.560	●		●
STN1614UNI	STN1614UNI	14	3/8	.630	.570			●
STN1612UNI	STN1612UNI	12	3/8	.630	.580			●

External • UN Thread

ISO catalog number	ANSI catalog number	TPI	D	LI	W	KC610M	KC620M	KC635M
STN1118UNE	STN1118UNE	18	1/4	.430	.390			●
STN1624UNE	STN1624UNE	24	3/8	.630	.580			●
STN1620UNE	STN1620UNE	20	3/8	.630	.550			●
STN1616UNE	STN1616UNE	16	3/8	.630	.560			●
STN1614UNE	STN1614UNE	14	3/8	.630	.570			●

Internal • ISO Thread

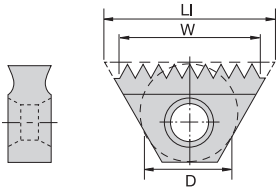
ISO catalog number	ANSI catalog number	thread pitch mm	D	LI	W	KC610M	KC620M	KC635M
STN10150ISOI	STN10150ISOI	1,5	.2362	.410	.350			●
STN10125ISOI	STN10125ISOI	1,25	.2362	.410	.340			●
STN10100ISOI	STN10100ISOI	1,0	.2362	.410	.350	●		●
STN10075ISOI	STN10075ISOI	0,75	.2362	.410	.380			●
STN11150ISOI	STN11150ISOI	1,5	1/4	.430	.410			●
STN11125ISOI	STN11125ISOI	1,25	1/4	.430	.340			●
STN11100ISOI	STN11100ISOI	1,0	1/4	.430	.390			●
STN11050ISOI	STN11050ISOI	0,50	1/4	.430	.410			●
STN16200ISOI	STN16200ISOI	2,0	3/8	.630	.550			●
STN16175ISOI	STN16175ISOI	1,75	3/8	.630	.550			●
STN16150ISOI	STN16150ISOI	1,5	3/8	.630	.590			●
STN16100ISOI	STN16100ISOI	1,0	3/8	.630	.590			●

Internal • ISO Thread • Coarse

ISO catalog number	ANSI catalog number	thread pitch mm	D	LI	W	KC610M	KC620M	KC635M
STN22300ISOIC	STN22300ISOIC	3,0	.500	.870	.700	●		●
STN27350ISOIC	STN27350ISOIC	3,5	.625	1.060	.960	●		●



Thread Mills



● first choice
○ alternate choice

P	●	○	○
M	○	●	●
K	●	○	○
N	●	○	○
S	○	●	●
H	○	○	○

■ External • ISO Thread

ISO catalog number	ANSI catalog number	thread pitch mm	D	LI	W	KC610M	KC620M	KC635M
STN16150ISOE	STN16150ISOE	1,5	3/8	.630	.590	●	●	
STN27200ISOE	STN27200ISOE	2,0	5/8	1.060	.940	●		

■ BSW Thread

ISO catalog number	ANSI catalog number	TPI	D	LI	W	KC610M	KC620M	KC635M
STN1119BSW	STN1119BSW	19	1/4	.430	.370			●
STN1614BSW	STN1614BSW	14	3/8	.630	.570	●		●
STN1612BSW	STN1612BSW	12	3/8	.630	.580			●
STN1611BSW	STN1611BSW	11	3/8	.630	.550	●		●

■ NPS Thread

ISO catalog number	ANSI catalog number	TPI	D	LI	W	KC610M	KC620M	KC635M
STN1614NPS	STN1614NPS	14	3/8	.630	.570			●
STN16115NPS	STN16115NPS	11.5	3/8	.630	.520			●

■ NPT Thread

ISO catalog number	ANSI catalog number	TPI	D	LI	W	KC610M	KC620M	KC635M
STN1118NPT	STN1118NPT	18	1/4	.430	.390			●
STN1614NPT	STN1614NPT	14	3/8	.630	.570			●
STN16115NPT	STN16115NPT	11.5	3/8	.630	.520			●

■ NPTF Thread

ISO catalog number	ANSI catalog number	TPI	D	LI	W	KC610M	KC620M	KC635M
STN1118NPTF	STN1118NPTF	18	1/4	.430	.390			●
STN1614NPTF	STN1614NPTF	14	3/8	.630	.570			●
STN16115NPTF	STN16115NPTF	11.5	3/8	.630	.520			●

NOTE: NPTF = Dry Seal
NPT and NPTF inserts possess right- and left-hand edge.
Order left-hand bar for left-hand inserts.

■ Minimum Bore Diameters for Thread Milling

UN-ISO-BSW

cutter	TPI	48	32	24	20	16	12	10	8	7	6	5.5	5	4.5	4
	pitch mm	0,5	0,75	1,0	1,25	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0	5,5	6,0
	cutter diameter (D1)	minimum bore diameter (D) (inches)													
K035TM1RW050-STN10	.35	.374	.394	.421	.449										
K045TM1RW050-STN11N	.45	.472	.492	.520	.547	.571									
K049TM1RW037LT11S	.49	.512	.531	.559	.587	.610									
K061TM1RW062-STN16T	.61	.630	.650	.667	.705	.728	.768								
K067TM2RW075-STN11D	.67	.693	.717	.748	.772	.787	.827								
K075TM1RW075-STN16T	.75	.776	.803	.827	.850	.866	.906								
K079TM1RW075-STN16N	.79	.815	.843	.866	.890	.906	.945								
K087TM1RW100-STN16L	.87	.893	.921	.945	.969	.984	1.024								
K102TM2RW100-STN16D	1.02	1.051	1.079	1.102	1.130	1.154	1.193								
K118TM1RW100-STN27N	1.18	1.209	1.236	1.260	1.291	1.319	1.362	1.441	1.535	1.654	1.772	1.890			
K146TM1RW125-STN27N	1.46	1.496	1.520	1.555	1.591	1.614	1.654	1.732	1.830	1.929	2.047	2.185			
K165TM2RW125-STN27D	1.65	1.701	1.724	1.772	1.811	1.831	1.866	1.929	2.047	2.146	2.268	2.401			
—	1.38 (UN)	—	—	—	—	—	—	—	—	—	—	1.969	—	1.843	—
—	1.38 (ISO)	—	—	—	—	—	—	—	—	—	—	1.969	2.102	1.673	1.969
—	1.38 (BSW)	—	—	—	—	—	—	—	—	—	—	1.961	—	1.831	—

Cutting Data Recommendation

workpiece material	cutting speed (SFM)	feed rate per revolution (inch)
	KC635M	
carbon steels <187 HB	300 - 700	.004 - .008
carbon steels 187-220 HB	300 - 500	.004 - .006
alloy steel 200-250 HB	200 - 425	.004 - .006
alloy steel 250-325 HB	150 - 300	.004 - .006
stainless steel, austenitic <210 HB	300 - 450	.004 - .006
stainless steel, martensitic <321 HB	250 - 350	.002 - .006
stainless steel, ferritic <245 HB	350 - 550	.002 - .004
cast steel <140 HB	350 - 550	.002 - .006
cast steel 220-302 HB	225 - 425	.002 - .004
titanium alloys	200 - 400	.001 - .003
high-temperature (nickel and iron based)	75 - 150	.001 - .002
high-temperature (cobalt based)	50 - 100	.001 - .002
cast iron	250 - 350	.002 - .006
malleable iron	250 - 400	.001 - .003

NOTE:

- All thread milling inserts are full profile or cresting type. Inserts are designed to mill full thread depth in one revolution or pass.
- When machining difficult materials, two passes may be desired. A 60% thread depth on the first pass and a 40% thread depth on the second pass is recommended.
- Thread relief grooves in blind holes are not necessary.
- Thread milling large parts requires considerably less horsepower compared to other threading methods.
- Thread milling produces short chips compared to stringy chips of other threading methods.
- One holder is suitable for many different thread pitches.
- PVD-coated inserts provide maximum tool life for a wide variety of materials.



Thread Mills

Understanding Thread Milling

In order to perform a thread milling operation, a milling machine with 3-axis control, capable of helical interpolation, is required. Helical interpolation is a CNC function producing tool movement along a helical path. This helical travel combines circular movement in one plane with a simultaneous linear motion in a plane perpendicular to the first. For example, the path from point A to point B (Figure A) on the envelope of the cylinder combines a circular movement in the X and Y plane with a linear movement in the Z direction.

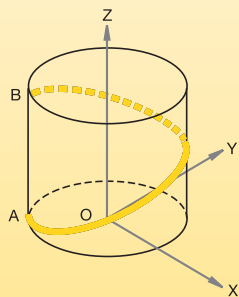
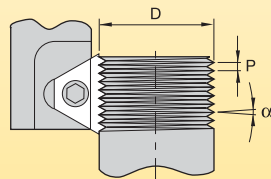


Figure A



α — helix angle
D — external diameter
P — pitch

Figure B

On most CNC systems, this function can be executed in two different ways:

1. G02: helical interpolation in a clockwise direction.
2. G03: helical interpolation in a counterclockwise direction.

The thread milling operation (Figure B) consists of circular rotation of the tool about its own axis together with an orbiting motion along the bore or workpiece circumference.

During one such orbit, the tool will move vertically one pitch length. These movements, combined with the insert geometry, create the required thread form.

There are two acceptable ways of approaching the workpiece with the tool to initiate production of the thread:

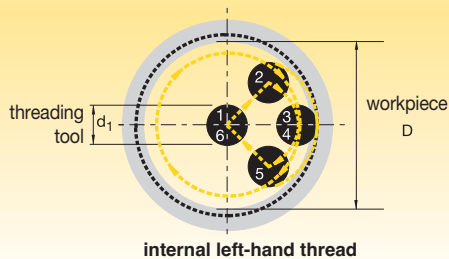
1. Along a tangential arc.
2. Along a tangential straight line.

NOTE: Climb milling is preferred.

Tangential Approach (Arc)

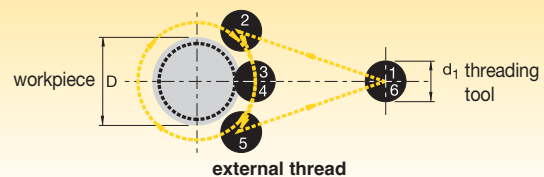
With this method, the tool enters and exits the workpiece smoothly. No marks are left on the workpiece, and there is no vibration, even with harder materials.

Although it requires slightly more complex programming, this is the method recommended for machining the highest quality threads.



internal left-hand thread

1-2:	rapid approach
2-3:	tool entry along tangential arc with simultaneous feed along Z-axis
3-4:	helical movement during one full orbit (360°)
4-5:	tool exit along tangential arc with continuing feed along the Z-axis
5-6:	rapid return

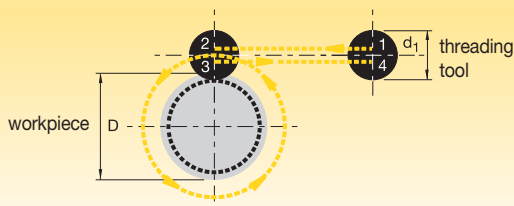


external thread

Tangential Approach (Line)

This method is very simple and has all of the advantages of the tangential arc method. However, it is applicable only to external threads.

1-2:	radial entry with simultaneous feed along the Z-axis
2-3:	helical movement during one full orbit (360°)
3-4:	radial exit



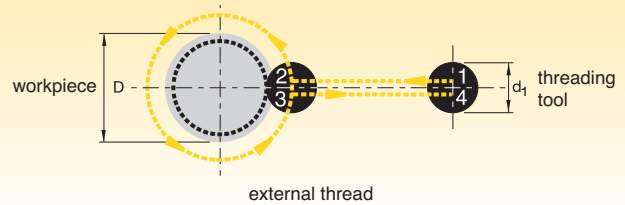
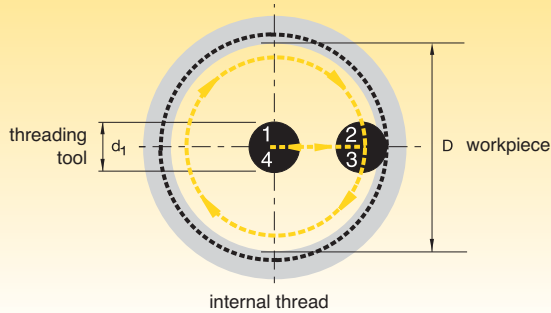
■ Preparing for the Thread Milling Operation

This is the simplest method. There are two characteristics worth noting about the radial approach:

- A small vertical mark may be left at the entry (and exit) point. This is of no significance to the thread itself.
- When using this method with very hard materials, there may be a tendency for the tool to vibrate as it approaches the full cutting depth.

1-2:	radial entry
2-3:	helical movement during one full orbit (360°)
3-4:	radial exit

NOTE: Radial feed during entry to the full profile depth should be only 1/3 of the subsequent circular feed!



■ Calculation of Feed Rates at the Cutting Edge

The first step is to calculate the tool feed rate at the cutting edge.

$$F_1 = f_z \times z \times n$$

- F_1 = tool feed rate at the cutting edge (in/min)
 f_z = inch per tooth (feed rate)
 Z = number of effective inserts in cutter
 n = rotational speed (spindle RPM)

The rotational speed (RPM) is calculated by the following formula:

$$RPM = \frac{12 \times SFM}{\pi \times d_1}$$

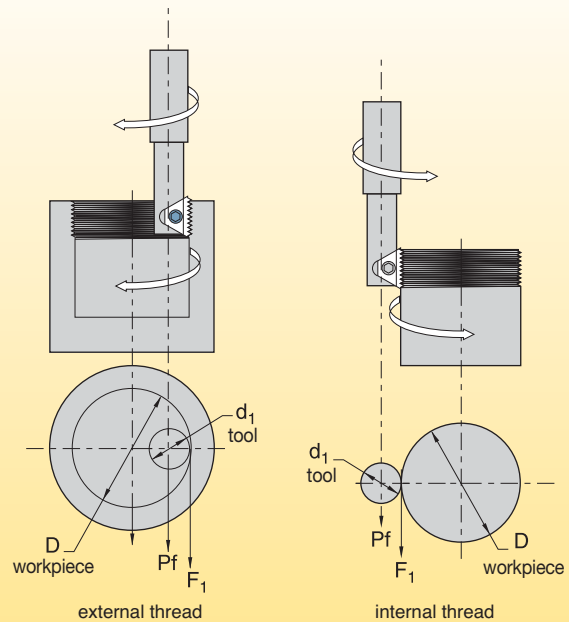
- SFM = cutting speed, surface feet per minute
 d_1 = cutter diameter, over insert
 $\pi = 3.1416$

■ Calculation of Program Feed Rate

On most CNC machines, the feed rate required for programming is at the centerline of the tool. When dealing with linear tool movement, the feed rate at the cutting edge and the centerline are identical. However, with circular tool movement, this is not the case. The following equations define the relationship between feed rates at the cutting edge and at the tool centerline.

$$P_f = F_1 + \frac{(F_1 \times d_1)}{D}$$

- P_f = program feed rate (in/min)
 D = major diameter (external thread)
 D = minor diameter (internal thread)
 d_1 = cutting diameter, over insert



■ Step-by-Step Thread Milling Example

thread: internal right hand 11/4 x 16 UN-2B-RH(21)

material: AISI 4140 (300 HB)

thread diameters: D (minimum bore dia.) = 1.182

Do (nominal dia.) = 1.25"

thread length: .50"

For best thread quality, the cutter with the largest d_1 (cutter diameter) possible should be used. This cutter diameter can be found in the table on page S13 as a function of pitch and minimum bore diameter D. The result for the above example is that any cutter diameter 1.02 inch or smaller can be utilized.

A cutter with a smaller d_1 will perform the thread milling operation in less time. The smaller d_1 may result in less tool rigidity, so it should be used with caution on very tough materials.

Find the appropriate normal-length shank cutter diameter on pages S9–S10.

Use the minimum bore diameter table below for reference.

pitch (TPI)	24	20	16	12
pitch (mm)	1,0	1,25	1,5	2,0
cutter dia. d_1	minimum bore diameter D			
.67	.748	.772	.787	.827
.75	.827	.850	.866	.906
.79	.866	.890	.906	.945

Figure B: cutter selected: K079TMIRW075STN16N
outer dimensions: $d_1 = .79$, R_t (radius of tool) = $d_1 \div 2 = .395$

■ Choosing Insert Size

The insert IC is defined by the selected cutter (STN16).

Use the appropriate insert table on pages S11–S12.

insert size IC	a in (mm)	pitch (TPI)	internal thread	b thread length (in)	number of teeth	grade		external thread	b thread length (in)	number of teeth	grade		cutter type
			catalog number			KC610M	KC620M	catalog number			KC610M	KC620M	
		32	STN16 32UN-I	.59	19	<input type="checkbox"/>	<input type="checkbox"/>	STN16 32UN-E	.59	19	<input type="checkbox"/>	<input type="checkbox"/>	
		28	STN16 28UN-I	.57	16	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	STN16 28UN-E	.57	16	<input type="checkbox"/>	<input type="checkbox"/>	
		27	STN16 27UN-I	.56	15	<input type="checkbox"/>	<input checked="" type="checkbox"/>	STN16 27UN-E	.56	15	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
		24	STN16 24UN-I	.55	14	<input type="checkbox"/>	<input type="checkbox"/>	STN16 24UN-E	.58	14	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3/8	.63 (16)	20	STN16 20UN-I	.55	11	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	STN16 20UN-E	.55	11	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	STN16
		18	STN16 18UN-I	.56	10	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	STN16 18UN-E	.56	10	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
		16	STN16 16UN-I	.56	9	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	STN16 16UN-E	.56	9	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
		14	STN16 14UN-I	.57	8	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	STN16 14UN-E	.57	8	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
		13	STN16 13UN-I	.54	7	<input type="checkbox"/>	<input type="checkbox"/>	STN16 13UN-E	.54	7	<input type="checkbox"/>	<input type="checkbox"/>	
		12	STN16 12UN-I	.58	7	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	STN16 12UN-E	.58	7	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

insert selected: STN16 16UN-I

■ stock standard

□ non-stock standard

Step-by-Step Thread Milling Example

Calculate the feed rates:

First, find the RPM.

$$\text{RPM} = \frac{12 \times \text{SFM}}{\pi \times d_1} = \frac{12 \times 500}{3.14 \times .79} = 2418 \text{ RPM}$$

Next, calculate the feed rate at the insert cutting edge (F₁):

(using the chosen feed per tooth of .004.)

$$F_1 = \text{IPT} \times n_t \times \text{RPM} = .004 \times 1 \times 2418 = 9.67 \text{ in/min}$$

Finally, calculate the feed rate at the cutter centerline (F₂):

$$F_2 = \frac{F_1 \times (D - d_1)}{D} = \frac{9.67 \times (1.182 - .79)}{1.182} = 3.207 \text{ in/min}$$

Select the thread milling method.

Selected method — climb milling (preferred) refer to page S8.

Calculate the radius of the tangential arc R_e:

$$R_e = \frac{(R_i - C_L)^2 + R_o^2}{2R_o} = \frac{(.591 - .02)^2 + .625^2}{2 \times .625}$$

$$R_e = .573333 \text{ in.}$$

Calculate the angle (β):

$$\beta = 90^\circ + \arcsin \frac{R_o - R_e}{R_e}$$

$$\beta = 90^\circ + \arcsin \frac{.625 - .573333}{.573333}$$

$$\beta = 90^\circ + 5.17^\circ = 95.17^\circ = 95^\circ 10'$$

Calculate the movement along the Z-axis during the entry approach from point A to point B (Zα).
(NOTE: P = pitch)

$$Z\alpha = P \text{ (in)} \times \frac{\alpha^\circ}{360^\circ} = .0625 \times \frac{.0156}{4} = .0156 \text{ in, because } \alpha = 90^\circ$$

Calculate the X and Y values at the start of the entry approach.

$$X = 0Y = -R_i + C_L = -.591 + .02 = -.571 \text{ in}$$

Define Z-axis location at the start of the entry approach.
(NOTE: L = length of thread)

$$Z = -(L + Z\alpha) = -(.50 + .0156) = -.5156 \text{ in}$$

Define the starting point.

$$X_a = 0$$

$$Y_a = 0$$

CNC Program (Fanuc 11M)

```
%
N10G90G00G57X0.000Y0.000
N20G43H10Z0.M3S2417
N30G91G00X0.Y0.Z-.5156
N40G41D60X0.000Y-.5710Z0.
N50G03X0.6250Y0.5710Z0.0156R0.5733F3.206
N60G03X0.Y0.Z0.0625I-.625J0.
N70G03X-.625Y0.5710Z0.0156R0.5733
N80G00G40X0.Y-.5710Z0.
N90G49G57G00Z8.0M5
N100M30
%
```

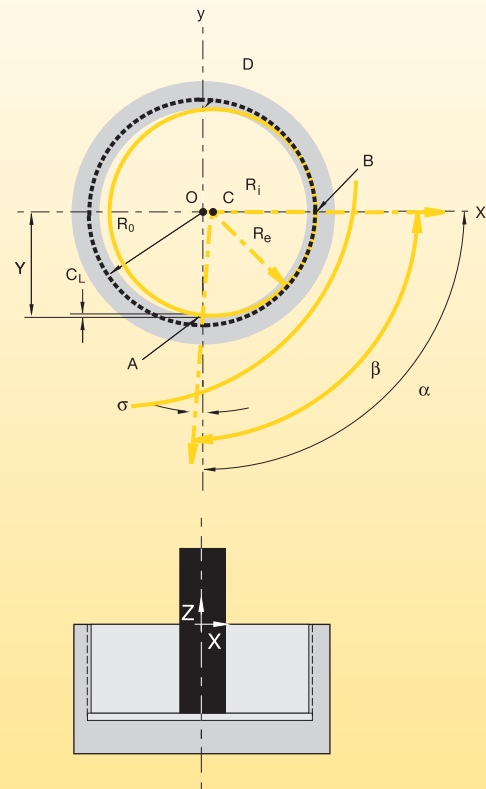
$$R_i = \frac{D}{2}$$

D = minor diameter

$$R_o = \frac{D_o}{2}$$

D_o = nominal diameter

$$\alpha = 90^\circ$$



■ Step-by-Step Thread Milling Example

Appendix A

Derivation of Formulas for Internal Thread Milling

R_e , β , and X can be found by a geometric analysis of the entry path. This entry path is defined by the tool traveling along a circular path, with a radius of R_e about the point C.

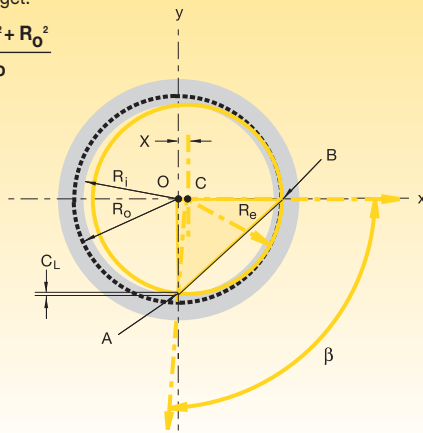
derivation of $R_e = \frac{(R_i - C_L)^2 + R_o^2}{2R_o}$

Triangle OAC enables us to simply solve for R_e . Note that OAC is a right-angle triangle, and that:
 $OA = R_i - C_L$
 $CA = R_e$
 $OC = R_o - R_e$
 Pythagoras' law states: $OA^2 + OC^2 = AC^2$
 Replacing actual values, we get:

$(R_i - C_L)^2 + (R_o - R_e)^2 = R_e^2$

Simplifying, we get:

$R_e = \frac{(R_i - C_L)^2 + R_o^2}{2R_o}$



Appendix B

Derivation of Formulas for External Thread Milling

R_e , β , and X can be found by a geometric analysis of the entry path. This entry path is defined by the tool traveling along a circular path, with a radius of R_e about the point C.

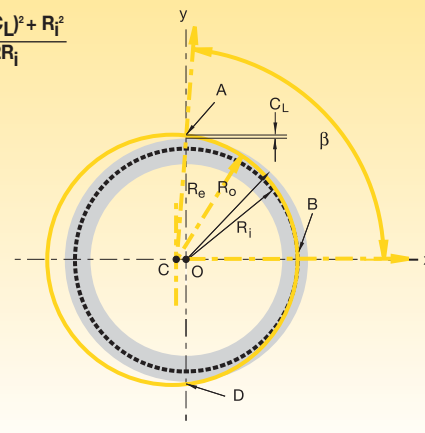
derivation of $R_e = \frac{(R_o - C_L)^2 + R_i^2}{2R_i}$

Triangle OAC enables us to simply solve for R_e . Note that OAC is a right-angle triangle, and that:
 $OA = R_o + C_L$
 $CA = R_e$
 $OC = R_e - R_i$
 Pythagoras' law states: $OA^2 + OC^2 = AC^2$
 Replacing actual values, we get:

$(R_o + C_L)^2 + (R_e - R_i)^2 = R_e^2$

Simplifying, we get:

$R_e = \frac{(R_o - C_L)^2 + R_i^2}{2R_i}$



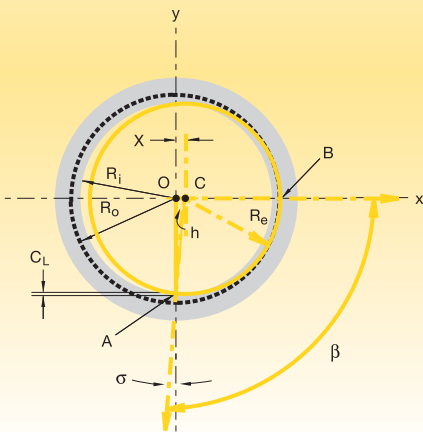
Find the angle β .

$\beta = 90^\circ + \sigma$

$\sin \sigma = \frac{OC}{CA} = \frac{(R_o - R_e)}{R_e}$

$\sigma = \arcsin \left(\frac{R_o - R_e}{R_e} \right)$

Therefore, $\beta = 90^\circ + \arcsin \left(\frac{R_o - R_e}{R_e} \right)$

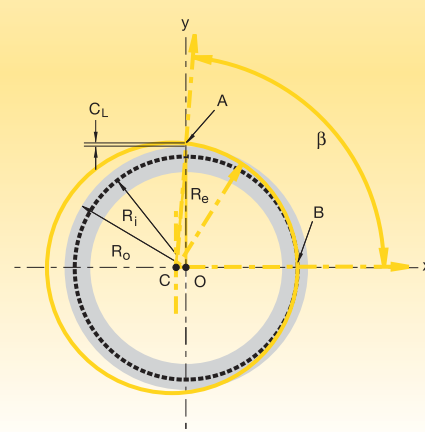


Find the angle β .

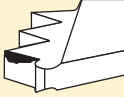


β can be easily found using the same triangle:

$\sin \beta = \frac{AO}{AC} = \frac{(R_o + C_L)}{R_e}$

$\beta = \arcsin \left(\frac{R_o + C_L}{R_e} \right)$



■ Thread Mill Troubleshooting

problem	possible cause	solution
excessive insert flank wear 	• Cutting speed too high.	• Reduce cutting speed.
	• Chip is too thin.	• Increase feed rate.
	• Insufficient coolant.	• Increase coolant quantity/pressure.
chipping of cutting edge 	• Chip is too thick.	• Reduce feed rate. • Use the tangential arc method of entrance. • Increase rpm.
	• Vibration.	• Check rigidity.
material build-up on the cutting edge 	• Cutting speed too slow.	• Increase cutting speed.
	• Chip thickness too small.	• Increase feed rate.
chatter/vibration	• Feed rate is too high.	• Reduce the feed.
	• Profile is too deep (coarse pitch threads).	• Execute two passes, each with increased cutting depth. • Execute two passes, each cutting only half the thread length.
	• Thread length is too long.	• Execute two passes, each cutting only half of the thread length.
insufficient thread accuracy	• Tool deflection.	• Reduce feed rate. • Execute a zero cut.

■ Insert Tolerance Classes

thread designation	standard designation	tolerance class
UN	ANSI B 1.174	2A/2B
UNJ	MIL-S-8879A	3A/3B
ISO	R262 (DIN 13)	6g/6H
NPT	USAS B2.1 : 1968	standard NPT
NPTF	ANSI B 1.20.3-1976	standard
BSW	B.S. 84 : 1956, DIN 259, ISO 228/1 : 1982	medium class A
BSPT	B.S. 21 : 1985	standard BSPT
ACME	ANSI B1/5 : 1988	3G
PG	DIN 40430	standard
TR	DIN 103	7e/7H



Order No.	Catalog No.	Page(s)	Order No.	Catalog No.	Page(s)	Order No.	Catalog No.	Page(s)	Order No.	Catalog No.	Page(s)
1013702	KM63PKG3L	F106	1016730	SM41 K9	C46-49, C91-92, C128	1018449	CM112	F55	1020807	KUAM27	P61-62
1015557	H106R60H	F81	1016746	SM45 K9	C39	1018523	CM65	F50	1020809	KUAM28	C134, C137-140,
1015558	H106L60H	F81	1016748	SM46 K9	C39	1018525	CM66	F50			C144-149, C151, C153-161
1015559	SWR744SET	F90	1016750	SM47 K9	C40-41	1018527	CM68	F50-51, F54-55	1020811	KUAM30	C134, C137-140,
1015560	SWR750SET	F90	1016752	SM48 K9	C42-43	1018529	CM71	F50, F54-56			C144-149, C151, C153-161
1015561	SWR754SET	F90	1016798	SM87 K9	C40	1018531	CM72	D151, E38-39	1020813	KUAM31	C134-145, C147-148,
1015562	SWR759SET	F90	1016800	SM88 K9	C42	1018533	CM73	D151, E38-39			C150, C154-161, D154, E36
1015563	SWR763SET	F90	1016802	SM99 K9	C47, C49	1018567	CM79	F50-51, F54-56	1020835	KUAM32	C134-145, C147-148,
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1095951	H24NDLPL4W	F58	1096082	MCLNR246E	C17	1096191	MTGNR163D	C28	1096306	MRGNR164C	C22
1095952	H28NDLPL4W	F58	1096083	MCLNR854D	C17	1096192	MTGNR164C	C28	1096307	MRGNR164D	C22
1095953	H32NDLPL4W	F58	1096084	MCLNR856D	C17	1096193	MTGNR164D	C28	1096308	MRGNR204D	C22
1095954	H40NDLPL4W	F58	1096085	MCLNR866E	C17	1096194	MTGNR204D	C28	1096309	MRGNR206D	C22
1095955	H20NDXPR4W	F59	1096086	MCLNR083A	C17	1096195	MTGNR205D	C28	1096314	MRGNL164D	C22
1095956	H24NDXPR4W	F59	1096087	MCLNR103A	C17	1096197	MTGNR082B	C28	1096315	MRGNL204D	C22
1095957	H32NDXPR4W	F59	1096088	MCLNL123B	C18	1096199	MTGNR103B	C28	1096316	MRGNL206D	C22
1095958	H40NDXPR4W	F59	1096089	MCLNL124B	C18	1096200	MTGNL123B	C28	1096318	MTCNN083	C26
1095959	H20NDXPL4W	F59	1096092	MCLNL164D	C18	1096201	MTGNL124B	C28	1096319	MTCNN124	C26
1095960	H24NDXPL4W	F59	1096093	MCLNL165C	C18	1096204	MTGNL164C	C28	1096320	MTCNN443	C26
1095961	H32NDXPL4W	F59	1096094	MCLNL165D	C18	1096205	MTGNL164D	C28	1096321	MTCNN644	C26
1095962	H40NDXPL4W	F59	1096095	MCLNL166D	C18	1096206	MTGNL204D	C28	1096324	MTRNR164D	C30
1095963	H20NVLPR3W	F59	1096097	MCLNL204D	C18	1096207	MTGNL205D	C28	1096328	MTRNR103B	C30
1095964	H24NVLPR3W	F59	1096098	MCLNL205D	C18	1096211	MTGNL103B	C28	1096331	MTRNL164D	C30
1095965	H32NVLPR3W	F59	1096099	MCLNL206D	C18	1096212	MTFNR123B	C27	1096336	MTJNRS123	C29
1095966	H40NVLPR3W	F59	1096101	MCLNL244D	C18	1096213	MTFNR124B	C27	1096337	MTJNRS124	C29
1095968	H20NVLPL3W	F59	1096102	MCLNL245E	C18	1096214	MTFNR163C	C27	1096338	MTJNRS163	C29
1095969	H24NVLPL3W	F59	1096103	MCLNL246D	C18	1096216	MTFNR164C	C27	1096339	MTJNRS164	C29
1095970	H32NVLPL3W	F59	1096104	MCLNL246E	C18	1096217	MTFNR164D	C27	1096340	MTJNRS165	C29
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1095975	MRGNR163D	C22	1096106	MCLNL856D	C18	1096219	MTFNR205D	C27	1096342	MTJNRS205	C29
1095977	MRGNR165D	C22	1096107	MCLNL866E	C18	1096220	MTFNR245D	C27	1096343	MTJNLS123	C29
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1095988	MWLNLI854D	C32	1096116	MCRNR124B	C19	1096238	MTFNL103B	C27	1096352	MTENN123	C26
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115960	HEC250S2150 KC610M	M83	1131892	E04KBLPL05 K9	F69	1138041	STN16150ISOE KC620M	S12	1152693	E16SCLPR3AP5 KWH	C103
115961	HEC312S2163 KC610M	M83	1131898	E04KBLPR03 K9	F69	1138057	513.033	F103, F105	1152694	E12SCLPL3AP5 KWH	C103
115962	HEC375S2175 KC610M	M84	1131906	E04KBLPR05 K9	F69	1138064	513.038	F105	1152695	E16SCLPL3AP5 KWH	C103
115963	HEC188S4075 KC610M	M88	1131917	E05KBLPL05 K9	F69	1138065	169.322	F100	1152698	E08NELR05 KWH	F53
115964	BNEC0500S4450 KC610M	M98	1131930	E05KBLPR05 K9	F69	1138073	169.325	F100	1152699	E08NELLO5 KWH	F53
115965	HEC188S4113 KC610M	M88	1131977	SN2TPKG	S9-10	1138080	169.327	F100	1152704	E10SCLPR3 KWH	C113
115966	HEC250S4113 KC610M	M88	1132036	KM50FBH01670	K191	1138100	169.333	F99-100	1152705	E12STLPL3 KWH	C113
115967	HEC312S4113 KC610M	M88	1132063	191.698	J20	1138108	169.337	F99-101	1152706	E16STLPR3 KWH	C113
115968	HEC375S4113 KC610M	M89	1132063	191.698	J20	1138118	169.339	F99, F101	1152707	E05STFPR18 KF310	C111
115970	HEC500S4450 KC610M	M89	1132110	191.720	K129	1138136	STN27200ISOE KC610M	S12	1152708	E05STFPL18 KWH	C111
115971	HEC100S4225 KC610M	M89	1132119	191.725	R109-110	1138208	S04KBFPR05	F68	1152709	E06STFPR2 KWH	C111
115972	HEC625S4225 KC610M	M89	1132523	191.916	J20	1138228	S04KBLPL05	F68	1152710	E06STFPL2 KWH	C111
115973	HEC750S4225 KC610M	M89	1132523	191.916	J29	1138235	S04KBLPR03	F68	1152711	E08STFPR2 KWH	C111
115974	HEC100S4300 KC610M	M89	1132599	ISSN846 K9	C23-24	1138240	S04KBLPR05	F68	1152712	E10STFPR2 KWH	C111
115975	HEC438S4600 KC610M	M89	1132857	EB23035250	K199	1138249	S05KBFPR05	F68	1152713	E10STFPR2 KWH	C111
115976	HEC500S4300 KC610M	M89	1132990	DCMT2151LF K313	B97	1138257	S05KBLPL05	F68	1152714	E10STFPL2 KWH	C111
115979	HEC750S4300 KC610M	M89	1133280	EB13030150	K199	1138265	S05KBLPR05	F68	1152715	E12STFPL3 KWH	C111
115980	HEC250S4163 KC610M	M88	1133349	SN3TPKG	E74-75, E79	1138280	170.001	F100	1152716	E16STFPR3 KWH	C111
115981	HEC312S4163 KC610M	M88	1133349	SN3TPKG	S9-10	1138297	170.002	F100	1152717	E16STFPL3 KWH	C111
115982	HEC375S4175 KC610M	M89	1133366	SN5TMPKG	S9	1138307	170.003	F34-40, F83, F100	1152722	E05KSCPLR18 KWH	C102
115983	BNEC188S2300 KC610M	M93	1133428	CCMT21505LF K313	B89	1138307	170.003	070, 074, 078, 082, 0123-125	1152723	E05KSCPLR18 KWH	C102
115984	BNEC250S2150 KC610M	M93	1133581	DV50BT13069	K202				1152724	E06SCLPR2 KWH	C102
115986	BNEC375S2175 KC610M	M93	1133669	R31FBHS06	K198	1138315	170.004	K129-131	1152725	E06SCLPL2 KWH	C102
115987	BNEC100S2300 KC610M	M94	1133775	A2BNSN26J05	D22	1138315	170.004	F36-38, F41, F100-101	1152726	E08SCLPR2 KWH	C102
115989	BNEC500S2300 KC610M	M94	1133782	A2BNSN32M05	D22	1138319	515.022	F103, F105	1152727	E10SCLPL2 KWH	C102
115990	BNEC60S2300 KC610M	M94	1133883	AFB13085SCFCR06	K194	1138323	170.005	K129-131	1152728	E10SCLPR2 KWH	C102
115991	BNEC750S2600 KC610M	M94	1133894	AFB17100SCFCR06	K194	1138323	170.005	F101	1152729	E10SCLPL2 KWH	C102
115992	BNEC188S4300 KC610M	M97	1133982	FP477	C35	1138328	515.028	F105	1152730	E12SCLPR2 KWH	C102
115993	BNEC250S4150 KC610M	M97	1134246	192.416	B60	1138331	170.006	K129-131	1152731	E12SCLPL2 KWH	C102
115994	BNEC312S4400 KC610M	M98	1134285	SNMA432 K68	R90	1138430	170.024	J20	1152732	E10SCLPR3 KWH	C102
115995	BNEC375S4175 KC610M	M98	1134321	S04KBLPL03	F68	1138430	170.024	J29	1152733	E10SCLPL3 KWH	C102
115996	HEC625S4075 KC610M	M89	1134329	S04KBFPR03	F68	1138438	170.025	J20	1152734	E12SCLPR3 KWH	C102
115997	BNEC100S4300 KC610M	M98	1134385	192.432	J29	1138438	170.025	J29	1152735	E12SCLPL3 KWH	C102
115999	BNEC500S4300 KC610M	M98	1134385	192.432	J29	1138438	170.025	O13, O16, O19, R14-15	1152736	E16SCLPR3 KWH	C102
116000	BNEC625S4300 KC610M	M98	1134393	192.433	J20	1138438	170.025	O4-5, O8-10	1152737	E16SCLPL3 KWH	C102
116001	BNEC750S4600 KC610M	M98	1134393	192.433	J29	1138465	170.028	J20, K107, K110	1152738	E06SDUPR2 KWH	C106
116031	HEC125S4100 KC610M	M88	1135177	NPL5M05 K68	F47	1138465	170.028	J29	1152739	E06SDUPL2 KWH	C106
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1554362	40510201071	L121	1560795	CNMP432 KC5410	B48	1600173	A3M50R426B180250	D50	1610085	TNMG333FN KC315	B68
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1556270	SEHW43A6 KC520M	0136	1560799	CNMS542 KC5410	B49	1600175	A3M50R426B350999	D50	1610905	VPR332 KC315	F48
1556306	SEHW43A6T KC520M	0136	1560801	CNMS642 KC5410	B49	1600176	A3M50R526B060075	D50	1610983	DNMG332FN KC315	B52
1556332	SNHX1103T KC520M	016	1560803	DNMS432 KC5410	B58	1600177	A3M50R532B075100	D50	1610985	DNMG441FF KC5010	B52
1556483	LINEQ1245R04 KC520M	022	1560805	SNMS432 KC5410	B66	1600178	A3M50R532B100180	D50	1610988	DNMG441FF KC315	B52
1556531	LINEU1245R04 KC520M	021	1560806	SNMS433 KC5410	B66	1600179	A3M50R532B180250	D50	1610989	SNMG431FF KC5010	B60
1556533	LINEU1245R08 KC520M	021	1560808	SNMS643 KC5410	B66	1600180	A3M50R532B250350	D50	1611082	TNMG431FN KC315	B60
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1557661	CNG452T0420 KY4400	B122	1581441	H16SCLQ3	C129	1600213	A3M50L426B180250	D50	1611420	SNMG432FF KC315	B60
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1557697	DNG452T0420 KY4400	B123	1581689	H16SDUPR3	C129	1600218	A3M50L532B100180	D50	1616172	HEC031S2 KC635M	M83
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1557744	RNG43T0420 KY4400	B124	1599840	A3M50R316M	D48	1600263	KGMR1650N	D114	1616179	HEC15S2 KC635M	M83
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1557803	TNG333T0420 KY4400	B126	1599918	A3M50L432M	D48	1601655	WNMG432FF KC315	B80	1617593	KGML2050N	D114
1557804	TNG431T0420 KY4400	B120	1599919	A3M50R516M	D48	1601656	TNMG332FF KC5010	B68	1617593	KGML2050N	D55
1557806	TNG432T0420 KY4400	B120	1599920	A3M50L516M	D48	1601886	TNMG332FF KC315	B68	1620371	CPGM3252 KC315	B92
1557807	TNG433T0420 KY4400	B120	1599921	A3M50R526M	D48	1601888	VNMG331FF KC5010	B75	1620372	NPGR51R KC315	F46
1557809	TNG432T0420 KY4400	B120	1599922	A3M50L526M	D48	1601890	VNMG332FF KC5010	B75	1620373	TPMT2151LF KC315	B112
1557810	TPG221T0420 KY4400	B130	1599923	A3M50R532M	D48	1601953	VNMG332FF KC315	B75	1620374	CPMT2152LF KC315	B94
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1557816	TPG322T0420 KY4400	B130	1599926	A3M50L616M	D48	1602249	WNMG331FF KC315	B80	1623194	CCGT3252HP KC5410	B88
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1558021	A32CRGNR4MN5	C87	1599930	A3M50L632M	D48	1602604	TNMG331FF KC5010	B68	1623273	TCGT2151HP KC5410	B106
1558022	A32CRGNL4MN5	C87	1599937	A3M50R412A025030	D49	1604705	DNMG432FF KC315	B52	1623274	TCGT16T304HPKC5410 KC5410	
1558277	DNG433T0420 KY4400	B123	1599938	A3M50R412A030035	D49	1604706	DNMG432FF KC5010	B52	1623275	TCGT3252HP KC5410	B106
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1560655	CCGT432HP KC5410	B88	1599958	A3M50R426A350999	D49	1606670	SNMG431FN KC315	B60	1624227	SNMG322FF KC315	B60
1560660	CNMG432P KC5410	B45	1599959	A3M50R526A060075	D49	1606718	WNMG432FN KC315	B80	1624229	SNMG322FF KC315	B60
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1743788	LT16ER6STACME KC5025	E65	1744002	LT22NR5API403 KC5025	E62	1763375	KM50SVS4B125M	K150	1783143	CNMG431FW KT315	B80
1743789	LT22ER5STACME KC5025	E65	1744003	LT22NR4API502 KC5025	E62	1763376	KM63SVS4B110M	K150	1783144	WNMG432FW KT315	B80
1743791	LT16ER2TR KC5025	E66	1744005	LT22NR5BUT75 KC5025	E63	1763378	KM50SVS5B125M	K150	1783145	WNMG433FW KT315	B80
1743792	LT16ER3TR KC5025	E66	1744006	LT22NR5BUT1 KC5025	E63	1763379	KM63SVS5B110M	K150	1783152	CNMG431FW KC5010	B43
1743793	LT22ER4TR KC5025	E66	1744444	KUAM33 C140, C142, D154, E36		1763382	KM80SVS6B150M	K150	1783233	CNMG432FW KC5010	B43
1743794	LT22ER5TR KC5025	E66	1744586	A204L06CF02 KC5025	D15	1763631	A2030L10CF00 KC5025	D15	1783234	CNMG433FW KC5010	B43
1743796	LT16ER8RD KC5025	E67	1744587	A204R06CF02 KC5025	D15	1764146	NG4250LK KC5010	D132	1783235	DNMG331FW KC5010	B53
1743797	LT22ER6RD KC5025	E67	1744665	NG3094R KC5010	D128	1764148	NG4250LK KC5025	D132	1783236	DNMG332FW KC5010	B53
1743798	LT16ER10APIRD KC5025	E63	1745243	193.326	O125	1764575	NTP3L KC5010	E11	1783237	DNMG431FW KC5010	B53
1743799	LT16ER8APIRD KC5025	E63	1746442	CTFPR12CA3	C147	1764576	NTP3L KC5025	E11	1783238	DNMG432FW KC5010	B53
1743800	LT22ER4API382 KC5025	E62	1746909	KM50SVS00B083M	K150	1765422	NPL51 KC5410	F47	1783239	DNMG441FW KC5010	B53
1743803	LT22ER4API502 KC5025	E62	1746981	KM50SVS2B107M	K150	1765641	NTC3R8E KC5010	E13	1783241	DNMG442FW KC5010	B53
1743805	LT22ER5BUT75 KC5025	E63	1747635	DCGT21505HP KC5010	B95	1765732	NTC3R8E KC5025	E13	1783242	WNMG331FW KC5010	B80
1743810	LT11N132UN KC5025	E54	1747831	A3V0000M04U02DM KC5025	D33	1765733	NTC3R12E KC5010	E13	1783273	WNMG431FW KC5010	B80
1743824	LT16N16UN KC5025	E54	1747833	A3V0000M08U08DM KC5025	D33	1765734	NTC3R12E KC5025	E13	1783274	WNMG431FW KC5010	B80
1743826	LT16N12UN KC5025	E54	1748690	A3G0300M03P04DF KC5025	D31	1770917	NT3LCK KC5010	E11	1783275	WNMG432FW KC5010	B80
1743827	LT16N10UN KC5025	E54	1748698	NG3062FK KC5010	D130	1771602	NG3125FK KT315	D130	1783276	WNMG433FW KC5010	B80
1743828	LT16N18UN KC5025	E54	1748861	A3G0400M04P04DF KMF	D31	1771940	SDACR083D	C56	1784176	A2022R10CF00 KC5025	D15
1743829	LT11N1A60 KC5025	E48	1748863	A3G0400M04P04DF KC5010	D31	1771941	SDACL083D	C56	1784177	A2022R16CF00 KC5025	D15
1743830	LT16N1A60 KC5025	E48	1748865	A3G0400M04P04DF KC5025	D31	1771942	SDPCN062D	C58	1785086	NG2M300RK KC5025	D130
1743831	LT16N1A60 KC5025	E48	1748866	A3G0400M04P04DF KT315	D31	1772113	SDPCN082D	C58	1785474	DCGT2151HP KC5010	B95
1743832	LT16N1G60 KC5025	E48	1748868	A3G0400M04P08DF KC5025	D31	1772114	SDPCN083D	C58	1785475	NG2M332FW KC5010	B95
1743833	LT22N1G60 KC5025	E48	1748869	A3G0500M05P04DF KMF	D31	1772115	SDPCN103B	C58	1785476	DCGT2152HP KC5010	B98
1743847	LT16N11W KC5025	E61	1748870	A3G0500M05P04DF KC5010	D31	1772116	STACR062D	C61	1785477	CCGT2152HP KC5010	B98
1743871	LT16N10ACME KC5025	E65	1748901	A3G0500M05P04DF KC5025	D31	1772118	STACR082D	C61	1785478	CNMG431FW KC5010	B80
1743872	LT16N18ACME KC5025	E65	1748903	A3G0500M05P08DF KC5025	D31	1772119	STACL082D	C61	1785479	CPGT3252HP KC5010	B88
1743899	LT11NR32UN KC5025	E54	1748905	A3G0600M06P08DF KMF	D31	1772122	STACR103B	C61	1785480	CPGT3253HP KC5010	B93
1743900	LT11NR28UN KC5025	E54	1748906	A3G0600M06P08DF KC5010	D31	1772123	STACL103B	C61	1785481	TCGT2152HP KC5010	B106
1743901	LT11NR24UN KC5025	E54	1748907	A3G0600M06P08DF KC5025	D31	1772124	STJCRF062D	C63	1785482	TPGT2152HP KC5010	B110
1743902	LT11NR20UN KC5025	E54	1748941	A3G0800M08P08DF KC5010	D31	1772125	STJCRF062D	C63	1785501	NG2M300LK KC5025	D131
1743903	LT11NR18UN KC5025	E54	1748944	A3G0800M08P08DF KC5025	D31	1772126	STJCRF082D	C63	1785713	VBGT331HP KC5010	B113
1743904	LT11NR16UN KC5025	E54	1749650	A3R0300M03P00DF KMF	D32	1772128	STJCRF102B	C63	1785714	VBGT332HP KC5010	B113
1743908	LT16NR32UN KC5025	E54	1749718	420.060	O70, O123-125	1772130	STJCRF103B	C63	1785715	CNMG430 KC5410	B40
1743909	LT16NR28UN KC5025	E54	1749741	A3G250I08P2DF KC5010	D31	1772144	SWLGRF082D	C67	1785716	CNMG4305 KC5410	B40
1743910	LT16NR24UN KC5025	E54	1749742	A3G250I08P2DF KC5025	D31	1772145	SWLCLF082D	C67	1785717	CNMG431 KC5410	B40
1743921	LT16NR20UN KC5025	E54	1749931	A3G312I08P2DF KC5010	D31	1772148	SWLGRF103B	C67	1785718	CNMG432 KC5410	B40
1743922	LT16NR18UN KC5025	E54	1749933	A3G312I08P2DF KC5025	D31	1772149	SWLCLF103B	C67	1785719	CNMG433 KC5410	B40
1743923	LT16NR16UN KC5025	E54	1752604	A3R0300M03P00DF KC5010	D32	1775033	NG3125FK KC5025	D130	1785720	CNMG434 KC5410	B40
1743924	LT16NR14UN KC5025	E54	1752605	A3R0300M03P00DF KC5025	D32	1775034	NG3125LK KC5010	D132	1785721	CNMP543 KC5410	B48
1743925	LT16NR12UN KC5025	E54	1752606	A3R0300M03P00DF KT315	D32	1775035	NG3125LK KC5025	D132	1785722	CNMP643 KC5410	B48
1743926	LT16NR10UN KC5025	E54	1752607	A3R0400M04P00DF KMF	D32	1775036	NG3047FK KC5025	D130	1785723	DNMG431 KC5410	B50
1743927	LT11NRA60 KC5025	E48	1752608	A3R0400M04P00DF KC5010	D32	1775037	NG3062FK KC5025	D130	1785734	DNMG432 KC5410	B50
1743928	LT16NRA60 KC5025	E48	1752609	A3R0400M04P00DF KC5025	D32	1775478	CM72LP	D143, D146-150	1785735	DNMG441 KC5410	B50
1743929	LT16NRA60 KC5025	E48	1752632	A3R0500M05P00DF KC5010	D32			D152-154, E24-28, E32-37	1785736	DNMG442 KC5410	B50
1743930	LT16NRA60 KC5025	E48	1752633	A3R0500M05P00DF KC5025	D32	1775479	CM73LP	D143, D146-150	1785737	SNMG431 KC5410	B59
1743931	LT22NRA60 KC5025	E48	1752635	A3R0600M06P00DF KMF	D32			D152-154, E24-28, E32-37	1785738	SNMG432 KC5410	B59
1743932	LT11NRA55 KC5025	E58	1752636	A3R0600M06P00DF KC5010	D32	1775726	KIPR125RP43555	R110	1785739	TNMG3305 KC5410	B67
1743933	LT16NRA55 KC5025	E58	1752637	A3R0600M06P00DF KC5025	D32	1775728	KIPR150RP43655	R110	1785740	TNMG331 KC5410	B67
1743934	LT16NRA65 KC5025	E58	1752651	A3R0800M08P00DF KC5025	D32	1775730	KDNR200RN40C3	R115	1785741	TNMG332 KC5410	B67
1743935	LT16NRA65 KC5025	E58	1752786	A3R093I03P00DF KC5010	D32	1775731	KDNR250RN40C3	R115	1785743	TNMG432 KC5410	B73
1743936	LT22NRA65 KC5025	E58	1753784	A3R093I03P00DF KC5025	D32	1775740	A3SSR201032	D36	1785746	VNMG330 KC5410	B74
1743937	LT11NR19W KC5025	E61	1753787	A3R187I05P00DF KC5010	D32	1775753	KDNR300RN40C4	R115	1785747	CNMG3305 KC5410	B74
1743938	LT11NR14W KC5025	E61	1753788	A3R187I05P00DF KC5025	D32	1775754	KDNR400RN40C5	R115	1785748	CPGT21505HP KC5410	B93
1743939	LT16NR20W KC5025	E61	1753791	A3R218I06P00DF KC5010	D32	1775983	RDHX0702MOSLN KC510M	R23	1785749	CPGT2151HP KC5410	B93
1743940	LT16NR19W KC5025	E61	1753792	A3R218I06P00DF KC5025	D32	1775984	RDHX0702MOSLN KC725M	R23	1785750	CPGT2152HP KC5410	B93
1743942	LT16NR16W KC5025	E61	1753794	A3R312I08P00DF KMF	D32	1775987	RDHX1003MOSGN KC510M	R27	1785752	CPGT3252HP KC5410	B93
1743943	LT16NR14W KC5025	E61	1753796	A3R312I08P00DF KC5025	D32	1775988	RDHX1003MOSGN KC725M	R27	1785753	DCGT2152HP KC5410	B95
1743944	LT16NR12W KC5025	E61	1755724	RNG45T0220 KY4300	B124	1775991	RDHX1213MOSGN KC525M	R32	1785754	DCGT2152HP KC5410	B98
1743945	LT16NR11W KC5025	E61	1756488	MSSNR246D	C24	1775996	RDHX1213MOSGN KC510M	R32	1785755	TPGT2152HP KC5410	B106
1743946	LT16NR10W KC5025	E61	1756489	MSSNL246D	C24	1775997	RDHX1213MOSGN KC725M	R32	1785756	TPGT2152HP KC5410	B110
1743948	LT16NR8W KC5025	E61	1756550	KMG3XMKZKMSR50Y	D57	1776002	RDHX1604MOSGN KC510M	R36	1785759	DPGR432 KC5410	F46
1743949	LT22NR7W KC5025	E61	1756574	KMG3XMKZKMSL50Y	D57	1776013	RDHX1604MOSGN KC725M	R36	1785761	NPGR51R KC5410	F46
1743950	LT22NR6W KC5025	E61	1756576	C4KGMRS90	D58	1776260	ODG5197ISGB KC735M	Q11	1785762	NPGR51L KC5410	F46
1743962	LT11NR14BSPT KC5025	E62	1756578	C4KGMMSL50	D58	1776261	DDG6236ISGB KC735M	Q11	1785786	VNMG333 KC5410	F48
1743963	LT16NR14BSPT KC5025	E62	1756579	C4KGMMSL50	D58	1777131	CDHX1201S1 PF5M5F2	B189	1787513	WNGX4530R20 KY3500	B127
1743964	LT16NR11BSPT KC5025	E62	1756583	C4KGMMSL50	D58	1777860	CNMG432MP KC5025	B44	1790143	A2016N00CF01 KT315	D15
1743966	LT11NR18NPT KC5025	E57	1756584	C5KGMMSL50	D58	1778588	VPGR332 KC9315	F48	1790153	A2016N00CF01 KC5025	D15
1743967	LT11NR14NPT KC5025	E57	1756585	C5KGMMSL50	D58	1779000	KHSS09582	L139	1790154	A2016N00CF01 KMF	D15
1743970	LT16NR14NPT KC5025	E57	1756587	C5KGMMSL50	D58	1779085	KHSS09608	L154	1790156	A2016R06CF00 KC5025	D15
1743971	LT16NR115NPT KC5025	E57	1756589	C5KGMMSL50	D58	1779088	KHSS09608	L154	1790157	A2016R06CF00 KMF	D15
1743972	LT16NR8NPT KC5025	E57	1760926	A3G0600M06P12DF KC5025	D31	1779090	KHSS09611	L154	1790159	A2016L06CF00 KC5025	D15
1743973	LT11NR14NPTF KC5025	E58	1760930	A3G093I03P05DF KC5010	D31	1779105	KHSS09615	L154	1790162	A2016R10CF00 KC5025	D15
1743974	LT16NR14NPTF KC5025	E58	1761051	A3G093I03P05DF KC5025	D31	1779125	KHSS09624	L162	1790164	A2016R16CF00 KC5025	D15
1743975	LT16NR115NPTF KC5025	E58	1761054	A3G218I06P1DF KC5010	D31	1779151	KHSS09640	L164	1790166	A2016L10CF00 KC5025	D15
1743978	LT16NR12ACME KC5025	E65	1761055	A3G218I06P1DF KC5025	D31	1779184	KHSS09644	L164	1790167	A2016L16CF00 KC5025	D15
1743979	LT16NR10ACME KC5025	E65	1761058	A3G218I06P2DF KC5010	D31	1779185	KHSS09643	L164	1790169	A2022N00CF02 KC5025	D15
1743980	LT16NRA6ACME KC5025	E65	1761059	A3G218I06P2DF KC5025	D31	1781755	TK01338D	F82	1790170	A2022R00CF02 KMF	D15
1743981	LT22NRA6ACME KC5025	E65	1762299	NG3062LK KC5010	D130	1781756	TK01339D	F82	1790171	A2022R06CF02 KT315	D15
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1791528	410.084	082	1796106	NTP3R KC5025	E11	1796520	NAS3R16 KC5025	E20	1799491	NDC88VL75M KC5010	E16
1792632	NR3047RK KC5010	D140	1796107	NTP3R KC5410	E11	1796521	NAS3L16 KC5025	E20	1799492	NDC8115VR75M KC5010	E16
1792683	NR3047RK KC5025	D140	1796109	NTP4R KC5010	E11	1796522	NAS3R14 KC5025	E20	1799494	NDC8115VL75M KC5010	E16
1792684	NR3062RK KC5010	D140	1796110	NTP4R KC5025	E11	1796524	NAS3R12 KC5025	E20	1799497	NTU4R KC5025	E12
1792685	NR3062RK KC5025	D140	1796112	NTP4L KC5010	E11	1796525	NAS3L12 KC5025	E20	1799500	NWC3R11E KC5010	E17
1793315	NG3110R KC5025	D128	1796113	NTP4L KC5025	E11	1796526	NAS3R10 KC5010	E20	1799501	NWC3R11E KC5025	E17
1793453	A3G250I06P2DF KC5025	D31	1796115	NT2PK KC5010	E10	1796527	NAS3R10 KC5025	E20	1799502	NWC3L111 KC5025	E17
1793454	A3R250I06P00DF KC5025	D32	1796116	NT2LK KC5010	E10	1796528	NAS3L10 KC5010	E20	1799503	NWC3R14E KC5010	E17
1793688	A2030L15FC00 KC5025	D15	1796117	NT3PK KC5010	E10	1796529	NAS3L10 KC5025	E20	1799504	NWC3R14E KC5025	E17
1793691	A2050N00CF03 KC5025	D15	1796118	NT3LK KC5010	E10	1796530	NAS3R8 KC5010	E20	1799507	ND3040R KC5025	E17
1793692	A2050N00CF03 KMF	D15	1796119	NT4RK KC5010	E10	1796531	NAS3R8 KC5025	E20	1799509	ND3040L KC5025	E17
1793743	A2050R06CF03 KC5025	D15	1796120	NT4LK KC5010	E11	1796532	NAS3L8 KC5010	E20	1799511	ND3038R KC5025	E17
1793744	A2050L06CF03 KC5025	D15	1796121	NT3RCK KC5010	E11	1796543	NAS3L8 KC5025	E20	1799512	ND3038L KC5010	E17
1793745	A2016N00CM01 KT315	D16	1796122	NT3RCK KC5025	E11	1796544	NAS3R6 KC5010	E20	1799513	ND3038L KC5025	E17
1793746	A2016N00CM01 KC5025	D16	1796133	NT3LCK KC5025	E11	1796545	NAS3R6 KC5025	E20	1799515	ND4040L KC5025	E17
1793748	A2016R06CM00 KC5025	D16	1796134	NT4RCK KC5010	E11	1796546	NAS3L6 KC5010	E20	1799517	ND4050R KC5025	E17
1793750	A2016L06CM00 KC5025	D16	1796135	NT4RCK KC5025	E11	1796547	NAS3L6 KC5025	E20	1799519	ND4050L KC5025	E17
1793751	A2016R16CM00 KC5025	D16	1796136	NT4LCK KC5010	E11	1796548	NAS3R5 KC5010	E20	1799521	NDC3040R3 KC5025	E18
1793752	A2016L16CM00 KC5025	D16	1796137	NT4LCK KC5025	E11	1796549	NAS3R5 KC5025	E20	1799522	NDC3040L3 KC5010	E18
1793763	A2022N00CM02 KC5025	D16	1796138	NTF2R KC5010	E11	1796550	NAS3L5 KC5010	E20	1799524	NDC4038R2 KC5010	E18
1793764	A2022R06CM00 KC5025	D16	1796139	NTF2L KC5010	E11	1796551	NAS3L5 KC5025	E20	1799525	NDC4038R2 KC5025	E18
1793765	A2022L06CM00 KC5025	D16	1796140	NTF3R KC5010	E11	1796552	NJ3020R8 KC5010	E14	1799526	NDC4038L2 KC5010	E18
1793767	A2030L06CM01 KC5025	D16	1796141	NTF3L KC5010	E11	1796553	NJ3020R8 KC5025	E14	1799527	NDC4038L2 KC5025	E18
1793769	A2060N00CM03 KC5025	D16	1796153	NTF4R KC5025	E11	1796555	NJ3020L8 KC5025	E14	1799529	ND4040R3 KC5025	E18
1793770	A2080N00CM04 KC5025	D16	1796155	NTF4L KC5025	E11	1796556	NJ3014R12 KC5010	E14	1799531	NDC4040L3 KC5025	E18
1793771	A2022N00CR02 KT315	D17	1796156	NTK2R KC5010	E12	1796557	NJ3014R12 KC5025	E14	1799532	NDC4050R2 KC5010	E18
1793772	A2022N00CR02 KC5025	D17	1796157	NTK2L KC5010	E12	1796558	NJ3014L12 KC5010	E14	1799553	NDC4050R2 KC5025	E18
1793803	A2022R06CR03 KC5025	D17	1796158	NTK3R KC5010	E12	1796559	NJ3014L12 KC5025	E14	1799555	NDC4050L2 KC5025	E18
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1793805	A2030N00CR02 KT315	D17	1796160	NTK3L KC5010	E12	1796583	NJ3010L16 KC5025	E14	1799557	NDC4050R3 KC5025	E18
1793807	A2030L06CR03 KC5025	D17	1796161	NTK3L KC5025	E12	1796705	470.232	0103	1799558	NDC4050L3 KC5010	E18
1793808	A2040N00CR02 KT315	D17	1796176	NJP3020R8 KC5010	E14	1796725	SCFPRI0CA09	C149	1799560	NDC38RD75 KC5010	E18
1793809	A2040R06CR03 KC5025	D17	1796177	NJP3020R8 KC5025	E14	1799238	NT1L KC5010	E10	1799561	NDC38RD75 KC5025	E18
1793810	A2040L06CR03 KC5025	D17	1796179	NJP3020L8 KC5025	E14	1799239	NT1L KC5025	E10	1799562	NDC38RD75 KC5010	E18
1793811	A2050N00CR03 KC5025	D17	1796180	NJP3014R12 KC5010	E14	1799241	NTC3R7E KC5025	E13	1799563	NDC38RD75 KC5025	E18
1793812	A2050R06CR04 KC5025	D17	1796181	NJP3014L12 KC5010	E14	1799363	NTC3L8E KC5010	E13	1799564	NDC310RD75 KC5010	E18
1793823	A2050L06CR04 KC5025	D17	1796182	NJP3010R16 KC5010	E14	1799365	NTC3R8E KC5025	E13	1799565	NDC310RD75 KC5025	E18
1793824	A2060N00CR03 KC5025	D17	1796194	NJF3012R14 KC5010	E15	1799366	NTC3L8I KC5025	E13	1799566	NDC310RD75 KC5010	E18
1793825	A2060R06CR04 KC5025	D17	1796195	NJF3012R14 KC5025	E15	1799367	NTC3R9E KC5010	E13	1799567	NDC310RD75 KC5025	E18
1793827	A2080N00CR04 KC5025	D17	1796198	NJF3010R16 KC5010	E15	1799368	NTC3R9E KC5025	E13	1799568	NDC68RD75M KC5010	E18
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1794630	BGHX15L5PCFRGG K110M	0126	1796202	NJF3009R18 KC5010	E15	1799370	NTC3R10E KC5025	E13	1799571	NTB2RA KC5010	E20
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1818097	..NG2M140LK KC5025D131	1818489	..NG2M225LK KC5025D131	1819207	..DNMG432FP KT315B43	1826928	..40510200614L124
1818098	..NG2M140RK KC5010D130	1818490	..NG2M225RK KC5010D130	1819210	..DNMG331FP KT315B53	1826929	..40510200622L125
1818099	..NG2M140RK KC5025D130	1818491	..NG2M225RK KC5025D130	1819211	..DNMG332FP KT315B53	1826930	..40510200625L124
1818105	..NG6281R KC5025D128	1818492	..NG2M250LK KC5025D131	1819335	..DNMG431FP KT315B53	1827400	..40510200251L100
1818108	..NG6375L KC5025D129	1818493	..NG2M250RK KC5025D131	1819336	..DNMG432FP KT315B53	1828006	..40510200373L120
1818109	..NG6375R KC5025D128	1818494	..NG2M275LK KC5010D130	1819338	..DNMG441FP KT315B53	1828949	..A2030R06CF02 KMFD15
1818110	..NGD3062LK KC5010D134	1818495	..NG2M275LK KC5025D131	1819339	..DNMG442FP KT315B53	1828950	..A2030L06CF02 KMFD15
1818111	..NGD3062LK KC5025D134	1818496	..NG2M275RK KC5010D130	1819340	..DNMG443FP KT315B53	1829218	..TMMG331FW KT315B69
1818112	..NGD3062RK KC5010D134	1818497	..NG2M275RK KC5025D130	1819342	..SNMG432FP KT315B61	1829219	..TMMG332FW KT315B69
1818113	..NGD3062RK KC5025D134	1818498	..NG2M300LK KC5010D131	1819354	..TMMG331FP KT315B68	1829220	..TMMG331FW KC5010B69
1818114	..NGD3094LK KC5010D134	1818503	..NG3072LK KC5025D131	1819355	..TMMG332FP KT315B68	1829221	..TMMG332FW KC5010B69
1818115	..NGD3094LK KC5025D134	1818504	..NG3072RK KC5010D130	1819357	..VNMG331FP KT315B76	1830286	..40510200007L98
1818116	..NGD3094RK KC5010D134	1818505	..NG3072RK KC5025D131	1819358	..VNMG332FP KT315B76	1830287	..40510200011L98
1818117	..NGD3094RK KC5025D134	1818506	..NG3078LK KC5010D130	1819435	..WMMG331FP KT315B80	1831590	..KMG3M2KR5060YK158
1818118	..NGD3125LK KC5010D134	1818507	..NG3078LK KC5025D131	1819436	..WMMG332FP KT315B80	1831749	..NG3062L KC5010D129
1818119	..NGD3125LK KC5025D134	1818508	..NG3078RK KC5010D130	1819437	..WMMG431FP KT315B80	1831750	..NG4250R KC5010D128
1818120	..NGD3125RK KC5010D134	1818509	..NG3078RK KC5025D130	1819438	..WMMG432FP KT315B80	1831957	..RPGV45T0220 KY4300B129
1818121	..NGD3189LK KC5010D134	1818592	..RDHX07T1MOSLN KC510MR23	1819440	..DNMG431FP KC5010B53	1831958	..RPGV35T0220 KY4300B129
1818122	..NGD3189LK KC5025D134	1818714	..SPHX15T6ZCERGP KCK15083	1819441	..DNMG432FP KC5010B53	1831959	..RPGV23T0220 KY4300B129
1818126	..NGD3189RK KC5010D134	1818717	..SPHX15T6ZCERGP KC520M083	1819451	..SPHX1205PCTRGRPB KTKP20079	1832100	..40510200004L98
1818352	..NPD3012RK KC5010D137	1818718	..SPHX15T6ZCTRGP KTKP20083	1819493	..DNMG433FP KC5010B53	1832101	..40510200013L98
1818353	..NGD3189RK KC5025D134	1818721	..SPHX15T6ZCTRGP KY3500083	1819494	..DNMG441FP KC5010B53	1832102	..40510200019L98
1818354	..NGD4125LK KC5010D134	1818755	..SPHX15T6ZCERGP4S KCK15083	1819495	..DNMG442FP KC5010B53	1832151	..40510200323L115
1818355	..NGD4125LK KC5025D134	1818764	..NG3088L KC5025D129	1819496	..DNMG443FP KC5010B53	1832166	..40510200651L125
1818356	..NGD4125RK KC5010D134	1818765	..NG3088R KC5025D128	1819497	..SNMG431FP KC5010B61	1832184	..40510200061L99
1818357	..NGD4125RK KC5025D134	1818766	..NG3094LK KC5010D131	1819498	..SNMG432FP KC5010B61	1832185	..40510200099L104
1818359	..NGD4189LK KC5010D134	1818768	..NG3094LK KC5025D131	1819499	..SNMG433FP KC5010B61	1832186	..40510200110L102
1818360	..NGD4189LK KC5025D134	1818769	..NG3094RK KC5025D130	1819500	..TMMG331FP KC5010B68	1832187	..40510200123L102
1818361	..NGD4189RK KC5010D134	1818770	..NG3097L KC5025D129	1819501	..TMMG332FP KC5010B68	1832188	..40510200170L103
1818362	..NGD4189RK KC5025D134	1818772	..NG3097R KC5025D128	1819502	..TMMG333FP KC5010B68	1832189	..40510200193L103
1818366	..NG2M300RK KC5010D130	1818823	..NG3105L KC5025D129	1819513	..VNMG331FP KC5010B76	1832190	..40510200199L103
1818367	..NG2M325LK KC5025D131	1818824	..NG3105R KC5025D128	1819514	..VNMG332FP KC5010B76	1832215	..40510200207L103
1818368	..NG2M325RK KC5025D130	1818825	..NG3110L KC5025D129	1819515	..WMMG331FP KC5010B80	1832293	..CNMG322MP KC5010B44
1818369	..NG3047LK KC5010D131	1818827	..NR3078LK KC5010D140	1819516	..WMMG332FP KC5010B80	1832294	..CNMG431MP KC5010B44
1818370	..NG3047LK KC5025D131	1818828	..NR3078LK KC5025D140	1819517	..WMMG431FP KC5010B80	1832295	..CNMG432MP KC5010B44
1818371	..NG3062LK KC5025D131	1818829	..NR3078RK KC5010D140	1819518	..WMMG432FP KC5010B80	1832296	..CNMG433MP KC5010B44
1818372	..NG3072LK KC5010D131	1818830	..NR3078RK KC5025D140	1819519	..WMMG433FP KC5010B80	1832297	..CNMG434MP KC5010B44
1818373	..NGD4250LK KC5010D134	1818831	..NR3094L KC5010D139	1819846	..SPHX1205PCFRGN1WB KCK15080	1832298	..CNMG542MP KC5010B44
1818374	..NGD4250LK KC5025D134	1818833	..NR3094L KC5025D139	1819849	..SPHX1205PCFRGN1WB KC520M080	1832299	..CNMG543MP KC5010B44
1818375	..NGD4250RK KC5010D134	1818834	..NR3094R KC5010D138	1819850	..SPHX1205PCFRGN1WB KTKP20080	1832301	..CNMG544MP KC5010B44
1818376	..NGD4250RK KC5025D134	1818835	..NR3094R KC5025D138		080	1832302	..CNMG642MP KC5010B44
1818377	..NGP2031L KC5410D135	1818836	..NR4062LK KC5010D140		080	1832313	..CNMG643MP KC5010B44
1818378	..NGP2031R KC5410D135	1818837	..NR4062LK KC5025D140	1819852	..SPHX1205PCFRGN1WBK KY3500080	1832315	..CNMG644MP KC5010B44
1818379	..NGP2062L KC5410D135	1818838	..NR4062RK KC5010D140		080	1832316	..DNMG332MP KC5010B54
1818380	..NGP2062R KC5410D135	1818839	..NR4062RK KC5025D140	1819853	..SPHX1205ZCTRGP KTKP20075	1832317	..DNMG333MP KC5010B54
1818381	..NGP2125L KC5410D135	1818840	..NR4094LK KC5010D140	1819858	..SPHX1205ZCFRGN1WB KCK15076	1832318	..DNMG431MP KC5010B54
1818382	..NGP2125R KC5410D135	1818841	..NR4094LK KC5025D140	1819861	..SPHX1205ZCFRGN1WB KC520M076	1832319	..DNMG432MP KC5010B54
1818384	..NGP3088R KC5410D135	1818842	..NR4094RK KC5010D140		076	1832321	..DNMG433MP KC5010B54
1818385	..NGP3125L KC5410D135	1818853	..NR4094RK KC5025D140	1819864					

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1832376	WNMG332MP KC5010	B81	1849885	VBMR221 KT315	F48	1862065	TPGW2151S0415M KB5625	B196	1864912	VPGR332 KC9125	F48
1832378	WNMG432MP KC5010	B81	1849886	VBMR222 KT315	F48	1862066	TPGW2152S0415M KB5625	B196	1864923	VPGR333 KC9125	F48
1832379	WNMG433MP KC5010	B81	1849887	VPGR3305 KT315	F48	1862067	TPGW3251S0415M KB5625	B196	1865005	NPR651R KC9110	F46
1832856	NPRGR52R KC5025	F46	1849903	VPGR52L KC5025	F46	1862068	TPGW3252S0415M KB5625	B196	1865006	NPR651L KC9110	F46
1832957	40510200116	L104	1849905	VBMR2205 KC5025	F48	1862069	CNGA431EFWMT KB5625	B174	1865007	NPR652R KC9110	F46
1832958	40510200184	L105	1849906	VBMR221 KC5025	F48	1862071	CNGA432EFWMT KB5625	B174	1865008	NPR652L KC9110	F46
1833500	SPHX1205PCERGNT1WB KB1340		1849908	VPGR3305 KC5025	F48	1862072	CNGA433EFWMT KB5625	B174	1865010	VBMR221 KC9110	F48
		080	1849909	VPGR331 KC5025	F48	1862083	DNGA431EFWMT KB5625	B177	1865012	VPGR3305 KC9110	F48
1833501	SPHX1205ZCERGNT1WB KB1340		1849910	VPGR332 KC5025	F48	1862085	DNGA432EFWMT KB5625	B177	1865023	VPGR331 KC9110	F48
		076	1849931	VPGR333 KC5025	F48	1862086	DNGA433EFWMT KB5625	B177	1865024	VPGR332 KC9110	F48
1834274	R67FBHS06	K198	1849935	VPGR333 KT315	F48	1862087	TNGA332EFWMT KB5625	B179	1865025	VPGR333 KC9110	F48
1834294	SNMG432FW KT315	B61	1849938	DPGR431 KC5025	F46	1862088	TNGA333EFWMT KB5625	B179	1865174	SPGF322 KC5010	B86
1834295	SNMG433FW KT315	B61	1849939	DPGR432 KC5025	F46	1862089	CNGA432EMT KB5625	B174	1865176	SPGF422 KC5010	B86
1834625	40510200250	L100	1849940	DPGR433 KC5025	F46	1862090	CNGA433EMT KB5625	B174	1865210	TPGF221 KC5010	B87
1834819	170.294	H41	1849964	DPGR432 KC9225	F46	1862091	DNGA432EMT KB5625	B176	1865212	TPGF222 KC5010	B87
1834860	40510200389	L120	1849983	NPR505 KC5025	F47	1862092	DNGA433EMT KB5625	B176	1865214	TPGF321 KC5010	B87
1835471	40510200408	L120	1849984	NPL505 KC5025	F47	1862656	S321	C121	1865218	TPGF322 KC5010	B87
1835472	40510200102	L102	1849995	NPR508 KC5025	F47	1863241	MCKNR165C	C16	1865220	TPGF431 KC5010	B87
1836143	40510200429	L120	1849997	NPL508 KC5025	F47	1863283	MCKNL245D	C16	1865235	VPGR332 KC5010	B87
1836144	40510200446	L120	1849998	NPR51 KC5025	F47	1863286	MCRNR245D	C19	1865436	SPG321 KC5010	B85
1836470	170.295	H41	1850004	NPR51 KC9225	F47	1863289	MDQNL245E	C21	1865452	SPG322 KC5010	B85
1836471	170.296	H41	1850006	NPL51 KC9225	F47	1863291	MSRNL248	C24	1865454	SPG323 KC5010	B85
1838353	40510200393	L118	1850011	NPL51 KC5025	F47	1863292	MSRNL328	C24	1865483	SPG421 KC5010	B85
1839418	BGHX15LSPCELOGT KD1415	0126	1850012	NPR52 KC5025	F47	1863297	MTFNL854D	C27	1865484	SPG422 KC5010	B85
1840501	NPR51 KC5410	F47	1850023	NPL52 KC5025	F47	1863299	MVJNR123A	C30	1865485	SPG423 KC5010	B85
1841138	40510200136	L102	1850028	NPR131F KC5025	F46	1863300	MTJNL864	C29	1865486	SPG424 KC5010	B85
1841355	VPGR334 KC5010	F48	1850029	NPL131F KC5025	F46	1863302	MVJNR204C	C31	1865487	SPG433 KC5010	B85
1841815	S2043	051	1850032	NPR132F KC5025	F46	1863407	552.21	C37, C87	1865488	SPG633 KC5010	B85
1841853	S2044	051, 029	1850035	NPL132F KC5025	F46	1863461	40510200654	L125	1865531	TPG221 KC5010	B86
1843874	SCLQL124B	C53	1850043	NPR331N KC5025	F46	1863790	40510200650	L124	1865532	TPG222 KC5010	B86
1843875	SCLCR124B	C53	1850045	NPL331N KC5025	F46	1863842	40510200108	L102	1865533	TPG3205 KC5010	B86
1843876	SCLCL164D	C53	1850055	NPR651R KC9225	F46	1864501	VCMR331 KC5010	F48	1865534	TPG321 KC5010	B86
1843877	SCLCR164D	C53	1850057	NPR651L KC9225	F46	1864502	VCMR332 KC5010	F48	1865535	TPG322 KC5010	B86
1843880	SVJPR164EW	C65	1850059	NPR652R KC9225	F46	1864543	VCMR331 KC5025	F48	1865536	TPG323 KC5010	B86
1843881	SVJPL164EW	C65	1850060	NPR652L KC9225	F46	1864544	VCMR332 KC5025	F48	1865537	TPG324 KC5010	B86
1843886	MCKNL246D	C16	1850064	VBMR221 KC9225	F48	1864545	NPR508 KC5410	F47	1865538	TPG431 KC5010	B86
1843889	MVJNL244D	C31	1850067	NPR651R KC5025	F46	1864550	VCMR331 KC9225	F48	1865539	TPG432 KC5010	B86
1843976	RCMT1204MO KC5010	B101-B102	1850068	VPGR3305 KC9225	F48	1864551	VCMR332 KC9225	F48	1865540	TPG433 KC5010	B86
1845216	TCMT2151LF KC5010	B107	1850069	VPGR331 KC9225	F48	1864553	NPR505 KC9315	F47	1865541	TPG434 KC5010	B86
1845218	CCMT432LF KC5010	B89	1850070	NPR651L KC5025	F46	1864557	VPGR333 KC9315	F48	1865870	RCMK152 KC5010	F61
1845219	TPMT2151LF KC5010	B112	1850071	VPGR332 KC9225	F48	1864561	VCMR332 KC9315	F48	1865871	RCMK23 KC5010	F61
1845227	CCMT3251LF KC5010	B89	1850073	VPGR333 KC9225	F48	1864562	VCMR331 KT315	F48	1865953	RCMK35 KC5010	F61
1845230	SCMT3251LF KC5010	B103	1851263	CNGA432T0420FW KY3500	B118	1864582	SUWFTF	F79	1865954	RCMK46 KC5010	F61
1845775	470.243	019, 024, 0103	1851264	CNGA434T0420FW KY3500	B118	1864583	VCMR332 KT315	F48	1865955	RCGK152HP KC5010	F61
1845807	420.201	016, 019, 024, 059, 064, 0103	1851265	WNGA432T0420FW KY3500	B121	1864608	DPGR431 KC9110	F46	1865956	RCGK23HP KC5010	F61
			1851266	WNGA433T0420FW KY3500	B121	1864608	DPGR431 KC9110	F46	1865957	RCGK35HP KC5010	F61
			1851268	CNGX452T0420FW KY3500	B122	1864611	RNMG43RN KC9110	F96	1865958	RCGK46HP KC5010	F61
1846796	40510200776	L102	1851269	CNGX453T0420FW KY3500	B122	1864622	SNHX1102PZTNGP KC735M	016	1865959	RCG321 KC5010	B84
1847935	CNGA433T0420FW KY3500	B118	1851270	CNGX454T0420FW KY3500	B122	1864633	DPGR432 KC9110	F46	1865960	RCG35 KC5010	B84
1848655	ICSN443 K9	C6-7	1851274	SNGX453T0420FW KY3500	B126	1864637	DPGR432 KC9125	F46	1865961	RCG45 KC5010	B84
1848845	RDHX07T1MOSLN KC725M	R23	1851278	WNGX452T0820 KY3500	B127	1864639	RNMG64RN KC9110	F96	1865962	RPV35 KC5010	B85
1849051	DPGR431 KC5010	F46	1851304	SCG332FW KY3500	B129	1864643	RNMG32RN KC9125	F96	1865999	RCMT0602M KC5010	B101-B102
1849052	DPGR432 KC5010	F46	1852181	CS412	C68-69	1864644	RNMG43RN KC9125	F96	1866000	RCMT1083M KC5010	B101-B102
1849053	DPGR433 KC5010	F46	1852198	S1020	E26	1864645	RNMG54RN KC9125	F96	1866001	RCMT073M KC5010	B101-B102
1849054	NPR505 KC5010	F47	1852223	S153	C69	1864647	NPR505 KC9110	F47	1866014	RCMT1605M KC5010	B101-B102
1849055	NPL505 KC5010	F47	1852649	S421	F89	1864650	RNMG64RN KC9125	F96	1866015	RCMT2006M KC5010	B101-B102
1849056	NPR508 KC5010	F47	1852650	S423	D68	1864652	RNMG68RN KC9125	F96	1866017	RCMT215 KC5010	B101-B102
1849057	NPL508 KC5010	F47	1852652	S432	C120	1864655	NPR51 KC9110	F47	1866019	RCMT325 KC5010	B101-B102
1849058	NPR51 KC5010	F47	1852683	S435	C120	1864661	CPG1251LF K313	B93	1866561	CCGT21505LF KC5025	B88
1849059	NPL51 KC5010	F47	1852684	S530	F58	1864667	NPL51 KC9110	F47	1866565	CCGT21505LF KC5025	B88
1849060	NPR52 KC5010	F47	1853650	40510200171	L103	1864673	NPL52 KC9110	F47	1866566	CCGT21505LF KC5025	B88
1849243	NPL52 KC5010	F47	1854201	CPMT18151LF KC5010	B94	1864684	NPR131F KC9110	F46	1866567	CCGT2151LF KC5025	B88
1849244	NPR1305 KC5010	F46	1854439	NG3M200RK KT315	D130	1864688	NPR132F KC9110	F46	1866569	CCGT2151LF KC5025	B88
1849245	NPL1305 KC5010	F46	1855473	NG2031LK KT315	D131	1864690	NPL132F KC9110	F46	1866569	CCGT2151LF KC5025	B88
1849247	NPR1308 KC5010	F46	1855476	NG2031RK KT315	D130	1864717	NPR51 KC9125	F47	1866570	CCGT21505LF KC5025	B88
1849249	NPR131F KC5010	F46	1855479	NG2047RK KT315	D130	1864720	NPL51 KC9125	F47	1866571	CCGT21505LF KC5025	B88
1849250	NPL131F KC5010	F46	1855484	NG3M250RK KT315	D130	1864722	NPR52 KC9125	F47	1866572	CCGT2151LF KC5025	B88
1849251	NPR132F KC5010	F46	1855489	NG3M300RK KT315	D130	1864723	NPL52 KC9125	F47	1866593	CCGT2152LF KC5025	B88
1849252	NPL132F KC5010	F46	1855504	NG2062RK KT315	D130	1864814	SNHX1203PZTNGP KC735M	016	1866595	CCGT21505LF KC5410	B88
1849256	NPL331N KC5010	F46	1855506	NG2094RK KT315	D130	1864815	SNHX1102PZTNGP KC725M	016	1866596	CCGT21505LF KC5410	B88
1849258	NPL332F KC5010	F46	1855508	NG2125RK KT315	D130	1864816	SNHX113PZTNGP KC725M	016	1866597	CCGT2151LF KC5410	B88
1849260	NPL332N KC5010	F46	1855515	NG3M350RK KT315	D130	1864817	SNHX1203PZTNGP KC725M	016	1866599	CCGT2152LF KC5410	B88
1849261	NPR332 KC5010	F46	1855518	NG3M400RK KT315	D130	1864824	SNHX1215PZTNGP KC735M	016	1866600	CCGT21505LF KC5410	B88
1849274	NPR651R KC5010	F46	1855556	NG2M200RK KT315	D130	1864825	SNHX1215PZTNGP KC725M	016	1866602	CCGT21505LF KC5410	B88
1849275	NPR651L KC5010	F46	1855574	NG3062LK KT315	D131	1864829	SNHX113PZFNGE KC510M	016	1866608	CCGT2152LF KC5410	B88
1849276	NPR652R KC5010	F46	1855576	NG3062RK KT315	D130	1864830	SNHX1203PZFNGE KC510M	016	1866609	CCGT21505LF K313	B88
1849277	NPR652L KC5010	F46	1855577	NG3094LK KT315	D131	1864831	SNHX1215PZFNGE KC510M	016	1866610	CCGT21505LF K313	B88
1849278	VBMR2205 KC5010	F48	1855578	NG3094RK KT315	D130	1864849	NPR131F KC9125	F46	1866611	CCGT2151LF K313	B88
1849279	VBMR221 KC5010	F48	1855584	NG3189RK KT315	D130	1864850	NPL131F KC9125	F46	1866613	CCGT21505LF K313	B88
1849280	VBMR222 KC5010	F48	1855588	NG3M150RK KT315	D130	1864851	NPR132F KC9125	F46	1866615	CCGT2151LF K313	B88
1849281	VPGR3305 KC5010	F48	1855910	SPHX1205ZCERGNT KCK15	075	1864852	NPL132F KC9125	F46	1866616	CCGT2152LF K313	B88
1849301	VPGR331 KC5010	F48	1859604	VBMT331LF KT315	B114	1864894	NPL132N KC9125	F46	1866617	CCGT21505LF KC5025	B93
1849302	VPGR332 KC5010	F48	1860639	168.936	D24	1864895	NPR331N KC9125	F46	1866618	CCGT21505LF KC5025	B93
1849323	VPGR333 KC5010	F48	1860827	NG3088L KC5010	D129	1864899	NPR332N KC9125	F46	1866619	CCGT2151LF KC50	

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1866638	...TPGT18151LF KC5025B111	1867024	...DPGT2152HP KC5025B98	1869996	...TCMT2151LF KT315B107	1871108	...TPMT21505LF KC5010B112
1866639	...TPGT2150LF KC5025B111	1867025	...DPGT3251HP KC5025B98	1869998	...TCMT2152LF KT315B107	1871110	...TPMT2152LF KC5010B112
1866640	...TPGT21505LF KC5025B111	1867026	...DPGT3252HP KC5025B98	1870000	...TCMT3251LF KT315B107	1871111	...TPMT3251LF KC5010B112
1866641	...TPGT2151LF KC5025B111	1867027	...RCGT0803MOHP KC5025B100	1870021	...CNGG430LF KC5010B40	1871112	...TPMT3252LF KC5010B112
1866642	...TPGT2152LF KC5025B111	1867028	...RCGT10T3MOHP KC5025B100	1870022	...CNGG4305LF KC5010B40	1871128	...CNGA644T0420 KY4400B118
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1866762	...VBGT331LF KC5410B113	1868462	...TNGP331 KC5010B67	1870815	...CNGA543T0420 KY4400B118	1871320	...WNGG431LF KC5010B79
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1866777	...DPGT32505LF KC5410B98	1868467	...VNGP432 KC5010B74	1870989	...CCMT433LF KC5010B89	1873185	...CWLNR204DMX5C37
1866778	...DPGT3251LF KC5410B98	1868603	...SNMG433RN KC9110F96	1870990	...CPMT181505LF KC5010B94	1873221	...A3R0400M3SP00DF KC5010D32
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1866782	...SPGT3251LF KC5025B105	1868606	...SNMG543RN KC9110F96	1870999	...DPMT3251LF KC5010B99	1873452	...A24CWLNR4MX5C87
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1866796	...SPGT3252LF KC5010B105	1868610	...SNMG644RN KC9110F96	1871013	...CPMT2151LF KC5010B94	1874234	...SPH1205PCTGLPBK KY3500079
1866799	...TCGT215XOLF KC5025B106	1868611	...SNMG646RN KC9110F96	1871042	...CPMT2152LF KC5010B94	1874248	...MDHX1004ZDFR6D4W K110M071
1866801	...TCGT2150LF KC5025B106	1869820	...CCMT21505LF KC5010B89	1871015	...CPMT32505LF KC5010B94	1874250	...MDHX1004ZDFR6D4W KC520M071
1866802	...TCGT2151LF KC5025B106	1869821	...CCMT2151LF KC5010B89	1871016	...CPMT3251LF KC5010B94	1874862	...DCLNR164DKC3C6
1866815	...TCGT3250LF KC5025B106	1869893	...CPGM32505 KT315B92	1871017	...CPMT3252LF KC5010B94	1875058	...CNMNR644RH KC9110F107
1866816	...TCGT3251LF KC5025B106	1869894	...CPGM3251 KC5010B92	1871019	...DCMT3253LF KC5010B97	1875059	...CNMNR646RH KC9110F107
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1875187	DSRNR164DKC3	C11	1882211	SNM6432RM KC9125	F109	1908980	SRCCL162D	C60	1924292	HPFSS500S3125 KC635M	M70
1875188	DSRNL164DKC3	C11	1882212	SNM6433RM KC9125	F109	1908981	SRCCL123B	C60	1924293	HPFSS625S3075 KC635M	M70
1875189	DTFNR164DKC3	C11	1882213	SNM6434RM KC9125	F109	1908982	SRCCL123B	C60	1924294	HPFSS625S3163 KC635M	M70
1875190	DTFNL164DKC3	C11	1882214	SNM6543RM KC9125	F109	1908994	SRCCL163D	C60	1924295	HPFSS375S5088 KC635M	M70
1876239	40510200341	L116	1882215	SNM6544RM KC9125	F109	1908995	SRCCL163D	C60	1924296	HPFSS750S3163 KC635M	M70
1876263	40510200391	L118	1882216	SNM6433RM KC9125	F109	1908996	SRCCL203D	C60	1924299	HPFSS125S5050 KC635M	M71
1876267	40510200375	L120	1882217	SNM6444RM KC9125	F109	1909002	SRCCL203D	C60	1924300	HPFSS188S5056 KC635M	M71
1876287	40510200225	L105	1882218	SNM646RW KC9125	F109	1909003	KGML2450N	D114	1924301	HPFSS250S5075 KC635M	M71
1876292	40510200138	L102	1882219	SNM686RW KC9125	F109	1909003	KGML2450N	D55	1924302	HPFSS250S5125 KC635M	M71
1876568	554.261	C36	1882220	TNM6332RM KC9125	F109	1909004	KGML2450N	D114	1924303	HPFSS312S5081 KC635M	M71
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1876839	TNMG333FW KC5010	B69	1882223	TNM6433RM KC9125	F109	1909006	SRA2L44D	C59	1924305	HPFSS375S5088 KC635M	M71
1876844	WNMG333FW KC5010	B80	1882224	TNM6434RM KC9125	F109	1909159	D64TTB56	C121	1924306	HPFSS375S5150 KC635M	M71
1876849	TNMG431FP KC5010	B68	1882225	TNM6543RM KC9125	F109	1909790	CPGT2152FL KC5010	B93	1924576	HPFT250S6075 KC635M	M72
1876850	TNMG431FP KT315	B68	1882226	TNM6544RM KC9125	F109	1909791	TPGT21505FL KC5010	B111	1924577	HPFT312S6081 KC635M	M72
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1877953	40510200644	L125	1884625	420.081	O124	1912477	STN1612UNI KC635M	S11	1924743	HPFT750S6150 KC635M	M72
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1878083	A2TEN2452	D24			059, 064, 070	1916215	LNEU1245R08SGP KC725M	Q22	1925133	HPFDM375S4038 KC633M	M37
1878086	A2TZN1226	D24	1884631	470.241	O16, O19, O24,	1916218	LNEU1245R16SGP KC725M	Q22	1925134	HPFDM500S4050 KC633M	M37
1878087	A2TZN1626	D24			059, 064, 070, O103, O124	1916221	LNEU1250R04SGP KC725M	Q22	1925135	HPFDM625S6063 KC633M	M37
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1925488	100B08RPO0MD10CUF	070	1937646	TPGH322 KC5025	B110	1952748	A4G0305M03U04GMP KC5010	D79	1953344	A16RA4EML0410N	D95
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1925490	160B12RPO0MD10CUF	070	1937958	E04HSCFDL12	C95	1952752	A4G0405M04U08GMP KC5010	D79	1953346	A20SA4EML0412N	D95
1925491	200C14RPO0MD10CUF	070	1937955	E05MSCFDR12	C95	1952753	A4G0405M04U08GMP KC5025	D79	1953347	A24TA4EMR0416N	D95
1925541	TNMG432RP KC9110	F97	1937956	E05MSCDL12	C98	1952754	A4G0305M03U04GMP KC5010	D79	1953348	A24TA4EML0416N	D95
1925654	RDHX0720MSLN KC522M	R23	1937957	E05MSCDLR12	C98	1952749	A4G0305M03U04GMP KC5025	D79	1953349	A20SA4EMR0516N	D95
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1937510	CDHB120605 KC5025	B91	1940968	DNMG442RP KC5010	B56	1952782	A4R0405M04U00GMN KC5025	D81	1989347	A4M50L0314M	D106
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1937523	CDG120252R KC5010	B91	1940984	VNMG332RP KC5010	B77	1952795	A4R0405M04U00GMN KC5010	D81	1998280	DNGA431E KD1405	B176
1937524	CDG120302R KC5010	B91	1940985	VNMG333RP KC5010	B77	1952796	A4R0405M04U00GMN KC5025	D81	1998281	VNMS432E KD1405	B176
1937528	CDG120402R KC5010	B91	1940986	VNMG432RP KC5010	B83	1952797	A4R0405M04U00GMN KC5010	D81	1998287	VNMS332E KD1405	B180
1937529	CDT120022R KC5010	B92	1940987	VNMG433RP KC5010	B83	1952798	A4R0405M04U00GMN KC5025	D81	1998288	CPGW2151E KD1405	B189
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1937533	TDHB12807501 KC5025	B109	1942350	KSSR200RP430C3	R111	1952802	A4R0405M04U00GMN KC5025	D81	1998300	TPGW2152E KD1405	B195
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2245029	SNMG643RP KC5510	B63	2251718	KDM075RD07W400	R22	2263374	A4G0605M06U08GMN KC5010	D80	2263486	CRHEC312S4R45 KC635M	M90
2245030	SNMG644RP KC5510	B63	2251719	KDM100RD07W200	R22	2263377	A4G0605M06U12GMN KC5010	D80	2263487	CRHEC375S4R15 KC635M	M90
2245031	TNMG332RP KC5510	B71	2251720	KDM100RD07W400	R22	2263375	A4G0605M06U08GMN KC5025	D80	2263488	CRHEC375S4R20 KC635M	M90
2245033	TNMG432RP KC5510	B71	2251721	KDM075RD10W275	R25	2263376	A4G0605M06U12GMN KC5010	D80	2263489	CRHEC375S4R30 KC635M	M90
2245034	TNMG433RP KC5510	B71	2251722	KDM075RD10W475	R25	2263379	A4G0605M06U12GMN KC5025	D80	2263490	CRHEC375S4R45 KC635M	M90
2245035	TNMG434RP KC5510	B71	2251753	KDM100RD10W300	R25	2263377	A4G0605M06U12GMN KC5010	D80	2263491	CRHEC500S4R15 KC635M	M90
2245036	TNMG438RP KC5510	B71	2251754	KDM100RD10W475	R25	2263377	A4G0605M06U12GMN KC5025	D80	2263492	CRHEC500S4R20 KC635M	M90
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2245044	WNMG434RP KC5510	B83	2251760	KDM150RD12W275	R30	2263381	A4G0805M08U12GMN KC5010	D80	2263498	CRHEC625S4R60 KC635M	M90
2245045	CNMG432RP KC5525	B46	2251761	KDM150RD12W475	R30	2263380	A4G0805M08U12GMN KC5010	D80	2263499	CRHEC625S4R90 KC635M	M90
2245046	CNMG433RP KC5525	B46	2251762	KDM150RD10S050F	R26	2263381	A4G0805M08U12GMN KC5025	D80	2263500	CRHEC750S4R125 KC635M	M90
2245047	CNMG434RP KC5525	B46	2251763	KDM200RD10S075F	R26	2263381	A4G0805M08U12GMN KC5025	D80	2263501	CRHEC750S4R15 KC635M	M90
2245048	CNMG542RP KC5525	B46	2251764	KDM200RD12S075F	R31	2263381	A4G0805M08U12GMN KC5025	D80	2263502	CRHEC750S4R30 KC635M	M90
2245049	CNMG543RP KC5525	B46	2251765	KDM250RD12S100F	R31	2263383	A4G1005M10U08GMN KC5025	D80	2263503	CRHEC750S4R30 KC635M	M90
2245050	CNMG544RP KC5525	B46	2251766	KDM300RD12S100F	R31	2263383	A4G1005M10U08GMN KC5010	D80	2263505	CRHEC750S4R60 KC635M	M90
2245051	CNMG643RP KC5525	B46	2251767	KDM400RD12S125C	R31	2263385	A4G1005M10U12GMN KC5025	D80	2263506	CRHEC750S4R90 KC635M	M90
2245052	CNMG644RP KC5525	B46	2251768	KDM200RD16S075F	R35	2263386	A4G0605M06U04GMP KC5010	D79	2263507	RCGH43 KC5510	B100
2245053	DNMG432RP KC5525	B56	2251769	KDM250RD16S100F	R35	2263387	A4G0605M06U04GMP KC5010	D79	2265404	KMG3TSKGMERF50	D56
2245054	DNMG433RP KC5525	B56	2251770	KDM300RD16S100F	R35	2263387	A4G0605M06U04GMP KC5025	D79	2265405	KMG3TSKGMEL50	D57
2245056	DNMG442RP KC5525	B56	2251771	KDM400RD16S125F	R35	2263387	A4G0605M06U04GMP KC5025	D79	2265770	A4G0605M06U08GMN KC9110	D80
2245057	DNMG443RP KC5525	B56	2251772	KDM500RD16S150F	R35	2263388	A4G0605M06U08GMP KT315	D79	2265903	A4G0605M06U08GMP KC9125	D80
2245058	DNMG444RP KC5525	B56	2251773	KDM600RD16S150F	R35	2263389	A4G0605M06U12GMP KC5010	D79	2265905	A4G0305M03U02GMN KC9110	D79
2245059	SNMG432RP KC5525	B63	2251774	KDM200RD12S075F	R31	2263392	A4G0805M08U08GMP KC5025	D79	2266152	KTIP1300HPM KC7315	H6-H10
2245060	SNMG433RP KC5525	B63	2251775	KDM300RD12S100F	R31	2263394	A4G0805M08U12GMP KC5025	D79	2266872	KCMS-SD12CA	O110
2245061	SNMG433RP KC5525	B63	2251776	KDM400RD12S125F	R31	2263396	A4G1005M10U12GMP KC5025	D79	2267054	KCMS-SE14CA	O110
2245062	SNMG544RP KC5525	B63	2254192	KTIP1130HPM KC7315	H6-H10	2263397	A4G0605M06U00GMN KC5010	D81	2267534	M1D100E1802C100L800	P49
2245063	SNMG643RP KC5525	B63	2255543	KMG3TSKGMEL50	D56	2263398	A4R0605M06U00GMN KC5010	D81	2267535	M1D100E1802C100L1000	P49
2245064	SNMG644RP KC5525	B63	2255599	RDPX1003MOSH CPK30	R27	2263399	A4R0605M06U00GMN KC5010	D81	2267536	M1D125E1802C125L800	P49
2245065	TNMG332RP KC5525	B71	2255600	RDPX123MOSH CP522M	R32	2263399	A4R0605M06U00GMN KC5010	D81	2267537	M1D125E1802C125L1000	P49
2245066	TNMG333RP KC5525	B71	2255601	RDPX1604MOSH CP725M	R36	2263398	A4R0605M06U00GMN KC5025	D81	2267538	M1D150E1803C125L800	P49
2245067	TNMG432RP KC5525	B71	2255824	KMG3TSKGMER50	D56	2263400	A4R0805M08U00GMN KC5025	D81	2267539	M1D150E1803C125L1000	P49
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2245071	TNMG543RP KC5525	B71	2258309	KTIP1600HPM KC7315	H6-H10	2263402	A4R1005M10U00GMN KC5025	D81	2267542	M1D200E1803S075L157	P47
2245074	VNMG332RP KC5525	B77	2258692	MS1566	F106	2263402	A4R1005M10U00GMN KC5025	D81	2267545	M1D097E1802W100L175	P47
2245075	VNMG333RP KC5525	B77	2259981	MS2126	P47-52	2263402	A4R1005M10U00GMN KC5025	D81	2267546	M1D100E1802W100L175	P47
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2245077	WNMG433RP KC5525	B83	2262953	KSSC551-630L_Q31-32, Q34-35	Q42, Q44, Q46, Q49-50	2263402	A4R1005M10U00GMN KC5025	D81	2267548	M1D150E1804C100L288	P51
2245078	WNMG434RP KC5525	B83	2262954	KSSC630-709R_Q30, Q32-33, Q35	Q42, Q44, Q46, Q49-50	2263403	A4R0600M06P00GMP KC5010	D81	2267549	M1D100E1802C100L250	P51
2245079	DNMG332RP KC5510	B56	2262955	KSSC630-709L_Q31-32, Q34-35	Q42, Q44, Q46, Q49-50	2263404	A4R0600M06P00GMP KC5025	D81	2267550	M1D100E1802W100L175R	P47
2245080	DNMG332RP KC5525	B56	2262956	KSSC709-813R_Q42, Q44, Q46, Q49-50	Q42, Q44, Q46, Q49-50	2263406	A4R0800M08P00GMP KC5010	D81	2267551	M1D125E1803C100L288	P51
2245083	WNMG332RP KC5510	B83	2262957	KSSC709-813L_Q44, Q46, Q49-50	Q42, Q44, Q46, Q49-50	2263407	A4R0800M08P00GMP KC5025	D81	2267552	M1D100E1802W100L375R	P47
2245084	WNMG332RP KC5525	B83	2262958	KSSC813-917R_Q43, Q47-48, Q50	Q42, Q44, Q46, Q49-50	2263408	A4R0800M08P00GMP K313	D81	2267614	M1D200E1803S575L157	P50
2245087	SNMG434RP KC5510	B63	2262959	KSSC813-917L_Q45, Q47, Q49-50	Q42, Q44, Q46, Q49-50	2263411	A4R1000M10P00GMP K313	D81	2267615	M1D300E1807S100L175	P50
2245575	RNMG66RN KC9125	F96	2262960	KSSW551-630_Q30-35	Q42, Q44, Q46, Q49-50	2263412	A4G1005M10U08GMP KC5010	D79	2267616	M1D300E1807S100L175	P50
2245926	KCMS-OF07CA	O110	2262961	KSSW630-709_Q30-35	Q42, Q44, Q46, Q49-50	2263412	A4G1005M10U08GMP KC5010	D79	2267617	M1D00E1808S150L200	P50
2245972	HNEN090508S KY3500	O91, O97	2262962	KSSW709-813_Q42, Q44, Q46, Q49-50	Q42, Q44, Q46, Q49-50	2263413	A4G1005M10U08GMP KC5025	D79	2267620	M1D00E1808S200L200	P50
2246044	A4G0605M06U08GMP KC5025	D79	2262963	KSSW813-917_Q43, Q45, Q47-50	Q42, Q44, Q46, Q49-50	2263414	A4G0600M06P04GMP KC5010	D79	2267621	M1D200E1805W125L225	P48
2246045	A4G0605M06U08GMP KC5010	D79	2262964	KSSCP551-709_Q30-35	Q42, Q44, Q46, Q49-50	2263414	A4G0600M06P04GMP KC5010	D79	2267623	M1D125E1803W125L225	

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2268627	KSS500BSP10L551-630	034	2268721	KSS51000BSD43R813-917	050	2269881	NGC2C265R150K KC5025	D133	2273388	EP1848E KC725M	P55
2268628	KSS500ASP10R551-630	032	2268722	KSS51000BSD43R813-917	048	2269882	NGC2C265L150K KC5025	D133	2273389	EP1848E KC525M	P55
2268629	KSS500ASP10R551-630	030	2268723	KSS51000BSD43L813-917	049	2269884	NGC2C265L175K KC5025	D133	2273390	EP1848E KC522M	P55
2268630	KSS500ASP10L551-630	031	2268724	KSS51200ASD43R709-813	046	2269913	DT9IP	P23-27, P35-36, P67-69, Q27-29	2274469	NG2062R KC5010	D128
2268631	KSS500BSP10R551-630	035	2268725	KSS51200ASD43R709-813	042	2269914	DT15IP	046, 050-51, P47-52, P73, P86, Q39-41, R39-41, R45-47, R93-95	2274946	A4G125I03P05GMN KC5025	D80
2268632	KSS500BSP10R551-630	033	2268726	KSS51200ASD43L709-813	044	2270351	114.305	F83	2274947	A4G125I03P1GMN KC5025	D80
2268633	KSS500BSP10L551-630	034	2268727	KSS51200BSD43R709-813	050	2270900	RCGT86SHF KC715M	R57	2274948	A4G187I04P1GMN KC5025	D80
2268634	KSS500ASP10R630-709	032	2268728	KSS51200BSD43R709-813	048	2270901	RCGT86SHF KCPK30	R57	2274949	A4G187I04P2GMN KC5025	D80
2268635	KSS500ASP10R630-709	030	2268729	KSS51200BSD43L709-813	049	2270973	RCGT86SHF KC725M	R57	2274950	A4G25I006P1GMN KC5025	D80
2268636	KSS500ASP10L630-709	031	2268730	KSS51200ASD43R813-917	047	2271064	EP1816E KC725M	P55	2274951	A4G25I006P2GMN KC5025	D80
2268637	KSS500BSP10R630-709	035	2268731	KSS51200ASD43R813-917	043	2271065	EP1816E KC525M	P55	2274952	A4G312I08P1GMN KC5025	D80
2268638	KSS500BSP10R630-709	033	2268732	KSS51200ASD43L813-917	045	2271067	EP1816E KC522M	P55	2275073	A4G312I08P2GMN KC5025	D80
2268639	KSS500BSP10R630-709	034	2268733	KSS51200BSD43R813-917	050	2271068	EP1816E KC520M	P55	2275074	A4G312I08P1GMN KC5010	D80
2268640	KSS500ASP10R551-630	032	2268734	KSS51200BSD43R813-917	048	2271071	EP1816E KCPK30	P55	2275075	A4G375I10P00GMN KC5025	D81
2268641	KSS500ASP10R551-630	030	2268735	KSS51200BSD43L813-917	049	2271072	EP1832E KC725M	P55	2275076	A4R125I03P00GMN KC5025	D81
2268642	KSS500ASP10L551-630	031	2268973	KTIPO850HPM KC7315	H6-H10	2271087	EP1832E KC725M	P54	2275077	A4R187I04P00GMN KC5025	D81
2268643	KSS500BSP10R551-630	035	2268974	KTIPO860HPM KC7315	H6-H10	2271088	EP1816E KC520M	P55	2275078	A4R25I006P00GMN KC5025	D81
2268644	KSS500BSP10R551-630	033	2268975	KTIPO870HPM KC7315	H6-H10	2271089	EP1832E KC725M	P54	2275080	A4R375I10P00GMN KC5025	D81
2268645	KSS500BSP10L551-630	034	2268976	KTIPO870HPM KC7315	H6-H10	2271090	EP1832E KC522M	P54	2275081	A4G125I03P05GMN KC5010	D80
2268646	KSS500ASP10R630-709	032	2268981	KTIPO930HPM KC7315	H6-H10	2271091	EP1832E KC410M	P53	2275082	A4G125I03P1GMN KC5010	D80
2268647	KSS500ASP10R630-709	030	2268983	KTIPO950HPM KC7315	H6-H10	2271092	EP1832E KC410M	P53	2275083	A4G187I04P1GMN KC5010	D80
2268648	KSS500ASP10L630-709	031	2268985	KTIPO990HPM KC7315	H6-H10	2271093	EP1832E KC522M	P54	2275084	A4G187I04P2GMN KC5010	D80
2268649	KSS500BSP10R630-709	035	2268986	KTIPO990HPM KC7315	H6-H10	2271094	EP1832E KC522M	P54	2275085	A4G25I006P1GMN KC5010	D80
2268650	KSS500BSP10R630-709	033	2268987	KTIPO1020HPM KC7315	H6-H10	2271095	EP1832E KC522M	P54	2275086	A4G25I006P2GMN KC5010	D80
2268651	KSS500BSP10L630-709	034	2268988	KTIPO1030HPM KC7315	H6-H10	2271097	EP1824E KC725M	P55	2275087	A4G312I08P1GMN KC5010	D80
2268652	KSS500ASP10R551-630	032	2268989	KTIPO1050HPM KC7315	H6-H10	2271098	EP1832E KC522M	P54	2275089	A4G375I10P1GMN KC5010	D80
2268653	KSS500ASP10R551-630	030	2268990	KTIPO1060HPM KC7315	H6-H10	2271099	EP1832E KC522M	P54	2275090	A4G375I10P2GMN KC5010	D80
2268654	KSS500ASP10L551-630	031	2268992	KTIPO1080HPM KC7315	H6-H10	2271101	EP1824E KC725M	P55	2275091	A4R125I03P00GMN KC5010	D81
2268655	KSS500BSP10R551-630	035	2268993	KTIPO1090HPM KC7315	H6-H10	2271103	EP1832E KC525M	P55	2275092	A4R187I04P00GMN KC5010	D81
2268656	KSS500BSP10R551-630	033	2268995	KTIPO110HPM KC7315	H6-H10	2271115	EP1832E KC522M	P55	2275093	A4R25I006P00GMN KC5010	D81
2268657	KSS500BSP10L551-630	034	2268996	KTIPO1120HPM KC7315	H6-H10	2271116	EP1832E KC520M	P55	2275094	A4R312I08P00GMN KC5010	D81
2268658	KSS500ASP10R630-709	032	2268997	KTIPO1140HPM KC7315	H6-H10	2271118	EP1832E KCPK30	P55	2275552	MS2148PKG	P36
2268659	KSS500ASP10R630-709	030	2268999	KTIPO1160HPM KC7315	H6-H10	2271119	EP1808E KC725M	P55	2275583	MS2148	P35, P67-69, Q27-35
2268660	KSS500ASP10L630-709	031	2269000	KTIPO1170HPM KC7315	H6-H10	2271120	EP1808E KC525M	P55	2277900	VBM221LF KC5025	B114
2268661	KSS500BSP10R630-709	035	2269001	KTIPO1180HPM KC7315	H6-H10	2271121	EP1808E KC520M	P55	2288132	A4G0805M08U08GMN KC9110	D80
2268662	KSS500BSP10R630-709	033	2269002	KTIPO1190HPM KC7315	H6-H10	2271135	EP1808E KCPK30	P55	2383555	SDCT431PDER8LD2 KC725M	P82, Q52
2268663	KSS500BSP10L630-709	034	2269003	KTIPO1210HPM KC7315	H6-H10	2271155	EP1864E KC725M	P55	2383556	SDCT431PDEL8LD2 KC725M	Q52
2268664	KSS51000ASP10R630-709	032	2269005	KTIPO1240HPM KC7315	H6-H10	2271156	EP1864E KC525M	P55	2383557	SDCT43PDEL8LD2 KC725M	Q52
2268665	KSS51000ASP10R630-709	030	2269007	KTIPO1260HPM KC7315	H6-H10	2271157	EP1864E KC522M	P55	2383558	SDCT43PDER8LD2 KC725M	P82, Q52
2268666	KSS51000ASP10L630-709	031	2269008	KTIPO1330HPM KC7315	H6-H10	2271158	EP1846E KCPK30	P55	2383559	SDCT431PDEL8LD2 KC725M	Q52
2268667	KSS51000BSP10R630-709	035	2269009	KTIPO1350HPM KC7315	H6-H10	2271159	EP1812E KC725M	P55	2383560	SDCT433ENLD2 KC725M	P82, Q52
2268668	KSS51000BSP10R630-709	033	2269010	KTIPO1400HPM KC7315	H6-H10	2273004	DCKNR164DKC3	C6	2383561	SDCT435ENLD2 KC725M	P82, Q52
2268669	KSS51000BSP10L630-709	034	2269012	KTIPO1430HPM KC7315	H6-H10	2273005	DCKNL164DKC3	C6	2383562	SDCT436ENLD2 KC725M	P82, Q52
2268670	KSS51200ASP10R630-709	032	2269013	KTIPO1450HPM KC7315	H6-H10	2273006	DCKNR204DKC3	C6	2383563	SDCT436ENLD2 KC725M	P82, Q52
2268671	KSS51200ASP10R630-709	030	2269014	KTIPO1470HPM KC7315	H6-H10	2273007	DCKNL204DKC3	C6	2383583	SDCT438ENLD2 KC725M	P82, Q52
2268672	KSS51200ASP10L630-709	031	2269017	KTIPO1530HPM KC7315	H6-H10	2273008	DCLNR166DKC4	C7	2383584	SDCT438ENLD2 KC725M	P82, Q52
2268673	KSS51200BSP10R630-709	035	2269018	KTIPO1550HPM KC7315	H6-H10	2273009	DCLNR166DKC4	C7	2383585	SDCT438ENLD2 KC725M	P82, Q52
2268674	KSS51200BSP10R630-709	033	2269019	KTIPO1570HPM KC7315	H6-H10	2273010	DCLNR206DKC4	C7	2383586	SDCT438ENLD2 KC725M	P82, Q52
2268675	KSS51200BSP10L630-709	034	2269020	KTIPO1580HPM KC7315	H6-H10	2273011	DCLNR206DKC4	C7	2383587	SDCT438ENLD2 KC725M	P82, Q52
2268676	KSS500ASD43N709-813	046	2269753	KTIPO3214HP KC7315	H6-H10	2273012	DCLNR246DKC4	C7	2383588	SDCT438ENLD2 KC725M	P82, Q52
2268677	KSS500ASD43R709-813	042	2269755	KTIPO3281HP KC7315	H6-H10	2273013	DCLNR246DKC4	C7	2383589	SDCT438ENLD2 KC725M	P82, Q52
2268678	KSS500ASD43L709-813	044	2269756	KTIPO3320HP KC7315	H6-H10	2273014	DDJNR123BK3	C8	2383590	SDCT438ENLD2 KC725M	P82, Q52
2268679	KSS500BSD43N709-813	050	2269757	KTIPO3390HP KC7315	H6-H10	2273015	DDJNL123BK3	C8	2383591	SDCT438ENLD2 KC725M	P82, Q52
2268680	KSS500BSD43R709-813	048	2269758	KTIPO3438HP KC7315	H6-H10	2273016	DDJNL163DKC3	C8	2383592	SDCT438ENLD2 KC725M	P82, Q52
2268681	KSS500BSD43L709-813	049	2269759	KTIPO3480HP KC7315	H6-H10	2273017	DDJNL163DKC3	C8	2383593	SDCT438ENLD2 KC725M	P82, Q52
2268682	KSS500ASD43R813-917	047	2269760	KTIPO3580HP KC7315	H6-H10	2273018	DDJNL203DKC3	C8	2383594	SDCT438ENLD2 KC725M	P82, Q52
2268683	KSS500ASD43R813-917	043	2269762	KTIPO3680HP KC7315	H6-H10	2273019	DDJNL203DKC3	C8	2383595	SDCT438ENLD2 KC725M	P82, Q52
2268684	KSS500ASD43L813-917	045	2269763	KTIPO3750HP KC7315	H6-H10	2273020	DDQNR164DKC3	C9	2383596	SDCT438ENLD2 KC725M	P82, Q52
2268685	KSS500BSD43R813-917	050	2269764	KTIPO3763HP KC7315	H6-H10	2273021	DDQNL164DKC3	C9	2383597	SDCT438ENLD2 KC725M	P82, Q52
2268686	KSS500BSD43R813-917	048	2269765	KTIPO3770HP KC7315	H6-H10	2273022	DDQNR204DKC3	C9	2383598	SDCT438ENLD2 KC725M	P82, Q52
2268687	KSS500BSD43L813-917	049	2269766	KTIPO3820HP KC7315	H6-H10	2273023	DDQNL204DKC3	C9	2383599	SDCT438ENLD2 KC725M	P82, Q52
2268688	KSS500ASD43R709-813	046	2269767	KTIPO3860HP KC7315	H6-H10	2273024	DDQNL206DKC4	C10	2383600	SDCT438ENLD2 KC725M	P82, Q52
2268689	KSS500ASD43R709-813	044	2269768	KTIPO3906HP KC7315	H6-H10	2273026	DSRNP206DKC4	C10	2383601	SDCT438ENLD2 KC725M	P82, Q52
2268690	KSS500ASD43L709-813	042	2269769	KTIPO3946HP KC7315	H6-H10	2273027	DSRNL206DKC4	C11	2383602	SDCT438ENLD2 KC725M	P82, Q52
2268691	KSS500BSD43N709-813	050	2269770	KTIPO3970HP KC7315	H6-H10	2273029	DTFNR123BK3	C11	2383603	SDCT438ENLD2 KC725M	P82, Q52
2268692	KSS500BSD43R709-813	048	2269771	KTIPO4040HP KC7315	H6-H10	2273030	DTFNL123BK3	C11	2383604	SDCT438ENLD2 KC725M	P82, Q52
2268693	KSS500BSD43L709-813	049	2269772	KTIPO4063HP KC7315	H6-H10	2273033	DTFNR163DKC3	C11	2383605	SDCT438ENLD2 KC725M	P82, Q52
2268694	KSS500ASD43R813-917	047	2269774	KTIPO4219HP KC7315	H6-H10	2273034	DTFNL163DKC3	C11	2383606	SDCT438ENLD2 KC725M	P82, Q52
2268695	KSS500ASD43R813-917	043	2269776	KTIPO4531HP KC7315	H6-H10	2273035	DTGMR123BK3	C12	2383607	SDCT438ENLD2 KC725M	P82, Q52
2268696	KSS500ASD43L813-917	045	2269777	KTIPO4571HP KC7315	H6-H10	2273036	DTGMR123BK3	C12	2383608	SDCT438ENLD2 KC725M	P82, Q52
2268697	KSS500BSD43R813-917	050	2269778	KTIPO4688HP KC7315	H6-H10	2273037	DTGMR163DKC3	C12	2383609	SDCT438ENLD2 KC725M	P82, Q52
2268698	KSS500BSD43R813-917	048	2269780	KTIPO4911HP KC7315	H6-H10	2273038	DTGMR163DKC3	C12	2383610	SDCT438ENLD2 KC725M	P82, Q52
2268699	KSS500BSD43L813-917	049	2269781	KTIPO5000HP KC7315	H6-H10	2273045	DWLN123BK3	C14	2383611	SDCT438ENLD2 KC725M	P82, Q52
2268700	KSS500ASD43N709-813	046	2269782	KTIPO5080HP KC7315	H6-H10	2273046	DWLN123BK3	C14	2383612	SDCT438ENLD2 KC725M	P82, Q52
2268701	KSS500ASD43R709-813	042	2269784	KTIPO5312HP KC7315	H6-H10	2273047	DWLN163DKC3	C14	2383613		



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2384521	STN1624UNI KC635M	S11	2389298	.NR4125L KC5025	D139	2398768	A4M50L0314B036048	D110			P71, Q37
2384522	STN1627UNI KC635M	S11	2390253	SDCT43PDER8LD2 KC725M		2398769	A4M50L0314B042058	D110	2405382	.SPPT3125PPSR8GB2 KCPK30	
2384524	STN1632UNI KC635M	S11			P82, Q52	2398770	A4M50L0314B052074	D110			P71, Q37
2384627	.NG4M350LK KC9110	D132	2390254	SPCT3125PPER8LD2 KC725M		2398771	A4M50L0314B068100	D110	2405384	.SDPT43PDER8GB2 KC725M	
2384837	A4G0405M04U08GMN KC9110				P71, Q37	2398772	A4M50L0314B090160	D110			P83, Q52
		D80	2390256	.SECT443AEN7LD2 KC725M	.052	2398773	A4M50L0314B130300	D110	2405385	.SDPT43PDER8GB2 KCK15	
2384838	A4G0505M05U04GMN KC9110		2390257	.SEKT443AEN7GP2 KC725M	.052	2398774	A4M50L0314B290999	D110			P83, Q52
		D80	2390258	.SEKT443AEN7GP2 KC520M	.052	2398775	A4M50R0414B048072	D109	2405386	.SDPT43PDER8GB2 KCPK30	
2384839	A4G0605M06U04GMN KC9110		2390259	.SEKT443AEN7GP2 KCK15	.052	2398776	A4M50R0414B064100	D109			P83, Q52
		D80	2390260	.SEKT443AEN7GP2 KCPK30	.052	2398777	A4M50R0414B092150	D109	2405387	.SDPT43PDR8GB2 KC725M	
2384841	A4G0805M08U12GMN KC9110		2390261	.SEKT443AEN7GP2 KC725M	.052	2398778	A4M50R0414B132300	D109			P83, Q52
		D80	2390262	.SEKT443AEN7GP2 KC520M	.052	2398779	A4M50R0414B290999	D109	2405388	.SDPT43PDR8GB2 KCK15	
2384842	A4G1005M10U08GMN KC9110		2390263	.SEKT443AEN7GP2 KCK15	.052	2398780	A4M50L0414B048072	D110			P83, Q52
		D80	2390264	.SEKT443AEN7GP2 KCPK30	.052	2398781	A4M50L0414B064100	D110	2405389	.SDPT43PDR8GB2 KCPK30	
2384908	.HNGX5354MR KCPK30	.091, 097	2390265	.SPET3125PEL8GB2 KC725M	.037	2398782	A4M50L0414B092150	D110			P83, Q52
2384961	.H40MCLN4	C123	2390266	.SPET3125PEL8GB2 KCK15	.037	2398783	A4M50L0414B132300	D110	2408385	.A20UDDUNL4KC3	C78
2384973	.H40MCLN4	C123	2390267	.SPET3125PEL8GB2 KCPK30	.037	2398784	A4M50L0414B290999	D110	2408386	.A24UDDUNL4KC3	C78
2384977	.H40MVUNR3	C126	2390268	.SPET3125PEL8GB2 KC520M	.037	2398785	A4M50R0519B058094	D109	2408387	.A28UDDUNL4KC3	C78
2384978	.H40MVUNL3	C126	2390269	.SPET3125PEL8GB2 KC725M	.037	2398786	A4M50R0519B080136	D109	2408388	.A32VDDUNL4KC3	C78
2384979	.H32MVUNR3	C126	2390271	.SPET3125PEL8GB2 KCPK30	.037	2398787	A4M50R0519B120300	D109	2408389	.A16TDDUNR3KC3	C78
2384980	.H32MVUNL3	C126	2390273	SPET3125PPER8GB2 KC725M		2398788	A4M50R0519B250999	D109	2408390	.A20UDDUNR3KC3	C78
2385283	A4G1005M10U12GMN KC9110				P71, Q37	2398789	A4M50L0519B058094	D110	2408391	.A20UDDUNR4KC3	C78
		D80	2390274	.SPET3125PPER8GB2 KCK15		2398790	A4M50L0519B080136	D110	2408392	.A24UDDUNR4KC3	C78
2385284	A4G0305M03U02GMP KC9110				P71, Q37	2398791	A4M50L0519B120300	D110	2408463	.A28UDDUNR4KC3	C78
		D79	2390275	.SPET3125PPER8GB2 KCPK30		2398792	A4M50L0519B250999	D110	2408464	.A32VDDUNR4KC3	C78
2385285	A4G0305M03U04GMP KC9110				P71, Q37	2399462	.KM25NER230	E37	2408465	.A16TDFNL3KC3	C79
		D79	2390276	.SPET3125PPER8GB2 KC520M		2399493	.KM25NEL230	E37	2408466	.A20UDTFNL3KC3	C79
2385286	A4G0405M04U08GMP KC9110				P71, Q37	2399494	.KM25NER330	E37	2408467	.A24UDTFNL3KC3	C79
		D79	2390277	.SPET3125PPSR8GB2 KC725M		2399495	.KM25NEL330	E37	2408468	.A24UDTFNL4KC3	C79
2385287	A4G0505M05U04GMP KC9110				P71, Q37	2399496	.KM25NER430	E37	2408469	.A16TDFNR3KC3	C79
		D79	2390278	.SPET3125PPSR8GB2 KCK15		2399497	.KM25NEL430	E37	2408472	.A24UDTFNR4KC3	C79
2385288	A4G0505M05U08GMP KC9110				P71, Q37	2399498	.KM25NSR230	E37	2408473	.A28UDTFNR3KC3	C79
		D79	2390279	.SPET3125PPSR8GB2 KCPK30		2399499	.KM25NSL230	E37	2408475	.A32VDFNR4KC3	C79
2385289	A4G0605M06U04GMP KC9110				P71, Q37	2399500	.KM25NSR330	E37	2408485	.A20UDCKNL4KC3	C76
		D79	2390280	.SPET3125PPSR8GB2 KC520M		2399501	.KM25NSL330	E37	2408486	.A24UDCKNL4KC3	C76
2385290	A4G0605M06U08GMP KC9110				P71, Q37	2399502	.KM25NSR430	E37	2408487	.A32VDCCKNL4KC3	C76
		D79	2390281	.SDET43PDEL8GB2 KC520M	.052	2399503	.KM25NSL430	E37	2408488	.A32VDCCKNL5KC4	C76
2385292	A4G0805M08U08GMP KC9110		2390282	.SDET43PDEL8GB2 KCK15	.052	2399504	.KM25LSSR1630	E77	2408489	.A20UDCKNR4KC3	C76
		D79	2390283	.SDET43PDEL8GB2 KCPK30	.052	2399505	.KM25SSL1630	E77	2408490	.A24UDCKNR4KC3	C76
2385296	A4R0305M03U00GMN KC9110		2390284	.SDET43PDEL8GB2 KC725M	.052	2399506	.KM25LSER1630	E77	2408491	.A32VDCCKNR4KC3	C76
		D81	2390285	.SDET43PDER8GB2 KC520M		2399507	.KM25SEL1630	E77	2408492	.A32VDCCKNR5KC4	C76
2385297	A4R0405M04U00GMN KC9110				P83, Q52	2399678	.HNGX5354MR KCK15	.091, 097	2408493	.A16TDSKNL3KC2	C79
		D81	2390286	.SDET43PDER8GB2 KCK15		2400680	.KSSP200R3SD43L168	P80	2408494	.A20UDSKNL3KC2	C79
2385298	A4R0505M05U00GMN KC9110				P83, Q52	2400681	.KSSP250R3SD43L200	P80	2408495	.A20UDSKNL4KC3	C79
		D81	2390287	.SDET43PDER8GB2 KCPK30		2400682	.KSSP300R4SD43L240	P80	2408497	.A28UDTFNL4KC3	C79
2385299	A4R0605M06U00GMN KC9110				P83, Q52	2401211	.KTIP1440HPM KC7315	H6-H10	2408498	.A32VDFNL4KC3	C79
		D81	2390288	.SDET43PDER8GB2 KC725M		2401860	.KTIP1410HPM KC7315	H6-H10	2408499	.A40VDFNL4KC3	C79
2385300	A4R0805M08U00GMN KC9110				P83, Q52	2402358	.RDHX0702MOTLN KTKP20	R23	2408500	.A16TDFCNL4KC3	C76
		D81	2390289	.SDET43PDR8GB2 KC520M		2402359	.RDHX1003MOTGN KTKP20	R27	2408501	.A20UDCFNL4KC3	C76
2385302	A4G0305M03U02GMN KC9125				P83, Q52	2402360	.RDHX1213MOTGN KTKP20	R32	2408502	.A24UDCFNL4KC3	C76
		D80	2390290	.SDET43PDR8GB2 KCK15		2402837	.K315A1ORF45HNO9C	.089	2408503	.A16TDFCNR4KC3	C76
2385303	A4G0405M04U08GMN KC9125				P83, Q52	2402838	.K400B14RF45HNO9C	.089	2408504	.A20UDCFNR4KC3	C76
		D80	2390291	.SDET43PDR8GB2 KCPK30		2402839	.K500B18RF45HNO9C	.089	2408505	.A24UDCFNR4KC3	C76
2385304	A4G0605M06U04GMN KC9125				P83, Q52	2402840	.K600B22RF45HNO9C	.089	2408506	.A16TDCNLR3KC2	C77
		D80	2390292	SDET43PDR8GB2 KC725M		2402841	.K800C28RF45HNO9C	.089	2408507	.A16TDCNLR4KC3	C77
2385305	A4G0605M06U12GMN KC9125				P83, Q52	2402999	.AADF0125J2B K600	.M48	2408508	.A20UDCNLR4KC3	C77
		D80	2390293	.SDET43PDEL8GB2 KC520M	.052	2403000	.AADF0188J2B K600	.M48	2408509	.A24UDCNLR4KC3	C77
2385306	A4G0805M08U08GMN KC9125		2390294	.SDET43PDEL8GB2 KCK15	.052	2403001	.AADF0250J2B K600	.M49	2408510	.A24UDCNL5KC4	C77
		D80	2390296	.SDET43PDEL8GB2 KC725M	.052	2403002	.AADF0312J2A K600	.M49	2408511	.A28UDCNLR4KC3	C77
2385307	A4G0805M08U12GMN KC9125		2390297	.SDET43PDER8GB2 KC520M		2403013	.AADF0375J2B K600	.M49	2408512	.A32VDCNLR4KC3	C77
		D80			P83, Q52	2403015	.AADF0625J2A K600	.M51	2408513	.A32VDCNLR5KC4	C77
2385308	A4G1005M10U08GMN KC9125		2390298	.SDET43PDER8GB2 KCK15		2403016	.AADF0750J2B K600	.M51	2408514	.A32VDCNLR6KC4	C77
		D80			P83, Q52	2404444	.STN10075ISOI KC635M	.S11	2408515	.A40VDCNLR4KC3	C77
2385309	A4G1005M10U12GMN KC9125		2390299	.SDET43PDER8GB2 KCPK30		2404445	.STN10100ISOI KC635M	.S11	2408516	.A40VDCNLR5KC4	C77
		D80			P83, Q52	2404446	.STN10125ISOI KC635M	.S11	2408517	.A16TDCNLR3KC2	C77
2385310	A4G0305M03U02GMP KC9125		2390300	.SDET43PDER8GB2 KC725M		2404447	.STN10150ISOI KC635M	.S11	2408518	.A16TDCNLR4KC3	C77
		D79			P83, Q52	2404448	.STN11050ISOI KC635M	.S11	2408519	.A20UDCNLR4KC3	C77
2385311	A4G0305M03U04GMP KC9125		2393422	.STN1118UNE KC635M	.S11	2404449	.STN11100ISOI KC635M	.S11	2408520	.A24UDCNLR4KC3	C77
		D79	2393667	.STN1624UNE KC635M	.S11	2404450	.STN11125ISOI KC635M	.S11	2408521	.A24UDCNLR5KC4	C77
2385312	A4G0405M04U08GMP KC9125		2393668	.STN1620UNE KC635M	.S11	2404451	.STN11150ISOI KC635M	.S11	2408522	.A28UDCNLR4KC3	C77
		D79	2393670	.STN1616UNE KC635M	.S11	2404452	.STN11150ISOI KC635M	.S11	2408523	.A32VDCNLR4KC3	C77
2385313	A4G0505M05U04GMP KC9125		2393671	.STN1614UNE KC635M	.S11	2404453	.STN11150ISOI KC635M	.S11	2408524	.A32VDCNLR5KC4	C77
		D79	2396961	.KTIP1370HPM KC7315	H6-H10	2404454	.STN11150ISOI KC635M	.S11	2408525	.A32VDCNLR6KC4	C77
2385314	A4G0505M05U08GMP KC9125		2397693	.DRGNR124BK3	.C9	2404455	.STN11150ISOI KC635M	.S11	2408526	.A40VDCNLR4KC3	C77
		D79	2397694	.DRGNL124BK3	.C9	2404472	.MDHX1004ZDERGD4W K110M	.071	2408527	.A40VDCNLR6KC4	C77
2385315	A4G0605M06U04GMP KC9125		2397697	.DRGNR164DK3	.C9	2404707	A4G0305M03U02B KC5025	D85	2408528	.A16TDDUNL3KC3	C78
		D79	2397698	.DRGNL164DK3	.C9	2404708	A4G0405M04U04B KC5025	D85	2408529	.A20UDDUNL3KC3	C78
2385317	A4G0805M08U08GMP KC9125		2397699	.DRGNR204DK3	.C9	2404709	A4G0505M05U04B KC5025	D85	2408530	.A24UDDUNL4KC3	C79
		D79	2397700	.DRGNL204DK3	.C9	2404710	A4G0605M06U04B KC5025	D85	2408532	.A32VDCNLR6KC4	C79
2385320	A4G1005M10U12GMP KC9125		2397703	.DRGNR165DK4	.C9	2404943	.MDHX1004ZDERGD K110M	.071	2408536	.A20UDSKNR4KC3	C

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2414057	AADF0250J2B KC651M	M49	2425845	DCMT3251LF KC5025	B97	2435300	CNMG643P KC5010	B45	2456170	RCM11003MORP KC9125	F108
2414058	AADF0312J2A KC651M	M49	2425846	DCMT3252LF KC5025	B97	2435301	DNMG431P KC5010	B55	2456172	RCMT1204MORP KC9125	F108
2414059	AADF0375J2B KC651M	M49	2425847	VBMT331LF KC5025	B114	2435302	DNMG432P KC5010	B55	2456173	RCMT1606MORP KC9125	F108
2414060	AADF0500J2B KC651M	M50	2425848	VBMT332LF KC5025	B114	2435313	SNMG6432P KC5010	B62	2456181	CNMM190740RRP KC9110	F87
2414061	AADF0625J2A KC651M	M51	2425849	TNMG334RP KC5010	B70	2435314	SNMG6433P KC5010	B62	2456182	CNMM190740RRP KC9125R	F87
2414062	AADF0750J2B KC651M	M51	2425860	DNGG434FS KC5510	B51	2435315	TNMG631P KC5010	B70	2456183	SNMX190640RRP KC9110	F87
2414138	A4ENN120305	D94	2425863	DNMG332MS KC5510	B54	2435316	TNMG632P KC5010	B70	2456184	SNMX190640RRP KC9125	F87
2414139	A4ENN160305	D94	2425864	DNMG332MS KC5525	B54	2435317	TNMG631P KC5010	B70	2456213	RCGT1204MOMS KC5025	B101-B102
2414670	TPG22150420M KB9610	B186	2425865	DNMG332MS K313	B54	2435318	TNMG6432P KC5010	B70	2456214	RCGT1606MOMS KC5025	B101-B102
2414672	TPG321EM KB9610	B186	2425869	WNMG332MS KC5510	B81	2435319	TNMG6433P KC5010	B70	2458790	OFKT53AFEN4GB KC522M	061
2414673	TPG322EM KB9610	B186	2425870	WNMG332MS KC5525	B81	2435320	VNMG631P KC5010	B77	2458791	OFKT53AFEN4GB KC522M	061
2414674	TPG22150420M KB9610	B186	2425871	WNMG332MS K313	B81	2435322	WNMG431P KC5010	B82	2458833	OFKT53AFEN4GB KC522M	061
2414676	TPG32150420M KB9610	B186	2425898	CPGW21505EFWM KB9610	B190	2435323	WNMG432P KC5010	B82	2458914	SDET4345NGB2 KCPK30	P83, Q52
2417192	IRSN54 K9	C9	2425899	CPGW2151EFWM KB9610	B190	2435324	DNMG441P KC5010	B55	2458915	SDET4345NGB2 KCPK30	P83, Q52
2417292	DCLNR123BK3	C6	2425900	CPGW2152EFWM KB9610	B190	2435325	DNMG442P KC5010	B55	2458916	SDET4345NGB2 KCK15	P83, Q52
2417293	DCLNL123BK3	C7	2425908	DCGW21505EM KB9610	B191	2438407	NG3125R KC5010	D128	2458917	SDET4345NGB2 KC520M	P83, Q52
2417294	DCLNR163DK3	C6	2425909	DCGW2151S0415M KB9610	B191	2438408	NG3125R KC5025	D128	2458918	SDET435NGB2 KCPK30	P83, Q52
2417295	DCLNL163DK3	C7	2425912	DCGW2151EM KB9610	B191	2438663	BGHX15L5PCERGTM KD1410	0126	2458919	SDET435NGB2 KCK15	P83, Q52
2417433	IRSN64 K9	C9	2425918	DCGW3252S0415FWMT KB9610	B191	2438664	BGHX15L5PCTRHT KD1410	0126	2458920	SDET435NGB2 KCK15	P83, Q52
2418397	A2022N00CF00 KC5025	D15	2425919	DCGW2151EFWM KB9610	B191	2438665	BGHX15L504ERGET KD1415	0126	2458921	SDET435NGB2 KC520M	P83, Q52
2419341	KTIP1380HPM KC7315	H6-H10	2425920	DCGW3251EFWMT KB9610	B191	2441653	NG4189LK KC9110	D132	2458922	SDET436NGB2 KCPK30	P83, Q52
2420366	KM100NCFM	F106	2425930	DPGW2151S0415FWM KB9610	B193	2442348	RCGT645HF KCPK30	R53	2458933	SDET436NGB2 KCK15	P83, Q52
2421384	SSY5T K9	E76, E78, E80	2425951	CCGW3251EMT KB9610	B187	2444419	RCGK23FS KC5010	F61	2458934	SDET436NGB2 KCK15	P83, Q52
2421386	SSA5T	E76, E78, E80	2426013	SNGA432S0420FWMT KB9610	B181	2444419	RCGK23FS KC5010	F61	2458935	SDET436NGB2 KC520M	P83, Q52
2424496	HNGX5352MH KCK15	090, 096	2426038	WNGA443S0420FWMT KB9610	B181	2444420	RCGK35FS KC5010	F61	2458936	SDET438NGB2 KCPK30	P83, Q52
2424497	HNGX5358MR KCK15	091, 097	2426876	SDET43PDSL8GB2 KC520M	Q52	2444421	RCGK46FS KC5010	F61	2458937	SDET438NGB2 KCK15	P83, Q52
2424498	HNGX5355MM KCK15	090, 096	2426877	SDET43PDSL8GB2 KCK15	Q52	2444424	RCGK35FS KC5025	F61	2458938	SDET438NGB2 KCK15	P83, Q52
2424499	HNGX5355ML KCK15	090, 096	2426878	SDET43PDSL8GB2 KCPK30	Q52	2444542	A3G0605M06U04DM KC9110	D33	2458939	SDET438NGB2 KC520M	P83, Q52
2424500	HNGX5352MH KCPK30	090, 096	2426879	SDET43PDSL8GB2 KC725M	Q52	2445418	RCGK152FS KC5010	F61	2460124	EP1812S KC725M	P55
2425574	LNJX19194ORRP KC9110	F87	2428772	NG3094R KC9110	D128	2446615	RPV45 KC5510	B85	2460125	EP1812S KCPK30	P55
2425575	LNJX19194ORRP KC9125	F87	2429098	NG3125R KC9110	D130	2446617	RPV35 KC5510	B85	2460185	EP1812S KCK15	P55
2425576	LNJX19194ORRH KC9110	F86	2429100	NG3125LK KC9110	D132	2446618	RPV23 KC5510	B85	2462984	SNX433NCP KC917M	0104
2425577	LNJX19194ORRH KC9125	F86	2429102	NG3189R KC9110	D130	2447377	EC1808E2 KC522M	P54	2462986	SNX43ZNEJL KC914M	0104
2425578	LNJX30194ORRP KC9110	F87	2429114	NG3189LK KC9110	D132	2447380	EC1848E KC522M	P54	2467632	KSSR200SN434M3	0102
2425579	LNJX30194ORRP KC9125	F87	2429563	STN1118NPT KC635M	S12	2447623	A3G0300M3SP02DF KC5025	D32	2467665	KSSR200SN434M3	0102
2425580	LNJX30194ORRH KC9110	F86	2429564	STN11614NPT KC635M	S12	2447624	A3G0300M3SP04DF KC5025	D32	2467666	KSSR800SN434M8	0102
2425581	LNJX30194ORRH KC9125	F86	2429565	STN16115NPT KC635M	S12	2447625	A3R0300M3SP00DF KC5010	D32	2467667	KSSR800SN434M8	0102
2425659	CCMT21505LF KC5025	B89	2429570	STN1118NPTF KC635M	S12	2447626	A3G0300M3SP02DF KC5010	D32	2467668	KSSR100SN434M10	0102
2425660	CCMT2151LF KC5025	B89	2429571	STN1614NPTF KC635M	S12	2447627	A3G0300M3SP04DF KC5010	D32	2478031	NG3047R KC9110	D128
2425661	CCMT2152LF KC5025	B89	2429572	STN16115NPTF KC635M	S12	2447628	A3R0300M3SP00DF KC5010	D32	2478032	NG3047R KC9110	D128
2425662	CCMT32505LF KC5025	B89	2429575	STN1614NPS KC635M	S12	2447630	A3G1253SP05DF KC5025	D32	2478075	NG3062R KC9110	D128
2425673	CCMT3251LF KC5025	B89	2429576	STN16115NPS KC635M	S12	2447633	A3G0400M4SP08DF KC5025	D32	2478076	NG3062R KC9110	D128
2425675	CCMT431LF KC5025	B89	2429582	STN119BSW KC635M	S12	2448304	KTIP1610HPM KC7315	H6-H10	2478077	NG3078R KC9110	D130
2425677	CPMT181505LF KC5025	B94	2429587	STN1614BSW KC635M	S12	2450469	HNGF5353MT KCK15	097	2478078	NG3094L KC9110	D129
2425679	CPMT18151LF KC5025	B94	2429588	STN1612BSW KC635M	S12	2450470	HNGF5353MT KCK15	097	2478079	NG3094L KC9110	D129
2425680	CPMT21505LF KC5025	B94	2429589	STN161BSW KC635M	S12	2451576	EC1808E KC725M	P54	2478080	NG3094L KC9110	D129
2425681	CPMT2151LF KC5025	B94	2429638	514.133	F103, F105	2451578	EC1812FJ KC410M	P53	2478081	NG3125L KC9110	D129
2425682	CPMT2152LF KC5025	B94	2429639	514.138	F105	2451579	EC1812E KC725M	P54	2478082	NG3125R KC9110	D128
2425683	CPMT32505LF KC5025	B94	2429804	CM212LP	E37	2451580	EC1824FJ KC410M	P53	2478083	NG3189L KC9110	D128
2425684	CPMT3251LF KC5025	B94	2429805	CM213LP	E37	2451581	EC1840FJ KC410M	P53	2478085	NG3M150LK KC9110	D131
2425685	CPMT3252LF KC5025	B94	2429805	CM213LP	E37	2451582	EC1840E KC522M	P54	2478088	NG3M200R KC9110	D130
2425686	DCMT21505LF KC5025	B97	2429851	CNMG432CT KC5010	B42	2451684	EC1848FJ KC410M	P53	2478089	NG3M255LK KC9110	D131
2425688	DCMT431LF KC5025	B97	2429967	DNMG331CT KC5010	B52	2452135	OFKT644FN6GB KC725M	065	2478090	NG3M255LK KC9110	D130
2425689	DCMT432LF KC5025	B97	2429973	DNMG332CT KC5010	B52	2452136	OFKT644FN6GB KC725M	065	2478091	NG3M255LK KC9110	D130
2425690	DCMT432LF KC5025	B97	2429979	DNMG431CT KC5010	B52	2452137	OFKT644FN6GB KC725M	065	2478092	NG3M255LK KC9110	D130
2425691	DCMT432LF KC5025	B97	2429985	DNMG432CT KC5010	B52	2452372	M1D100E1802W075L175	P48	2478093	NG3M300LK KC9110	D132
2425692	DCMT432LF KC5025	B97	2429991	SCMT3251LF KC5025	B103	2452414	M1D125E1802W100L225	P48	2478094	NG3M300LK KC9110	D132
2425693	DCMT432LF KC5025	B97	2429996	SCMT3252LF KC5025	B103	2453684	OFPT53AFEN4GB KC725M	061	2478095	NG3M400LK KC9110	D132
2425694	DCMT432LF KC5025	B97	2430001	DNMG442CT KC5010	B52	2453686	OFPT53AFEN4GB KC725M	061	2478096	NG3M400LK KC9110	D130
2425695	DCMT432LF KC5025	B97	2430006	DNMG443CT KC5010	B52	2453687	OFPT53AFEN4GB KC725M	061	2479506	M1D125E1404W125L225	P23
2425696	DCMT432LF KC5025	B97	2430035	TNMG432CT KC5010	B68	2453688	OFKT53AFEN4GB KC725M	061	2479507	M1D100E1403W075L175	P23-P24
2425697	DCMT432LF KC5025	B97	2430041	TNMG433CT KC5010	B68	2455430	A4R0500M05P00T01025 KY3500	D85	2479508	M1D100E1403W100L175	P23
2425698	DCMT432LF KC5025	B97	2430830	K315A62RF60HN09C	094	2455801	OFPT53AFEN4GB KCK15	061	2479509	M1D125E1404S050L157	P26
2425699	DCMT432LF KC5025	B97	2430832	K400B82RF60HN09C	094	2455802	OFPT53AFEN4GB KCK15	061	2479510	M1D200E1406S075L157	P26
2425700	DCMT432LF KC5025	B97	2430924	K500B123RF60HN09C	094	2455814	OFKT53AFEN4GB KCK15	061	2487512	M1D125E1404W100L225	P23-P24
2425701	DCMT432LF KC5025	B97	2430931	K600B164RF60HN09C	094	2455816	OFPT53AFEN4GB KCPK30	061	2487540	NG4189R KC9110	D131
2425702	DCMT432LF KC5025	B97	2430973	K800C205RF60HN09C	094	2455818	OFPT53AFEN4GB KCPK30	061	2487541	NR4062R KC9110	D140
2425703	DCMT432LF KC5025	B97	2431066	NR4062LK KC9110	D140	2455819	OFPT53AFEN4GB KCPK30	061	2487542	KRR65652 KC5125RR	F84
2425704	DCMT432LF KC5025	B97	2432404	RCMT2006MORP KC9110	F108	2455820	OFPT53AFEN4GB KCPK30	061	2487543	KRR65652 KC5125RR	F84
2425705	DCMT432LF KC5025	B97	2432405	RCMT2006MORP KC9125	F108	2455821	OFPT53AFEN4GB KCPK30	061	2487544	KRR65652 KC5125RR	F84
2425706	DCMT432LF KC5025	B97	2432408	RCMT2006MORP KC9125	F108	2455822	OFPT53AFEN4GB KC520M	061	2487545	KRR65652 KC5125RR	F84
2425707	DCMT432LF KC5025	B97	2432410	RCMT2006MORH KC9110	F108	2455823	OFPT53AFEN4GB KC520M	061	2487546	KRR65652 KC5125RR	F84
2425708	DCMT432LF KC5025	B97	2432411	RCMT2006MORH KC9125	F108	2455854	OFKT53AFEN4GB KC520M	061	2487547	KRR65652 KC9125RR	F85
2425709	DCMT432LF KC5025	B97	2432412	RCMT2006MORH KC9125	F108	2456097	RCGT0803MOMS KC5010	B101-B102	2487548	KRR65652 KC9125RR	F85
2425710	DCMT432LF KC5025	B97	2432463	RCMX2507MORP KC9110	F108	2456098	RCGT1003MOMS KC5010	B101-B102	2487549	KRR65652 KC9125RR	F85
2425711	DCMT432LF KC5025	B97	2432464	RCMX2507MORP KC9125	F108	2456099	RCGT1204MOMS KC5010	B101-B102	2487550	KRR65652 KC9125RR	F85
2425712	DCMT432LF KC5025	B97	2432466	RCMX2507MORH KC9110	F108	2456100	RCGT1606MOMS KC5010	B101-B102	2487551	KRR65652 KC9125RR	F85
2425713	DCMT432LF KC5025	B97	2432467	RCMX2507MORH KC9125	F108	2456101	RCGT0803MOMS KC5025	B101-B102	2487552	KRR65652 KC9125RR	F85
2425714	DCMT432LF KC5025	B97	2432469	RCMX3209MORP KC9110	F108	2456102	RCGT1003MOMS KC5025	B101-B102	2487553	KRR65652 KC9125RR	F85
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2509328	EP1808S KCK15	P55	2542529	A4M50L0314A130300	D108	2599515	NR3062L KC5010	D140	2618967	KSSS600ASD43N750	Q40
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2646801	KTP160310HP KC7315	H6-H10	2657844	BNEC188S4100 K600	M97	2879404	KDMB0375R591A038HNC	R73	2890395	HEC500S4200 KC635M	M89
2646923	KTIPO6310HP KC7315	H6-H10	2657845	BNEC250S4150L K600	M97	2879405	KDMB0500R472A050HNC	R73	2890396	HEC125S4100 KC635M	M88
2646924	KTIPO6406HP KC7315	H6-H10	2657846	BNEC250S4150L K600	M97	2879406	KDMB0500R630A050HNC	R73	2890397	HEC562S2125 KC635M	M84
2646925	KTIPO640HP KC7315	H6-H10	2657847	BNEC312S4050 K600	M98	2879407	KDMB0625R551A063HNC	R73	2890398	HEC562S2225 KC635M	M88
2646926	KTIPO6643HP KC7315	H6-H10	2657848	BNEC312S4150 K600	M98	2879408	KDMB0625R689A063HNC	R73	2890399	HEC156S2031 KC635M	M83
2646927	KTIPO690HPM KC7315	H6-H10	2657849	BNEC375S4063 K600	M98	2879409	KDMB0750R551A075HNC	R73	2890400	HEC562S4125 KC635M	M89
2649548	R30FBHS06	K198	2657850	BNEC375S4088 K600	M98	2879410	KDMB0750R827A075HNC	R73	2890401	HEC125S4225 KC635M	M88
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2649551	R65FBHS06	K198	2657853	BNEC500S4063 K600	M98	2879413	KDMB1250R748A125HNC	R73	2890404	HEC188S4075 KC635M	M88
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2649553	R85FBHS09	K198	2657855	BNEC500S4200 K600	M98	2879415	KDMT05002ERGN KC515M	R90	2890406	HEC188S4113 KC635M	M88
2649554	R125FBHS09	K198	2657856	BNEC750S4100 K600	M98	2879416	KDMT05004ERGN KC515M	R90	2890781	HEC250S2050 KC635M	M83
2649555	R24FBHS06LF	K198	2657857	BNEC750S4200 K600	M98	2879417	KDMT06252ERGN KC515M	R90	2890782	HEC250S4050 KC635M	M88
2649556	R31FBHS06LF	K198	2657858	BNEC125S2075 K600	M98	2879418	KDMT06254ERGN KC515M	R90	2890863	HEC250S2113 KC635M	M83
2649557	R40FBHS06LF	K198	2658352	SFRHEC250S3075 K600	M58	2879419	KDMT07502ERGN KC515M	R90	2890864	HEC250S4113 KC635M	M88
2649558	R51FBHS06LF	K198	2658419	A4G0300M03P04T01025 KY3500	D85	2879420	KDMT07504ERGN KC515M	R90	2890865	HEC250S2150 KC635M	M83
2649559	R67FBHS09LF	K198	2658420	A4G0400M04P04T01025 KY3500	D85	2879421	KDMT10002ERGN KC515M	R90	2890866	HEC250S4125 KC635M	M88
2649913	DH35M	051, P73	2658421	A4G0500M05P08T01025 KY3500	D85	2879422	KDMT10004ERGN KC515M	R90	2890867	HEC250S4150L KC635M	M88
2649914	DH4M	P86	2658422	A4G0600M06P08T01025 KY3500	D85	2879513	KDMT10008ERGN KC515M	R90	2890868	HEC312S2050 KC635M	M83
2651037	HSK63FBH01695	K191	2658443	SFRHEC312S3075 K600	M58	2879514	KDMT05004ERGC KC515M	R90	2890869	HEC125S4113 KC635M	M88
2651038	AFB38115SCFP09	K194	2658444	SFRHEC375S3088 K600	M58	2879515	KDMT05002ERGC KC515M	R90	2890870	HEC312S2113 KC635M	M83
2651039	AFB42115SCFP09	K194	2658445	SFRHEC500S3100 K600	M58	2879516	KDMT06254ERGC KC515M	R90	2890871	HEC312S4113 KC635M	M88
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2652968	SYB40RBHT09F	K190	2658449	SFRHEC750S3150 K600	M58	2879520	KDMT10004ERGC KC515M	R90	2890875	HEC375S4063 KC635M	M89
2652969	SYB50RBHT09F	K190	2658450	SFRHEC750S3225 K600	M58	2879521	KDMT10008ERGC KC515M	R90	2890876	HEC375S2113 KC635M	M84
2652970	SYB66RBHT12F	K190	2658451	SFRHEC100S3150 K600	M58	2879522	KDMT10002ERGC KC515M	R90	2890877	HEC375S4113 KC635M	M89
2652971	SYB66RBHT12LF	K190	2658452	SFRHEC100S3225 K600	M58	2879602	KG2524ELDJ KC410M	P63	2890878	HEC375S2175 KC635M	M84
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2652984	SYB115RBHT16LF	K190	2659235	A4G18704P2T0425 KY3500	D85	2881073	HEC094S4063 KC610M	M83	2890881	HEC438S2063 KC635M	M84
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2657739	HEC188S2031 K600	M83	2659239	A4R0400M04P00T01025 KY3500	D85	2881076	HEC219S2044 KC610M	M83	2890884	HEC500S4063 KC635M	M89
2657740	HEC188S4031 K600	M88	2659240	A4R0600M06P00T01025 KY3500	D85	2881077	HEC219S4044 KC610M	M88	2890885	HEC500S2300 KC635M	M89
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2890918	BNEC03152 KC635M	M93	2962052	SFRHEC312S3075 KC625M	M58	2983278	EC1408ELD KC522M	P39	3016779	BNEC188S2100 KC610M	M93
2890919	BNEC03154 KC635M	M97	2962053	SFRHEC375S3088 KC625M	M58	2983279	EC1408FLD KC410M	P38	3016780	BNEC188S4031 KC610M	M97
2890920	BNEC062S2 KC635M	M93	2962054	SFRHEC500S3100 KC625M	M58	2983284	KTIP1780HPM KC7315	H6-H10	3016781	BNEC188S4100 KC610M	M97
2890921	BNEC062S4 KC635M	M97	2962055	SFRHEC500S3200 KC625M	M58	2983285	KTIP07031HP KC7315	H6-H10	3016782	BNEC250S2050 KC610M	M93
2890922	BNEC094S2018 KC635M	M93	2962056	SFRHEC625S3125 KC625M	M58	2983286	KTIP1790HPM KC7315	H6-H10	3016783	BNEC250S2150L KC610M	M93
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2890946	BNEC125S2075L KC635M	M93	2962060	SFRHEC100S3150 KC625M	M58	2983290	KTIP07188HP KC7315	H6-H10	3016787	BNEC312S2150L KC610M	M93
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2890948	BNEC125S4075 KC635M	M97	2964503	CNMG434P KC5010	B45	2983292	KTIP1840HPM KC7315	H6-H10	3016789	BNEC312S4150L KC610M	M98
2890949	BNEC125S4075L KC635M	M97	2964505	RNMG43RN KC5010	B58	2983294	KTIP1860HPM KC7315	H6-H10	3016790	BNEC375S2063 KC610M	M93
2890950	BNEC156S2 KC635M	M93	2964507	RNMG64RN KC5010	B58	2983295	KTIP07344HP KC7315	H6-H10	3016791	BNEC375S2088 KC610M	M93
2890951	BNEC156S2031 KC635M	M93	2970342	DWG MS1599	F106	2983296	KTIP1870HPM KC7315	H6-H10	3016792	BNEC375S2300L KC610M	M93
2890952	BNEC156S4 KC635M	M97	2971371	RCGT64SGF KC522M	R53	2983298	KTIP1890HPM KC7315	H6-H10	3016793	BNEC375S3088 KC610M	M96
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2890960	BNEC250S2050 KC635M	M93	2976491	A4SML100214	D91	2983307	KTIP07656HP KC7315	H6-H10	3018917	BNEC500S2063 KC610M	M93
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2890984	BNEC438S4100 KC635M	M98	2981100	A4SCL120113	D93	2984015	A4G0200M02P02GMP KC5010	D79	3031717	TM25N100S0 KC610M	S6
2890985	BNEC500S2063 KC635M	M93	2981101	A4SCL100113	D93	2984016	A4G0200M02P02GMP KC5025	D79	3031718	TM25N100S0L KC610M	S6
2890986	BNEC500S2150 KC635M	M93	2981102	A4SCL080113	D93	2984017	A4G0255M2BU02GMM KC5010	D80	3031719	TM25N150S0 KC610M	S6
2890987	BNEC500S2200 KC635M	M93	2981193	A4SCL060113	D93	2984018	A4G0255M2BU02GMM KC5025	D80	3031720	TM25N200S0 KC610M	S6
2890988	BNEC500S2300 KC635M	M94	2981194	A4SCR120113	D93	2984019	A4G0255M2BU02GMP KC5025	D79	3031721	TM25N200S0L KC610M	S6
2890989	BNEC500S4063 KC635M	M98	2981195	A4SCR100113	D93	2984020	A4G0255M2BU02GMP KC5010	D79	3031722	TM25N300S0 KC610M	S6
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2890994	BNEC625S4300 KC635M	M98	2982019	OFKT64AFEN6L KC725M	065	2984026	A4R0200M02P00GMP KC5010	D81	3031737	TM25N12UN KC610M	S6
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2951623	BGHX15L5PCSRLET KD1415	0126	2982057	KSCM160R18CAB40U	0114	2984137	EC1412ELD KC522M	P39	3031752	TM25N50S0 KC635M	S6
2956333	VNGX353T0820 KY3500	B126	2982058	KSCM200R24CAB60U	0114	2984138	EC1412FLD KC410M	P38	3031753	TM25N300S0L KC635M	S6
2956334	VNGX354T0820 KY3500	B126	2982059	KSCM250R30CAB80U	0114	2984210	EC1412EGD KC725M	P39	3031754	TM25N20UN KC635M	S6
2957590	HNGX5354MR KC524M	091, 097	2982060	KSCM315R36CAB90U	0114	2984359	EC1416ELD KC522M	P39	3031755	TM25N16UN KC635M	S6
2957592	HNGX5358MM KC514M	090, 096	2982065	OFKT64AFEN6L KC522M	065	2984360	EC1416FLD KC410M	P38	3031757	TM25N14UN KC635M	S6
2957703	HNGX5354MR KC514M	091, 097	2982066	OFKT64AFEN6L KC520M	065	2984773	EC1416EGD KC725M	P39	3031758	TM25N12UN KC635M	S6
2957704	HNGX5355ML KC524M	090, 096	2982067	OFKT64AFEN6L KCK15	065	2985682	193.465	0113-114	3031		

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		L10	3051666	A4M50L0212B060084	D110	319111	KSSL40010SN434C5	0102	3330217	CTFPL16CA3	C147
3031911	T320NC05000-13R3BX	KC7542	3051667	A4M50L0212B080124	D110	319112	KSSL50012SN434C6	0102	3330218	CTFPR16CA3	C147
		L10	3051668	A4M50L0212B120254	D110	319113	KSSL60014SN434C8	0102	3330219	CTGPR16CA3	C148
3031912	T320NC05625-12R3BX	KC7542	3051670	A4M50R0212A036046	D107	319114	KSSL80020SN434C10	0102	3330220	MCNPL16CA4	C134
		L10	3051671	A4M50R0212A042054	D107	319115	KSSL100024SN434C10	0102	3330221	MCKNL16CA4	C134
3031913	T320NC06250-11R3BX	KC7542	3051672	A4M50R0212A050064	D107	3121225	193.492	013, 016, 019, R14-5	3330222	MCKNR16CA4	C134
		L10	3051673	A4M50R0212A060084	D107	3121225	193.492	04-5, 08-10	3330273	MCLNL16CA4	C135
3031914	T320M060X100R6HX	KC7542	3051674	A4M50R0212A080124	D107	3124442	KTP2099HPM KC7315	H6-H10	3330274	MDJNL16CA4	C136
3031915	T320M080X125R6HX	KC7542	3051675	A4M50R0212A120254	D107	3124468	EP1848S KC725M	P55	3330275	MDJNR16CA4	C136
3031916	T320M100X150R6HX	KC7542	3051676	A4M50R0212A250999	D107	3124549	193.491	J20	3330276	MDQNL16CA4	C136
3031917	T320M120X175R6HX	KC7542	3051677	A4M50R0212B036046	D109	3124549	193.491	J29	3330277	MDQNR16CA4	C136
3031918	T320M140X200R6HX	KC7542	3051678	A4M50R0212B042054	D109	3124699	EP1864S KC725M	P55	3330278	MSKNL16CA4	C137
3031919	T320M160X200R6HX	KC7542	3051679	A4M50R0212B050064	D109	3127186	NAS3L4 KC5025	E20	3330279	MSRNL16CA4	C138
3031920	T340NC03750-16R3BX	KC7542	3051680	A4M50R0212B060084	D109	3136330	EP1840EHD KCPK30	P55	3330280	MSSNL16CA4	C139
		L13	3051681	A4M50R0212B080124	D109	3136510	EP1864S KC725M	P55	3330281	MSSNR16CA4	C139
3031921	T340NF03750-24R3BX	KC7542	3051682	A4M50R0212B120254	D109	3138954	SNF433AMSN KY3500	0105	3330282	MSYNL16CA4	C140
		L13	3051683	A4M50R0212B250999	D109	3138955	SNF433ZAMSN KY3500	0105	3330283	MSYNR16CA4	C140
3031922	T340NC04375-14R3BX	KC7542	3051863	EP1404EHD KC725M	P40	3176219	KM25LSSR2230	E77	3330284	MTGNL16CA3	C141
		L13	3051864	EP1404EHD KCK15	P40	3176220	KM25LSSL2230	E77	3330285	MTGNR16CA3	C141
3031923	T340NC05000-13R3BX	KC7542	3051865	EP1404EHD KCPK30	P40	3176594	TRM50R1250M	F64	3330287	MVNLN16CA4	C143
		L13	3051866	EP1404EHD KC520M	P40	3176595	TRM50L1250M	F64	3330952	HNGJ535ANENLD KCK15	021
3031924	T340NF05000-20R3BX	KC7542	3053564	SDET433PDENGZ KCPK30	R97	3176596	TRM50R0640M	F64	3330995	L08RSCFPL2	C97
		L13	3053565	SDET433PDSNGDZ KCPK30	R97	3176598	TRM50L0640M	F64	3330996	L06MSCFPL2	C97
3031925	T340NC05625-12R3BX	KC7542	3054849	KSSZR200SD430C3A05	R95	3176599	TRM50L0432M	F64	3330997	L10RSCFPL2	C97
		L13	3064493	KSSZR300SD430CA05	R95	3176600	TRM50R0432M	F64	3330998	L12RSCFPL2	C97
3031926	T340NC06250-11R3BX	KC7542	3064601	KISZR125SD430CA02	R94	3176601	TRM50R0920M	F64	3330999	L06MSCFPR2	C97
		L13	3064602	KSSZR300SD430M4A06	R95	3176602	TRM50L0920M	F64	3331000	L08RSCFPR2	C97
3031927	T340NC07500-10R3BX	KC7542	3064755	KSSZR200SD430M3A05	R95	3176603	TRM50L0940M	F64	3331001	L10RSCFPR2	C97
		L13	3064902	KSSZR300SD430F4A07	R95	3176604	TRM50R0940M	F64	3331002	L12RSCFPR3	C97
3031928	T340M100X150R6HX	KC7542	3066053	A4G0605M06U04B KC9320	D85	3176605	TRM50R0620M	F64	3331033	L16SSCFPR3	C97
3031929	T340M120X175R6HX	KC7542	3066133	SDET433PDENGZ KC725M	R97	3176606	TRM50L0620M	F64	3331034	L08RSCPL2	C104
3031930	T340M140X200R6HX	KC7542	3066281	SDET433PDSNGDZ KC725M	R97	3176688	MS2173	C149, C151-152	3331035	L06MSCPL2	C104
3031931	T340M160X200R6HX	KC7542	3066374	SDET433PDENGZ KC522M	R97	3176689	MS2175	C149-154, C158-161	3331036	L05MSCPL2	C104
3031932	T340M180X250R6HX	KC7542	3066375	SDET433PDSNGDZ KC522M	R97	3273589	EC1402FLDJ KC410M	P38	3331037	L10RSCPL2	C104
3031933	T340M200X250R6HX	KC7542	3066673	KSSZR600SD430C6A09	R95	3273590	EC1440FLDJ KC410M	P38	3331038	L12RSCPL3	C104
3032732	EP1412EHD SP77CV	P40	3066674	KSSZR400SD430F5A09	R95	3287987	CSWM 035 040	C149, C151-152	3331039	L10RSCPL3	C104
3033723	EP1412EHD KC522M	P40	3071140	SF150FBHO1660	K191	3287988	CSWM 040 050	C149-154, C158-161	3331040	L16SSCPL3	C104
3033724	EP1412EHD KC725M	P40	3077141	SF100FBHO1660	K191	3287989	CSWM 060 050	C134-151, C158-161	3331041	L08RSCPL2	C104
3033725	EP1412EHD KCK15	P40	3088484	RCGV24T0220 KY4300	B128			C153-161, D154, E36	3331042	L08RSCPL2	C104
3033726	EP1412EHD KCPK30	P40	3091262	VPGR331 K09105	F48			C134-151, C158-161, D154, E36	3331043	L06MSCPL2	C104
3033727	EP1408EHD KC520M	P40	3091263	VPGR332 K09105	F48	3287990	CSWM 080 050	C134-145, C147-148, C150, C155, C157-158, C161, D154, E36	3331044	L10RSCPL2	C104
3033728	EP1408EHD KC522M	P40	3093561	HNGJ535ANENLD KC522M	021			C135, C137, C140, C143, D154, E36	3331045	L10RSCPL3	C104
3033729	EP1408EHD KC725M	P40	3093600	KSOM1250F5345F5	058	3292774	EC1808EJ KC422M	P53	3331046	L12RSCPL3	C104
3033730	EP1408EHD KCK15	P40	3093601	KSOM1250F5345F3	058	3292775	EC1824EJ KC422M	P53	3331047	L16SSCPL3	C104
3033731	EP1408EHD KCPK30	P40	3093602	KSOM1500F5345F5	058	3292776	EC1848EJ KC422M	P53	3331048	L06MSDUPL2	C106
3033730	EP1416EHD KC520M	P40	3093623	KSOM1500F5345F3	058	3324721	A4G0305M03U02B KC9320	D85	3331049	L08RSDUPL2	C106
3033731	EP1416EHD KC522M	P40	3093624	KSOM1250F5345M3	058	3324722	A4G0405M04U04B KC9320	D85	3331050	L10RSDUPL2	C106
3033732	EP1416EHD KC725M	P40	3093625	KSOM1250F5345M3	058	3324723	A4G0505M05U04B KC9320	D85	3331051	L12RSDUPL2	C106
3033733	EP1416EHD KCK15	P40	3093626	KSOM1500F5345M5	058	3324724	A4G0805M08U08B KC9320	D85	3331052	L06MSDUPL2	C106
3033954	EP1416EHD KCPK30	P40	3093627	KSOM1500F5345M3	058	3324725	A4G1005M10U08B KC9320	D85	3331073	L10RSDUPL2	C106
3042627	LT16ERAG55K KUJ25T	E46	3093628	KSOM2000F5345F3	059	3324726	EC1424EJLJ KC422M	P38	3331074	L10RSDUPL2	C106
3042628	LT16NRAG55K KUJ25T	E47	3093629	KSOM2500F5345F3	059	3324994	EC1404EJLJ KC422M	P38	3331075	L12RSDUPL2	C106
3042632	LT16ER11WK KUJ25T	E60	3093630	KSOM3000F5345F4	059	3326217	RCGT86SGF KC522M	R57	3331076	L08RSTFPL2	C110
3043043	LT16NR11WK KUJ25T	E60	3093631	KSOM4000F5345F5	059	3326850	KSHR200HN5345C3	019	3331077	L06MSTFPL2	C110
3045090	KSSP200R3SD43L200HC	P80	3093632	KSOM5000F5345F5	059	3326851	KSHR200HN5345M3	019	3331078	L12RSTFPL3	C110
3045800	S422CG	P26, R15, R41	3093633	KSOM6000F5345F8	059	3326852	KSHR250HN5345C3	019	3331079	L08RSTFPR2	C110
3045801	S467	029, 033-34, Q48-50	3093634	KSOM2000F5345M3	059	3326923	KSHR250HN5345M3	019	3331080	L10RSTFPR2	C110
3047639	T320NF0500020R3BX	KC7542	3093635	KSOM2500F5345M3	059	3326924	KSHR300HN5345C4	019	3331081	L06MSTFPR2	C110
3047640	T320MF120X150R6HX	KC7542	3093636	KSOM3000F5345M4	059	3326925	KSHR300HN5345M4	019	3331082	L12RSTFPR3	C110
3047641	T320MF140X150R6HX	KC7542	3093637	KSOM4000F5345M4	059	3326926	KSHR400HN5345C5	019	3331084	L08RNL2	E34
3048604	KLS20C	P50	3093638	KSOM5000F5345M6	059	3326927	KSHR400HN5345M5	019	3331085	L10RNL2	E34
3048765	KLS15C	P26, P50	3093639	KSOM6000F5345M8	059	3326928	KSHR400HN5345C6	019	3331086	L12RNL2	E34
3050792	HPFSS250S3050 KC635M	M70	3093640	KSOM2500F6445F3	064	3326929	KSHR500HN5345M6	019	3331087	L16SNEL3	E34
3050793	HPFSS125S5025 KC635M	M71	3093641	KSOM3000F6445F4	064	3326930	KSHR600HN5345C8	019	3331088	L06MNER1S	E34
3050794	HPFSS188S031 KC635M	M71	3093642	KSOM4000F6445F4	064	3326931	KSHR600HN5345M8	019	3331089	L08RNER1S	E34
3050795	HPFSS219S5075 KC635M	M71	3093643	KSOM5000F6445F6	064	3330186	CCLPL12CA4	C144	3331090	L05MNER1S	E34
3050796	HPFSS250S5050 KC635M	M71	3093644	KSOM6000F6445F8	064	3330187	CSKPL12CA4	C144	3331091	L08RNER2	E34
3050798	HPFT250S6113 KC635M	M72	3093645	KSOM2500F6445M3	064	3330188	CSRPL12CA4	C145	3331092	L12RNER2	E34
3050799	HPFT375S6113 KC635M	M72	3093646	KSOM3000F6445M4	064	3330189	CSSPL12CA4	C145	3331103	L10RNER2	E34
3051244	EP1420EHD KC522M	P40	3093647	KSOM4000F6445M5	064	3330190	CTGPL12CA3	C148	3331104	L16SNER2	E34
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3331478	HPHV71000S4150CH KC643M	M22	3385770	H106L55	F80	3397290	NGD3M250RK KC5025	D134	3483054	T331NC5000-1R3B3X KC7542	L12
3331479	HPHV71250S4225 KC643M	M22	3386082	OPG524 KC9125RR	F97	3397291	NGD3M300RK KC5025	D134	3483055	T331NC5625-1R3B3X KC7542	L12
3331480	HPHV71250S4225CH KC643M	M22	3386186	WTS10P KC5125PR	F87	3397292	NGD3M350RK KC5025	D134	3483056	T331NC6250-1R3B3X KC7542	L12
3331481	HPRST250S4038 KC643M	M78	3386254	KPR16K KC5125PR	F84	3397293	NGD3M400RK KC5025	D134	3483057	T331M060X100R6HX KC7542	L12
3331482	HPRST250S4075 KC643M	M78	3386261	KPR658665 KC5125PR	F85	3397294	NGD4M400RK KC5025	D134	3483058	T331M080X125R6HX KC7542	L12
3331483	HPRST375S4050 KC643M	M78	3387723	RCGT645GF KC725M	R53	3397295	NGD4M450RK KC5025	D134	3483059	T331M100X150R6HX KC7542	L12
3331484	HPRST375S4088 KC643M	M78	3387724	RCGT865GF KC725M	R57	3397296	NGD4M500RK KC5025	D134	3483060	T331M100X100R6HX KC7542	L12
3331485	HPRST500S4063 KC643M	M78	3387910	NR2M050L KC5010	D139	3397297	NGD4M550RK KC5025	D134	3483061	T331M120X175R6HX KC7542	L12
3331486	HPRST500S4125 KC643M	M78	3387925	NR2M175L KC5010	D139	3397369	NG2M050LK KC5010	D131	3483062	T331M1F120X150R6HX KC7542	L12
3331487	HPRST625S4075 KC643M	M78	3387928	NR3M150L KC5010	D139	3397370	NG2M050RK KC5010	D130	3483073	T331M140X200R6HX KC7542	L12
3331488	HPRST625S4125 KC643M	M78	3387935	NR2M050R KC5010	D138	3397371	NG2M050LK KC5025	D131	3483074	T331M1F140X150R6HX KC7542	L12
3331489	HPRST625S6125 KC643M	M78	3387936	NR2M075R KC5010	D138	3397372	NG2M050RK KC5025	D130	3483075	T331M160X200R6HX KC7542	L12
3331490	HPRST750S4088 KC643M	M78	3387937	NR2M100R KC5010	D138	3397613	NF3M200LK KC5025	D136	3483076	T331NC#6-32R3B3X KC7542	L15
3331491	HPRST750S4150 KC643M	M78	3388405	NR2M050L KC5025	D139	3397614	NF3M300LK KC5025	D136	3483077	T351NC#8-32R3B3X KC7542	L15
3331492	HPRST750S6150 KC643M	M78	3388407	NR2M100L KC5025	D139	3397615	NF3M300LK KC5025	D136	3483078	T351NC#10-24R3B3X KC7542	L15
3331493	HPRST1000S4150 KC643M	M78	3388408	NR2M125L KC5025	D139	3397616	NGD3M200RK KC5025	D136	3483079	T351NF#10-24R3B3X KC7542	L15
3331494	HPRST1000S6150 KC643M	M78	3388409	NR2M150L KC5025	D139	3397617	NF3M300RK KC5025	D136	3483080	T351NC2500-20R3B3X KC7542	L15
3331577	HPHVBN125S4050 KC633M	M16	3388411	NR3M100L KC5025	D139	3397618	NF3M300RK KC5025	D136	3483081	T351NF2500-28R3B3X KC7542	L15
3331579	HPHVBN188S4063 KC633M	M16	3388453	NR3M150L KC5025	D139	3400552	MS2197	R93-95	3483082	T351NC3125-18R3B3X KC7542	L15
3331580	HPHVBN250S4075 KC633M	M16	3388455	NR3M200L KC5025	D139	3400611	MS2191C00	P35, P37, R93-94, R96	3483083	T351NC3750-16R3B3X KC7542	L15
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3331582	HPHVBN375S4088 KC633M	M16	3388460	NR2M050R KC5025	D138	3400613	MS2191C08	P35, P37, R93-94, R96	3483085	T351NC5000-13R3B3X KC7542	L15
3331713	HPHVBN438S4088 KC633M	M16	3388462	NR2M100R KC5025	D138	3400614	MS2191C10	P35, P37, R93-94, R96	3483086	T351NC5625-12R3B3X KC7542	L15
3331714	HPHVBN500S4150 KC633M	M16	3388463	NR2M125R KC5025	D138	3400616	MS2191C12	P35, P37, R93-94, R96	3483087	T351NC6250-11R3B3X KC7542	L15
3331715	HPHVBN500S4125 KC633M	M16	3388464	NR2M150R KC5025	D138	3400617	MS2191C14	P35, P37, R93-94, R96	3483088	T351NC7500-10R3B3X KC7542	L15
3331716	HPHVBN625S4125 KC633M	M16	3388465	NR2M175R KC5025	D138	3400618	MS2191C16	P35-37, R93-94, R96	3483089	T351M040X070R6HX KC7542	L16
3331717	HPHVBN750S4150 KC633M	M16	3388466	NR3M100R KC5025	D138	3400619	MS2191C18	P35, P37, R93-94, R96	3483090	T351M050X080R6HX KC7542	L16
3331718	HPHVBN1000S4150 KC633M	M16	3388468	NR3M150R KC5025	D138	3400620	MS2191C20	P35-37, R93-94, R96	3483091	T351M060X100R6HX KC7542	L16
3332360	MCLN125CA4	C135	3388470	NR3M200R KC5025	D138	3402421	LNJX031940RRSM KC9125	F87	3483092	T351M080X125R6HX KC7542	L16
3332361	MCLN125CA5	C135	3388471	NR3M225R KC5025	D138	3402525	LNJX031940RRSM KC9110	F87	3483093	T351M100X100R6HX KC7542	L16
3332362	MCLN125CA6	C135	3389299	NGP2M150L K313	D135	3403362	CNMG431UP KC5010	B47	3483094	T351M120X150R6HX KC7542	L16
3332803	MCLN125CA4	C135	3389362	NGP2M200L K313	D135	3403423	CNMG432UP KC5010	B47	3483095	T351M140X200R6HX KC7542	L16
3332804	MCLN125CA5	C135	3389645	NGP2M150R K313	D135	3403424	CNMG433UP KC5010	B47	3483096	T351M160X200R6HX KC7542	L16
3332805	MCLN125CA6	C135	3390341	NR3M125R KC9110	D138	3403425	CNMG434UP KC5010	B47	3483097	T351M180X200R6HX KC7542	L16
3332806	MSKNL25CA4	C137	3390430	40510200395	L118	3403426	CNMG435UP KC5010	B47	3483098	T340NC#6-32R3B3X KC7542	L13
3332809	MWLN125CA4	C143	3396815	CGGW21505EFCW KB5625	B187	3403427	DNMG332UP KC5010	B56	3483099	T340NC#8-32R3B3X KC7542	L13
3345201	NPR5M05 KC9105	F47	3396816	CGGW21505EFCW KB5625	B187	3403428	DNMG333UP KC5010	B56	3483100	T340NC#10-24R3B3X KC7542	L13
3346236	MCKNR12CA4	C134	3396817	CGGW215150415C KB5625	B187	3403429	DNMG431UP KC5010	B56	3483101	T340NC#10-32R3B3X KC7542	L13
3346237	MCKNR12CA5	C134	3396822	CGGW215150415C KB5625	B187	3403430	DNMG432UP KC5010	B56	3483102	T340NC2500-20R3B3X KC7542	L13
3346238	MCKNR12CA4	C134	3396833	CGGW3251EFCW KB5625	B187	3403431	DNMG433UP KC5010	B56	3483103	T340NC2500-28R3B3X KC7542	L13
3346240	MDJNL12CA3	C136	3396984	MS2085	P80	3403432	DNMG434UP KC5010	B56	3483104	T340NC3125-18R3B3X KC7542	L13
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3346275	MTGNL12CA3	C141	3397108	DPGW215150415C KB5625	B192	3403437	SNMG432UP KC5010	B64	3483109	T340M100X100R6HX KC7542	L14
3346277	MWLN12CA3	C143	3397123	DCGW21505EFCW KB5625	B191	3403438	SNMG433UP KC5010	B64	3483110	T340M120X150R6HX KC7542	L14
3349650	T351M120X175R6HX KC7542	L16	3397124	DCGW215150415C KB5625	B191	3403439	SNMG434UP KC5010	B64	3483111	T340M140X200R6HX KC7542	L14
3349652	T351M100X150R6HX KC7542	L16	3397126	DPGW2152S0415C KB5625	B192	3403440	SNMG435UP KC5010	B64	3483112	T391NC#6-32R3B3X KC7542	L18
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3352574	KMDA0312J6ANA KC639M	M32	3397137	TCGW215150415C KB5625	B194	3403442	TNMG631UP KC5010	B72	3483114	T391NC#10-24R3B3X KC7542	L18
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3352577	KMDA0625J6ANA KC639M	M32	3397142	TPGW2152S0415C KB5625	B195	3403445	TNMG634UP KC5010	B72	3483117	T391NF2500-28R3B3X KC7542	L18
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3352773	KHDA0500J6ANA KC639M	M33	3397225	NGD3M250LK KC5010	D134	3403450	WNMG334UP KC5010	B78	3483122	T391M060X100R6HX KC7542	L18
3352774	KHDA0625J6ANA KC639M	M33	3397226	NGD3M300LK KC5010	D134	3403451	WNMG335UP KC5010	B78	3483123	T391M080X125R6HX KC7542	L18
3352775	KHDA0750J6ANA KC639M	M33	3397227	NGD3M350LK KC5010	D134	3403452	WNMG336UP KC5010	B78	3483124	T391M100X150R6HX KC7542	L18
3353311	CKC5	E76, E78, E80	3397228	NGD3M400LK KC5010	D134	3448592	KSSZR250SD430C3A05	R95	3483125	T391NC#6-32R3B3X KC7542	L17
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3379064	EP1864EHD KC725M	P55	3397243	NGD2M150RK KC5010	D134	3448917	KSSZR400SD430M6A08	R95	3483130	T381NF2500-28R3B3X KC7542	L17
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3527352	T461NC3750-16R3BX	KC7512	L20	3556350	MB66RBHT12F	K189	3557635	KTIP1020HPLM	KC7320	H6-H10	3562941	SS125KR32023	K159	
3527413	T461NC4375-14R3BX	KC7512	L20	3556352	MB66RBHT12F	K189	3557636	KTIP1030HPLM	KC7320	H6-H10	3562942	SS125KR50033	K159	
3527414	T461NC5000-13R3BX	KC7512	L20	3556373	HNGJ53511ANSNHD	KCK15	021	3557637	KTIP1040HPLM	KC7320	H6-H10	3562943	SS125KR50033	024
3527415	T461NC5625-12R3BX	KC7512	L20	3556374	HNGJ53511ANSNHD	KCK15	021	3557638	KTIP1050HPLM	KC7320	H6-H10	3562944	SS125KR50033	024
3527416	T461NC6250-11R3BX	KC7512	L20	3556375	HNGJ53511ANSNHD	KCKP30	021	3557639	KTIP1060HPLM	KC7320	H6-H10	3562945	SS125KR50033	024
3527417	T461M060X100R6HX	KC7512	L21	3556387	KTIP0810HPLM	KC7320	H6-H10	3557640	KTIP1070HPLM	KC7320	H6-H10	3562946	SS125KR50033	024
3527418	T461M080X125R6HX	KC7512	L21	3556388	KTIP0830HPLM	KC7320	H6-H10	3557641	KTIP1080HPLM	KC7320	H6-H10	3562947	SS125KR50033	024
3527419	T461M100X150R6HX	KC7512	L21	3556389	KTIP0840HPLM	KC7320	H6-H10	3557642	KTIP1090HPLM	KC7320	H6-H10	3562948	SS125KR50033	024
3527420	T461M100X100R6HX	KC7512	L21	3556390	KTIP0850HPLM	KC7320	H6-H10	3557643	KTIP1100HPLM	KC7320	H6-H10	3562949	SS125KR50033	024
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3527422	T461M120X150R6HX	KC7512	L21	3556392	KTIP0870HPLM	KC7320	H6-H10	3557645	KTIP1120HPLM	KC7320	H6-H10	3562951	SS125KR50033	024
3527423	T461M140X200R6HX	KC7512	L21	3556393	MB87RBHT12F	K189	3557646	KTIP1140HPLM	KC7320	H6-H10	3562952	SS125KR50033	024	
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3527434	T471NC6250-11R3BX	KC7512	L22	3556404	MB87RBHT12K	K189	3557657	KTIP1320HPLM	KC7320	H6-H10	3562963	SS125KR50033	024	
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3527460	T481M100X100R6HX	KC7512	L25	3557120	A4M65R0826M	D106	3557683	KTIP2050HPLM	KC7320	H6-H10	3562989	SS125KR50033	024	
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3527465	T491NC#10-24R3BX	KC7512	L26	3557125	A4M65L1026M	D106	3557688	KTIP05000HPL	KC7320	H6-H10	3562994	SS125KR50033	024	
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3527470	T491NC3750-16R3BX	KC7512	L26	3557165	A4M65R0624A200-999	D107	3557696	KTIP03125HPL	KC7320	H6-H10	3562999	SS125KR50033	024	
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3527480	T491M120X150R6HX	KC7512	L26	3557175	A4M65R0624B070-112	D109	3557706	KTIP05312HPL	KC7320	H6-H10	3563009	SS125KR50033	024	
3547022	XNGJ535ANSNGD3W	KCK15	020	3557176	A4M65L0624B070-112	D110	3557707	KTIP05469HPL	KC7320	H6-H10	3563010	SS125KR50033	024	
3547033	XNGJ535ANSNGD3W	KC725M	020	3557177	A4M65R0624B100-212	D109	3557708	KTIP05625HPL	KC7320	H6-H10	35630			

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3579306	KTIP1250HPCM KC7410	H6-H10	3580813	UDDE500K5BS KC643M	M23	3586543	KM50RBHT66	K187	3637604	NR3M125L KC9320	D139
3579307	KTIP1260HPCM KC7410	H6-H10	3580814	UDDE500K5BRA KC643M	M23	3586544	KM50RBHT87	K187	3637605	NR3M150L KC9320	D139
3579308	KTIP1280HPCM KC7410	H6-H10	3580815	UDDE500K5BRB KC643M	M23	3586545	KM63UTRBHT87	K187	3637606	NR3M175L KC9320	D139
3579309	KTIP1300HPCM KC7410	H6-H10	3580816	UDDE500K5BRF KC643M	M23	3586546	KM63UTRBHT115	K187	3637607	NR3M200L KC9320	D139
3579310	KTIP1320HPCM KC7410	H6-H10	3580817	UDDE625K5BS KC643M	M23	3586547	HSK63RBHT24	K187	3637608	NR3M225L KC9320	D139
3579311	KTIP1330HPCM KC7410	H6-H10	3580818	UDDE625K5BRB KC643M	M23	3586548	HSK63RBHT30	K187	3637609	NR4M200L KC9320	D139
3579312	KTIP1340HPCM KC7410	H6-H10	3580819	UDDE750K5BS KC643M	M23	3586549	HSK63RBHT40	K187	3637610	NR4M225L KC9320	D139
3579313	KTIP1350HPCM KC7410	H6-H10	3580820	UDDE750K5BRB KC643M	M23	3586550	HSK63RBHT50	K187	3637611	NR4M250L KC9320	D139
3579314	KTIP1360HPCM KC7410	H6-H10	3580821	UDDE750K5BRF KC643M	M23	3586551	HSK63RBHT66	K187	3637612	NR2M050R KC9320	D138
3579315	KTIP1370HPCM KC7410	H6-H10	3580822	UDDE1000K5BS KC643M	M23	3586553	HSK63RBHT87	K187	3637613	NR2M075R KC9320	D138
3579316	KTIP1380HPCM KC7410	H6-H10	3580833	UDDE1000K5BRB KC643M	M23	3586554	SF075RBHT24	K188	3637614	NR2M100R KC9320	D138
3579317	KTIP1400HPCM KC7410	H6-H10	3580834	UDDE1000K5BRF KC643M	M23	3586565	SF100RBHT30	K188	3637615	NR2M125R KC9320	D138
3579318	KTIP1410HPCM KC7410	H6-H10	3580836	UCDE188J5BS KC643M	M17	3586566	SF125RBHT40	K188	3637616	NR2M150R KC9320	D138
3579319	KTIP1420HPCM KC7410	H6-H10	3580837	UCDE188J5BRA KC643M	M17	3586567	SF100RBHT50	K188	3637617	NR2M175R KC9320	D138
3579320	KTIP1430HPCM KC7410	H6-H10	3580838	UCDE188J5BRB KC643M	M17	3586569	SF125RBHT66	K188	3637618	NR3M100R KC9320	D138
3579321	KTIP1440HPCM KC7410	H6-H10	3580839	UCDE250J5BS KC643M	M17	3586570	SF150RBHT87	K188	3637619	NR3M125R KC9320	D138
3579322	KTIP1450HPCM KC7410	H6-H10	3580840	UCDE250J5BRA KC643M	M17	3586571	SF200RBHT115	K188	3637620	NR3M150R KC9320	D138
3579323	KTIP1460HPCM KC7410	H6-H10	3580841	UCDE250J5BRB KC643M	M17	3586572	KM32FBHS24	K196	3637621	NR3M175R KC9320	D138
3579324	KTIP1470HPCM KC7410	H6-H10	3580842	UCDE312J5BS KC643M	M17	3586573	KM32FBHS31	K196	3637622	NR3M200R KC9320	D138
3579325	KTIP1480HPCM KC7410	H6-H10	3580863	UCDE312J5BRA KC643M	M17	3586574	KM40FBHS40	K196	3637623	NR3M225R KC9320	D138
3579326	KTIP1500HPCM KC7410	H6-H10	3580864	UCDE312J5BRB KC643M	M17	3586575	KM50FBHS51	K196	3637624	NR4M200R KC9320	D138
3579327	KTIP1510HPCM KC7410	H6-H10	3580865	UCDE375J5BS KC643M	M17	3586576	KM50FBHS67	K196	3637625	NR4M225R KC9320	D138
3579328	KTIP1520HPCM KC7410	H6-H10	3580866	UCDE375J5BRA KC643M	M17	3586577	KM50FBHS87	K196	3637626	NR4M250R KC9320	D138
3579329	KTIP1530HPCM KC7410	H6-H10	3580867	UCDE375J5BRB KC643M	M17	3586578	KM63UTFBHS87	K196	3637915	D28TTB26KM40	C121
3579330	KTIP1540HPCM KC7410	H6-H10	3580868	UCDE500J5BS KC643M	M17	3586579	KM63UTFBHS116	K196	3637916	D32TTB29KM40	C121
3579331	KTIP1550HPCM KC7410	H6-H10	3580869	UCDE500J5BRA KC643M	M17	3586580	HSK63FBHS124	K196	3637917	D40TTB36KM40	C121
3579332	KTIP1560HPCM KC7410	H6-H10	3580870	UCDE500J5BRB KC643M	M17	3586581	HSK63FBHS31	K196	3638033	D47TTB45KM63	C121
3579333	KTIP1570HPCM KC7410	H6-H10	3580871	UCDE500J5BRF KC643M	M17	3586582	HSK63FBHS40	K196	3638034	D64TTB59KM63	C121
3579334	KTIP1580HPCM KC7410	H6-H10	3580872	UCDE625J5BS KC643M	M17	3586583	HSK63FBHS51	K196	3639212	NG3062LEST KD1425	D129
3579335	KTIP1600HPCM KC7410	H6-H10	3580873	UCDE625J5BRB KC643M	M17	3586584	HSK63FBHS67	K196	3639213	NG3062R KD1425	D128
3579336	KTIP1610HPCM KC7410	H6-H10	3580874	UCDE750J5BS KC643M	M17	3586585	HSK63FBHS87	K196	3639214	NG3094LEST KD1425	D129
3579337	KTIP1620HPCM KC7410	H6-H10	3580875	UCDE750J5BRA KC643M	M17	3586586	SF075FBHS24	K197	3639215	NG3094R KD1425	D128
3579338	KTIP1630HPCM KC7410	H6-H10	3580876	UCDE750J5BRB KC643M	M17	3586587	SF100FBHS31	K197	3639216	NG3125LEST KD1425	D129
3579339	KTIP1640HPCM KC7410	H6-H10	3580877	UCDE750J5BRF KC643M	M17	3586588	SF125FBHS40	K197	3639217	NG3125R KD1425	D128
3579340	KTIP1650HPCM KC7410	H6-H10	3580878	UCDE750J5BRF KC643M	M17	3586589	SF100FBHS51	K197	3639218	NG3189LEST KD1425	D129
3579341	KTIP1660HPCM KC7410	H6-H10	3580879	UCDE1000J5BS KC643M	M18	3586590	SF125FBHS67	K197	3639219	NG3189R KD1425	D128
3579342	KTIP1670HPCM KC7410	H6-H10	3580880	UCDE1000J5BRB KC643M	M18	3586591	SF150FBHS87	K197	3639220	NGP3088L KD1425	D135
3579343	KTIP1680HPCM KC7410	H6-H10	3580881	UCDE1000J5BRF KC643M	M18	3586592	SF200FBHS116	K197	3639221	NGP3088R KD1425	D135
3579344	KTIP1690HPCM KC7410	H6-H10	3580882	UCDE1000J5BRA KC643M	M18	3586679	KM63XZKMGMSR65Y	D57	3639222	NGP3125L KD1425	D135
3579345	KTIP1700HPCM KC7410	H6-H10	3580883	UCDE1000J5BRF KC643M	M18	3588680	KM63XZKMGMSLF65Y	D57	3639223	NGP3125R KD1425	D135
3579346	KTIP1710HPCM KC7410	H6-H10	3583635	GOMT08T208ERLD KC505M	R104	3590203	KM63TSKGMRS65	D56	3639344	NG3062LEST KB1630	D129
3579347	KTIP1720HPCM KC7410	H6-H10	3583636	GOMT08T208ERLF KC720M	R104	3590204	KM63TSKGMRS65	D56	3639345	NG3062R KB1630	D128
3579348	KTIP1730HPCM KC7410	H6-H10	3583637	GOMT100308ERLD KC505M	R104	3590205	KM63TSKGMRS65	D56	3639346	NG3094LEST KB1630	D129
3579349	KTIP1750HPCM KC7410	H6-H10	3583638	GOMT100308ERLF KC720M	R104	3590206	KM63TSKGMEL65	D57	3639347	NG3094R KB1630	D128
3579350	KTIP1760HPCM KC7410	H6-H10	3583639	GOMT13T308ERLD KC505M	R104	3593662	SM904	P91	3639348	NG3125LEST KB1630	D129
3579351	KTIP1770HPCM KC7410	H6-H10	3583640	GOMT13T308ERLF KC720M	R104	3593673	MS2211	R103	3639349	NG3125R KB1630	D128
3579352	KTIP1780HPCM KC7410	H6-H10	3583641	GOMT160408ERLD KC505M	R104	3593674	MS2212	R103	3639350	NG4189LEST KB1630	D129
3579353	KTIP1800HPCM KC7410	H6-H10	3583642	GOMT160408ERLF KC720M	R104	3593675	MS2206	Q3	3639351	NG4189R KB1630	D128
3579354	KTIP1810HPCM KC7410	H6-H10	3583693	JOMT08T208ERLF KC505M	R104	3593676	MS2207	Q3	3639352	SCMT3252MP KCK20	B104
3579355	KTIP1850HPCM KC7410	H6-H10	3583694	JOMT08T208ERLF KC720M	R104	3593677	MS2213	R103	3639353	SCMT3252MP KCP25	B104
3579356	KTIP1880HPCM KC7410	H6-H10	3583695	JOMT100308ERLF KC505M	R104	3593678	MS2210	P91	3639354	SCMT3252MP KCU10	B104
3579357	KTIP1890HPCM KC7410	H6-H10	3583696	JOMT100308ERLF KC720M	R104	3593679	MS2214	R103	3639355	DCMT3252MP KCK20	B97
3579358	KTIP1900HPCM KC7410	H6-H10	3583697	JOMT13T308ERLF KC505M	R104	3593681	MS2208	Q3	3639356	DCMT3252MP KCP25	B97
3579359	KTIP1920HPCM KC7410	H6-H10	3583698	JOMT13T308ERLF KC720M	R104	3593683	MS2209	P91	3639357	DCMT3252MP KCU10	B97
3579360	KTIP1950HPCM KC7410	H6-H10	3583699	JOMT160408ERLF KC505M	R104	3593911	MS2205	P13-16	3639880	TCMT3252MP KCK20	B108
3579361	KTIP1960HPCM KC7410	H6-H10	3583700	JOMT160408ERLF KC720M	R104	3594301	LNJX19194ORRSM KC9125	F87	3639881	TCMT3252MP KCP25	B108
3579362	KTIP1970HPCM KC7410	H6-H10	3583701	APMT250608ERGG KC505M	P92	3594302	LNJX19194ORRSM KC9110	F87	3639883	TCMT3252MP KCU10	B108
3579363	KTIP1980HPCM KC7410	H6-H10	3583702	APMT250608ERGA KC505M	P92	3608340	RNG45T0425 KY4300	B124	3641465	CRGPL30354	Q30, Q38, Q41
3579364	KTIP2000HPCM KC7410	H6-H10	3583703	APMT250616ERGG KC505M	P92	3608047	CNGA643T0820 KY4300	B118	3641473	BTQT25	Q30, Q38, Q41
3579365	KTIP2010HPCM KC7410	H6-H10	3583704	APMT250616ERGB KC720M	P92	3608872	RNGA43T0625 KY4400	B119	3641572	CRDPN162DV	C68
3579366	KTIP2030HPCM KC7410	H6-H10	3583705	APMT250616ERGC KC730M	P92	3615073	RCGV45T0425 KY4300	B128	3641593	CRDPN163DV	C68
3579367	KTIP2050HPCM KC7410	H6-H10	3583706	APMT250616ERL3P KC505M	P93	3632195	T351M200X250RHX KC7542	L116	3641594	CRDPN203DV	C68
3579368	KTIP2060HPCM KC7410	H6-H10	3583707	APMT250616ERL3P KC720M	P93	3636039	PPG2150E KYSP30	R12	3641595	CRDPN164DV	C68
3579369	KTIP2099HPCM KC7410	H6-H10	3583708	APMT250616ERL3P KC730M	P93	3637573	NG3062RK KC9320	D130	3641597	CRDPN204DV	C68
3580522	UCDE250J5ARA KC643M	M19	3583709	APMT250616ERGA KC505M	P92	3637574	NG3189L KC9320	D132	3641599	CRDPN205DV	C68
3580763	UCDE375J5ARA KC643M	M19	3583710	APMT250616ERGB KC720M	P92	3637575	NG3189RK KC9320	D130	3641600	CRDPN206DV	C68
3580764	UCDE500K5ARB KC643M	M19	3583711	APMT250616ERGA KC730M	P92	3637576	NG3062LK KC9320	D131	3641601	CRDPN246DV	C68
3580765	UCDE625K5ARB KC643M	M19	3583712	APMT250616ERL4P KC505M	P93	3637577	NG3M225RK KC9320	D130	3641602	CRDPN248DV	C68
3580766	UCDE750K5ARB KC643M	M19	3583713	APMT250616ERL4P KC720M	P93	3637578	NG4M350LK KC9320	D132	3641603	CRDPN162DV	C69
3580767	UCDE1000K5ARB KC643M	M19	3583714	APMT250616ERL4P KC730M	P93	3637579	NG3M300LK KC9320	D132	3641604	CRGPL162DV	C69
3580769	UCDE500K5BS KC643M	M17	3583715	APMT250640ERGG KC505M	P92	3637580	NG3M300RK KC9320	D130	3641605	CRGPR163DV	C69
3580770	UCDE500K5BRA KC643M	M17	3583716	APMT25064							

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3642028	EP1012EHD KC522M	P19	3648476	DFT090508056HP	H53	3652762	WNGA431S0425MT KB1610	B181	3658107	VBGW331S0415MT KB1610	B197
3642029	EP1012EHD KCT25M	P19	3648478	DFT090508056MD	H53	3652763	WNGA432S0425MT KB1610	B181	3658108	VBGW332S0415MT KB1610	B197
3642030	EP1012EHD KCK15	P19	3648583	TPG222F KD1425	B185	3652766	CNGA431S0425MT KB1630	B175	3658815	ADE0250J3A K600	M53
3642031	EP1012EHD KCPK30	P19	3648584	TPG321F KD1425	B185	3652767	CNGA432S0425MT KB1630	B175	3658816	ADE0250J3ARB K600	M53
3642032	EP1016EHD KC522M	P19	3648585	TPG322F KD1425	B185	3652768	DNGA431S0425MT KB1630	B177	3658817	ADE0250J3BRB K600	M53
3642034	EP1016EHD KCT25M	P19	3648586	TPG323F KD1425	B185	3652769	DNGA432S0425MT KB1630	B177	3658818	ADE0250J3BRB K600	M53
3642035	EP1016EHD KCK15	P19	3648587	TPG431F KD1425	B185	3652770	TNGA331S0425MT KB1630	B180	3658819	ADE0250J3C K600	M53
3642036	EP1016EHD KCPK30	P19	3648588	TPG432F KD1425	B185	3652771	TNGA332S0425MT KB1630	B180	3658820	ADE0250J3CRA K600	M53
3642037	EP1020EHD KCT25M	P19	3648715	CCGW2150S0415C KB5610	B187	3652772	VNGA331S0425MT KB1630	B180	3658821	ADE0250J3CRB K600	M53
3642038	EP1020EHD KCPK30	P19	3648716	CCGW2151S0415C KB5610	B187	3652803	VNGA332S0425MT KB1630	B180	3658822	ADE0312J3ARB K600	M54
3642102	EP1024EHD KCT25M	P19	3648717	CCGW3251S0415MT KB5610	B188	3652844	CNMG644RM KCP30	B46	3658823	ADE0312J3ARC K600	M54
3642103	EP1024EHD KCPK30	P19	3648718	CCGW3252S0415MT KB5610	B188	3652845	CNMG666RM KCP30	B46	3658824	ADE0375J3A K600	M54
3642136	EP1031EHD KC522M	P19	3648733	DCGW2150S0415C KB5610	B191	3652847	SNMG644RM KCP30	B63	3658825	ADE0375J3BRB K600	M54
3642137	EP1031EHD KCT25M	P19	3648734	DCGW2151S0415C KB5610	B191	3652848	TNMG666RM KCP30	B70	3658826	ADE0375J3BRB K600	M54
3642138	EP1031EHD KCPK30	P19	3648735	DCGW3251S0415MT KB5610	B192	3652852	KF063WP0302M08100	R9	3658827	ADE0375J3C K600	M54
3642141	EP1004SGD KCT25M	P19	3648736	DCGW3252S0415MT KB5610	B192	3652863	SNMG644RM KCU10	B63	3658828	ADE0375J3CRB K600	M54
3642142	EP1004SGD KCK15	P19	3648737	TPGW2151S0415C KB5610	B195	3652864	TNMG666RM KCU10	B70	3658829	ADE0375J3CRC K600	M54
3642163	EP1004SGD KCPK30	P19	3648738	TPGW2152S0415C KB5610	B195	3652893	KF063WP0302C063100	R9	3658830	ADE0500J3A K600	M54
3642170	EP1008SGD KCT25M	P19	3648739	VBGW331S0415MT KB5610	B197	3652911	DNMG542RM KC5010	B55	3658831	ADE0500J3ARB K600	M54
3642171	EP1008SGD KCK15	P19	3648740	VBGW332S0415MT KB5610	B197	3652912	DNMG543RM KC5010	B55	3658832	ADE0500J3ARB K600	M54
3642172	EP1008SGD KCPK30	P19	3649186	EC1008FLDJ K313	P17	3654372	SPET31251PPER8GB2 KC725M		3658833	ADE0500J3BRB K600	M55
3642193	EP1012SGD KCT25M	P19	3649187	EC1008FLDJ KC410M	P17				3658834	ADE0500J3BRB K600	M55
3642194	EP1012SGD KCK15	P19	3649188	EC1008ELDJ KC422M	P18	3654503	SPET31251PPER8GB2 KCPK30	P71, Q37	3658835	ADE0500J3BRE K600	M55
3642195	EP1012SGD KCPK30	P19	3649189	EC1008ELDJ KC520M	P18				3658836	ADE0500J3C K600	M55
3642196	EP1016SGD KCT25M	P19	3649190	EC1008ELDJ KC522M	P18	3654504	SPET31251PPER8GB2 KCK15		3658837	ADE0500J3CRB K600	M55
3642197	EP1016SGD KCK15	P19	3649191	EC1008ELDJ KC725M	P18				3658838	ADE0500J3CRC K600	M55
3642198	EP1016SGD KCPK30	P19	3649192	EC1008ELDJ KCPK30	P18	3654505	SPET31251PPEL8GB2 KC725M		3658839	ADE0500J3D K600	M55
3643845	NPGR51L KD1425	F46	3649213	EC1008ELDJ KCK15	P18				3658840	ADE0500J3DRB K600	M55
3643846	NPGR51R KD1425	F46	3650822	VGSOR164125D	D68	3654506	SPET31251PPEL8GB2 KCPK30	Q37	3658841	ADE0500J3DRC K600	M55
3643847	NPGR52L KD1425	F46	3650831	SCMT432MP KCK20	B104	3654507	SPET31251PPEL8GB2 KCK15	Q37	3658842	ADE0625J3A K600	M55
3643848	NPGR52R KD1425	F46	3650863	VGSOL164125D	D68	3655880	CNGA431FST KD1400	B174	3658843	ADE0625J3B K600	M55
3643849	NPL505 KD1425	F47	3650864	VGSOR204125E	D68	3655881	CNGA432FST KD1400	B174	3658844	ADE0625J3BRB K600	M55
3643850	NPR505 KD1425	F47	3650865	VGSOL204125E	D68	3655882	CNMS431FST KD1400	B176	3658845	ADE0625J3BRC K600	M55
3643851	NPL508 KD1425	F47	3650866	VGSOR244125E	D68	3656063	CNMS432FST KD1400	B176	3658846	ADE0750J3BRB K600	M56
3643852	NPR508 KD1425	F47	3650867	VGSOL244125E	D68	3656064	DNGA431FST KD1400	B177	3658847	ADE0750J3BRB K600	M56
3643853	NPL51 KD1425	F47	3650868	VGSOR164156D	D68	3656065	DNGA432FST KD1400	B177	3658848	ADE0750J3BRE K600	M56
3643854	NPR51 KD1425	F47	3650869	VGSOL164156D	D68	3656066	DNMS431FST KD1400	B178	3658849	ADE0750J3C K600	M56
3643855	VPGN331 KD1425	F48	3650870	VGSOR204156D	D68	3656067	DNMS432FST KD1400	B178	3658850	ADE0750J3CRB K600	M56
3643856	VPGN332 KD1425	F48	3650871	VGSOL204156E	D68	3656068	TNMS331FST KD1400	B180	3658851	ADE0750J3CRC K600	M56
3643857	VPGN333 KD1425	F48	3650872	VGSOR244156E	D68	3656069	TNMS332FST KD1400	B180	3658852	ADE0750J3D K600	M56
3643858	VPGR331 KD1425	F48	3650873	VGSOL244156E	D68	3656070	VNGA331FST KD1400	B180	3658853	ADE0750J3DRB K600	M56
3643859	VPGR332 KD1425	F48	3650874	VGSOR164187D	D68	3656071	VNGA332FST KD1400	B180	3658854	ADE0750J3DRC K600	M56
3643860	VPGR333 KD1425	F48	3650875	VGSOL164187D	D68	3656072	VNMS331FST KD1400	B181	3658855	ADE1000J3A K600	M56
3643861	DPGR431 KD1425	F46	3650876	VGSOR204187E	D68	3656073	VNMS332FST KD1400	B181	3658856	ADE1000J3ARB K600	M56
3643862	DPGR432 KD1425	F46	3650877	VGSOL204187E	D68	3656075	WNGA432FST KD1400	B181	3658857	ADE1000J3ARC K600	M56
3644073	DT71P	P14-16	3650878	VGSOR244187E	D68	3656449	CNGA431FST KD1425	B174	3658858	ADE1000J3ARE K600	M56
3646515	DNGA436T0420 KY4300	B119	3650879	VGSOL244187E	D68	3656450	CNGA432FST KD1425	B174	3658859	ADE1000J3B K600	M57
3646573	DCGW3251S0415MT KB1625	B192	3650880	VGSOR206219E	D68	3656451	CNMS431FST KD1425	B176	3658860	ADE1000J3BRB K600	M57
3646574	DCGW3252S0415MT KB1625	B192	3650881	VGSOL206219E	D68	3656452	CNMS432FST KD1425	B176	3658871	ADE1000J3CRB K600	M57
3646575	TCGW3251S0415MT KB1625	B195	3650882	VGSOR246219E	D68	3656463	DNGA431FST KD1425	B177	3658872	ADE1000J3C K600	M57
3646576	DPGW3251S0415MT KB1625	B194	3650883	VGSOL246219E	D68	3656464	DNGA432FST KD1425	B177	3658873	ADE1000J3CRB K600	M57
3646577	DPGW3252S0415MT KB1625	B194	3650884	VGSOR206250E	D68	3656465	DNMS431FST KD1425	B178	3658874	ADE1000J3CRC K600	M57
3646578	TPGW3252S0415MT KB1625	B196	3650885	VGSOL206250E	D68	3656466	DNMS432FST KD1425	B178	3658875	AADF0125J2A K600	M48
3646579	VBGW331S0415MT KB1625	B197	3650886	VGSOR246250E	D68	3656467	TNMS331FST KD1425	B180	3658876	AADF0125J2BRA K600	M48
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3660003	CPGW3252FST KD1425	B190	3668651	DFT070408D50HP	H53	3744878	SPMT3252MP KCM15	B106	3745034	S460	P36
3660004	CPGW431FST KD1425	B190	3668652	DFT090508D63HP	H53	3744879	TCMT3251MP KCM15	B108	3745035	S462	P36
3660005	CPGW432FST KD1425	B190	3668653	DFT05T308D33MD	H53	3744880	TCMT3252MP KCM15	B108	3745036	S464	P36
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3660022	VBGW221FST KD1425	B197	3668670	DFT06T308D39MD	H53	3744897	SPMT433MP KCP25	B106	3746084	CNMG431MN KCP05	B76
3660023	VBGW331FST KD1425	B197	3668671	DFT070408D50MD	H53	3744898	TCMT3251MP KCP25	B108	3746085	CNMG432MN KCP05	B81
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3751939	WNMA433 KCK05	B79	3752058	RCMT1204MORP KCK15	B101-102	3752168	WNMA433 KCK15	B79	3753243	WNMG432FN KCP10	B80
3751940	WNMG333UN KCK05	B83	3752059	RCMT1606MORP KCK15	B101-102	3752169	WNMA434 KCK15	B79	3753244	CCMT2151LF KCP10	B89
3751941	WNMA434 KCK05	B79	3752060	SNMG432RP KCK15	B63	3752170	CCMT2151LF KCK15	B89	3753245	CCMT3251LF KCP10	B89
3751942	CNMG321FN KCK05	B42	3752061	SNMG433RP KCK15	B63	3752171	CCMT3251LF KCK15	B89	3753246	CCMT3252LF KCP10	B89
3751943	WNMG431UN KCK05	B83	3752062	SNMG543RP KCK15	B63	3752172	CCMT3252LF KCK15	B89	3753247	CCMT431LF KCP10	B89
3751944	CNMG322FN KCK05	B42	3752063	TNMG332RP KCK15	B71	3752173	DCMT3251LF KCK15	B97	3753248	CCMT433LF KCP10	B89
3751945	CNMG431FN KCK05	B42	3752064	TNMG432RP KCK15	B71	3752174	CCMT3252MF KCK15	B90	3753249	DCMT3251LF KCP10	B97
3751946	CNMG432FN KCK05	B42	3752065	TNMG433RP KCK15	B71	3752175	CCMT432MF KCK15	B90	3753250	CCMT3252MF KCP10	B90
3751947	WNMG432UN KCK05	B83	3752066	TNMG434RP KCK15	B71	3752176	CNMG432RP KCK15	B46	3753251	CCMT432MF KCP10	B90
3751948	CNMG433FN KCK05	B42	3752067	WNMG332RP KCK15	B77	3752177	CNMG431UN KCK15	B47	3753252	CNMG432MN KCP10	B44
3751949	CNMG434FN KCK05	B42	3752068	WNMG333RP KCK15	B77	3752178	CNMG432UN KCK15	B47	3753253	CNMG433MN KCP10	B44
3751950	DNMG331FN KCK05	B52	3752069	WNMG432RP KCK15	B83	3752179	CNMG433UN KCK15	B47	3753254	DNMG432MN KCP10	B53
3751951	WNMG433UN KCK05	B83	3752070	WNMG433RP KCK15	B83	3752180	CNMG434UN KCK15	B47	3753255	DNMG442MN KCP10	B53
3751952	DNMG332FN KCK05	B52	3752072	CCMT2152LF KCK05	B89	3752181	CNMG542UN KCK15	B47	3753256	TNMG332MN KCP10	B69
3751955	DNMG431FN KCK05	B52	3752073	CCMT432LF KCK05	B89	3752182	CNMG543UN KCK15	B47	3753257	WNMG432MN KCP10	B81
3751956	DNMG432FN KCK05	B52	3752074	CPMT2151LF KCK05	B94	3752183	CNMG544UN KCK15	B47	3753288	CNMG433RN KCP10	B46
3751958	DNMG433FN KCK05	B52	3752075	CPMT2152LF KCK05	B94	3752184	CNMG642UN KCK15	B47	3753291	CNMG542RN KCP10	B46
3751959	DNMG441FN KCK05	B52	3752076	CPMT3251LF KCK05	B94	3752185	CNMG643UN KCK15	B47	3753292	CNMG543RN KCP10	B46
3751960	DNMG442FN KCK05	B52	3752077	CPMT3252LF KCK05	B94	3752186	CNMG644UN KCK15	B47	3753299	CNMG544RN KCP10	B46
3751961	DNMG443FN KCK05	B52	3752078	DCMT2151LF KCK05	B97	3752187	DNMG332UN KCK15	B56	3753294	CNMG642RN KCP10	B46
3751962	SNMG321FN KCK05	B60	3752079	DCMT3252LF KCK05	B97	3752188	DNMG333UN KCK15	B56	3753295	CNMG643RN KCP10	B46
3751963	SNMG322FN KCK05	B60	3752080	DCMT3253LF KCK05	B97	3752189	DNMG432UN KCK15	B56	3753296	CNMG644RN KCP10	B46
3751964	SNMG431FN KCK05	B60	3752082	DCMT432LF KCK05	B97	3752190	DNMG433UN KCK15	B56	3753297	CNMG646RN KCP10	B46
3751965	SNMG432FN KCK05	B60	3752083	DPMT2151LF KCK05	B99	3752191	DNMG434UN KCK15	B56	3753298	DNMG432RN KCP10	B55
3751966	SNMG433FN KCK05	B60	3752084	DPMT3251LF KCK05	B99	3752192	DNMG442UN KCK15	B56	3753299	DNMG433RN KCP10	B55
3751967	SNMG434FN KCK05	B60	3752085	DPMT3252LF KCK05	B99	3752193	DNMG443UN KCK15	B56	3753300	DNMG434RN KCP10	B55
3751968	TNMG5221FN KCK05	B68	3752086	SCMT3251LF KCK05	B103	3752194	DNMG644UN KCK15	B56	3753301	DNMG643RN KCP10	B55
3751970	TNMG331FN KCK05	B68	3752087	SCMT3252LF KCK05	B103	3752195	RNMG43UN KCK15	B59	3753302	DNMG443RN KCP10	B55
3751971	TNMG332FN KCK05	B68	3752088	SCMT431LF KCK05	B103	3752196	SNMG432UN KCK15	B64	3753303	DNMG444RN KCP10	B55
3751972	TNMG333FN KCK05	B68	3752089	SCMT432LF KCK05	B103	3752197	SNMG433UN KCK15	B64	3753304	DNMG542RN KCP10	B55
3751973	TNMG431FN KCK05	B68	3752090	SCMT433LF KCK05	B103	3752198	SNMG434UN KCK15	B64	3753305	DNMG543RN KCP10	B55
3751974	VNMG331FN KCK05	B76	3752092	SPMT3252LF KCK05	B105	3752199	SNMG544UN KCK15	B64	3753306	RNMG432RN KCP10	B58, F96
3751975	VNMG332FN KCK05	B76	3752093	TCMT2151LF KCK05	B107	3752200	SNMG544UN KCK15	B64	3753307	CNMG432MW KCP10	B45
3751976	WNMG331FN KCK05	B80	3752094	TCMT2152LF KCK05	B107	3752201	SNMG643UN KCK15	B64	3753308	RNMG43RN KCP10	B58, F96
3751977	WNMG332FN KCK05	B80	3752095	TCMT3251LF KCK05	B107	3752202	SNMG644UN KCK15	B64	3753309	RNMG544RN KCP10	B58, F96
3751978	WNMG431FN KCK05	B80	3752096	TCMT3252LF KCK05	B107	3752203	TNMG332UN KCK15	B71	3753310	RNMG64RN KCP10	B58, F96
3751979	WNMG432FN KCK05	B80	3752097	TCMT3253LF KCK05	B107	3752204	TNMG333UN KCK15	B71	3753311	RNMG66RN KCP10	B58, F96
3751980	CCMT2151LF KCK05	B89	3752098	TCMT432LF KCK05	B107	3752205	TNMG334UN KCK15	B71	3753312	SNMG333RN KCP10	B63, F96
3751981	CCMT3251LF KCK05	B89	3752099	TPMT1815LF KCK05	B112	3752206	TNMG432UN KCK15	B71	3753313	CNMG432RN KCP10	B63, F96
3751982	CCMT3252LF KCK05	B89	3752100	TPMT2151LF KCK05	B112	3752207	WNMG433UN KCK15	B71	3753314	SNMG433MW KCP10	B82
3751983	CCMT431LF KCK05	B89	3752101	TPMT2152LF KCK05	B112	3752208	TNMG434UN KCK15	B71	3753315	SNMG433RN KCP10	B63, F96
3751984	CCMT433LF KCK05	B89	3752102	TPMT3251LF KCK05	B112	3752209	VNMG331UN KCK15	B78	3753316	CNMG643RH KCP10	B47, F107
3751985	DCMT3251LF KCK05	B97	3752103	TPMT3252LF KCK05	B112	3752210	VNMG332UN KCK15	B78	3753317	CNMG644RH KCP10	B47, F107
3751986	CCMT2152LF KCK15	B89	3752104	TPMT3253LF KCK05	B112	3752211	WNMG332UN KCK15	B83	3753318	SNMG434RN KCP10	B63, F96
3751987	CCMT432LF KCK15	B89	3752105	TPMT432LF KCK05	B112	3752212	WNMG333UN KCK15	B83	3753319	CNMG646RH KCP10	B47, F107
3751988	CPMT2151LF KCK15	B94	3752106	VBMT221LF KCK05	B114	3752213	WNMG431UN KCK15	B83	3753320	SNMG643RH KCP10	B64, F108
3751989	CPMT2152LF KCK15	B94	3752107	VBMT222LF KCK05	B114	3752214	WNMG432UN KCK15	B83	3753321	SNMG542RN KCP10	B63, F96
3751990	CPMT3251LF KCK15	B94	3752108	VBMT331LF KCK05	B114	3752215	WNMG433UN KCK15	B83	3753322	SNMG644RH KCP10	B64, F108
3751991	CPMT3252LF KCK15	B94	3752109	VBMT332LF KCK05	B114	3752216	WNMG434UN KCK15	B83	3753323	SNMG646RH KCP10	B64, F108
3751992	DCMT3252LF KCK15	B97	3752110	VBMT333LF KCK05	B114	3752218	CM220	D68	3753324	CNMG543RN KCP10	B63, F96
3752013	SCMT3252LF KCK15	B103	3752111	WPMT2151LF KCK05	B115	3752220	CM222	D68	3753325	CNMG432RN KCP10	B48, F107
3752014	SCMT432LF KCK15	B103	3752113	WPMT3252LF KCK05	B115	3753160	CNMG321FF KCP10	B42	3753326	CNMG433RN KCP10	B48, F107
3752015	SPMT3252LF KCK15	B105	3752114	CNMG433RP KCK05	B46	3753161	CNMG322FF KCP10	B42	3753327	CNMG544RN KCP10	B63, F96
3752016	TCMT2151LF KCK15	B107	3752115	CNMG543RP KCK05	B46	3753162	CNMG331FF KCP10	B52	3753328	SNMG543RN KCP10	B48, F107
3752017	TCMT2152LF KCK15	B107	3752116	CNMG643RP KCK05	B46	3753203	DNMG432FF KCP10	B52	3753329	CNMG544RN KCP10	B48, F107
3752018	TCMT3251LF KCK15	B107	3752117	DNMG432RP KCK05	B56	3753204	DNMG321FF KCP10	B60	3753330	CNMG433RN KCP10	B63, F96
3752019	TCMT3252LF KCK15	B107	3752118	DNMG442RP KCK05	B56	3753205	SNMG431FF KCP10	B60	3753331	CNMG546RN KCP10	B48, F107
3752020	TCMT3253LF KCK15	B107	3752119	DNMG443RP KCK05	B56	3753206	WNMG331FF KCP10	B80	3753332	CNMG643RN KCP10	B48, F107
3752021	TPMT1815LF KCK15	B112	3752120	SNMG432RP KCK05	B63	3753207	WNMG432FF KCP10	B80	3753333	CNMG644RN KCP10	B48, F107
3752022	TPMT2151LF KCK15	B112	3752121	SNMG433RP KCK05	B63	3753208	WNMG432FF KCP10	B80	3753334	SNMG644RN KCP10	B63, F96
3752023	TPMT2152LF KCK15	B112	3752122	TNMG332RP KCK05	B71	3753209	CNMG321FN KCP10	B42	3753335	DNMG442RN KCP10	B57
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3752027	VBMT332LF KCK15	B114	3752127	CNMA431 KCK15	B41	3753213	CNMG433FN KCP10	B42	3753339	SNMG543RN KCP10	B65, F109
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3752029	CCMT3251MF KCK15	B90	3752129	CNMA433 KCK15	B41	3753215	DNMG331FN KCP10	B52	3753341	CNMG644RN KCP10	B65, F109
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3752031	CCMT433MF KCK15	B90	3752131	CNMA542 KCK15	B41	3753217	DNMG333FN KCP10	B52	3753343	SNMG644RN KCP10	B65, F109
3752032	CPMT2152MF KCK15	B94	3752132	CNMA543 KCK15	B41	3753218	DNMG431FN KCP10	B52	3753344	CNMG432RN KCP10	B71
3752033	CPMT3252MF KCK15	B94	3752143	CNMA544 KCK15	B41	3753219	DNMG432FN KCP10	B52	3753345	TNMG332RN KCP10	B72, F109
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3752039	SCMT3252MF KCK15	B103	3752148	DNMA443 KCK15	B51	3753224	SNMG321FN KCP10	B60	3753350	TNMG434RN KCP10	B71
3752040	SCMT432MF KCK15	B103	3752149	RNMA43 KCK15	B58	3753225	SNMG322FN KCP10	B60	3753351	CNMG432RP KCP10	B46
3752041	SCMT433MF KCK15	B103	3752150	SNMA432 KCK15	B60	3753226	SNMG431FN KCP10	B60	3753352	CNMG432RP KCP10	B48
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3752047	TPMT2152MF KCK15	B112	3752157	TNMA332 KCK15</							



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3755930	ABDE0750J3CQB K600	M46	3758051	VNMG432RP KCM15	B83	3758167	CCMT2151LF KCK20	B89	3760316	VBMT332LF KCM25	B114
3755931	ABDE1000J3AQ K600	M47	3758053	VNMG433RP KCM15	B83	3758168	CCMT2151LF KCK20	B89	3760317	WPMT3251LF KCM25	B115
3755932	ABDE1000J3AQB K600	M47	3758054	CNMG431UP KCM15	B47	3758169	CCMT3252LF KCK20	B89	3760318	WPMT3252LF KCM25	B115
3755933	ABDE1000J3AQE K600	M47	3758055	CNMG432UP KCM15	B47	3758170	CCMT431LF KCK20	B89	3760319	CCMT2151MF KCM25	B90
3755934	ABDE1000J3BQ K600	M47	3758056	CNMG433UP KCM15	B47	3758171	CCMT433LF KCK20	B89	3760320	TCMT3252LF KCM25	B90
3755935	ABDE1000J3BQB K600	M47	3758057	CNMG542UP KCM15	B47	3758172	DCMT3251LF KCK20	B97	3760321	CCMT3253MF KCM25	B90
3755936	ABDE1000J3BQE K600	M47	3758058	CNMG543UP KCM15	B47	3758173	CCMT3252MF KCK20	B90	3760322	CCMT433MF KCM25	B90
3755937	ABDE1000J3CQ K600	M47	3758059	CNMG642UP KCM15	B47	3758174	CCMT432MF KCK20	B90	3760323	CPMT2152MF KCM25	B94
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3757391	DNMA332 KCK20	B51	3758061	CNMG644UP KCM15	B47	3758176	CNMG433RP KCK20	B43	3760325	CPMT3253MF KCM25	B94
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3794395	KSEMP1438FDS32A1H50	3854279	A4SMR120408D101	3856564	KST175CSK110	3859735	RHM42000KST350H7HF KC6305K103-K104
3794396	KSEMP3750FDS36A1MH50	3854280	A4SML120408D101	3856565	KST200CSK110	3859736	RHM42000KST350H7HF KC6305K103-K104
3794397	KSEMP1500FDS36A1H50	3854281	A4SMR160510D101	3856566	CNGA433T0820 KYK25B118	3859737	RHM42000KST350H7HF KC6305K103-K104
3794398	KSEMP3970FDS36A1MH51	3854282	A4SML160510D101	3856567	CNGA434T0820 KYK25B118	3859738	RHM42000KST350H7HF KC6305K103-K104
3794399	KSEMP4000FDS40A1MH51	3854283	A4SMR160610D101	3856568	EP1808SGE KC725MP83, Q52	3859739	RHM42000KST350H7HF KC6305K103-K104
3794400	KSEMP4128FDS40A1MH51	3854284	A4SML160610D101	3856569	RHM25000KST200H7HF KC6305K103-K104	3859740	RHM42000KST350H7HF KC6305K103-K104
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3794402	KSEMP4300FDS40A1MH51	3854756	A4E0375J3B K600M54	3856571	RHM25000KST200H7HF KC6305K103-K104	3859742	RHM42000KST350H7HF KC6305K103-K104
3794403	KSEMP4445FDS40A1MH51	3854759	A4E0500J3B K600M55	3856572	RHM25000KST200H7HF KC6305K103-K104	3859743	RHM42000KST350H7HF KC6305K103-K104
3794404	KSEMP4500FDS45A1MH51	3854761	A4E0625J3A K600M55	3856573	RHM25000KST200H7HF KC6305K103-K104	3859744	RHM42000KST350H7HF KC6305K103-K104
3794405	KSEMP4600FDS45A1MH51	3854762	A4E0750J3B K600M56	3856574	RHM25000KST200H7HF KC6305K103-K104	3859745	RHM42000KST350H7HF KC6305K103-K104
3794406	KSEMP4763FDS45A1MH51	3855176	EP1416SGE KC522MP40	3856575	RHM25000KST200H7HF KC6305K103-K104	3859746	RHM42000KST350H7HF KC6305K103-K104
3794407	KSEMP4800FDS45A1MH51	3855177	EP1416SGE KC725MP40	3856576	RHM25000KST200H7HF KC6305K103-K104	3859747	RHM42000KST350H7HF KC6305K103-K104
3794408	KSEMP5080FDS50A1MH51	3855178	EP1416SGE KCPK30P40	3856577	RHM25000KST200H7HF KC6305K103-K104	3859748	RHM42000KST350H7HF KC6305K103-K104
3794409	KSEMP5100FDS50A1MH51	3855179	EP1431SGE KC522MP40	3856578	RHM25000KST200H7HF KC6305K103-K104	3859749	RHM42000KST350H7HF KC6305K103-K104
3794410	KSEMP5200FDS50A1MH51	3855180	EP1431SGE KC725MP40	3856579	RHM25000KST200H7HF KC6305K103-K104	3859750	RHM42000KST350H7HF KC6305K103-K104
3794411	KSEMP5398FDS50A1MH51	3855181	EP1431SGE KCPK30P40	3856580	RHM25000KST200H7HF KC6305K103-K104	3859751	RHM42000KST350H7HF KC6305K103-K104
3794412	KSEMP5400FDS50A1MH51	3855209	EP14							



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		K106			K106			K106	3860980	SIF70KST350RR5M	K110
3859764	RHM39690KST350H7SF	KC6305	3860526	RHM31000KST250H7SF	KT325	3860661	RHM34000KST300H7SF	KT6215	3861185	SS20KST175AR3M	K107
		K106			K106			K106	3861186	SS20KST200AR3M	K107
3859765	RHM40000KST350H7SF	KC6305	3860527	RHM31750KST250H7SF	KT325	3860662	RHM34930KST300H7SF	KT6215	3861187	SS25KST250AR3M	K107
		K106			K106			K106	3861188	SS32KST300AR3M	K107
3859766	RHM41000KST350H7SF	KC6305	3860528	RHM32000KST250H7SF	KT325	3860663	RHM35000KST300H7SF	KT6215	3861189	SS32KST350AR3M	K107
		K106			K106			K106	3861190	SS20KST175AR5M	K107
3859767	RHM41280KST350H7SF	KC6305	3860529	RHM32500KST300H7SF	KT325	3860664	RHM36000KST300H7SF	KT6215	3861191	SS20KST200AR5M	K107
		K106			K106			K106	3861192	SS25KST250AR5M	K107
3859768	RHM42000KST350H7SF	KC6305	3860530	RHM33000KST300H7SF	KT325	3860665	RHM36510KST300H7SF	KT6215	3861193	SS32KST300AR5M	K107
		K106			K106			K106	3861194	SS32KST350AR5M	K107
3860364	RHM20000KST175H7HF	KT325	3860531	RHM33340KST300H7SF	KT325	3860666	RHM37000KST300H7SF	KT6215	3861195	SS20KST175RR3M	K108
		K103-K104			K106			K106	3861196	SS20KST200RR3M	K108
3860366	RHM21000KST175H7HF	KT325	3860532	RHM34000KST300H7SF	KT325	3860667	RHM37500KST350H7SF	KT6215	3861197	SS25KST250RR3M	K108
		K103-K104			K106			K106	3861198	SS32KST300RR3M	K108
3860367	RHM22000KST175H7HF	KT325	3860533	RHM34930KST300H7SF	KT325	3860668	RHM38000KST350H7SF	KT6215	3861199	SS32KST350RR3M	K108
		K103-K104			K106			K106	3861200	SS20KST175RR5M	K108
3860368	RHM22230KST175H7HF	KT325	3860534	RHM35000KST300H7SF	KT325	3860669	RHM38100KST350H7SF	KT6215	3861201	SS20KST200RR5M	K108
		K103-K104			K106			K106	3861202	SS25KST250RR5M	K108
3860370	RHM23000KST200H7HF	KT325	3860535	RHM36000KST300H7SF	KT325	3860670	RHM39000KST350H7SF	KT6215	3861203	SS32KST300RR5M	K108
		K103-K104			K106			K106	3861204	SS32KST350RR5M	K108
3860371	RHM23810KST200H7HF	KT325	3860536	RHM36510KST300H7SF	KT325	3860671	RHM39690KST350H7SF	KT6215	3861562	DNGA432T0820 KYK10	B119
		K103-K104			K106			K106	3861628	MS-2225	R39-41, R45-47
3860372	RHM24000KST200H7HF	KT325	3860537	RHM37000KST300H7SF	KT325	3860672	RHM40000KST350H7SF	KT6215	3861630	KST175200PK	K110
		K103-K104			K106			K106	3861631	KST250250PK	K110
3860383	RHM25000KST200H7HF	KT325	3860538	RHM37500KST350H7SF	KT325	3860673	RHM41000KST350H7SF	KT6215	3861632	KST300350PK	K110
		K103-K104			K106			K106	3861773	DNGA433T0820 KYK10	B119
3860384	RHM25400KST200H7HF	KT325	3860539	RHM38000KST350H7SF	KT325	3860674	RHM41280KST350H7SF	KT6215	3861774	DNGA434T0820 KYK10	B119
		K103-K104			K106			K106	3861775	RNG43T0820 KYK10	B124
3860385	RHM26000KST200H7HF	KT325	3860540	RHM38100KST350H7SF	KT325	3860675	RHM42000KST350H7SF	KT6215	3861776	RNG45T0820 KYK10	B124
		K103-K104			K106			K106	3861777	TPG32T0820 KYK10	B130
3860386	RHM26990KST200H7HF	KT325	3860541	RHM39000KST350H7SF	KT325	3860855	RHM20000KST175H7HF	KT6215	3861778	TPG43T0820 KYK10	B130
		K103-K104			K106			K103-K104	3861779	WNGX453T0420FV KYK10	B127
3860387	RHM27000KST200H7HF	KT325	3860542	RHM39690KST350H7SF	KT325	3860857	RHM21000KST175H7HF	KT6215	3861780	CNG433T0820 KYK10	B122
		K103-K104			K106			K103-K104	3861781	TPG32T0820 KYK10	B130
3860389	RHM28000KST250H7HF	KT325	3860543	RHM40000KST350H7SF	KT325	3860858	RHM22000KST175H7HF	KT6215	3862224	KST175200PK	K107, K110
		K103-K104			K106			K103-K104	3862225	KST250250AS	K107, K110
3860392	RHM30000KST250H7HF	KT325	3860544	RHM41000KST350H7SF	KT325	3860859	RHM22230KST175H7HF	KT6215	3862226	KST300350AS	K107, K110
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3860394	RHM31000KST250H7HF	KT325	3860545	RHM41280KST350H7SF	KT325	3860861	RHM23000KST200H7HF	KT6215	3865903	A4SBR122S12020025	D97
		K103-K104			K106			K103-K104	3865904	A4SBR122S12025036	D97
3860395	RHM31750KST250H7HF	KT325	3860546	RHM42000KST350H7SF	KT325	3860862	RHM23810KST200H7HF	KT6215	3865905	A4SBR123S14020025	D97
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3860396	RHM32000KST250H7HF	KT325	3860625	RHM20000KST175H7SF	KT6215	3860863	RHM24000KST200H7HF	KT6215	3865907	A4SBR124S14025035	D97
		K103-K104			K105			K103-K104	3865908	A4SBR124S14035048	D97
3860400	RHM34000KST300H7HF	KT325	3860626	RHM20640KST175H7SF	KT6215	3860864	RHM25000KST200H7HF	KT6215	3865909	A4SBR165S19028038	D97
		K103-K104			K105			K103-K104	3865910	A4SBR165S19038058	D97
3860402	RHM35000KST300H7HF	KT325	3860627	RHM21000KST175H7SF	KT6215	3860865	RHM25400KST200H7HF	KT6215	3865911	A4SBL122S12016020	D97
		K103-K104			K105			K103-K104	3865912	A4SBL122S12020025	D97
3860403	RHM36000KST300H7HF	KT325	3860628	RHM22000KST175H7SF	KT6215	3860866	RHM26000KST200H7HF	KT6215	3865913	A4SBL122S12025036	D97
		K103-K104			K105			K103-K104	3865914	A4SBL123S14020025	D97
3860411	RHM40000KST350H7HF	KT325	3860629	RHM22230KST175H7SF	KT6215	3860867	RHM26990KST200H7HF	KT6215	3865915	A4SBL123S14025036	D97
		K103-K104			K105			K103-K104	3865916	A4SBL124S14025035	D97
3860414	RHM42000KST350H7HF	KT325	3860630	RHM22500KST200H7SF	KT6215	3860868	RHM27000KST200H7HF	KT6215	3865917	A4SBL124S14035048	D97
		K103-K104			K105			K103-K104	3865918	A4SBL165S19028038	D97
3860476	RHM20000KST175H7SF	KT325	3860631	RHM23000KST200H7SF	KT6215	3860870	RHM28000KST250H7HF	KT6215	3865919	A4SBL165S19038058	D97
		K105			K105			K103-K104	3865920	A4SBR202K2S12016020	D96
3860477	RHM20640KST175H7SF	KT325	3860632	RHM23810KST200H7SF	KT6215	3860873	RHM30000KST250H7HF	KT6215	3865921	A4SBR202K2S12020025	D96
		K105			K105			K103-K104	3865922	A4SBR202K2S12025036	D96
3860478	RHM21000KST175H7SF	KT325	3860643	RHM24000KST200H7SF	KT6215	3860875	RHM31000KST250H7HF	KT6215	3865923	A4SBR202K3S14020025	D96
		K105			K105			K103-K104	3865924	A4SBR202K3S14025036	D96
3860479	RHM22000KST175H7SF	KT325	3860644	RHM25000KST200H7SF	KT6215	3860876	RHM31750KST250H7HF	KT6215	3865925	A4SBR202K4S14025035	D96
		K105			K105			K103-K104	3865926	A4SBR202K4S14035048	D96
3860480	RHM22230KST175H7SF	KT325	3860645	RHM25400KST200H7SF	KT6215	3860877	RHM32000KST250H7HF	KT6215	3865927	A4SBR2525MSS19028038	D96
		K105			K105			K103-K104	3865928	A4SBR2525MSS19038058	D96
3860481	RHM22500KST200H7SF	KT325	3860646	RHM26000KST200H7SF	KT6215	3860881	RHM34000KST300H7HF	KT6215	3865929	A4SBL202K2S12016020	D96
		K105			K105			K103-K104	3865930	A4SBL202K2S12020025	D96
3860482	RHM23000KST200H7SF	KT325	3860647	RHM26990KST200H7SF	KT6215	3860883	RHM35000KST300H7HF	KT6215	3865931	A4SBL202K2S12025036	D96
		K105			K105			K103-K104	3865932	A4SBL202K3S14020025	D96
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		K105			K105			K103-K104	3865934	A4SBL202K4S14025035	D96
3860514	RHM24000KST200H7SF	KT325	3860649	RHM27500KST250H7SF	KT6215	3860892	RHM40000KST350H7HF	KT6215	3865935	A4SBL202K4S14035048	D96
		K105			K105			K103-K104	3865936	A4SBL2525MSS19028038	D96
3860515	RHM25000KST200H7SF	KT325	3860650	RHM28000KST250H7SF	KT6215	3860895	RHM42000KST350H7HF	KT6215	3865937	A4SBL2525MSS19038058	D96
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3860516	RHM25400KST200H7SF	KT325	3860651	RHM28580KST250H7SF	KT6215	3860911	HSK63AKST175AR3M	K109	3865956	A4DE0750J3JRB K600	M56
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3860517	RHM26000KST200H7SF	KT325	3860652	RHM29000KST250H7SF	KT6215	3860912	HSK63AKST200AR3M	K109	3865958	A4DE0750J3JRD K600	M56
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3860518	RHM26990KST200H7SF	KT325	3860653	RHM30000KST250H7SF	KT6215	3860964	HSK63AKST300AR3M	K109	3865960	A4DE1000J3FRA K600	M56
		K105			K106			K109	3865961	A4DE1000J3FRB K600	M56
3860519	RHM27000KST200H7SF	KT325	3860654	RHM30160KST250H7SF	KT6215	3860965	HSK63AKST350AR3M	K109	3865962	A4DE1000J3FRB K600	M56
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3866269	AAAE062J3JDRA K600	M55	3868118	T620MF180X150R6HX-D4 KM6515		3868943	T630MF100X100R6HX-D4 KP6525	L58	3870869	KM63MZDFS440R3YM	J20
3866270	AAAE062J3JDRB K600	M55			L52				3870870	KM63MZDFS470R3YM	J20
3866271	AAAE062J3JDRK K600	M55	3868174	T620M030X050R6HX-D1 KP6525		3868944	T630MF100X125R6HX-D4 KP6525	L58	3871002	A4G0205M2SU02GMN KCU10	D83
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3866273	AAAE062J3JE K600	M55	3868175	T620M040X070R6HX-D1 KP6525		3868946	T630MF120X150R6HX-D4 KP6525	L58	3871024	A12RAASAL2S12N021026	D98
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3866276	AAAE062J3JG K600	M55			L52				3871027	A16RAASAL3S14N026036	D98
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3871112	A4G0505MSU04GUP	KCU25D83	3876378ADF0375J2E K600M50	3884582RCMT0602MOMP	KCS10		3884886KTI1580HPCCLM	KC7410H6-H10	
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3900306	AAAF0500J2CRC KC651M	M50	3904124	AAAE1000J3BRC KC651M	M57	3960823	SNXG534S0820 KB1340	B183	4006439	KTIP10110HPL KC7320	H6-H10
3900307	AAAF0500J2D KC651M	M50	3904125	AAAE1000J3CC KC651M	M57	3960824	VNXG333S0820 KB1340	B184	4006440	KTIP10160HPL KC7320	H6-H10
3900308	AAAF0500J2DRB KC651M	M50	3904126	AAAE1000J3CRB KC651M	M57	3960825	TNGX333EFW KB1340	B184	4006483	KTIP2150HPCM KC7410	H6-H10
3900309	AAAF0500J2DRC KC651M	M50	3904127	AAAE1000J3CRC KC651M	M57	3965293	40510200409	L118	4006484	KTIP2200HPCM KC7410	H6-H10
3900310	AAAF0625J2ARC KC651M	M51	3950265	KM40TSKGMEL50	D57	3967116	A4BHCR32K0113R	D102-103	4006485	KTIP2250HPCM KC7410	H6-H10
3900311	AAAF0625J2B KC651M	M51	3950266	KM40TSKGMER50	D56	3967117	A4BHCR32K0217R	D102-103	4006486	KTIP2300HPCM KC7410	H6-H10
3900312	AAAF0625J2BRC KC651M	M51	3950267	KM40TSKGMSEL50	D56	3967118	A4BHCR32K0317R	D102-103	4006487	KTIP2350HPCM KC7410	H6-H10
3900313	AAAF0750J2A KC651M	M51	3950268	KM40TSKGMRS50	D56	3967119	A4BHCR26K0113R	D102-103	4006488	KTIP2400HPCM KC7410	H6-H10
3900314	AAAF0750J2BRB KC651M	M51	3950831	KM40TSLSEL16N	E78	3967120	A4BHCR26K0217R	D102-103	4006489	KTIP2450HPCM KC7410	H6-H10
3900315	AAAF0750J2BRC KC651M	M51	3950832	KM40TSLSER16N	E78	3967121	A4BHCR26K0317R	D102-103	4006490	KTIP2550HPCM KC7410	H6-H10
3900316	AAAF0750J2BRE KC651M	M51	3950853	KM40TSLSEL22N	E78	3967122	A4BHCL32K0113R	D102-103	4006491	KTIP2599HPCM KC7410	H6-H10
3900317	AAAF0750J2C KC651M	M52	3950854	KM40TSLSER22N	E78	3967123	A4BHCL32K0217R	D102-103	4006801	KTIP2700HPCM KC7315	H6-H10
3900318	AAAF0750J2CRB KC651M	M52	3950855	KM40TSLSSL16	E80	3967124	A4BHCL32K0317R	D102-103	4008096	TNMG332FP KCP10	B68
3900319	AAAF0750J2CRC KC651M	M52	3950856	KM40TSLSSL22	E80	3967125	A4BHCL26K0113R	D102-103	4011180	EC1850FJ KC410M	P53
3900320	AAAF0750J2D KC651M	M52	3950857	KM40TSLSSR16	E80	3967126	A4BHCL26K0217R	D102-103	4026180	T631M050X080R6HX-D1 KM6515	L59
3900321	AAAF0750J2DRB KC651M	M52	3950858	KM40TSLSSR22	E80	3967127	A4BHCL26K0317R	D102-103	4026181	T631M060X100R6HX-D1 KM6515	L59
3900322	AAAF0750J2DRC KC651M	M52	3954294	G32TB1KM40	C121	3967128	A4BHCR32K0113L	D102-103	4026182	T631M080X125R6HX-D1 KM6515	L59
3900323	AAAF1000J2A KC651M	M52	3954295	G40TB51KM40	C121	3967129	A4BHCR32K0217L	D102-103	4026223	T631M100X150R6HX-D1 KM6515	L59
3900324	AAAF1000J2ARB KC651M	M52	3954296	G48TB63KM63	C121	3967130	A4BHCL32K0317L	D102-103	4026224	T631M120X175R6HX-D6 KM6515	L59
3900325	AAAF1000J2ARC KC651M	M52	3954297	G64TTB83KM63	C121	3967131	A4BHCL32K0113L	D102-103	4026225	T631M140X200R6HX-D6 KM6515	L59
3900326	AAAF1000J2ARE KC651M	M52	3954566	EP1404SGE KCPM20	P40	3967132	A4BHCL26K0217L	D102-103	4026226	T631M160X200R6HX-D6 KM6515	L59
3900327	AAAF1000J2B KC651M	M52	3954567	EP1408SGE KCPM20	P40	3967133	A4BHCL32K0317L	D102-103	4026227	T631M180X250R6HX-D6 KM6515	L59
3900328	AAAF1000J2BRB KC651M	M52	3954568	EP1431SGE KCPM20	P40	3967134	A4BHCL32K0113L	D102-103	4026231	T631M180X250R6HX-D4 KM6515	L59
3900329	AAAF1000J2BRC KC651M	M52	3954569	EC1808E KCPM20	P54	3967135	A4BHCL32K0113L	D102-103	4026232	T631M100X100R6HX-D4 KM6515	L59
3900330	AAAF1000J2C KC651M	M52	3954570	EP1808SGE KCPM20	P55	3967136	A4BHCL32K0217L	D102-103	4026233	T631M100X125R6HX-D4 KM6515	L59
3900331	AAAF1000J2CRB KC651M	M52	3954571	EC1004ELD KCPM20	P18	3967137	A4BHCL32K0317L	D102-103	4026234	T631M120X150R6HX-D4 KM6515	L59
3900332	AAAF1000J2CRC KC651M	M52	3954572	EC1008ELD KCPM20	P18	3967138	A4BHCL26K0113L	D102-103	4026235	T631M140X150R6HX-D4 KM6515	L59
3901933	RNG33T0220 KY4300	B124	3954573	EC1008ELD KCPM20	P18	3967139	A4BHCL26K0217L	D102-103	4026236	T631M160X150R6HX-D4 KM6515	L59
3902132	KM40TSNEL2	E38	3954603	EC1031ELD KCPM20	P18	3967140	A4BHCL26K0317L	D102-103	4026237	T631M180X150R6HX-D4 KM6515	L59
3902283	KM40TSNEL3	E38	3954604	SDCT431PDER8LD2 KCPM20	P82, Q52	3992689	RPPT1605MOSH KCPM20	R48	4026238	T631M180X150R6HX-D4 KM6515	L59
3902284	KM40TSNEL4	E38	3954605	SDCT43PDER8LD2 KCPM20	P82, Q52	3993990	KC1	R10	4026239	T631M180X150R6HX-D4 KM6515	L59
3902285	KM40TSNER2	E38	3954614	SPCT31251PPER8LD2 KCPM20	P71, Q37	3993991	KC2	R109-110	4026240	T631M180X150R6HX-D4 KM6515	L59
3902286	KM40TSNER3	E38	3954615	SPCT3125PPER8LD2 KCPM20	P71, Q37	3994022	A10CTLPL2	C93	4026241	T631M100X100R6HX-D4 KM6515	L59
3902287	KM40TSNER4	E38	3954633	KM40TSS10DLSL11	E79	3997448	BMD300R1607S100L200	R47	4026242	T631M100X100R6HX-D4 KM6515	L59
3902288	KM40TSNRL3045M	E39	3954634	KM40TSS10DLSER11	E79	3999269	TRM50L0720M	F64	4026243	T631M120X125R6HX-D4 KM6515	L59
3902289	KM40TSNRR3045M	E39	3954635	KM40TSS12ELSER11	E79	3999270	TRM50R0720M	F64	4026244	T631M140X125R6HX-D4 KM6515	L59
3902290	KM40TSSNL2	E38	3954636	KM40TSS12ELSER11	E79	3999271	TRM50L0725M	F64	4026245	T631M160X125R6HX-D4 KM6515	L59
3902291	KM40TSSNL3	E38	3954637	KM40TSS16FLSER16	E79	3999272	TRM50R0725M	F64	4026246	T631M180X125R6HX-D4 KM6515	L59
3902292	KM40TSSNL4	E38	3954638	KM40TSS16FLSER16	E79	3999273	TRM50L0932M	F64	4026247	T631M180X125R6HX-D4 KM6515	L59
3902293	KM40TSSNSR2	E38	3954639	KM40TSS20GLSER16	E79	3999274	TRM50R0932M	F64	4026248	T631M100X150R6HX-D4 KM6515	L59
3902294	KM40TSSNSR3	E38	3954640	KM40TSS20GLSER16	E79	3999275	TRM50L0632M	F64	4026249	T631M120X150R6HX-D4 KM6515	L59
3902295	KM40TSSNSR4	E38	3954641	KM40TSS25HLSL16	E79	3999276	TRM50R0632M	F64	4026250	T631M140X125R6HX-D4 KM6515	L59
3904042	AAAE0250J3A KC651M	M53	3954642	KM40TSS25HLSER16	E79	3999277	TRM50L0950M	F64	4026251	T631M160X125R6HX-D4 KM6515	L59
3904043	AAAE0250J3ARB KC651M	M53	3954643	KM40TSS25HLSER16	E79	3999278	TRM50R0950M	F64	4026252	T631M180X125R6HX-D4 KM6515	L59
3904044	AAAE0250J3ARB KC651M	M53	3954644	KM40TSS32JLSL16	E79	3999279	TRM50L0732M	F64	4026253	T631M180X125R6HX-D4 KM6515	L59
3904045	AAAE0250J3B KC651M	M53	3954645	KM40TSS32JLSER16	E79	3999280	TRM50R0732M	F64	4026254	T631M100X150R6HX-D4 KM6515	L59
3904046	AAAE0250J3BRA KC651M	M53	3954646	KM40TSS32JLSL22	E79	3999281	TRM50L0957M	F64	4026255	T631M120X150R6HX-D4 KM6515	L59
3904047	AAAE0250J3BRB KC651M	M53	3954647	KM40TSS32JLSER16	E79	3999282	TRM50R0957M	F64	4026256	T631M140X150R6HX-D4 KM6515	L59
3904048	AAAE0250J3CRA KC651M	M53	3954648	KM40TSS32JLSL22	E79	3999283	TRM50L0657M	F64	4026257	T631M160X150R6HX-D4 KM6515	L59
3904049	AAAE0250J3CRB KC651M	M53	3954649	KM40TSS32JLSER22	E79	3999284	TRM50R0657M	F64	4026258	T631M180X150R6HX-D4 KM6515	L59
3904050	AAAE0250J3CA KC651M	M53	3954650	KM40TSS40EGD KCPM20	P39	4002349	BMD400R1209S125L200	R41	4026259	T631M100X100R6HX-D4 KM6515	L53
3904051	AAAE0250J3CBA KC651M	M53	3957213	EC1404EGD KCPM20	P39	4002812	40510200638	L124	4026260	T631M120X100R6HX-D4 KM6515	L53
3904052	AAAE0250J3CBB KC651M	M53	3957214	EC1408EGD KCPM20	P39	4004710	CM215R ASSY	C13-14	4026261	T631M140X100R6HX-D4 KM6515	L53
3904053	AAAE0250J3CBB KC651M	M53	3957215	EC1431EGD KCPM20	P39	4005103	KSSR250SN434M3W1	0103	4026262	T631M160X100R6HX-D4 KM6515	L53
3904054	AAAE0250J3CBB KC651M	M53	3957216	EC1412ELD KC422M	P38	4005104	KSSR300SN434M4W2	0103	4026263	T631M180X100R6HX-D4 KM6515	L53
3904055	AAAE0250J3CBB KC651M	M53	3957217	EC1416ELD KC422M	P38	4005105	KSSR400SN434M5W3	0103	4026264	T631M100X150R6HX-D4 KM6515	L53
3904056	AAAE0250J3CBB KC651M	M53	3957218	EC1431ELD KC422M	P38	4005106	KSSR500SN434M6W3	0103	4026265	T631M120X150R6HX-D4 KM6515	L53
3904057	AAAE0250J3CBB KC651M	M53	3957219	EC1440ELD KC422M	P38	4005107	KSSR600SN434M8W3	0103	4026266	T631M140X150R6HX-D4 KM6515	L53
3904058	AAAE0250J3CBB KC651M	M53	3957965	SDPT43PDER8GB2 KCPM20	P83, Q52	4005108	KSSR800SN434M10W4	0103	4026267	T631M160X150R6HX-D4 KM6515	L53
3904059	AAAE0250J3CBB KC651M	M53	3957966	SDPT43PDR8GB2 KCPM20	P83, Q52	4005109	KSSR1000SN434M10W4	0103	4026268	T631M180X150R6HX-D4 KM6515	L53
3904091	AAAE0500J3ARB KC651M	M54	3957967	SPPT3125PPER8GB2 KCPM20	P71, Q37	4005110	KSSL250SN434M3W1	0103	4026269	T631M100X125R6HX-D4 KM6515	L53
3904092	AAAE0500J3ARC KC651M	M54	3957968	SPPT3125PPSR8GB2 KCPM20	P71, Q37	4005111	KSSL300SN434M4W2	0103	4026270	T631M120X125R6HX-D4 KM6515	L53
3904093	AAAE0500J3B KC651M	M55	3958572	EP1816SGE KC522M	P55	4005112	KSSL400SN434M5W3	0103	4026271	T631M140X125R6HX-D4 KM6515	L53
3904094	AAAE0500J3BRB KC651M	M55	3958644	KTIP2500HPCM KC7410	H6-H10	4005113	KSSL500SN434M6W3	0103	4026272	T631M160X125R6HX-D4 KM6515	L53
3904095	AAAE0500J3BRE KC651M	M55	3958803	EP1816SGE KC725M	P55	4005114	KSSL600SN434M8W3	0103	4026273	T631M180X125R6HX-D4 KM6515	L53
3904096	AAAE0500J3C KC651M	M55	3958804	EP1816SGE KCPK30	P55	4005115	KSSL800SN434M10W4	0103	4026274	T631M100X100R6HX-D4 KM6515	L53
3904097	AAAE0500J3C KC651M	M55	3958805	EP1816SGE KCPM20	P55	4005116	KSSL1000SN434M10W4	0103	4026275	T631M120X100R6HX-D4 KM6515	L53
3904098	AAAE0500J3CRB KC651M	M55	3958813	EP1812SGE KC522M	P55	4005117	KSSL1200SN434M10W4	0103	4026276	T631M140X100R6HX-D4 KM6515	L53
3904099	AAAE0500J3CRC KC651M	M55	3958815	EP1812SGE KC725M	P55	4005118	KSSL1500SN434M10W4	0103	4026277	T631M160X100R6HX-D4 KM6515	L53
3904100	AAAE0500J3D KC651M	M55	3958816	EP1812SGE KCPK30	P55	4005119	KSSL1800SN434M10W4	0103	4026278	T631M180X100R6HX-D4 KM6515	L53
3904101	AAAE0500J3DRB KC651M	M55	3958817	EP1812SGE KCPM20	P55	4005120	KTIP08438HPC KC7410	H6-H10	4026279	T631M100X125R6HX-D4 KM6515	L53
3904102	AAAE0500J3DRC KC651M	M55	3958874	EP1832SGE KC522M	P55	4006200	KTIP08750HPC KC7410	H6-H10	4026280	T631M120X125R6HX-D4 KM6515	L53
3904103	AAAE0625J3A KC651M	M55	3958875	EP1832SGE KC725M	P55	4006201	KTIP09375HPC KC7410	H6-H10	4026281	T631M140X125R6HX-D4 KM6515	L53
3904104	AAAE0625J3ARC KC651M	M55	3958876	EP1832SGE KCPK30	P55	4006202	KTIP09688HPC KC7410	H6-H10	4026282	T631M160X125R6HX-D4 KM6515	L53
3904105	AAAE0625J3B KC651M	M55	3958877	EP1832SGE KCPM20	P55	4006203	KTIP1000HPC KC7410	H6-H10	4026283	T631M180X125R6HX-D4 KM6515	L53
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4028505	T621M180X250R6HX-D6	KP6525	4033878	NTC3R20E	KCU25	4034811	A4G250I06P2GMN	KCU10	4035530	T641M140X200R6HX-D6	KP6525
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4028506	T621MF080X100R6HX-D4	KP6525	4033880	NTC3R8E	KCU25	4034813	A4R0200M02P00GMP	KCU10	4035531	T641M160X200R6HX-D6	KP6525
		L53	4033881	NTC3R8I	KCU25	4034814	A4R0205M02U00GMM	KCU10			L65
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		L53	4033883	NU3094L	KCU25	4034816	A4R0305M03U00GMM	KCU10			L65
4028508	T621MF100X125R6HX-D4	KP6525	4033884	NU3094R	KCU25	4034817	A4R0400M04P00GMP	KCU10	4035533	T641M200X250R6HX-D6	KP6525
		L53	4033885	NU3125L	KCU25	4034818	A4R0405M04U00GMM	KCU10			L65
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		L53	4033887	NV3RJ	KCU25	4034820	A4R0505M05U00GMM	KCU10			L62
4028510	T621MF120X150R6HX-D4	KP6525	4033888	NV4LL	KCU25	4034821	A4R0600M06P00GMP	KCU10	4035544	T640NC03750-16R2BX-A	KP6525
		L53	4033889	NV4RL	KCU25	4034822	A4R0605M06U00GMM	KCU10			L62
4028511	T621MF140X125R6HX-D4	KP6525	4033890	NWC3L11E	KCU25	4034823	A4R0800M08P00GMP	KCU10	4035545	T640NC03750-16R3BX-A	KP6525
		L53	4033891	NWC3R11E	KCU25	4034824	A4R0805M08U00GMM	KCU10			L62
4028512	T621MF140X150R6HX-D4	KP6525	4033892	NWC3R14E	KCU25	4034825	A4R1005M10U00GMM	KCU10	4035546	T640NF03750-24R3BX-A	KP6525
		L53	4034661	A3G0300M03P02DF	KCU10	4034826	A4R12503P00GMM	KCU10			L62
4028513	T621MF160X150R6HX-D4	KP6525	4034662	A3G0300M03SP04DF	KCU10	4034827	A4R18704P00GMM	KCU10	4035547	T640NC04375-14R3BX-A	KP6525
		L53	4034717	A4G0200M02P02GMP	KCU10	4034828	A4R25006P00GMM	KCU10			L62
4028514	T621MF180X150R6HX-D4	KP6525	4034718	A4G0205M02U02GMM	KCU10	4034829	A4R31208P00GMM	KCU10	4035548	T640NF04375-20R3BX-A	KP6525
		L53	4034719	A4G0205M02U02GMP	KCU10	4034878	W0EJ090512SRHD	KC522M			L62
4029315	HNPJ755ANSNGD	KC725M	4034720	A4G0250M02B02GMP	KCU10	4034880	W0EJ090512SRHD	KC725M	4035549	T640NC05000-13R3BX-A	KP6525
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4029317	HNPJ755ANSNGD	KCK15	4034724	A3G0400M04P04DF	KCU10	4034927	W0EJ090512SRGD	KCPK30	4035551	T640NC06250-11R3BX-A	KP6525
		025	4034725	A3G0400M04SP02DF	KCU10	4035075	T630M030X050R6HX-D1	KP6505			L62
4029760	KLSS0712C		4034726	A3G0400M04SP04DF	KCU10	4035076	T630M040X070R6HX-D1	KP6505	4035552	T640NC07500-10R3BX-A	KP6525
		P50	4034727	A3G0500M05P02DF	KCU10			L58			L62
4029761	KLSS1013C		4034728	A3G0500M05P04DF	KCU10	4035077	T630M050X080R6HX-D1	KP6505	4035585	RCMX3209MORU	KCP10
		P50	4034729	A3G0600M06P04DF	KCU10			L58			F95
4032274	MEGA45D500LN863M6		4034730	A3G0600M06P08DF	KCU10	4035078	T630M060X100R6HX-D1	KP6505	4035586	RCMX3209MORU	KCK20
		030	4034731	A3G0800M08P04DF	KCU10			L58			F95
4032276	MEGA45D600LN863M8		4034732	A3G0800M08P08DF	KCU10	4035079	T630M080X125R6HX-D1	KP6505	4035587	RCMX3209MORU	KCU10
		030	4034733	A3G0930I0P05DF	KCU10			L58			F95
4032277	MEGA45D800LN863M10		4034734	A3G1250I0P05DF	KCU10	4035080	T630M100X150R6HX-D1	KP6505	4035588	RCMX3209MORU	KCP10
		030	4034735	A3G1250I0P05DF	KCU10			L58			F95
4032278	MEGA45D1000LN863M10		4034736	A3G1870I0P05DF	KCU10	4035081	T630M120X175R6HX-D6	KP6505	4035589	RCMX3209MORU	KCK20
		030	4034737	A3G2180I0P1DF	KCU10			L58			F95
4032279	MEGA45D1200LN863M10		4034738	A3G250I0P1DF	KCU10	4035082	T630M140X200R6HX-D6	KP6505	4035590	RCMX3209MORU	KCU10
		030	4034739	A3G250I0P2DF	KCU10			L58			F95
4033279	RCMX3209MOTUP	KCP10	4034740	A3G250I0P8DF	KCU10	4035103	T630M160X200R6HX-D6	KP6505	4035591	RCMX3209MORU	KCP25
		F95	4034741	A3G250I0P8DF	KCU10			L58			F95
4033280	RCMX3209MOTUP	KCP25	4034742	A3G312I0P8DF	KCU10	4035104	T630M180X250R6HX-D6	KP6505	4035592	RCMX3209MORU	KCK20
		F95	4034743	A3R0300M03P00DF	KCU10			L58			F95
4033281	RCMX3209MOTUP	KCK20	4034744	A3R0300M03SP00DF	KCU10	4035105	T630M200X250R6HX-D6	KP6505	4035593	RCMX3209MORU	KCK20
		F95	4034745	A3R0400M04P00DF	KCU10			L58			F95
4033282	RCMX3209MOTUP	KCP10	4034746	A3R0400M04SP00DF	KCU10	4035459	T640M040X070R6HX-D1	KP6525	4035594	RCMX3209MORU	KCP10
		F95	4034747	A3R0500M05P00DF	KCU10			L64			F95
4033293	RCMX3209MOTUP	KCP25	4034748	A3R0600M06P00DF	KCU10	4035460	T640M050X080R6HX-D1	KP6525	4035595	RCMX3209MORU	KCP25
		F95	4034749	A3R0930I0P00DF	KCU10			L64			F95
4033294	RCMX3209MOTUP	KCK20	4034750	A3R1250I0P00DF	KCU10	4035461	T640M060X100R6HX-D1	KP6525	4035596	RCMX3209MORU	KCK20
		F95	4034751	A3R1250I0P00DF	KCU10			L64			F95
4033295	RCMX2507MOTUP	KCP10	4034752	A3R1870I0P00DF	KCU10	4035462	T640M080X125R6HX-D1	KP6525	4035698	LNHX19194ORRF	KCP10
		F95	4034753	A3R2180I0P00DF	KCU10			L64			F86
4033296	RCMX2507MOTUP	KCP25	4034754	A3R250I0P00DF	KCU10	4035463	T640M100X150R6HX-D1	KP6525	4036621	RP32E KYS30	
		F95	4034755	A3R250I0P8DF	KCU10			L64			R112
4033297	RCMX2507MOTUP	KCK20	4034773	A4G0305M03U02GMM	KCU10	4035464	T640M120X175R6HX-D6	KP6525	4036622	RP32E KYSM10	
		F95	4034774	A4G0305M03U04GMM	KCU10			L64			R112
4033298	RCMX2507MOTUP	KCP10	4034775	A4G0305M03U04GMP	KCU10	4035465	T640M140X200R6HX-D6	KP6525	4036916	LNHX19194ORRF	KCP25
		F95	4034776	A4G0305M03U04GMP	KCU10			L64			F86
4033299	RCMX2507MOTUP	KCP25	4034777	A4G0400M04P02GMP	KCU10	4035466	T640M160X200R6HX-D6	KP6525	4038003	LNPU863ANSRHD	KCPK30
		F95	4034778	A4G0400M04P04GMP	KCU10			L64			031
4033300	RCMX2507MOTUP	KCK20	4034779	A4G0400M04P08GMP	KCU10	4035467	T640M180X250R6HX-D6	KP6525	4038004	LNPU863ANSRHD	KCK15
		F95	4034780	A4G0405M04U04GMM	KCU10			L64			031
4033826	NA4L4	KCU25	4034781	A4G0405M04U04GMP	KCU10	4035468	T640M200X250R6HX-D6	KP6525	4038005	LNPU863ANSRHD	KC725M
		E19	4034782	A4G0405M04U08GMM	KCU10			L64			031
4033827	NA4L5	KCU25	4034783	A4G0405M04U08GMP	KCU10	4035469	T640M220X250R6HX-D6	KP6525	4039608	SM-906	KC720
		E19	4034784	A4G0500M05P04GMP	KCU10			L64			030, 038, 041
4033828	NA4L6	KCU25	4034785	A4G0500M05P08GMP	KCU10	4035505	T640NC#10-24R3BX-A	KP6525	4039774	SM-2236	
		E19	4034786	A4G0505M05U04GMM	KCU10			L62			R73
4033829	NA4L8	KCU25	4034787	A4G0505M05U04GMP	KCU10	4035506	T640NF#10-32R3BX-A	KP6525	4040758	RPET1204M0E1J	KC422M
		E19	4034788	A4G0505M05U08GMM	KCU10			L62			R42
4033830	NA4R4	KCU25	4034789	A4G0600M06P04GMP	KCU10	4035507	T640NC02500-20R2BX-A	KP6525	4040759	RPET1605M0E1J	KC422M
		E19	4034790	A4G0600M06P08GMP	KCU10			L62			R48
4033831	NA4R5	KCU25	4034791	A4G0605M06U04GMM	KCU10	4035508	T640NC02500-20R3BX-A	KP6525	4040760	RPET1204M0E1J	KC422M
		E19	4034792	A4G0605M06U04GMM	KCU10			L62			R42
4033832	NA4R6	KCU25	4034793	A4G0605M06U04GMP	KCU10	4035509	T640NF02500-28R2BX-A	KP6525	4040905	KCJ3M	
		E19	4034794	A4G0605M06U08GMM	KCU10			L62			R109-111
4033833	NA6L2	KCU25	4034795	A4G0605M06U08GMP	KCU10	4035510	T640NF02500-28R3BX-A	KP6525	4041060	ABDF0188J2ARA	K600
		E19	4034796	A4G0605M06U12GMM	KCU10			L62			M42
4033834	NA6L25	KCU25	4034797	A4G0605M06U12GMP	KCU10	4035511	T640NC03125-18R2BX-A	KP6525	4041062	ABDF025J2ARA	K600
		E19	4034798	A4G0800M08P08GMP	KCU10			L62			M42
4033835	NA6L3	KCU25	4034799	A4G0800M08P12GMP	KCU10	4035512	T640NC03125-18R3BX-A	KP6525	4041075	ABDF050J2ARE	K600
		E19	4034800	A4G0805M08U08GMM	KCU10			L62			M42
4033836	NA6R2	KCU25	4034801	A4G0805M08U12GMM	KCU10	4035525	T641M050X080R6HX-D1	KP6525	4041076	ABDF0625J2BS	K600
		E19	4034802	A4G0942BP05GMM	KCU10			L65			M42
4033837	NA6R25	KCU25	4034803	A4G1000M10P08GMM	KCU10	4035526	T641M060X100R6HX-D1	KP6525	4041077	ABDF0625J2BRB	K600
		E19	4034804	A4G1000M10P12GMP	KCU10			L6			

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4042714	BMD200R1203S075L200	R41	4045221	CPGT32505HP KCU10	B93	4045347	WPGT12505UF KCU10	B115	4047742	HPHV312S4050R030 KCPM15	M10
4042715	BMD200R1205S075L200	R41	4045222	CPGT32505LF KCU10	B93	4045403	NPL131F KCU10	F46	4047743	HPHV312S4075 KCPM15	M10
4042716	BMD250R1207S100L200	R41	4045223	CPGT3251HP KCU10	B93	4045404	NPL132F KCU10	F46	4047744	HPHV312S4075CH KCPM15	M10
4042717	BMD300R1208S100L200	R41	4045224	CPGT3251LF KCU10	B93	4045405	NPL331N KCU10	F46	4047745	HPHV312S4075R015 KCPM15	M10
4042718	BMD400R1207S125L200	R41	4045225	CPGT3252HP KCU10	B93	4045406	NPL332F KCU10	F46	4047746	HPHV312S4075R030 KCPM15	M10
4043037	BMD150R1603M16	R45	4045226	CPGT3252LF KCU10	B93	4045407	NPL332N KCU10	F46	4047747	HPHV312S4075R060 KCPM15	M10
4043038	BMD150R1603W125L200	R45	4045227	CPMT125105FW KCU10	B94	4045408	NPL505 KCU10	F47	4047748	HPHV312S4125R030 KCPM15	M10
4043039	BMD150R1602C125L800	R46	4045228	CPMT125151FW KCU10	B94	4045409	NPL508 KCU10	F47	4047749	HPHV312S4050 KCPM15	M10
4043040	BMD200R1603S075L200	R47	4045229	CPMT125152FW KCU10	B94	4045410	NPL51 KCU10	F47	4047750	HPHV312S4050CH KCPM15	M10
4043041	BMD200R1604S075L200	R47	4045230	CPMT3251FW KCU10	B94	4045411	NPL52 KCU10	F47	4047751	HPHV312S4050L KCPM15	M10
4043042	BMD250R1605S100L200	R47	4045231	CPMT3251MW KCU10	B95	4045412	NPR1305 KCU10	F46	4047752	HPHV312S4050LR015 KCPM15	M10
4043053	BMD300R1605S100L200	R47	4045232	CPMT3252FW KCU10	B94	4045413	NPR1308 KCU10	F46	4047753	HPHV312S4050LR030 KCPM15	M10
4043054	BMD400R1608S125L200	R47	4045233	CPMT3252MW KCU10	B95	4045414	NPR131F KCU10	F46	4047754	HPHV312S4050R030 KCPM15	M10
4043055	BMD500R1609S150L250	R47	4045237	DCGT125105HP KCU10	B95	4045415	NPR132F KCU10	F46	4047755	HPHV312S4088 KCPM15	M10
4043056	BMD600R1610S150L250	R47	4045238	DCGT125105LF KCU10	B96	4045416	NPR332 KCU10	F46	4047756	HPHV312S4088CH KCPM15	M10
4044819	TCGT125105HP KCU10	B106	4045239	DCGT12511HP KCU10	B95	4045417	NPR505 KCU10	F47	4047757	HPHV312S4088L KCPM15	M10
4044820	TCGT125105LF KCU10	B106	4045240	DCGT12512HP KCU10	B95	4045418	NPR508 KCU10	F47	4047758	HPHV312S4088LR015 KCPM15	M10
4044821	TCGT12511HP KCU10	B106	4045241	DCGT125105HP KCU10	B95	4045419	NPR51 KCU10	F47	4047759	HPHV312S4088LR030 KCPM15	M10
4044822	TCGT12511LF KCU10	B106	4045242	DCGT125105LF KCU10	B96	4045420	NPR52 KCU10	F47	4047760	HPHV312S4088LR060 KCPM15	M10
4044975	SNGG322LF KCU10	B59	4045245	DPGR431 KCU10	F46	4045421	VBMR2205 KCU10	F48	4047761	HPHV312S4088LR090 KCPM15	M10
4045101	VNGG3305LF KCU10	B74	4045246	DPGR432 KCU10	F46	4045422	VBMR221 KCU10	F48	4047762	HPHV312S4088LR090 KCPM15	M10
4045102	VNGG331LF KCU10	B74	4045247	DPGR433 KCU10	F46	4045423	VBMR222 KCU10	F48	4047763	HPHV312S4088LR090 KCPM15	M10
4045134	CCGT125105HP KCU10	B88	4045248	NPGR51L KCU10	F46	4045424	VCMR331 KCU10	F48	4047764	HPHV312S4088LR090 KCPM15	M10
4045135	CCGT125105LF KCU10	B88	4045249	NPGR51R KCU10	F46	4045425	VCMR332 KCU10	F48	4047765	HPHV312S4088LR090 KCPM15	M10
4045136	CCGT125105HP KCU10	B88	4045250	NPGR52L KCU10	F46	4045426	VPCR3305 KCU10	F48	4047766	HPHV312S4088LR090 KCPM15	M10
4045137	CCGT12511HP KCU10	B88	4045251	NPGR52R KCU10	F46	4045427	VPCR331 KCU10	F48	4047767	HPHV312S4088LR090 KCPM15	M10
4045138	CCGT12511LF KCU10	B88	4045252	NPL1305 KCU10	F46	4045428	VPCR332 KCU10	F48	4047768	HPHV312S4088LR090 KCPM15	M10
4045139	CCGT12512HP KCU10	B88	4045263	DCGT3251HP KCU10	B95	4045429	VPCR333 KCU10	F48	4047769	HPHV312S4088LR090 KCPM15	M10
4045140	CCGT12512LF KCU10	B88	4045264	DCGT3252HP KCU10	B95	4045430	VPCR334 KCU10	F48	4047770	HPHV312S4088LR090 KCPM15	M10
4045141	CCGT32505HP KCU10	B88	4045265	DCGT432LF KCU10	B96	4046076	SVUBB1KR32KIT	K141	4047771	HPHV312S4088LR090 KCPM15	M10
4045142	CCGT32505LF KCU10	B88	4045266	DCMT3251FW KCU10	B96	4046077	SVUBB2KR32KITD025M	K141	4047772	HPHV312S4088LR090 KCPM15	M10
4045143	VNGG332LF KCU10	B74	4045267	DCMT3251MW KCU10	B97	4046078	SVUBB2KR50KITD025M	K141	4047773	HPHV312S4088LR090 KCPM15	M10
4045144	VNGG432LF KCU10	B74	4045268	DCMT3252FW KCU10	B96	4046079	SVS00BK32KIT	K141	4047774	HPHV312S4088LR090 KCPM15	M10
4045145	VNGP330 KCU10	B74	4045269	DCMT3252LF KCU10	B97	4046080	SVS00KR32KIT	K141	4047775	HPHV312S4088LR090 KCPM15	M10
4045146	VNGP3305 KCU10	B74	4045270	DCMT3252MW KCU10	B97	4046081	SVS1BKR32KIT	K141	4047776	HPHV312S4088LR090 KCPM15	M10
4045147	VNGP431 KCU10	B74	4045271	DPGT125105HP KCU10	B98	4046082	SVS2BKR32KIT	K141	4047777	HPHV312S4088LR090 KCPM15	M10
4045148	VNGP432 KCU10	B74	4045272	DPGT125105LF KCU10	B98	4046103	SVS3BKR32KIT	K141	4047778	HPHV312S4088LR090 KCPM15	M10
4045149	VNMG331FF KCU10	B75	4045273	DPGT125105LF KCU10	B98	4046104	SVS4BKR50KIT	K141	4047779	HPHV312S4088LR090 KCPM15	M10
4045150	VNMG331MP KCU10	B76	4045274	DPGT12511HP KCU10	B98	4047419	KSHRH200HN5315C3	016	4047780	HPHV312S4088LR090 KCPM15	M10
4045151	VNMG331P KCU10	B76	4045275	DPGT12511LF KCU10	B98	4047420	KSHRH250HN5315C3	016	4047781	HPHV312S4088LR090 KCPM15	M10
4045152	VNMG331UP KCU10	B78	4045276	DPGT12512HP KCU10	B98	4047421	KSHRH300HN5315C4	016	4047782	HPHV312S4088LR090 KCPM15	M10
4045163	VNMG332FF KCU10	B75	4045277	DPGT32505LF KCU10	B98	4047422	KSHRH400HN5315C5	016	4047783	HPHV312S4088LR090 KCPM15	M10
4045164	VNMG332MP KCU10	B76	4045278	DPGT32505LF KCU10	B98	4047583	KSHRH500HN5315C6	016	4047784	HPHV312S4088LR090 KCPM15	M10
4045166	VNMG332P KCU10	B77	4045279	DPGT3251HP KCU10	B98	4047584	KSHRH600HN5315C8	016	4047785	HPHV312S4088LR090 KCPM15	M10
4045167	VNMG332RP KCU10	B77	4045280	DPGT3251LF KCU10	B98	4047693	HPHV125S4025 KCPM15	M9	4047786	HPHV312S4088LR090 KCPM15	M10
4045168	VNMG332UP KCU10	B78	4045281	DPGT3252HP KCU10	B98	4047694	HPHV125S4025CH KCPM15	M9	4047787	HPHV312S4088LR090 KCPM15	M10
4045169	VNMG333MP KCU10	B76	4045282	DPGT3252LF KCU10	B98	4047695	HPHV125S4025L KCPM15	M9	4047788	HPHV312S4088LR090 KCPM15	M10
4045170	VWNG4305LF KCU10	B79	4045283	DPMT1252FW KCU10	B101	4047696	HPHV125S4025LR015 KCPM15	M9	4047789	HPHV312S4088LR090 KCPM15	M10
4045171	VWNG430LF KCU10	B79	4045284	RCGT10T3M0HP KCU10	B100	4047697	HPHV125S4050 KCPM15	M9	4047790	HPHV312S4088LR090 KCPM15	M10
4045172	VWNG431LF KCU10	B79	4045285	RCGT1204M0HP KCU10	B100	4047698	HPHV125S4050CH KCPM15	M9	4047791	HPHV312S4088LR090 KCPM15	M10
4045173	VWNG432LF KCU10	B79	4045286	RCMT0602M0 KCU10	B101-B102	4047699	HPHV125S4050L KCPM15	M9	4047792	HPHV312S4088LR090 KCPM15	M10
4045174	VWNG433LF KCU10	B80	4045287	RCMT0803M0 KCU10	B101-B102	4047700	HPHV125S4050LR015 KCPM15	M9	4047793	HPHV312S4088LR090 KCPM15	M10
4045175	VWNG433MP KCU10	B81	4045288	RCMT10T3M0 KCU10	B101-B102	4047701	HPHV125S4050R015 KCPM15	M9	4047794	HPHV312S4088LR090 KCPM15	M10
4045176	VWNG433P KCU10	B81	4045289	RCMT1204M0 KCU10	B101-B102	4047702	HPHV188S4031 KCPM15	M9	4047795	HPHV312S4088LR090 KCPM15	M10
4045177	VWNG433UP KCU10	B81	4045290	RCMT1605M0 KCU10	B101-B102	4047703	HPHV188S4031CH KCPM15	M9	4047796	HPHV312S4088LR090 KCPM15	M10
4045178	VWNG433RP KCU10	B83	4045291	RCMT2006M0 KCU10	B101-B102	4047704	HPHV188S4031L KCPM15	M9	4047797	HPHV312S4088LR090 KCPM15	M10
4045179	VWNG431FW KCU10	B80	4045292	RCMT215 KCU10	B101-B102	4047705	HPHV188S4031LR015 KCPM15	M9	4047798	HPHV312S4088LR090 KCPM15	M10
4045180	VWNG431P KCU10	B82	4045293	RCMT325 KCU10	B101-B102	4047706	HPHV188S4063 KCPM15	M9	4047799	HPHV312S4088LR090 KCPM15	M10
4045181	VWNG432FW KCU10	B80	4045294	SPGT3251LF KCU10	B105	4047707	HPHV188S4063CH KCPM15	M9	4047800	HPHV312S4088LR090 KCPM15	M10
4045182	VWNG432MP KCU10	B81	4045295	SPGT3252LF KCU10	B105	4047708	HPHV188S4063L KCPM15	M9	4047801	HPHV312S4088LR090 KCPM15	M10
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4045185	VWNG432RP KCU10	B83	4045314	TCGT32505HP KCU10	B106	4047710	HPHV188S4063LR030 KCPM15	M9	4047803	HPHV312S4088LR090 KCPM15	M10
4045186	VWNG432UP KCU10	B83	4045315	TCGT32505LF KCU10	B106	4047711	HPHV188S4063R015 KCPM15	M9	4047804	HPHV312S4088LR090 KCPM15	M10
4045187	VWNG433MP KCU10	B81	4045316	TCGT3251HP KCU10	B106	4047712	HPHV188S4063R030 KCPM15	M9	4047805	HPHV312S4088LR090 KCPM15	M10
4045188	VWNG433RP KCU10	B83	4045317	TCGT3251LF KCU10	B106	4047713	HPHV250S4038 KCPM15	M9	4047806	HPHV312S4088LR090 KCPM15	M10
4045189	VWNG433UP KCU10	B83	4045318	TCGT3252HP KCU10	B106	4047714	HPHV250S4038CH KCPM15	M9	4047807	HPHV312S4088LR090 KCPM15	M10
4045193	CCGT3250LF KCU10	B88	4045319	TCGT3252LF KCU10	B106	4047715	HPHV250S4038L KCPM15	M9	4047808	HPHV312S4088LR090 KCPM15	M10
4045194	CCGT3251HP KCU10	B88	4045320	TPGM3251 KCU10	B110	4047716	HPHV250S4038LR015 KCPM15	M9	4047809	HPHV312S4088LR090 KCPM15	M10
4045195	CCGT3251LF KCU10	B88	4045321	TPGT181505LF KCU10	B111	4047717	HPHV250S4038LR030 KCPM15	M9	4047810	HPHV312S4088LR090 KCPM15	M10
4045196	CCGT3252HP KCU10	B88	4045322	TPGT18151LF KCU10	B111	4047718	HPHV250S4038R030 KCPM15	M9	4047811	HPHV312S4088LR090 KCPM15	M10
4045197	CCGT3252LF KCU10	B88	4045323	TPGT125105HP KCU10	B110	4047719	HPHV250S4050 KCPM				



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4048707	UCDE1000K5BRF KCPM15	M18	4050444	TPGT3251HP KCU25	B110	4050585	VNMG333RP KCS10	B77	4050752	SPG322 KCU10	B85
4048708	UCDE1000K5BS KCPM15	M18	4050445	TPGT3252HP KCU25	B110	4050588	VNMG431FS KCS10	B79	4050763	SPG323 KCU10	B85
4048709	UCDE188J5BRA KCPM15	M17	4050446	VBGT2205HP KCU25	B113	4050598	VNMG434RP KCS10	B83	4050764	SPG421 KCU10	B85
4048710	UCDE188J5BRB KCPM15	M17	4050447	VBGT221HP KCU25	B113	4050599	RCGH43 KCS10	B100	4050765	SPG422 KCU10	B85
4048711	UCDE188J5BS KCPM15	M17	4050448	VBGT331HP KCU25	B113	4050607	CDHB120601 KCU25	B91	4050766	SPG423 KCU10	B85
4048712	UCDE250J5BRA KCPM15	M17	4050449	VBGT332HP KCU25	B113	4050608	CDHB120605 KCU25	B91	4050767	SPG424 KCU10	B85
4048713	UCDE250J5BRB KCPM15	M17	4050450	RCGK35FS KCU25	F61	4050609	CDHB12061 KCU25	B91	4050768	SPG433 KCU10	B85
4048714	UCDE250J5BS KCPM15	M17	4050451	CNMG432MP KCU25	B44	4050611	CDHH120605L KCU25	B92	4050769	SPG633 KCU10	B85
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4048719	UCDE375J5BRB KCPM15	M17	4050456	CNMG433RP KCU25	B46	4050616	GPCD51 KCU25	B100	4050774	TPG321 KCU10	B86
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4048721	UCDE500J5BRA KCPM15	M17	4050459	CNMG434RP KCU25	B46	4050618	TD6P2 KCU25	B109	4050776	TPG323 KCU10	B86
4048722	UCDE500J5BRB KCPM15	M17	4050460	CNMG542MS KCU25	B46	4050619	TDHB12807501 KCU25	B109	4050777	TPG324 KCU10	B86
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4048728	UCDE500K5BS KCPM15	M17	4050468	CNMG643RP KCU25	B46	4050625	TDHH1280751R KCU25	B109	4050783	TPGF222 KCU10	B87
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4048730	UCDE625J5BRF KCPM15	M17	4050470	CNMG644RP KCU25	B45	4050627	TPCH2205 KCU25	B110	4050785	TPGF322 KCU10	B87
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4048732	UCDE625K5BS KCPM15	M17	4050472	DNGG4305FS KCU25	B50	4050629	TPGH322 KCU25	B110	4050787	TPGF432 KCU10	B87
4048733	UCDE750J5BRB KCPM15	M17	4050473	DNGG431FS KCU25	B50	4050632	RCGK152FS KCU10	F61	4050894	D2FX110404RHP KCU10	F27
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4048738	UCDE750K5BRB KCPM15	M17	4050479	DNMG4305MS KCU25	B54	4050657	RCGK35HP KCU10	F61	4050899	D2FX1150508LHP KCU10	F27
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4050424	DCGT32505HP KCU25	B95	4050540	NPR51 KCU25	F47	4050704	CNMG543RP KCU10	B46	4051085	C8FX120508LRN KCU10	F30
4050425	DCGT3251HP KCU25	B95	4050541	NPR52 KCU25	F47	4050705	CNMG543UP KCU10	B47	4051087	C8FX150612LRN KCU10	F30
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4050427	DPGT21505HP KCU25	B98	4050543	VBMR221 KCU25	F48	4050707	CNMG544RP KCU10	B46	4051089	D2FX1110403RHP KCU10	F27
4050428	DPGT2151HP KCU25	B98	4050544	VCMR331 KCU25	F48	4050708	CNMG642MP KCU10	B44	4051090	C2FX1110405LRN KCU10	F25
4050429	DPGT2152HP KCU25	B98	4050545	VCMR332 KCU25	F48	4050709	CNMG643 KCU10	B41	4051091	D2FX1100505LHP KCU10	F28
4050430	DPGT3251HP KCU25	B98	4050546	VPR3305 KCU25	F48	4050710	CNMG643MP KCU10	B44	4051092	E2FX1100505RHP KCU10	F28
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4050432	RCGT1032MOHP KCU25</										

Order No.	Catalog No.	Page(s)	Order No.	Catalog No.	Page(s)	Order No.	Catalog No.	Page(s)	Order No.	Catalog No.	Page(s)
4051117	C8FX120503LRP	KCU10	F30	4051845	B255A10000YPC	KCK10	G45-G49	4051967	B254A003734YPC	KCK10	G45-G49
4051118	C8FX120505LRP	KCU10	F30	4051846	B255A10200YPC	KCK10	G45-G49	4051968	B254A003797YPC	KCK10	G45-G49
4051119	C8FX120503RRP	KCU10	F30	4051847	B255A10262YPC	KCK10	G45-G49	4051969	B254A03800YPC	KCK10	G45-G49
4051120	C8FX120505RRP	KCU10	F30	4051848	B255A10300YPC	KCK10	G45-G49	4051970	B254A03861YPC	KCK10	G45-G49
4051121	C8FX120503LRP	KCU10	F30	4051849	B255A10320YPC	KCK10	G45-G49	4051971	B254A03970YPC	KCK10	G45-G49
4051122	C8FX120503RMP	KCU10	F30	4051850	B255A10400YPC	KCK10	G45-G49	4051972	B254A04000YPC	KCK10	G45-G49
4051123	C8FX120505LRN	KCU10	F30	4051851	B255A10490YPC	KCK10	G45-G49	4051973	B254A04039YPC	KCK10	G45-G49
4051124	C8FX120506LRN	KCU10	F30	4051852	B255A10500YPC	KCK10	G45-G49	4051974	B254A04100YPC	KCK10	G45-G49
4051125	C8FX120505RRN	KCU10	F30	4051853	B255A10600YPC	KCK10	G45-G49	4051975	B254A04200YPC	KCK10	G45-G49
4051126	C8FX120506RRN	KCU10	F30	4051854	B255A10716YPC	KCK10	G45-G49	4051976	B254A04366YPC	KCK10	G45-G49
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4051132	C8FX120508LRM	KCU10	F30	4051860	B255A11200YPC	KCK10	G45-G49	4051982	B254A04800YPC	KCK10	G45-G49
4051133	C8FX120508RMP	KCU10	F30	4051861	B255A11300YPC	KCK10	G45-G49	4051983	B254A05000YPC	KCK10	G45-G49
4051134	C8FX1205085RMP	KCU10	F30	4051862	B255A11500YPC	KCK10	G45-G49	4051984	B254A05055YPC	KCK10	G45-G49
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4051218	C8FX120508LRN	KCP10	F30	4051888	B255A14600YPC	KCK10	G45-G49	4052009	B254A06909YPC	KCK10	G45-G49
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4051221	C8FX120508RMP	KCP10	F30	4051891	B255A14750YPC	KCK10	G45-G49	4052012	B254A07366YPC	KCK10	G45-G49
4051222	C8FX1205085RMP	KCP10	F30	4051892	B255A14800YPC	KCK10	G45-G49	4052013	B254A07400YPC	KCK10	G45-G49
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4054489	D2FX150510RMIN KCP25	F26	4056987	RHM18000KST155H7HF KT325	K103-K104	4057206	EB16301281650	K200	4059136	T631M420X450R6HX-D6 KP6525	L73
4054490	D2FX150503RMN KCP25	F26	4056988	RHM19000KST155H7HF KT325	K103-K104	4057207	EBSD1105	K200	4059938	LNEU1240R08 4 KC725M	Q21
4054491	C2FX150505LMN KCP25	F25	4056989	RHM19050KST155H7HF KT325	K103-K104	4057208	EBSD2205	K200	4059939	LNEU1240R16 4 KC725M	Q21
4054556	D2FX150504RMN KCP40	F26	4056990	RHM14288KST115H7HF KT6215	K103-K104	4057561	RP443E KYHS10	R112	4059940	LNEU1235R03 4 KC725M	Q21
4054557	D2FX150508RMN KCP40	F26	4056991	RHM15000KST115H7HF KT6215	K103-K104	4057575	KSHR300HN7545M4	024	4059941	LNEU1240R03 4 KC725M	Q21
4054558	D2FX110404LMN KCP40	F26	4056992	RHM16000KST135H7HF KT6215	K103-K104	4057576	KSHR400HN7545M5	024	4059942	LNEQ1235R03 4 KC725M	Q22
4054559	D2FX110404LMN KCP40	F26	4056993	RHM17000KST135H7HF KT6215	K103-K104	4057577	KSHR500HN7545M6	024	4060093	LNEQ1240R03 4 KC725M	Q22
4054560	D2FX110404LMN KCP40	F26	4056994	RHM17463KST135H7HF KT6215	K103-K104	4057578	KSHR600HN7545M8	024	4060094	LNEQ1240 4 KC735M	Q22
4054561	C2FX110404RMN KCP40	F25	4056995	RHM18000KST135H7HF KT6215	K103-K104	4057579	KSHR800HN7545M10	024	4060097	LNEU1235R03 4 KC735M	Q21
4054562	C2FX110404RMN KCP40	F26	4056996	RHM19000KST155H7HF KT6215	K103-K104	4057583	KSHR1000HN7545M10	024	4060098	LNEU1240R03 4 KC735M	Q21
4054643	C2FX110404RMN KCP40	F25	4056997	RHM19050KST155H7HF KT6215	K103-K104	4057584	KSHR1200HN7545M10	024	4060099	LNEU1235R03 4 KC520M	Q21
4054644	C2FX110404RMN KCP40	F25	4056998	RHM19050KST155H7HF KT6215	K103-K104	4057585	KSHR1200HN7545M10	024	4060100	LNEU1240R08 4 KC520M	Q21
4054645	C2FX110404RMN KCP40	F25	4057024	RHM14000KST115H7SF KC6305	K105	4057639	HNPJ75ANSNHD KCPK30	025	4060101	LNEU1240R03 4 KC520M	Q21
4054646	C2FX110404RMN KCP40	F25	4057025	RHM14288KST115H7SF KC6305	K105	4057640	HNPJ75ANSNHD KCK15	025	4060102	LNEU1235R03SGP 4 KC725M	Q22
4054647	C2FX110404RMN KCP40	F25	4057026	RHM15000KST115H7SF KC6305	K105	4057641	HNPJ75ANSNHD KC725M	025	4060528	KST11515AS	K107, K110
4054648	C2FX110404RMN KCP40	F25	4057027	RHM15875KST115H7SF KC6305	K105	4057657	A2016R16CLO1 KCJ25	D14	4060529	KST135155AS	K107, K110
4054649	C2FX110404RMN KCP40	F25	4057028	RHM16000KST135H7SF KC6305	K105	4057658	A2022R06CLO2 KCJ25	D14	4061407	XNFX432NENW KY3500	0105
4054650	C2FX110404RMN KCP40	F25	4057029	RHM17000KST135H7SF KC6305	K105	4057659	A2040R06CLO2 KCJ25	D14	4062111	920028015	K203
4054651	D4FX140604RMN KCP40	F29	4057030	RHM17463KST135H7SF KC6305	K105	4057660	A2040N00CLO2 KCJ25	D14	4062112	HSK100B113075	K203
4054652	D4FX140608RMN KCP40	F29	4057031	RHM18000KST155H7SF KC6305	K105	4057661	A2022R06CLO2 KCJ25	D14	4062443	EBUCW0074	K101
4054653	D4FX140604LMN KCP40	F29	4057032	RHM19000KST155H7SF KC6305	K105	4057662	A2030R06CLO2 KCJ25	D14	4062796	MS2235	R3-4
4054654	D4FX140608LMN KCP40	F29	4057033	RHM19050KST155H7SF KC6305	K105	4057673	A2040R06CLO2 KCJ25	D14	4063996	SDB24RBHT06F	K190
4054655	C8FX120504RRP KCP40	F30	4057034	RHM14000KST115H7SF KC6305	K105	4057828	HNPJ75ANSNHD KCPK30	025	4063997	SDB30RBHT06F	K190
4054656	C8FX120508RRP KCP40	F30	4057035	RHM14288KST115H7SF KC6305	K105	4057829	HNPJ75ANSNHD KCK15	025	4063998	SDB40RBHT09F	K190
4054658	C8FX150612RRN KCP40	F30	4057036	RHM15000KST115H7SF KC6305	K105	4057830	HNPJ75ANSNHD KC725M	025	4063999	SDB50RBHT09F	K190
4054659	C8FX120504LRP KCP40	F30	4057037	RHM15875KST115H7SF KC6305	K105	4057854	HNPJ75ANSNHD KCPK30	025	4064000	SDB66RBHT12F	K190
4054660	C8FX120508LRP KCP40	F30	4057038	RHM16000KST135H7SF KC6305	K105	4057855	HNPJ75ANSNHD KCK15	025	4064001	SDB66RBHT12LF	K190
4054662	C8FX150612LRN KCP40	F30	4057039	RHM17000KST135H7SF KC6305	K105	4057856	HNPJ75ANSNHD KC725M	025	4064002	SDB87RBHT12F	K190
4054718	KTIP2600HPM KC7315	H6-H10	4057040	RHM17463KST135H7SF KC6305	K105	4057865	HNGJ75ANENGDK CPK30	025	4064159	LNPJ863ANSRHD KC520M	031
4054719	KTIP10310HP KC7315	H6-H10	4057041	RHM18000KST155H7SF KC6305	K105	4057866	HNGJ75ANENGDK CCK15	025	4064203	SDB87RBHT16LF	K190
4054720	KTIP2650HPM KC7315	H6-H10	4057042	RHM19000KST155H7SF KC6305	K105	4057867	HNGJ75ANENGDK KC725M	025	4064204	SDB115RBHT16LF	K190
4054721	KTIP10469HP KC7315	H6-H10	4057043	RHM19050KST155H7SF KC6305	K105	4058547	LNEQ1235R03 4 KCK15	Q22	4064205	SDB115RBHT12F	K190
4054722	KTIP2750HPM KC7315	H6-H10	4057044	RHM14000KST115H7SF KT6215	K105	4058549	LNEU1240R03 4 KCK15	Q22	4064258	TP225	Q24
4054723	KTIP10938HP KC7315	H6-H10	4057045	RHM14288KST115H7SF KT6215	K105	4058550	LNEU1240R03SGP 4 KC735M	Q22	4067219	HPHV750S4225SCH KCPM15	M13
4054725	KTIP10310HP KC7410	H6-H10	4057046	RHM15000KST115H7SF KT6215	K105	4058551	LNEU1240R03SGP 4 KC725M	Q22	4067220	HPHV750S4225R030 KCPM15	M13
4054726	KTIP10469HP KC7410	H6-H10	4057047	RHM15875KST115H7SF KT6215	K105	4058763	LNEQ1240R03 4 CCKP30	Q22	4067221	HPHV750S4225R060 KCPM15	M13
4054727	KTIP10938HP KC7410	H6-H10	4057048	RHM16000KST135H7SF KT6215	K105	4059040	T620M240X300R6HX-LX KP6525	L71	4067222	HPHV750S4300 KCPM15	M13
4054728	KTIP2600HPM KC7410	H6-H10	4057049	RHM17000KST135H7SF KT6215	K105	4059042	T620M300X350R6HX-LX KP6525	L71	4067236	HPHV625S4075SCH KCPM15	M12
4054729	KTIP2650HPM KC7410	H6-H10	4057050	RHM17463KST135H7SF KT6215	K105	4059043	T620M330X350R6HX-LX KP6525	L71	4067237	HPHV625S4075CH KCPM15	M12
4054730	KTIP2700HPM KC7410	H6-H10	4057051	RHM18000KST155H7SF KT6215	K105	4059044	T620M360X400R6HX-LX KP6525	L71	4067238	HPHV625S4075L KCPM15	M12
4054731	KTIP2750HPM KC7410	H6-H10	4057052	RHM19000KST155H7SF KT6215	K105	4059045	T620M360X400R6HX-LX KP6525	L71	4067239	HPHV625S4075LR015 KCPM15	M12
4054732	KTIP2799HPM KC7410	H6-H10	4057053	RHM19050KST155H7SF KT6215	K105	4059047	T620M420X450R6HX-LX KP6525	L71	4067240	HPHV625S4075LR030 KCPM15	M12
4054733	HSK100ASVUBB2124MCLB	K147	4057054	RHM19050KST155H7SF KT6215	K105	4059051	T630M240X300R6HX-LX KP6525	L72	4067242	HPHV625S4075LR120 KCPM15	M12
4054735	HSK63ASVUBB2116MCLB	K147	4057055	RHM19050KST155H7SF KT6215	K105	4059053	T630M300X350R6HX-LX KP6525	L72	4067253	HPHV625S4075R060 KCPM15	M12
4054736	KM50TSSVUBB2100MCLB	K146	4057056	RHM19050KST155H7SF KT6215	K105	4059054	T630M300X350R6HX-LX KP6525	L72	4067254	HPHV625S4075R120 KCPM15	M12
4054738	KR32SVUBB2085MCLB	K146	4057057	RHM19050KST155H7SF KT6215	K105	4059055	T630M360X400R6HX-LX KP6525	L72	4067255	HPHV625S4125 KCPM15	M12
4054739	KR50SVUBB2075MCLB	K146	4057058	RHM19050KST155H7SF KT6215	K105	4059056	T630M360X400R6HX-LX KP6525	L72	4067256	HPHV625S4125CH KCPM15	M12
4056174	SS16KST115AR3M	K107	4057059	RHM19050KST155H7SF KT6215	K105	4059058	T630M420X450R6HX-LX KP6525	L72	4067257	HPHV625S4125R030 KCPM15	M12
4056175	SS20KST135AR3M	K107	4057060	RHM19050KST155H7SF KT6215	K105	4059062	T631M240X300R6HX-LX KP6525	L73	4067258	HPHV625S4125R060 KCPM15	M12
4056176	SS20KST155AR3M	K107	4057061	AFM29115	K194	4059064	T631M300X350R6HX-LX KP6525	L73	4067259	HPHV625S4125R090 KCPM15	M12
4056177	SS16KST115AR5M	K107	4057062	AFM47115	K194	4059065	T631M330X350R6HX-LX KP6525	L73	4067260	HPHV625S4125R120 KCPM15	M12
4056178	SS20KST135AR5M	K107	4057063	AFM29SCFPR06	K195	4059066	T631M360X400R6HX-LX KP6525	L73	4067261	HPHV625S4163 KCPM15	M12
4056179	SS20KST155AR5M	K107	4057064	AFM47SCFPR09	K195	4059067	T631M360X400R6HX-LX KP6525	L73	4067262	HPHV625S4163R030 KCPM15	M12
4056180	HSK63AKST115AR3M	K109	4057065	AFM47SCFPR09	K195	4059069	T631M420X450R6HX-LX KP6525	L73	4067263	HPHV625S4163R060 KCPM15	M12
4056181	HSK63AKST135AR3M	K109	4057066	EBM8015086	K195	4059092	T620M300X350R6HX-D6 KP6525	L71	4067264	HPHV625S4163R120 KCPM15	M12
4056182	HSK63AKST155AR3M	K109	4057067	886038045	K195	4059092	T620M300X350R6HX-D6 KP6525	L71	4067265	HPHV625S4213 KCPM15	M12
4056183	SIF70KST115AR5M	K110	4057068	886038045	K195	4059067	T631M360X400R6HX-LX KP6525	L73	4067266	HPHV625S4213R030 KCPM15	M12
4056184	SIF70KST135AR5M	K110	4057069	HSK63FBHMKIT164M	K186	4059067	T631M360X400R6HX-LX KP6525	L73	4067267	HPHV625S4213R120 KCPM15	M12
4056185	SIF70KST155AR5M	K110	4057070	HSK63FBHMKIT164M	K186	4059090	T620M240X300R6HX-D6 KP6525	L71	4067268	HPHV625S4225R060 KCPM15	M12
4056390	RHM14000KST115H7HF KT6215	K103-K104	4057071	BT40FBHMKIT164M	K186	4059092	T620M240X300R6HX-D6 KP6525	L71	4067269	HPHV750S4088 KCPM15	M12
4056513	RP443E KYSP30	R112	4057100	KM50TSFBHMKIT164M	K186	4059092	T620M240X300R6HX-D6 KP6525	L71	4067270	HPHV750S4088CH KCPM15	M12
4056514	RP443E KYSM10	R112	4057101	KM50TSFBHMKIT164M	K186	4059092	T620M240X300R6HX-D6 KP6525	L71	4067271	HPHV750S4088L KCPM15	M12
4056960	RHM14000KST115H7HF KC6305	K103-K104	4057204	EB630128650	K200	4067272	HPHV750S4088LR030 KCPM15	M12	4067273	HPHV750S4150 KCPM15	M12
4056961	RHM14288KST115H7HF KC6305	K103-K104				4067274	HPHV750S4150CH KCPM15	M12	4067275	HPHV750S4150R015 KCPM15	M12
4056962	RHM15000KST115H7HF KC6305	K103-K104				4067276	HPHV750S4150R030 KCPM15	M12	4067276	HPHV750S4150R030 KCPM15	M12
4056963	RHM16000KST135H7HF KC6305	K103-K104				4067277	HPHV750S4150R060 KCPM15	M12	4067277	HPHV750S4150R060 KCPM15	M12
4056964	RHM17000KST135H7HF KC6305	K103-K104				4067278	HPHV750S4150R090 KCPM15	M12	4067278	HPHV750S4150R090 KCPM15	M12



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4067307	HPHV1000S4150CH KCPM15	M13	4071912	HPHV500S4125 KCPM15	M11	4096485	B211A03300HP KCM15	G26	4096638	K210A03750HP KCM15	G30
4067308	HPHV1000S4150R030 KCPM15	M13	4071913	HPHV500S4125CH KCPM15	M11	4096486	B211A03400HP KCM15	G26	4096639	K210A03906HP KCM15	G30
4067309	HPHV1000S4150R060 KCPM15	M13	4071914	HPHV500S4125R015 KCPM15	M11	4096487	B211A03455HP KCM15	G26	4096640	K210A04063HP KCM15	G30
4067310	HPHV1000S4150R090 KCPM15	M13	4071915	HPHV500S4125R030 KCPM15	M11	4096488	B211A03500HP KCM15	G26	4096641	K210A04219HP KCM15	G30
4067311	HPHV1000S4150R120 KCPM15	M13	4071916	HPHV500S4125R060 KCPM15	M11	4096489	B211A03571HP KCM15	G26	4096642	K210A04375HP KCM15	G31
4067312	HPHV1000S4150R250 KCPM15	M13	4071917	HPHV500S4125R090 KCPM15	M11	4096490	B211A03600HP KCM15	G26	4096643	K210A04531HP KCM15	G31
4067313	HPHV1000S4200 KCPM15	M13	4071918	HPHV500S4125R120 KCPM15	M11	4096491	B211A03658HP KCM15	G26	4096644	K210A04688HP KCM15	G31
4067314	HPHV1000S4200R030 KCPM15	M13	4071919	HPHV500S4150 KCPM15	M11	4096492	B211A03700HP KCM15	G26	4096645	K210A04844HP KCM15	G31
4067315	HPHV1000S4200R060 KCPM15	M13	4071920	HPHV500S4150CH KCPM15	M11	4096493	B211A03734HP KCM15	G26	4096646	K210A05000HP KCM15	G31
4067316	HPHV1000S4200R120 KCPM15	M13	4071921	HPHV500S4150R030 KCPM15	M11	4096494	B211A03800HP KCM15	G26	4096647	K210A05625HP KCM15	G31
4067317	HPHV1000S4200R250 KCPM15	M13	4071922	HPHV500S4150R060 KCPM15	M11	4096495	B211A03861HP KCM15	G26	4096648	K210A06250HP KCM15	G31
4067318	HPHV1000S4225 KCPM15	M13	4071923	HPHV500S4163 KCPM15	M11	4096496	B211A03900HP KCM15	G26	4096649	K210A06875HP KCM15	G31
4067319	HPHV1000S4225CH KCPM15	M13	4071924	HPHV500S4163R030 KCPM15	M11	4096497	B211A04000HP KCM15	G26	4096650	K210A07500HP KCM15	G31
4067320	HPHV1000S4225R030 KCPM15	M13	4071925	HPHV500S4163R060 KCPM15	M11	4096498	B211A04039HP KCM15	G26	4097078	MCLNR164DBB	F11
4067321	HPHV1000S4225R060 KCPM15	M13	4071926	HPHV500S4163R120 KCPM15	M11	4096499	B211A04090HP KCM15	G26	4097079	MCLNR164DBB	F11
4067322	HPHV1000S4263 KCPM15	M13	4071927	HPHV500S4200 KCPM15	M11	4096500	B211A04100HP KCM15	G26	4097081	MCLNR2020K12BB	F11
4067323	HPHV1000S4263CH KCPM15	M13	4071928	HPHV500S4200CH KCPM15	M11	4096501	B211A04200HP KCM15	G26	4097082	MCLNR2020K12BB	F11
4067324	HPHV1000S4263R030 KCPM15	M13	4071929	HPHV500S4200R030 KCPM15	M11	4096502	B211A04217HP KCM15	G26	4098740	KM50TSMCLNR12BB	F10
4067325	HPHV1000S4300CH KCPM15	M13	4071930	HPHV500S4250R030 KCPM15	M12	4096503	B211A04300HP KCM15	G26	4098741	KM50TSMCLNR12BB	F10
4067326	HPHV1000S4300R030 KCPM15	M13	4071931	HPHV500S4250R060 KCPM15	M12	4096504	B211A04366HP KCM15	G26	4099188	K211A01563HP KCM15	G30
4067327	HPHV1000S4300R060 KCPM15	M13	4071932	HPHV500S4300R030 KCPM15	M12	4096505	B211A04400HP KCM15	G26	4099189	K211A01636HP KCM15	G30
4067328	HPHV1000S4400CH KCPM15	M13	4071933	HPHV500S4300R060 KCPM15	M12	4096506	B211A04500HP KCM15	G26	4099190	K211A01803HP KCM15	G30
4067329	HPHV1000S4400R030 KCPM15	M13	4072182	HPRSHV1000S4600 KCPM15	M15	4096507	B211A04700HP KCM15	G26	4099191	K211A01820HP KCM15	G30
4067330	HPHV1000S4400R060 KCPM15	M13	4072203	HPRSHV1000S4600CH KCPM15	M15	4096508	B211A04800HP KCM15	G26	4099192	K211A01850HP KCM15	G30
4067331	HPHV1250S4225CH KCPM15	M13	4072204	HPRSHV1000S4700CH KCPM15	M15	4096509	B211A04852HP KCM15	G26	4099283	K211A01875HP KCM15	G30
4067332	HPHV1250S4225R030 KCPM15	M13	4072205	HPRSHV500S4600 KCPM15	M15	4096510	B211A04900HP KCM15	G26	4099284	K211A02071HP KCM15	G30
4067333	HPHV1250S4225R120 KCPM15	M13	4072206	HPRSHV500S4600CH KCPM15	M15	4096511	B211A05000HP KCM15	G26	4099285	K211A02130HP KCM15	G30
4067343	HPHVB188S4063 KCPM15	M16	4072207	HPRSHV625S4600 KCPM15	M15	4096512	B211A05100HP KCM15	G26	4099286	K211A02180HP KCM15	G30
4067344	HPHVB188S4063R030 KCPM15	M16	4072208	HPRSHV625S4600CH KCPM15	M15	4096513	B211A05106HP KCM15	G26	4099287	K211A02211HP KCM15	G30
4067345	HPHVB188S4063R060 KCPM15	M16	4072209	HPRSHV750S4500CH KCPM15	M15	4096514	B211A05159HP KCM15	G26	4099288	K211A02500HP KCM15	G30
4067346	HPHVB188S4063R120 KCPM15	M16	4072210	HPRSHV750S4600 KCPM15	M15	4096515	B211A05200HP KCM15	G26	4099289	K211A02570HP KCM15	G30
4067347	HPHVB188S4063R250 KCPM15	M16	4072211	HPRSHV750S4600CH KCPM15	M15	4096516	B211A05300HP KCM15	G26	4099290	K211A02610HP KCM15	G30
4067348	HPHVB188S4063R300 KCPM15	M16	4072212	HPRSHV750S4600CH KCPM15	M15	4096517	B211A05400HP KCM15	G26	4099291	K211A02649HP KCM15	G30
4067349	HPHVB188S4063R450 KCPM15	M16	4072213	HPRSHV750S4600CH KCPM15	M15	4096518	B211A05500HP KCM15	G27	4099292	K211A02656HP KCM15	G30
4067350	HPHVB188S4063R600 KCPM15	M16	4072214	HPRSHV750S4600CH KCPM15	M15	4096519	B211A05600HP KCM15	G27	4099293	K211A02720HP KCM15	G30
4067351	HPHVB188S4063R900 KCPM15	M16	4072215	HPRSHV750S4600CH KCPM15	M15	4096520	B211A05616HP KCM15	G27	4099294	K211A02770HP KCM15	G30
4067352	HPHVB188S4063R1200 KCPM15	M16	4072216	HPRSHV750S4600CH KCPM15	M15	4096521	B211A05700HP KCM15	G27	4099295	K211A02813HP KCM15	G30
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4067358	HPHVB188S4063R3000 KCPM15	M16	4072222	HPRSHV750S4600CH KCPM15	M15	4096527	B211A06200HP KCM15	G27	4099301	K211A03390HP KCM15	G30
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4109755	..NG3M400RK KCU25D130	4109856NGD4250LK KCU25D134	4109961NTK3R KCU25E12	4111753B221A04700HP KCPK15G34
4109756	..NG3M425LK KCU25D132	4109857NGD4250RK KCU25D134	4109962NTP2L KCU25E11	4111754B221A04763HP KCPK15G34
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4109759	..NG3M450RK KCU25D130	4109860NJ3014R12 KCU25E14	4109965NTP3R KCU25E11	4111757B221A04900HP KCPK15G34
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4109762	..NG4125R KCU25D128	4109863NJF3008R20 KCU25E15	4111030A2016L06CM00 KCU25D16	4111760B221A05106HP KCPK15G34
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4109776	..NG4189R KCU25D128	4109877NJP3020L8 KCU25E14	4111084A2022N00CM02 KCU25D16	4111774B221A06000HP KCPK15G35
4109777	..NG4189RK KCU25D131	4109878NJP3020R8 KCU25E14	4111085A2022N00CR02 KCU25D17	4111775B221A06100HP KCPK15G35
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4109784	..NG3072LK KCU25D131	4109885NPD3012RK KCU25D137	4111092A2030L06CM01 KCU25D16	4111782B221A06600HP KCPK15G35
4109785	..NG3072RK KCU25D130	4109886NR2031L KCU25D139	4111093A2030R06CR03 KCU25D17	4111783B221A06630HP KCPK15G35
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4109802	..NG4M550LK KCU25D132	4109903NR3062LK KCU25D140	4111110A2040N00CR02 KCU25D17	4111800B221A07900HP KCPK15G35
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4109805	..NG3097R KCU25D128	4109906NR3078L KCU25D140	4111113A2050N00CF03 KCU25D15	4111803B221A08100HP KCPK15G35
4109806	..NG3105L KCU25D129	4109907NR3078RK KCU25D140	4111114A2050N00CM03 KCU25D16	4111804B221A08200HP KCPK15G35
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4109808	..NG3110L KCU25D129	4109909NR3094R KCU25D138	4111116A2050R06CF03 KCU25D15	4111806B221A08334HP KCPK15G35
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4109811	..NG3122R KCU25D128	4109912NR4094LK KCU25D140	4111119A2060N00CR03 KCU25D17	4111809B221A08500HP KCPK15G35
4109812	..NG3125L KCU25D129	4109913NR4094RK KCU25D140	4111120A2060N00CR04 KCU25D16	4111810B221A08600HP KCPK15G35
4109813	..NG4M550RK KCU25D131	4109914NR4125L KCU25D139	4111121A2080N00CM04 KCU25D16	4111811B221A08700HP KCPK15G35
4109814	..NG4M600LK KCU25D132	4109915NR4125LK KCU25D140	4111122B221A03048HP KCPK15G34	4111812B221A08733HP KCPK15G35
4109815	..NG4M600RK KCU25D131	4109916NR4125RK KCU25D138	411112					

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4112672	B224A03048HP	KCPK15.....G39	4112766	B224A18000HP	KCPK15.....G43	4114407	A3G0400M04P08DF	KCU25.....D31	4116675	T620NC#12-24R3BX-A	KM6515.....L50
4112673	B224A03000HP	KCPK15.....G39	4112767	B224A19000HP	KCPK15.....G43	4114408	A3G0400M4SP02DF	KCU25.....D32	4116676	T620NC02500-20R2BX-A	KM6515.....L50
4112674	B224A03100HP	KCPK15.....G39	4112768	B224A19050HP	KCPK15.....G43	4114409	A3G0400M4SP04DF	KCU25.....D32	4116677	T620NC02500-20R3BX-A	KM6515.....L50
4112675	B224A03175HP	KCPK15.....G39	4112769	B224A20000HP	KCPK15.....G43	4114410	A3G0405M04U02DM	KCU25.....D33	4116678	T620NC03125-18R2BX-A	KM6515.....L50
4112676	B224A03200HP	KCPK15.....G39	4113456	W0EJ090512SRHD	KCK115.....R85	4114411	A3G0500M05P02DF	KCU25.....D31	4116679	T620NC03125-18R3BX-A	KM6515.....L50
4112677	B224A03264HP	KCPK15.....G39	4113708	A4C0155N00CF01	KCU25.....D86	4114412	A3G0500M05P04DF	KCU25.....D31	4116680	T620NC03750-16R2BX-A	KM6515.....L50
4112678	B224A03300HP	KCPK15.....G39	4113709	A4C0155R10CF01	KCU25.....D86	4114413	A3G0500M05P08DF	KCU25.....D31	4116681	T620NC03750-16R3BX-A	KM6515.....L50
4112679	B224A03400HP	KCPK15.....G39	4113710	A4C0205L06CF02	KCU25.....D86	4114414	A3G0505M05U02DM	KCU25.....D33	4116682	T620NC04375-14R3BX-A	KM6515.....L50
4112680	B224A03455HP	KCPK15.....G39	4113711	A4C0205N00CF02	KCU25.....D86	4114415	A3G0600M06P04DF	KCU25.....D31	4116683	T620NC05000-13R3BX-A	KM6515.....L50
4112681	B224A03500HP	KCPK15.....G39	4113712	A4C0205R06CF02	KCU25.....D86	4114416	A3G0600M06P08DF	KCU25.....D31	4116684	T620NC06250-11R3BX-A	KM6515.....L50
4112682	B224A03571HP	KCPK15.....G39	4114283	A4C0205R10CF02	KCU25.....D86	4114417	A3G0600M06P12DF	KCU25.....D31	4116685	T620NC07500-10R3BX-A	KM6515.....L50
4112683	B224A03600HP	KCPK15.....G39	4114284	A4C0255N00CF02	KCU25.....D86	4114418	A3G0605M06U04DM	KCU25.....D33	4116686	T620NF#08-36R3BX-A	KM6515.....L50
4112684	B224A03658HP	KCPK15.....G39	4114285	A4C0305L06CF02	KCU25.....D86	4114419	A3G0800M08P04DF	KCU25.....D31	4116687	T620NF#10-32R2BX-A	KM6515.....L50
4112685	B224A03700HP	KCPK15.....G39	4114286	A4C0305L10CF02	KCU25.....D86	4114420	A3G0800M08P08DF	KCU25.....D31	4116688	T620NF#10-32R3BX-A	KM6515.....L50
4112686	B224A03734HP	KCPK15.....G39	4114287	A4C0305N00CF02	KCU25.....D86	4114421	A3G0805M08U04DM	KCU25.....D33	4116689	T620NF02500-28R2BX-A	KM6515.....L50
4112687	B224A03800HP	KCPK15.....G39	4114288	A4C0305R06CF02	KCU25.....D86	4114422	A3G09303P05DF	KCU25.....D33	4116690	T620NF02500-28R3BX-A	KM6515.....L50
4112688	B224A03900HP	KCPK15.....G39	4114289	A4C0305R10CF02	KCU25.....D86	4114423	A3G1005M10U05DM	KCU25.....D33	4116691	T620NF03125-24R3BX-A	KM6515.....L50
4112689	B224A03970HP	KCPK15.....G39	4114290	A4C0405L06CF02	KCU25.....D86	4114424	A3G12503P05DF	KCU25.....D31	4116692	T620NF03750-24R3BX-A	KM6515.....L50
4112690	B224A04000HP	KCPK15.....G39	4114291	A4C0405L10CF02	KCU25.....D86	4114425	A3G12504P05DF	KCU25.....D31	4116693	T620NF04375-20R3BX-A	KM6515.....L50
4112691	B224A04039HP	KCPK15.....G39	4114292	A4C0405N00CF02	KCU25.....D86	4114426	A3G18705P05DF	KCU25.....D31	4116694	T620NF05000-20R3BX-A	KM6515.....L50
4112692	B224A04090HP	KCPK15.....G39	4114293	A4C0405R06CF02	KCU25.....D86	4114427	A3G21806P1DF	KCU25.....D31	4116695	T620NF05000-20R3BX-A	KM6515.....L50
4112693	B224A04200HP	KCPK15.....G39	4114294	A4C0405R10CF02	KCU25.....D86	4114428	A3G21806P2DF	KCU25.....D31	4116696	T620NF05000-20R3BX-A	KM6515.....L50
4112694	B224A04217HP	KCPK15.....G39	4114295	A4G0200M02P02GMP	KCU25.....D79	4114429	A3G25006P1DF	KCU25.....D31	4116697	T620NF05000-20R3BX-A	KM6515.....L50
4112695	B224A04366HP	KCPK15.....G39	4114296	A4G0205M02U02GMM	KCU25.....D80	4114430	A3G25006P2DF	KCU25.....D31	4116698	T620NF05000-20R3BX-A	KM6515.....L50
4112696	B224A04623HP	KCPK15.....G39	4114297	A4G0205M02U02GMP	KCU25.....D79	4114431	A3G25008P1DF	KCU25.....D31	4116699	T620NF05000-20R3BX-A	KM6515.....L50
4112697	B224A04763HP	KCPK15.....G39	4114298	A4G0255M2BU02GMP	KCU25.....D79	4114432	A3G25008P2DF	KCU25.....D31	4116700	T620M050X080R6HX-A	KP6505.....L57
4112698	B224A04852HP	KCPK15.....G39	4114299	A4G0300M03P02GMP	KCU25.....D79	4114433	A3G31208P1DF	KCU25.....D31	4116701	T620M060X100R6HX-A	KM6515.....L51
4112699	B224A05000HP	KCPK15.....G39	4114300	A4G0300M03P04GMP	KCU25.....D79	4114434	A3R0300M03P00DF	KCU25.....D32	4116702	T620M060X100R6HX-A	KP6505.....L57
4112700	B224A05100HP	KCPK15.....G39	4114301	A4G0305M03U02GM	KCU25.....D85	4114435	A3R0305M03U00DR	KCU25.....D33	4116703	T620M060X100R6HX-A	KP6505.....L57
4112701	B224A05159HP	KCPK15.....G40	4114302	A4G0305M03U02GMM	KCU25.....D80	4114436	A3R0400M4SP00DF	KCU25.....D32	4116704	T620M060X100R6HX-A	KP6505.....L57
4112702	B224A05410HP	KCPK15.....G40	4114303	A4G0305M03U02GMP	KCU25.....D79	4114437	A3R0400M4SP00DF	KCU25.....D32	4116705	T620M060X100R6HX-A	KP6505.....L57
4112703	B224A05500HP	KCPK15.....G40	4114304	A4G0305M03U04GMM	KCU25.....D80	4114438	A3R0405M04U00DR	KCU25.....D33	4116706	T620M060X100R6HX-A	KP6505.....L57
4112704	B224A05558HP	KCPK15.....G40	4114305	A4G0305M03U04GMP	KCU25.....D79	4114439	A3R0500M05P00DF	KCU25.....D32	4116707	T620M060X100R6HX-A	KP6505.....L57
4112705	B224A05616HP	KCPK15.....G40	4114306	A4G0400M04P02GMP	KCU25.....D79	4114440	A3R0505M05U00DR	KCU25.....D33	4116708	T620M060X100R6HX-A	KP6505.....L57
4112706	B224A05954HP	KCPK15.....G40	4114307	A4G0400M04P04GMP	KCU25.....D79	4114441	A3R0600M06P00DF	KCU25.....D32	4116709	T620M060X100R6HX-A	KP6505.....L57
4112707	B224A06000HP	KCPK15.....G40	4114308	A4G0400M04P08GMP	KCU25.....D79	4114442	A3R0605M06U00DR	KCU25.....D33	4116710	T620M060X100R6HX-A	KP6505.....L57
4112708	B224A06350HP	KCPK15.....G40	4114309	A4G0405M04U04GMM	KCU25.....D80	4114443	A3R0800M08P00DF	KCU25.....D32	4116711	T620M060X100R6HX-A	KP6505.....L57
4112709	B224A06500HP	KCPK15.....G40	4114310	A4G0405M04U04GMP	KCU25.....D79	4114444	A3R0805M08U00DR	KCU25.....D33	4116712	T620M060X100R6HX-A	KP6505.....L57
4112710	B224A06630HP	KCPK15.....G40	4114311	A4G0405M04U08GMM	KCU25.....D80	4114445	A3R09303P00DF	KCU25.....D32	4116713	T620M060X100R6HX-A	KP6505.....L57
4112711	B224A06746HP	KCPK15.....G40	4114312	A4G0405M04U08GMP	KCU25.....D79	4114446	A3R12503P00DF	KCU25.....D32	4116714	T620M060X100R6HX-A	KP6505.....L57
4112712	B224A06800HP	KCPK15.....G40	4114313	A4G0500M05P04GMP	KCU25.....D79	4114447	A3R12504P00DF	KCU25.....D32	4116715	T620M060X100R6HX-A	KP6505.....L57
4112713	B224A07000HP	KCPK15.....G40	4114314	A4G0500M05P08GMP	KCU25.....D79	4114448	A3R18705P00DF	KCU25.....D32	4116716	T620M060X100R6HX-A	KP6505.....L57
4112714	B224A07145HP	KCPK15.....G40	4114315	A4G0505M05U04B	KCU25.....D85	4114449	A3R21806P00DF	KCU25.....D32	4116717	T620M060X100R6HX-A	KP6505.....L57
4112715	B224A07500HP	KCPK15.....G40	4114316	A4G0505M05U04GMM	KCU25.....D80	4114450	A3R25006P00DF	KCU25.....D32	4116718	T620M060X100R6HX-A	KP6505.....L57
4112716	B224A07541HP	KCPK15.....G40	4114317	A4G0505M05U04GMP	KCU25.....D79	4114451	A3R25008P00DF	KCU25.....D32	4116719	T620M060X100R6HX-A	KP6505.....L57
4112717	B224A07938HP	KCPK15.....G40	4114318	A4G0505M05U08GMM	KCU25.....D80	4114452	A3V0000M04U02DM	KCU25.....D33	4116720	T620M060X100R6HX-A	KP6505.....L57
4112718	B224A08000HP	KCPK15.....G40	4114319	A4G0505M05U08GMP	KCU25.....D79	4114453	A3V0000M08U08DM	KCU25.....D33	4116721	T620M060X100R6HX-A	KP6505.....L57
4112719	B224A08200HP	KCPK15.....G40	4114320	A4G0600M06P04GMP	KCU25.....D79	4116607	T630M030X050R6HX-A	KM6515.....L57	4116722	T620M060X100R6HX-A	KP6505.....L57
4112720	B224A08334HP	KCPK15.....G40	4114321	A4G0600M06P08GMP	KCU25.....D79	4116608	T630M040X070R6HX-A	KM6515.....L57	4116723	T620M060X100R6HX-A	KP6505.....L57
4112721	B224A08433HP	KCPK15.....G40	4114322	A4G0605M06U04B	KCU25.....D85	4116609	T630M050X080R6HX-A	KM6515.....L57	4116724	T620M060X100R6HX-A	KP6505.....L57
4112722	B224A08500HP	KCPK15.....G41	4114323	A4G0605M06U04GMM	KCU25.....D80	4116610	T630M050X080R6HX-A	KM6515.....L57	4116725	T620M060X100R6HX-A	KP6505.....L57
4112723	B224A08700HP	KCPK15.....G41	4114324	A4G0605M06U04GMP	KCU25.....D79	4116611	T630M080X125R6HX-A	KM6515.....L57	4116726	T620M060X100R6HX-A	KP6505.....L57
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4112725	B224A08800HP	KCPK15.....G41	4114326	A4G0605M06U08GMP	KCU25.....D79	4116613	T630M100X150R6HX-A	KM6515.....L57	4116728	T620M060X100R6HX-A	KP6505.....L57
4112726	B224A09000HP	KCPK15.....G41	4114327	A4G0605M06U12GMM	KCU25.....D80	4116614	T630M100X150R6HX-A	KM6515.....L57	4116729	T620M060X100R6HX-A	KP6505.....L57
4112727	B224A09129HP	KCPK15.....G41	4114328	A4G0800M08P08GMP	KCU25.....D79	4116615	T630M100X150R6HX-A	KM6515.....L57	4116730	T620M060X100R6HX-A	KP6505.....L57
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4112729	B224A09525HP	KCPK15.....G41	4114330	A4G0805M08U08GMP	KCU25.....D79	4116617	T630M100X150R6HX-A	KM6515.....L57	4116732	T620M060X100R6HX-A	KP6505.....L57
4112730	B224A09921HP	KCPK15.....G41	4114331	A4G0805M08U12GMM	KCU25.....D80	4116618	T630M100X150R6HX-A	KM6515.....L57	4116733	T620M060X100R6HX-A	KP6505.....L57
4112731	B224A10000HP	KCPK15.....G41	4114332	A4G1000M10P08GMP	KCU25.....D80	4116619	T630M100X150R6HX-A	KM6515.....L57	4116734	T620M060X100R6HX-A	KP6505.....L57
4112732	B224A10200HP	KCPK15.....G41	4114333	A4G1005M10U08GMM	KCU25.....D80	4116620	T630M100X150R6HX-A	KM6515.....L57	4116735	T620M060X100R6HX-A	KP6505.....L57
4112733	B224A10300HP	KCPK15.....G41	4114334	A4G1005M10U08GMP	KCU25.....D79	4116621	T630M100X150R6HX-A	KM6515.....L57	4116736	T620M060X100R6HX-A	KP6505.....L57
4112734	B224A10320HP	KCPK15.....G41	4114335	A4G12503P05GMM	KCU25.....D80	4116622	T630M100X150R6HX-A	KM6515.....L57	4116737	T620M060X100R6HX-A	KP6505.....L57
4112735	B224A10400HP	KCPK15.....G41	4114336	A4G12503P1GMM	KCU25.....D80	4116623	T630M100X150R6HX-A	KM6515.....L57	4116738	T620M060X100R6HX-A	KP6505.....L57
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4116770	T630NC02500-20R3BX-A KM6515	L56	4116835	T630NC#04-40R2BX-A KP6525	L56	4117173	T620NC03125-18R3BX-A KP6525	L50	4121575	HNGJ43ANFNLDJ KC410M	011, 014
4116771	T630NC03125-18R2BX-A KM6515	L56	4116836	T630NC#04-40R3BX-A KP6525	L56	4117174	T620NC03750-16R2BX-A KP6525	L50	4121576	HNGJ43ANENLD KC510M	011, 014
4116772	T630NC03125-18R3BX-A KM6515	L56	4116837	T630NC#06-32R2BX-A KP6525	L56	4117175	T620NC03750-16R3BX-A KP6525	L50	4121577	HNGJ43ANENLD KC520M	011, 014
4116773	T630NC03750-16R2BX-A KM6515	L56	4116838	T630NC#06-32R3BX-A KP6525	L56	4117176	T620NC04375-14R3BX-A KP6525	L50	4121578	HNGJ43ANENLD KC522M	011, 014
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4116775	T630NC04375-14R3BX-A KM6515	L56	4116840	T630NC#10-24R3BX-A KP6525	L56	4117178	T620NC06250-11R3BX-A KP6525	L50	4121603	XNGJ43ANFNLDJ3W K313	011
4116776	T630NC05000-13R2BX-A KM6515	L56	4116841	T630NC02500-20R2BX-A KP6525	L56	4117179	T620NC07500-10R3BX-A KP6525	L50	4121604	XNGJ43ANFNLDJ3W KC410M	011
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4116778	T630NC06250-11R2BX-A KM6515	L56	4116843	T630M080X125R6HX-A KP6525	L57	4117181	T620NF#10-32R2BX-A KP6525	L50	4121606	XNGJ43ANENLD3W KC520M	011
4116779	T630NC06250-11R3BX-A KM6515	L56	4116844	T630M100X150R6HX-A KP6525	L57	4117182	T620NF#10-32R3BX-A KP6525	L50	4121607	XNGJ43ANENLD3W KC522M	011
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4116781	T630NC07500-10R3BX-A KM6515	L56	4116846	T630M140X200R6HX-A KP6525	L57	4117184	T620NF02500-28R3BX-A KP6525	L50	4121634	DFS1000R5SSF100	J29
4116782	T630NC10000-08R3BX-A KM6515	L56	4116847	T630M160X200R6HX-A KP6525	L57	4117185	T620NF03125-24R3BX-A KP6525	L50	4121635	DFS1000R5SSF125	J29
4116783	T630NF#10-32R2BX-A KM6515	L56	4116848	T630M160X200R6HX-A KP6525	L57	4117186	T620NF03750-24R3BX-A KP6525	L50	4121636	DFS1000R5SSF150	J29
4116784	T630NF#10-32R3BX-A KM6515	L56	4116853	T630NC03125-18R2BX-A KP6525	L56	4117187	T620NF04375-20R3BX-A KP6525	L50	4121637	DFS1031R5SSF125	J29
4116785	T630NF02500-28R2BX-A KM6515	L56	4116854	T630NC03125-18R3BX-A KP6525	L56	4117188	T620NF05000-20R3BX-A KP6525	L50	4121638	DFS1063R5SSF125	J29
4116786	T630NF02500-28R3BX-A KM6515	L56	4116855	T630NC03750-16R2BX-A KP6525	L56	4119190	HNGJ43ANENLD KCPK30	011, 014	4121639	DFS1094R5SSF125	J29
4116787	T630NF03125-24R2BX-A KM6515	L56	4116856	T630NC03750-16R3BX-A KP6525	L56	4119224	HNGJ43ANENLD KC725M	011, 014	4121640	DFS1125R5SSF125	J29
4116788	T630NF03125-24R3BX-A KM6515	L56	4116857	T630NC04375-14R3BX-A KP6525	L56	4119227	HNGJ43ANENLD KCK15	011, 014	4121641	DFS1156R5SSF125	J29
4116789	T630NF03750-24R3BX-A KM6515	L56	4116858	T630NC05000-13R2BX-A KP6525	L56	4119228	HNPJ43ANSNHD KCPK30	011, 014	4121642	DFS1188R5SSF125	J29
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4116791	T630NF05000-20R3BX-A KM6515	L56	4116860	T630NC06250-11R2BX-A KP6525	L56	4119230	HNPJ43ANSNHD KCK15	011, 014	4121644	DFS1219R5SSF150	J29
4116792	T630NF05000-20R3BX-A KM6515	L56	4116861	T630NC06250-11R3BX-A KP6525	L56	4119231	XNGJ43ANENLD3W KCPK30	011	4121645	DFS1250R5SSF150	J29
4116793	T630NC02500-20R2BX-A KP6505	L56	4116862	T630NC07500-10R2BX-A KP6525	L56	4119253	XNGJ43ANENLD3W KC725M	011	4121647	DFS1281R5SSF125	J29
4116794	T630NC02500-20R3BX-A KP6505	L56	4116863	T630NC07500-10R3BX-A KP6525	L56	4119254	XNGJ43ANENLD3W KCK15	011	4121648	DFS1281R5SSF150	J29
4116795	T630NC03125-18R2BX-A KP6505	L56	4116864	T630NC10000-08R3BX-A KP6525	L56	4119635	HNGJ438ANENLD KC520M	011, 014	4121649	DFS1313R5SSF125	J29
4116796	T630NC03125-18R3BX-A KP6505	L56	4116865	T630NF#10-32R2BX-A KP6525	L56	4119636	HNGJ438ANENLD KC522M	011, 014	4121650	DFS1313R5SSF150	J29
4116797	T630NC03750-16R2BX-A KP6505	L56	4116866	T630NF#10-32R3BX-A KP6525	L56	4119637	HNGJ438ANENLD KCPM20	011, 014	4121651	DFS1375R5SSF125	J29
4116798	T630NC03750-16R3BX-A KP6505	L56	4116867	T630NF02500-28R2BX-A KP6525	L56	4119638	HNGJ438ANENLD KCK15	011, 014	4121652	DFS1375R5SSF150	J29
4116799	T630NC04375-14R3BX-A KP6505	L56	4116868	T630NF02500-28R3BX-A KP6525	L56	4119639	HNGJ438ANENLD KCPK30	011, 014	4121653	DFS1406R5SSF125	J29
4116800	T630NC05000-13R2BX-A KP6505	L56	4116869	T630NF03125-24R2BX-A KP6525	L56	4119640	HNGJ438ANENLD KC725M	011, 014	4121654	DFS1406R5SSF150	J29
4116801	T630NC05000-13R3BX-A KP6505	L56	4116870	T630NF03125-24R3BX-A KP6525	L56	4119696	HNPJ43ANSNGD KC520M	011, 014	4121655	DFS1438R5SSF125	J29
4116802	T630NC06250-11R3BX-A KP6505	L56	4116871	T630NF03750-24R3BX-A KP6525	L56	4119697	HNPJ43ANSNGD KC522M	011, 014	4121656	DFS1438R5SSF150	J29
4116803	T630NC07500-10R3BX-A KP6505	L56	4116872	T630NF04375-20R3BX-A KP6525	L56	4119698	HNPJ43ANSNGD KCPM20	011, 014	4121657	DFS1469R5SSF125	J29
4116804	T630NF#10-32R3BX-A KP6505	L56	4116873	T630NF05000-20R3BX-A KP6525	L56	4119699	HNPJ43ANSNGD KCK15	011, 014	4121658	DFS1469R5SSF150	J29
4116805	T630NF02500-28R2BX-A KP6505	L56	4117139	T620NC#02-56R2BX-A KP6525	L50	4119700	HNPJ43ANSNGD KCPK30	011, 014	4121659	DFS1500R5SSF125	J29
4116806	T630NF02500-28R3BX-A KP6505	L56	4117140	T620NC#02-56R3BX-A KP6525	L50	4119701	HNPJ43ANSNGD KC725M	011, 014	4121660	DFS1500R5SSF150	J29
4116807	T630NF03125-24R3BX-A KP6505	L56	4117141	T620NC#04-40R2BX-A KP6525	L50	4119702	HNPJ43ANSNGD KC520M	011, 014	4121661	DFS1531R5SSF125	J29
4116808	T630NF04375-20R3BX-A KP6505	L56	4117142	T620NC#04-40R3BX-A KP6525	L50	4119703	HNPJ43ANSNHD KC522M	011, 014	4121662	DFS1531R5SSF150	J29
4116809	T630NF05000-20R3BX-A KP6505	L56	4117163	T620NC#05-40R3BX-A KP6525	L50	4119704	HNPJ43ANSNHD KCPM20	011, 014	4121663	DFS1563R5SSF125	J29
4116819	T630M030X050R6HX-A KP6525	L57	4117164	T620NC#06-32R2BX-A KP6525	L50	4119988	HNPJ438ANSNHD KC520M	011, 014	4121664	DFS1563R5SSF150	J29
4116820	T630M040X070R6HX-A KP6525	L57	4117165	T620NC#06-32R3BX-A KP6525	L50	4119989	HNPJ438ANSNHD KC522M	011, 014	4121665	DFS1625R5SSF125	J29
4116821	T630M050X080R6HX-A KP6525	L57	4117166	T620NC#08-32R2BX-A KP6525	L50	4119990	HNPJ438ANSNHD KCPK30	011, 014	4121666	DFS1625R5SSF150	J29
4116822	T630M060X100R6HX-A KP6525	L57	4117167	T620NC#08-32R3BX-A KP6525	L50	4119991	HNPJ438ANSNHD KCK15	011, 014	4121667	DFS1688R5SSF125	J29
4116823	T630M120X175R6HX-A KM6515	L57	4117168	T620NC#10-24R3BX-A KP6525	L50	4119992	HNPJ438ANSNHD KCPK30	011, 014	4121668	DFS1688R5SSF150	J29
4116824	T630M140X200R6HX-A KM6515	L57	4117169	T620NC#12-24R3BX-A KP6525	L50	420003	HNPJ438ANSNHD KC725M	011, 014	4121669	DFS1750R5SSF150	J29
4116825	T630M160X200R6HX-A KM6515	L57	4117170	T620NC02500-20R2BX-A KP6525	L50	4121505	B052A03300CPG KC7325	.G10	4121670	DFS1813R5SSF150	J29
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4122620	KM50TSDFS380R3M	J20	4129992	KHSST28773	L161	4130514	KSHR100D02W075HN06	.08	4130655	KHSST28096	L170
4122621	KM63TSDFS250R3M	J20	4129993	KHSST28017	L138	4130515	KSHR100D03W075HN06	.08	4130656	KHSST28097	L170
4122622	KM63TSDFS270R3M	J20	4129998	KHSST28020	L144	4130516	KSHR125D03W100HN06	.08	4130657	KHSST28098	L170
4122623	KM63TSDFS290R3M	J20	4130013	KHSST28021	L141	4130517	KSHR125D04W100HN06	.08	4130659	KHSST28099	L171
4122624	KM63TSDFS310R3M	J20	4130014	KHSST28022	L138	4130518	KSHR100D02C075HN06L480	.09	4130660	KHSST28100	L170
4122625	KM63TSDFS330R3M	J20	4130020	KHSST28028	L144	4130519	KSHR100D03C075HN06L480	.09	4130661	KHSST28101	L170
4122626	KM63TSDFS350R3M	J20	4130021	KHSST28029	L141	4130520	KSHR125D03C100HN06L520	.09	4130662	KHSST28102	L143
4122627	KM63TSDFS380R3M	J20	4130022	KHSST28030	L138	4130521	KSHR125D04C100HN06L520	.09	4130663	KHSST28103	L140
4122628	KM63TSDFS410R3M	J20	4130024	KHSST28772	L162	4130522	KSHR100D02C100HN06L800	.09	4130664	KHSST28104	L173
4122629	KM63TSDFS440R3M	J20	4130026	KHSST28771	L161	4130526	KHSST28050	L165	4130665	KHSST28105	L172
4122630	KM63TSDFS470R3M	J20	4130029	KHSST28770	L162	4130527	KHSST28051	L168	4130666	KHSST28106	L169
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4122719	RCGX64SGF KC725M	R63	4130031	KHSST28768	L161	4130529	KHSST28053	L150	4130668	KHSST28108	L170
4122739	RCGX86ELF KC725M	R67	4130032	KHSST28767	L162	4130531	KHSST28055	L162	4130669	KHSST28109	L169
4122742	RCGX86SGF KC725M	R67	4130035	KHSST28032	L144	4130532	KHSST28056	L161	4130670	KHSST28110	L169
4124962	B051A02000CPG KC7325	G10	4130036	KHSST28033	L141	4130533	KSHR100D03C100HN06L800	.09	4130671	KHSST28111	L154
4128663	40510200405	L120	4130037	KHSST28034	L138	4130544	KHSST28719	L167	4130672	KHSST28112	L154
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4129399	RCGV45T0420 KYS25	B128	4130053	KHSST28766	L162	4130546	KHSST28717	L167	4130682	40512201275	L124
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4129533	RPVG45T0420 KYS25	B129	4130058	KHSST28762	L166	4130552	KHSST28711	L167	4130686	KHSST28116	L140
4129534	RNG43E KYS25	B124	4130059	KHSST28761	L166	4130554	KHSST28710	L167	4130688	KHSST28117	L144
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4129540	CNG433T0420 KYS25	B122	4130065	KHSST28042	L144	4130560	KHSST28704	L164	4130695	40512201273	L124
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4129543	RP32E KYS25	B128	4130070	KHSST28047	L166	4130572	KHSST28701	L167	4130700	40512201269	L121
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4129555	CNGA432T0420 KYS25	B118	4130383	KSHR100D03M16HN06	.08	4130589	KHSST28061	L170	4130714	KHSST28131	L142
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4133094	T922NC#6-32RH2-A KSU52L152	4133340	T922NC03125-18RH5-A KSU50L152	4135772	TM721MF100X125R2DHA KCU32L181	4136393	KSHRH2500HN43C3013
4133095	T922NC#6-32RH3-A KSU52L152	4133343	T922NF03125-24RH3-A KSU50L152	4135773	TM721MF120X100R2DHA KCU32L181	4136394	KSHRH2500HN43M3013
4133096	T922NC#8-32RH2-A KSU52L152	4133355	T922M030X050RD3-A KSU50L153	4135774	TM721MF120X125R2DHA KCU32L181	4136395	KSHRH3000HN43C4013
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4133104	T922NC02500-20RH5-A KSU52L152	4133364	T923M100X150RD6-A KSU50L153	4135782	TM721NC5000-13R2DHA KCU32L181	4136403	KSHRH125D03M16HN4304
4133107	T922NF02500-28RH2-A KSU52L152	4133365	T923M120X175RD6-A KSU50L153	4135783	TM721NC625-12R2DHA KCU32L181	4136404	KSHRH125D04M16HN4304
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4133109	T922NC03125-18RH3-A KSU52L152	4133367	T923M160X200RD7-A KSU50L153	4135785	TM721NC0625-11R2DHA KCU32L181	4136406	KSHRH150D05M16HN4304
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4133134	T923M100X150RD6-A KSU52L153	4135575	TM711M040X070R2DHA KCU33L180	4135824	TM731M050X080R2DHA KCU32L182	4137447	CNC0250J3BH KCN05M63
4133135	T923M120X175RD6-A KSU52L153	4135576	TM711M050X080R2DHA KCU33L180	4135825	TM731M060X100R2DHA KCU32L182	4137448	CNC0250J3CH KCN05M63
4133136	T923M140X200RD7-A KSU52L153	4135577	TM711M060X100R2DHA KCU33L180	4135826	TM731M060X100R2DHA KCU32L182	4137449	CNC0375J4BH KCN05M63
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4133139	T922NC#4-40RH2-A KSU54L152	4135579	TM711M100X150R2DHA KCU33L180	4135828	TM731M100X150R2DHA KCU32L182	4137460	CBDB0250JXBS KCN05M65
4133140	T922NC#5-40RH2-A KSU54L152	4135580	TM711M100X150R2DHA KCU33L180	4135829	TM731M100X150R2DHA KCU32L182	4137461	CBDB0375JXAS KCN05M65
4133141	T922NC#6-32RH2-A KSU54L152	4135581	TM711M100X150R2DHA KCU33L180	4135830	TM731M100X150R2DHA KCU32L182	4137462	CBDB0375JXBS KCN05M65
4133142	T922NC#6-32RH3-A KSU54L152	4135582	TM711M100X150R2DHA KCU33L180	4135831	TM731M100X150R2DHA KCU32L182	4137473	CBDB0500JXAS KCN05M65
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4133165	T922NC#10-24RH2-A KSU54L152	4135665	TM711M200X250R2DHA KCU33L180	4135834	TM731M160X200R2DHA KCU32L182	4137482	CBDB0250JXAS KCN05M65
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4133167	T922NF#10-32RH2-A KSU54L152	4135667	TM711M200X250R2DHA KCU33L180	4135836	TM731M160X200R2DHA KCU32L182	4137484	CBDB0500JXAS KCN05M65
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4151111	B051A03600CPG	KC7325G10	4151214	B051A10800CPG	KC7325G13	4151761	B053A02947CPG	KC7325G10
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4151113	B051A03700CPG	KC7325G10	4151216	B051A11000CPG	KC7325G13	4151776	B042A1016CPG	KC7325G6-G9
4151114	B051A03734CPG	KC7325G10	4151217	B051A11100CPG	KC7325G13	4151777	B042A10141CPG	KC7325G6-G9
4151115	B051A03800CPG	KC7325G11	4151218	B051A11133CPG	KC7325G13	4151778	B042A10167CPG	KC7325G6-G9
4151116	B051A03900CPG	KC7325G11	4151219	B051A11200CPG	KC7325G13	4151779	B042A10192CPG	KC7325G6-G9
4151117	B051A03970CPG	KC7325G11	4151220	B051A11300CPG	KC7325G13	4151780	B042A11000CPG	KC7325G6-G9
4151118	B051A04039CPG	KC7325G11	4151221	B051A11400CPG	KC7325G13	4151781	B042A11181CPG	KC7325G6-G9
4151119	B051A04090CPG	KC7325G11	4151222	B051A11500CPG	KC7325G13	4151782	B042A11191CPG	KC7325G6-G9
4151120	B051A04100CPG	KC7325G11	4151223	B051A11509CPG	KC7325G13	4151783	B042A12000CPG	KC7325G6-G9
4151121	B051A04200CPG	KC7325G11	4151224	B051A11600CPG	KC7325G13	4151784	B042A1300CPG	KC7325G6-G9
4151122	B051A04217CPG	KC7325G11	4151225	B051A11700CPG	KC7325G13	4151785	B042A1321CPG	KC7325G6-G9
4151123	B051A04300CPG	KC7325G11	4151226	B051A11800CPG	KC7325G13	4151786	B042A1397CPG	KC7325G6-G9
4151124	B051A04366CPG	KC7325G11	4151227	B051A11900CPG	KC7325G13	4151787	B042A1400CPG	KC7325G6-G9
4151125	B051A04400CPG	KC7325G11	4151228	B051A11908CPG	KC7325G13	4151788	B042A1500CPG	KC7325G6-G9
4151126	B051A04500CPG	KC7325G11	4151229	B051A12000CPG	KC7325G13	4151789	B042A1600CPG	KC7325G6-G9
4151127	B051A04600CPG	KC7325G11	4151230	B051A12100CPG	KC7325G13	4151790	B042A1700CPG	KC7325G6-G9
4151128	B051A04623CPG	KC7325G11	4151231	B051A12200CPG	KC7325G13	4151791	B042A1800CPG	KC7325G6-G9
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4151145	B051A05616CPG	KC7325G11	4151633	B041A01321CPG	KC7325G6-G9	4151808	B042A20779CPG	KC7325G6-G9
4151146	B051A05700CPG	KC7325G11	4151634	B041A01397CPG	KC7325G6-G9	4151809	B042A2800CPG	KC7325G6-G9
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4151149	B051A06100CPG	KC7325G11	4151637	B041A01600CPG	KC7325G6-G9	4151812	B042A2900CPG	KC7325G6-G9
4151150	B051A06200CPG	KC7325G11	4151638	B041A01700CPG	KC7325G6-G9	4151813	B042A2947CPG	KC7325G6-G9
4151151	B051A06300CPG	KC7325G11	4151639	B041A01800CPG	KC7325G6-G9	4152648	CRBD0375J4AR KCN05M66	
4151152	B051A06350CPG	KC7325G11	4151640	B041A01900CPG	KC7325G6-G9	4152649	CRBD0500J4AR KCN05M66	
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4154111.....	T600M160X200R6HX-D6 KSP21	L42	4156561.....	1.77720L101.....	F37	4158951.....	KTIP04531HP KCP15	H6-H10	4159515.....	T606M100X150R6HX-D1 KSSH22	L45
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4154115.....	T600MF100X100R6HX-D4 KSP21	L42	4157736.....	T410M050X080R6HX-D1 KCU36	L19	4158958.....	KTIP1340HPM KCP15	H6-H10	4159626.....	T623M160X200R6HX-D74 KSN28	L55
4154116.....	T600MF100X125R6HX-D4 KSP21	L42	4157737.....	T410M060X100R6HX-D1 KCU36	L19	4158959.....	KTIP1360HPM KCP15	H6-H10	4159627.....	T623M160X200R6HX-D74 KSN28	L55
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4154118.....	T600MF120X150R6HX-D4 KSP21	L42	4157739.....	T410M080X125R6HX-D1 KCU36	L19	4158973.....	KTIP05471HP KCP15	H6-H10	4159629.....	T623M120X150R6HX-D74 KSN28	L55
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4154652.....	T622M100X150R6HX-D74 KSN28	L54	4158449.....	T622M030X050R6HX-D74 KSP21	L54	4159228.....	KTIP06250HP KCP15	H6-H10	4159818.....	T606MF140X150R6HX-D4 KSSH22	L45
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4154654.....	T622M140X200R6HX-D74 KSN28	L54	4158451.....	T622M050X080R6HX-D74 KSP21	L54	4159231.....	KTIP06330HP KCP15	H6-H10	4159820.....	T623M160X150R6HX-D74 KSP21	L55
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4154656.....	T622MF100X100R6HX-D74 KSN28	L54	4158453.....	T622M080X125R6HX-D74 KSP21	L54	4159233.....	KTIP1620HPM KCP15	H6-H10	4159822.....	T623M080X125R6HX-D74 KSP21	L55
4154657.....	T622MF100X125R6HX-D74 KSN28	L54	4158483.....	T622M080X125R6HX-D74 KSP21	L54	4159234.....	KTIP06406HP KCP15	H6-H10	4159843.....	T623M100X150R6HX-D74 KSP21	L55
4154658.....	T622MF120X125R6HX-D74 KSN28	L54	4158484.....	T622M100X150R6HX-D74 KSP21	L54	4159235.....	KTIP1640HPM KCP15	H6-H10	4159844.....	T623M120X175R6HX-D74 KSP21	L55
4154659.....	T622MF120X150R6HX-D74 KSN28	L54	4158485.....	T622M120X175R6HX-D74 KSP21	L54	4159236.....	KTIP06563HP KCP15	H6-H10	4159845.....	T623M160X200R6HX-D74 KSP21	L55
4154700.....	T622MF140X150R6HX-D74 KSN28	L54	4158486.....	T622M160X200R6HX-D74 KSP21	L54	4159240.....	KTIP1670HPM KCP15	H6-H10	4159846.....	T623MF080X100R6HX-D74 KSP21	L55
4154701.....	T622MF160X150R6HX-D74 KSN28	L54	4158487.....	T622M160X200R6HX-D74 KSP21	L54	4159241.....	KTIP1680HPM KCP15	H6-H10	4159847.....	T623MF100X100R6HX-D74 KSP21	L55
4155723.....	EP1408SGD2 KC725M.....	P40	4158488.....	T622MF080X100R6HX-D74 KSP21	L54	4159242.....	KTIP1680HPM KCP15	H6-H10	4159848.....	T623MF120X150R6HX-D74 KSP21	L55
4155725.....	EP1408SGD2 KCPX30.....	P40	4158489.....	T622MF100X100R6HX-D74 KSP21	L54	4159243.....	KTIP1700HPM KCP15	H6-H10	4159849.....	T623MF140X150R6HX-D74 KSP21	L55
4155726.....	EP1408SGD2 KC520M.....	P40	4158490.....	T622MF120X125R6HX-D74 KSP21	L54	4159244.....	KTIP06719HP KCP15	H6-H10	4159850.....	T623MF160X150R6HX-D74 KSP21	L55
4156451.....	T642M050X080R6HX-D1 KP6525	L66	4158491.....	T622MF120X150R6HX-D74 KSP21	L54	4159246.....	KTIP06719HP KCP15	H6-H10	4159851.....	T670M030X050R6HX-D1 KSN38	L68
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4156544.....	T642M100X150R6HX-D1 KP6525	L66	4158728.....	KTIP03125HP KCP15	H6-H10	4159249.....	KTIP06875HP KCP15	H6-H10	4159934.....	T670M060X100R6HX-D1 KSN38	L68
4156545.....	T642M120X175R6HX-D6 KP6525	L66	4158729.....	KTIP0800HPM KCP15	H6-H10	4159251.....	KTIP1760HPM KCP15	H6-H10	4159935.....	T670M080X125R6HX-D1 KSN38	L68
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4156547.....	T642MF120X150R6HX-D4 KP6525	L66	4158731.....	KTIP03214HP KCP15	H6-H10	4159254.....	KTIP07031HP KCP15	H6-H10	4159937.....	T670M120X175R6HX-D6 KSN38	L68
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4156550.....	T643M050X080R6HX-D1 KP6525	L67	4158895.....	KTIP0840HPM KCP15	H6-H10	4159258.....	KTIP1820HPM KCP15	H6-H10	4159940.....	T680M040X070R6HX-D1 KSN38	L69
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4156552.....	T643M080X125R6HX-D1 KP6525	L67	4158899.....	KTIP03390HP KCP15	H6-H10	4159260.....	KTIP1850HPM KCP15	H6-H10	4159942.....	T680M060X100R6HX-D1 KSN38	L69
4156553.....	T643M100X150R6HX-D1 KP6525	L67	4158902.....	KTIP0880HPM KCP15	H6-H10	4159261.....	KTIP1860HPM KCP15	H6-H10	4159943.....	T680M080X125R6HX-D1 KSN38	L69
4156554.....	T643M120X175R6HX-D6 KP6525	L67	4158903.....	KTIP03480HP KCP15	H6-H10	4159263.....	KTIP1870HPM KCP15	H6-H10	4159944.....	T680M100X150R6HX-D1 KSN38	L69
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			4158905.....	KTIP0900HPM KCP15	H6-H10	4159265.....	KTIP1880HPM KCP15	H6-H10	4159946.....	T680M160X200R6HX-D6 KSN38	L69
			4158906.....	KTIP03580HP KCP15	H6-H10	4159266.....	KTIP1910HPM KCP15	H6-H10	4159947.....	T680M200X250R6HX-D6 KSN38	L69
			4158907.....	KTIP0910HPM KCP15	H6-H10	4159269.....	KTIP1920HPM KCP15	H6-H10	4159974.....	T612M030X050R6HX-D1 KSSH22	L47
			4158908.....	KTIP03594HP KCP15	H6-H10	4159270.....	KTIP07570HP KCP15	H6-H10	4159975.....	T612M040X070R6HX-D1 KSSH22	L47
			4158911.....	KTIP03680HP KCP15	H6-H10	4159271.....	KTIP07580HP KCP15	H6-H10	4159976.....	T612M060X100R6HX-D1 KSSH22	L47
			4158912.....	KTIP0940HPM KCP15	H6-H10	4159272.....	KTIP1930HPM KCP15	H6-H10	4159977.....	T612M080X125R6HX-D1 KSSH22	L47
			4158914.....	KTIP03750HP KCP15	H6-H10	4159273.....	KTIP1940HPM KCP15	H6-H10	4159978.....	T612M100X150R6HX-D1 KSSH22	L47
			4158916.....	KTIP03770HP KCP15	H6-H10	4159275.....	KTIP1950HPM KCP15	H6-H10			
			4158917.....	KTIP0960HPM KCP15	H6-H10	4159276.....	KTIP1960HPM KCP15	H6-H10			
			4158918.....	KTIP03820HP KCP15	H6-H10	4159277.....	KTIP1970HPM KCP15	H6-H10			
			4158921.....	KTIP03906HP KCP15	H6-H10	4159279.....	KTIP07813HP KCP15	H6-H10			
			4158923.....	KTIP03946HP KCP15	H6-H10	4159280.....	KTIP1990HPM KCP15	H6-H10			
			4158924.....	KTIP03970HP KCP15	H6-H10	4159281.....	KTIP2000HPM KCP15	H6-H10			
			4158931.....	KTIP04130HP KCP15	H6-H10	4159282.....	KTIP2010HPM KCP15	H6-H10			
						4159283.....	KTIP2020HPM KCP15	H6-H10			
						4159284.....	KTIP07969HP KCP15	H6-H10			
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4165743.....	DNMG443R K35P	F126	4165943.....	VNMG432R K10M	F134	4166124.....	DNMG442F K15U	F125	4166235.....	VNMG431F K15U	F134
4165744.....	DNMG443R K10M	F126	4165944.....	VNMG432R K25M	F134	4166125.....	DNMG443F K10P	F125	4166236.....	VNMG432F K10P	F134
4165745.....	DNMG443R K25M	F126	4165945.....	VNMG433R K10P	F134	4166126.....	DNMG443F K25P	F125	4166237.....	VNMG432F K25P	F134
4165746.....	DNMG543R K35P	F126	4165946.....	VNMG433R K25P	F134	4166127.....	DNMG443F K20K	F125	4166238.....	VNMG432F K20K	F134
4165747.....	SNMG322R K10P	F128	4165947.....	VNMG433R K35P	F134	4166128.....	DNMG443F K10M	F125	4166239.....	VNMG432F K10M	F134
4165748.....	SNMG322R K25P	F128	4165948.....	VNMG433R K10M	F134	4166129.....	DNMG443F K25M	F125	4166240.....	VNMG432F K10U	F134
4165749.....	SNMG431R K10P	F128	4165949.....	VNMG433R K25M	F134	4166130.....	DNMG443F K10M	F125	4166241.....	VNMG432F K15U	F134
4165750.....	SNMG431R K25P	F128	4165950.....	CNMG431F K10P	F122	4166131.....	SNMG322F K10P	F127	4166681.....	DNMG433H K20K	F125
4165751.....	SNMG431R K10M	F128	4165961.....	CNMG431F K20K	F122	4166132.....	SNMG322F K25P	F127	4167040.....	DNMG433H K35P	F125
4165752.....	SNMG431R K25M	F128	4165962.....	CNMG431F K20K	F122	4166133.....	SNMG322F K20K	F127	4167041.....	DNMG442H K20K	F125
4165753.....	SNMG432R K10P	F128	4166023.....	CNMG431F K10M	F122	4166134.....	SNMG322F K10U	F127	4167042.....	DNMG442H K10P	F125
4165754.....	SNMG432R K25P	F128	4166024.....	CNMG431F K25M	F122	4166135.....	SNMG432F K10P	F127	4167043.....	DNMG442H K25P	F125
4165755.....	SNMG432R K35P	F128	4166025.....	CNMG431F K10U	F122	4166136.....	SNMG432F K25P	F127	4167044.....	DNMG442H K35P	F125
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4165757.....	SNMG432R K25M	F128	4166027.....	CNMG432F K10P	F122	4166138.....	SNMG432F K10M	F127	4167046.....	DNMG443H K25P	F125
4165758.....	SNMG433R K10P	F128	4166028.....	CNMG432F K25P	F122	4166139.....	SNMG432F K10U	F127	4167047.....	DNMG443H K35P	F125
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4165760.....	SNMG433R K35P	F128	4166030.....	CNMG432F K10M	F122	4166141.....	TNMG331F K10P	F130	4167049.....	DNMG543H K25P	F125
4165761.....	SNMG433R K10M	F128	4166031.....	CNMG432F K25M	F122	4166142.....	TNMG331F K25P	F130	4167050.....	CNMG543H K35P	F125
4165762.....	SNMG433R K25M	F128	4166032.....	CNMG432F K10U	F122	4166143.....	TNMG331F K20K	F130	4167051.....	RNMG43H K25P	F126
4165763.....	SNMG643R K25P	F128	4166033.....	CNMG432F K15U	F122	4166144.....	TNMG331F K10M	F130	4167052.....	RNMG43H K20K	F126
4165764.....	SNMG643R K35P	F128	4166034.....	CNMG433F K10P	F122	4166145.....	TNMG331F K25M	F130	4167053.....	RNMG64H K10P	F126
4165765.....	SNMG643R K10M	F128	4166035.....	CNMG433F K25P	F122	4166146.....	TNMG331F K10U	F130	4167054.....	RNMG64H K25P	F126
4165766.....	SNMG643R K25M	F128	4166036.....	CNMG433F K20K	F122	4166147.....	TNMG331F K15U	F130	4167055.....	SNMG432H K10P	F127
4165767.....	TNMG331R K10P	F130	4166037.....	CNMG433F K10M	F122	4166148.....	TNMG332F K10P	F130	4167056.....	SNMG432H K25P	F127
4165768.....	TNMG331R K25P	F130	4166038.....	CNMG433F K10U	F122	4166149.....	TNMG332F K25P	F130	4167057.....	SNMG432H K20K	F127
4165769.....	TNMG331R K10M	F130	4166039.....	DNMG431F K10P	F125	4166150.....	TNMG332F K20K	F130	4167058.....	SNMG433H K10P	F127
4165770.....	SCMT3251F K20K	F126	4166040.....	DNMG431F K25P	F125	4166151.....	TNMG332F K10M	F130	4167059.....	SNMG433H K25P	F127
4165771.....	SCMT3251F K10M										



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4167073	SNMG643H K35P	F127	4169266	B269A06909HP KCPK15	G56	4169662	UEBD0125J3A KC643M	M95	4175837	NGD3189R KCU10	D133
4167074	SNMG643H K20K	F127	4169267	B269A07000HP KCPK15	G56	4169805	UEDE0156J4AH KC643M	M87	4175838	NGD3189R KCU10	D134
4167075	SNMG644H K25P	F127	4169268	B269A07145HP KCPK15	G56	4169806	UEDE0188J4AH KC643M	M87	4175839	NGD3M200RK KCU10	D134
4167076	SNMG644H K35P	F127	4169269	B269A07500HP KCPK15	G56	4169807	UEDE0250J4AH KC643M	M87	4175840	NGP3088L KCU10	D135
4167077	SNMG644H K20K	F127	4169270	B269A07541HP KCPK15	G56	4169808	UEDE0312J4AH KC643M	M87	4175841	NGP3088R KCU10	D135
4167078	TNMG331H K25P	F130	4169271	B269A07700HP KCPK15	G56	4169809	UEDE0375J4AH KC643M	M87	4175842	NGP3125L KCU10	D135
4167596	RCGX64ELF KCU10	F9	4169272	B269A07800HP KCPK15	G56	4169810	UEDE0437J4AH KC643M	M87	4175843	NG2031L KCU10	D129
4167597	RCGX64ELF KCU10	F9	4169273	B269A07938HP KCPK15	G56	4169811	UEDE0500J4AH KC643M	M87	4175844	NG2031LK KCU10	D131
4168064	CNGM431S0525MTCB2 KB5610	B175	4169274	B269A08000HP KCPK15	G56	4169812	UEDE0156K4AH KC643M	M87	4175845	NG2031R KCU10	D128
4168065	CNGM432S0525MTCB2 KB5610	B175	4169275	B269A08100HP KCPK15	G56	4169823	UEDE0188K4AH KC643M	M87	4175846	NG2031RK KCU10	D130
4168066	CNGM433S0525MTCB2 KB5610	B175	4169276	B269A08334HP KCPK15	G56	4169824	UEDE0250K4AH KC643M	M87	4175847	NG2041R KCU10	D128
4168067	DNGM432S0525MTCB2 KB5610	B178	4169277	B269A08433HP KCPK15	G56	4169825	UEDE0312K4AH KC643M	M87	4175848	NG2047L KCU10	D129
4168068	DNGM433S0525MTCB2 KB5610	B178	4169278	B269A08700HP KCPK15	G57	4169826	UEDE0375K4AH KC643M	M87	4175849	NG2047LK KCU10	D131
4168669	A4G0300M03P04S02025ST KB1630	D87	4169279	B269A08733HP KCPK15	G57	4169827	UEDE0437K4AH KC643M	M87	4175850	NG2047R KCU10	D128
4168670	A4G0400M04P04S02025ST KB1630	D87	4169280	B269A09000HP KCPK15	G57	4169828	UEDE0500K4AH KC643M	M87	4175851	NG2047RK KCU10	D130
4168671	A4G0500M05P08S02025ST KB1630	D87	4169281	B269A09100HP KCPK15	G57	4169833	UEBD0156J3A KC643M	M95	4175852	NG2062L KCU10	D129
4168672	A4G0600M06P08S02025ST KB1630	D87	4169282	B269A09129HP KCPK15	G57	4169834	UEBD0188J3A KC643M	M95	4175853	NG2062LK KCU10	D131
4168753	A4G0300M03P04EST KB1630	D87	4169283	B269A09500HP KCPK15	G57	4169835	UEBD0250J3A KC643M	M95	4175854	NG2062R KCU10	D128
4168754	A4G0400M04P04EST KB1630	D87	4169284	B269A09525HP KCPK15	G57	4169836	UEBD0312J3A KC643M	M95	4175855	NG2062RK KCU10	D130
4168755	A4G0500M05P08EST KB1630	D87	4169285	B269A09921HP KCPK15	G57	4169837	UEBD0375J3A KC643M	M95	4175856	NG2094L KCU10	D129
4168756	A4G0600M06P08EST KB1630	D87	4169286	B269A10000HP KCPK15	G57	4169838	UEBD0437J3A KC643M	M95	4175857	NG2094LK KCU10	D131
4168757	A4R0300M03P00EST KB1630	D87	4169287	B269A10200HP KCPK15	G57	4169839	UEBD0500J3A KC643M	M95	4175858	NG2094R KCU10	D128
4168758	A4R0400M04P00EST KB1630	D87	4169288	B269A10300HP KCPK15	G57	4170138	SROCN206BB	F12	4175859	NG2094RK KCU10	D130
4168759	A4R0500M05P00EST KB1630	D87	4169289	B269A10320HP KCPK15	G57	4170139	SRDCN3P19BB	F12	4175860	NG2125L KCU10	D131
4168760	A4R0600M06P00EST KB1630	D87	4169290	B269A10500HP KCPK15	G57	4170385	CM209R ASSY	C6-9, C11, C76-77	4175861	NG2125LK KCU10	D131
4168856	A4SCR080214	D93	4169291	B269A10716HP KCPK15	G57	4170386	CM210R ASSY	C6-7, C9-11, C77, C79	4175862	NG2125R KCU10	D128
4168857	A4SCR100217	D93	4169292	B269A10800HP KCPK15	G57	4170388	CM235R ASSY	C13-14	4175863	NG2125RK KCU10	D130
4168858	A4SCR080314	D93	4169293	B269A11000HP KCPK15	G57	4170389	CM234R ASSY	C76-79	4175864	NG2M080LK KCU10	D130
4168859	A4SCR100317	D93	4169294	B269A11113HP KCPK15	G57	4170408	KSCMCA900F KD1420	0115	4175865	NG2M080RK KCU10	D131
4168860	A4SCL080214	D93	4169295	B269A11500HP KCPK15	G57	4170410	KSCMCA90UNBF KD1420	0115	4175866	NG2M100L KCU10	D130
4168861	A4SCL100217	D93	4169296	B269A11800HP KCPK15	G57	4170411	KSCMCA90QFBF KD1420	0115	4175867	NG2M100RK KCU10	D130
4168862	A4SCL080314	D93	4169297	B269A12000HP KCPK15	G57	4170454	MS2246	F12	4175868	NG2M120L KCU10	D130
4168883	A4SCL100317	D93	4169298	B269A12100HP KCPK15	G57	4171227	LNJX30194ORRF KCP10	F86	4175869	NG2M120RK KCU10	D131
4168928	A4G0300M03P04S02025ST KB5625	D87	4169299	B269A12304HP KCPK15	G57	4171228	LNJX30194ORRF KCP25	F86	4175870	NG2M140L KCU10	D131
4168929	A4G0400M04P04S02025ST KB5625	D87	4169300	B269A12700HP KCPK15	G57	4171768	RCGT0803MOMS KCU10	B101-B102	4175871	NG2M140RK KCU10	D130
4168930	A4G0500M05P08S02025ST KB5625	D87	4169301	B269A13000HP KCPK15	G57	4171768	RCGT0803MOMS KCU10	B101-B102	4175872	NG2M170L KCU10	D131
4168931	A4G0600M06P08S02025ST KB5625	D87	4169302	B269A13100HP KCPK15	G57	4171768	RCGT0803MOMS KCU10	B101-B102	4175873	NG2M170RK KCU10	D130
4168932	NG3M200LS02020ST KB5625	D142	4169303	B269A13500HP KCPK15	G57	4171768	RCGT0803MOMS KCU10	B101-B102	4175874	NG2M195L KCU10	D131
4168933	NG3M200LS02020ST KB5625	D142	4169304	B269A14100HP KCPK15	G57	4171768	RCGT0803MOMS KCU10	B101-B102	4175875	NG2M195RK KCU10	D130
4168934	SM907	F12	4169305	B269A14288HP KCPK15	G57	4171770	RCGT1606MOMS KCU10	B101-B102	4175876	NG2M200L KCU10	D131
4168943	NG3M300LS02020ST KB5625	D142	4169306	B269A14500HP KCPK15	G57	4171771	CNMG321FF KCU10	B42	4175877	NG2M200RK KCU10	D130
4168944	NG3M400LS02020ST KB5625	D142	4169307	B269A14684HP KCPK15	G57	4171771	CNMG321FF KCU10	B42	4175878	NG2M225L KCU10	D131
4168945	NG3M200RS02020ST KB5625	D142	4169308	B269A15000HP KCPK15	G57	4171772	CNMG322FF KCU10	B42	4175879	NG2M225RK KCU10	D130
4168946	NG3M300RS02020ST KB5625	D142	4169309	B269A15500HP KCPK15	G57	4171823	CNMG6430FN KCU10	B42	4175880	NG2M275RK KCU10	D130
4168947	NG3M400RS02020ST KB5625	D142	4169310	B269A15875HP KCPK15	G57	4171824	CNMG6431FF KCU10	B43	4175881	NG2M300L KCU10	D131
4168948	NG3125RS0820ST KB5625	D142	4169311	B269A16000HP KCPK15	G57	4171825	CNMG6432FF KCU10	B53	4175882	NG2M300RK KCU10	D130
4168949	NG3189RS0820ST KB5625	D142	4169312	B269A16500HP KCPK15	G57	4171826	CNMG6433FF KCU10	B53	4175883	NGP3125R KCU10	D135
4168950	NG3125LS0820ST KB5625	D142	4169313	B269A17000HP KCPK15	G57	4171827	CNMG6434FF KCU10	B53	4175884	NGP3156R KCU10	D135
4168951	NG3189LS0820ST KB5625	D142	4169314	B269A17463HP KCPK15	G57	4171828	CNMG6435FF KCU10	B53	4175885	NJ3014L12 KCU10	E14
4169239	B269A03175HP KCPK15	G56	4169315	B269A17500HP KCPK15	G57	4171829	CNMG6436FF KCU10	B53	4175886	NJ3014R12 KCU10	E14
4169240	B269A03264HP KCPK15	G56	4169316	B269A18000HP KCPK15	G57	4171830	CNMG6441FF KCU10	B53	4175887	NJ3020R8 KCU10	E14
4169241	B269A03500HP KCPK15	G56	4169317	B269A18500HP KCPK15	G57	4171831	CNMG6442FF KCU10	B53	4175888	NJF3005P32 KCU10	E15
4169242	B269A03970HP KCPK15	G56	4169318	B269A19000HP KCPK15	G57	4171832	CNMG6443FF KCU10	B53	4175889	NJF3006R28 KCU10	E15
4169243	B269A04000HP KCPK15	G56	4169319	B269A19050HP KCPK15	G57	4171833	CNMG6444FF KCU10	B60	4175890	NJF3007R24 KCU10	E15
4169244	B269A04500HP KCPK15	G56	4169320	B269A19500HP KCPK15	G57	4171834	CNMG6445FF KCU10	B60	4175891	NJF3008R20 KCU10	E15
4169245	B269A04600HP KCPK15	G56	4169321	B269A20000HP KCPK15	G57	4171835	CNMG6446FF KCU10	B61	4175892	NJF3009R18 KCU10	E15
4169246	B269A04763HP KCPK15	G56	4169333	NG3M200LS02020ST KB1630	D142	4171836	CNMG6447FF KCU10	B61	4175893	NJF3009R18 KCU10	E15
4169247	B269A04800HP KCPK15	G56	4169335	NG3M300LS02020ST KB1630	D142	4171837	CNMG6448FF KCU10	B61	4175894	NJF3010R12 KCU10	E10
4169248	B269A05000HP KCPK15	G56	4169336	NG3M400LS02020ST KB1630	D142	4171838	CNMG6449FF KCU10	B61	4175895	NJF3010R12 KCU10	E10
4169249	B269A05100HP KCPK15	G56	4169337	NG3M200RS02020ST KB1630	D142	4171839	CNMG6450FF KCU10	B61	4175896	NJF3010R12 KCU10	E10
4169250	B269A05200HP KCPK15	G56	4169338	NG3M300RS02020ST KB1630	D142	4171840	CNMG6451FF KCU10	B61	4175897	NJF3010R12 KCU10	E10
4169251	B269A05300HP KCPK15	G56	4169339	NG3M400RS02020ST KB1630	D142	4171841	CNMG6452FF KCU10	B61	4175898	NJF3010R12 KCU10	E10
4169252	B269A05410HP KCPK15	G56	4169341	NG3125RS0820ST KB1630	D142	4171842	CNMG6453FF KCU10	B61	4175899	NJF3010R12 KCU10	E10
4169253	B269A05500HP KCPK15	G56	4169342	NG3189RS0820ST KB1630	D142	4171843	CNMG6454FF KCU10	B61	4175900	NJF3010R12 KCU10	E10
4169254	B269A05558HP KCPK15	G56	4169343	NG3125LS0820ST KB1630	D142	4171844	CNMG6455FF KCU10	B61	4175901	NJF3010R12 KCU10	E10
4169255	B269A05600HP KCPK15	G56	4169344	NG3189LS0820ST KB1630	D142	4171845	CNMG6456FF KCU10	B61	4175902	NJF3010R12 KCU10	E10
4169256	B269A05700HP KCPK15	G56	4169351	UEDE0078J3AS KC643M	M85	4171846	CNMG6457FF KCU10	B61	4175903	NJF3010R12 KCU10	E10
4169257	B269A05800HP KCPK15	G56	4169352	UEDE0094J3AS KC643M	M85	4171847	CNMG6458FF KCU10	B61	4175904	NJF3010R12 KCU10	E10
4169258	B269A06000HP KCPK15	G56	4169353	UEDE0125J3AS KC643M	M85	4171848	CNMG6459FF KCU10	B61	4175905	NJF3010R12 KCU10	E10
4169259	B269A06200HP KCPK15	G56	4169354	UEDE0156J3AS KC643M	M85	4171849	CNMG6460FF KCU10	B61	4175906	NJF3010R12 KCU10	E10
4169260	B269A06350HP KCPK15	G56	4169355	UEDE0188J3AS KC643M	M85	4171850	CNMG6461FF KCU10	B61	4175907	NJF3010R12 KCU10	E10
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4175946	NP3002RK KCU10	D137	4176072	NG3M120LK KCU10	D131	4176190	NTB4PA KCU10	E20	5047217	GAD0050J6ASA K600	M110
4175947	NPD3012RK KCU10	D137	4176073	NG4189L KCU10	D129	4176191	NTB4RB KCU10	E21	5047218	GADCC0375J6ASA K600	M110
4175948	NR3031LK KCU10	D139	4176074	NG4189LK KCU10	D132	4176192	NTC3L10E KCU10	E13	5047219	HPFF25056113 KC625M	M112
4175949	NR3031LK KCU10	D140	4176075	NG4189R KCU10	D128	4176193	NTC3L12E KCU10	E13	5047440	GADCC031J6ASA K600	M110
4175950	NR3031R KCU10	D138	4176076	NG4189RK KCU10	D131	4176194	NTC3L16E KCU10	E13	5047441	HPFF25056075 KC625M	M112
4175951	NR3031RK KCU10	D140	4176077	NG4250L KCU10	D129	4176195	NTC3MR150E KCU10	E12	5047442	HPFF25056038 KC625M	M112
4175952	NR3047L KCU10	D139	4176078	NG4250LK KCU10	D132	4176196	NTC3MR200E KCU10	E12	5047443	GADCC0250J6ASA K600	M110
4175953	NR3047LK KCU10	D140	4176079	NG4250R KCU10	D128	4176197	NTC3R10E KCU10	E13	5047444	HPFF312S6113 KC625M	M112
4175954	NR3047R KCU10	D138	4176080	NG4250RK KCU10	D131	4176198	NTC3R11E KCU10	E13	5047445	HPFF312S6081 KC625M	M112
4175955	NR3047RK KCU10	D140	4176081	NG4M400LK KCU10	D132	4176199	NTC3R12E KCU10	E13	5047447	HPFF375S6113 KC625M	M112
4175956	NR3062L KCU10	D139	4176082	NG4M400RK KCU10	D131	4176200	NTC3R13E KCU10	E13	5047449	HPFF375S6088 KC625M	M112
4175957	NR3062LK KCU10	D140	4176083	NG4M500LK KCU10	D132	4176201	NTC3R14E KCU10	E13	5047500	HPFF375S6050 KC625M	M112
4175958	NR3062R KCU10	D138	4176084	NG4M500RK KCU10	D131	4176202	NTC3R16E KCU10	E13	5047502	HPFF500S6200 KC625M	M112
4175959	NR3062RK KCU10	D140	4176085	NGD4125LK KCU10	D134	4176203	NTC3R18E KCU10	E13	5047504	HPFF500S6100 KC625M	M112
4175960	NR3078LK KCU10	D140	4176086	NGD4125RK KCU10	D134	4176204	NTC3R20E KCU10	E13	5047506	HPFF625S6225 KC625M	M112
4175961	NR3078RK KCU10	D140	4176087	NGD4189LK KCU10	D134	4176205	NTC3R24E KCU10	E13	5047508	HPFF625S6125 KC625M	M112
4175962	NR3094L KCU10	D139	4176088	NGD4189RK KCU10	D134	4176206	NTC3R32E KCU10	E13	5047509	HPFF750S6225 KC625M	M112
4175963	NR3094R KCU10	D138	4176089	NGD4250L KCU10	D133	4176207	NTC3R8E KCU10	E13	5047531	HPFF750S6150 KC625M	M112
4175964	NR3M150L KCU10	D139	4176090	NGD4250LK KCU10	D134	4176208	NTC3R9E KCU10	E13	5047532	HPFF750S6100 KC625M	M112
4175965	NRD3031L KCU10	D141	4176091	NGD4250R KCU10	D133	4176209	NWC3R11E KCU10	E17	5047533	HPFF500S6063 KC625M	M112
4175966	NRD3031R KCU10	D141	4176092	NGD4250RK KCU10	D134	4177167	KDMB025R394A038HN	R73	5049358	HPFF750S6400 K600	M72
4175967	NRD3062L KCU10	D141	4176093	NG3M120RK KCU10	D130	4177168	KDMB0312R394A038HN	R73	5049359	HPFF625S6075 K600	M72
4175968	NRD3062R KCU10	D141	4176094	NG3M225LK KCU10	D131	4177169	KDMB0312R591A038HN	R73	5049540	HPFF25056038 K600	M72
4175969	NRP3031L KCU10	D140	4176095	NG3M225RK KCU10	D130	4177170	KDMB025R394A025HN	R73	5049543	HPFF1000S6300 K600	M72
4175970	NRP3031R KCU10	D140	4176096	NG3M275LK KCU10	D132	4177171	KDMB025R591A025HN	R73	5049544	HPFF750S6300 K600	M72
4175971	NRP3047L KCU10	D140	4176097	NG3M275RK KCU10	D132	4177172	KDMB025R788A025HN	R73	5049545	HPFF625S6300 K600	M72
4175972	NRP3047R KCU10	D140	4176098	NG3M300LK KCU10	D130	4177243	KDMB025R788A025HNS	R73	5049546	HPFF750S6100 K600	M72
4175974	NRP3062L KCU10	D140	4176099	NG3M300RK KCU10	D130	4177244	KDMB0312R788A031HN	R73	5049547	HPFF750S6225 K600	M72
4175975	NRP3062R KCU10	D140	4176100	NG3M400LK KCU10	D132	4177576	KDMT0500SRHF KC515M	R90	5049548	HPFF625S6225 K600	M72
4175976	NRP3094L KCU10	D140	4176101	NG3M400RK KCU10	D130	4177577	KDMT0625SRHF KC515M	R90	5049549	HPFF500S6200 K600	M72
4175977	NRP3094R KCU10	D140	4176102	NG3M425LK KCU10	D132	4177578	KDMT0750SRHF KC515M	R90	5049590	HPFF375S6112 K600	M72
4175978	NT3L KCU10	E10	4176103	NGP4189L KCU10	D135	4177635	KDMB0250MOERGP KC515M	R76	5049591	HPFF312S6112 K600	M72
4175979	NT3LCK KCU10	E11	4176104	NGP4189R KCU10	D135	4177637	KDMB0375MOERGP KC515M	R76	5049592	HPFF750S6150 K600	M72
4175980	NT3LKC KCU10	E10	4176105	NGP4250L KCU10	D135	4177639	KDMB0625MOERGP KC515M	R76	5049593	HPFF625S6125 K600	M72
4175981	NT3R KCU10	E10	4176106	NGP4250R KCU10	D135	4177640	KDMB0250MOERGP KC515M	R76	5049594	HPFF500S6100 K600	M72
4175982	NT3RCK KCU10	E11	4176107	NR4062LK KCU10	D140	4177641	KDMB1000MOERGP KC515M	R76	5049595	HPFF375S6088 K600	M72
4175983	NT3RK KCU10	E10	4176108	NR4062RK KCU10	D140	4177642	KDMB1250MOERGP KC515M	R76	5049596	HPFF750S6081 K600	M72
4175984	NTF3L KCU10	E11	4176109	NR4094LK KCU10	D140	4177643	KDMB0312MOERGP KC505M	R76	5049597	HPFF250S6075 K600	M72
4175985	NTF3R KCU10	E11	4176110	NR4094RK KCU10	D140	4177644	KDMB0375MOERGP KC505M	R76	5051282	HPFF375S6050 KC635M	M72
4175986	NTK3L KCU10	E12	4176111	NR4125L KCU10	D139	4177645	KDMB0500MOERGP KC505M	R76	5051283	HPFF500S6063 KC635M	M72
4175987	NTK3R KCU10	E12	4176112	NR4125LK KCU10	D140	4177646	KDMB0625MOERGP KC505M	R76	5051285	HPFF250S6038 KC635M	M72
4175988	NTP3L KCU10	E11	4176113	NR4125R KCU10	D138	4177647	KDMB0750MOERGP KC505M	R76	5051321	HPFF750S6088 KC635M	M72
4175989	NTP3R KCU10	E11	4176114	NR4125RK KCU10	D140	4177648	KDMB1000MOERGP KC505M	R76	5051322	HPFF438S6088 KC635M	M72
4176009	NG4125L KCU10	D129	4176115	NRD4062L KCU10	D141	4177649	KDMB1250MOERGP KC505M	R76	5051323	HPFF188S6063 KC635M	M72
4176010	NG4125LK KCU10	D132	4176116	NRD4062R KCU10	D141	4177650	KDMB0250MOERLD K115M	R76	5051325	HPFF500S6030 KC635M	M72
4176011	NG4125R KCU10	D128	4176117	NRD4094L KCU10	D141	4177651	KDMB0312MOERLD K115M	R76	5051327	HPFF750S6300 KC635M	M72
4176012	NG4125RK KCU10	D131	4176118	NRD4094R KCU10	D141	4177652	KDMB0375MOERLD K115M	R76	5051381	HPFF625S6300 KC635M	M72
4176015	NAS3L4 KCU10	E19	4176119	NRD4125L KCU10	D141	4177653	KDMB0500MOERLD K115M	R76	5051382	HPFF750S6400 KC635M	M72
4176026	NAS3L10 KCU10	E20	4176120	NRD4125R KCU10	D141	4177654	KDMB0625MOERLD K115M	R76	5051389	HPFF1000S6400 KC635M	M72
4176027	NAS3L5 KCU10	E20	4176121	NT4L KCU10	E10	4177655	KDMB0750MOERLD K115M	R76	5051413	AADF0750J2C KC625M	M52
4176028	NAS3L6 KCU10	E20	4176122	NT4LK KCU10	E10	4177656	KDMB1000MOERLD K115M	R76	5051414	AADF0625J2C KC625M	M51
4176029	NAS3L8 KCU10	E20	4176123	NG3M425RK KCU10	D130	4177657	KDMB1250MOERLD K115M	R76	5051415	AADF0750J2A KC625M	M51
4176030	NAS3R10 KCU10	E20	4176124	NGD3062LK KCU10	D134	4177658	KDMB0500MOERHC KC530M	R76	5051418	AADF0625J2C KC625M	M51
4176031	NAS3R5 KCU10	E20	4176125	NGD3062RK KCU10	D134	4177659	KDMB0625MOERHC KC530M	R76	5051419	AADF0500J2C KC625M	M50
4176032	NAS3R6 KCU10	E20	4176126	NGD3094LK KCU10	D134	4177660	KDMB0750MOERHC KC530M	R76	5051472	AADF0375J2A KC625M	M49
4176033	NAS3R8 KCU10	E20	4176127	NGD3094RK KCU10	D134	4177661	KDMB1000MOERHC KC530M	R76	5051473	AADF0312J2C KC625M	M49
4176034	NG3047L KCU10	D129	4176128	NGD3125LK KCU10	D134	4178114	KDR125R1203M16L150	R13	5051475	AADF0250J2A KC625M	M48
4176035	NG3047LK KCU10	D131	4176133	NT4R KCU10	E10	4178115	KDR150R1203M16L150	R13	5051477	AADF0188J2A KC625M	M48
4176036	NG3047R KCU10	D128	4176134	NT4RCK KCU10	E11	4178116	KDR150R1204M16L150	R13	5051478	AADF0125J2A KC625M	M48
4176037	NG3047RK KCU10	D130	4176135	NT4RK KCU10	E10	4178119	KDR125R1202W100L200	R13	5051479	AADF0500J2J KC625M	M50
4176038	NG3062L KCU10	D129	4176136	NTP4L KCU10	E11	4178120	KDR125R1202C125L900	R14	5051510	AADF1000J2B KC625M	M52
4176039	NG3062LK KCU10	D131	4176137	NTP4R KCU10	E11	4178121	KDR150R1203C150L900	R14	5051511	AADF0500J2C KC625M	M52
4176040	NG3062R KCU10	D128	4176138	NA4L4 KCU10	E19	4178122	KDR150R1204S050L157	R15	5051513	AADF0500J2C KC625M	M50
4176041	NG3062RK KCU10	D130	4176139	NA4R4 KCU10	E19	4178123	KDR200R1204S075L200	R15	5051514	AADF0375J2C KC625M	M50
4176042	NG3072L KCU10	D129	4176140	NA6L2 KCU10	E19	4178124	KDR200R1205S075L200	R15	5051515	AADF0312J2D KC625M	M49
4176043	NG3072LK KCU10	D131	4176141	NA6R2 KCU10	E19	4178125	KDR250R1207S075L200	R15	5051516	AADF0250J2C KC625M	M49
4176044	NG3072R KCU10	D128	4176142	NDC3040L3 KCU10	E18	4178126	KDR300R1208S100L200	R15	5051517	AADF0750J2B KC625M	M51
4176045	NG3072RK KCU10	D130	4176163	NDC310RDR75 KCU10	E18	4178127	KDR400R1209S150L200	R15	5051518	AADF0625J2A KC625M	M51
4176046	NG3078L KCU10	D129	4176164	NDC3115VL75 KCU10	E16	4178128	A2014N00CF01 KCJ25	D15	5051519	AADF0500J2B KC625M	M50
4176047	NG3078LK KCU10	D131	4176165	NDC3115VR75 KCU10	E16	4178129	A2016N00CF00 KCJ25	D15	5051560	AADF0500J2F KC625M	M50
4176048	NG3078R KCU10	D128	4176166	NDC314VR75 KCU10	E16	4178130	A2014L06CF01 KCJ25	D15	5051561	AADF0375J2B KC625M	M49
4176049	NG3078RK KCU10	D130	4176167	NDC327VR75 KCU10	E16	4178131	A2016L06CF00 KCJ25	D15	5051564	AADF0312J2A KC625M	M49
4176050	NG3088L KCU10	D129	4176168	NDC338RL75 KCU10	E18	4178132	A2016L10CF00 KCJ25	D15	5051566	AADF0250J2B KC625M	M49
4176051	NG3088R KCU10	D128	4176169	NDC338RDR75 KCU10	E18	4178183	A2016L16CF00 KCJ25	D15	5051568	AADF0188J2B KC625M	M48
4176052	NG3094L KCU10	D129	4176170	NDC338VL75 KCU10	E16	4178184	A2050L06CF03 KCJ25	D15	5051570	AADF0125J2B KC625M	M48
4176053	NG3094LK KCU10	D131	4176171	NDC338VR75 KCU10	E16	4178185	A2014R06CF01 KCJ25	D15	5051571	AADF1000J2A KC625M	M52
4176054	NG3094R KCU10	D128	4176172	NDC4038L2 KCU10	E18	4178186	A2014N00CF01 KCJ25	D16	5051572	AADF0438J2A KC625M	M50
4176055	NG3094RK KCU10	D130	4176173	NDC4038R2 KCU10	E18	4178187	A2016L16CM00 KCJ25	D16	5051573	AADF0750J2D KC625M	M52
4176056	NG3097L KCU10	D129	4176174	NDC4050L3 KCU10	E18	4178188	A2022L06CM00 KCJ25	D16	5051574	AADF0500J2C KC625M	M50
4176057	NG3097R KCU10	D128	4176175	NDC4050R2 KCU10	E18	4178189	A2050L06CR04 KCJ25	D17	5051575	AAD	



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5051944	AADE0250J3GRB K600	M53	5053628	HPHV438S4200 KC635M	M11	5056345	HEC438S363R20 KC635M	M86	5057439	HPFSS406S1100 K600	M71
5051945	AADE0312J3CRB K600	M53	5053629	HPHV312S4125 KC635M	M10	5056346	HEC375S388R20 KC635M	M86	5057500	HPFSS438S5088 K600	M71
5051946	AADE0312J3DRB K600	M54	5053660	HPHV438S4063 KC635M	M11	5056349	HEC375S350R20 KC635M	M86	5057501	HPFSS438S5063 K600	M71
5051947	AADE0375J3ARB K600	M54	5053661	HPHV1250S4225 KC635M	M13	5056390	HEC125S381R20 KC635M	M86	5057572	HPFSS438S5200 K600	M71
5051949	AADE0375J3KRB K600	M54	5053662	HPHV438S4088 KC635M	M12	5056391	HEC125S350R20 KC635M	M86	5057573	HPFSS281S5081 K600	M71
5052000	AADE0375J3KRC K600	M54	5053663	HPHV625S4163 KC635M	M12	5056392	HEC250S375R20 KC635M	M86	5057612	HPFSS156S5056 KC625M	M71
5052001	AADE0500J3KRB K600	M55	5053664	HPHV750S4225 KCPM15	M13	5056393	HEC188S363R10 KC635M	M86	5057615	HPFSS438S5200 KC625M	M71
5052002	AADE0500J3KRC K600	M55	5053665	HPHV500S4200R060 KC635M	M11	5056394	HEC156S356R10 KC635M	M86	5057616	HPFSS438S5088 KC625M	M71
5052003	AADE0500J3LRB K600	M55	5053666	HPHV625S4163R060 KC635M	M12	5056396	HEC125S350R10 KC635M	M86	5057617	HPFSS438S5063 KC625M	M71
5052004	AADE0500J3LRC K600	M55	5053667	HPHV750S4088R030 KC635M	M12	5056397	HEC125S325R10 KC635M	M86	5057618	HPFSS188S5031 KC625M	M71
5052005	AADE0625J3IRC K600	M55	5053668	HPHV750S4088R060 KC635M	M12	5056398	HEC250S350R20 KC635M	M86	5057641	HPFSS375S150 KC625M	M71
5052006	AADE0625J3IRD K600	M55	5053669	HPHV750S4088R120 KC635M	M12	5056430	HEC63S2 K600	M83	5057643	HPFSS375S5088 KC625M	M71
5052007	AADE0625J3JRC K600	M55	5053670	HPHV750S4300R030 KC635M	M13	5056432	HEC16S2 KC625M	M83	5057644	HPFSS375S5063 KC625M	M71
5052008	AADE0750J3ARB K600	M56	5053671	HPHV750S4300R060 KC635M	M13	5056433	HEC31S2 KC625M	M83	5057660	HPFSS344S5088 KC625M	M71
5052040	AADE0750J3ARC K600	M56	5054205	UADE0375J4AQCH KC633M	M14	5056434	HEC47S2 KC625M	M83	5057661	HPFSS312S5125 KC625M	M71
5052041	AADE0750J3ARD K600	M56	5054207	UADE0250J4AQCH KC633M	M14	5056435	HEC63S2 KC625M	M83	5057662	HPFSS312S5081 KC625M	M71
5052042	HPFT500S6100 KC625M	M72	5054230	UADE0375J4AQC KC633M	M14	5056436	HEC63S2018 KC625M	M83	5057663	HPFSS312S5050 KC625M	M71
5052043	HPFT750S6400 KC625M	M72	5054262	UADE0750J4BLA KC633M	M13	5056437	HEC63S2013 KC625M	M83	5057665	HPFSS250S125 KC625M	M71
5052044	HPFT750S6088 KC625M	M72	5054264	UADE0625J4BLA KC633M	M13	5056439	HEC78S2 KC625M	M83	5057666	HPFSS406S1100 KC625M	M71
5052045	HPFT625S6075 KC625M	M72	5054265	UADE0500J4BLA KC633M	M13	5056460	HEC94S2018 KC625M	M83	5057670	HPFSS250S5075 KC625M	M71
5052046	HPFT500S6063 KC625M	M72	5054266	UADE0250J4BLA KC633M	M13	5056461	HEC94S2 KC625M	M83	5057671	HPFSS250S5050 KC625M	M71
5052047	HPFT375S6050 KC625M	M72	5054268	UADE0375J4BLA KC633M	M13	5056465	HEC109S2 KC625M	M83	5057672	HPFSS219S5075 KC625M	M71
5052048	HPFT250S6038 KC625M	M72	5054269	FMDE0625J5ASA K600	M11	5056467	HEC125S2100 KC625M	M83	5057673	HPFSS188S5063 KC625M	M71
5052049	HPFT750S6300 KC625M	M72	5054321	FMDE0500J5ASA K600	M11	5056468	HEC125S2075 KC625M	M83	5057675	HPFSS125S5050 KC625M	M71
5052120	HPFT625S6300 KC625M	M72	5054322	FMDE0375J5ASA K600	M11	5056470	HEC125S2 KC625M	M83	5057676	HPFSS125S5025 KC625M	M71
5052121	HPFT500S6300 KC625M	M72	5054325	FMDE031J5ASA K600	M11	5056471	HEC125S2025 KC625M	M83	5057804	MDRHEC62S4063 K600	M77
5052122	HPFT750S6225 KC625M	M72	5054326	FMDE0250J5ASA K600	M11	5056472	HEC156S2031 KC625M	M83	5057805	MDRHEC750S4075 K600	M77
5052123	HPFT625S6225 KC625M	M72	5054340	FMDE0750J5CSC K600	M11	5056475	HEC156S2 KC625M	M83	5057806	MDRHEC62S4125 K600	M77
5052124	HPFT500S6200 KC625M	M72	5054341	FMDE0625J5CSC K600	M11	5056476	HEC188S2113 KC625M	M83	5057809	MDRHEC750S4125 K600	M77
5052125	HPFT375S6112 KC625M	M72	5054343	FMDE0500J5DSD K600	M11	5056477	HEC188S2075 KC625M	M83	5058020	MDRHEC500S4100 K600	M77
5052126	HPFT312S6112 KC625M	M72	5054344	FMDE0375J5CSC K600	M11	5056478	HEC188S2 KC625M	M83	5058021	MDRHEC500S4050 K600	M77
5052127	HPFT250S6112 KC625M	M72	5054345	FMDE031J5CSC K600	M11	5056479	HEC188S2031 KC625M	M83	5058022	MDRHEC375S4088 K600	M77
5052128	HPFT1000S6150 KC625M	M72	5054346	FMDE0250J5CSC K600	M11	5056490	HEC63S2044 KC625M	M83	5058023	MDRHEC375S4038 K600	M77
5052129	HPFT750S6150 KC625M	M72	5054347	FMDE0750J5BSB K600	M11	5056495	HEC219S2 KC625M	M83	5058028	MDRHEC100S150 K600	M77
5052130	HPFT625S6125 KC625M	M72	5054348	FMDE0625J5BSB K600	M11	5056497	HEC250S2150 KC625M	M83	5058029	MDRHEC750S4150 KC625M	M77
5052131	HPFT438S6088 KC625M	M72	5054349	FMDE0500J5CSC K600	M11	5056498	HEC250S2113 KC625M	M83	5058080	MDRHEC750S4075 KC625M	M77
5052132	HPFT375S6088 KC625M	M72	5054360	FMDE0500J5BSB K600	M11	5056499	HEC250S2 KC625M	M83	5058081	MDRHEC62S4125 KC625M	M77
5052133	HPFT312S6081 KC625M	M72	5054361	FMDE0375J5BSB K600	M11	5056510	HEC250S2050 KC625M	M83	5058082	MDRHEC62S4063 KC625M	M77
5052134	HPFT250S6075 KC625M	M72	5054362	FMDE031J5BSB K600	M11	5056511	HEC312S2163 KC625M	M83	5058083	MDRHEC500S4100 KC625M	M77
5052135	HPFT438S6200 KC625M	M72	5054363	FMDE0250J5BSB K600	M11	5056512	HEC312S2 KC625M	M83	5058084	MDRHEC500S4050 KC625M	M77
5052460	AADE1000J3K KC625M	M57	5054364	FMDE0188J5ASA K600	M11	5056513	HEC344S2 KC625M	M83	5058089	MDRHEC100S150 KC625M	M77
5052461	AADE1000J3K KC625M	M57	5054365	FMDE0125J5ASA K600	M11	5056514	HEC375S2088 KC625M	M84	5058120	MDRHEC100S150 KC625M	M77
5052462	AADE0750J3D KC625M	M56	5054551	FMDE0750J5ASA K625M	M11	5056515	HEC375S2113 KC625M	M84	5058122	HPFF250S6113 K600	M12
5052463	AADE0750J3H KC625M	M56	5054555	FMDE0625J5ASA K625M	M11	5056517	HEC438S2200 KC625M	M84	5058124	HPFF250S6075 K600	M12
5052464	AADE0625J3D KC625M	M55	5054556	FMDE0500J5ASA K625M	M11	5056530	HEC438S2 KC625M	M84	5058125	HPFF250S6038 K600	M12
5052503	AADE0500J3D KC625M	M55	5054557	FMDE0375J5ASA K625M	M11	5056532	HEC500S2300 KC625M	M84	5058126	HPFF312S6113 K600	M12
5052504	AADE0750J3A KC625M	M56	5054558	FMDE031J5ASA K625M	M11	5056534	HEC500S2200 KC625M	M84	5058127	HPFF312S6081 K600	M12
5052506	AADE0375J3A KC625M	M54	5054671	FMDE0250J5ASA K625M	M11	5056535	HEC500S2 KC625M	M84	5058128	HPFF375S6113 K600	M12
5052507	AADE0250J3A KC625M	M53	5054673	FMDE1000J5ASA K625M	M11	5056537	HEC500S2063 KC625M	M84	5058129	HPFF375S6088 K600	M12
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1.18025L330Z	F40	20MHC050M	.G68	3.75210R215	.J53	3.76180R110	J80-J84
1.18025R110	F36	20MHC060M	.G68	3.75210R218	.J54	3.76180R110	J80-J84
1.18025R130	F36	20MHC070M	.G68	3.75220R215	.J53	3.76195R110	J80-J84
1.18025R302	F35	20MHC080M	.G68	3.75220R218	.J54	3.76195R110	J80-J84
1.18025R310	F36	20MHC090M	.G68	3.75230R215	.J53	3.76213R125	J80-J84
1.18025R310Z	F40	20MHC100M	.G68	3.75230R218	.J54	3.76213R125	J80-J84
1.18025R315	F36	20MHC110M	.G68	3.75240R215	.J53	3.76230R160	J80-J84
1.18025R315Z	F40	20MHC120M	.G68	3.75240R218	.J54	3.76230R160	J80-J84
1.18025R330	F36	20MHC130M	.G68	3.75250R215	.J53	3.76260R160	J80-J84
1.18025R330Z	F40	20MHC140M	.G68	3.75250R218	.J54	3.76260R160	J80-J84
1.18032L315	F36	20MHC150M	.G68	3.75260R215	.J53	3.77000R023V	J80-J84
1.18032L410	F36	20MHC160M	.G68	3.75260R218	.J54	3.77000R023V	J80-J84
1.18032L430	F36	250C20RP70SP12C4WUFP	.074	3.75270R215	.J53	3.77000R023V	J80-J84
1.18032R315	F36	25MHC030M	.G68	3.75270R218	.J54	3.77000R024V	J80-J84
1.18032R410	F36	25MHC040M	.G68	3.75280R215	.J53	3.77000R024V	J80-J84
1.18032R430	F36	25MHC050M	.G68	3.75280R218	.J54	3.77000R024V	J80-J84
1.38020L021	F37	25MHC060M	.G68	3.75290R215	.J53	3.77000R024V	J80-J84
1.38020R021	F37	25MHC070M	.G68	3.75290R218	.J54	3.77000R025V	J80-J84
1.38025L021	F37	25MHC080M	.G68	3.75300R215	.J53	3.77000R025V	J80-J84
1.38025L021Z	F41	25MHC090M	.G68	3.75300R218	.J54	3.77000R025V	J80-J84
1.38025R021	F37	25MHC100M	.G68	3.75310R215	.J53	3.77000R025V	J80-J84
1.38025R021Z	F41	25MHC120M	.G68	3.75310R218	.J54	3.77000R025V	J80-J84
1.77120L100	F38	25MHC140M	.G68	3.75320R215	.J53	3.77000R026V	J80-J84
1.77120R100	F37	25MHC160M	.G68	3.75320R218	.J54	3.77000R026V	J80-J84
1.77125L300Z	F41	3.37042R320	.I12	3.75330R215	.J53	3.77000R026V	J80-J84
1.77125R300	F37	3.37042R820	.I12	3.75330R218	.J54	3.77000R026V	J80-J84
1.77125R300Z	F41	3.37051R320	.I12	3.75340R215	.J53	3.77000R026V	J80-J84
1.77132L400	F38	3.37051R820	.I12	3.75340R218	.J54	3.77000R027V	J80-J84
1.77132L400Z	F41	3.37052R320	.I12	3.75350R215	.J53	3.77000R027V	J80-J84
1.77132R400	F37	3.37052R820	.I12	3.75350R218	.J54	3.77000R027V	J80-J84
1.77132R400Z	F41	3.37060R720	.I22	3.75360R215	.J53	3.77000R028V	J80-J84
1.77225R301	F38	3.37061R320	.I12	3.75360R218	.J54	3.77000R028V	J80-J84
1.77720L101	F37	3.37061R820	.I12	3.75370R215	.J53	3.77000R028V	J80-J84
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1.77725R301	F37	3.37062R820	.I12	3.75380R215	.J53	3.77000R028V	J80-J84
1.78012R103	F38	3.37071R320	.I12	3.75380R218	.J54	3.77000R028V	J80-J84
1.78016R100	F38	3.37071R820	.I12	3.75390R215	.J53	3.77000R029V	J80-J84
1.78020R100	F38	3.37080R720	.I22	3.75390R218	.J54	3.77000R029V	J80-J84
1.78025L100	F38	3.37081R320	.I12	3.75400R215	.J53	3.77000R029V	J80-J84
1.78025L300	F38	3.37081R820	.I12	3.75400R218	.J54	3.77000R029V	J80-J84
1.78025L300Z	F41	3.37091R320	.I12	3.75410R215	.J53	3.77000R030V	J80-J84
1.78025R100	F38	3.37091R820	.I12	3.75410R218	.J54	3.77000R030V	J80-J84
1.78025R300	F38	3.37092R320	.I12	3.75420R215	.J53	3.77000R030V	J80-J84
1.78025R300Z	F41	3.37092R820	.I12	3.75420R218	.J54	3.77000R030V	J80-J84
1.78032L400	F38	3.37100R720	.I22	3.75430R215	.J53	3.77000R030V	J80-J84
1.78032L400Z	F41	3.37101R332	.I12	3.75430R218	.J54	3.77000R031V	J80-J84
1.78032R400	F38	3.37101R832	.I12	3.75440R215	.J53	3.77000R031V	J80-J84
1.78032R400Z	F41	3.37111R332	.I12	3.75440R218	.J54	3.77000R031V	J80-J84
100B04RP90BG15CUM	.0123	3.37111R832	.I12	3.75450R215	.J53	3.77000R031V	J80-J84
100B06RP90BG15C2WUFP	.0124	3.37120R732	.I22	3.75450R218	.J54	3.77000R031V	J80-J84
100B06RP90BG15C6WUHPM	.0125	3.37121R332	.I12	3.76045R028V	J80-J84	3.77000R038V	J80-J84
100B08RP00MD10CUF	.070	3.37121R832	.I12	3.76045R028V	J80-J84	3.77000R038V	J80-J84
100B08RP70SP12C2WUFP	.074	3.37131R332	.I12	3.76050R028V	J80-J84	3.77000R038V	J80-J84
100B08RP90BG15C2WUFP	.0124	3.37131R832	.I12	3.76050R028V	J80-J84	3.77000R038V	J80-J84
100B08RP90SP12C2WUFP	.078	3.37140R732	.I22	3.76055R032V	J80-J84	3.77000R039V	J80-J84
100B12RP70SP12C3WUFP	.074	3.37141R332	.I12	3.76055R032V	J80-J84	3.77000R048V	J80-J84
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125B05RP90BG15CUM	.0123	3.37151R832	.I12	3.76063R032V	J80-J84	3.77000R049V	J80-J84
125B08RP70SP15C2WUFP	.082	3.37160R732	.I22	3.76063R032V	J80-J84	3.77000R050V	J80-J84
125B10RP00MD10CUF	.070	3.37161R332	.I12	3.76063R040V	J80-J84	3.77000R050V	J80-J84
125B10RP70SP12C2WUFP	.074	3.37161R832	.I12	3.76063R040V	J80-J84	3.77000R051V	J80-J84
125B10RP90SP12C2WUFP	.078	3.37171R332	.I12	3.76068R040V	J80-J84	3.77000R051V	J80-J84
125B15RP70SP12C3WUFP	.074	3.37171R832	.I12	3.76068R040V	J80-J84	3.77000R052V	J80-J84
125B15RP90SP12C3WUFP	.078	3.37180R732	.I22	3.76073R040V	J80-J84	3.77000R052V	J80-J84
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12748358200 W	.089, 094, 0103	3.37181R832	.I12	3.76078R040V	J80-J84	3.77000R053V	J80-J84
12748500200 W	.095	3.37526R006	.I23	3.76078R040V	J80-J84	3.77000R073V	J80-J84
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12748503400 W	.095	3.37530R010	.I23	3.76078R048V	J80-J84	3.77000R074V	J80-J84
12748600900 W	.089, 094, 0103, 0110	3.37532R012	.I23	3.76084R048V	J80-J84	3.77000R074V	J80-J84
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12MHC040M	.G68	3.37538R016	.I23	3.76090R048V	J80-J84	3.77000R075V	J80-J84
12MHC050M	.G68	3.37540R018	.I23	3.76090R048V	J80-J84	3.77000R075V	J80-J84
12MHC060M	.G68	3.37542R020	.I23	3.76096R048V	J80-J84	3.77000R075V	J80-J84
12MHC070M	.G68	3.41020R900	.I15	3.76096R048V	J80-J84	3.77000R076V	J80-J84
12MHC080M	.G68	3.41020R900STF	.I15	3.76096R058V	J80-J84	3.77000R076V	J80-J84
12MHC090M	.G68	3.41020R901	.I14	3.76096R058V	J80-J84	3.77000R077V	J80-J84
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160B10RP70SP15C2WUFP	.082	3.41020R904	.I15	3.76108R058V	J80-J84	3.77000R077V	J80-J84
160B10RP90BG15C2WUFP	.0124	3.41220R900	.I15	3.76108R058V	J80-J84	3.77000R078V	J80-J84
160B12RP00MD10CUF	.070	3.41220R900SF	.I15	3.76115R070V	J80-J84	3.77000R078V	J80-J84
160B12RP70SP12C3WUFP	.074	3.41220R900STF	.I15	3.76115R070V	J80-J84	3.77000R078V	J80-J84
160B12RP90SP12C3WUFP	.078	3.41220R901	.I14	3.76122R070V	J80-J84	3.77000R078V	J80-J84
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3.7700R082V	J80-J84	40512201281	.L123	80A06RP90SP12C1WUFP	.078	A08STLPR2	.C113
3.7700R083V	J80-J84	40512201282	.L123	80A08RP70SP12C2WUFP	.074	A08SWLCL2	.C115
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3.7700R083V	J80-J84	40512201284	.L123	A0306SCLDR12	.C100	A08SWLPL2	.C116
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3.7700R280V	J80-J84	5.34350-090100	.J89	A08CTFPR2	.C91	A12NKQCL05	.F55
3.7700R280V	J80-J84	5.34350-090100	.J95	A08CTLNR2	.C89	A12NKQCR05	.F55
3.7700R280V	J80-J84	5.36050-154050	.J89	A08CTLPL2	.C93	A12NKXCL05	.F56
3.7700R282V	J80-J84	50A03RP90BG15CUM	.0123	A08CTLPR2	.C93	A12NKXCR05	.F56
3.7700R282V	J80-J84	50A03RP90BG15CUPM	.0124	A08NEL2	.D150, E32	A12RA4EML0207N	.D95
3.7700R282V	J80-J84	50A04RP70SP12CUFP	.074	A08NER1	.D151, E33	A12RA4EML0307N	.D95
3.7700R284V	J80-J84	50A04RP90SP12CUFP	.078	A08NER2	.D150, E32	A12RA4EML0407N	.D95
3.7700R284V	J80-J84	50A05RP70SP12CUFP	.074	A08NKQCL05	.F55	A12RA4EMR0207N	.D95
3.7700R284V	J80-J84	50A05RP90SP12CUFP	.078	A08NKQCR05	.F55	A12RA4EMR0307N	.D95
3.7700R286V	J80-J84	50HC030M	.G68	A08RSCFCR2	.C94	A12RA4EMR0407N	.D95
3.7700R286V	J80-J84	50HC040M	.G68	A08RSCFDR2	.C94	A12RA4SAL2S12N021026	.D98
3.7700R288V	J80-J84	50HC050M	.G68	A08RSCCL2	.C97	A12RA4SAL3S14N021026	.D98
3.7700R288V	J80-J84	50HC060M	.G68	A08RSCLCR2	.C97	A12RA4SAR2S12N021026	.D98
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32MHC070M	.G68	50HC100M	.G68	A08RSDUPL2	.C105	A12SCFPL3	.C96
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32MHC100M	.G68	63A04RP90BG15C4WUHPM	.0125	A08RSDXCR2	.C107	A12SCFPR3AP5	.C96
32MHC110M	.G68	63A05RP70SP12CUFP	.074	A08RSDXPL2	.C107	A12SCLPL3	.C101
32MHC120M	.G68	63A05RP90SP12CUFP	.078	A08RSDXPR2	.C107	A12SCLPL3AP5	.C103
32MHC130M	.G68	75HC030M	.G68	A08RSTFCL2	.C108	A12SCLPR3	.C101
32MHC140M	.G68	75HC040M	.G68	A08RSTFCR2	.C108	A12SCLPR3AP5	.C103
32MHC150M	.G68	75HC050M	.G68	A08RSTFPR2	.C109	A12SCLPR3D	.C104

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ABDF0625J2BQB K600	M44	B041A02000CPG KC7325	G6-G9	B041A07900CPG KC7325	G6-G9	B042A02779CPG KC7325	G6-G9
ABDF0625J2BQE K600	M44	B041A02100CPG KC7325	G6-G9	B041A07938CPG KC7325	G6-G9	B042A02800CPG KC7325	G6-G9

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B343S14280HPG	.18	B504S10000	.J57	B707A04800FBS	.G89	B707A12800FBL	.G90
B343S15000HPG	.18	B505Z06000	.G109	B707A04900FBG	.G89	B707A12800FBS	.G90
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B343S15870HPG	.18	B505Z10000	.G109	B707A05000FBL	.G89	B707A13000FBL	.G90
B343S16000HPG	.18	B505Z12000	.G109	B707A05000FBS	.G89	B707A13000FBS	.G90
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B343S16670HPG	.18	B505Z20000	.G109	B707A05560FBL	.G89	B707A13500FBL	.G90
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B343S17460HPG	.18	B510S08000	.J80-J84	B707A05900FBG	.G89	B707A14000FBG	.G90
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B411A03800	.G81	B510S20000	.J80-J84	B707A06350FBG	.G89	B707A14500FBG	.G90
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B411A16500	.G82	B532A06375SPF	.G86	B707A10500FBL	.G89	B731A05000HP	.G94
B411A17000	.G82	B532A066375SPF	.G86	B707A10500FBS	.G89	B731A05106HP	.G94
B411A17500	.G82	B532A06400SPF	.G86	B707A10600FBG	.G90	B731A05410HP	.G94
B411A18000	.G82	B532A06500SPF	.G86	B707A11000FBG	.G90	B731A06528HP	.G94
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B411A20000	.G82	B532A07938SPF	.G86	B707A11111FBG	.G90	B731A07938HP	.G94
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C8FX120505RRP KCP40	F30	C8O560 KWH	F92	CCGT3251HP K68	B88	CCLNR164	C38
C8FX120505RRP KCU10	F30	C8S16 KWH	F92	CCGT3251HP K68	B88	CCLNR164DMX5	C36
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C8FX120508LRP KCP25	F30	C8TF180R2WD20N2M	J105	CCGT3251HP KCU10	B88	CCLPL12CA4	C144
C8FX120508LRP KCP40	F30	C8TF180R2WD20N3M	J105	CCGT3251HP KCU25	B88	CCLPL164C	C43
C8FX120508LRP KCU10	F30	C8TF200R2WD20N2M	J105	CCGT3251LF K313	B88	CCLPR084V	C43
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CCMT3251FP KCM15	.889	CCMT3252MF KCP25	.890	CCMT432MP KCU10	.890	CE1031	.F68-69
CCMT3251FP KCM25	.889	CCMT3252MF KCP30	.890	CCMT432MW KC5010	.890	CK10	.C40-46, C48-49, C90-92, C128
CCMT3251FP KCP05	.889	CCMT3252MP KCK20	.890	CCMT432MW KCK20	.890	CK12	.C16-24, C26-27, C29, C39, C43, C80-83, C122-125
CCMT3251FP KCP10	.889	CCMT3252MP KCM15	.890	CCMT432MW KCP25	.890	CK13	.C43, C47, F92
CCMT3251FP KCP25	.889	CCMT3252MP KCM25	.890	CCMT432MW KCU10	.890	CK19	.C25, C28-29, C42, C46, C48-49, C91-93
CCMT3251FP KCU10	.889	CCMT3252MP KCP10	.890	CCMT433FP KCM25	.889	CK20	.C15-18, C20-21, C30, C38-39, C80-81, C85-86, C90-93, C122-123, C127
CCMT3251FP KCU25	.889	CCMT3252MP KCP25	.890	CCMT433FP KCM35	.889	CK21	.C16, C22, C32-33, C38, C80, C122, C125
CCMT3251FP K10P	.889	CCMT3252MP KCU10	.890	CCMT433FP KCP05	.889	CK22	.C82, C90, C124, C126
CCMT3251FP K10U	.889	CCMT3252MW KC5010	.890	CCMT433FP KCP10	.889	CK23	.C20-21, C47
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CCMT3251FW KCK20	.889	CCMT3252MW KCP25	.890	CCMT433LF KC5010	.889		
CCMT3251FW KCP25	.889	CCMT3252MW KCU10	.890	CCMT433LF KCK05	.889		
CCMT3251FW KCU10	.889	CCMT3252MW KT315	.890	CCMT433LF KCK20	.889		
CCMT3251FW KT315	.889	CCMT3252UF KC5010	.890	CCMT433LF KCM25	.889		
CCMT3251LF K313	.889	CCMT3252UF KCP05	.890	CCMT433LF KCP10	.889		

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CNMG642RN KCP10	.B46	CNMG644RP KC5525	.B46	CNMM546RM KCP30	.B48	CPG422 K313	.B84
CNMG642RN KCP25	.B46	CNMG644RP KCK20	.B46	CNMM546RM KCP40	.B48	CPG422 K68	.B84
CNMG642RN KCP40	.B46	CNMG644RP KCM15	.B46	CNMM546RM KCP40	.B48	CPG422F KD1425	.B185
CNMG642UN KCK05	.B47	CNMG644RP KCM25	.B46	CNMM546RM KCM15	.B48	CPG422S0415MT KB1630	.B185
CNMG642UN KCK15	.B47	CNMG644RP KCM35	.B46	CNMM546RM KCP25	.B48	CPGM21505 K313	.B92
CNMG642UN KCK20	.B47	CNMG644RP KCP10	.B46	CNMM546RM KCP30	.B48	CPGM21505 K68	.B92
CNMG642UP KCM15	.B47	CNMG644RP KCP25	.B46	CNMM546RM KCP40	.B48	CPGM2151 K313	.B92
CNMG642UP KCM25	.B47	CNMG644RP KCP30	.B46	CNMM546RM KCP40	.B48	CPGM2151 K68	.B92
CNMG643 K68	.B41	CNMG644RP KCP40	.B46	CNMM546RM KCM15	.B48	CPGM2151 K68	.B92
CNMG643 KC5010	.B41	CNMG644RP KCU10	.B46	CNMM546RM KCP10	.B48	CPGM2151 KC5410	.B92
CNMG643 KCP25	.B41	CNMG644RP KCU25	.B46	CNMM546RM KCP25	.B48	CPGM2152 K313	.B92
CNMG643 KCP40	.B41	CNMG644UN KCK05	.B47	CNMM546RM KCP30	.B48	CPGM2152 K68	.B92
CNMG643 KCU10	.B41	CNMG644UN KCK15	.B47	CNMM546RM KCP40	.B48	CPGM3250 K5010	.B92
CNMG643H K10P	.F122	CNMG644UN KCK20	.B47	CNMM546RM KC9110	.F107	CPGM3250 KCU10	.B92
CNMG643H K20K	.F122	CNMG644UN KCK20	.B47	CNMM546RM KC9125	.F107	CPGM3250 KCU25	.B92
CNMG643H K25P	.F122	CNMG644UP KCM15	.B47	CNMM546RM KCP10	.B47, F107	CPGM32505 KC5025	.B92
CNMG643H K35P	.F122	CNMG644UP KCM25	.B47	CNMM546RM KCP25	.B47, F107	CPGM32505 KCU10	.B92
CNMG643M K10M	.F123	CNMG644UP KCM35	.B47	CNMM546RM KCP30	.B48	CPGM32505 KCU25	.B92
CNMG643M K25M	.F123	CNMG646RN KCP10	.B46	CNMM546RM KCP40	.B48	CPGM32505 K313	.B92
CNMG643MN KCP10	.B44	CNMG646RN KCP25	.B46	CNMM546RM KCP40	.B48	CPGM32505 K68	.B92
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CNMG643MN KCP40	.B44	CNMG866 KC5010	.B41	CNMM546RM KCP25	.B48, F107	CPGM32505 KCU10	.B92
CNMG643MP KC5010	.B44	CNMG866 KCP25	.B41	CNMM546RM KCP30	.B48, F107	CPGM32505 KCU25	.B92
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CNMG643MS K313	.B45	CNMM19074ORRP KC9110	.F87	CNMM546RM KCP40	.B48	CPGM3251 KCU10	.B92
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CNMG643R K25M	.F123	CNMM432RP KCM15	.B48	CNMM546RM KCP30	.B47, F107	CPGM3252 KCU10	.B92
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CNMG643R K35P	.F123	CNMM432RP KCP05	.B48	CNMM546RM KCM15	.F107	CPGM3252 KT315	.B92
CNMG643RM KCP25	.B46	CNMM432RP KCP10	.B48	CNMM546RM KCP25	.B48, F107	CPGT21505HP KC5010	.B93
CNMG643RM KCP40	.B46	CNMM432RP KCP25	.B48	CNMM546RM KCP30	.B48	CPGT21505HP KC5025	.B93
		CNMM432RP KCP40	.B48	CNMM546RM KCP40	.B48	CPGT21505HP KC5410	.B93
				CNMM546RP KCP10	.B48	CPGT21505HP KCU10	.B93

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CPGT21505LF KC5410	B93	CPMT18151FP KCU25	B93	CPMT3251FP KCM25	B93	CRDPM203DV	C68
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CPGT2151FWL20	K159	CPMT21505FP KCP10	B93	CPMT3251FW KC5010	B94	CRGNL163	C39
CPGT2151HP KC5010	B93	CPMT21505FP KCP25	B93	CPMT3251FW KCK20	B94	CRGNL164	C39
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CSKPR164D	C44	CTFNL163	C43	D2FX1110403RHP KCU10	F27	D4FX140604RMN KCP10	F29
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CSNR124	C41	CTFNR853	C42	D2FX1110403RMN KCP25	F26	D4FX140604RMN KCP40	F29
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CSRPL124B	C45	CTFPL163D	C48	D2FX1110404LMN KCP40	F26	D4FX140605RMN KCP25	F29
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CSRPL164D	C45	CTFPL16CA3	C147	D2FX1110404LMN KCU25	F26	D4FX140608LMN KCP25	F29
CSRPL856D	C45	CTFPL204D	C48	D2FX1110404RHP KCU10	F27	D4FX140608LMN KCP40	F29
CSRPL866E	C45	CTFPL854D	C48	D2FX1110404RHP KCU25	F27	D4FX140608LMN KCU10	F29
CSRPR083B	C45	CTFPR082V	C48	D2FX1110404RMN KCP10	F26	D4FX140608LMN KCU25	F29
CSRPR10CA3	C145	CTFPR10CA2	C147	D2FX1110404RMN KCP25	F26	D4FX140608RMN KCP10	F29
CSRPR124B	C45	CTFPR123B	C48	D2FX1110404RMN KCP40	F26	D4FX140608RMN KCP25	F29
CSRPR12CA4	C145	CTFPR12CA3	C147	D2FX1110404RMN KCU10	F26	D4FX140608RMN KCP40	F29
CSRPR164D	C45	CTFPR163C	C48	D2FX1110404RMN KCU25	F26	D4FX140608RMN KCU10	F29
CSRPR856D	C45	CTFPR163D	C48	D2FX1110405LMN KCP10	F26	D4FX140608RMN KCU25	F29
CSRPR866E	C45	CTFPR164C	C48	D2FX1110405LMN KCP25	F26	D5420W	C120
CSSNL164	C41	CTFPR164D	C48	D2FX1110405LMN KCP40	F26	D5424W	C120
CSSNR164	C41	CTFPR16CA3	C147	D2FX1110405RMN KCP10	F26	D5428W	C120
CSSPL10CA3	C145	CTFPR204D	C48	D2FX1110405RMN KCP25	F26	D5432W	C120
CSSPL12CA4	C145	CTFPR20CA4	C147	D2FX1110405RMN KCP40	F26	D5440W	C120
CSSPL164D	C45	CTFPR854D	C48	D2FX1150503LHP KCP25	F27	D64TTB56	C121
CSSPL16CA4	C145	CTGNL123	C43	D2FX1150503LHP KCU10	F27	D64TTB58KM63	C121
CSSPL854D	C45	CTGNL163	C43	D2FX1150503LMS KCU10	F27	DCGT21505HP K313	B95
CSSPL856D	C45	CTGNL164	C43	D2FX1150503RHP KCP25	F27	DCGT21505HP KC5010	B95
CSSPR10CA3	C145	CTGNR123	C43	D2FX1150503RHP KCU10	F27	DCGT21505HP KC5025	B95
CSSPR12CA4	C145	CTGNR163	C43	D2FX1150503RMN KCP10	F26	DCGT21505HP KC5410	B95
CSSPR164D	C45	CTGNR164	C43	D2FX1150503RMN KCP25	F26	DCGT21505HP KCU10	B95
CSSPR16CA4	C145	CTGNR204	C43	D2FX1150503RMS KCU10	F27	DCGT21505HP KCU25	B95
CSSPR854D	C45	CTGPL102B	C49	D2FX1150504LHP KCU10	F27	DCGT2150F K10U	F123
CSSPR856D	C45	CTGPL123B	C49	D2FX1150504LHP KCU25	F27	DCGT2150F K15U	F123
CSTPR10CA3	C146	CTGPL12CA3	C148	D2FX1150504LMN KCP10	F26	DCGT2150LF KC5010	B96
CSWM 035 040	C149, C151-152	CTGPL163C	C49	D2FX1150504LMN KCP25	F26	DCGT2150LF KC5025	B96
CSWM 040 050	C149-154, C158-161	CTGPL163D	C49	D2FX1150504LMN KCP40	F26	DCGT2150LF KCU10	B96
CSWM 060 050	C134-151, C153-161, D154, E36	CTGPL164C	C49	D2FX1150504LMN KCU10	F26	DCGT2151HP K313	B95
		CTGPL164D	C49	D2FX1150504LMN KCU25	F26	DCGT2151HP KC5010	B95
CSWM 080 050	C134-145, C147-148, C150, C155, C157-158, C161, D154, E36	CTGPL204D	C49	D2FX1150504RHP KCU10	F27	DCGT2151HP KC5025	B95
		CTGPL205D	C49	D2FX1150504RHP KCU25	F27	DCGT2151HP KC5410	B95
CSWM 100 080	C135, C137, C140, C143, D154, E36	CTGPL20CA4	C148	D2FX1150504RMN KCP10	F26	DCGT2151HP KCU10	B95
		CTGPR082B	C49	D2FX1150504RMN KCP25	F26	DCGT2151HP KCU25	B95
CSYPL10CA3	C146	CTGPR102B	C49	D2FX1150504RMN KCP40	F26	DCGT2152HP KC5010	B95
CSYPR10CA3	C146	CTGPR10CA2	C148	D2FX1150504RMN KCU10	F26	DCGT2152HP KC5025	B95
CT11 WG	C118	CTGPR123A	C49	D2FX1150504RMN KCU25	F26	DCGT2152HP KC5410	B95
CT15	C118	CTGPR123B	C49	D2FX1150505LFN KCP25	F27	DCGT2152HP KCU10	B95
CTANL164	C42	CTGPR12CA3	C148	D2FX1150505LFN KCU10	F27	DCGT2152HP KCU25	B95
CTANR082	C42	CTGPR163C	C49	D2FX1150505LMN KCP10	F26	DCGT215XOLF KC5025	B96
CTANR123	C42	CTGPR163D	C49	D2FX1150505LMN KCP25	F26	DCGT32505HP K313	B95
CTANR124	C42	CTGPR164C	C49	D2FX1150505LMN KCP40	F26	DCGT32505HP KC5010	B95
CTANR164	C42	CTGPR164D	C49	D2FX1150505LMS KCU10	F27	DCGT32505HP KC5025	B95
CTAPL082B	C46	CTGPR16CA3	C148	D2FX1150505LMN KCP10	F28	DCGT32505HP KC5410	B95
CTAPL123B	C46	CTGPR204D	C49	D2FX1150505LRN KCP25	F28	DCGT32505HP KCU10	B95
CTAPL163D	C46	CTGPR205D	C49	D2FX1150505LRN KCP40	F28	DCGT32505HP KCU25	B95
CTAPL854D	C46	CTGPR20CA4	C148	D2FX1150505RFN KCP25	F27	DCGT3250F K10U	F123
CTAPR082B	C46	CTGPR854D	C49	D2FX1150505RFN KCU10	F27	DCGT3250F K15U	F123
CTAPR102B	C46	CV40BKR32157	K157	D2FX1150505RMN KCP10	F26	DCGT3250LF KC5010	B96
CTAPR123B	C46	CV40BKR50236	K157	D2FX1150505RMN KCP25	F26	DCGT3250LF KC5025	B96
CTAPR163D	C46	CV40BSIF80248	K129	D2FX1150505RMN KCP40	F26	DCGT3250LF KCU10	B96
CTAPR854D	C46	CV40FBHM1691	K193	D2FX1150505RMS KCU10	F27	DCGT3251HP K313	B95
CTBNL123	C42	CV40FBHMKIT645	K186	D2FX1150505RNN KCP10	F28	DCGT3251HP K68	B95
CTBNL204	C42	CV50BHTS13M295	J88	D2FX1150505RNN KCP40	F28	DCGT3251HP KC5010	B95
CTBNR123	C42	CV50BHTS16M295	J88	D2FX1150508LHP KCU10	F27	DCGT3251HP KC5025	B95
CTBNR204	C42	CV50BHTS22M295	J88	D2FX1150508LHP KCU25	F27	DCGT3251HP KC5410	B95
CTBNR864	C42	CV50BHTS27M295	J88	D2FX1150508LMN KCP10	F26	DCGT3251HP KCU10	B95
CTBPL123B	C46	CV50BHTS32M314	J88	D2FX1150508LMN KCP25	F26	DCGT3251HP KCU25	B95
CTBPL163D	C46	CV50BHTS40M314	J88	D2FX1150508LMN KCP40	F26	DCGT3252HP K313	B95
CTBPR123B	C46	CV50BHTS50M314	J88	D2FX1150508LMN KCU10	F26	DCGT3252HP K68	B95
CTBPR163D	C46	CV50BKR32157	K157	D2FX1150508LMN KCU25	F26	DCGT3252HP KC5010	B95
CTCPL123B	C47	CV50BKR50157	K157	D2FX1150508RHP KCU10	F27	DCGT3252HP KC5025	B95
CTCPL163C	C47	CV50BKR63236	K157	D2FX1150508RHP KCU25	F27	DCGT3252HP KC5410	B95
CTCPL164C	C47	CV50BKR80275	K157	D2FX1150508RMN KCP10	F26	DCGT3252HP KCU10	B95
CTCPL164D	C47	CV50BSIF100236	K129	D2FX1150508RMN KCP25	F26	DCGT3252HP KCU25	B95
CTCPL204D	C47	CV50BSIF70236	K129	D2FX1150508RMN KCP40	F26	DCGT325XOLF KC5025	B96
CTCPL205D	C47	CV50BT13069	K202	D2FX1150508RMN KCU10	F26	DCGT432F K10U	F123
CTCPL244D	C47	CV50RMHTS13M394	J88	D2FX1150508RMN KCU25	F26	DCGT432LF KC5010	B96
CTCPN124	C47	CV50RMHTS16M394	J88	D2FX1150510LMN KCP25	F26	DCGT432LF KC5025	B96
CTCPN443	C47	CV50RMHTS22M394	J88	D2FX1150510RMN KCP10	F26	DCGT432LF KCU10	B96
CTCPN644	C47	CV50RMHTS27M394	J88	D2FX1150510RMN KCP25	F26	DCGW21505EC KB5625	B191
CTCPN664	C47	CV50RMHTS32M394	J88	D2FX1150510RMN KCP40	F26	DCGW21505EM KB5625	B191
CTCPR123B	C47	CV50RMHTS40M413	J88	D2FX1180610LMN KCP25	F26	DCGW21505EM KB9610	B191
CTCPR163C	C47	CV50RMHTS50M413	J88	D2FX1180610RMN KCP25	F26	DCGW21505S0415C KB1610	B191
CTCPR164C	C47	CWLN164DMX5	C37	D32TTB28	C121	DCGW21505S0415C KB5610	B191

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DNMG431FW KCU10	.B53	DNMG432R K35P	.F126	DNMG441CT KCP10	.B52	DNMG442MP KCM25	.B54
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DNMG431MN KCP10	.B53	DNMG432RP KC5525	.B56	DNMG441FF KC5010	.B52	DNMG442MS KC5510	.B54
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H28MCLNR4	C123	H40NDLPR4W	F58	HEC109S2 KC625M	M83	HEC188S4 KC610M	M88
H28MDUNL4	C124	H40NDQPL4W	F58	HEC109S3 K600	M86	HEC188S4 KC635M	M88
H28MDUNR4	C124	H40NDQPR4W	F58	HEC109S3 KC610M	M86	HEC188S4031 K600	M88
H28MSKNR4	C125	H40NDXPL4W	F59	HEC109S4 K600	M88	HEC188S4031 KC610M	M88
H28MTFNL3	C126	H40NDXPR4W	F59	HEC109S4 KC610M	M88	HEC188S4031 KC635M	M88
H28MTFNR3	C126	H40NEL3W	D153, E35	HEC1250S4200 K600	M89	HEC188S4075 K600	M88
H28MWLNL4	C127	H40NEL4W	D153, E35	HEC1250S4200 KC635M	M89	HEC188S4075 KC610M	M88
H28MWLNR4	C127	H40NEL6W	D153, E35	HEC125S2 K600	M83	HEC188S4075 KC635M	M88
H28NDLPL4W	F58	H40NER3W	D153, E35	HEC125S2 KC610M	M83	HEC188S4113 K600	M88
H28NEL3W	D153, E35	H40NER4W	D153, E35	HEC125S2 KC625M	M83	HEC188S4113 KC610M	M88
H28NEL4W	D153, E35	H40NER6W	D153, E35	HEC125S2 KC635M	M83	HEC188S4113 KC635M	M88
H28NEL6W	D153, E35	H40NVLPL3W	F59	HEC125S2025 K600	M83	HEC203S2 K600	M83
H28NER3W	D153, E35	H40NVLPR3W	F59	HEC125S2025 KC610M	M83	HEC203S2 KC610M	M83
H28NER4W	D153, E35	HEC016S2 K600	M83	HEC125S2025 KC625M	M83	HEC203S3 KC610M	M86
H28NER6W	D153, E35	HEC016S2 KC610M	M83	HEC125S2025 KC635M	M83	HEC203S4 K600	M88
H32CRGNR4	C128	HEC016S4 K600	M88	HEC125S2075 K600	M83	HEC203S4 KC610M	M88
H32CTFPL4W	C128	HEC016S4 KC610M	M88	HEC125S2075 KC610M	M83	HEC219S2 K600	M83
H32CTFPR4W	C128	HEC031S2 K600	M83	HEC125S2075 KC625M	M83	HEC219S2 KC610M	M83
H32LSEL4	E76	HEC031S2 KC610M	M83	HEC125S2075 KC635M	M83	HEC219S2 KC625M	M83
H32LSEL5	E76	HEC031S2 KC635M	M83	HEC125S2100 K600	M83	HEC219S2 KC635M	M83
H32LSEF3	E76	HEC031S3 KC610M	M86	HEC125S2100 KC610M	M83	HEC219S2044 K600	M83
H32LSEF4	E76	HEC031S4 K600	M88	HEC125S2100 KC625M	M83	HEC219S2044 KC610M	M83
H32LSEF5	E76	HEC031S4 KC610M	M88	HEC125S2100 KC635M	M83	HEC219S2044 KC625M	M83
H32MCFNR5	C122	HEC031S4 KC635M	M88	HEC125S3 K600	M86	HEC219S2044 KC635M	M83
H32MCKNL4	C122	HEC047S2 K600	M86	HEC125S3 KC610M	M86	HEC219S3 K600	M86
H32MCKNL5	C122	HEC047S2 KC610M	M83	HEC125S325R10 K600	M86	HEC219S3 KC610M	M86
H32MCKNR4	C122	HEC047S3 K600	M86	HEC125S325R10 KC625M	M86	HEC219S375R20 K600	M86
H32MCKNR5	C122	HEC047S3 KC610M	M86	HEC125S325R10 KC635M	M86	HEC219S375R20 KC625M	M86
H32MCLNL4	C123	HEC047S4 K600	M88	HEC125S350R10 K600	M86	HEC219S375R20 KC635M	M86
H32MCLNL5	C123	HEC047S4 KC610M	M88	HEC125S350R10 KC625M	M86	HEC219S4 K600	M88
H32MCLNL6	C123	HEC062S2 K600	M83	HEC125S350R10 KC635M	M86	HEC219S4 KC610M	M88
H32MCLNR4	C123	HEC062S2 KC610M	M83	HEC125S4 K600	M88	HEC219S4 KC635M	M88
H32MCLNR5	C123	HEC062S2 KC635M	M83	HEC125S4 KC610M	M88	HEC219S4044 K600	M88
H32MCLNR6	C123	HEC062S2013 KC610M	M83	HEC125S4 KC635M	M88	HEC219S4044 KC610M	M88
H32MDUNL4	C124	HEC062S2013 KC635M	M83	HEC125S4025 K600	M88	HEC219S4044 KC635M	M88
H32MDUNR4	C124	HEC062S3 K600	M86	HEC125S4025 KC610M	M88	HEC234S2 K600	M83
H32MDUNR3	C124	HEC062S3 KC610M	M86	HEC125S4025 KC635M	M88	HEC234S2 KC610M	M83
H32MDUNR4	C124	HEC062S4 K600	M88	HEC125S4075 K600	M88	HEC234S4 K600	M88
H32MSKNR4	C125	HEC062S4 KC610M	M88	HEC125S4075 KC610M	M88	HEC234S4 KC610M	M88
H32MSSNR6	C125	HEC062S4 KC635M	M88	HEC125S4075 KC635M	M88	HEC250S2 K600	M83
H32MTFNL4	C126	HEC062S4013 K600	M88	HEC125S4100 K600	M88	HEC250S2 KC610M	M83
H32MTFNR4	C126	HEC062S4013 KC610M	M88	HEC125S4100 KC610M	M88	HEC250S2 KC625M	M83
H32MVUNL3	C126	HEC062S4013 KC635M	M88	HEC125S4100 KC635M	M88	HEC250S2 KC635M	M83
H32MVUNL4	C126	HEC062S4050 K600	M88	HEC141S2 K600	M83	HEC250S2050 K600	M83
H32MVUNR3	C126	HEC062S4050 KC625M	M88	HEC141S2 KC610M	M83	HEC250S2050 KC610M	M83
H32MVUNR4	C126	HEC078S2 K600	M86	HEC141S3 K600	M86	HEC250S2050 KC625M	M83
H32MWLNL4	C127	HEC078S2 KC610M	M83	HEC141S3 KC610M	M86	HEC250S2050 KC635M	M83
H32MWLNR4	C127	HEC078S4 K600	M88	HEC141S4 K600	M88	HEC250S2113 K600	M83
H32NDLPL4W	F58	HEC078S4 KC610M	M88	HEC141S4 KC610M	M88	HEC250S2113 KC610M	M83
H32NDLPR4W	F58	HEC094S2 K600	M83	HEC156S2 K600	M83	HEC250S2113 KC625M	M83
H32NDQPL4W	F58	HEC094S2 KC610M	M83	HEC156S2 KC610M	M83	HEC250S2113 KC635M	M83
H32NDQPR4W	F58	HEC094S2 KC635M	M83	HEC156S2 KC625M	M83	HEC250S2150 K600	M83
H32NDXPL4W	F59	HEC094S2018 KC610M	M83	HEC156S2 KC635M	M83	HEC250S2150 KC610M	M83
H32NDXPR4W	F59	HEC094S2018 KC635M	M83	HEC156S2031 K600	M83	HEC250S2150 KC625M	M83
H32NEL3W	D153, E35	HEC094S2063 K600	M83	HEC156S2031 KC610M	M83	HEC250S2150 KC635M	M83
H32NEL4W	D153, E35	HEC094S2063 KC610M	M83	HEC156S2031 KC625M	M83	HEC250S3 K600	M86
H32NEL6W	D153, E35	HEC094S2063 KC635M	M83	HEC156S2031 KC635M	M83	HEC250S3 KC610M	M86
H32NER3W	D153, E35	HEC094S3 K600	M86	HEC156S3 K600	M86	HEC250S350R20 K600	M86
H32NER4W	D153, E35	HEC094S3 KC610M	M86	HEC156S3 KC610M	M86	HEC250S350R20 KC625M	M86
H32NER6W	D153, E35	HEC094S4 K600	M88	HEC156S356R10 K600	M86	HEC250S350R20 KC635M	M86
H32NER8W	D153, E35	HEC094S4 KC610M	M88	HEC156S356R10 KC635M	M86	HEC250S375R20 K600	M86
H32NVLPL3W	F59	HEC094S4 KC635M	M88	HEC156S4 K600	M88	HEC250S375R20 KC625M	M86
H32NVLPR3W	F59	HEC094S4018 K600	M88	HEC156S4 KC610M	M88	HEC250S375R20 KC635M	M86
H36MCLNL6	C123	HEC094S4018 KC610M	M88	HEC156S4 KC635M	M88	HEC250S4 K600	M88
H36MCLNR6	C123	HEC094S4018 KC635M	M88	HEC156S4031 K600	M88	HEC250S4 KC610M	M88
H36MDUNL4	C124	HEC094S4063 K600	M88	HEC156S4031 KC610M	M88	HEC250S4 KC625M	M88
H36MDUNR4	C124	HEC094S4063 KC610M	M88	HEC156S4031 KC635M	M88	HEC250S4 KC635M	M88
H36NEL4W	D153, E35	HEC094S4063 KC635M	M88	HEC16S2 KC625M	M83	HEC250S4038 K600	M88
H36NER4W	D153, E35	HEC100S2 KC625M	M84	HEC172S2 KC610M	M83	HEC250S4050 K600	M88
H40CTFPL4W	C128	HEC100S2 K600	M84	HEC172S4 K600	M88	HEC250S4050 KC610M	M88
H40CTFPR4W	C128	HEC100S2 KC610M	M84	HEC172S4 KC610M	M88	HEC250S4050 KC635M	M88
H40LSEL5	E76	HEC100S2 KC635M	M84	HEC188S2 K600	M83	HEC250S4113 K600	M88
H40LSEF5	E76	HEC100S2225 K600	M84	HEC188S2 KC610M	M83	HEC250S4113 KC610M	M88
H40MCFNR6	C122	HEC100S2225 KC610M	M84	HEC188S2 KC625M	M83	HEC250S4113 KC635M	M88
H40MCKNL5	C122	HEC100S2225 KC635M	M84	HEC188S2 KC635M	M83	HEC250S4150 K600	M88
H40MCKNR5	C122	HEC100S2300 KC610M	M84	HEC188S2031 K600	M83	HEC250S4150 KC610M	M88
H40MCKNR6	C122	HEC100S2300 KC635M	M84	HEC188S2031 KC610M	M83	HEC250S4150 KC635M	M88
H40MCLNL4	C123	HEC100S2400 K600	M84	HEC188S2031 KC625M	M83	HEC250S4150L K600	M88
H40MCLNL5	C123	HEC100S2400 KC635M	M84	HEC188S2031 KC635M	M83	HEC250S4150L KC635M	M88
H40MCLNL6	C123	HEC100S3 K600	M86	HEC188S2075 K600	M83	HEC266S2 K600	M83
H40MCLNR4	C123	HEC100S3 KC610M	M86	HEC188S2075 KC610M	M83	HEC266S2 KC610M	M83
H40MCLNR5	C123	HEC100S3225 K600	M86	HEC188S2075 KC625M	M83	HEC266S4 K600	M88
H40MCLNR6	C123	HEC100S3225 KC610M	M86	HEC188S2075 KC635M	M83	HEC266S4 KC610M	M88
H40MDUNL4	C124	HEC100S4 K600	M89	HEC188S2113 K600	M83	HEC281S2 K600	M83
H40MDUNR4	C124	HEC100S4 KC610M	M89	HEC188S2113 KC610M	M83	HEC281S2 KC610M	M83
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HEC312S381R20 K600	.M86	HEC438S2200 KC625M	.M84	HEC625S2400 K600	.M84	HHEC188S3 KC635M	.M91
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HEC328S3 K610M	.M86	HEC438S4600 K600	.M89	HEC688S2 K610M	.M84	HNGF5351MT KC924M	.097
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HEC344S3 K610M	.M86	HEC47S2 KC625M	.M83	HEC750S2 KC610M	.M84	HNGJ438ANENLD KCK15	.06, .011, .014
HEC344S388R20 K600	.M86	HEC47S2013 K600	.M83	HEC750S2 KC625M	.M84	HNGJ438ANENLD KCK15	.06, .011, .014
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HEC344S4 K610M	.M88	HEC500S2 K600	.M84	HEC750S2100 K600	.M84	HNGJ438ANENLD KCKP20	.06, .011, .014
HEC344S4 KC610M	.M88	HEC500S2 K610M	.M84	HEC750S2100 K610M	.M84	HNGJ438ANENLD KC510M	.06, .011, .014
HEC360S4 K600	.M88	HEC500S2 KC625M	.M84	HEC750S2100 KC625M	.M84	HNGJ438ANENLD KC520M	.06, .011, .014
HEC360S4 K610M	.M88	HEC500S2 KC635M	.M84	HEC750S2100 KC635M	.M84	HNGJ438ANENLD KC522M	.06, .011, .014
HEC375S2 K600	.M84	HEC500S2063 K600	.M84	HEC750S2225 K600	.M84	HNGJ438ANENLD KC725M	.06, .011, .014
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HEC375S2063 K600	.M84	HEC500S2063 KC635M	.M84	HEC750S2300 K600	.M84	HNGJ438ANENLD KCKP20	.06, .011, .014
HEC375S2063 K610M	.M84	HEC500S2200 K600	.M84	HEC750S2300 K610M	.M84	HNGJ43ANFNLDJ K313	.06, .011, .014
HEC375S2063 KC635M	.M84	HEC500S2200 K610M	.M84	HEC750S2300 KC625M	.M84	HNGJ43ANFNLDJ KC410M	.06, .011, .014
HEC375S2088 K600	.M84	HEC500S2200 KC625M	.M84	HEC750S2300 KC635M	.M84	HNGJ43ANFNLDJ KC520M	.021
HEC375S2088 K610M	.M84	HEC500S2200 KC635M	.M84	HEC750S2400 K600	.M84	HNGJ43ANFNLDJ KC725M	.021
HEC375S2088 KC625M	.M84	HEC500S2200L K600	.M84	HEC750S2400 K610M	.M84	HNGJ53511ANSNHD KCK15	.021
HEC375S2088 KC635M	.M84	HEC500S2300 K600	.M84	HEC750S2400 KC635M	.M84	HNGJ53511ANSNHD KCKP30	.021
HEC375S2113 K600	.M84	HEC500S2300 K610M	.M84	HEC750S3 K600	.M86	HNGJ53511ANSNHD KCKP20	.021
HEC375S2113 K610M	.M84	HEC500S2300 KC610M	.M84	HEC750S3 K610M	.M86	HNGJ5351ANENLD KC520M	.021
HEC375S2113 KC625M	.M84	HEC500S2300 KC625M	.M84	HEC750S3225 K600	.M86	HNGJ5351ANENLD KC522M	.021
HEC375S2113 KC635M	.M84	HEC500S2300 KC635M	.M84	HEC750S3225 K610M	.M86	HNGJ5351ANENLD KC725M	.021
HEC375S2175 K600	.M84	HEC500S3 K600	.M86	HEC750S4 K600	.M89	HNGJ5351ANENLD KCK15	.021
HEC375S2175 K610M	.M84	HEC500S3 K610M	.M86	HEC750S4 K610M	.M89	HNGJ5351ANENLD KCKP30	.021
HEC375S2175 KC635M	.M84	HEC500S3200 K600	.M86	HEC750S4 KC625M	.M89	HNGJ5351ANENLD KCKP20	.021
HEC375S3 K600	.M86	HEC500S3200 K610M	.M86	HEC750S4 KC635M	.M89	HNGJ5351ANFNLDJ KC410M	.021
HEC375S3 K610M	.M86	HEC500S4 K600	.M89	HEC750S4100 K600	.M89	HNGJ5351ANSNGD KC725M	.021
HEC375S3088 K600	.M86	HEC500S4 K610M	.M89	HEC750S4100 K610M	.M89	HNGJ5351ANSNGD KCK15	.021
HEC375S3088 K610M	.M86	HEC500S4 KC625M	.M89	HEC750S4100 KC635M	.M89	HNGJ5351ANSNGD KCKP30	.021
HEC375S3113 K600	.M86	HEC500S4 KC635M	.M89	HEC750S4225 K600	.M89	HNGJ5351ANSNGD KCKP20	.021
HEC375S3113 K610M	.M86	HEC500S4063 K600	.M89	HEC750S4225 K610M	.M89	HNGJ5351ANSNHD KC520M	.021
HEC375S30R20 K600	.M86	HEC500S4063 K610M	.M89	HEC750S4225 KC635M	.M89	HNGJ5351ANSNHD KC725M	.021
HEC375S30R20 KC625M	.M86	HEC500S4063 KC635M	.M89	HEC750S4300 K600	.M89	HNGJ5351ANSNHD KCK15	.021
HEC375S30R20 KC635M	.M86	HEC500S4100 K600	.M89	HEC750S4300 K610M	.M89	HNGJ5351ANSNHD KCKP30	.021
HEC375S388R20 K600	.M86	HEC500S4100 KC625M	.M89	HEC750S4300 KC635M	.M89	HNGJ5351ANSNHD KCKP20	.021
HEC375S388R20 KC625M	.M86	HEC500S4100 KC635M	.M89	HEC750S4400 K600	.M89	HNGJ75ANENGD KC725M	.025
HEC375S388R20 KC635M	.M86	HEC500S4200 K600	.M89	HEC750S4400 KC635M	.M89	HNGJ75ANENGD KCK15	.025
HEC375S4 K600	.M89	HEC500S4200 K610M	.M89	HEC78S2 KC625M	.M83	HNGJ75ANENGD KCKP30	.025
HEC375S4 K610M	.M89	HEC500S4200 KC635M	.M89	HEC875S2 K600	.M84	HNGX090530MCI KC917M	.090, .096
HEC375S4 KC635M	.M89	HEC500S4300 K600	.M89	HEC875S2 K610M	.M84	HNGX5351MM KC907M	.090, .096
HEC375S4063 K600	.M89	HEC500S4300 K610M	.M89	HEC875S2 KC625M	.M84	HNGX5351MM KC917M	.090, .096
HEC375S4063 K610M	.M89	HEC500S4300 KC635M	.M89	HEC875S2225 KC635M	.M84	HNGX5352MH KC907M	.090, .096
HEC375S4063 KC635M	.M89						

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HNGX5352MH KC917M	.090, 096	HPFDM312S4075 KC633M	.M36	HPFSS250S5075 KC625M	.M71	HPFT625S6225 KC625M	.M72
HNGX5352MH KC924M	.090, 096	HPFDM312S4113 KC633M	.M36	HPFSS250S5075 KC635M	.M71	HPFT625S6225 KC635M	.M72
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HNGX5352MH KCPK30	.090, 096	HPFDM375S5094 KC633M	.M36	HPFSS250S5125 K600	.M71	HPFT625S6300 KC625M	.M72
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HNGX5355MM KC917M	.090, 096	HPFF750S6225 KC625M	.M112	HPFT625S6125 KC625M	.M72	HPHV250S4125R030 KCPM15	.M10
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HPHV375S4050 KCPM15	M10	HPHV625S4213 KCPM15	M12	HPRSS625S3163 KCPM15	M76	HTSC1625R5SSFF200	J55
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HPHV375S4050L KCPM15	M10	HPHV625S4213R120 KCPM15	M12	HPRST1000S4150 K0643M	M78	HTSC1688R5SSFF200	J55
HPHV375S4050LR015 KCPM15	M10	HPHV625S4225 K0635M	M12	HPRST1000S6150 K0643M	M78	HTSC1688R8SSFF200	J56
HPHV375S4050LR030 KCPM15	M10	HPHV625S4225R060 KCPM15	M12	HPRST250S4038 K0643M	M78	HTSC1750R5SSFF200	J55
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HPHV375S4088LR015 KCPM15	M10	HPHV750S4088LR030 KCPM15	M12	HPRST500S4125 K0643M	M78	HTSR049R028M	J73
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KSEM1418R1SSF125	H32	KSEM155R5WN20M	H26	KSEM1750PCM	H18	KSEM1950HPM	H18
KSEM1418R1SSF125F45	H37	KSEM155R7WN20M	H28	KSEM175R10WN20M	H28	KSEM1950HPM	H18
KSEM1420HPGM	H17	KSEM155SEFM	H38	KSEM175R3WN20M	H26	KSEM195R10WN25M	H28
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KSEM1422R5SS150	H30	KSEM1570HPGM	H17	KSEM1780HPLM	H18	KSEM1984HPGM	H18
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K50M6000F6445M8	064	K55R250SN434M3W1	0103	K55S500BSP10N625	029	K55Z200CS	K110
K50M6000F6445M8	064	K55R250SP10T30F4	P69	K55S500BSP10N630-709	035	K55Z250250AS	K107, K110
K50M6000F6445M8	064	K55R3008SN434C4	0102-103	K55S500BSP10R551-630	033	K55Z250250RK	K110
K50M6000F6445M8	064	K55R300RP430C4	R111	K55S500BSP10R630-709	033	K55Z250CS	K110
K50M6000F6445M8	064	K55R300SN434M4	0102	K55S500BSP10R630-709	034	K55Z30030AS	K110
K50M6000F6445M8	064	K55R300SN434M4W2	0103	K55S500BSP10R630-709	034	K55Z30030C5	K107, K110
K50M6000F6445M8	064	K55R300SP10T30F4	P69	K55S500BSP10R630-709	034	K55Z30030S0RK	K110
K50M6000F6445M8	064	K55R40010SN434C5	0102-103	K55S500BSP10R630-709	034	K55Z30030CS	K110
K50M6000F6445M8	064	K55R400RP430C5	R111	K55S500BSP10R630-709	034	K55Z350CS	K110
K50M6000F6445M8	064	K55R400SN434M5	0102	K55S500BSP10R630-709	034	KT15	0124-125, R71-73
K50M6000F6445M8	064	K55R400SN434M5W3	0103	K55S500BSP10L551-630	031	KT20	D93
K50M6000F6445M8	064	K55R400SP10T30F5	P69	K55S500BSP10L625	027	KT25	R71-73, R87-88
K50M6000F6445M8	064	K55R400SP10T30F6	P69	K55S500ASP10L630-709	031	KT30	R71-73, R87-88
K50M6000F6445M8	064	K55R50012SN434C6	0102-103	K55S500ASP10L625	027	KT6	R73
K50M6000F6445M8	064	K55R500SN434M6	0102	K55S500ASP10L630-709	031	KT8	R72-73
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K50M6000F6445M8	064	K55R600SN434M8	0102	K55S500ASP10N630-709	032	KTIP03125HPC KC7410	H6-H10
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K50M6000F6445M8	064	K55R800SN434M10	0102	K55S500ASP10R630-709	030	KTIP0313R3SS038	H12
K50M6000F6445M8	064	K55R800SN434M10W4	0103	K55S500ASP10R630-709	030	KTIP0313R5SS038	H12
K50M6000F6445M8	064	K55S1000ASD43L709-813	044	K55S500ASP10R630-709	030	KTIP0313R8SS038	H12
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K50M6000F6445M8	064	K55S1000ASD43N709-813	046	K55S500ASP10R630-709	030	KTIP03214HPL KCP15	H6-H10
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K50M6000F6445M8	064	K55S1000ASD43N813-917	047	K55S500ASP10R630-709	030	KTIP03230HP KCP15	H6-H10
K50M6000F6445M8	064	K55S1000ASD43R709-813	042	K55S500ASP10R630-709	030	KTIP03230HPC KC7410	H6-H10
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K50M6000F6445M8	064	K55S1000BSD43N709-813	050	K55S500ASP10R630-709	033	KTIP03320HPC KC7410	H6-H10
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KTIPO3763HPCC L KC7410	H6-H10	KTIPO5312HPL KC7320	H6-H10	KTIPO794HP KCP15	H6-H10	KTIPO860HPM KC7315	H6-H10
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KTIPO3820HP KC7315	H6-H10	KTIPO5469HPC KC7410	H6-H10	KTIPO8000HPCC L M	H6-H10	KTIPO870HPCC L M KC7410	H6-H10
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KTIPO472R8SS050	H12	KTIPO709R5SS075	H12	KTIPO840HPM KCP15	H6-H10	KTIPO910HPCM	H6-H10
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KTIP1740HPM	H6-H10	KTIP1890HPCCLM	H6-H10	KTIP200R1SCF25M	H14	KTIP220R3SCF25M	H14
KTIP1740HPM KC7315	H6-H10	KTIP1890HPCCLM KC7410	H6-H10	KTIP200R1SS25M	H13	KTIP220R3SS25M	H13
KTIP1740HPM KCP15	H6-H10	KTIP1890HPCM	H6-H10	KTIP200R3SCF25M	H14	KTIP220R5SCF25M	H14
KTIP1748HPLM	H6-H10	KTIP1890HPCM KC7410	H6-H10	KTIP200R3SS25M	H13	KTIP220R5SS25M	H13
KTIP1748HPM	H6-H10	KTIP1890HPM	H6-H10	KTIP200R5SCF25M	H14	KTIP220R8SS25M	H13
KTIP1748HPM KC7315	H6-H10	KTIP1890HPM KC7315	H6-H10	KTIP200R5SS25M	H13	KTIP2223HPCM	H6-H10
KTIP1750HPCCLM	H6-H10	KTIP1900HPCCLM	H6-H10	KTIP200R8SCF25M	H14	KTIP2223HPLM	H6-H10
KTIP1750HPCCLM KC7410	H6-H10	KTIP1900HPCCLM KC7410	H6-H10	KTIP200R8SS25M	H13	KTIP2223HPM	H6-H10
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KTIP1750HPLM	H6-H10	KTIP1900HPLM	H6-H10	KTIP2010HPCLM	H6-H10	KTIP2244HPM	H6-H10
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KTIP1750HPM	H6-H10	KTIP1900HPM	H6-H10	KTIP2010HPM	H6-H10	KTIP2250HPCLM KC7410	H6-H10
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KTIP2250HPM KC7315	H6-H10	KTIP260R8SS32M	H13	L06MSDUPL2	C106	LNP1763PNSRHD KC725M	Q42
KTIP2300HPCM	H6-H10	KTIP2619HPCM	H6-H10	L06MSDUPL2	C106	LNP1763PNSRHD KCK15	Q42
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KTIP230R1SCF25M	H14	KTIP2659HPCM	H6-H10	L08RSCFPL2	C97	LNUX19194ORRF KCP10	F86
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KTIP230R3SS25M	H13	KTIP2700HPCM KC7410	H6-H10	L08RSCPLR2	C104	LNUX19194ORRH KC9125	F86
KTIP230R5SCF25M	H14	KTIP2700HPM	H6-H10	L08RSDUPL2	C106	LNUX19194ORRH KCP10	F86
KTIP230R5SS25M	H13	KTIP2700HPM KC7315	H6-H10	L08RSDUPL2	C106	LNUX19194ORRH KCP25	F86
KTIP230R8SCF25M	H14	KTIP2700HPM KCP15	H6-H10	L08RSTFFL2	C110	LNUX19194ORRH KCP9110	F87
KTIP230R8SS25M	H13	KTIP270R1SCF25M	H14	L08RSTFFR2	C110	LNUX19194ORRH KCP9125	F87
KTIP2350HPCM	H6-H10	KTIP270R1SS32M	H13	L10RNL2	E34	LNUX19194ORRH KCP10	F87
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KTIP240R1SS25M	H13	KTMS21S25SD06	Q3	L12RSDUPL3	C106	LSASL164	E70
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KTIP240R3SS25M	H13	KTMS25S25SD06	Q3	L12RSTFFL3	C110	LSASR103	E70
KTIP240R5SCF25M	H14	KTMS25S25SD06H	Q3	L12RSTFFR3	C110	LSASR123	E70
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KTIP2450HPLM KC7320	H6-H10	KTSZR125SD430CM16A02	R93	LNEQ1235R03 4 KC725M	Q22	LSSL164D	E71
KTIP2450HPM	H6-H10	KTSZR150SD430CM16A03	R93	LNEQ1235R03 4 KCK15	Q22	LSSR123D	E71
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KTIP250R1SS32M	H13	KJAM33	C140, C142, D154, E36	LNEQ1255R04 KCK15	Q22	LT11NR075ISOCB KC5025	E50
KTIP250R3SCF25M	H14	KJAM34	C149-154, C158-161	LNEQ1260R04 KC725M	Q22	LT11NR10ISO KC5025	E51
KTIP250R3SS32M	H13	KJAM35	C149, C151-152	LNEQ1260R04 KCK15	Q22	LT11NR10ISOCB KC5025	E51
KTIP250R5SCF25M	H14	KVNS020630D	H6-H10	LNEQ1260R04 KCPK30	Q22	LT11NR10ISOCB KC5025	E51
KTIP250R5SS32M	H13	KVNS021180D	H6-H10	LNEU1235R03 4 KC520M	Q21	LT11NR10ISOK KU25T	E50
KTIP250R8SCF25M	H14	KVNS030630D	H6-H10	LNEU1235R03 4 KC725M	Q21	LT11NR125ISO KC5025	E51
KTIP250R8SS32M	H13	KVNS030870D	H6-H10	LNEU1235R03 4 KC735M	Q21	LT11NR125ISOCB KC5025	E50
KTIP250HPM	H6-H10	KVNS031180D	H6-H10	LNEU1235R03SGP 4 KC725M	Q22	LT11NR14BPT KC5025	E62
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KTIP260R3SCF25M	H14	L06MNER1S	E34	LNEU1250R04 KC725M	Q21	LT11NR24UNCB KC5025	E53
KTIP260R3SS32M	H13	L06MSCFPL2	C97	LNEU1250R04SGP KC725M	Q22	LT11NR28UNJ KC5025	E54
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				LNEU1250R08SGP KC725M	Q22	LT11NR32UNCB KC5025	E53
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OWF863SETF89	RCGT10T3MOHP KCU25B100	RCMH3209MORU KCU10F95	RCMT325 KCM25B101-B102
PCLNL4040S19F103	RCGT1204MOHP K313B100	RCMH3209MOTUP KC9110F95	RCMT325 KCP25B101-B102
PCLNL4040S19F103	RCGT1204MOHP KCU10B100	RCMH3209MOTUP KC9125F95	RCMT325 KCU10B101-B102
PRCCN2020K08H1F100	RCGT1204MOHP KC5010B100	RCMH3209MOTUP KCK20F95	RCMT43 KCK20B101-B102
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PRGCR6050U32H1F101	RCGT64ELF KC522MR53	RCMK46MP KCS10F61	RCMX2507MORP KC9125F108
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PROON206DC70	RCGT64ELF KCPK30R53	RCMT0602MO KCS010B101-B102	RCMX2507MORU KC9125F95
PROON208DC70	RCGT64SGF KC522MR53	RCMT0602MO KCK20B101-B102	RCMX2507MORU KCK20F95
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PROON3210C70	RCGT64SHF KCPK30R53	RCMT0602MO KCU10B101-B102	RCMX2507MOTUP KC9125F95
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RIQ09EDS12	K119	RMS08000H7HF K605	K96	RNG65T8015 KY3500	B124	RPET1605MOSGEJ KC725M	R48
RIQ09EGS06	K120	RMS08000H7HF KC6305	K96	RNG65T8015 KY4300	B124	RPET1605MOSGEJ KC522M	R48
RIQ09EK306	K120	RMS08000H7SF	K95	RNG65T8015 KYS25	B124	RPET1605MOSGEJ KC725M	R48
RIQ09R406	K120	RMS08000H7SF	K95	RNG65T8015 KYS30	B124	RPET1605MOSGEJ KC522M	R48
RIQ12E1306	K119	RMS09000H7HF	K96	RNG65T8015 KY3500	B124	RPET1605MOSGEJ KC725M	R48
RIQ12EDS06	K119	RMS09000H7HF	K96	RNG65T8015 KY4300	B124	RPET1605MOSGEJ KC522M	R48
RIQ12EDS12	K119	RMS09000H7HF K605	K96	RNG65T8015 KY4300	R116	RPET1605MOSGEJ KC725M	R48
RIQ12EGS06	K120	RMS09000H7HF KC6305	K96	RNG65T8015 KYS25	B124	RPET1605MOSGEJ KC522M	R48
RIQ12EK306	K120	RMS09000H7SF	K95	RNG65T8015 KYS30	B124	RPET1605MOSGEJ KC725M	R48
RIQ12R406	K120	RMS09000H7SF	K95	RNG65T8015 KY3500	B124	RPET1605MOSGEJ KC522M	R48
RIR00E1300	K118	RMS10000H7HF	K96	RNG65T8015 KY4300	B124	RPET1605MOSGEJ KC725M	R48
RIR01E1300	K118	RMS10000H7HF	K96	RNG65T8015 KY4300	R116	RPET1605MOSGEJ KC522M	R48
RIR01E1312	K118	RMS10000H7HF K605	K96	RNG65T8015 KYS25	B124	RPET1605MOSGEJ KC725M	R48
RIR01EDS00	K118	RMS10000H7HF KC6305	K96	RNG65T8015 KYS30	B124	RPET1605MOSGEJ KC522M	R48
RIR01EDS12	K118	RMS10000H7SF	K95	RNG65T8015 KY3500	B124	RPET1605MOSGEJ KC725M	R48
RIR01EGU00	K118	RMS10000H7SF	K95	RNG65T8015 KY4300	B124	RPET1605MOSGEJ KC522M	R48
RIR02E1300	K118	RMS11000H7HF	K96	RNG65T8015 KY4300	R116	RPET1605MOSGEJ KC725M	R48
RIR02E1312	K118	RMS11000H7HF	K96	RNG65T8015 KY4300	R116	RPET1605MOSGEJ KC522M	R48
RIR02EDS06	K118	RMS11000H7HF K605	K96	RNG65T8015 KYS25	B124	RPET1605MOSGEJ KC725M	R48
RIR02EDS12	K118	RMS11000H7HF KC6305	K96	RNG65T8015 KYS30	B124	RPET1605MOSGEJ KC522M	R48
RIR02EGU00	K118	RMS11000H7SF	K95	RNG65T8015 KY3500	B124	RPET1605MOSGEJ KC725M	R48
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RIR03EDS06	K118	RMS12000H7HF	K96	RNG65T8015 KY4300	R116	RPET1605MOSGEJ KC522M	R48
RIR03EDS12	K118	RMS12000H7HF K605	K96	RNG65T8015 KYS25	B124	RPET1605MOSGEJ KC725M	R48
RIR03EGU00	K118	RMS12000H7HF KC6305	K96	RNG65T8015 KYS30	B124	RPET1605MOSGEJ KC522M	R48
RIR04E1300	K118	RMS12000H7SF	K95	RNG65T8015 KY3500	B124	RPET1605MOSGEJ KC725M	R48
RIR04E1312	K118	RMS12000H7SF	K95	RNG65T8015 KY4300	B124	RPET1605MOSGEJ KC522M	R48
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RIR04EDS12	K118	RMS13000H7HF	K96	RNG65T8015 KY4300	R116	RPET1605MOSGEJ KC522M	R48
RIR04EGU00	K118	RMS13000H7HF K605	K96	RNG65T8015 KYS25	B124	RPET1605MOSGEJ KC725M	R48
RIR05E1300	K118	RMS13000H7HF KC6305	K96	RNG65T8015 KYS30	B124	RPET1605MOSGEJ KC522M	R48
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RIR05E1300	K118	RMS13000H7SF	K95	RNG65T8015 KY4300	B124	RPET1605MOSGEJ KC522M	R48
RIR05EGU00	K118	RMS13000H7SF	K95	RNG65T8015 KY4300	R116	RPET1605MOSGEJ KC725M	R48
RIR05E1300	K118	RMS13000H7SF	K95	RNG65T8015 KY4300	R116	RPET1605MOSGEJ KC522M	R48
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SDACL062D	C56	SDET43PDER8GB KC520M	P83, Q52	SECX443AEEN7GN KC725M	.047	SFRHEC625S3125 KC625M	M58
SDACL082D	C56	SDET43PDER8GB2 KC520M	P83, Q52	SECX443AESN7GN KC725M	.047	SFRHEC625S3225 K600	M58
SDACL083D	C56	SDET43PDER8GB2 KC725M	P83, Q52	SEF040060RHSK63AM	.122	SFRHEC625S3225 KC625M	M58
SDACL103B	C56	SDET43PDER8GB2 KCK15	P83, Q52	SEF040060RSS075M	.122	SFRHEC750S3150 K600	M58
SDACR062D	C56	SDET43PDER8GB2 KCPK30	P83, Q52	SEF060080RHSK63AM	.122	SFRHEC750S3150 KC625M	M58
SDACR082D	C56	SDET43PDSL8GB2 KC520M	Q52	SEF060080RSS075M	.122	SFRHEC750S3225 K600	M58
SDACR083D	C56	SDET43PDSL8GB2 KC725M	Q52	SEF080100RHSK63AM	.122	SFRHEC750S3225 KC625M	M58
SDACR103B	C56	SDET43PDSL8GB2 KCK15	Q52	SEF080100RSS100M	.122	SIF100HC120900	K133
SDB115RBHT12F	K190	SDET43PDSL8GB2 KCPK30	Q52	SEF100120RHSK63AM	.122	SIF100HC20100M	K133
SDB115RBHT16LF	K190	SDET43PDSR8GB KC725M	P83, Q52	SEF100120RSS125M	.122	SIF100HC25100M	K133
SDB24RBHT06F	K190	SDET43PDSR8GB KCPK30	P83, Q52	SEF120140RHSK63AM	.122	SIF100HSK32032M	K132
SDB30RBHT06F	K190	SDET43PDSR8GB2 KC520M	P83, Q52	SEF120140RSS125M	.122	SIF100HSK40035M	K132
SDB40RBHT09F	K190	SDET43PDSR8GB2 KC725M	P83, Q52	SEF140160RHSK63AM	.122	SIF100HSK50040M	K132
SDB50RBHT09F	K190	SDET43PDSR8GB2 KCK15	P83, Q52	SEF140160RSS125M	.122	SIF100HSK63055M	K132
SDB66RBHT112F	K190	SDET43PDSR8GB2 KCPK30	P83, Q52	SEF156187RSS075	.121	SIF70HC120900	K133
SDB66RBHT12F	K190	SDET533PDER8GB KC725M	P87	SEF160180RSS125M	.122	SIF70HC20100M	K133
SDB87RBHT12F	K190	SDET533PDER8GB KCK15	P87	SEF180200RSS125M	.122	SIF70KST115AR5M	K110
SDB87RBHT16LF	K190	SDET533PDER8GB KCPK30	P87	SEF218250RSS075	.121	SIF70KST135AR5M	K110
SDCT4316ENLD2 KC725M	P82, Q52	SDET533PDSR8GB KC725M	P87	SEF265312RSS075	.121	SIF70KST155AR5M	K110
SDCT431PDEL8LD2 KC725M	.052	SDET533PDSR8GB KCPK30	P87	SEF328375RSS075	.121	SIF70KST175AR5M	K110
SDCT431PDER8LD2 KC725M	P82, Q52	SDET533PDER8GB KC725M	P87	SEF390437RSS100	.121	SIF70KST175AR5M	K110
SDCT431PDER8LD2 KCPM20	P82, Q52	SDET533PDER8GB KCPK30	P87	SEF453500RSS100	.121	SIF70KST200AR5M	K110
SDCT431PDFL8LE KC410M	.051	SDET533PDSR8GB KC725M	P87	SEF500562RSS100	.121	SIF70KST200RR5M	K110
SDCT431PDFR8LE KC410M	P82, Q51	SDET533PDSR8GB KCPK30	P87	SEF562625RSS125	.121	SIF70KST250AR5M	K110
SDCT433PDEL8LD2 KC725M	.052	SDJCL062	C57	SEF626875RSS125	.121	SIF70KST250RR5M	K110
SDCT433PDER8LD2 KC725M	P82, Q52	SDJCL082	C57	SEF687750RSS125	.121	SIF70KST300AR5M	K110
SDCT433PDFL8LE KC410M	.051, R97	SDJCL083	C57	SEF750812RSS125	.121	SIF70KST300RR5M	K110
SDCT433PDFR8LE KC410M	P82, Q51, R97	SDJCL102	C57	SEF812875RSS150	.121	SIF70KST350AR5M	K110
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SDCT43PDEL8LD2 KC725M	.052	SDJCR083	C57	SEHW43A6 KCK15	.0136	SKDP343 K9	C56-58
SDCT43PDER8LD2 KC520M	P82, Q52	SDJCR102	C57	SEHW43A6 KCPK30	.0136	SKSN566K K9	C137-140
SDCT43PDER8LD2 KC725M	P82, Q52	SDJCR103	C57	SEHW43A6T KC520M	.0136	SKTP343 K9	C61-63
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SDCT43PDFL8LE KC410M	.051	SDJCR163	C57	SEHW43A6T KCK15	.0136	SKWP343 K9	C67
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SNG323T0820 KY4300	B125	SNHX11T3PZFNGE KC510M	Q16	SNMG431FP KCU10	B61	SNMG433FW KCP05	B61
SNG323T0820 KY4400	B125	SNHX11T3PZTNGP KC725M	Q16	SNMG431MN KCP10	B61	SNMG433FW KCP10	B61
SNG323T0820 KY3500	B125	SNHX11T3PZTNGP KC510M	Q16	SNMG431MN KCP25	B61	SNMG433H K10P	F127
SNG323T0820 KY3500	B125	SNHX11T3PZTNGP K110M	Q16	SNMG431MN KCP30	B61	SNMG433H K20K	F127
SNG323T0820 KY3500	B125	SNHX11T3PZTNGP KC725M	Q16	SNMG431R K10M	F128	SNMG433H K25P	F127
SNG323T0820 KY3500	B125	SNHX11T3PZTNGP KC735M	Q16	SNMG431R K10P	F128	SNMG433H K35P	F127
SNG323T0820 KY4300	B125	SNHX11T3PZTNGP KCPK30	Q16	SNMG431R K25M	F128	SNMG433M K10M	F128
SNG323T0820 KY4400	B125	SNHX11T3PZTNGP KC725M	Q16	SNMG431R K25P	F128	SNMG433M K25M	F128
SNG323T0820 KY3500	B125	SNHX11T3PZTNGP KC735M	Q16	SNMG432 K313	B60	SNMG433MN KCP10	B61
SNG323T0820 KY3500	B125	SNHX11T3PZTNGP KCPK30	Q16	SNMG432 K68	B60	SNMG433MN KCP25	B61
SNG323T0820 KY3500	B125	SNHX11T3PZTNGP KC510M	Q16	SNMG432F K10M	F127	SNMG433MN KCP30	B61
SNG323T0820 KY3500	B125	SNHX11T3PZTNGP K110M	Q16	SNMG432F K10U	F127	SNMG433MN KCP40	B61
SNG323T0820 KY3500	B125	SNHX11T3PZTNGP KC725M	Q16	SNMG432F K15U	F127	SNMG433MP KC5010	B62
SNG323T0820 KY3500	B125	SNHX11T3PZTNGP KC735M	Q16	SNMG432F K20K	F127	SNMG433MP KC5025	B62
SNG323T0820 KY3500	B125	SNHX11T3PZTNGP KCPK30	Q16	SNMG432F K25P	F127	SNMG433MP KCM15	B62
SNG323T0820 KY3500	B125	SNHX11T3PZTNGP KC510M	Q16	SNMG432FF KC5010	B60	SNMG433MP KCM25	B62
SNG323T0820 KY3500	B125	SNHX11T3PZTNGP K110M	Q16	SNMG432FF KCP10	B60	SNMG433MP KCM35	B62
SNG323T0820 KY3500	B125	SNHX11T3PZTNGP KC725M	Q16	SNMG432FF KT315	B60	SNMG433MP KCU25	B62
SNG323T0820 KY3500	B125	SNHX11T3PZTNGP KC735M	Q16	SNMG432FN KCK05	B60	SNMG433MS KC5510	B62
SNG323T0820 KY3500	B125	SNHX11T3PZTNGP KCPK30	Q16	SNMG432FN KCP05	B60	SNMG433MS KC5525	B62
SNG323T0820 KY3500	B125	SNHX11T3PZTNGP KC510M	Q16	SNMG432FN KCP10	B60	SNMG433MS KCU25	B62
SNG323T0820 KY3500	B125	SNHX11T3PZTNGP K110M	Q16	SNMG432FN KCP25	B60	SNMG433MN KCP10	B62
SNG323T0820 KY3500	B125	SNHX11T3PZTNGP KC725M	Q16	SNMG432FN KT315	B60	SNMG433MW KCP25	B62
SNG323T0820 KY3500	B125	SNHX11T3PZTNGP KC735M	Q16	SNMG432FP KC5010	B61	SNMG433P KC5010	B62
SNG323T0820 KY3500	B125	SNHX11T3PZTNGP KCPK30	Q16	SNMG432FP KCM15	B61	SNMG433P K10M	F128
SNG323T0820 KY3500	B125	SNHX11T3PZTNGP KC510M	Q16	SNMG432FP KCM15	B61	SNMG433R K10P	F128
SNG323T0820 KY3500	B125	SNHX11T3PZTNGP K110M	Q16	SNMG432FP KCU10	B61	SNMG433R K25M	F128
SNG323T0820 KY3500	B125	SNHX11T3PZTNGP KC725M	Q16	SNMG432FW KCP05	B61	SNMG433R K35P	F128
SNG323T0820 KY3500	B125	SNHX11T3PZTNGP KC735M	Q16	SNMG432FW KCP10	B61		
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SNG323T0820 KY3500	B125	SNHX11T3PZTNGP KC510M	Q16				
SNG323T0820 KY3500	B125	SNHX11T3PZTNGP K110M	Q16				
SNG323T0820 KY3500	B125	SNHX11T3PZTNGP KC725M	Q16				
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SNG323T0820 KY3500	B125	SNHX11T3PZTNGP KCPK30	Q16				
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SNG323T0820 KY3500	B125	SNHX11T3PZTNGP K110M	Q16				
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SNG323T0820 KY3500	B125	SNHX11T3PZTNGP KCPK30	Q16				
SNG323T0820 KY3500	B125	SNHX11T3PZTNGP KC510M	Q16				
SNG323T0820 KY3500	B125	SNHX11T3PZTNGP K110M	Q16				
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SNMG433RN KCP10	B63, F96	SNMG543UP KCM35	B64	SNMG644RN KCP30	B63	SNMM856RH KC9110	F108
SNMG433RN KCP25	B63, F96	SNMG544H K20K	F127	SNMG644RN KCP40	B63	SNMM856RH KC9125	F108
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SNMG433RP KC5025	B63	SNMG544MP KC5010	B62	SNMG644RP KCK20	B63	SNMM856RH KCP40	B64
SNMG433RP KC5510	B63	SNMG544MP KCM25	B62	SNMG644RP KCM25	B63	SNMM856RM KC9110	F109
SNMG433RP KC5525	B63	SNMG544RN KC9125	F96	SNMG644RP KCM35	B63	SNMM856RM KC9125	F109
SNMG433RP KCK05	B63	SNMG544RN KCP10	B63, F96	SNMG644RP KCP10	B63	SNMM856RM KCP10	B65, F109
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SNMG433RP KCK20	B63	SNMG544RN KCP30	B63	SNMG644RP KCP40	B63	SNMM856RM KCP30	B65
SNMG433RP KCM15	B63	SNMG544RN KCP40	B63	SNMG644RP KCU25	B63	SNMM856RP KCM25	B65
SNMG433RP KCM25	B63	SNMG544RP KC5525	B63	SNMG644UN KCK05	B64	SNMM856RP KCP25	B65
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SNMG433RP KCM05	B63	SNMG544RP KCM15	B63	SNMG644UN KCK20	B64	SNMM856RW KC9125	F109
SNMG433RP KCP10	B63	SNMG544RP KCM25	B63	SNMG646RN KC9110	F96	SNMM858RH KC9125	F108
SNMG433RP KCP25	B63	SNMG544RP KCP10	B63	SNMG646RN KC9125	F96	SNMM858RH KCP30	B64
SNMG433RP KCP30	B63	SNMG544RP KCP25	B63	SNMG646RN KCP25	B63, F96	SNMM866RH KC9110	F108
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SNMG433RP KCU25	B63	SNMG544RP KCU25	B63	SNMG866 KC5010	B60	SNMM866RH KCP10	B64, F108
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SNMG433UN KCK20	B64	SNMG544UN KCK20	B64	SNMG866RM KC5010	B63	SNMM866RH KCP40	B64
SNMG433UP KC5010	B64	SNMG642RN KC9110	F96	SNMG866RM KCP25	B63	SNMM866RM KC9110	F109
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SNMG434H K10P	F127	SNMG643 KCP40	B60	SNMM432RP KCM15	B65	SNMM866RP KCP25	B65
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SNMG434MN KCP10	B61	SNMG643MN KCP10	B61	SNMM432RP KCP40	B65	SNMP432K KCP25	B66
SNMG434MN KCP25	B61	SNMG643MN KCP25	B61	SNMM433RM KC9110	F109	SNMP543 K68	B65
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SNMG434MP KCM35	B62	SNMG643MP KCM15	B62	SNMM433RP KCM15	B65	SNMS432 K68	B66
SNMG434RN KC9110	F96	SNMG643MP KCM25	B62	SNMM433RP KCM25	B65	SNMS432 KC5410	B66
SNMG434RN KC9125	F96	SNMG643MP KCM35	B62	SNMM433RP KCP25	B65	SNMS432FST KD1425	B179
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SNMG434RN KCP30	B63	SNMG643MS KCU25	B62	SNMM434RM KCP25	B65, F109	SNMS643 K68	B66
SNMG434RN KCP40	B63	SNMG643R K10M	F128	SNMM434RM KCP30	B65	SNMS643 KC5410	B66
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SNMG543MN KCP25	B61	SNMG643RP KCP25	B63	SNMM643RM KCP40	B65	SNXF433ZVAMS KC917M	.0104
SNMG543MN KCP40	B61	SNMG643RP KCP30	B63	SNMM643RP KCM25	B65	SPCT31251PPFL8LD2 KC725M	.037
SNMG543MP KC5010	B62	SNMG643RP KCP40	B63	SNMM643RP KCP25	B65	SPCT31251PPFL8LD2 KC725M	P71, Q37
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SNMG543MP KCM25	B62	SNMG643RP KCU25	B63	SNMM644RH KC9110	F108	SPCT31251PPFL8LE KC410M	.037
SNMG543MS KC5525	B62	SNMG643UN KCK05	B64	SNMM644RH KC9125	F108	SPCT31251PPFL8LE KC410M	P70, Q37
SNMG543MS KCU25	B62	SNMG643UN KCK15	B64	SNMM644RH KCP10	B64, F108	SPCT31253PPFL8LD2 KC725M	.037
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SNMG543UN KCK05	B64	SNMG644RM KCP30	B63	SNMM646RM KC9125	F109	SPET31251PPFL8GB2 KCK15	P71, Q37
SNMG543UN KCK15	B64	SNMG644RM KCU10	B63	SNMM646RM KCP25	B65, F109	SPET31251PPFL8GB2 KCPK30	P71, Q37
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SSRPR10CA09	.C156	STN1118UNI KC635M	.S11	SVJBL102	.C66	T340NC3125-18R3BX	KC7542 .L13
SSSCL12CA12	.C157	STN1119BSW KC635M	.S12	SVJBR082	.C66	T340NF#10-32R3BX	KC7542 .L13
SSSCR12CA12	.C157	STN1120UNI KC635M	.S11	SVJBR102	.C66	T340NF03750-24R3BX	KC7542 .L13
SSSCR16CA12	.C157	STN1124UNI KC635M	.S11	SWLCL082	.C66	T340NF05000-20R3BX	KC7542 .L13
SSSPL10CA09	.C157	STN1128UNI KC635M	.S11	SWLCL102	.C66	T340NF05625-18R3BX	KC7542 .L13
SSSPR10CA09	.C157	STN16100ISOI KC635M	.S11	SWLCLF082D	.C67	T340NF2500-28R3BX	KC7542 .L13
SSSPR12CA09	.C157	STN16115NPS KC635M	.S12	SWLCLF103B	.C67	T351M040X070R6HX	KC7542 .L16
SSY3T	.E70-71, E74-80	STN16115NPTF KC635M	.S12	SWLCR082	.C66	T351M050X080R6HX	KC7542 .L16
SSY4T	.E70-71, E74-80	STN16115NPTF KC635M	.S12	SWLCR102	.C66	T351M060X100R6HX	KC7542 .L16
SSY5T K9	.E76, E78, E80	STN1611BSW KC610M	.S12	SWLCRF082D	.C67	T351M080X125R6HX	KC7542 .L16
STACL082D	.C61	STN1611BSW KC635M	.S12	SWLCRF103B	.C67	T351M100X150R6HX	KC7542 .L16
STACL103B	.C61	STN1612BSW KC635M	.S12	SWR744SET	.F90	T351M120X175R6HX	KC7542 .L16
STACR062D	.C61	STN1612UNI KC635M	.S11	SWR750SET	.F90	T351M140X200R6HX	KC7542 .L16
STACR082D	.C61	STN1614BSW KC610M	.S12	SWR754SET	.F90	T351M160X200R6HX	KC7542 .L16
STACR103B	.C61	STN1614BSW KC635M	.S12	SWR759SET	.F90	T351M200X250R6HX	KC7542 .L16
STC11	.C30, C38, C47, C81, C85, C90-93	STN1614NPS KC635M	.S12	SWR763SET	.F90	T351MF100X100R6HX	KC7542 .L16
STC19	.C17-18, C22-24, C39-40, C44, C47, C49	STN1614NPTF KC635M	.S12	SWR770SET	.F90	T351MF120X150R6HX	KC7542 .L16
STC20	.C15-18, C20-22, C32-33, C38-39, C80-82, C85-86, C122-127	STN1614UNE KC635M	.S11	SWR854SET	.F90	T351MF140X150R6HX	KC7542 .L16
STC26	.C90	STN1614UNI KC635M	.S11	SWR859SET	.F90	T351NC#10-24R3BX	KC7542 .L15
STC27	.C89, C91-93	STN16150ISOE KC610M	.S12	SWR863SET	.F90	T351NC#6-32R3BX	KC7542 .L15
STC4	.C16-32, C39-49, C80-85, C91-92, C122-126, C128, F92	STN16150ISOE KC635M	.S11	SWR870SET	.F90	T351NC#8-32R3BX	KC7542 .L15
STC5	.C17-18, C20-22, C24-29, C32, C39-40, C42, C44, C46, C48, C81, C83, C85-86, C123-124, C127	STN1616UNE KC635M	.S11	SWR874SET	.F90	T351NC2500-20R3BX	KC7542 .L15
STC8	.C43-49, C90-92, C128	STN1616UNI KC610M	.S11	SYB115RBT16LF	.K190	T351NC3125-18R3BX	KC7542 .L15
STC9	.C25-26, C28-29, C43, C45-46, C48-49, C80-81, C84, C88-89, C91-93, C123, C126, C128	STN16175ISOI KC635M	.S11	SYB24RBHT06F	.K190	T351NC3750-16R3BX	KC7542 .L15
STCM11	.C30-35, Q42-50	STN16175ISOI KC635M	.S11	SYB30RBHT06F	.K190	T351NC4375-14R3BX	KC7542 .L15
STCM20	.C135	STN16200ISOI KC635M	.S11	SYB40RBHT09F	.K190	T351NC5000-13R3BX	KC7542 .L15
STCM32	.Q30-32	STN16200ISOI KC635M	.S11	SYB50RBHT09F	.K190	T351NC5625-12R3BX	KC7542 .L15
STCM37	.C141-142	STN1620UNE KC635M	.S11	SYB66RBHT12F	.K190	T351NC6250-11R3BX	KC7542 .L15
STCM38	.C134-148	STN1624UNE KC635M	.S11	SYB66RBHT12LF	.K190	T351NC7500-10R3BX	KC7542 .L15
STCM4	.F104	STN1624UNI KC635M	.S11	SYB87RBHT12F	.K190	T351NF#10-32R3BX	KC7542 .L15
STCM40	.C135-140, C142-143	STN1627UNI KC635M	.S11	SYB87RBHT16LF	.K190	T351NF2500-28R3BX	KC7542 .L15
STCM8	.C135, C137, C140, C147-148	STN1632UNI KC635M	.S11	T320M060X100R6HX	KC7542 .L10	T381M040X070R6HX	KC7542 .L17
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STFCL123	.C62	STN27350ISOI KC610M	.S11	T320M120X175R6HX	KC7542 .L10	T381M080X125R6HX	KC7542 .L17
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STFPR062	.C62	SU2	.F74, F79	T320NF02500-28R3BX	KC7542 .L10	T391M060X100R6HX	KC7542 .L18
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STFPR10CA11	.C158	SU4	.F78	T320NF03750-24R3BX	KC7542 .L10	T391M100X150R6HX	KC7542 .L18
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STGCL062	.C63	SU6B	.F81	T321M120X175R6HX	KC7542 .L11	T391NC#8-32R3BX	KC7542 .L18
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TNMG333FN KCP10	.B68	TNMG432H K10P	.F130	TNMG434 K68	.B67	TNMM433RM KCP25	.B72, F109
TNMG333FN KCP25	.B68	TNMG432H K20K	.F130	TNMG434MN KCP25	.B69	TNMM433RM KCP30	.B72
TNMG333FN KT315	.B68	TNMG432H K25P	.F130	TNMG434MP KC5010	.B69	TNMM433RP KCM15	.B72
TNMG333FP KC5010	.B68	TNMG432H K35P	.F130	TNMG434MP KCM25	.B69	TNMM433RP KCM25	.B72
TNMG333FP KCM15	.B68	TNMG432M K10M	.F130	TNMG434RN KCP10	.B71	TNMM433RP KCM35	.B72
TNMG333FP KCU10	.B68	TNMG432M K25M	.F130	TNMG434RN KCP25	.B71	TNMM433RP KCP10	.B72
TNMG333FW KC5010	.B69	TNMG432MN KCP10	.B69	TNMG434RP KC5510	.B71	TNMM433RP KCP25	.B72
TNMG333FW KCP05	.B69	TNMG432MN KCP25	.B69	TNMG434RP KC5525	.B71	TNMM434RM KC9110	.F109
TNMG333FW KCP10	.B69	TNMG432MN KCP30	.B69	TNMG434RP KCK15	.B71	TNMM434RM KC9125	.F109
TNMG333FW KT315	.B69	TNMG432MN KCP40	.B69	TNMG434RP KCK20	.B71, F97	TNMM434RM KCP10	.B72, F109
TNMG333H K10P	.F130	TNMG432MP KC5010	.B69	TNMG434RP KCM25	.B71	TNMM434RM KCP25	.B72, F109
TNMG333H K20K	.F130	TNMG432MP KCM15	.B69	TNMG434RP KCP10	.B71, F97	TNMM434RP KCP10	.B72
TNMG333H K25P	.F130	TNMG432MP KCM25	.B69	TNMG434RP KCP25	.B71, F97	TNMM434RP KCP25	.B72
TNMG333H K35P	.F130	TNMG432MS K313	.B70	TNMG434RP KCS10	.B71	TNMM543RM KC9125	.F109
TNMG333M K10M	.F130	TNMG432MS KC5510	.B70	TNMG434RP KCU25	.B71	TNMM543RM KCP25	.B72, F109
TNMG333M K25M	.F130	TNMG432MS KC5525	.B70	TNMG434UN KCK15	.B71	TNMM543RM KCP30	.B72
TNMG333MN KCP05	.B69	TNMG432MS KCS10	.B70	TNMG434UN KCK20	.B71	TNMM544RM KC9110	.F109
TNMG333MN KCP10	.B69	TNMG432MS KCU25	.B70	TNMG438RP KC5510	.B71	TNMM544RM KC9125	.F109
TNMG333MN KCP25	.B69	TNMG432P KC5010	.B70	TNMG438RP KC9110	.F97	TNMM544RM KCP25	.B72, F109
TNMG333MN KCP30	.B69	TNMG432R K10M	.F130	TNMG438RP KC9125	.F97	TNMM544RM KCP30	.B72
TNMG333MN KCP40	.B69	TNMG432R K10P	.F130	TNMG438RP KCK20	.B71, F97	TNMM544RP KCP25	.B72
TNMG333MP KC5010	.B69	TNMG432R K25M	.F130	TNMG438RP KCP25	.B71, F97	TNMP331 K313	.B73
TNMG333MP KCM15	.B69	TNMG432R K25P	.F130	TNMG438RP KCP30	.B71	TNMP331 K68	.B73
TNMG333MP KCM25	.B69	TNMG432R K35P	.F130	TNMG542MS K313	.B70	TNMP331K KCP25	.B73
TNMG333MP KCP05	.B70	TNMG432RN KCP10	.B71	TNMG542MS KC5525	.B70	TNMP332 K313	.B73
TNMG333MP KCP10	.B70	TNMG432RN KCP25	.B71	TNMG542MS KCU25	.B70	TNMP332 K68	.B73
TNMG333MP KCP25	.B70	TNMG432RN KCP30	.B71	TNMG542RN KCP10	.B71	TNMP332K KCP10	.B73
TNMG333R K10M	.F130	TNMG432RN KCP40	.B71	TNMG542RN KCP25	.B71	TNMP332K KCP25	.B73
TNMG333R K10P	.F130	TNMG432RP KC5010	.B71	TNMG542RN KCP30	.B71	TNMP333 K68	.B73
TNMG333R K25M	.F130	TNMG432RP KC5510	.B71	TNMG543H K10P	.F130	TNMP431 K68	.B73
TNMG333R K25P	.F130	TNMG432RP KC5525	.B71	TNMG543H K20K	.F130	TNMP432 K313	.B73
TNMG333RN KCP10	.B71	TNMG432RP KC9110	.F97	TNMG543H K25P	.F130	TNMP432 K68	.B73
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TNMG333UN KCK20	.B71	TNMG432UN KCK20	.B71	TNMG543RP KCM25	.B71	TNMS332FST KD1425	.B180
TNMG333UN KCK15	.B71	TNMG432UP KC5010	.B72	TNMG543RP KCM35	.B71	TNMS431 K68	.B73
TNMG333UP KC5010	.B72	TNMG432UP KCM15	.B72	TNMG543RP KCP10	.B71, F97	TNMS431 KC5410	.B73
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TNMG333UP KCM25	.B72	TNMG432UP KCM35	.B72	TNMG543RP KCU25	.B71	TNMS432 KC5410	.B73
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WNMG432FW KCP10	..B80	WNMG433RN KCP05	..B82	WPMT2152LF KCM25	..B115
WNMG432FW KCU10	..B80	WNMG433RN KCP10	..B82	WPMT2152LF KCP10	..B115
WNMG432FW KT315	..B80	WNMG433RN KCP25	..B82	WPMT2152LF KCP25	..B115
WNMG432H K10P	..F134	WNMG433RN KCP30	..B82	WTENNS164	..C34
WNMG432H K20K	..F134	WNMG433RN KCP40	..B82	WTENNS205	..C34
WNMG432H K25P	..F134	WNMG433RP KC5010	..B83	WTINLS164	..C34
WNMG432H K35P	..F134	WNMG433RP KC5510	..B83	WTINLS205	..C34
WNMG432M K10M	..F134	WNMG433RP KC5525	..B83	WTINRS164	..C34
WNMG432M K25M	..F134	WNMG433RP KCK05	..B83	WTINRS205	..C34
WNMG432MN KCP05	..B81	WNMG433RP KCK15	..B83	WTJNLS164	..C35
WNMG432MN KCP10	..B81	WNMG433RP KCK20	..B83	WTJNLS854	..C35
WNMG432MN KCP25	..B81	WNMG433RP KCM15	..B83	WTJNRS164	..C35
WNMG432MN KCP30	..B81	WNMG433RP KCM25	..B83	WTJNRS854	..C35
WNMG432MN KCP40	..B81	WNMG433RP KCM35	..B83	WTS10P K40	..F87
WNMG432MP KC5010	..B81	WNMG433RP KCP05	..B83	WTS10P KC5125RR	..F87
WNMG432MP KCM15	..B81	WNMG433RP KCP10	..B83	WWLNL164	..C35
WNMG432MP KCM25	..B81	WNMG433RP KCP25	..B83	WWLNR124	..C35
WNMG432MP KCM35	..B81	WNMG433RP KCP30	..B83	WWLNR164	..C35
WNMG432MP KCP10	..B81	WNMG433RP KCP40	..B83	WXXNL4455X-FL	..F82
WNMG432MP KCP25	..B81	WNMG433RP KCU10	..B83	WXXNR4455X-FL	..F82
WNMG432MP KCU10	..B81	WNMG433RP KCU25	..B83	XNGJ43ANENLD3W KC510M	..011
WNMG432MS K313	..B81	WNMG433UN KCK05	..B83	XNGJ43ANENLD3W KC520M	..011
WNMG432MS KC5510	..B81	WNMG433UN KCK15	..B83	XNGJ43ANENLD3W KC522M	..011
WNMG432MS KC5525	..B81	WNMG433UN KCK20	..B83	XNGJ43ANENLD3W KC725M	..011
WNMG432MS KCU25	..B81	WNMG433UP KC5010	..B83	XNGJ43ANENLD3W KCK15	..011
WNMG432MW KCP05	..B82	WNMG433UP KCM15	..B83	XNGJ43ANENLD3W KCPK30	..011
WNMG432MW KCP10	..B82	WNMG433UP KCM25	..B83	XNGJ43ANENLD3W KCPM20	..011
WNMG432MW KCP25	..B82	WNMG433UP KCM35	..B83	XNGJ43ANFNLDJ3W K313	..011
WNMG432P KC5010	..B82	WNMG433UP KCU10	..B83	XNGJ43ANFNLDJ3W KC410M	..011
WNMG432P KC5410	..B82	WNMG434H K20K	..F134	XNGJ535ANFNLDJ3W KC410M	..020
WNMG432P KCU10	..B82	WNMG434H K25P	..F134	XNGJ535ANSNGD3W KC725M	..020
WNMG432R K10M	..F134	WNMG434H K35P	..F134	XNGJ535ANSNGD3W KCK15	..020
WNMG432R K10P	..F134	WNMG434MN KCP25	..B81	XNGJ535ANSNGD3W KCPK30	..020
WNMG432R K25M	..F134	WNMG434RN KCP10	..B82	XNGJ535ANSNGD3W KCPM20	..020
WNMG432R K25P	..F134	WNMG434RN KCP25	..B82	XNXF43Z2NENLDW KC907M	..0105
WNMG432R K35P	..F134	WNMG434RN KCP30	..B82	XNXF43Z2NENLDW KC914M	..0105
WNMG432RN KCP05	..B82	WNMG434RN KCP10	..B82	XNXF43Z2NENLDW KC917M	..0105
WNMG432RN KCP10	..B82	WNMG434RP KC5510	..B83	XNXF43Z2NENW KY3500	..0105
WNMG432RN KCP25	..B82	WNMG434RP KC5525	..B83		
WNMG432RN KCP30	..B82	WNMG434RP KCK20	..B83		
WNMG432RN KCP40	..B82	WNMG434RP KCP05	..B83		
WNMG432RP KC5010	..B83	WNMG434RP KCP10	..B83		
WNMG432RP KC5510	..B83	WNMG434RP KCP25	..B83		
WNMG432RP KC5525	..B83	WNMG434RP KCP30	..B83		
WNMG432RP KCK05	..B83	WNMG434RP KCS10	..B83		
WNMG432RP KCK15	..B83	WNMG434RP KCU25	..B83		
WNMG432RP KCK20	..B83	WNMG434UN KCK15	..B83		
WNMG432RP KCM15	..B83	WNMG434UN KCK20	..B83		
WNMG432RP KCM25	..B83	WOEJ090512SRGD KC522M	..R5		
WNMG432RP KCM35	..B83	WOEJ090512SRGD KC725M	..R5		
WNMG432RP KCP05	..B83	WOEJ090512SRGD KCPK30	..R5		
WNMG432RP KCP10	..B83	WOEJ090512SRHD KC522M	..R5		
WNMG432RP KCP25	..B83	WOEJ090512SRHD KC725M	..R5		
WNMG432RP KCP30	..B83	WOEJ090512SRHD KCK15	..R5		
WNMG432RP KCP40	..B83	WOEJ090512SRHD KCPK30	..R5		
WNMG432RP KCU10	..B83	WOGX03020424	..J99		
WNMG432RP KCU25	..B83	WPGT15105UF KC5010	..B115		
WNMG432UN KCK05	..B83	WPGT15105UF KCU10	..B115		
WNMG432UN KCK15	..B83	WPGT1510UF KC5010	..B115		
WNMG432UN KCK20	..B83	WPGT1510UF KCU10	..B115		
WNMG432UP KC5010	..B83	WPGT21505UF KCU10	..B115		
WNMG432UP KCM15	..B83	WPGX030204LD080 KC522M	..R10		
WNMG432UP KCM25	..B83	WPGX030204LD080 KC725M	..R10		
WNMG432UP KCM35	..B83	WPGX030204LD080 KCPK30	..R10		
WNMG432UP KCU10	..B83	WPGX030204LD080 KCPM20	..R10		
WNMG433FN KT315	..B80	WPGX030204LN080 KC510M	..R10		
WNMG433FP KC5010	..B80	WPMT15121FP KCP25	..B115		
WNMG433FP KCM15	..B80	WPMT15121FP KCU10	..B115		
		WPMT15121LF KC5010	..B115		

Visit www.kennametal.com for additional contact information for locations.

North America

- United States**
 General Sales: 1-800-446-7738
FtMill.Service@kennametal.com
 Technical Support: 1-800-835-3668
na-kmt.techsupport@kennametal.com

- Canada**
 General Sales: 800-446-7738
toronto.service@kennametal.com
 Technical Support: 1-800-835-3668
na-kmt.techsupport@kennametal.com

- Mexico**
 General Sales: 001-888-402-4963
k-mx.service@kennametal.com

Central/South America

- Argentina**
 General Sales: (011) 4719-0700
buenos-aires.ventas@kennametal.com

- Brazil**
 General Sales: 55 19 3936 9200
bra.marketing@kennametal.com

- Chile**
 General Sales: 56-2-2641177
kennametalchile@kennametalchile.cl

- El Salvador**
 General Sales: (503) 2218 8096
prometca@salnet.net

- Venezuela**
 General Sales: 305-595-5175
paxi@bellsouth.net

Africa

- Egypt**
 General Sales: +20 2-263-9828
gafa@link.net

- South Africa**
 General Sales: +27 11-397-3540
kempton.service@kennametal.com

Europe

- Austria**
 General Sales: +43-2236-379898
brunn.sales@kennametal.com
 Technical Support: 0800 202873
eu-kmt.techsupport@kennametal.com

- Belgium**
 General Sales: +32 4 248 48 48
liege.sales@kennametal.com
 Technical Support: 0800 80850
eu-kmt.techsupport@kennametal.com

- Czech Republic**
 Ricany-Jazlovice
 General Sales: 800 900 840
k-prha.sales@kennametal.com

- France**
 General Sales: +33 1 69 77 83 83
info.fr@kennametal.com
 Technical Support: 0805 540 367
eu-kmt.techsupport@kennametal.com

- Germany**
 General Sales: +49 6172 737-0
friedrichsdorf.service@kennametal.com
 Technical Support: 0800 0006651
eu-kmt.techsupport@kennametal.com

- Great Britain**
 General Sales: +44 1384 408060
kingswinford.service@kennametal.com
 Technical Support: 0800 032 8339
na-kmt.techsupport@kennametal.com

Europe (cont.)

- Hungary**
 General Sales: +36 96 618 158
gyoer.sales@kennametal.com

- Ireland**
 General Sales: +44 28-9084-9433

- Italy**
 General Sales: +39 02-895-961
milano.vendite@kennametal.com
 Technical Support: 800 916561
eu-kmt.techsupport@kennametal.com

- Luxembourg**
 General Sales: +32 4 248 48 48
liege.sales@kennametal.com

- Netherlands**
 General Sales: +31 26 384 48 50
arnhem.information@kennametal.com
 Technical Support: 0800 0201130
eu-kmt.techsupport@kennametal.com

- Poland**
 General Sales: +48 61 6656501
poznan.sales@kennametal.com
 Technical Support: 00800 4411887
eu-kmt.techsupport@kennametal.com

- Portugal**
 General Sales: +351 22 4119 400
porto.service@kennametal.com

- Russia**
 General Sales: +7 495 4115386
system@kennametal.ru

- Slovakia**
 General Sales: +421 42 444 0792
k-eu-trencin.sales@kennametal.com

- Spain**
 General Sales: +34 93 586 03 50
barcelona.service@kennametal.com

- Turkey**
 General Sales: +90 216-574-4780
tr.information@kennametal.com

East/Asia Pacific

- **Australia**
General Sales: 1-800-666-667
k-au.service@kennametal.com
Technical Support: 1800674037
ap-kmt.techsupport@kennametal.com

- **Bahrain**
General Sales: 00 971 (0) 5572371
info@passtech.co.uk

- **China**
General Sales: +86 400 889 2135
Technical Support: 400-889-2238

- **Dubai**
General Sales: 00 971 (0) 5572371
info@passtech.co.uk

- **India**
General Sales: +91 80 2219 8444 or
+91 80 4328 1444
bangalore.information@kennametal.com

- **Indonesia**
General Sales: +65 6 265-9222
k-sg.sales@kennametal.com
Technical Support: 1800 6221031

- **Israel**
General Sales: +97 23-558-1313
arnold1@inter.net.il
Technical Support: 1809 449889
na-kmt.techsupport@kennametal.com

- **Japan**
General Sales: 813 3820 2855
Technical Support: 0120-509-085
k-jp.techsupport@kennametal.com

- **Korea**
General Sales: +82 2-2109-6100
Technical Support: 080 728 0880

- **Kuwait**
General Sales: 00 971 (0) 5572371
info@passtech.co.uk

- **Malaysia**
General Sales: (6) 03-5569 9080
Technical Support: 1800812990

- **New Zealand**
General Sales: 0800 536 626
k-nz.service@kennametal.com
Technical Support: 0800 450941
ap-kmt.techsupport@kennametal.com

- **Pakistan**
General Sales: +92 21 2465305
itsystem@brain.net.pk

- **Singapore***
General Sales: +65 6 265-9222
k-sg.sales@kennametal.com
Technical Support: 1800 6221031
*Vietnam and Philippines individuals should contact the Singapore office.

- **Taiwan**
General Sales: +886 4-2350 1920
taiwan.service@kennametal.com
Technical Support: 0800 666 197

- **Thailand**
General Sales: 662 642 3455
Technical Support: 18004417820



Turning Icons

Shank: KM-TS ISO 26622	Coolant: Through Coolant 100 Bar (1500 psi) Maximum	Coolant: Through Coolant 100 Bar (1500 psi) Maximum		
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Holemaking Icons

Counterboring	Countersinking/ Stroke Chamfering	Drilling into Solid	Drilling: Inclined Entry	Drilling: Inclined Exit
Drilling: X-Offset	Drilling: Flat Bottom	Drilling: Stacked Plates	Drilling: Convex	Drilling: Blind
Reaming: Through Hole	Reaming: Blind Hole	Reaming: Through and Cross Holes	Reaming: Blind and Cross Holes	Reaming: Interrupted Cut
Tapping: Through Hole	Tapping: Blind Hole	Tapping: Pipe Thread	HSS: High-Speed Steel	HSS-E: High-Speed Steel with Cobalt Alloy for Materials with Higher Hardness
HSS-E-PM: High Speed Steel with Cobalt Alloy for Materials with Higher Hardness (PM = Powder Metal Steel)	HM: (Carbide)	Drilling Depth: 1x	Drilling Depth: 1.5x	Drilling Depth: 2x
Drilling Depth: 3x	Drilling Depth: 4x	Drilling Depth: 5x	Drilling Depth: 7x	Drilling Depth: 8x
Drilling Depth: 10x	Drilling Depth: 12x	Corner Style: Corner Chamfer	Corner Style: Square End	Shank: Cylindrical Plain
Shank: Cylindrical Plain ≤h6	Shank: HSK DIN 69893 Form A	Shank: HSK DIN 69893	Shank: KM-TS ISO 26622	Shank: KM-XMZ
Square Shank: L = 4"	Square Shank: L = 6"	Square Shank: L = 8"	Square Shank: L = 10"	Shank: Cylindrical Whistle Notch™
Shank: Cylindrical Whistle Notch 2°	Shank: Cylindrical with Flat	Shank: SK BT JIS B 6339	Shank: SK CAT(CV) ANSI B5.50	Shank: SK DV DIN 69871
SK Shank (Rübig)	Shank: Cylindrical Whistle Notch with Drive and Flange	Shank: Cylindrical with Flat and Flange	KM™ Shank	Helix Angle: 0°

(continued)

Holemaking Icons *(continued)*

Helix Angle: 30°	Chamfer Form A (6-8)	Chamfer Form B (3-5)	Chamfer Form: 3-4	Chamfer Form C (2-3)
Chamfer Form D (3.5-5)	Chamfer Form E (1.5-2)	Chamfer Form: 2.5-3.5	Chamfer Form: 4-6	Chamfer Form: 1-2
Tip Angle: 118°	Tip Angle: 130°	Tapping Helix Angle: 0°	Tapping Helix Angle: L8°	Tapping Helix Angle: 10°
Tapping Helix Angle: 15°	Tapping Helix Angle: L15°	Tapping Helix Angle: 25°	Tapping Helix Angle: 30°	Tapping Helix Angle: 42°
Tapping Helix Angle: 45°	Tapping Helix Angle: 49°	Balance (G 6.3/6,000)	Balance (G 6.3/10,000)	Balance (G 6.3/25,000)
DIN Number 371	DIN Number 374	DIN Number 376	DIN Number 2174	DIN Number 6535
DIN Number 6537	Drilling: No Coolant	Drilling: Through Coolant	Reaming: Through Coolant	Tapping: Through Coolant
Through Coolant: Radial: Indexable Drilling	Flood Coolant: Drilling	Flood Coolant: Tapping	Through Coolant: MQL (Minimum Quantity Lubricant): Drilling	Coolant: Through Coolant
Through Coolant: Axial: Reaming	Through Coolant: Axial: Tapping	Through Coolant: Coolant Entry AD	Through Coolant: Flange Coolant Entry B	Tool Dimensions: 2flute/2margin/coolant
Tool Dimensions: 2 Flute/2 Margin/ No Coolant	Tool Dimensions: 2 Flute/3 Margin/ Coolant	Tool Dimensions: 2 Flute/4 Margin/ Coolant	Tool Dimensions: 2 Flute/4 Margin/ No Coolant	Tool Dimensions: 2 Flute/4 Margin/ X/Coolant
Tool Dimensions: 3 Flute/3 Margin/ Coolant	Class of Fit: 2B	Class of Fit: 3B	Class of Fit: 6H	Class of Fit: 6HX
Class of Fit: 2BX	Class of Fit: 3BX	American Tapered Pipe Thread for Threads with Dryseal Material	American Tapered Pipe Thread for Threads without Dryseal Material	American National Standards Institute
American Standard Straight Pipe Thread	American Standard Straight Pipe Thread Dryseal	British Standard Pipe Fitting Thread	British Standard Pipe Taper Thread	Whitworth Pipe Thread
Cylindrical Whitworth Pipe Thread	Tapered Whitworth Pipe Thread	Unified Fine Thread	Unified Coarse Thread	ISO Metric Coarse Thread
ISO Metric fine thread	Flute Configuration: 2	Flute Configuration: 3		

Solid End Milling Icons

Plunge Milling	Ramping: Blank	Slotting: Ball Nose	Slotting: Ball Nose with AP Dimension	Slotting: Square End
Slotting: Square End with AP Dimension	Side Milling/Shoulder Milling: Ball Nose	Side Milling/Shoulder Milling: Ball Nose with AE/AP dimensions	Side Milling/Shoulder Milling: Square End	Side Milling/Shoulder Milling: Square End with AE/AP Dimensions
Side Milling/Shoulder Milling: Roughing	3D Profiling	3D Profiling with AE/AP Dimensions	Corner Style: Ball Nose	Corner Style: Corner Chamfer
Corner Style: Corner Radius	Corner Style: Square End	Corner Style: Torus	Shank: Cylindrical Plain	Shank: Cylindrical Weldon®
Helix Angle: 15°	Helix Angle: 20°	Helix Angle: 25°	Helix Angle: 30°	Helix Angle: 35°
Helix Angle: 37°	Helix Angle: 38°	Helix Angle: 40°	Helix Angle: 43°	Helix Angle: 45°
Helix Angle: 50°	Helix Angle: 60°	DIN Number 6527	DIN Number 6528	Drilling: Through Coolant
Tool Dimensions: Flute Configuration: X (Variable)	Tool Dimensions: Flute Configuration: 2	Tool Dimensions: Flute Configuration: 3	Tool Dimensions: Flute Configuration: 4	Tool Dimensions: Flute Configuration: 5
Tool Dimensions: Flute Configuration: 6				

Indexable Milling Icons

Drilling	Face Milling	Helical Milling	Plunge Milling	Ramping: Blank
Slotting: Ball Nose	Slotting: Side	Slotting: Side with AE/AP Dimensions	Slotting: Square End	Slotting: T
Slotting: T with AP Dimension	Side Milling/Shoulder Milling: Ball Nose	Side Milling/Shoulder Milling: Bottom Shouldering	Side Milling/Shoulder Milling: Bottom Shouldering with AE/AP Dimensions	Side Milling/Shoulder Milling: Square End
Side Milling/Shoulder Milling: Square End with AE/AP Dimensions	Side Milling/Shoulder Milling: Eased Chamfer	3D Profiling	Pocketing	Shank: Cylindrical Plain
Shank: HSK DIN 69893	Milling: Side and Face	Shank: Cylindrical Weldon®	Shank: Cylindrical Weldon 2 Flat	Shank: Screw-On
SK Shank: R8	Shank: SK BT JIS B 6339	Shank: SK CAT(CV) ANSI B5.50	Milling: Through Coolant	

DIN – German Institute for Standardization

ANSI – American National Standards Institute



History

Innovation, perseverance, and close attention to customer needs have characterized Kennametal since its founding in 1938. Metallurgist Philip M. McKenna pioneered the use of a tungsten-titanium carbide alloy in cutting tools, and in the process, rewrote the standards for machining steel.

Kennametal has not rested since.

Today, we are a diverse, global enterprise with nearly 11,000 employees doing business in more than 60 countries, with approximately \$2 billion in annual revenues. Our reputation for innovation is kept alive by more than 700 highly trained and experienced technical personnel, a forward-focused group that averages 40 US patents each year.

With Kennametal, you'll discover a strategic partner that can be counted on to listen first — and then lead.

1848 Greenfield Tap & Die is founded

1938 McKenna Metals Co. organized

1958 Expands, forming Kennametal Overseas Corporation

1991 Kennametal spends \$27 million to build its Corporate Technology Center

1997 Kennametal acquires Greenfield Industries Inc.

2004 Kennametal purchases Conforma Clad

2007 China investment — Tianjin opens
Kennametal acquires ISA

2009 Kennametal acquires Romicon™



2010 Kennametal implements transformation aligned to segments

2008 Kennametal acquires Tricon

2006 Kennametal acquires Sintec and Camco

2002 Kennametal acquires WIDIA (India) Ltd.

1993 Kennametal acquires German toolmaker, Hertel AG

1967 Kennametal completes its initial public offering of stock

1943 McKenna Metals is incorporated as Kennametal Inc.

1925 WIDIA™ is founded

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous Materials
S	High-Temp Alloys
H	Hardened Materials

Material Overview • ANSI



material group	description	content	tensile strength RM (MPa)*	hardness (HB)	hardness (HRC)	material number
P0	Low-Carbon Steels, Long Chipping	C <.25%	<530	<125	—	A36, 1008, 1010, 1018 through 1029; 1108, 1117
P1	Low-Carbon Steels, Short Chipping, Free Machining	C <.25%	<530	<125	—	10L18, 1200 Series, 1213, 12L14
P2	Medium- and High-Carbon Steels	C >.25%	>530	<220	<25	1035, 1045, 10L45, 1050, 10L50, 1080, 1137, 1144, 11L44, 1525, 1545, 1572
P3	Alloy Steels and Tool Steels	C >.25%	600–850	<330	<35	1300, 2000, 3000, 4000, 5000, 8000, P20, SAE: A, D, H, O, S, M, T
P4	Alloy Steels and Tool Steels	C >.25%	850–1400	340–450	35–48	1300, 2000, 3000, 4000, 5000, 8000, P20, SAE: A, D, H, O, S, M, T
P5	Ferritic, Martensitic, and PH Stainless Steels	—	600–900	<330	<35	15–5 PH, 13–8 PH, 17–4 PH, 400 and 500 Series
P6	High-Strength Ferritic, Martensitic, and PH Stainless Steels	—	900–1350	350–450	35–48	15–5 PH, 13–8 PH, 17–4 PH, 400 and 500 Series
M1	Austenitic Stainless Steel	—	<600	130-200	—	200 Series, 301, 302, 304, 304L, 309
M2	High-Strength Austenitic Stainless and Cast Stainless Steels	—	600–800	150–230	<25	310, 316, 316L, 321, 347, 384 ASTM Cast XM-1, XM-5, XM-7, XM-21
M3	Duplex Stainless Steel	—	<800	135–275	<30	323, 329, F55, 2205, S329000
K1	Gray Cast Iron	—	125–500	120–290	<32	class 20, 25, 30, 35, 40, 45, 50, 55, 60, G1800, G3000, G3500, G4000
K2	Low- and Medium-Strength Ductile Irons (Nodular Irons) and Compacted Graphite Irons (CGI)	—	<600	130–260	<28	60-40-18, 65-45-12, 80-55-06, SAE J434:D4018, D4512, D5506, ASTM A47: Grade 32510, 35018, SAE J158: Grade M3210, M4504, M5003, M5503, M7002, ASTM A842: Grade 250, 300, 350, 400, 450
K3	High-Strength Ductile Irons and Austempered Ductile Iron (ADI)	—	>600	180–350	<43	ASTM A536:100-70-03, 120-90-02, SAE J434: D7003, SAE J158: Grade M8501AST A897: 125-80-10, 150-100-7, 175-125-4, 200-150-1, 230-185
N1	Wrought Aluminum	—	—	—	—	2025, 5050, 7050, 1000, 2017
N2	Low-Silicon Aluminum Alloys and Magnesium Alloys	Si <12.2%	—	—	—	2024, 6061, 7075
N3	High-Silicon Aluminum Alloys and Magnesium Alloys	Si > 12.2%	—	—	—	—
N4	Copper-, Brass-, Zinc-Based on Machinability Index Range of 70–100	—	—	—	—	C81500
N5	Nylon, Plastics, Rubbers, Phenolics, Resins, Fiberglass	—	—	—	—	—
N6	Carbon, Graphite Composites, CFRP	—	—	—	—	Graphite, CFK, CFRP
N7	Metal Matrix Composites (MMC)	—	—	—	—	C63000
S1	Iron-Based, Heat-Resistant Alloys	—	500–1200	160–260	25–48	A-286, INCOLOY® 800 Series, A608, A567, Discaloy™, INVAR®, N-155, 16-25-6, 19-9 DL; Cast: ASTM A-297, A-351, A-567, A-608
S2	Cobalt-Based, Heat-Resistant Alloys	—	1000–1450	250–450	25–48	Haynes® 25 (L605), Haynes 188, J-1570, Stellite®, AiResist 213; Cast: AiResist 13, Haynes 21, MAR-M302, MAR-M509, NASA Co-W-Re, WI-52
S3	Nickel-Based, Heat-Resistant Alloys	—	600–1700	160–450	<48	Astroloy™, Hastelloy® B/C/ C-276 /X, INCONEL® 600 and 700 Series, IN102, INCOLOY 900 Series, Rene 41, Waspalloy® Monel® K-500, MAR-M20, NIMONIC® UDIMET®
S4	Titanium and Titanium Alloys	—	900–1600	300–400	33–48	Pure: Ti 98.8, Ti 98.9, Ti 99.9; Alloyed: Ti 5Al-2.5Sn, Ti6Al-4V, Ti6Al-2Sn-4Zr-2Mo, Ti-3Al-8V-6Cr-4Mo-4Zr, Ti-10V-2Fe-3Al, Ti-13V-11Cr-3Al
H1	Hardened Materials	—	—	—	44–48	Tool Steel H10, H11, H13, D2, D3, 4340, P20
H2	Hardened Materials	—	—	—	48–55	Tool Steel H10, H11, H13, D2, D3, 4340, P20
H3	Hardened Materials	—	—	—	56–60	Tool Steel H10, H11, H13, D2, D3, 4340, P20
H4	Hardened Materials	—	—	—	>60	Tool Steel H10, H11, H13, D2, D3, 4340, P20

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous Materials
S	High-Temp Alloys
H	Hardened Materials

Material Overview • DIN



material group	description	content	tensile strength RM (MPa)*	hardness (HB)	hardness (HRC)	material number
P0	Low-Carbon Steels, Long Chipping	C <.25%	<530	<125	—	—
P1	Low-Carbon Steels, Short Chipping, Free Machining	C <.25%	<530	<125	—	C15, Ck22, ST37-2, S235JR, 9SMnPb28, GS38
P2	Medium- and High-Carbon Steels	C >.25%	>530	<220	<25	ST52, S355JR, C35, GS60, Cf53
P3	Alloy Steels and Tool Steels	C >.25%	600–850	<330	<35	16MnCr5, Ck45, 21CrMoV5-7, 38SMn28
P4	Alloy Steels and Tool Steels	C >.25%	850–1400	340–450	35–48	100Cr6, 30CrNiMo8, 42CrMo4, C70W2, S6525, X120Mn12
P5	Ferritic, Martensitic, and PH Stainless Steels	—	600–900	<330	<35	100Cr6, 30CrNiMo8, 42CrMo4, C70W2, S6525, X120Mn12
P6	High-Strength Ferritic, Martensitic, and PH Stainless Steels	—	900–1350	350–450	35–48	X102CrMo17, G-X120Cr29
M1	Austenitic Stainless Steel	—	<600	130–200	—	X5CrNi 18 10, X2CrNiMo 17 13 2, G-X25CrNiSi18 9, X15CrNiSi 20 12
M2	High-Strength Austenitic Stainless and Cast Stainless Steels	—	600–800	150–230	<25	X2CrNiMo 13 4, X5NiCr 32 21, X5CrNiNb 18 10, G-X15CrNi 25-20
M3	Duplex Stainless Steel	—	<800	135–275	<30	X8CrNiMo27 5, X2CrNiMoN22 5 3, X20CrNiSi25 4, G-X40CrNiSi27 4
K1	Gray Cast Iron	—	125–500	120–290	<32	GG15, GG25, GG30, GG40, GTW40
K2	Low- and Medium-Strength Ductile Irons (Nodular Irons) and Compacted Graphite Irons (CGI)	—	<600	130–260	<28	GGG40, GTS35
K3	High-Strength Ductile Irons and Austempered Ductile Iron (ADI)	—	>600	180–350	<43	GGG60, GTW55, GTS65
N1	Wrought Aluminum	—	—	—	—	AlMg1, Al99.5, AlCuMg1, AlCuBiPb, AlMgSi1, AlMgSiPb
N2	Low-Silicon Aluminum Alloys and Magnesium Alloys	Si <12.2%	—	—	—	GAISiCu4, GDAISi10Mg
N3	High-Silicon Aluminum Alloys	Si >12.2%	—	—	—	G-ALSi12, G-AISi17Cu4, G-AISi21CuNiMg
N4	Copper-, Brass-, Zinc-Based on Machinability Index Range of 70–100	—	—	—	—	CuZn40, Ms60, G-CuSn5ZnPb, CuZn37, CuSi3Mn
N5	Nylon, Plastics, Rubbers, Phenolics, Resins, Fiberglass	—	—	—	—	LEXAN®, HOSTALEN™, Polystyrol, Makralon®
N6	Carbon, Graphite Composites, CFRP	—	—	—	—	CFK, GFK
N7	Metal Matrix Composites (MMC)	—	—	—	—	—
S1	Iron-Based, Heat-Resistant Alloys	—	500–1200	160–260	25–48	X1NiCrMoCu32 28 7, X12NiCrSi36 16, X5NiCrAlTi31 20, X40CoCrNi20 20
S2	Cobalt-Based, Heat-Resistant Alloys	—	1000–1450	250–450	25–48	Haynes® 188, Stellite® 6,21,31
S3	Nickel-Based, Heat-Resistant Alloys	—	600–1700	160–450	<48	INCONEL® 690, INCONEL 625, Hastelloy®, NIMONIC® 75
S4	Titanium and Titanium Alloys	—	900–1600	300–400	33–48	Ti1, TiAl5Sn2, TiAl6V4, TiAl4Mo4Sn2
H1	Hardened Materials	—	—	—	44–48	GX260NiCr42, GX330NiCr42, GX300CrNiSi952, GX300CrMo153, HARDOX® 400
H2	Hardened Materials	—	—	—	48–55	—
H3	Hardened Materials	—	—	—	56–60	—
H4	Hardened Materials	—	—	—	>60	—

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We support enterprises operating in everything from airframes to coal mining, from engines to natural gas wells, from turbochargers to construction. Just as every customer is different, so are their needs, but they recognize the extraordinary contributions Kennametal has made — and continues to make — to their value chains.

From Buenos Aires to Beijing, Moscow to Fuerth, and Houston to Tokyo, Kennametal is at the epicenter of today's most compelling operations in hundreds of geographies and rapidly expanding industries. Our global presence facilitates rapid responses to our client's most challenging needs. The application experts who make up our field sales force become immersed in customers' operations — the mine, the shop floor, the construction site — so they can quickly solve problems and increase productivity. After all, the world is our proving ground for the technologies and next-generation solutions we engineer every day.

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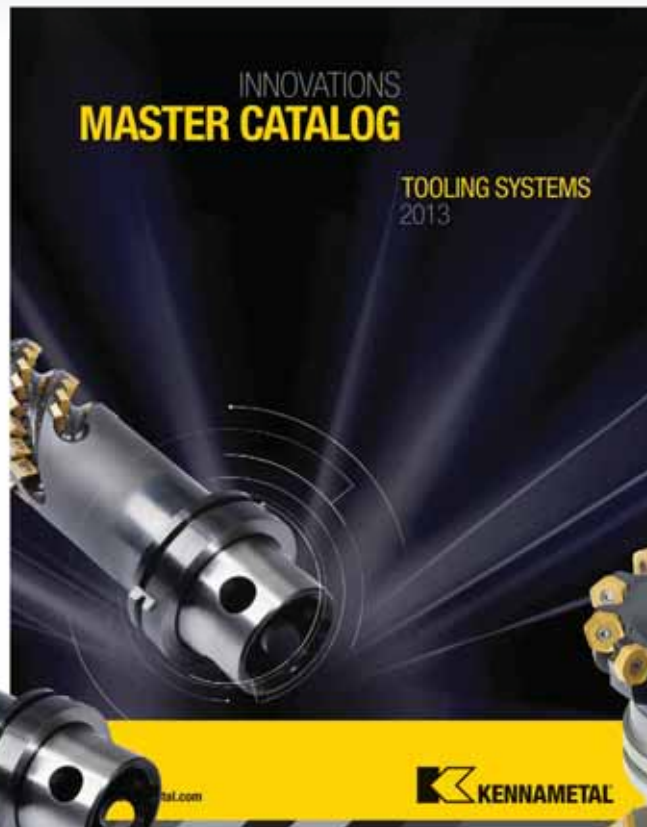
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Metalcutting Safety

IMPORTANT SAFETY INSTRUCTIONS

Read before using the tools in this catalog!

Projectile and Fragmentation Hazards:

Modern metalcutting operations involve high spindle and cutter speeds and high temperatures and cutting forces. Hot metal chips may fly off the workpiece during metalcutting. Although cutting tools are designed and manufactured to withstand high cutting forces and temperatures, they can sometimes fragment, particularly if they are subjected to over-stress, severe impact, or other abuse.

To avoid injury:

- Always wear appropriate personal protective equipment, including safety goggles, when operating metalcutting machines or working nearby.
- Always make sure all machine guards are in place.

Breathing and Skin Contact Hazards:

Grinding carbide or other advanced cutting tool materials produces dust or mist containing metallic particles. Breathing this dust or mist — especially over an extended period — can cause temporary or permanent lung disease or make existing medical conditions worse. Contact with this dust or mist can irritate eyes, skin, and mucous membranes and may make existing skin conditions worse.

To avoid injury:

- Always wear breathing protection and safety goggles when grinding.
- Provide ventilation control and collect and properly dispose of dust, mist, or sludge from grinding.
- Avoid skin contact with dust or mist.

For more information, read the applicable Material Safety Data Sheet provided by Kennametal and consult General Industry Safety and Health Regulations, Part 1910, Title 29 of the Code of Federal Regulations.

These safety instructions are general guidelines. Many variables affect machining operations. It is impossible to cover every specific situation. The technical information included in this catalog and recommendations on machining practices may not apply to your particular operation. For more information, consult Kennametal's Metalcutting Safety booklet, available free from Kennametal at 724.539.5747 or fax 724.539.5439. For specific product safety and environmental questions, contact our Corporate Environmental Health and Safety Office at 724.539.5066 or fax 724.539.5372.

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INNOVATIONS **MASTER CATALOG**

WORLD AND CORPORATE HEADQUARTERS

Kennametal Inc.

1600 Technology Way

Latrobe, PA 15650 USA

Phone: 800.446.7738 (United States and Canada)

E-mail: ftmill.service@kennametal.com

EUROPEAN HEADQUARTERS

Kennametal Europe GmbH

Rheingoldstrasse 50

CH 8212 Neuhausen am Rheinfall

Switzerland

Phone: 41.52.6750.100

E-mail: neuhausen.info@kennametal.com

ASIA-PACIFIC HEADQUARTERS

Kennametal (Singapore) Pte. Ltd.

ICON@IBP #01-02/03/05

3A International Business Park

Singapore 609935

Phone: 65.6.2659222

E-mail: k-sg.sales@kennametal.com

INDIA HEADQUARTERS

Kennametal India Limited

8/9th Mile, Tumkur Road

Bangalore - 560 073

Phone: 91.80.2839 4321

E-mail: bangalore.information@kennametal.com



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