

MASTER CATALOGUE 2018

VOLUME ONE | **TURNING TOOLS**



ISO TURNING | GROOVING & CUT-OFF | THREADING | APPLICATION SPECIFIC

Beyond™ Evolution™ — Grooving, Cut-off, and Multi-directional Turning Made EASY

Choosing the right tooling can be complicated and time-consuming. Built on simplicity, we have engineered a new tool that makes every machine operator's life EASY.

Beyond™ Evolution™

See pages C2–C85.

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 900+ pages bring you the latest in turning products and superior services — 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 kennametal.com.

POWERED BY



Volume I • Turning Tools

This Catalogue Consists of Two Volumes — Vol. I: Turning Tools / Vol. II: Rotating Tools

Turning Tools

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Turning

PRODUCT HIGHLIGHTS

▶ **BEYOND™ EVOLUTION™**

See section C for more details.

Kennametal proudly introduces the Beyond™ Evolution™ platform. This innovative platform is built on simplicity and challenges today's approach to grooving and cut-off. Selecting the right tool is easy with the Beyond™ Evolution™ platform because this high-performance system is versatile and flexible. It is the first portfolio in the market to compete in all grooving and cut-off applications, with up to 35% less tooling than current competitors.

The proprietary coolant delivery system directs coolant precisely to the cutting edges underneath the chip, which is the best method for heat removal in grooving and cut-off applications.



beyond **EVOLUTION™**

▶ **BEYOND™ DRIVE™**

See section B for more details.



beyond **DRIVE™**

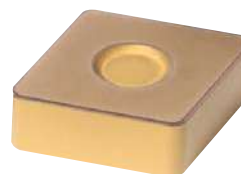
Beyond™ Drive™ ISO turning inserts provide up to 50% improved insert edge utilisation. The advanced surface treatment reduces coating stress and improves coating adhesion. The bronze outer layer simplifies wear detection and increases insert utilisation. PVD grades KCU10™ and KCU25™ with Beyond™ technology resist the high temperatures of machining in tough alloys. Achieve up to 30–40% longer tool life for more profitability in general engineering, transportation, aerospace, energy, and earthworks markets. The PVD coating helps to maintain consistent chip control and minimise insert edge wear in turning, grooving, and cut-off operations in a wide range of materials and applications.



➤ CAST IRON TURNING WITH KBK45™

See section B for more details.

KBK45 is a new high-content PcBN grade designed for high-performance machining of grey cast iron, such as brake discs and fly wheels. It is designed for reducing waste of unused corners, reducing cost-per-part (CPP) by maintaining tool changes between shifts, and enhancing output by using more reliable products. KBK45 grade provides an excellent CPP value.



➤ HARD TURNING WITH KBH20™

See section B for more details.

KBH20 is the ideal PcBN hard turning grade in continuous to lightly interrupted applications with up to medium-severity interruption. The structure and different edge preparations enable tight and repeatable workpiece tolerances, excellent surface finishes, and surface integrity — even at elevated speeds.

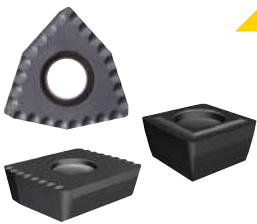
KBH20 grade is a new substrate for applications like case-hardened components, including gears, shafts, and other drive-train components.

The nano-composite coating enhances speed capabilities and tool life. The improved edge preparation promotes longer tool life, reliable performance, and better surface finish.



Holemaking

PRODUCT HIGHLIGHTS



DRILL FIX™ DFSP™ INDEXABLE DRILLS WITH DS AND LP INSERTS

See section J (Volume II) for more details.

DFSP is the renamed expanded Drill Fix DFS™ indexable drilling platform. The standard diameter range is now 14–55mm in L/D ratios 2 x D, 3 x D, 4 x D, and 5 x D. The DFSP platform combines the economical squared outboard insert with the superior centring capabilities of the trigon inboard insert. These indexable drills offer increased metal removal rates and high surface quality and hole straightness.

Use new DS and LP chipbreaker insert designs with Drill Fix DFSP, DFT™, and HTS indexable drills, and KSEM PLUS™ modular drills. These inserts enable excellent chip formation on low-carbon steels and other long-chipping materials.



KENTIP™ FS THE PERFECT FUSION OF A SOLID CARBIDE AND AN INDEXABLE DRILL

See section H (Volume II) for more details.

The new modular drill KenTIP FS covers more applications and provides better performance than any other modular system, delivering substantial cost savings and process simplifications on your shop floor.

- 3-point geometries, 3 high-performance grades, 3 different shank styles.
- 6–26mm diameter range.
- Up to 12 x D drilling depths.
- Applicable in steel, stainless steel, and cast iron.



COUNTERFIX MICRO SMALL INSERTS THAT MAKE A BIG DIFFERENCE!

See section H (Volume II) for more details.

New CounterFix Micro (CFM) tangential inserts offer a new way to enhance drilling, chamfering, and counterboring operations. They enable very small incremental steps on tailor-made step drills, longer tool life per edge, and improved surface finish.

CFM inserts can be used on KentIP, KSEM™, and Drill Fix products, as well as for made-to-order indexable countersinking tools.

CounterFix Micro will be available for KentIP FS tailor-made drills in 2018 upon request.



NEW SGL DRILLS WITH THROUGH COOLANT FOR STAINLESS STEEL

See section G (Volume II) for more details.

The all-new B21_SGL series solid carbide drills are designed specifically for stainless steel applications, offering high performance and long tool life in high-temperature alloys and regular steel, also.

By combining unique Kennametal features, such as the all-new SGL-point-geometry with patented gashing, a unique flute design, and a best-in-class coating into one tool, the B21_SGL drill is the ultimate high-volume production tool.

The all-new B27_SGL series is designed specifically for deep-hole drilling up to 40 x D applications in stainless steel and high-temperature alloys.





NEW KMH DRILLS FOR HARD MATERIALS

See section G (Volume II) for more details.

The all-new KMH solid carbide drills are engineered for hard material applications up to 65 HRC. The B94_drill series without through coolant is specifically designed to machine hardened and surface-hardened materials using flood coolant. With its 145° point angle, it is also perfectly suited as a pilot drill for the B95_drill series with through coolant and 140° point for deeper applications.

Both series come with an increased core to strengthen the drill, feature a curved cutting edge with corner chamfer to avoid chipping on the margin lands and increased tool life in these challenging materials.



RMR™ AND RHR™ DISC-STYLE REAMERS

See section K (Volume II) for more details.

Performance, quality, and regrindability, like solid carbide reamers for diameters 14–42,5mm.

Common reamers have single tips brazed onto a steel body. The new Kennametal RMR and RHR reamers have a solid carbide disc brazed onto the steel body. This enables more regrinds than a regular tipped reamer, reducing the cost-per-hole significantly. The new KCU05 coating holds the surface finish more than twice as long as conventional reamer coatings, depending on the workpiece material.



GOTAP™ MULTIPURPOSE HSS-E TAPS

See section M (Volume II) for more details.

GOTap is our multipurpose line of taps that include optimised geometries and PVD coatings capable of tapping a wide range of ductile materials, such as stainless steels, carbon and alloy steels, cast aluminium, and ductile iron. GOTap taps versatility extends beyond the part, as it can be used in a wide range of machine tools and application conditions. The new GOTap TC multipurpose taps enable blind-hole tapping with tension/compression holders without sizing problems due to over-feeding. The versatility of GOTap taps mean lower inventory costs with no loss of productivity, consistent tool life, and high-quality thread finish.

Solid End Milling

PRODUCT HIGHLIGHTS



DUO-LOCK®

See section O (Volume II) for more details.

Duo-Lock™ is a revolutionary new coupling for solid carbide end milling applications. This replaceable-head design combines high accuracy in runout and length repeatability with maximum stability, making it a precise and virtually unbreakable interface for challenging milling applications.

- Up to 1 x D full slotting increases metal removal rates for significantly higher productivity.
- 1,5 x D standard cutting edge length enables fewer passes.
- Cutting data and tool life comparable to high-performance solid carbide tools.



DUO-LOCK®
by HAIMER® and Kennametal



HARVI™ III FAMILY

See section P (Volume II) for more details.

HARVI III end mills are the first choice for high-temperature alloy machining, profiling, semi-finishing, and finishing. Beyond grade KCSM15™ delivers maximum metal removal rates and exceptional tool life in titanium and stainless steel, as well as excellent surface finishes.

- Taper ball nose for complex 5-axis machining.
- Ball nose for 3D profiling.
- Square end for semi-finishing/finishing operations.

beyond



BEYOND™ EADE SOLID CERAMIC END MILLS

See section P (Volume II) for more details.

Beyond™ EADE solid ceramic end mills offer higher productivity in roughing nickel-based high-temperature alloys. With reduced machining time, EADE ceramic end mills also achieve significantly longer tool life compared to carbide tooling.

— Beyond grade KYS40™ enables cutting speeds up to 1000 m/min.



beyond

GOMILL™ GP PLATFORM

See section Q (Volume II) for more details.

GOMill GP tools enable plunging, slotting, and profiling, plus longer tool life, on a wide range of workpiece materials. They are designed to provide higher metal removal rates (MRR) and good surface finishes at an excellent cost-benefit ratio.

- Roughing and finishing with one tool.
- Excellent cost-benefit ratio.
- Multilayer KC633M™ grades for longer tool life.



Indexable Milling

PRODUCT HIGHLIGHTS

➤ **MILL 4-11™ AND MILL 4-15™**

See section T (Volume II) for more details.

The Mill 4-11™ and Mill 4-15™ series tools are specially engineered to achieve excellent surface quality and higher metal removal rates in shoulder milling applications. The unique design enables multiple passes (stepping down) with outstanding results.

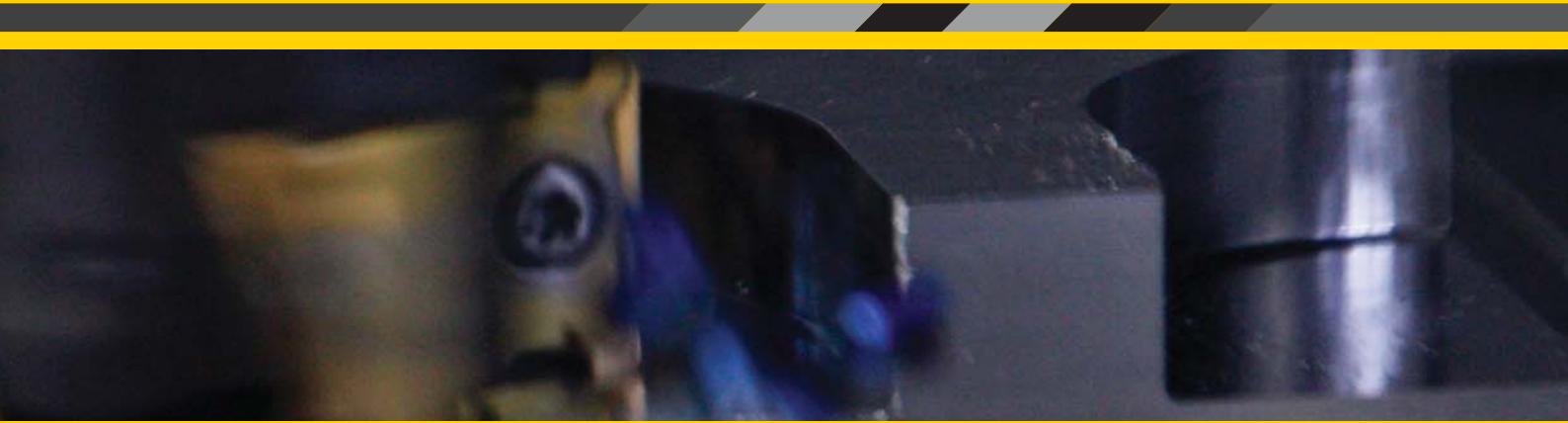
Use Mill 4-11 in roughing to finishing applications in steel, cast iron, stainless steel, non-ferrous materials, and high-temp alloys. Use Mill 4-15 for roughing to finishing in steel, cast iron, stainless steel, and titanium.



➤ **MILL 16™**

See section S (Volume II) for more details.

The new Mill 16™ series is a tailor-made platform for rough milling of components like engine heads and blocks, housings and gear boxes in cast iron materials (CGI, DCI, GCI), and all other cast iron face milling jobs.



KCSM40™

NEW MILLING GRADE FOR TITANIUM MACHINING

Breakthrough indexable milling grade for roughing and semi-finishing operations in titanium and stainless steels — S40, M30 application range.

Available in these indexable milling platforms: Mill 1-10™, Mill 1-14™, Mill 1-18™, Mill 4-11™, Mill 4-15™, Dodeka™ Mini, Dodeka™ MAX™, MEGA™, KSOM™ Mini, KSOM™, KSRM™, NGE™, KSSM™ 90, KSSM8+™, Rodeka™, Stellram® 5230, Stellram 7713, and Stellram 7792.



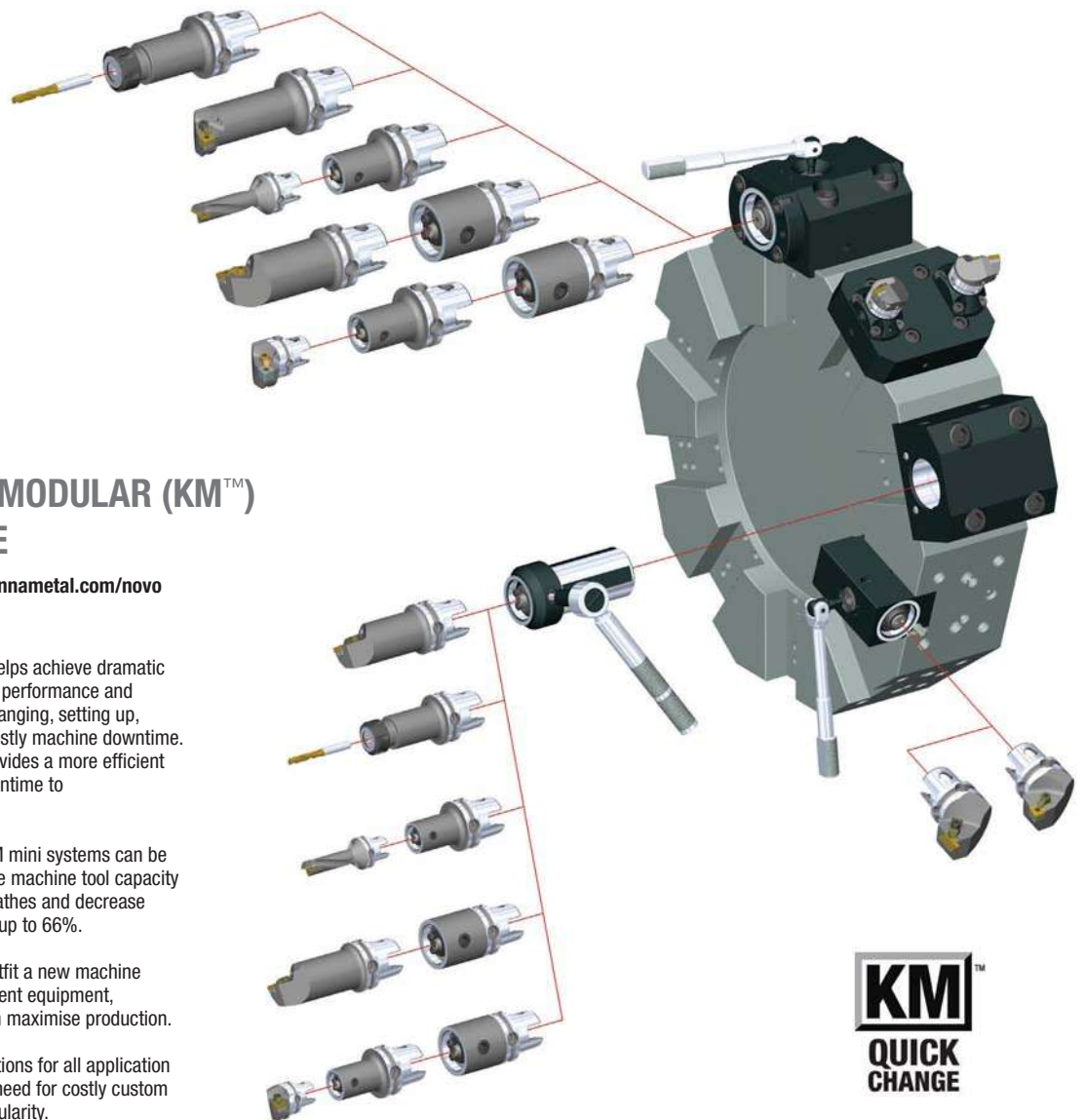
STELLRAM® 7792VX HIGH-FEED SERIES

See section V (Volume II) for more details.

The 7792VX cutter series is designed for high-feed milling applications with superior surface generation. The 7792VX cutters are designed for a wide range of applications, including facing, pocketing, ramping, helical interpolation, and plunging. They are capable of machining all materials, including steel, stainless steel, cast iron, and high-temperature and aluminium alloys.

Tooling Systems

PRODUCT HIGHLIGHTS



➤ KENNAMETAL MODULAR (KM™) QUICK CHANGE

Visit kennametal.com or kennametal.com/novo for more details.

KM™ quick-change tooling helps achieve dramatic improvements in cutting tool performance and machine output. Frequent changing, setting up, and gaging of tools create costly machine downtime. KM quick-change tooling provides a more efficient process that can reduce downtime to increase productivity.

In addition, KM micro and KM mini systems can be used to considerably increase machine tool capacity on automatic and universal lathes and decrease indexing and setup times by up to 66%.

Whether you're looking to outfit a new machine or improve the output of current equipment, KM quick-change tooling can maximise production.

The KM portfolio includes options for all application requirements and limits the need for costly custom solutions due to system modularity.





➤ KM4X™

Visit kennametal.com or kennametal.com/novo for more details.

The KM4X spindle interface is designed for heavy-duty machining applications. It's especially suited for machining large structural components. These rotating and static tool adaptors handle 3x more bending capacity than similar competitive models.

- Rigid configuration through higher clamping force.
- Design enables front-loaded spindle configurations.
- High spindle speed capability.
- Designed for use in most applications.
- Use in a wide range of high and low speeds and torques.
- Can upgrade to the KM4X system on spindles which use HSK format.
- Maintain taper contact in higher speeds.



➤ DRIVEN TOOLING AND STATIC TOOL BLOCKS

Visit kennametal.com or kennametal.com/novo for more details.

Turn your CNC lathe into a multi-task solution provider with turret-adapted driven clamping units for rotating applications and static tool blocks for maximum quick change flexibility. Whether it's for milling, drilling, tapping, boring, or non-rotating applications, you can maximise machine utilisation by employing Kennametal tooling and solutions. Available in multiple KM™ format sizes to allow for versatility and productivity.

- 0 and 90° options available as standard.
- Up to 12,000 RPM speeds for high metal removal rates.
- 1:1 and 1:2 gear ratios available for added speed or torque.
- Standard configurations for multiple manufactures and customisable to fit most turrets.
- Quick change solutions for static and rotating applications to maximise machine effectiveness.

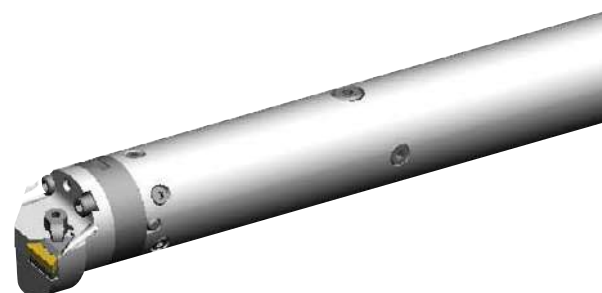
➤ TUNABLE BORING

Visit kennametal.com or kennametal.com/novo for more details.

Kennametal tunable boring bars can increase productivity and solve chatter and other issues in long-boring operations.

Several key improvements to our current tunable boring bar portfolio include:

- Enhanced tuning process at the manufacturing plant ensures accurate tuning at the maximum overhang.
- Nitriding of steel tunable boring bars eliminates the effects of chip wash.
- Elimination of flats on tunable boring bars enhances stability and proper toolholding.
- Addition of a small flat on the connection collar enables the use of a centre-height tool.
- Enhanced assembly process.



Kennametal on the Web

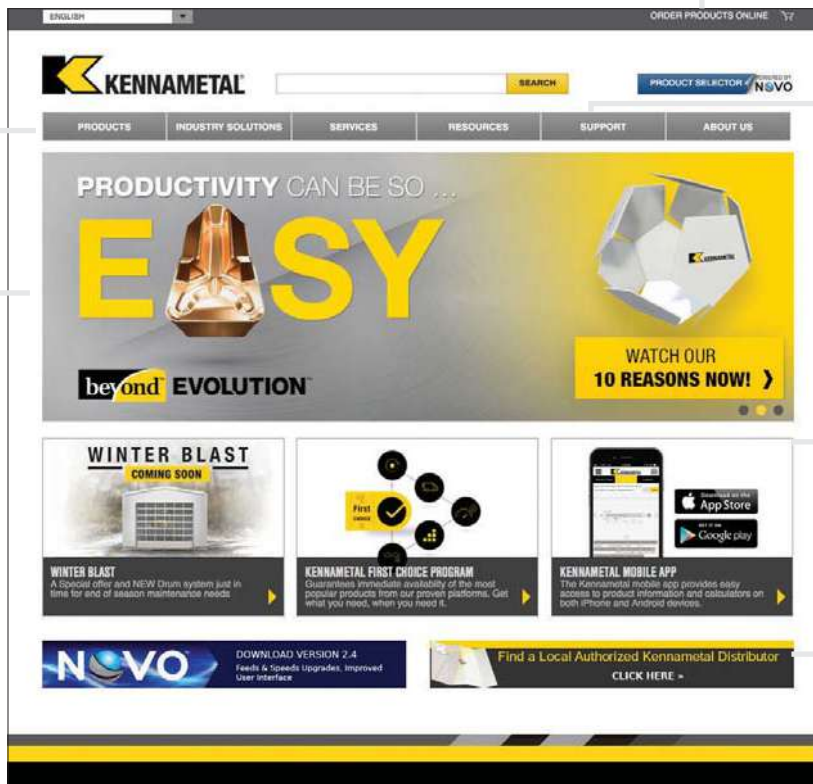
kennametal.com

FIND THE LATEST PRODUCT INFORMATION

Whether your operation is turning, milling, or holemaking, Kennametal brands are the high-performance tooling you need. We offer standard and custom solutions for a wide range of applications.

Find information about our most current campaigns and catalogues.

Register on Konnect for the full functionality of the Kennametal online ordering website.



CONTACT US

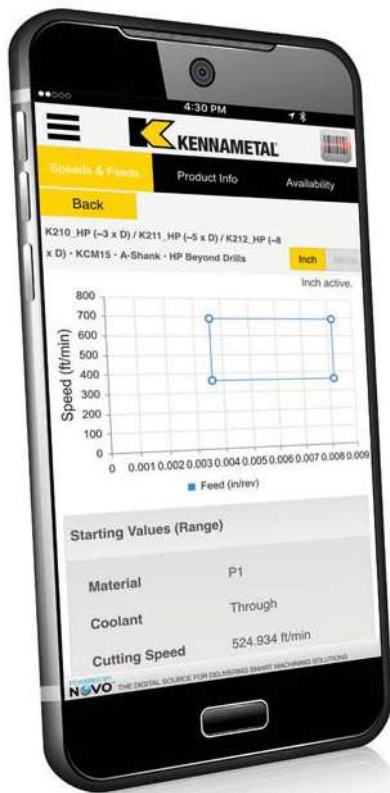
Our customers are important to us. We want to provide you the best customer service in the industry. If you have a comment or question, please send it to us. We strive to respond to all inquiries within 24 hours.

FIND A LOCAL AUTHORISED DISTRIBUTOR IN YOUR AREA

Kennametal offers world-class products and services globally. Our distributors know us, and more importantly, they know you. They know better than anyone in the industry how to put the global power of Kennametal to work for you — in your industry, in your region, and for your business.

Mobile App

The Kennametal mobile app makes it easy to access product information, calculators, and much more from iPhone® and Android™ devices.



FEATURES

Scan a Kennametal tool package barcode or search a product catalogue number to access complete product information.

Product information includes tool image, dimensions, grades, and product highlights.

View product availability at global locations.

Get speed and feed information in inch and metric values for all metalcutting products.

View tech tips for helpful solutions to common machining questions.

Contact Customer Support directly from the app.

MACHING CALCULATORS

View data for milling and drilling applications.

Inch and metric values calculated.

ORDERING

Login using your Konnect credentials to complete a purchase.

WHERE TO FIND IT

Download the free app today from iTunes® or the Google Play™ store.



Service and Support

Customer Application Support (CAS)

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 optimisation.
	Hardware support.
	Tooling selection.
	Troubleshooting.
BEST-IN-CLASS SUPPORT TOOLS AND TECHNOLOGY	Materials database.
	Application calculators.
	Tooling performance experts.



Originating Country	Language	Phone	E-mail
Australia	English	1800 666 667	ap-kmt.techsupport@kennametal.com
Austria	German	0800 202873	eu.techsupport@kennametal.com
Belgium	English/French	0800 80850	eu.techsupport@kennametal.com
China	Chinese	400 889 2238	k-cn.techsupport@kennametal.com
Denmark	English	808 89298	na.techsupport@kennametal.com
Finland	English	0800 919412	na.techsupport@kennametal.com
France	French	080 5540 367	eu.techsupport@kennametal.com
Germany	German	0800 0006651	eu.techsupport@kennametal.com
India	English	1 800 103 5227	in.techsupport@kennametal.com
Israel	English	1809 449889	na.techsupport@kennametal.com
Italy	Italian	800 916661	eu.techsupport@kennametal.com
Japan	English	03 3820 2855	ap-kmt.techsupport@kennametal.com
Korea (South)	English	+82 2 2100 6100	ap-kmt.techsupport@kennametal.com
Malaysia	English	1800 812 990	ap-kmt.techsupport@kennametal.com
Mexico	Spanish	1800 253 0758	na.techsupport@kennametal.com
Netherlands	English	0800 0201 130	eu.techsupport@kennametal.com
New Zealand	English	0800 450 941	ap-kmt.techsupport@kennametal.com
Norway	English	800 10080	na.techsupport@kennametal.com
Poland	Polish	0080 04411887	eu.techsupport@kennametal.com
Russia (landline)	Russian	8800 5556394	eu.techsupport@kennametal.com
Russia (cell phone)	Russian	+7 8005556394	eu.techsupport@kennametal.com
Singapore	English	1800 6221031	ap-kmt.techsupport@kennametal.com
South Africa	English	0800 981643	na.techsupport@kennametal.com
Sweden	English	020799246	na.techsupport@kennametal.com
Taiwan	English	0800 666 197	ap-kmt.techsupport@kennametal.com
Thailand	English	1800 4417820	ap-kmt.techsupport@kennametal.com
UK	English	0800 032 8339	na.techsupport@kennametal.com
Ukraine	Russian	0800502664	eu.techsupport@kennametal.com
USA	English	800 835 3668	na.techsupport@kennametal.com

NOVO KNOWS SEARCH

Searching for a tool has been enhanced by Advise and Select functions from NOVO™ applications — saving you time and money.

ADVISE

Uses a rules-based approach to provide cutting tool recommendations:

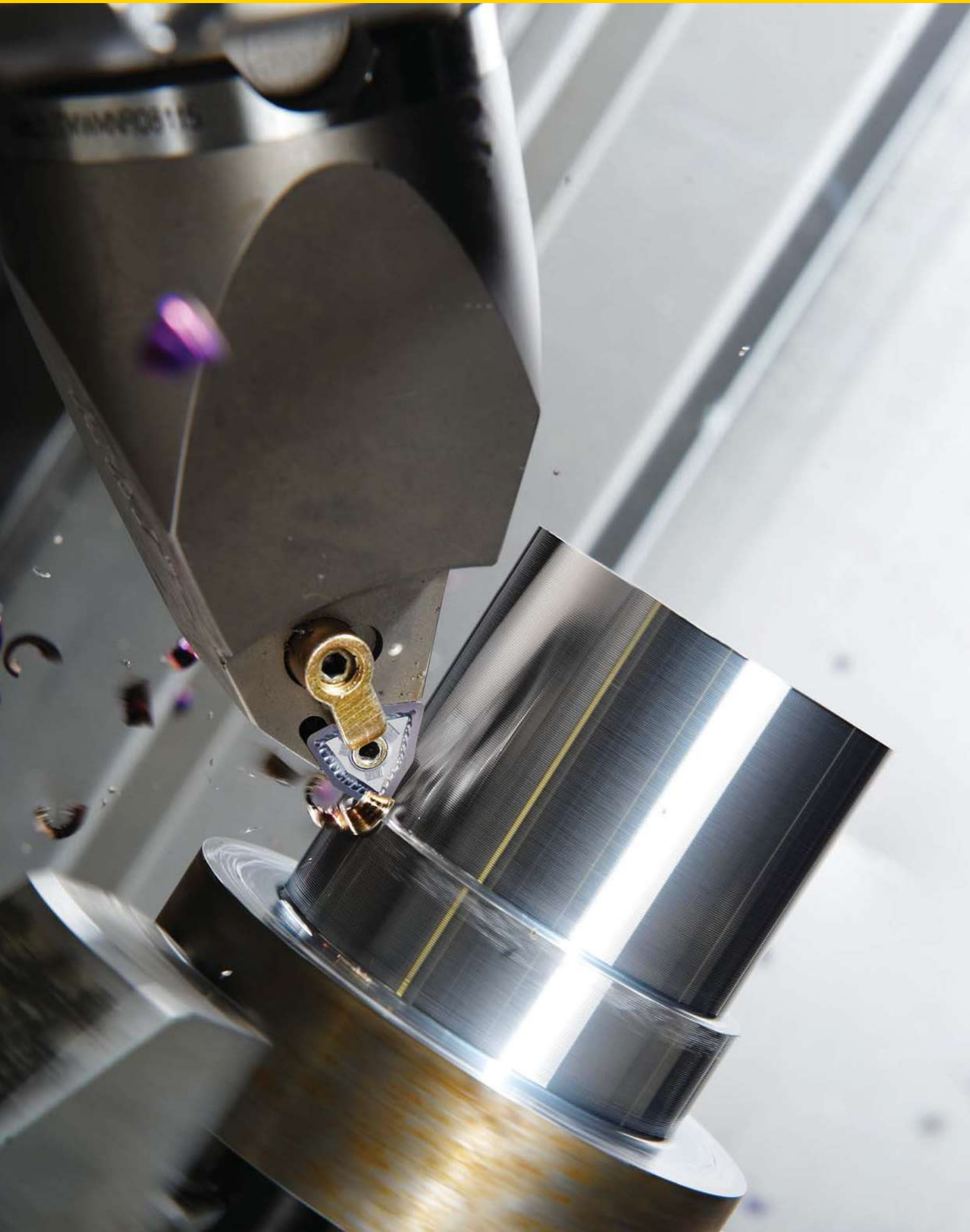
- Define Machining Feature (face milling, slotting, blind hole, etc.)
- Apply Constraint Requirements (geometric, material, tolerance, etc.)
- Set Machining Sequence (single or multi-step operations, rough then finish, etc.)
- Receive Ranked Results

SELECT

A method of selecting cutting tools from a tree structure via a hierarchy or parametric search:

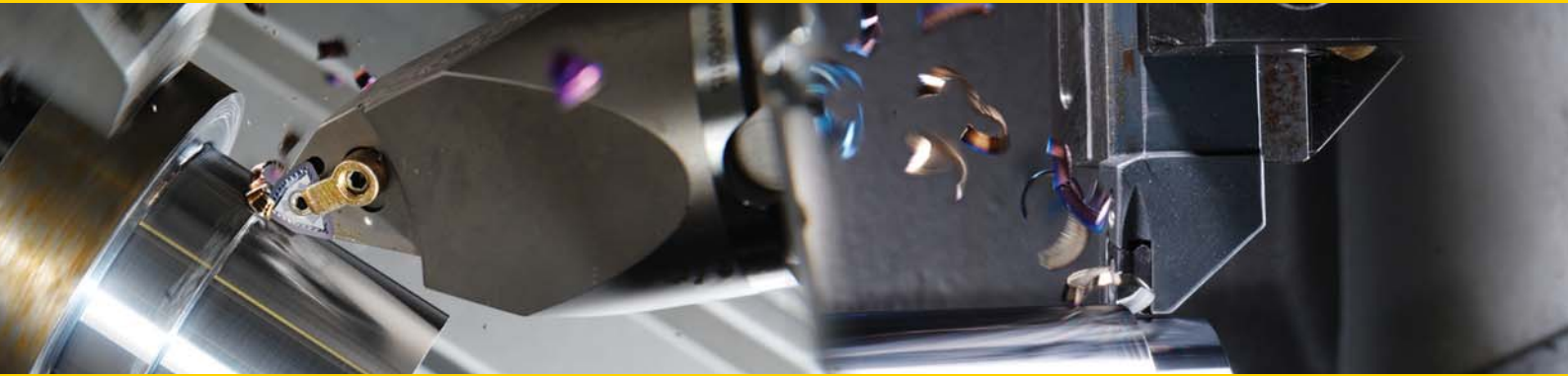
- If you know which product you are looking for, a quick search can be performed by just the catalogue number or product description.
- Smart filters significantly reduce the amount of potential tooling solutions.
- After the tool is selected, NOVO also provides cutting and adaptive item options that fit with your solution.

NOVO applications can ensure you have the right tools on your machines, in the right sequence. Resulting in flawless execution that accelerates every job, and maximises every shift. kennametal.com/novo



Turning

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Threading	D1–D110
Application Specific.....	E1–E65



Turning Products

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

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

➤ ISO TURNING

See Section B for more details.

- Negative-style inserts.
- Toolholders, boring bars, cartridges, and bolt-on heads for negative-style inserts.
- Positive-style inserts.
- Toolholders, boring bars, cartridges, and bolt-on heads for positive-style inserts.
- Advanced material inserts for machining:
 - Cast iron
 - Hardened steels
 - High-temperature alloys
- PCD inserts.
- Toolholders, boring bars, cartridges, and bolt-on heads for use with advanced material inserts.
- Tunable bars.

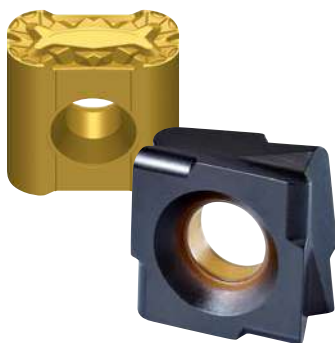




➤ THREADING, GROOVING, AND CUT-OFF

See Sections C and D for more details.

- Beyond™ Evolution™ Grooving, Cut-Off, and Side Turning
- A4™ Grooving and Side Turning
- Top Notch™ Grooving
- Top Notch™ Threading
- Laydown Threading



➤ APPLICATION SPECIFIC

See Section E for more details.

- Fix-Perfect™ Turning
- Top Notch™ Profiling
- Tools for Railroad and Wheel Machining
- K-Lock™





ISO Turning

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Chip Control Geometries, Feed Rates, Depth of Cut, and Application Areas	B30–B35
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Kendex Positive Style Inserts, Toolholders, Boring Bars, Cartridges, and Bolt-On Heads	B166–B174
Screw-On Positive Style Inserts, Toolholders, Boring Bars, Cartridges, and Bolt-On Heads	B175–B273
Advanced Material Inserts, Toolholders, Boring Bars, Cartridges, and Bolt-On Heads	B274–B378
Advanced Materials for Cast Iron Machining.....	B278–B300
Advanced Materials for Hard Turning.....	B302–B324
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Tunable Bars	B380–B387

Mobile Apps

The Kennametal mobile app provides easy access to product information and calculators on both iPhone® and Android™ devices. We've highlighted a few of the key features...

There's an app for that.

SPEEDS & FEEDS

View speeds and feeds information for metalworking products.

PRODUCT AVAILABILITY

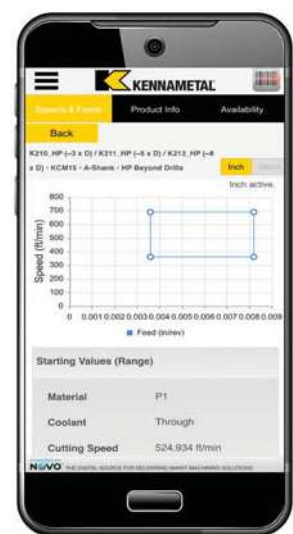
Check global availability of products. View available quantities by providing your Kennect login credentials.

CALCULATORS

Utilise our machining calculators for milling and drilling applications.

➔ **By just scanning the bar code on the insert packet, you can find the most productive cutting conditions for tool life, process time, and chip control.**

NOTE: The app is currently only available in the English-language version. We have plans to translate the app in different languages with future releases.



➤ ISO Turning Inserts, Toolholders, and Boring Bars

Modern CNC machines and flexible production facilities require tools with application versatility. Kennametal high-performance inserts, toolholders, and boring bars are designed to handle any turning application. Whether you're cutting steel or titanium, or doing light finishing or heavy roughing, we have the tooling solution to meet your needs.

Features and Benefits

Beyond™ Drive™ Inserts

- Designed for increased productivity.
- Post-coat treatment reduces stress, improves coating adhesion.
- Excellent toughness and wear resistance.
- Better insert wear detection.

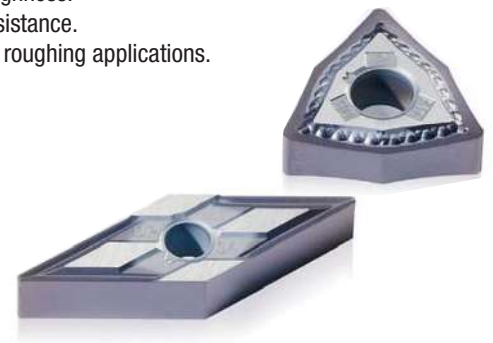
Beyond™ PVD Grades

KCU10™ Grade

- Superior wear resistance and faster cutting speeds at higher temperatures.
- Ideal for stainless steels and high-temp alloys.
- Improved depth-of-cut notch resistance.
- Use in finishing to medium applications.

KCU25™ Grade

- Superior edge toughness.
- Excellent wear resistance.
- Use in medium to roughing applications.



Kennametal Turning Solutions by Material

P	Steel	Carbide or Cermet Inserts
M	Stainless Steel	Carbide Inserts
K	Cast Iron	Carbide, Ceramic, or PcBN Inserts
N	Non-Ferrous	Carbide or PCD Inserts
S	High-Temp Alloys	Carbide, Ceramic, PcBN, or PCD Inserts
H	Hardened Materials	Ceramic or PcBN Inserts

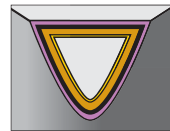
Beyond™ Drive™ Inserts • Technology Details

Post-Coat Grinding — Top and Bottom

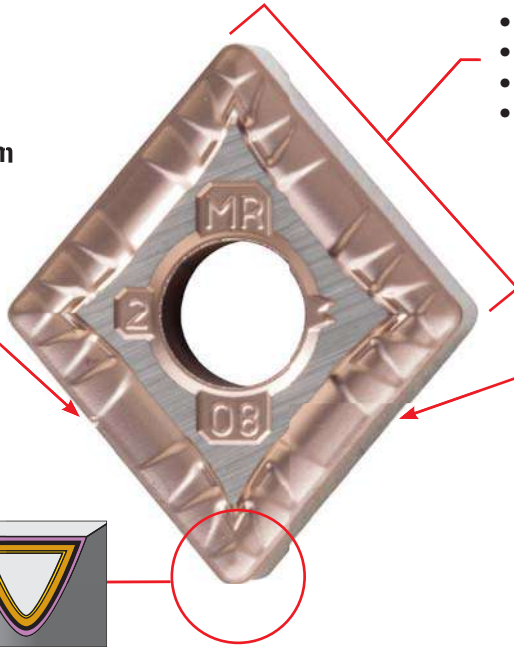
- Provides secure seating surface.

Fine-Grained Alumina Layer

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



TiN/MT-TiCN/TiCN/Al₂O₃/TiCN



Post-Coat Treatment

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

Micro-Polished Edges

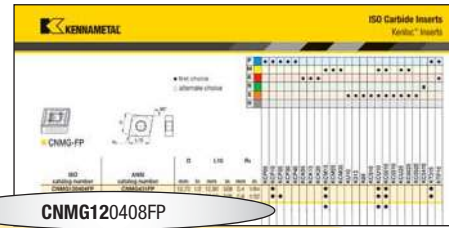
- Improves edge toughness.
- Provides smooth outer surface to reduce forces, friction, and workpiece sticking.

Toolholders, Boring Bars, and Cartridges



How Do Catalogue Numbers Work?

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

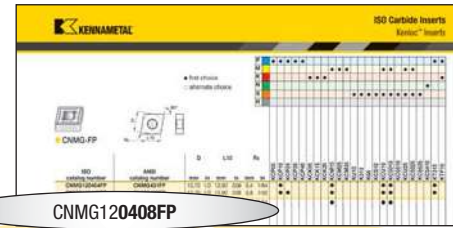


CNMG120408FP

C		N		M		G		12																																																																																																																																																																																																	
Insert Shape		Insert Clearance Angle		Tolerance Class		Insert Features		Size																																																																																																																																																																																																	
H	Hexagon 120°	A	3°	<p>Tolerances apply prior to edge prep and coating</p> <p>D = Theoretical diameter of the insert inscribed circle S = Thickness B = See figures below</p>	N		<p>Code for inch cutting edge length "L10"</p> <table border="1"> <thead> <tr> <th>"D"</th> <th>C</th> <th>D</th> <th>R</th> <th>S</th> <th>T</th> <th>V</th> <th>W</th> </tr> </thead> <tbody> <tr> <td>3,97</td> <td>S4</td> <td>04</td> <td>03</td> <td>03</td> <td>06</td> <td>—</td> <td>—</td> </tr> <tr> <td>4,76</td> <td>04</td> <td>05</td> <td>04</td> <td>04</td> <td>08</td> <td>08</td> <td>S3</td> </tr> <tr> <td>5,56</td> <td>05</td> <td>06</td> <td>05</td> <td>05</td> <td>09</td> <td>09</td> <td>03</td> </tr> <tr> <td>6,00</td> <td>—</td> <td>—</td> <td>06</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> </tr> <tr> <td>6,35</td> <td>06</td> <td>07</td> <td>06</td> <td>06</td> <td>11</td> <td>11</td> <td>04</td> </tr> <tr> <td>7,94</td> <td>08</td> <td>09</td> <td>07</td> <td>07</td> <td>13</td> <td>13</td> <td>05</td> </tr> <tr> <td>8,00</td> <td>—</td> <td>—</td> <td>08</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> </tr> <tr> <td>9,52</td> <td>09</td> <td>11</td> <td>09</td> <td>09</td> <td>16</td> <td>16</td> <td>06</td> </tr> <tr> <td>10,00</td> <td>—</td> <td>—</td> <td>10</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> </tr> <tr> <td>11,11</td> <td>11</td> <td>13</td> <td>11</td> <td>11</td> <td>19</td> <td>19</td> <td>07</td> </tr> <tr> <td>12,00</td> <td>—</td> <td>—</td> <td>12</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> </tr> <tr> <td>12,70</td> <td>12</td> <td>15</td> <td>12</td> <td>12</td> <td>22</td> <td>22</td> <td>08</td> </tr> <tr> <td>14,29</td> <td>14</td> <td>17</td> <td>14</td> <td>14</td> <td>24</td> <td>24</td> <td>09</td> </tr> <tr> <td>15,88</td> <td>16</td> <td>19</td> <td>15</td> <td>15</td> <td>27</td> <td>27</td> <td>10</td> </tr> <tr> <td>16,00</td> <td>—</td> <td>—</td> <td>16</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> </tr> <tr> <td>17,46</td> <td>17</td> <td>21</td> <td>17</td> <td>17</td> <td>30</td> <td>30</td> <td>11</td> </tr> <tr> <td>19,05</td> <td>19</td> <td>23</td> <td>19</td> <td>19</td> <td>33</td> <td>33</td> <td>13</td> </tr> <tr> <td>20,00</td> <td>—</td> <td>—</td> <td>20</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> </tr> <tr> <td>22,22</td> <td>22</td> <td>27</td> <td>22</td> <td>22</td> <td>38</td> <td>38</td> <td>15</td> </tr> <tr> <td>25,00</td> <td>—</td> <td>—</td> <td>25</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> </tr> <tr> <td>25,40</td> <td>25</td> <td>31</td> <td>25</td> <td>25</td> <td>44</td> <td>44</td> <td>17</td> </tr> <tr> <td>31,75</td> <td>32</td> <td>38</td> <td>31</td> <td>31</td> <td>54</td> <td>54</td> <td>21</td> </tr> <tr> <td>32,00</td> <td>—</td> <td>—</td> <td>32</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> </tr> </tbody> </table>	"D"	C	D	R	S	T	V	W	3,97	S4	04	03	03	06	—	—	4,76	04	05	04	04	08	08	S3	5,56	05	06	05	05	09	09	03	6,00	—	—	06	—	—	—	—	6,35	06	07	06	06	11	11	04	7,94	08	09	07	07	13	13	05	8,00	—	—	08	—	—	—	—	9,52	09	11	09	09	16	16	06	10,00	—	—	10	—	—	—	—	11,11	11	13	11	11	19	19	07	12,00	—	—	12	—	—	—	—	12,70	12	15	12	12	22	22	08	14,29	14	17	14	14	24	24	09	15,88	16	19	15	15	27	27	10	16,00	—	—	16	—	—	—	—	17,46	17	21	17	17	30	30	11	19,05	19	23	19	19	33	33	13	20,00	—	—	20	—	—	—	—	22,22	22	27	22	22	38	38	15	25,00	—	—	25	—	—	—	—	25,40	25	31	25	25	44	44	17	31,75	32	38	31	31	54	54	21	32,00	—	—	32	—	—	—	—	R	
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P	Pentagon 108°	C	7°	A																																																																																																																																																																																																					
R	Round —	D	15°	M																																																																																																																																																																																																					
S	Square 90°	E	20°	G																																																																																																																																																																																																					
T	Triangular 60°	F	25°	W																																																																																																																																																																																																					
C	Rhomboid 80° 55° 75° 86° 35°	G	30°	T																																																																																																																																																																																																					
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tolerance class	tolerance on "D"	tolerance on "B"	tolerance on "S"
C	±0,025	±0,013	±0,025
H	±0,013	±0,013	±0,025
E	±0,025	±0,025	±0,025
G	±0,025	±0,025	±0,013
M	See tables on next page		±0,013
U	See tables on next page		±0,013

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



CNMG120408FP

04		08						FP	
Thickness S		Corner Radius "Rε"		Hand of Insert (optional)		Cutting Edge (optional)		Chipbreaker (optional)	
symbol	thickness	symbol	corner radius	R = Right hand	F		Sharp	F	= Sharp
mm	mm	mm	mm	L = Left hand	E		Rounded	FF	= Fine Finishing
—	0,79	X0	0,04	N = Neutral	T		Chamfered	FN	= Finishing Negative
T0	1,00	01	0,1		S		Chamfered and Rounded	MN	= Medium Negative
01	1,59	02	0,2		K		Double-Chamfered	MR	= Medium Roughing
01	1,59	04	0,4		P		Double-Chamfered and Rounded	RN	= Roughing Negative
02	2,38	08	0,8					UN	= Universal Medium
03	3,18	12	1,2					FP	= Finishing Positive
04	4,76	16	1,6					MP	= Medium Positive
05	5,56	20	2,0					RP	= Roughing Positive
06	6,35	24	2,4					RM	= Roughing Medium
07	7,94	28	2,8					RH	= Roughing Heavy
9	9,52	32	3,2					FW	= Finishing Wiper
11	11,11	MO	round insert					MW	= Medium Wiper
12	12,70	—						FS	= Finishing Sharp

"D"	± Tolerance on "D"				"D"	± Tolerance on "B"			
	Class M Tolerance			Class U Tolerance		Class M Tolerance			Class U Tolerance
	Shapes S, T, C, R, & W	Shape D	Shape V	Shapes S, T, & C		Shapes S, T, C, R, & W	Shape D	Shape V	Shapes S, T, & C
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
3,97	0,05	—	—	—	3,97	0,08	—	—	—
4,76	0,05	—	—	0,08	4,76	0,08	—	—	0,13
5,56	0,05	0,05	0,05	0,08	5,56	0,08	0,11	—	0,13
6,35	0,05	0,05	0,05	0,08	6,35	0,08	0,11	—	0,13
7,94	0,05	0,05	0,05	0,08	7,94	0,08	0,11	—	0,13
9,52	0,05	0,05	0,05	0,08	9,52	0,08	0,11	0,18	0,13
11,11	0,08	0,08	0,08	0,13	11,11	0,13	0,15	—	—
12,70	0,08	0,08	0,08	0,13	12,70	0,13	0,15	0,25	0,20
14,29	0,08	0,08	0,08	0,13	14,29	0,13	0,15	—	—
15,88	0,10	0,10	0,10	0,18	15,88	0,15	0,18	—	0,27
17,46	0,10	0,10	0,10	0,18	17,46	0,15	0,18	—	0,27
19,05	0,10	0,10	0,10	0,18	19,05	0,15	0,18	—	0,27
22,22	0,13	—	—	0,25	22,22	0,15	—	—	0,38
25,40	0,13	—	—	0,25	25,40	0,18	—	—	0,38
31,75	0,15	—	—	0,25	31,75	0,20	—	—	0,38

- 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

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™ • Beyond™ Drive™



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

NOTE: Application range does not apply to PcBN grades.

Positive Inserts



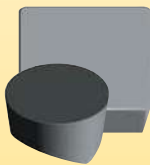
Screw-On Inserts

- 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 moulded and ground peripheries. Suitable for all workpiece materials.

See pages:

Carbide: B175–B273

Advanced Materials: B284–B351



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: B166–B168

Advanced Materials: B284–B351



Top Notch™ Profiling Inserts

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

See pages E20–E43 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 moulded and ground peripheries.

See page E62–E65 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 moulded and ground peripheries. Suitable for all workpiece materials.

See pages:

Carbide: B46–B165

Advanced Materials: B284–B351



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 moulded and ground peripheries.
- Wide selection of standard toolholders are offered.

See pages B284–B351 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 moulded and ground peripheries.

See pages B284–B351 for product listing.



Fix-Perfect™ Inserts

- Tangential design and rigid clamping system.

See pages E2–E18 for product listing.



Railroad Inserts

- Designed for the machining of railway wheels and axles.

See pages E44–E61 for product listing.

Insert Selection System

How to Use


The Kennametal 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, optimising selection accuracy.

Example: Six workpiece material groups


■ Step 1 • Select the insert geometry

Given: depths of cut = 1mm
feed = 0,4mm
Unknown: insert geometry
Solution: -MN

■ Step 2 • Select the grade

Given: cutting conditions: 
lightly interrupted cut
Geometry: -MN
Unknown: grade
Solution: KCP25B

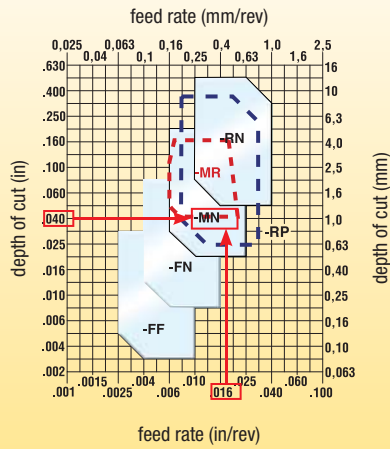
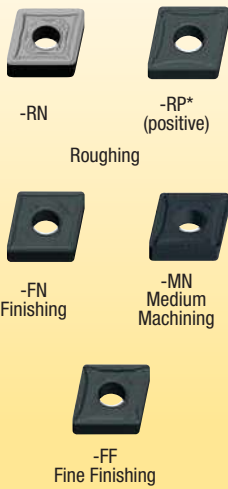
■ Step 3 • Select the cutting speed

Given: grade KCP25B 
cutting conditions
material CK15
Unknown: cutting speed
Solution: 280 m/min

Need help in selecting a product?
Additional information can be obtained by contacting
The Kennametal Customer Application Support Team.
Go to 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
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	KCP10B/ KCP10	KCP25B/ KCP25	KCP30B/ KCP30	KCP30B/ KCP30/ KCP40B/ KCP40	KCP30B/ KCP30/ KCP40B/ KCP40	-	KCU10/ KCP25B/ KCP25	KCP25B/ KCP25	KCU25/ KCP25B/ KCP25	KCP40B/ KCP40B	KCP40B/ KCP40B
lightly interrupted cut	KCP10B/ KCP10	KCP25B/ KCP25	KCP25B/ KCP25	KCP30B/ KCP30/ KCP40B/ KCP40	KCP30B/ KCP30/ KCP40B/ KCP40	-	KCU10/ KCP25B/ KCP25	KCP25B/ KCP25	KCP25B/ KCP25	KCP25B/ KCP25	KCP25B/ KCP25
varying depth of cut, casting, or forging skin	KCP05B/ KCP05/ KT315	KCP10B/ KCP10	KCP10B/ KCP10	KCP30B/ KCP30/ KCP40B/ KCP40	KCP30B/ KCP30/ KCP40B/ KCP40	KT315	KCP10B/ KCP10	KCP10B/ KCP10	KCP10B/ KCP10	KCP10B/ KCP10	KCP10B/ KCP10

Step 3 • Selecting the cutting speed

Low-Carbon (<0,3% C) and Free-Machining Steel

material group	grade	speed — m/min (SFM)									Starting Conditions	
		135 (450)	180 (600)	225 (800)	275 (900)	320 (1050)	360 (1200)	410 (1350)	455 (1500)	495 (1650)	m/min	SFM
P1	KCP05B/KCP05/KTP10										435	1450
	KCP10B/KCP10										395	1320
	KCP25B/KCP25										275	925
	KCP30B/KCP30/KCP40B/KCP40										210	700

New Beyond™ Material Group Selection Guide:

To optimise 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



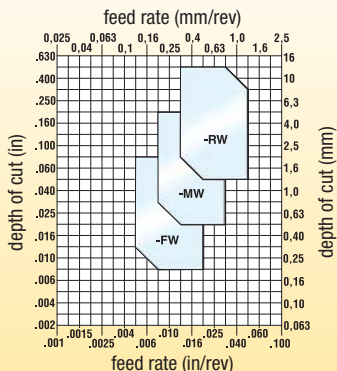
-RW
Rough Wiper



-MW
Medium Wiper



-FW
Finishing Wiper



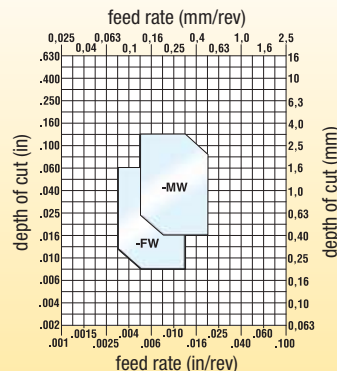
Positive Wiper Inserts



-MW
Medium Wiper



-FW
Finishing Wiper



Step 2 • Select the grade

cutting condition	Negative Insert Geometry			Positive Insert Geometry	
	-FW	-MW	-RW	-FW	-MW
heavily interrupted cut		-	-	KCP25B/KCP25	KCP25B/KCP25
lightly interrupted cut		KCP10B/KCP10	KCP25B/KCP25	KCP25B/KCP25	KCP25B/KCP25
varying depth of cut, casting, or forging skin		KCP05B/KCP05/ KT315	KCP10B/KCP10	KCP10B/KCP10/ KCK20B/KCK20	KCP10B/KCP10
smooth cut, pre-turned surface		KCP05B/KCP05/ KT315	KCP05B/KCP05	KCP10B/KCP10/ KT315	KT315

Step 1 • Select the insert geometry

Negative Inserts



-RN



-RP*
(positive)



-MR
Medium
Roughing



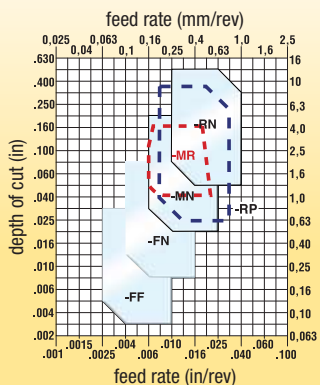
-MN
Medium
Machining



-FN
Finishing



-FF
Fine Finishing



*-RP – Supplemental geometry for high-strength materials

Positive Inserts



-MF



-MP
Positive



-LF



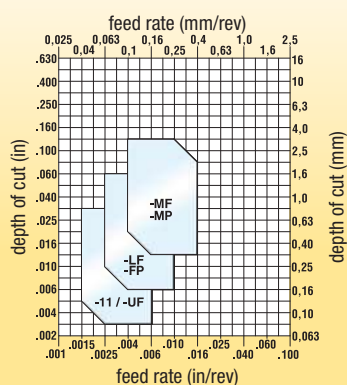
-FP
Positive



-11



-UF
Fine Finishing



Step 2 • Select the grade

cutting condition	Negative Insert Geometry						Positive Insert Geometry						
	-FF	-FN	-MN	-MR	-RN	-RP	-11	-UF	-LF	-FP	-MF	-MP	
heavily interrupted cut		KCP10B/ KCP10	KCP25B/ KCP25	KCP30B/ KCP30	-	KCP30B/ KCP40B	KCP30B/ KCP40B	-	KCU10/ KCP25B/ KCP25	KCP25B/ KCP25	KCP25B/ KCP25	KCP40B/ KCP40	KCM25B/ KCM25
lightly interrupted cut		KCP10B/ KCP10	KCP25B/ KCP25	KCP25B/ KCP25	KCP25B/ KCP25	KCP25B/ KCP25	KCP25B/ KCP25	-	KCU10/ KCP25B/ KCP25	KCP25B/ KCP25	KCP25B/ KCP25	KCP25B/ KCP25	KCP25B/ KCP25
varying depth of cut, casting, or forging skin		KCP05B/ KCP05/ KT315	KCP10B/ KCP10	KCP10B/ KCP10	KCP10B/ KCP10	KCP10B/ KCP10	KCP10B/ KCP10	KT315	KCP10B/ KCP10	KCP10B/ KCP10	KCP10B/ KCP10	KCP10B/ KCP10	KCP10B/ KCP10
smooth cut, pre-turned surface		KCP05B/ KCP05/ KT315	KCP05B/ KCP05	KCP05B/ KCP05	KCP10B/ KCP10/ KCK15B	KCP05B/ KCP10	KCP05B/ KCP10	KT315	KCP05B/ KCP05	KCP05B/ KCP05/ KT315	KCP05B/ KCP05/ KTP10	KCP05B/ KCP05	KCP05B/ KCP05

Step 3 • Selecting the cutting speed
Low-Carbon (<0,3% C) and Free-Machining Steel

material group	grade	speed — m/min (SFM)									Starting Conditions	
		135 (450)	180 (600)	225 (800)	275 (900)	320 (1050)	360 (1200)	410 (1350)	455 (1500)	495 (1650)	m/min	SFM
P0/P1	KCP05B/KCP05/KCPK05	◇									435	1450
	KCP10B/KCP10	◇									395	1320
	KCP25B/KCP25	◇									275	925
	KCP30B/KCP30/KCP40B/KCP40	◇									210	700
	KT315/KTP10	◇									440	1450
	KCU10	◇									280	925

Medium- and High-Carbon Steels (>0,3% C)

material group	grade	speed — m/min (SFM)									Starting Conditions	
		135 (450)	180 (600)	225 (800)	275 (900)	320 (1050)	360 (1200)	410 (1350)	455 (1500)	495 (1650)	m/min	SFM
P2	KCP05B/KCP05/KCPK05	◇									240	800
	KCP10B/KCP10	◇									265	880
	KCP25B/KCP25	◇									195	650
	KCP30B/KCP30/KCP40B/KCP40	◇									150	500
	KT315/KTP10	◇									270	880
	KCU10	◇									200	650

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

material group	grade	speed — m/min (SFM)									Starting Conditions	
		135 (450)	180 (600)	225 (800)	275 (900)	320 (1050)	360 (1200)	410 (1350)	455 (1500)	495 (1650)	m/min	SFM
P3	KCP05B/KCP05/KCPK05	◇									205	680
	KCP10B/KCP10	◇									190	630
	KCP25B/KCP25	◇									155	510
	KCP30B/KCP30/KCP40B/KCP40	◇									120	400
	KT315/KTP10	◇									210	680
	KCU10	◇									155	510

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

material group	grade	speed — m/min (SFM)									Starting Conditions	
		60 (200)	90 (300)	120 (400)	150 (500)	180 (600)	210 (700)	240 (800)	270 (900)	300 (1000)	m/min	SFM
P4	KCP05B/KCP05/KCPK05	◇									160	530
	KCP10B/KCP10	◇									145	480
	KCP25B/KCP25	◇									105	360
	KCP30B/KCP30/KCP40B/KCP40	◇									95	325
	KT315/KTP10	◇									210	530
	KCU10	◇									110	360

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

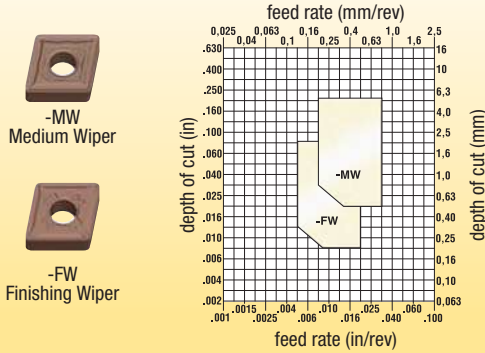
material group	grade	speed — m/min (SFM)									Starting Conditions	
		120 (400)	150 (500)	180 (600)	210 (700)	240 (800)	270 (900)	300 (1000)	330 (1100)	360 (1200)	m/min	SFM
P5	KCP05B/KCP05/KCPK05	◇									240	800
	KCP10B/KCP10	◇									215	720
	KCP25B/KCP25	◇									195	650
	KCP30B/KCP30/KCP40B/KCP40	◇									135	450
	KT315/KTP10	◇									250	800
	KCU10	◇									200	660

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

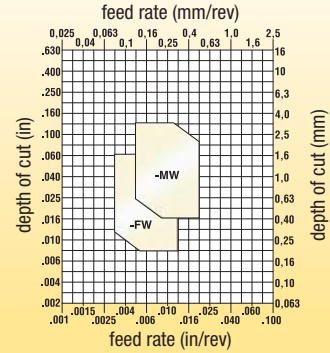
material group	grade	speed — m/min (SFM)									Starting Conditions	
		105 (350)	135 (450)	165 (550)	195 (650)	225 (750)	255 (850)	285 (950)	315 (1050)	345 (1150)	m/min	SFM
P6	KCP05B/KCP05/KCPK05	◇									200	660
	KCP10B/KCP10	◇									180	600
	KCP25B/KCP25	◇									150	500
	KCP30B/KCP30/KCP40B/KCP40	◇									105	350
	KT315/KTP10	◇									200	660
	KCU10	◇									150	500

Step 1 • Select the insert geometry

Negative Wiper Inserts



Positive Wiper Inserts

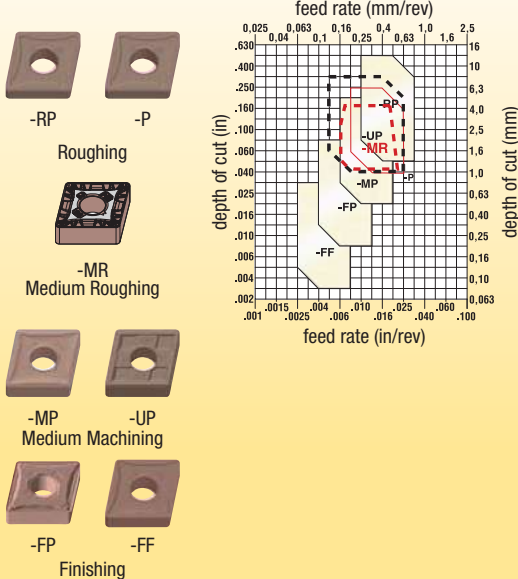


Step 2 • Select the grade

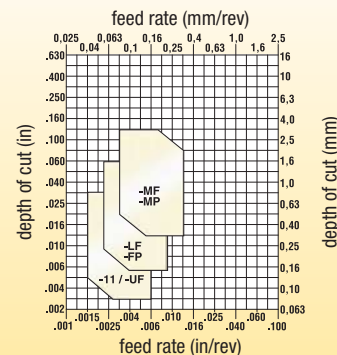
cutting condition	Negative Insert Geometry		Positive Insert Geometry	
	-FW	-MW	-FW	-MW
heavily interrupted cut	-	-	-	-
lightly interrupted cut	KCM15B/KCM15	KCM25B/KCM25	KCM15B/KCM15	KCM15B/KCM15
varying depth of cut, casting, or forging skin	KCM15B/KCM15/KCU10	KCM15B/KCM15	KCU10	KCU10
smooth cut, pre-turned surface	KCM15B/KCM15/KT315	KCM15B/KCM15	KT315	KT315

Step 1 • Select the insert geometry

Negative Inserts



Positive Inserts



Step 2 • Select the grade

cutting condition	Negative Insert Geometry				
	-FF	-FP	-MP/-UP	-P/-RP	-MR
heavily interrupted cut	KCU10	KCM15B/KCM15	KCM35B/KCM35	KCM35B/KCM35	KCM35B/KCM35
lightly interrupted cut	KCU10	KCM15B/KCM15	KCM25B/KCM25	KCM25B/KCM25	KCM25B/KCM25
varying depth of cut, casting, or forging skin	KT315	KCM15B/KCM15/KCU10	KCM15B/KCM15	KCM15B/KCM15/KCM25B/KCM25	KCM15B/KCM15
smooth cut, pre-turned surface	KT315	KCM15B/KCM15/KT315	KCM15B/KCM15/KCU10	KCU10	KCM15B/KCM15

(continued)

Step 2 • Select the grade *(continued)*

cutting condition		Positive Insert Geometry					
		-11	-UF	-LF	-MP/-MF	-FP	..GT-LF
heavily interrupted cut		-	KCU25	KCM35B/KCM35	KCM25B/KCM25	KCU25/KCM25B/KCM25	KCU25
lightly interrupted cut		-	KCU10	KCM25B/KCM25	KCM25B/KCM25	KCM15B/KCM15	KCU25
varying depth of cut, casting, or forging skin		KT315	-	KCM15B/KCU10	KCM15B/KCM15	KCU10	KCU10
smooth cut, pre-turned surface		KT315	-	KCM15B/KCM15/KT315	KCM15B/KCM15	KTP10	KCU10

Step 3 • Selecting 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	KCM15B/KCM15										180	600
	KCM25B/KCM25										150	500
	KCM35B/KCM35										120	400
	KT315										230	750
	KCU10										215	700
	KCU25										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	KCM15B/KCM15										165	550
	KCM25B/KCM25										140	450
	KCM35B/KCM35										105	350
	KT315										215	700
	KCU10										200	650
	KCU25										165	500

Austenitic Stainless Steel: Duplex (Ferritic and Austenitic Mixture)

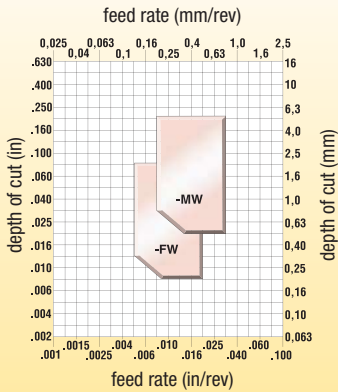
speed — m/min (SFM)

Starting Conditions

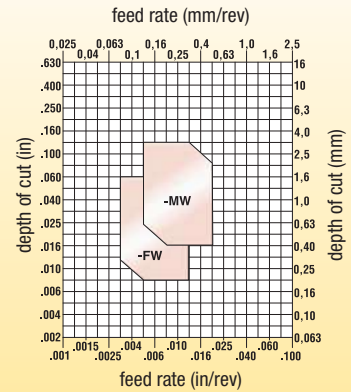
material group	grade	90 (300)	135 (450)	180 (600)	225 (800)	270 (900)	315 (1050)	360 (1200)	405 (1350)	450 (1500)	m/min	SFM
M3	KCM15B/KCM15										150	500
	KCM25B/KCM25										120	400
	KCM35B/KCM35										90	300
	KT315										200	650
	KCU10										185	600
	KCU25										150	450

Step 1 • Select the insert geometry

Negative Wiper Inserts



Positive Wiper Inserts



Step 2 • Select the grade


Grey Iron

cutting condition	Image	Negative Insert Geometry			Positive Insert Geometry	
		-FW	-T-20FW	-S...MW...	-FW	-MW
heavily interrupted cut		-	KY3500	KB1345	-	KCK15B/KCK15/ KCK20B/KCK20
lightly interrupted cut		KCK15B/KCK15	KY3500	KB1345	KCK20B/KCK20	KCK15B/KCK15/ KCK20B/KCK20
varying depth of cut, casting, or forging skin		KCK05B/KCK05/ KT315	KYK10	KB1345	KCK20B/KCK20	KCK15B/KCK15/ KCK20B/KCK20
smooth cut, pre-turned surface		KCK05B/KCK05/ KT315	KYK25	KB1345	KCK20B/ KT315	KCK15B/KCK15/ KCK20B/KCK20/KT315


Ductile Iron

cutting condition	Image	Negative Insert Geometry		Positive Insert Geometry	
		-FW	-T-20FW	-FW	-MW
heavily interrupted cut		-	-	-	-
lightly interrupted cut		KCK15B/ KCK15	KY3500	KCK20B/ KCK20	KCK20B/ KCK20
varying depth of cut, casting, or forging skin		KCK05B/KCK05/ KT315	KYK10	KCK20B/ KCK20	KCK20B/ KCK20
smooth cut, pre-turned surface		KCK05B/KCK05/ KT315	KYK25	KCK20B/KCK20/ KT315	KCK20B/KCK20/ KT315


■ Step 3 • Selecting the cutting speed

Grey 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	KCK05B/KCK05										450	1500
	KCK15B/KCK15										360	1200
	KCK20B/KCK20/KCPK05										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	KCK05B/KCK05										360	1200
	KCK15B/KCK15										270	900
	KCK20B/KCK20/KCPK05										240	800
	KT315										275	900

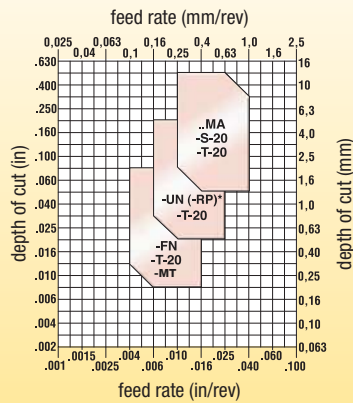
Ductile, Compacted Graphite, and Malleable Cast Irons (>80 KSI tensile strength) speed — m/min (SFM) Starting Conditions 

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	KCK05B/KCK05										240	800
	KCK15B/KCK15										215	725
	KCK20B/KCK20/KCPK05										210	700
	KT315										230	750

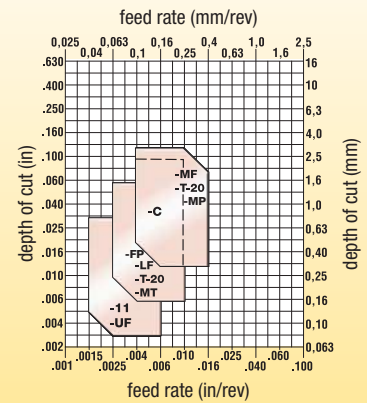
■ Step 1 • Select the insert geometry



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

Grey Iron

cutting condition	Negative Insert Geometry				Positive Insert Geometry			
	-FN	-MR	-UN(-RP)	-MA	-LF	-FP	-MF	-MP
heavily interrupted cut	KCK15B/ KCK15	KCP25B/ KCP25/ KCP10B/KCP10	KCK20B/ KCK20	KCK20B/ KCK20	KCK20B/ KCK20	KCK20B/ KCK20	KCK20B/ KCK20	KCK20B/ KCK20
lightly interrupted cut	KCK15B/ KCK15	KCP10B/ KCP10/ KCP25B/KCP25	KCK20B/ KCK20	KCK20B/ KCK20	KCK20B/ KCK20	KCK20B/ KCK20	KCK20B/ KCK20	KCK20B/ KCK20
varying depth of cut, casting, or forging skin	KCK05B/ KCK05/ KT315	KCK15B/ KCK15	KCK15B/ KCK15	KCK15B/ KCK15	KCK15B/ KCK15	KCK20B/ KCK20	KCK15B/ KCK15	KCK20B/ KCK20
smooth cut, pre-turned surface	KCK05B/ KCK05/ KT315	KCK15B/ KCK15	KCK05B/ KCK05	KCK05B/ KCK05	KCK05B/ KCK05	KCK20B/ KCK20	KCK15B/ KCK15	KCK20B/ KCK20

Ductile Iron

cutting condition	Negative Insert Geometry				Positive Insert Geometry			
	-FN	-UN(-RP)	-MA	-11/-UF	-LF	-MF	-FP	-MP
heavily interrupted cut	KCK15B/ KCK15	KCK20B/ KCK20	KCK20B/ KCK20	-	KCK20B/ KCK20	KCK20B/ KCK20	KCK20B/ KCK20	KCK20B/ KCK20
lightly interrupted cut	KCK15B/ KCK15	KCK20B/ KCK20	KCK20B/ KCK20	KCU10	KCK20B/ KCK20	KCK20B/ KCK20	KCK20B/ KCK20	KCK20B/ KCK20
varying depth of cut, casting, or forging skin	KCK05B/ KCK05/ KT315	KCK15B/ KCK15	KCK15B/ KCK15	KCU10	KCK15B/ KCK15	KCK15B/ KCK15	KCK20B/ KCK20	KCK20B/ KCK20
smooth cut, pre-turned surface	KCK05B/ KCK05/ KT315	KCK05B/ KCK05	KCK05B/ KCK05	KT315	KCU10	KCK15B/ KCK15	KCK20B/ KCK20	KCK20B/ KCK20

(continued)

■ Step 3 • Selecting the cutting speed (continued) (Optimal speed depends on casting quality and disposition.)

Grey Cast Iron		speed — m/min (SFM)											Starting Conditions	
material group	grade	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	
	KCK05B/KCK05	◊										450	1500	
	KCK15B/KCK15	◊										360	1200	
	KCK20B/KCK20/KCPK05	◊										300	1000	

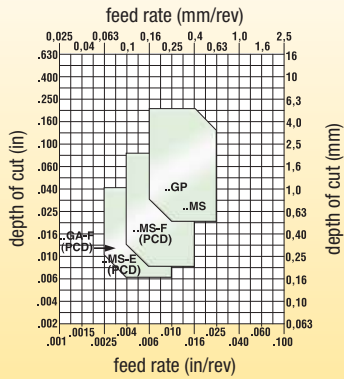
Ductile, Compacted Graphite, and Malleable Cast Irons (<600 MPa tensile strength)		speed — m/min (SFM)												Starting Conditions	
material group	grade	90 (300)	135 (450)	180 (600)	225 (750)	275 (900)	320 (1050)	360 (1200)	410 (1350)	460 (1500)	500 (1650)	550 (1800)	600 (1950)	m/min	SFM
K2	KT315	◊												275	900
	KCU10	◊												200	650
	KCK05B/KCK05	◊												360	1200
	KCK15B/KCK15	◊												270	900
	KCK20B/KCK20/KCPK05	◊												240	800

Ductile, Compacted Graphite, and Malleable Cast Irons (>600 MPa tensile strength)		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)	500 (1650)	550 (1800)	600 (1950)	m/min	SFM
K3	KT315	◊												230	750
	KCU10	◊												150	500
	KCK05B/KCK05	◊												240	800
	KCK15B/KCK15	◊												215	725
	KCK20B/KCK20/KCPK05	◊												210	700

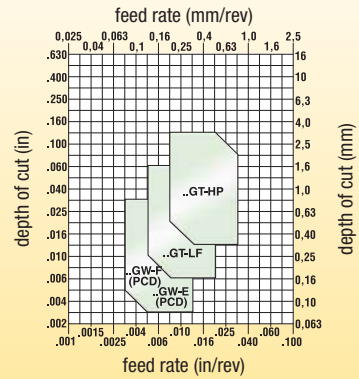
Step 1 • Select the insert geometry



Negative Inserts



Positive Inserts



Step 2 • Select the grade

cutting condition	Negative Insert Geometry		Positive Insert Geometry	
	..GP	..MS	..GT-LF	..GT-HP
heavily interrupted cut	KC5410/K313	KC5410	–	KC5410
lightly interrupted cut	KC5410/K313	KC5410	KC5410	KC5410
varying depth of cut, casting, or forging skin	KC5410/K313	KC5410	KC5410	KC5410
smooth cut, pre-turned surface	KC5410/K313	KC5410	KC5410	KC5410

Step 3 • Selecting the cutting speed

Low-Silicon Aluminium 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
N1	KC5410	◀▶										550	1800

■ 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	KC5410	◇				275	900
	K313	◇				260	850

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

speed — m/min (SFM)

Starting Conditions



material group	grade	250 (800)	500 (1600)	750 (2400)	1000 (3200)	m/min	SFM
N5	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	KC5410	◇				200	650

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

speed — m/min (SFM)

Starting Conditions

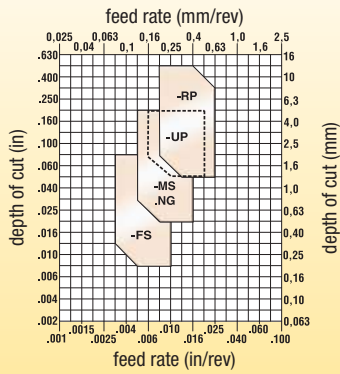
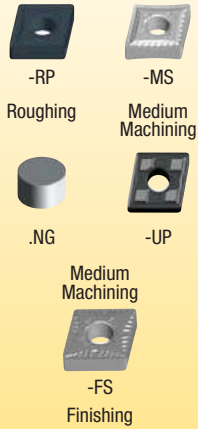


material group	grade	250 (800)	500 (1600)	750 (2400)	1000 (3200)	m/min	SFM
N8	KC5410	◇				215	700
	K313	◇				180	600

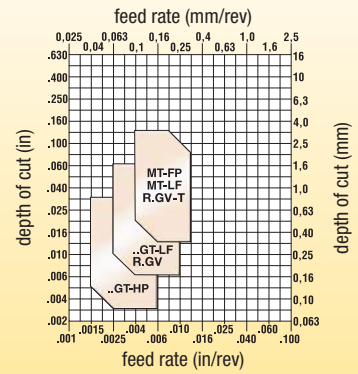
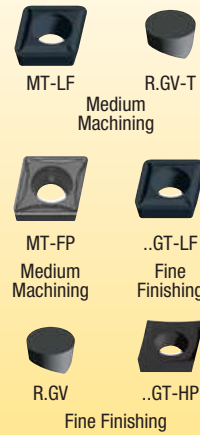
Step 1 • Select the insert geometry



Negative Inserts



Positive Inserts



Step 2 • Select the grade

cutting condition	Negative Insert Geometry			
	-FS	-MS	-UP	-RP
heavily interrupted cut	KCU25	KCU25	KCM35B	KCM25B/ KCM35B
lightly interrupted cut	KCU10	KCU25	KCM25B	KCM15B
varying depth of cut, casting, or forging skin	KCU10	KCU10	KCM15B	KCU25
smooth cut, pre-turned surface	KCU10/K313	KCU10/K313	KCU10	KCU10

cutting condition	Positive Insert Geometry			
	MT-FP	..GT-HP	MT-LF	..GT-LF
heavily interrupted cut	KCU25	-	KCU25	KCU25
lightly interrupted cut	KCU25	KCU25	KCU25	KCU25
varying depth of cut, casting, or forging skin	KCU10/KU10	KCU10	KCU10	KCU10
smooth cut, pre-turned surface	KCU10/KU10	KCU10/K313	KCU10/K313	KCU10/K313

■ 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	45	75	105	140	170	200	230	260	290	310	350	380	m/min	SFM
		(50)	(150)	(250)	(350)	(450)	(550)	(650)	(750)	(850)	(950)	(1050)	(1150)	(1250)		
S1	K313/KU10													30	100	
	KCU10													55	180	
	KCU25													40	125	
	KCM15B/KCM15													55	180	
	KCM25B/KCM25/KCM35B/KCM35													40	125	

Cobalt-Based, Heat-Resistant Alloys (150–425 HB) (≤45 HRC)

speed — m/min (SFM)

Starting Conditions

material group	grade	15	45	75	105	140	170	200	230	260	290	310	350	380	m/min	SFM
		(50)	(150)	(250)	(350)	(450)	(550)	(650)	(750)	(850)	(950)	(1050)	(1150)	(1250)		
S2	K313/KU10													35	110	
	KCU10													60	195	
	KCU25													30	100	
	KCM15B/KCM15													60	195	
	KCM25B/KCM25/KCM35B/KCM35													30	100	

Nickel-Based, Heat-Resistant Alloys (140–475 HB) (≤48 HRC)

speed — m/min (SFM)

Starting Conditions

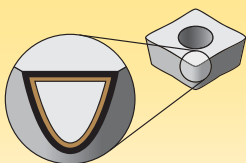
material group	grade	15	45	75	105	140	170	200	230	260	290	310	350	380	m/min	SFM
		(50)	(150)	(250)	(350)	(450)	(550)	(650)	(750)	(850)	(950)	(1050)	(1150)	(1250)		
S3	K313/KU10													40	125	
	KCU10													70	225	
	KCU25													40	125	
	KCM15B/KCM15													70	225	
	KCM25B/KCM25/KCM35B/KCM35													40	125	

Titanium and Titanium Alloys (110–450 HB) (≤48 HRC)

speed — m/min (SFM)

Starting Conditions

material group	grade	15	45	75	105	140	170	200	230	260	290	310	350	380	m/min	SFM
		(50)	(150)	(250)	(350)	(450)	(550)	(650)	(750)	(850)	(950)	(1050)	(1150)	(1250)		
S4	K313/KU10													45	150	
	KCU10													70	225	
	KCU25													55	175	
	KCM15B/KCM15													70	225	
	KCM25B/KCM25/KCM35B/KCM35													55	175	



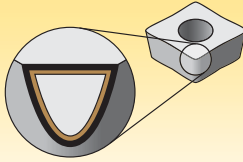
Coatings provide high-speed capability and are engineered for finishing to light roughing.

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous
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	K313	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									
Uncoated Carbide Grades	K68	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 high-temperature alloys. Use as a general-purpose grade for non-ferrous materials.										
			M									
			K									
			N									
			S									
PVD-Coated Carbide Grades	KCS10	Composition: An advanced PVD-AlTiN coated, fine-grained tungsten carbide grade. Application: The KCS10 grade specifically engineered for the productive machining of high-temperature alloys. The fine-grained tungsten carbide substrate has excellent toughness and deformation resistance while the advanced PVD coating allows metalcutting speeds double those of conventional PVD-coated cutting tools.	P									
			M									
			K									
			N									
			S									
			H									
PVD-Coated Carbide Grades	KCU10	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 high-temp alloys with improved edge toughness, notch resistance, and higher cutting speed/feed capability.	P									
			M									
			K									
			N									
			S									
			H									





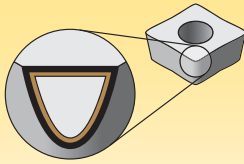
Coatings provide high-speed capability and are engineered for finishing to light roughing.

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

wear resistance ← → toughness

PVD-Coated Carbide Grades

Coating	Grade Description		05	10	15	20	25	30	35	40	45	
KCU25 —	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 —	Composition: An advanced PVD AlTiN coating over a very deformation-resistant unalloyed carbide substrate. 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 high-temp alloys under stable conditions. It also performs well machining hardened and short chipping materials.	P										
		M										
		K										
		N										
		S										
		H										
KC5025 —	Composition: An advanced PVD-AlTiN-coated grade with a tough, ultra-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 —	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) aluminium, aluminium 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 aluminium. 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. Moulded inserts have a light hone.											
		N										



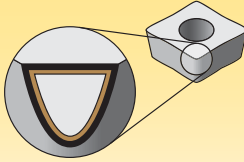
Coatings provide high-speed capability and are engineered for finishing to light roughing.

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous
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
KCP05B		<p>Composition: An innovative, highly deformation-resistant, cobalt-enriched substrate with a specially designed, adherent MTCVD TiCN-Al₂O₃-TiOCN coating.</p> <p>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>	P									
			K									
			beyond DRIVE™									
KCP05		<p>Composition: An innovative, highly deformation-resistant, cobalt-enriched substrate with a specially designed, adherent MTCVD TiCN-Al₂O₃ coating.</p> <p>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>	P									
			K									
			beyond									
KCPK05		<p>Composition: A deformation-resistant, cobalt-enriched substrate combined with thick MTCVD TiCN-Al₂O₃ coating.</p> <p>Application: For high productivity turning of steels and PH stainless steels in continuous to lightly interrupted cuts. This grade provides excellent combination of toughness and high speed wear resistance allowing the fastest steel part production. Its unique combination of substrate and coating also make it an ideal roughing grade for cast iron where chipping resistance is required.</p>	P									
			K									
			beyond									
KCP10B		<p>Composition: A specially engineered cobalt-enriched carbide grade with thick MTCVD TiCN-Al₂O₃-TiOCN coating for maximum wear resistance.</p> <p>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>	P									
			K									
			beyond DRIVE™									
KCP10		<p>Composition: A specially engineered cobalt-enriched carbide grade with thick MTCVD TiCN-Al₂O₃ coating for maximum wear resistance.</p> <p>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>	P									
			K									
			beyond									



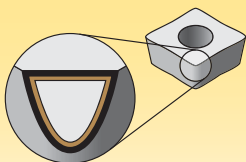
Coatings provide high-speed capability and are engineered for finishing to light roughing.

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous
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
KCK15		<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 grey 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 continuous and lightly interrupted cuts.</p>	P									
	—											
beyond												
KCK20B		<p>Composition: A specially toughened MTCVD TiCN-Al₂O₃-TiOCN coating over a wear-resistant substrate.</p> <p>Application: Specifically engineered to maximise coating adhesion and edge strength making this grade ideal in wet interrupted cutting of grey and ductile irons. It can be used in a wide range of applications from finishing to roughing to maximise productivity wherever strength and reliability are needed.</p>	P									
	—											
beyond DRIVE												
KCK20		<p>Composition: A specially toughened MTCVD TiCN-Al₂O₃ coating over a wear-resistant substrate.</p> <p>Application: Specifically engineered to maximise coating adhesion and edge strength making this grade ideal in wet interrupted cutting of grey and ductile irons. It can be used in a wide range of applications from finishing to roughing to maximise productivity wherever strength and reliability are needed.</p>	P									
	—											
beyond												
KCM15B		<p>Composition: A multilayer MTCVD TiCN-Al₂O₃ coated carbide grade.</p> <p>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–P25 range. KCM15B grade in combination with unique geometries have been designed to resist depth-of-cut notching and minimise bur formation. The post-coat treatment reduces coating stresses, improves coating adhesion, minimises microchipping and edge build-up, and improves workpiece finish.</p>	P									
	—											
beyond DRIVE												



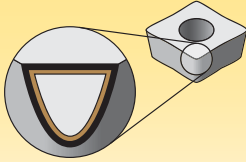
Coatings provide high-speed capability and are engineered for finishing to light roughing.

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous
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
KCM15		<p>Composition: A multilayer MTCVD TiCN-Al₂O₃ coated carbide grade.</p> <p>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–P25 range. KCM15 grade in combination with unique geometries have been designed to resist depth-of-cut notching and minimise bur formation. The post-coat treatment reduces coating stresses, improves coating adhesion, minimises microchipping and edge build-up, and improves workpiece finish.</p>	P									
			M									
			beyond									
KCM25B		<p>Composition: A multilayer MTCVD TiCN-Al₂O₃-TiOCN coated carbide grade.</p> <p>Application: This CVD-coated grade is designed for general-purpose machining of austenitic stainless steels at moderate speeds and feeds. This grade offers an extraordinary combination of toughness, built-up edge resistance, and wear resistance in stainless steel applications.</p>	P									
			M									
			beyond DRIVE™									
KCM25		<p>Composition: A multilayer CVD coating comprised of MTCVD TiCN-Al₂O₃ layers over a tough, cobalt-enriched carbide substrate.</p> <p>Application: This CVD-coated grade is designed for general-purpose machining of austenitic stainless steels at moderate speeds and feeds. This grade offers an extraordinary combination of toughness, built-up edge resistance, and wear resistance in stainless steel applications.</p>	P									
			M									
			beyond									
KCM35B		<p>Composition: A multilayer MTCVD TiCN-Al₂O₃-TiOCN coating over a super-tough substrate.</p> <p>Application: 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. Available in insert sizes and geometries appropriate for heavy feeds and large depths of cut.</p>	P									
			M									
			beyond DRIVE™									
KCM35		<p>Composition: A multilayer MTCVD TiCN-Al₂O₃ coating over a super-tough substrate.</p> <p>Application: 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. Available in insert sizes and geometries appropriate for heavy feeds and large depths of cut.</p>	P									
			M									
			beyond									



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

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

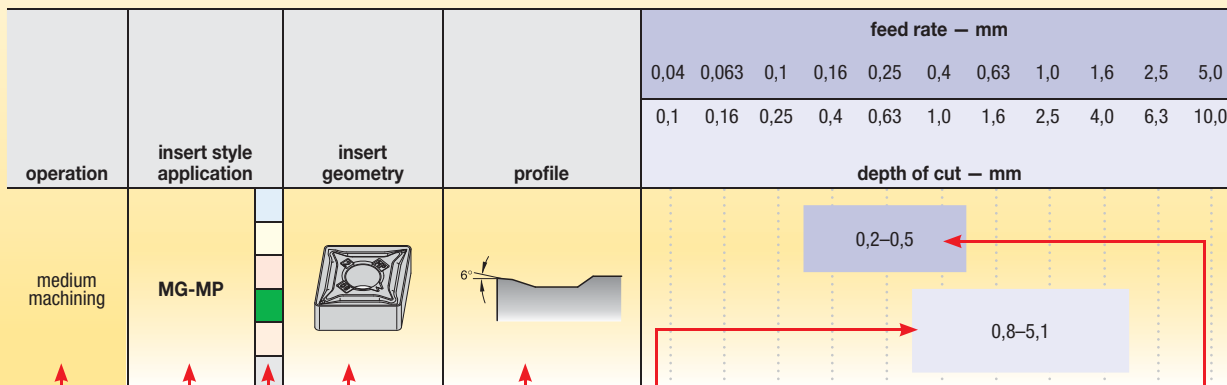
wear resistance ← → toughness

PVD-Coated Cermet Grades

Coating		Grade Description		05	10	15	20	25	30	35	40	45		
KT315		<p>Composition: A multilayer 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											
KT10		<p>Composition: A multilayer 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											

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

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



Pictorial View of Insert

Depth-of-Cut Range — for all inserts in the programme, select smaller inserts for lighter cuts and larger inserts for heavy cuts

Feed Rate Range — for best results, use the centre 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
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–B21.

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

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

operation	insert style application	insert geometry	profile	feed rate – mm										
				0,04	0,063	0,1	0,16	0,25	0,4	0,63	1,0	1,6	2,5	5,0
				0,1	0,16	0,25	0,4	0,63	1,0	1,6	2,5	4,0	6,3	10,0
				depth of cut – mm										
wiper finishing	MG-FW			0,2–0,4 0,25–2,0										
wiper medium machining	MG-MW			0,3–0,6 0,8–5,1										
wiper roughing	MM-RW			0,3–1,3 1,3–12,7										
fine finishing	MG-FF			0,05–0,25 0,08–2,0										
finishing sharp	GG-FS precision ground			0,07–0,25 0,20–2,0										
finishing	GG-LF precision ground			0,1–0,5 0,5–3,0										

Select the geometry – based on feed rate and depth of cut

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

operation	insert style application	insert geometry	profile	feed rate – mm											
				0,04	0,063	0,1	0,16	0,25	0,4	0,63	1,0	1,6	2,5	5,0	
				0,1	0,16	0,25	0,4	0,63	1,0	1,6	2,5	4,0	6,3	10,0	
				depth of cut – mm											
finishing	MG-FP			0,1–0,3											
				0,25–2,5											
finishing	MG-FN			0,1–0,3											
				0,3–2,5											
	MP-K			0,1–0,3											
				0,2–2,5											
medium sharp	MG-MS			0,12–0,35											
				0,76–5,0											
medium machining	MG-UP			0,2–0,6											
				1–6,4											

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

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

operation	insert style application	insert geometry	profile	feed rate — mm											
				0,04	0,063	0,1	0,16	0,25	0,4	0,63	1,0	1,6	2,5	5,0	
				0,1	0,16	0,25	0,4	0,63	1,0	1,6	2,5	4,0	6,3	10,0	
				depth of cut — mm											
roughing	MG-RP			0,2–0,6											
				1,1–6,4											
heavy roughing	MG-RN			0,3–0,63											
				1,1–5,7											
	MG			0,3–0,8											
				1,1–5,7											
	MM-RM single sided			0,3–1,0											
				1,3–12,7											
wiper finishing	MM-RP single sided			0,2–1,0											
				1,3–10,0											
	MM-RH single sided			0,4–1,3											
				1,3–12,7											
wiper, medium finishing	MT-FW			0,08–0,35											
				0,2–1,5											
wiper, medium finishing	MT-MW			0,12–0,5											
				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
S	High-Temp Alloys
H	Hardened Materials

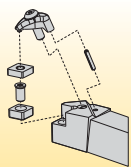
operation	insert style application	insert geometry	profile	feed rate — mm										
				0,04	0,063	0,1	0,16	0,25	0,4	0,63	1,0	1,6	2,5	5,0
				depth of cut — mm										
fine finishing	_GM precision ground			0,05–0,2 0,2–1,0										
	MT-11			0,08–0,25 0,2–1,3										
	.MT-UF			0,05–0,25 0,1–1,3										
finishing	GT-HP precision ground			0,2–0,4 0,6–2,3										
	GT-LF precision ground			0,2–0,4 0,8–2,3										
	MT-FP			0,063–0,25 0,16–1,6										
	MT-LF			0,2–0,4 0,8–2,3										
medium machining	MT-MP			0,15–0,4 0,4–2,3										
	MT-MF			0,2–0,4 1,1–2,3										

tool path	insert shape	clamping style	Turning	Profiling	Facing	Plunging	Chamfering	page(s)	
117,5° Lead Angle									
		Kenloc™	•	•	•			B151	
		Kenclamp™	•		•			B150	
107,5° Lead Angle									
		Screw-On	•	•				B213	
		TNT	•	•		•		B151	
		Screw-On	•	•				B265	
97,5° Lead Angle									
		MTS	•		•			—	
95° Lead Angle									
		Kenloc	•	•	•			B62	
		Kenclamp	•	•	•			B59	
		Kenlever™	•	•	•			B65	
		Screw-On	•	•	•			B180, B193	
		MTS	•	•	•			B358	
		Kenloc	•	•	•			B162	
		Kenclamp	•	•	•			B161	
		Kenlever	•	•	•			B163	
		Screw-On	•	•	•			B271	
		MTS	•	•	•			B369	
Wedgelock™	•	•	•			B162			
93° Lead Angle									
		Kenloc	•	•				B86	
		Kenclamp	•	•				B85	
		Kenlever	•	•				B87	
		Screw-On	•	•				B210	
		MTS	•	•				B360	
		Kenloc	•	•				B151	
		Kenclamp	•	•				B149	
		Screw-On	•	•				B267	
			Wedgelock	•	•				B133

tool path	insert shape	clamping style	Turning	Profiling	Facing	Plunging	Chamfering	page(s)
90° Lead Angle								
		Screw-on	•	•	•			B179
			Screw-on	•	•	•		B209
	Screw-on		•	•	•		B266	
			Kenloc	•	•	•	•	
Kenclamp		•	•	•			B132	
Kenlever		•	•	•			B135	
Screw-on		•	•	•			B247	
TNT		•	•	•			—	
Wedgelock	•	•	•			B133		
85° Lead Angle								
		MTS	•		•			B366
75° Lead Angle								
		Kenloc	•	•	•			B61
		Kenclamp	•	•	•			B58
		Kenlever	•	•	•			B64
		TNT	•	•				—
		Screw-On	•	•	•			B180
		MTS	•					B356
		Kenloc	•	•	•			B108
		Kenclamp	•	•	•			B105
		Kenlever	•	•	•			B111
		Screw-On	•	•	•			B233
MTS	•	•	•			B364		
72,5° Lead Angle								
		Kenloc	•	•				B152
		Kenclamp	•	•				B150
		Screw-On	•	•				B268

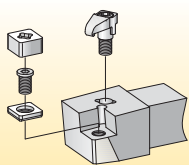
tool path	insert shape	clamping style	Turning	Profiling	Facing	Plunging	Chamfering	page(s)
70° Lead Angle								
		Kenloc™	•	•				—
63° Lead Angle								
		Kenloc	•	•				B85
62,5° Lead Angle								
		Kenloc	•	•	•			B86
		Kenlever	•	•	•			B88
		Screw-On	•	•				B211
60° Lead Angle								
		Kenloc	•	•	•			B133
50° Lead Angle								
		Kenloc	•	•	•			B63
45° Lead Angle								
		Kenloc	•	•	•			B60
		Kendex™	•	•	•			B66
		Screw-On	•	•	•			B192
		Kenloc	•	•	•			B109
		Kenclamp	•	•	•			B105
		Kenlever™	•	•	•			B111
		Kendex	•	•	•			—
		Screw-On	•	•	•			B233
		MTS	•	•	•			B213
		Kenlever	•	•	•			B86
		Kenloc	•	•	•			B95
		Kenclamp	•	•	•			—
		Fix-Perfect™	•	•	•			—
		Screw-On	•	•	•			B227
		MTS	•	•	•			B365

Clamping Styles



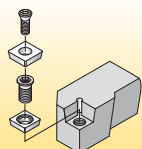
Kenclamp Style

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



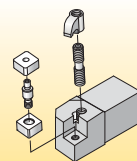
MTS Style Modular Tooling System

- 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.



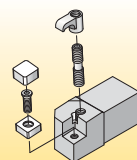
Screw-On Style

- Top clamping by screw for Screw-On inserts.



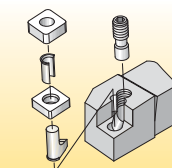
Kenloc Style

- Uses Kenloc negative style 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

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

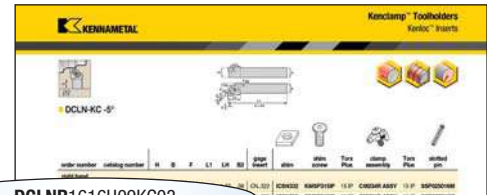


Kenlever Style

- Proven superior system for holding ceramic inserts rigidly in turning and profiling operations.
- Can be used on Kendex or Kenloc inserts using optional hardware.

How Do Catalogue Numbers Work?

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



DCLNR1616H09KC03

D	C	L	N	R	
Insert Holding Method	Insert Shape	Tool Style or Lead Angle	Insert Clearance Angle	Hand of Tool	Additional Information
<p>D </p> <p>M </p> <p>C </p> <p>N </p> <p>S </p> <p>P </p>	<p>A </p> <p>B </p> <p>C </p> <p>D </p> <p>E </p> <p>H </p> <p>K </p> <p>L </p> <p>M </p> <p>O </p> <p>P </p> <p>R </p> <p>S </p> <p>T </p> <p>V </p> <p>W </p>	<p>A </p> <p>B </p> <p>C </p> <p>D </p> <p>E </p> <p>F </p> <p>G </p> <p>H </p> <p>J </p> <p>K </p> <p>L </p> <p>M </p> <p>P </p> <p>Q </p> <p>R </p> <p>S </p> <p>U </p> <p>V </p> <p>Y </p>	<p>N </p> <p>B </p> <p>C </p> <p>P </p> <p>D </p> <p>E </p> <p>F </p>	<p>R = Right hand</p> <p>L = Left hand</p> <p>N = Neutral</p>	<p>C = Deep pocket for ceramic insert</p> <p>S = Single pocket locating wall</p> <p>F = Straight shank, no offset</p>

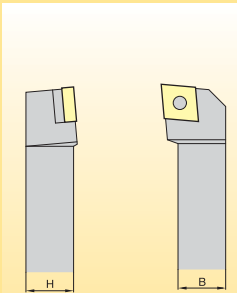
By referencing this easy-to-use guide, you can identify the correct product to meet your needs.



DCLNR1616H09KC03

16

Shank Dimensions



The seventh and eighth position shall be a significant two-digit number that indicates the holder cross section.

- If the dimension for the width "B" or the height "H" is represented by a one-digit number, a 0 (zero) will be used in front of it.

Example: 8,0mm = 08

16

H

Tool Length

L1	ISO
32	A
40	B
50	C
60	D
70	E
80	F
90	G
100	H
110	J
125	K
140	L
150	M
160	N
170	P
180	Q
200	R
250	S
300	T
350	U
400	V
450	W
500	Y
Special Design	X

09

Insert Size

KC

Additional Information

- KC** =
Kenclamp™
- H4** =
Wedglock™ clamping system
- M** =
MTS clamping system for ceramic and PcBN inserts

03

Insert Thickness (optional)

- 04** = 4,76mm
06 = 6,35mm

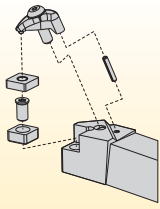
Cutting Edge Length L10

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

tool path	insert shape	clamping style	Boring	Back Boring	Profiling	page(s)
117,5° Lead Angle						
		Kenclamp™	•	•		B89
107,5° Lead Angle						
		Kenclamp	•	•	•	B89
		Screw-On	•	•		B212, B217
		Screw-On	•	•	•	B268
95° Lead Angle						
		Kenloc™	•		•	B67
		Kenclamp	•		•	B66
		Screw-on	•		•	B182, B196
		Kenlever™	•		•	B68
	MTS	•		•	B372	
		MTS	•		•	—
		Screw-On	•		•	B250
		Kenloc	•			B164
		Kenclamp	•		•	B163
		Kenlever	•		•	B165
		Screw-on	•		•	B271
		MTS	•		•	B374
93° Lead Angle						
		Kenloc	•	•	•	B90
		Kenclamp	•	•	•	B90
		Screw-on	•		•	B212, B217
		MTS	•		•	—
		Kenloc	•		•	B153
		Kenclamp	•	•		B152
		Screw-on	•	•	•	B269
		Kendex™	•		•	B371
		Screw-On	•		•	B272

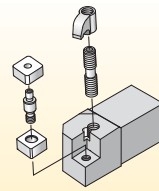
tool path	insert shape	clamping style	Boring	Back Boring	Profiling	page(s)	
90° Lead Angle							
		Screw-On	•		•	B182, B194	
		Kenloc	•			B137	
		Kenclamp	•		•	B137	
		Kenlever	•		•	B138	
		Kendex	•		•	—	
		Screw-On	•			B248, B257	
75° Lead Angle							
		Screw-On	•			B195	
		Kenloc	•			B114	
		Kenclamp	•			B113	
		Kenlever	•			B114	
		Kendex	•			—	
		Screw-On	•			B233	
			MTS	•			—
			Kendex	•			—
60° Lead Angle							
		Screw-On	•		•	—	
45° Lead Angle							
		MTS	•			B373	

Clamping Styles



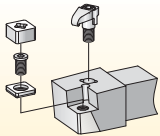
Kenclamp™ Style

- Uses Kenloc™ negative style inserts.
- Unique clamp design provides rigid clamping.
- Ensures insert repeatability and seating.
- Reduced chatter and improved tool life.



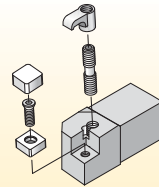
Kenloc™ Style

- Uses Kenloc™ negative style 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.



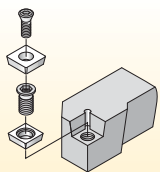
MTS Style

- 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.



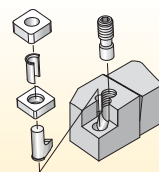
Kendex™ Style

- Uses 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.

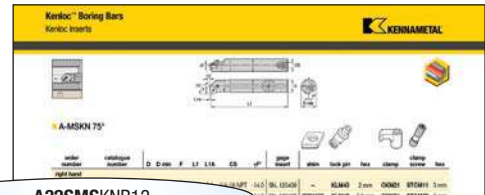


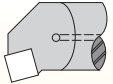
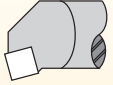
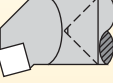
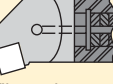
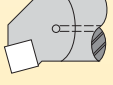
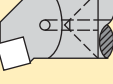


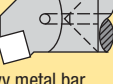

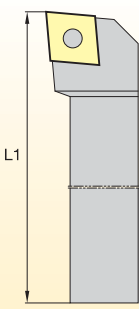
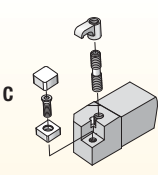
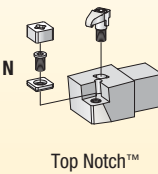
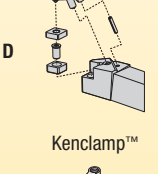
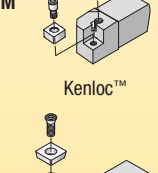
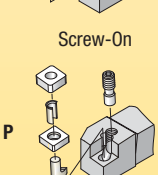

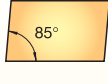
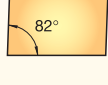






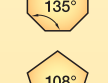
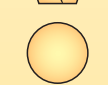
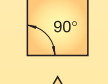





Kenlever™ Style

- Proven superior system for holding ceramic inserts rigidly in turning and profiling operations.
- Can be used on Kendex or Kenloc inserts using optional hardware.

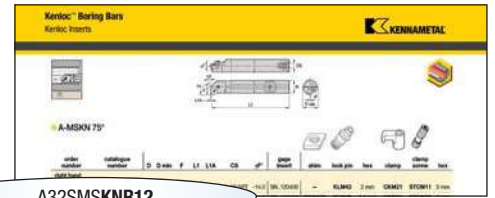
How Do Catalogue Numbers Work?

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



A	32	S	M	S																																																
Bar Type	Bar Diameter	Bar Length**	Insert Holding Method	Insert Shape																																																
<p>A  Steel bar with coolant</p> <p>S  Steel bar without coolant</p> <p>C  Carbide bar</p> <p>D  DeVibrator bar with coolant</p> <p>D  Tunable bar with coolant</p> <p>E  Carbide bar with coolant</p> <p>B  DeVibrator</p> <p>H  Interchangeable head</p> <p>L  Heavy metal bar with coolant</p>	<p></p> <p>Metric: A two-digit number indicates the bar diameter in mm. If the diameter is represented by a one digit number, a 0 (zero) will be used in front of it. Example: 8mm = 08</p>	<p></p> <table border="1"> <thead> <tr> <th>L1</th> <th>ISO</th> </tr> </thead> <tbody> <tr><td>32</td><td>= A</td></tr> <tr><td>40</td><td>= B</td></tr> <tr><td>50</td><td>= C</td></tr> <tr><td>60</td><td>= D</td></tr> <tr><td>70</td><td>= E</td></tr> <tr><td>80</td><td>= F</td></tr> <tr><td>90</td><td>= G</td></tr> <tr><td>100</td><td>= H</td></tr> <tr><td>110</td><td>= J</td></tr> <tr><td>125</td><td>= K</td></tr> <tr><td>140</td><td>= L</td></tr> <tr><td>150</td><td>= M</td></tr> <tr><td>160</td><td>= N</td></tr> <tr><td>170</td><td>= P</td></tr> <tr><td>180</td><td>= Q</td></tr> <tr><td>200</td><td>= R</td></tr> <tr><td>250</td><td>= S</td></tr> <tr><td>300</td><td>= T</td></tr> <tr><td>350</td><td>= U</td></tr> <tr><td>400</td><td>= V</td></tr> <tr><td>450</td><td>= W</td></tr> <tr><td>500</td><td>= Y</td></tr> <tr><td>Special Length</td><td>= X</td></tr> </tbody> </table>	L1	ISO	32	= A	40	= B	50	= C	60	= D	70	= E	80	= F	90	= G	100	= H	110	= J	125	= K	140	= L	150	= M	160	= N	170	= P	180	= Q	200	= R	250	= S	300	= T	350	= U	400	= V	450	= W	500	= Y	Special Length	= X	<p>C  Kendex™</p> <p>N  Top Notch™ Profiling</p> <p>D  Kenclamp™</p> <p>M  Kenloc™</p> <p>S  Screw-On</p> <p>P  Kenlever™</p>	<p>A  85°</p> <p>B  82°</p> <p>C  80°</p> <p>D  55°</p> <p>E  75°</p> <p>H  120°</p> <p>K  55°</p> <p>L  90°</p> <p>M  86°</p> <p>O  135°</p> <p>P  108°</p> <p>R  90°</p> <p>S  90°</p> <p>T  60°</p> <p>V  35°</p> <p>W  80°</p>
L1	ISO																																																			
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450	= W																																																			
500	= Y																																																			
Special Length	= X																																																			

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



A32SMSKNR12

K	N	R	12	
Bar Style or Lead Angle	Insert Clearance Angle	Hand of Tool	Insert Size Cutting Edge Length L10	Additional Information
<p>E </p> <p>F </p> <p>K </p> <p>L </p> <p>(E-style inserts)</p> <p>L </p> <p>P </p> <p>Q </p> <p>S </p> <p>U </p> <p>X </p>	<p>N 0° </p> <p>B 5° </p> <p>C 7° </p> <p>P 11° </p> <p>D 15° </p> <p>E 20° </p> <p>F 25° </p>	<p>R =</p> <p>Right-hand boring bar</p> <p>R </p> <p>L =</p> <p>Left-hand boring bar</p> <p>L </p>	<p>H </p> <p>O </p> <p>P </p> <p>S </p> <p>T </p> <p>CDE M V </p> <p>W </p> <p>L </p> <p>A B K </p> <p>R </p>	<p>M... = TNT/MTS clamping systems for ceramic and PcBN inserts</p> <p>D = Dual pocket</p> <p>AP5 = Axial positive</p> <p>KC = Kenclamp™</p> <p>+ = Insert Thickness</p>

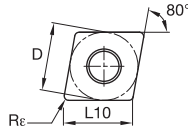
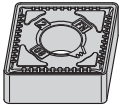
By referencing this easy-to-use guide, you can identify the correct product to meet your needs.

Kenloc® Cartridges Kenloc Inserts									
Order Number	Technical Number	D code	F	L1	W	W1	W2	W3	W4
MCLN 95°									
		30.3	18	4.1	4.3	12.1	12.1	12.1	12.1

MCLNR12CA12

<p>12</p> <p>Cartridge Size</p> <p>H1 = Cutting edge height of cartridge, in millimetres</p>	<p>C</p> <p>Identifying Code of Cartridge</p> <p>C = Cartridge</p>	<p>A</p> <p>Mounting Design of Cartridge</p> <p>A = Angular acc. ISO 5611</p>	<p>12</p> <p>Insert Size</p> <p>Cutting edge length D</p> <p>C </p> <p>D </p> <p>R </p> <p>S </p> <p>T </p> <p>W </p>
------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------

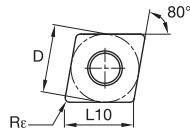
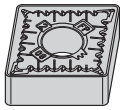
● first choice
○ alternate choice



■ CNMG-FN

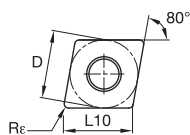
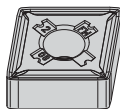
ISO catalogue number	D	L10	Rε
CNMG090304FN	9,53	9,67	0,4
CNMG090308FN	9,53	9,67	0,8
CNMG120402FN	12,70	12,90	0,2
CNMG120404FN	12,70	12,90	0,4
CNMG120408FN	12,70	12,90	0,8
CNMG120412FN	12,70	12,90	1,2
CNMG120416FN	12,70	12,90	1,6

NOTE: Indexable Inserts for P-clamping.



■ CNMG-FP

ISO catalogue number	D	L10	Rε
CNMG120404FP	12,70	12,90	0,4
CNMG120408FP	12,70	12,90	0,8
CNMG120412FP	12,70	12,90	1,2



■ CNMG-FW

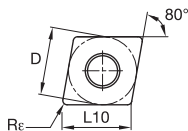
ISO catalogue number	D	L10	Rε
CNMG120404FW	12,70	12,90	0,4
CNMG120408FW	12,70	12,90	0,8
CNMG120412FW	12,70	12,90	1,2

P	M	K	N	S	H	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315			
●	●	○	○	○		-	-	-	●	●	●	-	-	-	-	-	●	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●	●	●
○	○	○	○	○		-	-	-	○	○	○	-	-	-	-	-	○	-	-	-	-	-	-	-	-	-	-	○	○	○	○	○	○	○	○	○	○	○	



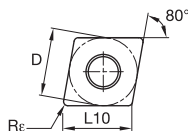
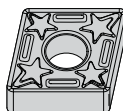
ISO Turning

- first choice
- alternate choice



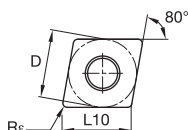
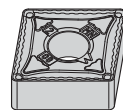
■ CNMG-FM

ISO catalogue number	D	L10	Re
CNMG120412FM	12,70	12,90	1,2



■ CNMG-LF

ISO catalogue number	D	L10	Re
CNMG120402LF	12,70	12,90	0,2
CNMG120404LF	12,70	12,90	0,4
CNMG120408LF	12,70	12,90	0,8

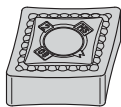


■ CNMG-MN

ISO catalogue number	D	L10	Re
CNMG090304MN	9,53	9,67	0,4
CNMG090308MN	9,53	9,67	0,8
CNMG090312MN	9,53	9,67	1,2
CNMG120404MN	12,70	12,90	0,4
CNMG120408MN	12,70	12,90	0,8
CNMG120412MN	12,70	12,90	1,2
CNMG120416MN	12,70	12,90	1,6
CNMG160608MN	15,88	16,12	0,8
CNMG160612MN	15,88	16,12	1,2
CNMG160616MN	15,88	16,12	1,6
CNMG190608MN	19,05	19,34	0,8
CNMG190612MN	19,05	19,34	1,2
CNMG190616MN	19,05	19,34	1,6
CNMG190624MN	19,05	19,34	2,4

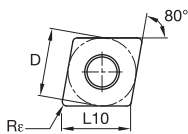
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KCP05	●					
KCP10B	●					
KCP10	●					
KCP25B	●					
KCP25	●					
KCP30B	●					
KCP30	●					
KCP40B	●					
KCP40	●					
KCK05B	○					
KCK05	○					
KCK15B	○					
KCK15	○					
KCK20B	○					
KCK20	○					
KCM15B	○					
KCM15	○					
KCM25B	○					
KCM25	○					
KCM35B	○					
KCM35	○					
KCPK05	○					
K313	○					
K68	○					
KCU10	○					
KCU25	○					
KC5010	○					
KC5025	○					
KC5410	○					
KT315	○					

ISO Turning



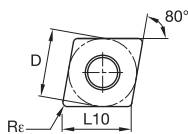
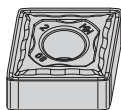
● first choice

○ alternate choice



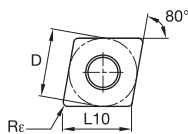
■ CNMG-MS

ISO catalogue number	D	L10	Re
CNMG120401MS	12,70	12,90	0,1
CNMG120402MS	12,70	12,90	0,2
CNMG120404MS	12,70	12,90	0,4
CNMG120408MS	12,70	12,90	0,8
CNMG120412MS	12,70	12,90	1,2
CNMG120416MS	12,70	12,90	1,6
CNMG160608MS	15,88	16,12	0,8
CNMG160612MS	15,88	16,12	1,2
CNMG190608MS	19,05	19,34	0,8
CNMG190612MS	19,05	19,34	1,2
CNMG190616MS	19,05	19,34	1,6



■ CNMG-MW

ISO catalogue number	D	L10	Re
CNMG120408MW	12,70	12,90	0,8
CNMG120412MW	12,70	12,90	1,2

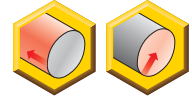
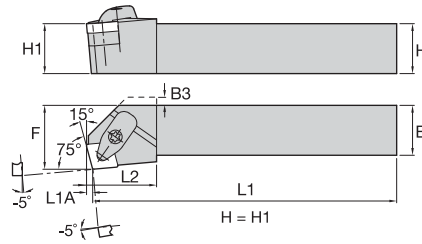
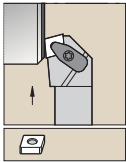


■ CNMG-P

ISO catalogue number	D	L10	Re
CNMG120404P	12,70	12,90	0,4
CNMG120408P	12,70	12,90	0,8
CNMG120412P	12,70	12,90	1,2
CNMG190612P	19,05	19,34	1,2

	P	M	K	N	S	H
KCP05B	●		○			
KCP05	●		○			
KCP10B	●		○			
KCP10	●		○			
KCP25B	●		○			
KCP25	●		○			
KCP30B	●		○			
KCP30	●		○			
KCP40B	●		○			
KCP40	●		○			
KCK05B	○	○				
KCK05	○	○				
KCK15B	○	○				
KCK15	○	○				
KCK20B	○	○				
KCK20	○	○				
KCM15B	○	○				
KCM15	○	○				
KCM25B	○	○				
KCM25	○	○				
KCM35B	○	○				
KCM35	○	○				
KCPK05	○	○				
K313	○	○				
K68	○	○				
KCU10	○	○				
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KC5010	○	○				
KC5025	○	○				
KC5410	○	○				
KT315	○	○				

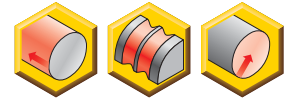
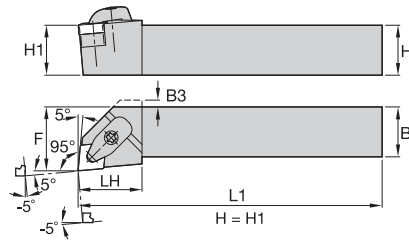
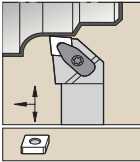
ISO Turning



■ DCKN-KC 75°

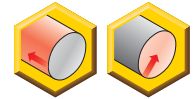
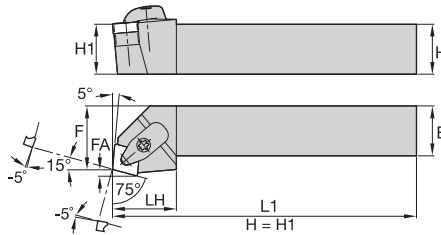
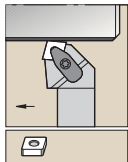


order number	catalogue number	H	B	F	L1	LH	L1A	B3	gage insert	shim	shim screw	Torx Plus	clamp assembly	Torx Plus	slotted pin	optional lock pin
right hand																
2273083	DCKNR2020K12KC04	20	20	25,0	125	32,0	3,1	6,0	CN..120408	ICSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM4615IP
1875200	DCKNR2525M12KC04	25	25	32,0	150	32,0	3,1	—	CN..120408	ICSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM4615IP
2273084	DCKNR3225P12KC04	32	25	32,0	170	32,0	3,1	—	CN..120408	ICSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP
2273085	DCKNR3232P16KC06	32	32	40,0	170	32,0	3,8	—	CN..160612	ICSN543	KMSP515IP	15 IP	CM209R ASSY	15 IP	SSP025016M	KLM58L15IP
left hand																
2273087	DCKNL2020K12KC04	20	20	25,0	125	32,0	3,1	6,0	CN..120408	ICSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM4615IP
1875204	DCKNL2525M12KC04	25	25	32,0	150	32,0	3,1	—	CN..120408	ICSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM4615IP
2273088	DCKNL3225P12KC04	32	25	32,0	170	32,0	3,1	—	CN..120408	ICSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP


■ DCLN-KC 95°


order number	catalogue number	H	B	F	L1	LH	B3	gage insert	shim	shim screw	Torx Plus	clamp assembly	Torx Plus	slotted pin	optional lock pin
right hand															
2417296	DCLNR1616H09KC03	16	16	20,0	100	30,0	6,0	CN..090308	ICSN332	KMSP315IP	9 IP	CM234R ASSY	15 IP	SSP025016M	KLM34L9IP
1875199	DCLNR2020K12KC04	20	20	25,0	125	32,0	4,0	CN..120408	ICSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM4615IP
1875193	DCLNR2525M12KC04	25	25	32,0	150	32,0	—	CN..120408	ICSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP
1875212	DCLNR2525M16KC06	25	25	32,0	150	33,0	—	CN..160612	ICSN543	KMSP515IP	15 IP	CM209R ASSY	15 IP	SSP025016M	KLM58L15IP
1875223	DCLNR3225P12KC04	32	25	32,0	170	32,0	—	CN..120408	ICSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP
1875232	DCLNR3225P16KC06	32	25	32,0	170	33,0	—	CN..160612	ICSN543	KMSP515IP	15 IP	CM209R ASSY	15 IP	SSP025016M	KLM58L15IP
1875224	DCLNR3232P16KC06	32	32	40,0	170	33,0	—	CN..160612	ICSN543	KMSP515IP	15 IP	CM209R ASSY	15 IP	SSP025016M	KLM58L15IP
2273091	DCLNR3232P19KC06	32	32	40,0	170	40,0	—	CN..190612	ICSN643	KMSP625IP	25 IP	CM210R ASSY	25 IP	SSP025016M	KLM68L25IP
2273092	DCLNR4040S19KC06	40	40	50,0	250	40,0	—	CN..190612	ICSN643	KMSP625IP	25 IP	CM210R ASSY	25 IP	SSP025016M	KLM68L25IP
left hand															
1875194	DCLNL2020K12KC04	20	20	25,0	125	32,0	4,0	CN..120408	ICSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM4615IP
1875196	DCLNL2525M12KC04	25	25	32,0	150	32,0	—	CN..120408	ICSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP
1875205	DCLNL2525M16KC06	25	25	32,0	150	33,0	—	CN..160612	ICSN543	KMSP515IP	15 IP	CM209R ASSY	15 IP	SSP025016M	KLM58L15IP
1875231	DCLNL3225P12KC04	32	25	32,0	170	32,0	—	CN..120408	ICSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP
1875230	DCLNL3225P16KC06	32	25	32,0	170	33,0	—	CN..160612	ICSN543	KMSP515IP	15 IP	CM209R ASSY	15 IP	SSP025016M	KLM58L15IP
1875225	DCLNL3232P16KC06	32	32	40,0	170	33,0	—	CN..160612	ICSN543	KMSP515IP	15 IP	CM209R ASSY	15 IP	SSP025016M	KLM58L15IP
2273093	DCLNL3232P19KC06	32	32	40,0	170	40,0	—	CN..190612	ICSN643	KMSP625IP	25 IP	CM210R ASSY	25 IP	SSP025016M	KLM68L25IP
2273094	DCLNL4040S19KC06	40	40	50,0	250	40,0	—	CN..190612	ICSN643	KMSP625IP	25 IP	CM210R ASSY	25 IP	SSP025016M	KLM68L25IP

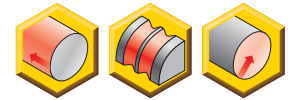
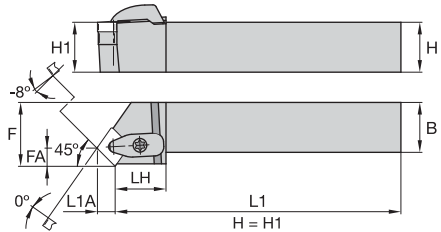
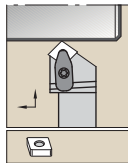
ISO Turning



■ **DCRN-KC 75°**



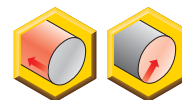
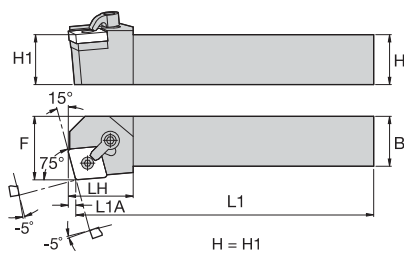
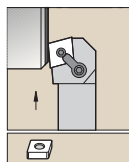
order number	catalogue number	H	B	F	L1	LH	FA	gage insert	shim	shim screw	Torx Plus	clamp assembly	Torx Plus	slotted pin	optional lock pin
right hand															
1875226	DCRNR2020K12KC04	20	20	25,0	125	32,0	3,3	CN..120408	ICSN433 KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM4615IP	
1875201	DCRNR2525M12KC04	25	25	32,0	150	32,0	3,3	CN..120408	ICSN443 KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP	
2273095	DCRNR3225P12KC04	32	25	32,0	170	32,0	3,3	CN..120408	ICSN443 KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP	
2273097	DCRNR3232P19KC06	32	32	40,0	170	38,0	4,9	CN..190612	ICSN643 KMSP625IP	25 IP	CM210R ASSY	25 IP	SSP025016M	KLM68L25IP	
left hand															
1875206	DCRNL2525M12KC04	25	25	32,0	150	32,0	3,3	CN..120408	ICSN443 KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP	
2273099	DCRNL3232P16KC06	32	32	40,0	170	38,0	4,1	CN..160612	ICSN543 KMSP515IP	15 IP	CM209R ASSY	15 IP	SSP025016M	KLM58L15IP	



■ **DCSN-KC 45°**



order number	catalogue number	H	B	F	L1	LH	FA	L1A	gage insert	shim	shim screw	Torx Plus	clamp assembly	Torx Plus	slotted pin	optional lock pin
right hand																
2273101	DCSNR2020K12KC04	20	20	25,0	125	35,0	8,2	8,5	CN..120408	ICSN433 KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM4615IP	
2273102	DCSNR2525M12KC04	25	25	32,0	150	35,0	8,2	8,5	CN..120408	ICSN443 KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP	
left hand																
2273104	DCSNL2525M12KC04	25	25	32,0	150	35,0	8,2	8,5	CN..120408	ICSN443 KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP	



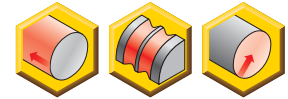
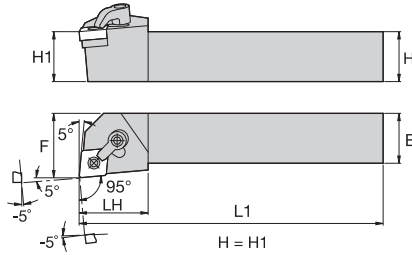
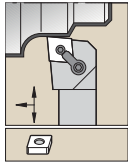
ISO Turning

MCKN 75°

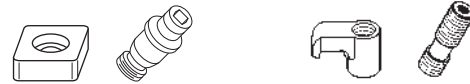

order number	catalogue number	H	B	F	L1	LH	L1A	gage insert	shim	lock pin	hex	clamp	clamp screw	hex	
right hand															
1102236	MCKNR2525M12	25	25	32,0	150	32,0	3,1	CN..120408	ICSN432	KLM46	2.5 mm	CKM21	STCM20	3 mm	
1102237	MCKNR3225P12	32	25	32,0	170	32,0	3,1	CN..120408	ICSN432	KLM46	2.5 mm	CKM21	STCM20	3 mm	
1102240	MCKNR3225P16	32	25	32,0	170	33,0	3,6	CN..160612	ICSN533	KLM58	3 mm	CKM21	STCM20	3 mm	
left hand															
1102729	MCKNL2525M12	25	25	32,0	150	32,0	3,1	CN..120408	ICSN432	KLM46	2.5 mm	CKM21	STCM20	3 mm	
1099253	MCKNL3225P16	32	25	32,0	170	33,0	3,6	CN..160612	ICSN533	KLM58	3 mm	CKM21	STCM20	3 mm	
1102728	MCKNL3232P19	32	32	40,0	170	38,0	4,4	CN..190612	ICSN633	KLM68	4 mm	CKM12	STCM4	4 mm	



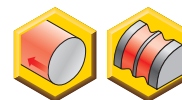
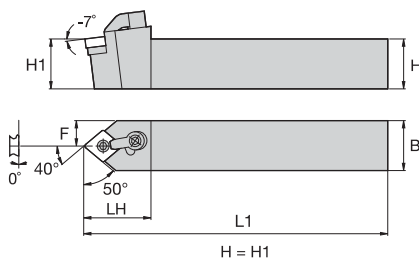
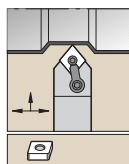
ISO Turning



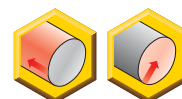
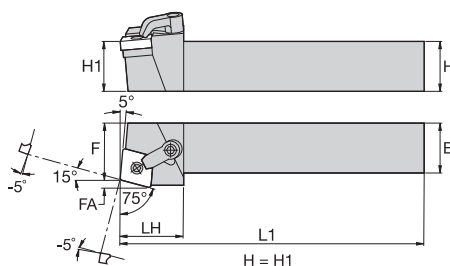
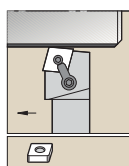
■ **MCLN 95°**



order number	catalogue number	H	B	F	L1	LH	gage insert	shim	lock pin	hex	clamp	clamp screw	hex
right hand													
1100939	MCLNR1616H09	16	16	20,0	100	25,0	CN..090308	—	KLM33	2 mm	CKM6	STCM5	2.5 mm
1101710	MCLNR1616H12	16	16	20,0	100	32,0	CN..120408	ICSN432	KLM46	2.5 mm	CKM21	STCM20	3 mm
1099132	MCLNR2020K09	20	20	25,0	125	25,0	CN..090308	ICSN332	KLM34L	2 mm	CKM6	STCM5	2.5 mm
1099133	MCLNR2020K12	20	20	25,0	125	32,0	CN..120408	ICSN432	KLM46	2.5 mm	CKM21	STCM20	3 mm
1100943	MCLNR2525M09	25	25	32,0	150	25,0	CN..090308	ICSN332	KLM34L	2 mm	CKM6	STCM5	2.5 mm
1101711	MCLNR2525M12	25	25	32,0	150	32,0	CN..120408	ICSN432	KLM46	2.5 mm	CKM21	STCM20	3 mm
1101641	MCLNR2525M16	25	25	32,0	150	33,0	CNMA160612	ICSN533	KLM58	3 mm	CKM21	STCM20	3 mm
1101704	MCLNR2525M19	25	25	32,0	150	38,0	CN..190612	ICSN633	KLM68	4 mm	CKM12	STCM4	4 mm
1101712	MCLNR3225P12	32	25	32,0	170	32,0	CN..120408	ICSN432	KLM46	2.5 mm	CKM21	STCM20	3 mm
1101642	MCLNR3225P16	32	25	32,0	170	33,0	CN..160612	ICSN533	KLM58	3 mm	CKM21	STCM20	3 mm
1101705	MCLNR3225P19	32	25	32,0	170	38,0	CN..190612	ICSN633	KLM68	4 mm	CKM12	STCM4	4 mm
3595785	MCLNR3232P12	32	32	40,5	171	32,0	CN..120408	ICSN432	KLM46	2.5 mm	CKM21	STCM20	3 mm
3595787	MCLNR3232P16	32	32	40,5	171	33,0	CN..160612	ICSN533	KLM58	3 mm	CKM21	STCM20	3 mm
1101706	MCLNR3232P19	32	32	40,0	170	38,0	CN..190612	ICSN633	KLM68	4 mm	CKM12	STCM4	4 mm
1101707	MCLNR4040R19	40	40	50,0	200	38,0	CN..190612	ICSN633	KLM68	4 mm	CKM12	STCM4	4 mm
left hand													
1100938	MCLNL1616H09	16	16	20,0	100	25,0	CN..090308	—	KLM33	2 mm	CKM6	STCM5	2.5 mm
1102539	MCLNL1616H12	16	16	20,0	100	32,0	CN..120408	ICSN432	KLM46	2.5 mm	CKM21	STCM20	3 mm
1102540	MCLNL2020K12	20	20	25,0	125	32,0	CN..120408	ICSN432	KLM46	2.5 mm	CKM21	STCM20	3 mm
1102541	MCLNL2525M12	25	25	32,0	150	32,0	CN..120408	ICSN432	KLM46	2.5 mm	CKM21	STCM20	3 mm
1102440	MCLNL2525M16	25	25	32,0	150	33,0	CNMA160612	ICSN533	KLM58	3 mm	CKM21	STCM20	3 mm
1102534	MCLNL2525M19	25	25	32,0	150	38,0	CN..190612	ICSN633	KLM68	4 mm	CKM12	STCM4	4 mm
1102542	MCLNL3225P12	32	25	32,0	170	32,0	CN..120408	ICSN432	KLM46	2.5 mm	CKM21	STCM20	3 mm
1102442	MCLNL3225P16	32	25	32,0	170	33,0	CN..160612	ICSN533	KLM58	3 mm	CKM21	STCM20	3 mm
1102535	MCLNL3225P19	32	25	32,0	170	38,0	CN..190612	ICSN633	KLM68	4 mm	CKM12	STCM4	4 mm
3595786	MCLNL3232P12	32	32	40,5	171	32,0	CN..120408	ICSN432	KLM46	2.5 mm	CKM21	STCM20	3 mm
3595788	MCLNL3232P16	32	32	40,5	171	33,0	CN..160612	ICSN533	KLM58	3 mm	CKM21	STCM20	3 mm
1102536	MCLNL3232P19	32	32	40,0	170	38,0	CN..190612	ICSN633	KLM68	4 mm	CKM12	STCM4	4 mm
1102537	MCLNL4040R19	40	40	50,0	200	38,0	CN..190612	ICSN633	KLM68	4 mm	CKM12	STCM4	4 mm

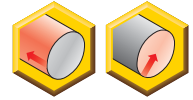
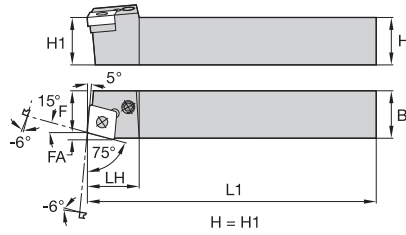
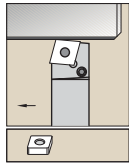

MCMN 50°

order number	catalogue number	H	B	F	L1	LH	gage insert	shim	lock pin	hex	clamp	clamp screw	hex
1101708	MCMNN2020K12	61	20	10,0	125	32,0	CN..120408	ICSN432	KLM46	2.5 mm	CKM21	STCM20	3 mm
1101709	MCMNN2525M12	86	25	12,9	150	32,0	CN..120408	ICSN432	KLM46	2.5 mm	CKM21	STCM20	3 mm
1102538	MCMNN3225P16	94	32	12,9	170	38,0	CN..160612	ICSN533	KLM58	3 mm	CKM21	STCM20	3 mm
1102239	MCMNN4040R19	117	40	20,0	200	42,0	CN..190612	ICSN633	KLM68	4 mm	CKM12	STCM4	4 mm

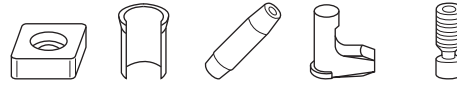

MCRN 75°

order number	catalogue number	H	B	F	L1	LH	FA	gage insert	shim	lock pin	hex	clamp	clamp screw	hex
right hand														
1101638	MCRNR2020K12	20	20	25,0	125	32,0	3,3	CN..120408	ICSN432	KLM46	2.5 mm	CKM21	STCM20	3 mm
1101639	MCRNR2525M12	25	25	32,0	150	32,0	3,3	CN..120408	ICSN432	KLM46	2.5 mm	CKM21	STCM20	3 mm
1101640	MCRNR3225P12	32	25	32,0	170	32,0	3,3	CN..120408	ICSN432	KLM46	2.5 mm	CKM21	STCM20	3 mm
1102732	MCRNR3232P16	32	32	32,0	170	33,0	4,2	CN..160612	ICSN533	KLM58	3 mm	CKM21	STCM20	3 mm
1101643	MCRNR3232P19	32	32	40,0	170	38,0	4,6	CN..190612	ICSN633	KLM68	4 mm	CKM12	STCM4	4 mm
left hand														
1102437	MCRNL2525M12	25	25	32,0	150	32,0	3,3	CN..120408	ICSN432	KLM46	2.5 mm	CKM21	STCM20	3 mm
1102439	MCRNL3225P12	32	25	32,0	170	32,0	3,3	CN..120408	ICSN432	KLM46	2.5 mm	CKM21	STCM20	3 mm
1102241	MCRNL3232P16	32	32	32,0	170	33,0	4,2	CN..160612	ICSN533	KLM58	3 mm	CKM21	STCM20	3 mm
1102443	MCRNL3232P19	32	32	40,0	170	38,0	4,6	CN..190612	ICSN633	KLM68	4 mm	CKM12	STCM4	4 mm

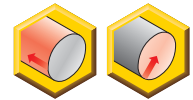
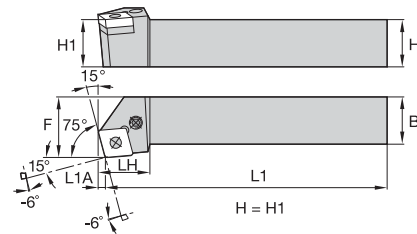
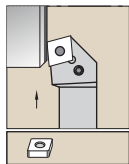
ISO Turning



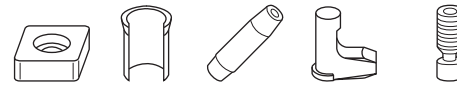
■ PCBN 75°



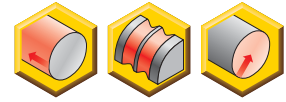
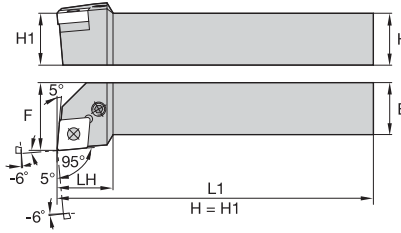
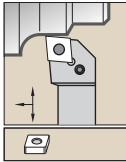
order number	catalogue number	H	B	F	L1	LH	FA	gage insert	shim	shim pin	punch pin	lever	lever screw	Torx Plus
right hand														
1244779	PCBNR2525M12	25	25	22,0	150	26,0	3,1	CN..120408	512.112	513.023	515.018	511.023	514.123	15 IP
1244635	PCBNR2525M16	25	25	22,0	150	28,0	4,2	CN..160612	512.117	513.025	515.022	511.025	514.125	15 IP
1244636	PCBNR3225P12	32	25	22,0	170	28,0	3,1	CN..120408	512.112	513.023	515.018	511.023	514.123	15 IP
1244637	PCBNR3225P16	32	25	22,0	170	28,0	4,2	CN..160612	512.117	513.025	515.022	511.025	514.125	15 IP
1244638	PCBNR3232P16	32	32	27,0	170	38,0	4,2	CN..160612	512.117	513.025	515.022	511.025	514.125	15 IP
1244795	PCBNR3232P19	32	32	27,0	170	38,0	4,6	CN..190612	512.123	513.033	515.022	511.033	514.133	25 IP
1192373	PCBNR4040S19	40	40	35,0	250	38,0	4,6	CN..190612	512.123	513.033	515.022	511.033	514.133	25 IP
left hand														
1244630	PCBNL2020K12	20	20	17,0	125	26,0	3,1	CN..120408	512.112	513.023	515.018	511.023	514.123	15 IP
1244859	PCBNL2525M12	25	25	22,0	150	26,0	3,1	CN..120408	512.112	513.023	515.018	511.023	514.123	15 IP
1244631	PCBNL2525M16	25	25	22,0	150	28,0	4,2	CN..160612	512.117	513.025	515.022	511.025	514.125	15 IP
1244794	PCBNL3232P16	32	32	27,0	170	38,0	4,2	CN..160612	512.117	513.025	515.022	511.025	514.125	15 IP
1244633	PCBNL3232P19	32	32	27,0	170	38,0	4,6	CN..190612	512.123	513.033	515.022	511.033	514.133	25 IP
1192372	PCBNL4040S19	40	40	35,0	250	38,0	4,6	CN..190612	512.123	513.033	515.022	511.033	514.133	25 IP



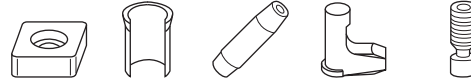
■ PCKN 75°



order number	catalogue number	H	B	F	L1	LH	L1A	gage insert	shim	shim pin	punch pin	lever	lever screw	Torx Plus
right hand														
1244649	PCKNR2020K12	20	20	25,0	125	23,0	3,1	CN..120408	512.112	513.023	515.018	511.023	514.123	15 IP
1244797	PCKNR2525M12	25	25	32,0	150	23,0	3,1	CN..120408	512.112	513.023	515.018	511.023	514.123	15 IP
1244775	PCKNR2525M16	25	25	32,0	150	30,0	3,8	CN..160612	512.117	513.025	515.022	511.025	514.125	15 IP
1244650	PCKNR3225P12	32	25	32,0	170	26,0	3,1	CN..120408	512.112	513.023	515.018	511.023	514.123	15 IP
1244776	PCKNR3225P16	32	25	32,0	170	30,0	3,8	CN..160612	512.117	513.025	515.022	511.025	514.125	15 IP
1244798	PCKNR3232P19	32	32	40,0	170	37,5	4,6	CN..190612	512.123	513.033	515.022	511.033	514.133	25 IP
left hand														
1244646	PCKNL2020K12	20	20	25,0	125	23,0	3,1	CN..120408	512.112	513.023	515.018	511.023	514.123	15 IP
1244780	PCKNL2525M12	25	25	32,0	150	23,0	3,1	CN..120408	512.112	513.023	515.018	511.023	514.123	15 IP
1244647	PCKNL3225P12	32	25	32,0	170	26,0	3,1	CN..120408	512.112	513.023	515.018	511.023	514.123	15 IP
1244777	PCKNL3225P16	32	25	32,0	170	30,0	3,8	CN..160612	512.117	513.025	515.022	511.025	514.125	15 IP
1244648	PCKNL3232P19	32	32	40,0	170	37,5	4,6	CN..190612	512.123	513.033	515.022	511.033	514.133	25 IP



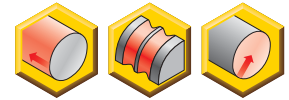
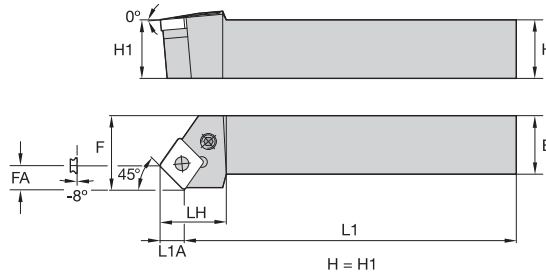
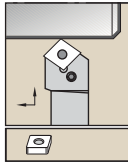
■ PCLN 95°



order number	catalogue number	H	B	F	L1	LH	gage insert	shim	shim pin	punch pin	lever	lever screw	Torx Plus
right hand													
1244809	PCLNR1616H12	16	16	20,0	100	26,0	CN..120408	512.112	513.023	515.018	511.023	514.123	15 IP
1244810	PCLNR2020K12	20	20	25,0	125	26,0	CN..120408	512.112	513.023	515.018	511.023	514.123	15 IP
1108097	PCLNR2525M12	25	25	32,0	150	26,0	CN..120408	512.112	513.023	515.018	511.023	514.123	15 IP
1192378	PCLNR2525M16	25	25	32,0	150	28,0	CN..160612	512.117	513.025	515.022	511.025	514.125	15 IP
1244652	PCLNR2525M19	25	25	32,0	150	36,0	CN..190612	512.123	513.033	515.022	511.033	514.133	25 IP
1244811	PCLNR3225P12	32	25	32,0	170	26,0	CN..120408	512.112	513.023	515.018	511.023	514.123	15 IP
1244812	PCLNR3225P16	32	25	32,0	170	38,0	CN..160612	512.117	513.025	515.022	511.025	514.125	15 IP
1244653	PCLNR3225P19	32	25	32,0	170	38,0	CN..190612	512.123	513.033	515.022	511.033	514.133	25 IP
1236864	PCLNR3232P16	32	32	40,0	170	36,0	CN..160612	512.117	513.025	515.022	511.025	514.125	15 IP
1244813	PCLNR3232P19	32	32	40,0	170	36,0	CN..190612	512.123	513.033	515.022	511.033	514.133	25 IP
1192379	PCLNR4040S19	40	40	50,0	250	36,0	CN..190612	512.123	513.033	515.022	511.033	514.133	25 IP
left hand													
1244799	PCLNL1616H12	16	16	20,0	100	26,0	CN..120408	512.112	513.023	515.018	511.023	514.123	15 IP
1156962	PCLNL2020K12	20	20	25,0	125	26,0	CN..120408	512.112	513.023	515.018	511.023	514.123	15 IP
1192375	PCLNL2525M12	25	25	32,0	150	26,0	CN..120408	512.112	513.023	515.018	511.023	514.123	15 IP
1192376	PCLNL2525M16	25	25	32,0	150	28,0	CN..160612	512.117	513.025	515.022	511.025	514.125	15 IP
1244800	PCLNL2525M19	25	25	32,0	150	36,0	CN..190612	512.123	513.033	515.022	511.033	514.133	25 IP
1244858	PCLNL3225P12	32	25	32,0	170	26,0	CN..120408	512.112	513.023	515.018	511.023	514.123	15 IP
1244802	PCLNL3225P16	32	25	32,0	170	38,0	CN..160612	512.117	513.025	515.022	511.025	514.125	15 IP
1244803	PCLNL3225P19	32	25	32,0	170	38,0	CN..190612	512.123	513.033	515.022	511.033	514.133	25 IP
1244804	PCLNL3232P16	32	32	40,0	170	36,0	CN..160612	512.117	513.025	515.022	511.025	514.125	15 IP
1244805	PCLNL3232P19	32	32	40,0	170	36,0	CN..190612	512.123	513.033	515.022	511.033	514.133	25 IP
1192377	PCLNL4040S19	40	40	50,0	250	36,0	CN..190612	512.123	513.033	515.022	511.033	514.133	25 IP



ISO Turning

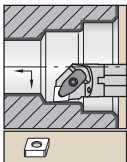


■ PCSN 45°

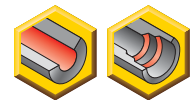
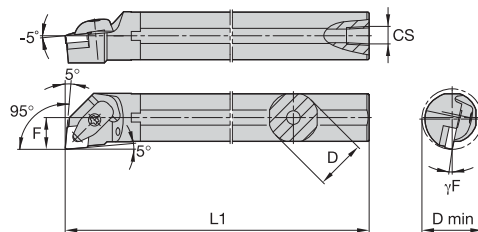


order number	catalogue number	H	B	F	L1	LH	FA	L1A	gage insert	shim	shim pin	punch pin	lever	lever screw	Torx Plus
right hand															
1244656	PCSNR2020K12	20	20	25,0	125	26,0	8,3	8,5	CN..120408	512.112	513.023	515.018	511.023	514.123	15 IP
1244818	PCSNR2525M12	25	25	32,0	150	28,0	8,3	8,5	CN..120408	512.112	513.023	515.018	511.023	514.123	15 IP
1244657	PCSNR3225P12	32	25	32,0	170	29,0	8,3	8,5	CN..120408	512.112	513.023	515.018	511.023	514.123	15 IP
1244819	PCSNR3232P19	32	32	40,0	170	37,5	12,5	12,7	CN..190612	512.123	513.033	515.022	511.033	514.133	25 IP
left hand															
1244654	PCSNL2020K12	20	20	25,0	125	26,0	8,3	8,5	CN..120408	512.112	513.023	515.018	511.023	514.123	15 IP
1244655	PCSNL2525M12	25	25	32,0	150	28,0	8,3	8,5	CN..120408	512.112	513.023	515.018	511.023	514.123	15 IP
1284109	PCSNL3225P12	32	25	32,0	170	29,0	8,3	8,5	CN..120408	512.112	513.023	515.018	511.023	514.123	15 IP
1244817	PCSNL3232P19	32	32	40,0	170	37,5	12,5	12,7	CN..190612	512.123	513.033	515.022	511.033	514.133	25 IP

Kenclamp™ Boring Bars



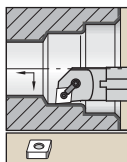
Steel shank with through coolant.



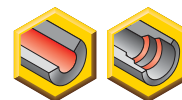
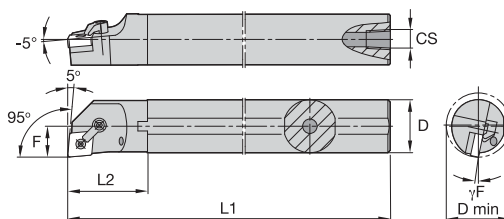
■ A-DCLN-KC 95°



order number	catalogue number	D	D min	F	L1	CS	γF°	gage insert	shim	shim screw	Torx Plus	clamp assembly	slotted pin	Torx Plus	
right hand															
2441867	A25RDCLNR12KC04	25	32,0	17,0	200	1/4-18 NPT	-12,0	CN.120408	—	—	15 IP	CM234R ASSY	SSP025016M	15 IP	
2441931	A32SDCLNR12KC04	32	40,0	22,0	250	1/4-18 NPT	-12,0	CN.120408	ICSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP	
2441933	A40TDCLNR12KC04	40	50,0	27,0	300	1/4-18 NPT	-9,0	CN..120408	ICSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP	
left hand															
2441930	A25RDCLNL12KC04	25	32,0	17,0	200	1/4-18 NPT	-12,0	CN.120408	—	—	15 IP	CM234R ASSY	SSP025016M	15 IP	
2441932	A32SDCLNL12KC04	32	40,0	22,0	250	1/4-18 NPT	-12,0	CN.120408	ICSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP	
2441934	A40TDCLNL12KC04	40	50,0	27,0	300	1/4-18 NPT	-9,0	CN.120408	ICSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP	
2441938	A40TDCLNL16KC06	40	50,0	27,0	300	1/4-18 NPT	-12,0	CN..160612	ICSN533	KMSP515IP	15 IP	CM209R ASSY	SSP025018M	15 IP	



Steel shank with through coolant.



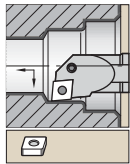
■ **A-MCLN 95°**



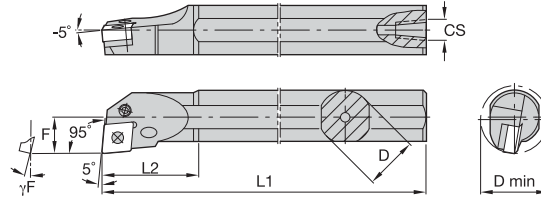
order number	catalogue number	D	D min	F	L1	L2	CS	γF°	gage insert	shim	lock pin	hex	clamp	clamp screw	hex
right hand															
1098767	A25RMCLNR09	25	32,0	17,0	200	40,0	1/4-18 NPT	-12.0	CN..090308	—	KLM33	2 mm	CKM6	STCM5	2.5 mm
1098088	A25RMCLNR12	25	32,0	17,0	200	33,0	1/4-18 NPT	-12.0	CN..120408	—	KLM43	2 mm	CKM21	STCM11	3 mm
1098090	A32SMCLNR12	32	40,0	22,0	250	—	1/4-18 NPT	-12.0	CN..120408	ICSN432	KLM46	2.5 mm	CKM21	STCM20	3 mm
1098092	A40TMCLNR12	40	50,0	27,0	300	—	1/4-18 NPT	-12.0	CN..120408	ICSN432	KLM46	2.5 mm	CKM21	STCM20	3 mm
1098096	A40TMCLNR16	40	50,0	27,0	300	—	1/4-18 NPT	-11.0	CN..160612	ICSN533	KLM58	3 mm	CKM21	STCM20	3 mm
1098094	A50UMCLNR12	50	63,0	35,0	350	—	1/4-18 NPT	-12.0	CN..120408	ICSN432	KLM46	2.5 mm	CKM21	STCM20	3 mm
1098098	A50UMCLNR16	50	63,0	35,0	350	—	1/4-18 NPT	-12.0	CN..160608	ICSN533	KLM58	3 mm	CKM21	STCM20	3 mm
1098100	A50UMCLNR19	50	63,0	35,0	350	—	1/4-18 NPT	-12.0	CN..190608	ICSN633	KLM68	4 mm	CKM12	STCM4	4 mm
left hand															
1098089	A25RMCLNL12	25	32,0	17,0	200	33,0	1/4-18 NPT	-12.0	CN..120408	—	KLM43	2 mm	CKM21	STCM11	3 mm
1098091	A32SMCLNL12	32	40,0	22,0	250	—	1/4-18 NPT	-12.0	CN..120408	ICSN432	KLM46	2.5 mm	CKM21	STCM20	3 mm
1098093	A40TMCLNL12	40	50,0	27,0	300	—	1/4-18 NPT	-12.0	CN..120408	ICSN432	KLM46	2.5 mm	CKM21	STCM20	3 mm
1098097	A40TMCLNL16	40	50,0	27,0	300	—	1/4-18 NPT	-11.0	CN..160608	ICSN533	KLM58	3 mm	CKM21	STCM20	3 mm
1098095	A50UMCLNL12	50	63,0	35,0	350	—	1/4-18 NPT	-7.0	CN..120408	ICSN432	KLM46	2.5 mm	CKM21	STCM20	3 mm
1098099	A50UMCLNL16	50	63,0	35,0	350	—	1/4-18 NPT	-12.0	CN..160608	ICSN533	KLM58	3 mm	CKM21	STCM20	3 mm
1098101	A50UMCLNL19	50	63,0	35,0	350	—	1/4-18 NPT	-12.0	CN..190608	ICSN633	KLM68	4 mm	CKM12	STCM4	4 mm



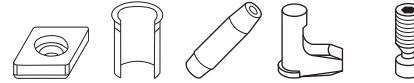
ISO Turning



Steel shank with through coolant.

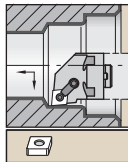


■ **A-PCLN 95°**

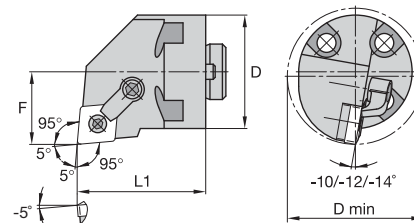


order number	catalogue number	D	D min	F	L1	L2	CS	γF°	gage insert	shim	shim pin	pin	toggle lever	lever screw	Torx Plus
right hand															
2447150	A25TPCLNR12	25	32,0	17,0	300	40	1/4-18 NPT	-12.0	CN..120408	—	—	—	511.022	514.122	10 IP
2447152	A32UPCLNR12	32	40,0	22,0	350	50	1/4-18 NPT	-10.0	CN..120408	512.112	513.023	515.018	511.023	514.123	15 IP
2447476	A32UPCLNR16	32	50,0	22,0	350	50	1/4-18 NPT	-10.0	CN..160612	512.117	513.025	515.022	511.025	514.125	15 IP
2447533	A40VPCLNR12	40	50,0	27,0	400	55	1/4-18 NPT	-10.0	CN..120408	512.112	513.023	515.018	511.023	514.123	15 IP
2447478	A40VPCLNR16	40	50,0	27,0	400	55	1/4-18 NPT	-11.0	CN..160612	512.117	513.025	515.022	511.025	514.125	15 IP
left hand															
2447151	A25TPCLNL12	25	32,0	17,0	300	40	1/4-18 NPT	-12.0	CN..120408	—	—	—	511.022	514.122	10 IP
2447473	A32UPCLNL12	32	40,0	22,0	350	50	1/4-18 NPT	-10.0	CN..120408	512.112	513.023	515.018	511.023	514.123	15 IP
2447534	A40VPCLNL12	40	50,0	27,0	400	55	1/4-18 NPT	-10.0	CN..120408	512.112	513.023	515.018	511.023	514.123	15 IP
2447479	A40VPCLNL16	40	50,0	27,0	400	55	1/4-18 NPT	-11.0	CN..160612	512.117	513.025	515.022	511.025	514.125	15 IP

Kenloc™ Boring Heads



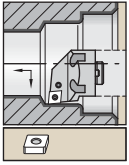
With through coolant.



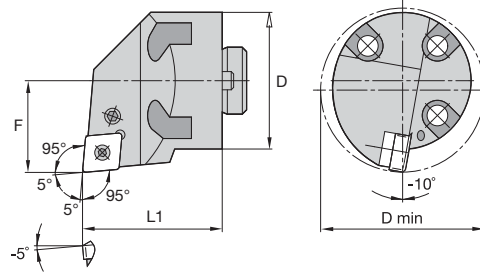
■ **H-MCLN 95°**



order number	catalogue number	D	D min	F	L1	gage insert	shim	lock pin	hex	clamp	clamp screw	hex
right hand												
3612156	H32MCLNR12	32	40,0	22,0	41	CN..120408	ICSN432	KLM46	2.5 mm	CKM21	STCM20	3 mm
3612178	H50MCLNR12	50	63,0	35,0	41	CN..120408	ICSN432	KLM46	2.5 mm	CKM20	STCM20	3 mm
1099102	H50MCLNR19	50	63,0	35,0	41	CN..190612	ICSN633	KLM68	4 mm	CKM12	STCM4	4 mm



With through coolant.



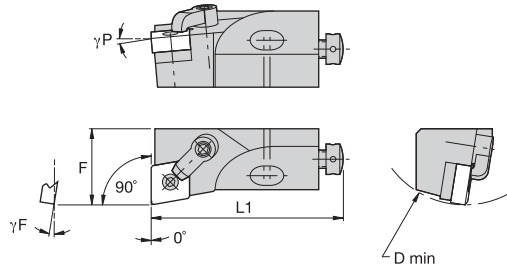
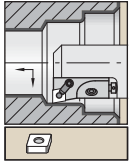
■ H-PCLN 95°



order number	catalogue number	D	D min	F	L1	gage insert	shim	shim pin	lever	punch pin	lever lock screw	hex
right hand												
1861493	H32PCLNR12	32	40,0	22,0	41	CN..120408	512.112	513.023	514.123	515.018	514.123	15 IP
1861500	H40PCLNR12	40	50,0	27,0	41	CN..120408	512.112	513.023	514.123	515.018	514.123	15 IP
1861517	H50PCLNR12	50	63,0	35,0	41	CN..120408	512.112	513.023	514.123	515.018	514.123	15 IP
left hand												
1861501	H40PCLNL12	40	50,0	27,0	41	CN..120408	512.112	513.023	514.123	515.018	514.123	15 IP
1861518	H50PCLNL12	50	63,0	35,0	41	CN..120408	512.112	513.023	514.123	515.018	514.123	15 IP



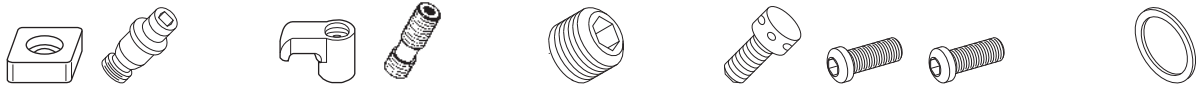
ISO Turning



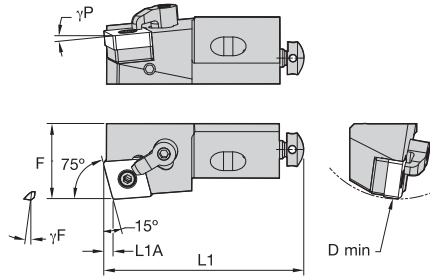
■ **MCFN 90°**

order number	catalogue number	D min	F	L1	γF°	γP°	gage insert
right hand							
3331146	MCFNR10CA09	40	14,0	50	-9.0	-9.0	CN..090308/CN..322
3346236	MCFNR12CA12	50	20,0	55	-9.0	-5.0	CN..120408/CN..432
2074433	MCFNR16CA12	60	25,0	63	-9.0	-5.0	CN..120408/CN..432
3330195	MCFNR20CA12	70	25,0	70	-9.0	-5.0	CN..120408/CN..432
left hand							
3331145	MCFNL10CA09	40	14,0	50	-9.0	-9.0	CN..090308/CN..322
1906272	MCFNL12CA12	50	20,0	55	-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	mounting screw	hex	washer
40	—	KLM33	2 mm	CKM36	STCM38	2 mm	KUAM28	2 mm	KUAM30	191.405	—	4 mm	CSWM 060 050
50	—	KLM43	2 mm	CKM34	STCM38	2 mm	KUAM22	2 mm	KUAM31	—	191.406	4 mm	CSWM 060 050
60	ICSN432	KLM46S	2.5 mm	CKM34	STCM9	2.5 mm	KUAM25	2.5 mm	KUAM32	—	191.407	5 mm	CSWM 080 050
70	ICSN432	KLM46	2.5 mm	CKM34	STCM9	2.5 mm	KUAM25	2.5 mm	KUAM32	—	191.407	5 mm	CSWM 080 050


MCKN 75°

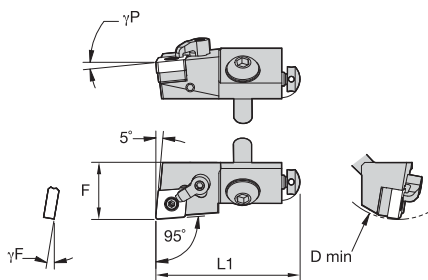
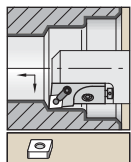
order number	catalogue number	D min	F	L1	L1A	γF°	γP°	gage insert
right hand								
3346238	MCKNR12CA12	50	20,0	55	3	-9.0	-5.0	CN..120408/CN..432
3330222	MCKNR16CA12	60	25,0	63	3	-9.0	-5.0	CN..120408/CN..432
left hand								
3346237	MCKNL12CA12	50	20,0	55	3	-9.0	-5.0	CN..120408/CN..432

Spare Parts


D min	shim	lock pin	hex	clamp	clamp screw	hex	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
50	—	KLM43	2 mm	CKM34	STCM38	2 mm	KUAM22	2 mm	KUAM31	191.406	4 mm	CSWM 060 050
60	ICSN432	KLM46S	2.5 mm	CKM34	STCM9	2.5 mm	KUAM25	2.5 mm	KUAM32	191.407	5 mm	CSWM 080 050



ISO Turning

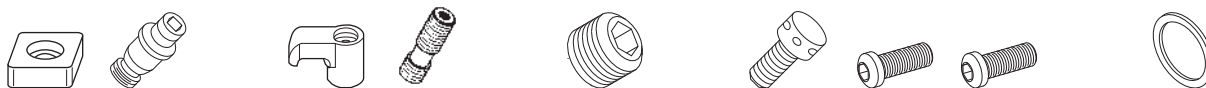


MCLN 95°

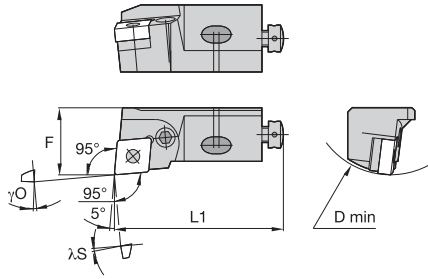
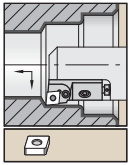
order number	catalogue number	D min	F	L1	γF°	γP°	gage insert
right hand							
1100493	MCLNR12CA12	50	20,0	55	-9.0	-5.0	CN..120408/CN..432
1282100	MCLNR16CA12	60	25,0	63	-9.0	-5.0	CN..120408/CN..432
3330197	MCLNR20CA12	70	25,0	70	-9.0	-5.0	CN..120408/CN..432
3332803	MCLNR25CA12	100	32,0	100	-9.0	-5.0	CN..120408/CN..432
3332804	MCLNR25CA16	100	32,0	100	-9.0	-5.0	CN..160612/CN..543
3332805	MCLNR25CA19	100	32,0	100	-9.0	-5.0	CN..190612/CN..643
left hand							
2077947	MCLNL12CA12	50	20,0	55	-9.0	-5.0	CN..120408/CN..432
3330273	MCLNL16CA12	60	25,0	63	-9.0	-5.0	CN..120408/CN..432
3330196	MCLNL20CA12	70	25,0	70	-9.0	-5.0	CN..120408/CN..432
3332362	MCLNL25CA19	100	32,0	100	-9.0	-5.0	CN..190612/CN..643

NOTE: Select spare parts based off of D min and the insert size selected.

Spare Parts



D min	shim	lock pin	hex	clamp	clamp screw	hex	radial adjusting screw	hex	axial adjusting screw	mounting screw	mounting screw	hex	washer
50	—	KLM43	2 mm	CKM34	STCM38	2 mm	KUAM22	2 mm	KUAM31	191.406	—	4 mm	CSWM 060 050
60	ICSN432	KLM46S	2.5 mm	CKM34	STCM9	2.5 mm	KUAM25	2.5 mm	KUAM32	191.407	—	5 mm	CSWM 080 050
70	ICSN432	KLM46	2.5 mm	CKM34	STCM9	2.5 mm	KUAM25	2.5 mm	KUAM32	191.407	—	5 mm	CSWM 080 050
100	ICSN633	KLM68	4 mm	CKM35	STCM8	4 mm	KUAM27	4 mm	KUAM32	—	MS364	8 mm	CSWM 100 080
100	ICSN432	KLM46	2.5 mm	CKM37	STCM40	2.5 mm	KUAM25	2.5 mm	KUAM32	—	MS364	8 mm	CSWM 100 080
100	ICSN533	KLM58	3 mm	CKM41	STCM20	3 mm	KUAM26	3 mm	KUAM32	—	MS364	8 mm	CSWM 100 080
100	ICSN633	KLM68	4 mm	CKM35	STCM8	4 mm	KUAM27	4 mm	KUAM32	—	MS364	8 mm	CSWM 100 080


■ PCLN 95°

order number	catalogue number	D min	F	L1	λS°	γO°	gage insert
right hand							
1244444	PCLNR12CA-12	50	20,0	55	-6.0	-9.0	CN..120408/CN..432
1244496	PCLNR16CA-12	60	25,0	63	-6.0	-7.0	CN..120408/CN..432
left hand							
1244443	PCLNL16CA-12	60	25,0	63	-6.0	-7.0	CN..120408/CN..432

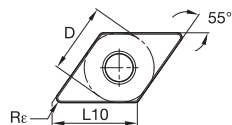
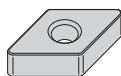
■ Spare Parts


D min	shim	shim pin	toggle lever	lever screw	wrench size lever screw	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
50	—	—	511.022	514.122	10 IP	KUAM28	2 mm	KUAM31	191.406	4 mm	CSWM 060 050
60	512.112	513.023	511.023	514.123	15 IP	KUAM23	2.5 mm	KUAM32	191.407	5 mm	CSWM 080 050

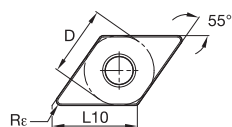
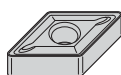


ISO Turning

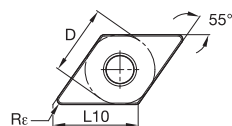
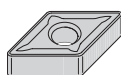
- first choice
- alternate choice


DNMA

ISO catalogue number	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
DNMA110408	9,53	11,63	0,8	●																														
DNMA150408	12,70	15,50	0,8																															
DNMA150608	12,70	15,50	0,8																															
DNMA150412	12,70	15,50	1,2																															
DNMA150612	12,70	15,50	1,2																															
DNMA150416	12,70	15,50	1,6																															

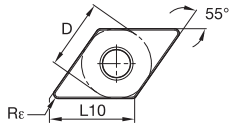
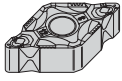

DNMG

ISO catalogue number	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
DNMG150408B	12,70	15,50	0,8																									●						


DNMG-33

ISO catalogue number	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
DNMG11040433	9,53	11,63	0,4																															●
DNMG11040833	9,53	11,63	0,8																															●
DNMG15060433	12,70	15,50	0,4																															●
DNMG15060833	12,70	15,50	0,8																															●

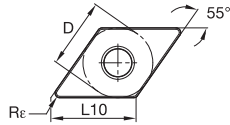
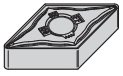
ISO Turning



- first choice
- alternate choice

■ DNMG-CT

ISO catalogue number	D	L10	Re
DNMG110412CT	9,53	11,62	1,2
DNMG110408CT	9,53	11,63	0,8
DNMG150604CT	12,70	15,50	0,3
DNMG150404CT	12,70	15,50	0,4
DNMG150408CT	12,70	15,50	0,8
DNMG150608CT	12,70	15,50	0,8
DNMG150412CT	12,70	15,50	1,2
DNMG150612CT	12,70	15,50	1,2

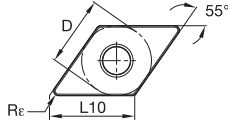


■ DNMG-FF

ISO catalogue number	D	L10	Re
DNMG110404FF	9,53	11,63	0,4
DNMG110408FF	9,53	11,63	0,8
DNMG150404FF	12,70	15,50	0,4
DNMG150604FF	12,70	15,50	0,4
DNMG150408FF	12,70	15,50	0,8
DNMG150608FF	12,70	15,50	0,8

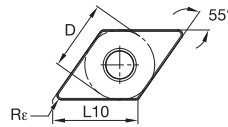
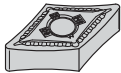
	P	M	K	N	S	H
KCP05B	●		○			
KCP05	●		○			
KCP10B	●		○			
KCP10	●		○			
KCP25B	●		○			
KCP25	●		○			
KCP30B	●		○			
KCP30	●		○			
KCP40B	●		○			
KCP40	●		○			
KCK05B	○	○				
KCK05	○	○				
KCK15B	○	○				
KCK15	○	○				
KCK20B	○	○				
KCK20	○	○				
KCM15B	○	○				
KCM15	○	○				
KCM25B	○	○				
KCM25	○	○				
KCM35B	○	○				
KCM35	○	○				
KCPK05	○	○				
K313				●	●	●
K68				●	●	●
KCU10				●	●	●
KCU25				●	●	●
KC5010				●	●	●
KC5025				●	●	●
KC5410				●	●	●
KT315				●	●	●

● first choice
○ alternate choice



■ DNMG-MP

ISO catalogue number	D	L10	Re
DNMG110408MP	9,53	11,63	0,8
DNMG110412MP	9,53	11,63	1,2
DNMG150404MP	12,70	15,50	0,4
DNMG150604MP	12,70	15,50	0,4
DNMG150408MP	12,70	15,50	0,8
DNMG150608MP	12,70	15,50	0,8
DNMG150412MP	12,70	15,50	1,2
DNMG150612MP	12,70	15,50	1,2



■ DNMG-MS

ISO catalogue number	D	L10	Re
DNMG110408MS	9,53	11,63	0,8
DNMG150401MS	12,70	15,50	0,1
DNMG150402MS	12,70	15,50	0,2
DNMG150404MS	12,70	15,50	0,4
DNMG150604MS	12,70	15,50	0,4
DNMG150408MS	12,70	15,50	0,8
DNMG150608MS	12,70	15,50	0,8
DNMG150412MS	12,70	15,50	1,2
DNMG150612MS	12,70	15,50	1,2

	P	M	K	N	S	H	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315			
DNMG110408MP	●	●	●	●	●	●	●																																	
DNMG110412MP	●	●	●	●	●	●	●																																	
DNMG150404MP	●	●	●	●	●	●	●																																	
DNMG150604MP	●	●	●	●	●	●	●																																	
DNMG150408MP	●	●	●	●	●	●	●				●																													
DNMG150608MP	●	●	●	●	●	●	●				●																													
DNMG150412MP	●	●	●	●	●	●	●																																	
DNMG150612MP	●	●	●	●	●	●	●				●																													
DNMG110408MS	●	●	●	●	●	●	●																																	
DNMG150401MS	●	●	●	●	●	●	●																																	
DNMG150402MS	●	●	●	●	●	●	●																																	
DNMG150404MS	●	●	●	●	●	●	●																																	
DNMG150604MS	●	●	●	●	●	●	●																																	
DNMG150408MS	●	●	●	●	●	●	●																																	
DNMG150608MS	●	●	●	●	●	●	●																																	
DNMG150412MS	●	●	●	●	●	●	●																																	
DNMG150612MS	●	●	●	●	●	●	●																																	

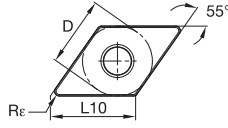
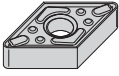


ISO Turning



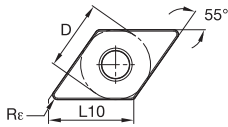
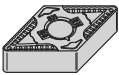
ISO Turning

- first choice
- alternate choice



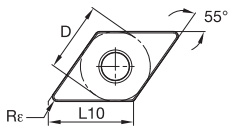
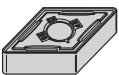
■ DNMG-P

ISO catalogue number	ISO catalogue number			KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
	D	L10	Rε																															
DNMG150404P	12,70	15,50	0,4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DNMG150408P	12,70	15,50	0,8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DNMG150608P	12,70	15,50	0,8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



■ DNMG-RN

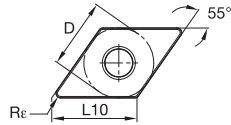
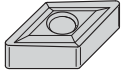
ISO catalogue number	ISO catalogue number			KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
	D	L10	Rε																															
DNMG150408RN	12,70	15,50	0,8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DNMG150608RN	12,70	15,50	0,8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DNMG150412RN	12,70	15,50	1,2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DNMG150612RN	12,70	15,50	1,2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DNMG150416RN	12,70	15,50	1,6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DNMG150616RN	12,70	15,50	1,6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DNMG190608RN	15,88	19,38	0,8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DNMG190612RN	15,88	19,38	1,2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



■ DNMG-RP

ISO catalogue number	ISO catalogue number			KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
	D	L10	Rε																															
DNMG110408RP	9,53	11,63	0,8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DNMG110412RP	9,53	11,63	1,2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DNMG150408RP	12,70	15,50	0,8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DNMG150608RP	12,70	15,50	0,8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DNMG150412RP	12,70	15,50	1,2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DNMG150612RP	12,70	15,50	1,2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DNMG150416RP	12,70	15,50	1,6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DNMG150616RP	12,70	15,50	1,6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

ISO Turning



- first choice
- alternate choice

■ DNMS

ISO catalogue number	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KCS010	KCS025	KCS410	KT315
DNMS150408	12,70	15,50	0,8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	●	-	-	-	-	●	-

Mobile Apps

The Kennametal mobile app provides easy access to product information and calculators on both iPhone® and Android™ devices. We've highlighted a few of the key features...

There's an app for that.

SPEEDS & FEEDS

View speeds and feeds information for metalworking products.

PRODUCT AVAILABILITY

Check global availability of products. View available quantities by providing your Konnect login credentials.

CALCULATORS

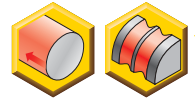
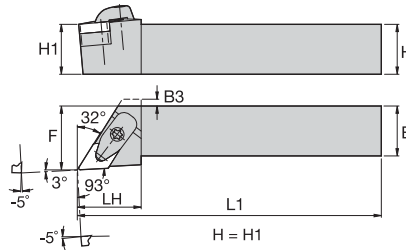
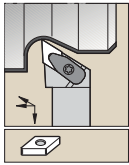
Utilise our machining calculators for milling and drilling applications.

➔ By just scanning the bar code on the insert packet, you can find the most productive cutting conditions for tool life, process time, and chip control.



NOTE: The app is currently only available in the English-language version. We have plans to translate the app in different languages with future releases.

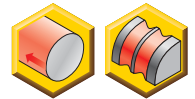
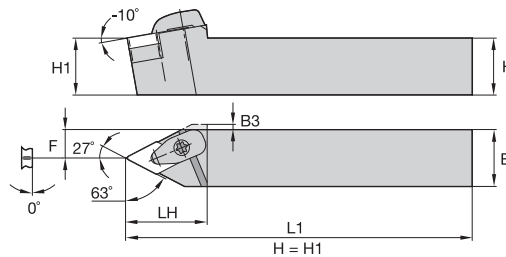
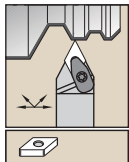




ISO Turning

DDJN-KC 93°

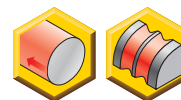
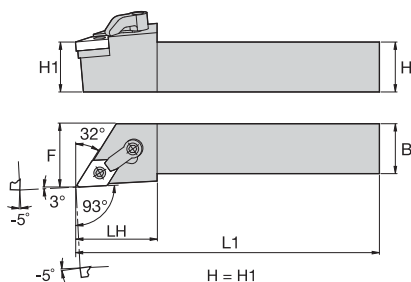
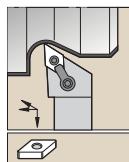

order number	catalogue number	H	B	F	L1	LH	B3	gage insert	shim	shim screw	Torx Plus	clamp assembly	Torx Plus	slotted pin	optional lock pin
right hand															
2273105	DDJNR2020K11KC04	20	20	25,0	125	30,0	2,0	DN..110408	IDSN322	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM34L9IP
1875197	DDJNR2020K15KC06	20	20	25,0	125	32,0	4,0	DN..150608	IDSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP
2273106	DDJNR2525M11KC04	25	25	32,0	150	30,0	—	DN..110408	IDSN322	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM34L9IP
1875191	DDJNR2525M15KC06	25	25	32,0	150	32,0	—	DN..150608	IDSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP
1875208	DDJNR3225P15KC06	32	25	32,0	170	32,0	—	DN..150608	IDSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP
1875227	DDJNR3232P15KC06	32	32	40,0	170	32,0	—	DN..150608	IDSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP
left hand															
2273107	DDJNL2020K11KC04	20	20	25,0	125	30,0	2,0	DN..110408	IDSN322	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM34L9IP
1875198	DDJNL2020K15KC06	20	20	25,0	125	32,0	4,0	DN..150608	IDSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP
2273108	DDJNL2525M11KC04	25	25	32,0	150	30,0	—	DN..110408	IDSN322	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM34L9IP
1875192	DDJNL2525M15KC06	25	25	32,0	150	32,0	—	DN..150608	IDSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP
1875207	DDJNL3225P15KC06	32	25	32,0	170	32,0	—	DN..150608	IDSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP
1875209	DDJNL3232P15KC06	32	32	40,0	171	32,0	—	DN..150608	IDSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP


DDNN-KC 63°


order number	catalogue number	H	B	F	L1	LH	B3	gage insert	shim	shim screw	Torx Plus	clamp assembly	Torx Plus	slotted pin	optional lock pin
right hand															
2273111	DDNNR2020K15KC06	20	20	10,0	125	40,0	2,5	DN..150608	IDSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP
2273112	DDNNR2525M15KC06	25	25	13,0	150	40,0	—	DN..150608	IDSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP



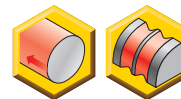
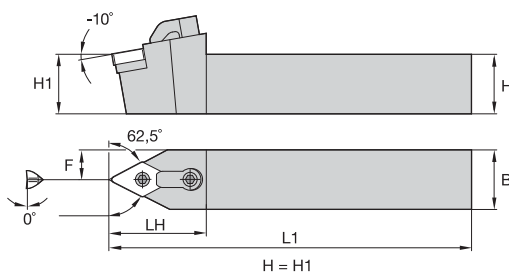
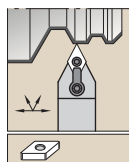
ISO Turning



■ MDJN 93°



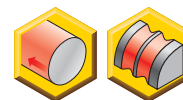
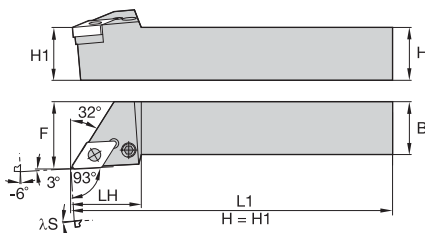
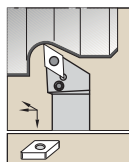
order number	catalogue number	H	B	F	L1	LH	gage insert	shim	lock pin	hex	clamp	clamp screw	hex
right hand													
1100936	MDJNR1616H11	16	16	20,0	100	32,0	DN..110408	IDSN322	KLM34L	2 mm	CKM7	STCM5	2.5 mm
1101286	MDJNR2020K11	20	20	25,0	125	32,0	DN..110408	IDSN322	KLM34L	2 mm	CKM7	STCM5	2.5 mm
1101356	MDJNR2020K15	20	20	25,0	125	36,0	DN..150608	IDSN432	KLM46L	2.5 mm	CKM22	STCM20	3 mm
1101288	MDJNR2525M11	25	25	32,0	150	32,0	DN..110408	IDSN322	KLM34L	2 mm	CKM7	STCM5	2.5 mm
1101357	MDJNR2525M15	25	25	32,0	150	36,0	DN..150608	IDSN432	KLM46L	2.5 mm	CKM22	STCM20	3 mm
1101358	MDJNR3225P15	32	25	32,0	170	36,0	DN..150608	IDSN432	KLM46L	2.5 mm	CKM22	STCM20	3 mm
3638550	MDJNR3232P15	32	32	40,5	173	32,0	DN..150608	IDSN432	KLM46L	2.5 mm	CKM22	STCM20	3 mm
left hand													
1101285	MDJNL2020K11	20	20	25,0	125	32,0	DN..110408	IDSN322	KLM34L	2 mm	CKM7	STCM5	2.5 mm
1101287	MDJNL2525M11	25	25	32,0	150	32,0	DN..110408	IDSN322	KLM34L	2 mm	CKM7	STCM5	2.5 mm
1102316	MDJNL2525M15	25	25	32,0	150	36,0	DN..150608	IDSN432	KLM46L	2.5 mm	CKM22	STCM20	3 mm
1102317	MDJNL3225P15	32	25	32,0	170	32,0	DN..150608	IDSN432	KLM46L	2.5 mm	CKM22	STCM20	3 mm
3638551	MDJNL3232P15	32	32	40,5	173	32,0	DN..150608	IDSN432	KLM46L	2.5 mm	CKM22	STCM20	3 mm



■ MDNN 62,5°



order number	catalogue number	H	B	F	L1	LH	gage insert	shim	lock pin	hex	clamp	clamp screw	hex
right hand													
1101636	MDNNR2525M15	68	25	12,5	150	41,0	DN..150608	IDSN432	KLM46L	2.5 mm	CKM22	STCM20	3 mm
1101637	MDNNR3225P15	88	32	12,5	170	41,0	DN..150608	IDSN432	KLM46L	2.5 mm	CKM22	STCM20	3 mm
left hand													
1102434	MDNNL2525M15	68	25	12,5	150	41,0	DN..150608	IDSN432	KLM46L	2.5 mm	CKM22	STCM20	3 mm
1102435	MDNNL3225P15	88	32	12,5	170	41,0	DN..150608	IDSN432	KLM46L	2.5 mm	CKM22	STCM20	3 mm



ISO Turning

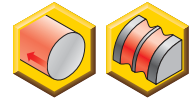
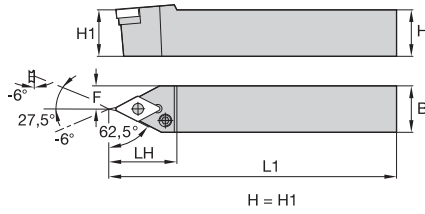
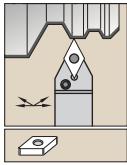
■ PDJN 93°



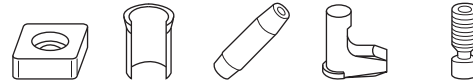
order number	catalogue number	H	B	F	L1	LH	λS°	gage insert	shim	shim pin	punch pin	lever	lever screw	Torx Plus
right hand														
1244752	PDJNR1616H11	16	16	20,0	100	24,0	-6,0	DN..110408	512.060	513.060	515.018	511.060	514.118	10 IP
1192382	PDJNR2020K11	20	20	25,0	125	30,0	-7,0	DN..110408	512.060	513.060	515.018	511.060	514.118	10 IP
1192383	PDJNR2020K15	20	20	25,0	125	36,0	-7,0	DN..150608	512.153	513.023	515.018	511.024	514.128	15 IP
1192384	PDJNR2525M11	25	25	32,0	150	30,0	-7,0	DN..110408	512.060	513.060	515.018	511.060	514.118	10 IP
1192385	PDJNR2525M15	25	25	32,0	150	36,0	-7,0	DN..150608	512.153	513.023	515.018	511.024	514.128	15 IP
1156969	PDJNR3225P15	32	25	32,0	170	36,0	-7,0	DN..150608	512.153	513.023	515.018	511.024	514.128	15 IP
1236865	PDJNR3232P15	32	32	40,0	170	36,0	-7,0	DN..150608	512.153	513.023	515.018	511.024	514.128	15 IP
1244784	PDJNR4025R15	40	25	32,0	200	36,0	-7,0	DN..150608	512.153	513.023	515.018	511.024	514.128	15 IP
left hand														
1244751	PDJNL1616H11	16	16	20,0	100	24,0	-6,0	DN..110408	512.060	513.060	515.018	511.060	514.118	10 IP
1244658	PDJNL2020K11	20	20	25,0	125	30,0	-7,0	DN..110408	512.060	513.060	515.018	511.060	514.118	10 IP
1244820	PDJNL2020K15	20	20	25,0	125	36,0	-7,0	DN..150608	512.153	513.023	515.018	511.024	514.128	15 IP
1192380	PDJNL2525M11	25	25	32,0	150	30,0	-7,0	DN..110408	512.060	513.060	515.018	511.060	514.118	10 IP
1156968	PDJNL2525M15	25	25	32,0	150	36,0	-7,0	DN..150608	512.153	513.023	515.018	511.024	514.128	15 IP
1244781	PDJNL3225P15	32	25	32,0	170	36,0	-7,0	DN..150608	512.153	513.023	515.018	511.024	514.128	15 IP
1244821	PDJNL3232P15	32	32	40,0	170	36,0	-7,0	DN..150608	512.153	513.023	515.018	511.024	514.128	15 IP
1192381	PDJNL4025R15	40	25	32,0	200	36,0	-7,0	DN..150608	512.153	513.023	515.018	511.024	514.128	15 IP



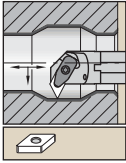
ISO Turning



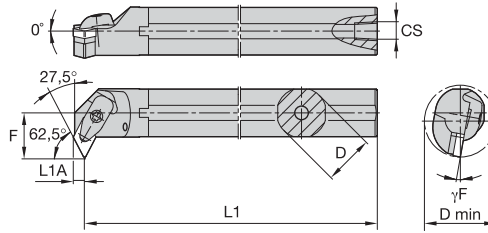
■ PDNN 62,5°



order number	catalogue number	H	B	F	L1	LH	gage insert	shim	shim pin	punch pin	lever	lever screw	Torx Plus
right hand													
1244756	PDNNR2020K11	20	20	10,0	125	24,0	DN..110408	512.060	513.060	515.018	511.060	514.118	10 IP
1244824	PDNNR2020K15	20	20	10,0	125	36,0	DN..150608	512.153	513.023	515.018	511.024	514.128	15 IP
1244773	PDNNR2525M15	25	25	12,5	150	36,0	DN..150608	512.153	513.023	515.018	511.024	514.128	15 IP
1244825	PDNNR4025M15	40	25	12,5	150	36,0	DN..150608	512.153	513.023	515.018	511.024	514.128	15 IP
left hand													
1244754	PDNNL2020K11	20	20	10,0	125	24,0	DN..110408	512.060	513.060	515.018	511.060	514.118	10 IP
1244822	PDNNL2020K15	20	20	10,0	125	36,0	DN..150608	512.153	513.023	515.018	511.024	514.128	15 IP
1244659	PDNNL2525M11	25	25	12,5	150	30,0	DN..110408	512.060	513.060	515.018	511.060	514.118	10 IP
1244785	PDNNL2525M15	25	25	12,5	150	36,0	DN..150608	512.153	513.023	515.018	511.024	514.128	15 IP
1244823	PDNNL4025M15	40	25	12,5	150	36,0	DN..150608	512.153	513.023	515.018	511.024	514.128	15 IP



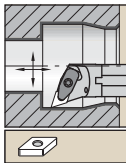
Steel shank with through coolant.



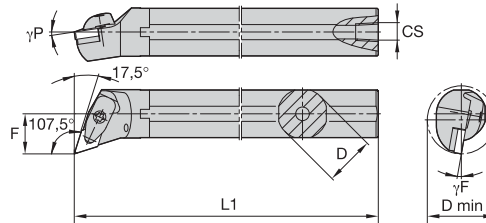
ISO Turning

A-DDPN-KC 117,5°


order number	catalogue number	D	D min	F	L1	L1A	CS	γF°	gage insert	shim	shim screw	Torx Plus	clamp assembly	slotted pin	Torx Plus
right hand															
2441957	A25RDDPNR11KC04	25	37,0	22,0	200	4,8	1/4-18 NPT	-10,0	DN..110408	IDSN322	KMSP315IP	15 IP	CM234R ASSY	SSP025016M	15 IP
2441959	A32SDDPNR15KC06	32	45,0	27,0	250	6,5	1/4-18 NPT	-12,0	DN..150608	IDSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP
2441961	A40TDDPNR15KC06	40	52,0	30,0	300	6,6	1/4-18 NPT	-10,0	DN..150608	IDSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP
left hand															
2441960	A32SDDPNL15KC06	32	45,0	27,0	250	—	1/4-18 NPT	-12,0	DN..150608	IDSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP
2441962	A40TDDPNL15KC06	40	52,0	30,0	300	6,6	1/4-18 NPT	-10,0	DN..150608	IDSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP

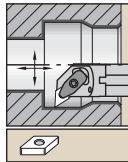


Steel shank with through coolant.

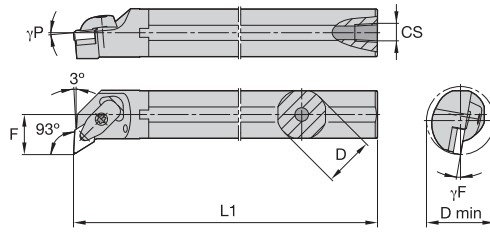

A-DDQN-KC 107,5°


order number	catalogue number	D	D min	F	L1	CS	γF°	γP°	gage insert	shim	shim screw	Torx Plus	clamp assembly	slotted pin	Torx Plus
right hand															
2441951	A25RDDQNR11KC04	25	32,0	17,0	200	1/4-18 NPT	-11,0	-7,0	DN..110408	—	—	—	CM234R ASSY	SSP025016M	15 IP
2441953	A32SDDQNR15KC06	32	40,0	22,0	250	1/4-18 NPT	-12,0	-10,0	DN..150608	IDSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP
2441955	A40TDDQNR15KC06	40	50,0	27,0	300	1/4-18 NPT	-10,0	-10,0	DN..150608	IDSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP
left hand															
2441952	A25RDDQNL11KC04	25	32,0	17,0	200	1/4-18 NPT	-11,0	-7,0	DN..110408	—	—	—	CM234R ASSY	SSP025016M	15 IP
2441954	A32SDDQNL15KC06	32	40,0	22,0	250	1/4-18 NPT	-12,0	-10,0	DN..150608	IDSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP
2441956	A40TDDQNL15KC06	40	50,0	27,0	300	1/4-18 NPT	-10,0	-10,0	DN..150608	IDSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP

ISO Turning



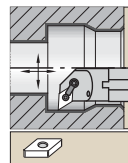
Steel shank with through coolant.



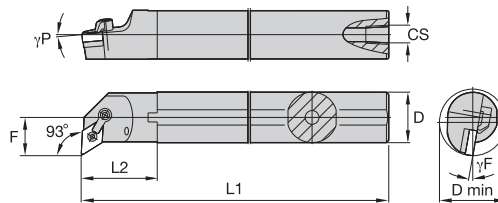
■ A-DDUN-KC 93°



order number	catalogue number	D	D min	F	L1	CS	γF°	γP°	gage insert	shim	shim screw	Torx Plus	clamp assembly	slotted pin	Torx Plus
right hand															
2441939	A25RDDUNR11KC04	25	32,0	17,0	200	1/4-18 NPT	-12,0	-5,0	DN..110408	—	—	—	CM234R ASSY	SSP025016M	15 IP
2441941	A32SDDUNR11KC04	32	40,0	22,0	250	1/4-18 NPT	-12,0	-5,0	DN..110408	IDSN322	KMSP315IP	15 IP	CM234R ASSY	SSP025016M	15 IP
2441945	A32SDDUNR15KC06	32	40,0	22,0	250	1/4-18 NPT	-12,0	-6,0	DN..150608	IDSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP
2441947	A40TDDUNR15KC06	40	50,0	27,0	300	1/4-18 NPT	-9,0	-5,0	DN..150608	IDSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP
2441949	A50UDDUNR15KC06	50	63,0	35,0	350	1/4-18 NPT	-7,0	-5,0	DN..150608	IDSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP
left hand															
2441940	A25RDDUNL11KC04	25	32,0	17,0	200	1/4-18 NPT	-12,0	-5,0	DN..110408	—	—	—	CM234R ASSY	SSP025016M	15 IP
2441942	A32SDDUNL11KC04	32	40,0	22,0	250	1/4-18 NPT	-12,0	-5,0	DN..110408	IDSN322	KMSP315IP	15 IP	CM234R ASSY	SSP025016M	15 IP
2441946	A32SDDUNL15KC06	32	40,0	22,0	250	1/4-18 NPT	-12,0	-6,0	DN..150608	IDSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP
2441948	A40TDDUNL15KC06	40	50,0	27,0	300	1/4-18 NPT	-9,0	-5,0	DN..150608	IDSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP
2441950	A50UDDUNL15KC06	50	63,0	35,0	350	1/4-18 NPT	-7,0	-5,0	DN..150608	IDSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP



Steel shank with through coolant.



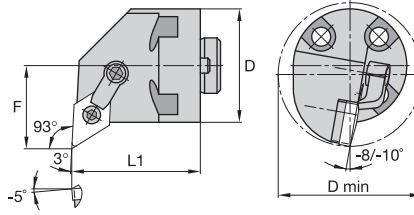
■ A-MDUN 93°



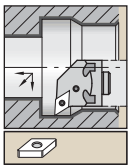
order number	catalogue number	D	D min	F	L1	L2	CS	γF°	γP°	gage insert	shim	lock pin	hex	clamp	clamp screw	hex
right hand																
1098769	A25RMDUNR11	25	32,0	17,0	200	40,0	1/4-18 NPT	-14,0	-5,0	DN..110408	—	KLM33L	2 mm	CKM7	STCM5	2.5 mm
1098102	A25RMDUNR15	25	32,0	17,0	200	—	1/4-18 NPT	-14,0	-5,0	DN..150408	IDSN432	KLM46L	2.5 mm	CKM22	STCM11	3 mm
1098770	A32SMDUNR11	32	40,0	22,0	250	50,0	1/4-18 NPT	-12,0	-5,0	DN..110408	IDSN322	KLM34L	2 mm	CKM7	STCM5	2.5 mm
1098104	A32SMDUNR15	32	40,0	22,0	250	—	1/4-18 NPT	-12,0	-6,0	DN..150608	IDSN432	KLM46L	2.5 mm	CKM22	STCM20	3 mm
1098106	A40TMDUNR15	40	50,0	27,0	300	—	1/4-18 NPT	-9,0	-5,0	DN..150608	IDSN432	KLM46L	2.5 mm	CKM22	STCM20	3 mm
1098108	A50UMDUNR15	50	63,0	35,0	350	—	1/4-18 NPT	-7,0	-5,0	DN..150608	IDSN432	KLM46L	2.5 mm	CKM22	STCM20	3 mm
left hand																
1098779	A25RMDUNL11	25	32,0	17,0	200	40,0	1/4-18 NPT	-14,0	-5,0	DN..110408	—	KLM33L	2 mm	CKM7	STCM5	2.5 mm
1098103	A25RMDUNL15	25	32,0	17,0	200	—	1/4-18 NPT	-14,0	-5,0	DN..150408	IDSN432	KLM46L	2.5 mm	CKM22	STCM11	3 mm
1098780	A32SMDUNL11	32	40,0	22,0	250	50,0	1/4-18 NPT	-12,0	-5,0	DN..110408	IDSN322	KLM34L	2 mm	CKM7	STCM5	2.5 mm
1098105	A32SMDUNL15	32	40,0	22,0	250	—	1/4-18 NPT	-12,0	-6,0	DN..150608	IDSN432	KLM46L	2.5 mm	CKM22	STCM20	3 mm
1098107	A40TMDUNL15	40	50,0	27,0	300	—	1/4-18 NPT	-9,0	-5,0	DN..150608	IDSN432	KLM46L	2.5 mm	CKM22	STCM20	3 mm
1098109	A50UMDUNL15	50	63,0	35,0	350	—	1/4-18 NPT	-7,0	-5,0	DN..150608	IDSN432	KLM46L	2.5 mm	CKM22	STCM20	3 mm



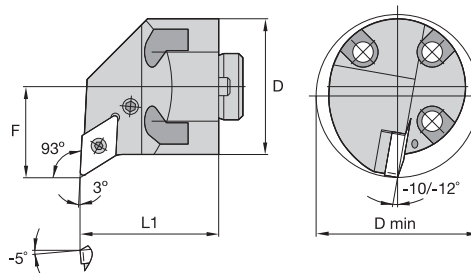
With through coolant.


H-MDUN 93°


order number	catalogue number	D	D min	F	L1	gage insert	shim	lock pin	hex	clamp	clamp screw	hex
right hand												
1099094	H40MDUNR15	40	50,0	27,0	41	DN..150608	IDSN432	KLM46L	2.5 mm	CKM22	STCM20	3 mm
left hand												
3612192	H50MDUNL19	50	63,0	35,0	41	DN..190612	IDSN533	KLM58	3 mm	CKM12	STCM4	4 mm

Kenlever™ Boring Heads


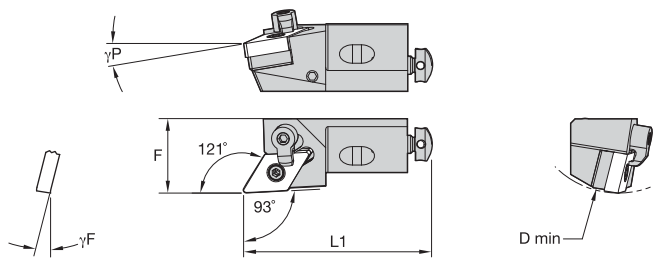
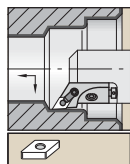
With through coolant.


H-PDUN 93°


order number	catalogue number	D	D min	F	L1	gage insert	shim	shim pin	pin	toggle lever	lever screw	Torx Plus
right hand												
1861496	H32PDUNR15	32	43,0	25,0	41	DN..150608	512.153	513.023	515.018	511.024	514.128	15 IP
1861519	H50PDUNR15	50	63,0	35,0	41	DN..150608	512.153	513.023	515.018	511.024	514.128	15 IP
left hand												
1861520	H50PDUNL15	50	63,0	35,0	41	DN..150608	512.153	513.023	515.018	511.024	514.128	15 IP



ISO Turning



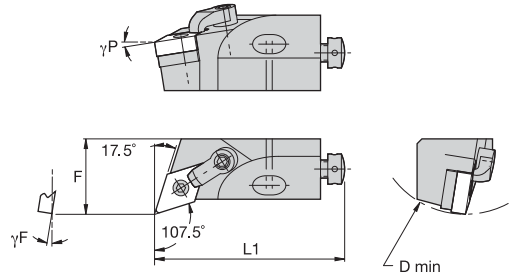
■ MDJN 93°

order number	catalogue number	D min	F	L1	γF°	γP°	gage insert
right hand							
3346241	MDJNR12CA11	50	20,0	55	-9.0	-9.0	DN..110408/DN..322
3330275	MDJNR16CA15	60	25,0	63	-9.0	-9.0	DN..150408/DN..432
3330199	MDJNR20CA15	70	25,0	70	-8.5	-8.5	DN..150408/DN..3.532
left hand							
3346240	MDJNL12CA11	50	20,0	55	-9.0	-9.0	DN..110408/DN..322
3330274	MDJNL16CA15	60	25,0	63	-9.0	-9.0	DN..150408/DN..432

■ Spare Parts



D min	shim	lock pin	hex	clamp	clamp screw	hex	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
50	—	KLM33L	2 mm	CKM34	STCM38	2 mm	KUAM22	2 mm	KUAM31	191.406	4 mm	CSWM 060 050
60	IDSN432	KLM46S	2.5 mm	CKM36	STCM9	2.5 mm	KUAM25	2.5 mm	KUAM32	191.407	5 mm	CSWM 080 050
70	IDSN432	KLM46	2.5 mm	CKM41	STCM40	2.5 mm	KUAM25	2.5 mm	KUAM32	191.407	5 mm	CSWM 080 050


■ MDQN 107,5°

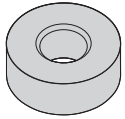
order number	catalogue number	D min	F	L1	γF°	γP°	gage insert
right hand							
3330277	MDQNR16CA15	60	25,0	63	-9.0	-6.0	DN..150408/DN..432
3330201	MDQNR20CA15	70	25,0	70	-9.0	-8.0	DN..150408/DN..432
left hand							
3330276	MDQNL16CA15	60	25,0	63	-9.0	-6.0	DN..150408/DN..432
3330200	MDQNL20CA15	70	25,0	70	-9.0	-8.0	DN..150408/DN..432

■ Spare Parts


D min	shim	lock pin	hex	clamp	clamp screw	hex	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
60	IDSN432	KLM46S	2.5 mm	CKM36	STCM9	2.5 mm	KUAM25	2.5 mm	KUAM32	191.407	5 mm	CSWM 080 050
70	IDSN432	KLM46	2.5 mm	CKM34	STCM9	2.5 mm	KUAM25	2.5 mm	KUAM32	191.407	5 mm	CSWM 080 050

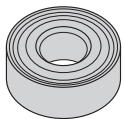
ISO Turning

● first choice
○ alternate choice



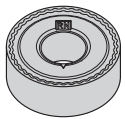
RNMA

ISO catalogue number	D	L10	Re
RNMA120400	12,70	—	—
RNMA150600	15,88	—	—



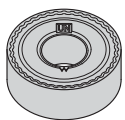
RNMG

ISO catalogue number	D	L10	Re
RNMG190600	19,05	—	—



RNMG-RN

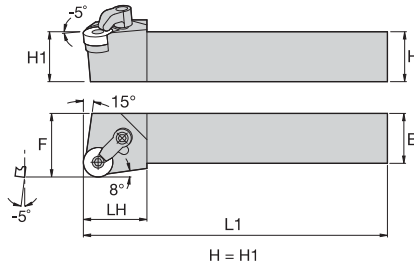
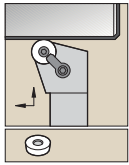
ISO catalogue number	D	L10	Re
RNMG090300RN	9,53	—	—
RNMG120400RN	12,70	—	—
RNMG150600RN	15,88	—	—
RNMG190600RN	19,05	—	—
RNMG250900RN	25,40	—	—



RNMG-UN

ISO catalogue number	D	L10	Re
RNMG120400UN	12,70	—	—

	P	M	K	N	S	H
KCP05B	●		○			
KCP05	●		○			
KCP10B	●		○			
KCP10	●		○			
KCP25B	●		○			
KCP25	●		○			
KCP30B	●					
KCP30	●					
KCP40B	●					
KCP40	●					
KCK05B	○					
KCK05	○					
KCK15B	○					
KCK15	○					
KCK20B	○					
KCK20	○					
KCM15B	○					
KCM15	○					
KCM25B	○					
KCM25	○					
KCM35B	○					
KCM35	○					
KCPK05	○					
K313	○					
K68	○					
KCU10	○					
KCU25	○					
KC5010	○					
KC5025	○					
KC5410	○					
KT315	○					



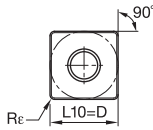
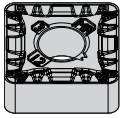
ISO Turning

MRGN

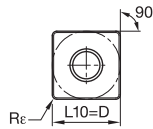
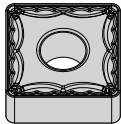


order number	catalogue number	H	B	F	L1	LH	gage insert	shim	lock pin	hex	clamp	clamp screw	hex
right hand													
1102086	MRGNR2525M12	25	25	32,0	150	32,0	RN..120400	IRSN43	KLM46	2.5 mm	CKM21	STCM20	3 mm
left hand													
1102699	MRGNL2525M12	25	25	32,0	150	32,0	RN..120400	IRSN43	KLM46	2.5 mm	CKM21	STCM20	3 mm

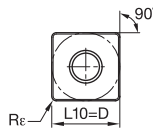
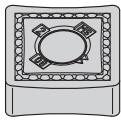
● first choice
○ alternate choice


■ SNMG-MR

ISO catalogue number	D	L10	Rε
SNMG120408MR	12,70	12,70	0,8
SNMG120412MR	12,70	12,70	1,2
SNMG150612MR	15,88	15,88	1,2


■ SNMG-MG

ISO catalogue number	D	L10	Rε
SNMG120416MG	12,70	12,70	1,6


■ SNMG-MS

ISO catalogue number	D	L10	Rε
SNMG120408MS	12,70	12,70	0,8
SNMG120412MS	12,70	12,70	1,2
SNMG150608MS	15,88	15,88	0,8
SNMG150612MS	15,88	15,88	1,2
SNMG190612MS	19,05	19,05	1,2

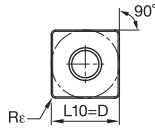
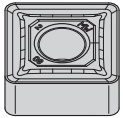
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KCP05B	●					
KCP05	●					
KCP10B	○					
KCP10	○					
KCP25B	●					
KCP25	●					
KCP30B	●					
KCP30	●					
KCP40B	●					
KCP40	○					
KCK05B	○					
KCK05	○					
KCK15B	○					
KCK15	○					
KCK20B	○					
KCK20	○					
KCM15B	○					
KCM15	○					
KCM25B	○					
KCM25	○					
KCM35B	○					
KCM35	○					
KCPK05	○					
K313	○					
K68	○					
KCU10	○					
KCU25	○					
KC5010	○					
KC5025	○					
KC5410	○					
KT315	○					



ISO Turning

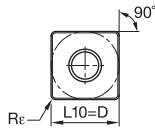
ISO Turning

- first choice
- alternate choice



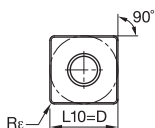
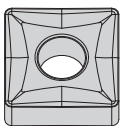
■ SNMG-MW

ISO catalogue number	D	L10	Rε
SNMG120408MW	12,70	12,70	0,8
SNMG120412MW	12,70	12,70	1,2



■ SNMG-P

ISO catalogue number	D	L10	Rε
SNMG120412P	12,70	12,70	1,2

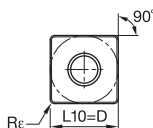
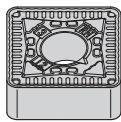


■ SNMG-RM

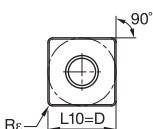
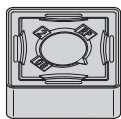
ISO catalogue number	D	L10	Rε
SNMG250924RM	25,40	25,40	2,4

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KCP05B	●					
KCP05	●					
KCP10B	●					
KCP10	○					
KCP25B	●					
KCP25	○					
KCP30B	●					
KCP30	○					
KCP40B	●					
KCP40	○					
KCK05B	○					
KCK05	○					
KCK15B	○					
KCK15	○					
KCK20B	○					
KCK20	○					
KCM15B	○					
KCM15	○					
KCM25B	○					
KCM25	○					
KCM35B	○					
KCM35	○					
KCPK05	○					
K313	○					
K68	○					
KCU10	○					
KCU25	○					
KC5010	○					
KC5025	○					
KC5410	○					
KT315	○					

- first choice
- alternate choice


SNMG-RN

ISO catalogue number	D	L10	Re	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
SNMG090412RN	9,53	9,53	1,2	-	-	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SNMG120408RN	12,70	12,70	0,8	-	-	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SNMG120412RN	12,70	12,70	1,2	-	-	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SNMG120416RN	12,70	12,70	1,6	-	-	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SNMG150608RN	15,88	15,88	0,8	-	-	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SNMG150612RN	15,88	15,88	1,2	-	-	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SNMG150616RN	15,88	15,88	1,6	-	-	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SNMG190608RN	19,05	19,05	0,8	-	-	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SNMG190612RN	19,05	19,05	1,2	-	-	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SNMG190616RN	19,05	19,05	1,6	-	-	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SNMG190624RN	19,05	19,05	2,4	-	-	-	-	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SNMG250924RN	25,40	25,40	2,4	-	-	-	-	-	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

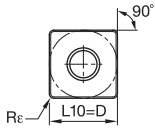
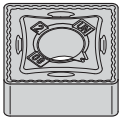

SNMG-RP

ISO catalogue number	D	L10	Re	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
SNMG120408RP	12,70	12,70	0,8	-	●	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SNMG120412RP	12,70	12,70	1,2	-	●	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SNMG120416RP	12,70	12,70	1,6	-	-	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SNMG150612RP	15,88	15,88	1,2	-	-	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SNMG150616RP	15,88	15,88	1,6	-	-	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SNMG190612RP	19,05	19,05	1,2	-	-	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SNMG190616RP	19,05	19,05	1,6	-	-	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

ISO Turning

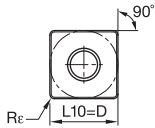
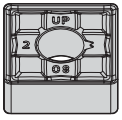
ISO Turning

- first choice
- alternate choice



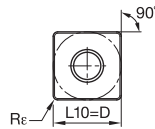
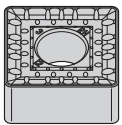
■ SNMG-UN

ISO catalogue number	D	L10	Re
SNMG120408UN	12,70	12,70	0,8
SNMG120412UN	12,70	12,70	1,2
SNMG120416UN	12,70	12,70	1,6
SNMG150612UN	15,88	15,88	1,2
SNMG150616UN	15,88	15,88	1,6
SNMG190612UN	19,05	19,05	1,2
SNMG190616UN	19,05	19,05	1,6



■ SNMG-UP

ISO catalogue number	D	L10	Re
SNMG120408UP	12,70	12,70	0,8
SNMG120412UP	12,70	12,70	1,2
SNMG150612UP	15,88	15,88	1,2



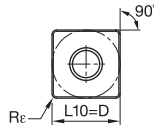
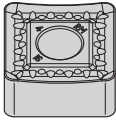
■ SNMM-RH

ISO catalogue number	D	L10	Re
SNMM190612RH	19,05	19,05	1,2
SNMM190616RH	19,05	19,05	1,6
SNMM190624RH	19,05	19,05	2,4
SNMM250724RH	25,40	25,40	2,4
SNMM250924RH	25,40	25,40	2,4

	P	M	K	N	S	H
KCP05B	●		○			
KCP05	●		○			
KCP10B	●		○			
KCP10	●		○			
KCP25B	●		○			
KCP25	●		○			
KCP30B	●					
KCP30	●					
KCP40B	●					
KCP40	●					
KCK05B	○	○				
KCK05	○	○				
KCK15B			●			
KCK15			●			
KCK20B			●			
KCK20			●			
KCM15B			●			
KCM15			●			
KCM25B			●			
KCM25			●			
KCM35B			●			
KCM35			●			
KCPK05			●			
K313				●		
K68				●		
KCU10				●		
KCU25				●		
KC5010				●		
KC5025				●		
KC5410				●		
KT315				●		

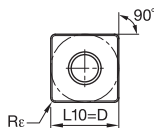
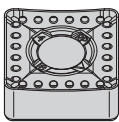


● first choice
○ alternate choice



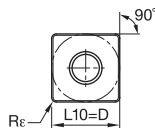
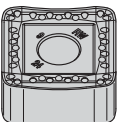
■ SNMM-RM

ISO catalogue number	D	L10	Re	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
SNMM120408RM	12,70	12,70	0,8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SNMM120412RM	12,70	12,70	1,2	-	-	-	-	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SNMM150612RM	15,88	15,88	1,2	-	-	-	-	●	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SNMM150616RM	15,88	15,88	1,6	-	-	-	-	●	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SNMM190612RM	19,05	19,05	1,2	-	-	-	-	●	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SNMM190616RM	19,05	19,05	1,6	-	-	-	-	●	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SNMM190624RM	19,05	19,05	2,4	-	-	-	-	●	●	-	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SNMM250724RM	25,40	25,40	2,4	-	-	-	●	●	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SNMM250924RM	25,40	25,40	2,4	-	-	-	-	●	●	●	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



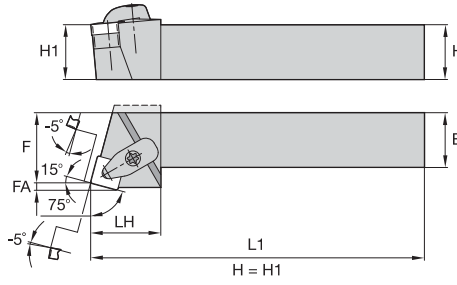
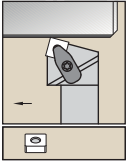
■ SNMM-RP

ISO catalogue number	D	L10	Re	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
SNMM120408RP	12,70	12,70	0,8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SNMM120412RP	12,70	12,70	1,2	-	-	-	-	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SNMM150612RP	15,88	15,88	1,2	-	-	-	-	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SNMM150616RP	15,88	15,88	1,6	-	-	-	●	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SNMM190612RP	19,05	19,05	1,2	-	-	-	-	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SNMM190616RP	19,05	19,05	1,6	-	-	-	-	-	●	-	-	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SNMM190624RP	19,05	19,05	2,4	-	-	-	-	●	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SNMM250724RP	25,40	25,40	2,4	-	-	-	-	●	●	-	-	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SNMM250924RP	25,40	25,40	2,4	-	-	-	-	●	●	●	-	-	-	-	-	-	-	-	-	-	-	●	-	-	-	-	-	-	-	-	-	-	-	-



■ SNMM-RW

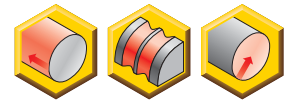
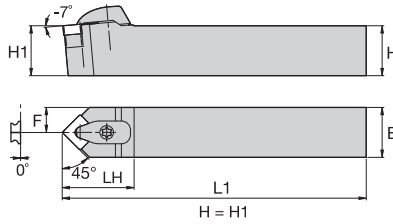
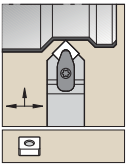
ISO catalogue number	D	L10	Re	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
SNMM190624RW	19,05	19,05	2,4	-	-	-	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SNMM250724RW	25,40	25,40	2,4	-	-	-	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



ISO Turning

DSBN-KC 75°

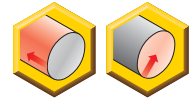
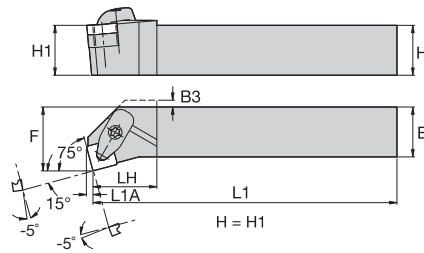
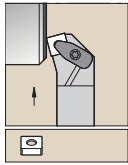

order number	catalogue number	H	B	F	L1	LH	FA	gage insert	shim	shim screw	Torx Plus	clamp assembly	Torx Plus	slotted pin	optional lock pin
left hand															
1875215	DSBNL2525M12KC04	25	25	22,0	150	32,0	3,0	SN..120408	ISSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP


DSDN-KC 45°


order number	catalogue number	H	B	F	L1	LH	gage insert	shim	shim screw	Torx Plus	clamp assembly	Torx Plus	slotted pin	optional lock pin
1875210	DSDNN2020K12KC04	20	20	10,0	125	36,0	SN..120408	ISSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM4615IP
1875211	DSDNN2525M12KC04	25	25	12,0	150	36,0	SN..120408	ISSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP
1875216	DSDNN2525M15KC06	25	25	12,0	150	42,0	SN..150612	ISSN543	KMSP515IP	15 IP	CM209R ASSY	15 IP	SSP025016M	KLM58L15IP
2273139	DSDNN3232P19KC06	32	32	15,5	170	44,0	SN..190612	ISSN643	KMSP625IP	25 IP	CM210R ASSY	25 IP	SSP025016M	KLM68L25IP
2456320	DSDNN4040S25KC09	40	40	19,5	250	59,0	SN..250924	ISSN846	KMSP825IP	25 IP	CM236R ASSY	25 IP	SSP025018M	KLM81025IP



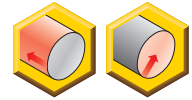
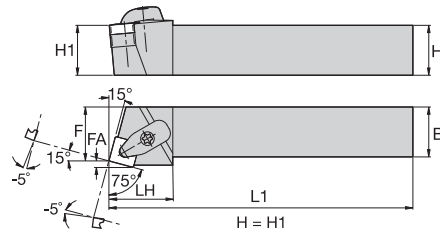
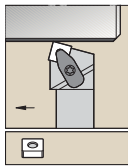
ISO Turning



■ **DSKN-KC 75°**



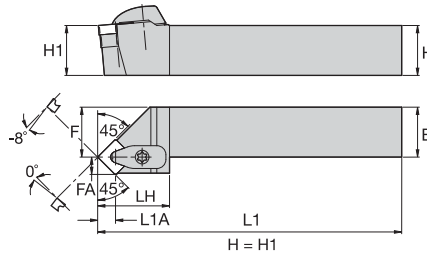
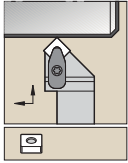
order number	catalogue number	H	B	F	L1	LH	L1A	B3	gage insert	shim	shim screw	Torx Plus	clamp assembly	Torx Plus	slotted pin	optional lock pin
right hand																
1875219	DSKNR2525M12KC04	25	25	32,0	150	32,0	3,1	4,0	SN..120408	ISSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP
left hand																
1875220	DSKNL2525M12KC04	25	25	32,0	150	32,0	3,1	4,0	SN..120408	ISSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP



■ **DSRN-KC 75°**



order number	catalogue number	H	B	F	L1	LH	FA	gage insert	shim	shim screw	Torx Plus	clamp assembly	Torx Plus	slotted pin	optional lock pin	
right hand																
1875228	DSRNR2525M12KC04	25	25	27,0	150	32,0	3,3	SN..120408	ISSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP	
2456321	DSRNR4040S25KC09	40	40	43,0	250	52,0	6,1	SN..250924	ISSN846	KMSP825IP	25 IP	CM236R ASSY	25 IP	SSP025018M	KLM81025IP	
left hand																
2456322	DSRNL4040S25KC09	40	40	43,0	250	52,0	6,1	SN..250924	ISSN846	KMSP825IP	25 IP	CM236R ASSY	25 IP	SSP025018M	KLM81025IP	

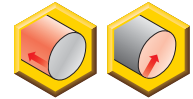
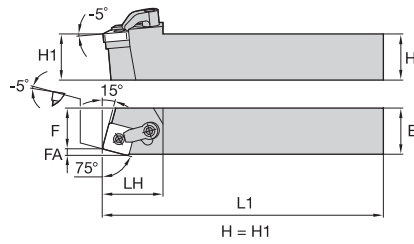
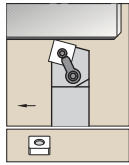


ISO Turning

■ **DSSN-KC 45°**



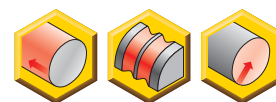
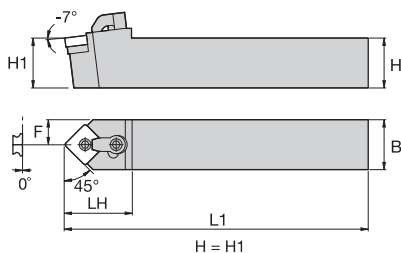
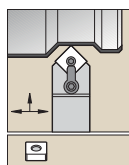
order number	catalogue number	H	B	F	L1	LH	FA	L1A	gage insert	shim	shim screw	Torx Plus	clamp assembly	Torx Plus	slotted pin	optional lock pin
right hand																
1875202	DSSNR2020K12KC04	20	20	25,0	125	36,0	8,4	8,7	SN..120408	ISSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM4615IP
1875195	DSSNR2525M12KC04	25	25	32,0	150	36,0	8,4	9,6	SN..120408	ISSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP
2273156	DSSNR3225P12KC04	32	25	32,0	170	35,4	8,4	8,7	SN..120408	ISSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP
left hand																
1875203	DSSNL2525M12KC04	25	25	32,0	150	36,0	8,4	8,7	SN..120408	ISSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP



■ MSBN 75°



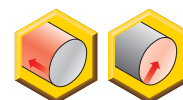
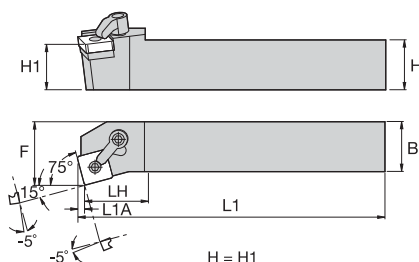
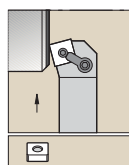
order number	catalogue number	H	B	F	L1	LH	FA	gage insert	shim	lock pin	hex	clamp	clamp screw	hex	
right hand															
1101893	MSBNR3232P19	32	32	27,0	170	40,0	4,6	SN..190612	ISSN633	KLM68	4 mm	CKM12	STCM4	4 mm	
1101954	MSBNR4040R19	40	40	35,0	200	40,0	4,6	SN..190612	ISSN633	KLM68	4 mm	CKM12	STCM4	4 mm	
1100937	MSBNR2020K12	61	20	17,0	125	32,0	3,1	SN..120408	ISSN433	KLM46	2.5 mm	CKM21	STCM20	3 mm	
1101359	MSBNR2525M15	80	25	22,0	150	35,0	3,8	SN..150612	ISSN533	KLM58	3 mm	CKM21	STCM20	3 mm	
1100941	MSBNR2525M12	86	25	22,0	150	32,0	3,1	SN..120408	ISSN433	KLM46	2.5 mm	CKM21	STCM20	3 mm	
1101361	MSBNR3232P15	100	32	27,0	170	35,0	3,8	SN..150612	ISSN533	KLM58	3 mm	CKM21	STCM20	3 mm	
1101289	MSBNR3225P12	106	32	22,0	170	32,0	3,1	SN..120408	ISSN433	KLM46	2.5 mm	CKM21	STCM20	3 mm	
left hand															
1102640	MSBNL3232P19	32	32	27,0	170	40,0	4,6	SN..190612	ISSN633	KLM68	4 mm	CKM12	STCM4	4 mm	
1099148	MSBNL4040R19	40	40	35,0	200	40,0	4,6	SN..190612	ISSN633	KLM68	4 mm	CKM12	STCM4	4 mm	
1102242	MSBNL2020K12	61	20	17,0	125	32,0	3,1	SN..120408	ISSN433	KLM46	2.5 mm	CKM21	STCM20	3 mm	
1102318	MSBNL2525M15	80	25	22,0	150	35,0	3,8	SN..150612	ISSN533	KLM58	3 mm	CKM21	STCM20	3 mm	
1102243	MSBNL2525M12	86	25	22,0	150	32,0	3,1	SN..120408	ISSN433	KLM46	2.5 mm	CKM21	STCM20	3 mm	
1102319	MSBNL3232P15	100	32	27,0	170	35,0	3,8	SN..150612	ISSN533	KLM58	3 mm	CKM21	STCM20	3 mm	
1102314	MSBNL3225P12	106	32	22,0	170	32,0	3,1	SN..120408	ISSN433	KLM46	2.5 mm	CKM21	STCM20	3 mm	



ISO Turning

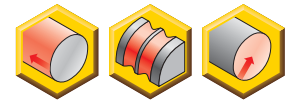
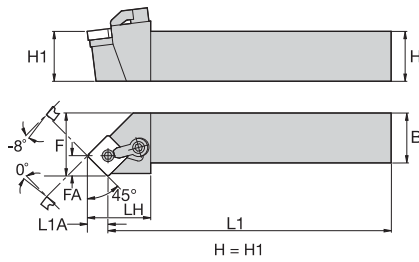
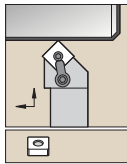
MSDN 45°


order number	catalogue number	H	B	F	L1	LH	gage insert	shim	lock pin	hex	clamp	clamp screw	hex
1101891	MSDNN2525M12	25	25	12,0	150	32,0	SN..120408	ISSN432	KLM46	2.5 mm	CKM21	STCM20	3 mm
1101889	MSDNN1616H09	44	16	8,0	100	28,0	SN..090308	ISSN332	KLM34L	2 mm	CKM19	STCM9	2.5 mm
1101890	MSDNN2020K12	61	20	10,0	125	32,0	SN..120408	ISSN432	KLM46	2.5 mm	CKM21	STCM20	3 mm
1101892	MSDNN2525M15	80	25	12,5	150	35,0	SN..150612	ISSN533	KLM58	3 mm	CKM21	STCM20	3 mm
1101888	MSDNN3232P19	86	32	16,0	170	42,0	SN..190612	ISSN633	KLM68	4 mm	CKM12	STCM4	4 mm
1101713	MSDNN3225P12	106	32	12,5	170	32,0	SN..120408	ISSN432	KLM46	2.5 mm	CKM21	STCM20	3 mm


MSKN 75°


order number	catalogue number	H	B	F	L1	LH	L1A	gage insert	shim	lock pin	hex	clamp	clamp screw	hex
right hand														
1101886	MSKNR2525M12	25	25	32,0	150	32,0	3,1	SN..120408	ISSN432	KLM46	2.5 mm	CKM21	STCM20	3 mm
1101957	MSKNR3232P19	32	32	40,0	170	40,0	4,6	SN..190612	ISSN633	KLM68	4 mm	CKM12	STCM4	4 mm
left hand														
1102637	MSKNL2525M12	25	25	32,0	150	32,0	3,1	SN..120408	ISSN432	KLM46	2.5 mm	CKM21	STCM20	3 mm
1102638	MSKNL3225P12	32	25	32,0	170	32,0	3,1	SN..120408	ISSN432	KLM46	2.5 mm	CKM21	STCM20	3 mm
1099158	MSKNL3232P15	32	32	40,0	170	35,0	3,7	SN..150612	ISSN533	KLM58	3 mm	CKM21	STCM20	3 mm
1102641	MSKNL3232P19	32	32	40,0	170	40,0	4,6	SN..190612	ISSN633	KLM68	4 mm	CKM12	STCM4	4 mm

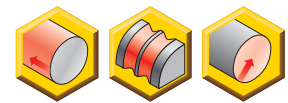
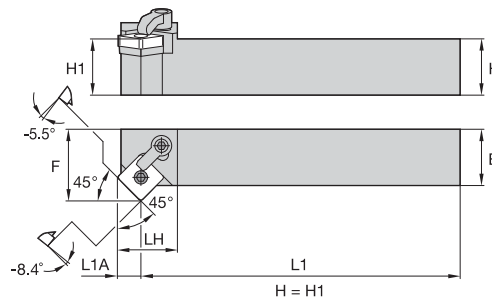
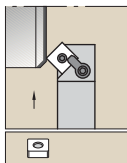
ISO Turning



■ **MSSN 45°**



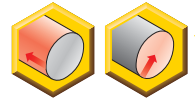
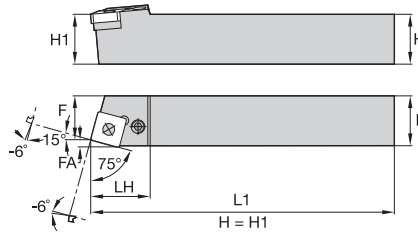
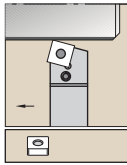
order number	catalogue number	H	B	F	L1	LH	FA	L1A	gage insert	shim	lock pin	hex	clamp	clamp screw	hex
right hand															
1102166	MSSNR3232P19	32	32	40,0	170	40,0	12,5	12,5	SN..190612	ISSN633	KLM68	4 mm	CKM12	STCM4	4 mm
1102164	MSSNR2020K12	71	20	25,0	125	32,0	8,4	9,6	SN..120408	ISSN433	KLM46	2.5 mm	CKM21	STCM20	3 mm
1102165	MSSNR2525M12	96	25	32,0	150	32,0	8,4	9,6	SN..120408	ISSN433	KLM46	2.5 mm	CKM21	STCM20	3 mm
left hand															
1102717	MSSNL2020K12	20	20	25,0	125	32,0	8,4	8,3	SN..120408	ISSN433	KLM46	2.5 mm	CKM21	STCM20	3 mm
1102719	MSSNL3232P19	32	32	40,0	170	40,0	12,5	12,5	SN..190612	ISSN633	KLM68	4 mm	CKM12	STCM4	4 mm
1102718	MSSNL2525M12	96	25	32,0	150	32,0	8,4	9,6	SN..120408	ISSN433	KLM46	2.5 mm	CKM21	STCM20	3 mm



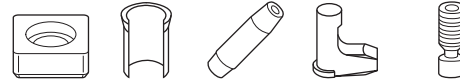
■ **MSZN 45°**



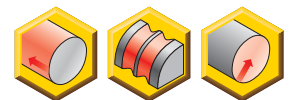
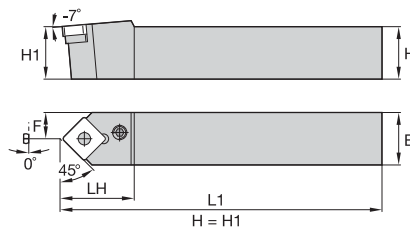
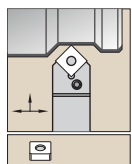
order number	catalogue number	H	B	F	L1	LH	L1A	gage insert	shim	lock pin	hex	clamp	clamp screw	hex	
right hand															
1101884	MSZNR2525M12	25	25	32,0	150	25,0	8,5	SN..120408	ISSN432	KLM46	2.5 mm	CKM21	STCM20	3 mm	
left hand															
1102634	MSZNL2525M12	25	25	32,0	150	25,0	8,5	SN..120408	ISSN432	KLM46	2.5 mm	CKM21	STCM20	3 mm	



ISO Turning

PSBN 75°


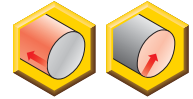
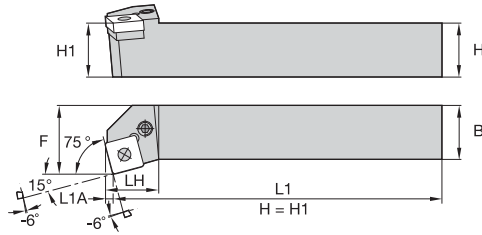
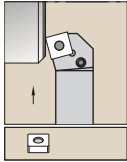
order number	catalogue number	H	B	F	L1	LH	FA	gage insert	shim	shim pin	punch pin	lever	lever screw	Torx Plus	
right hand															
1244833	PSBNR2020K12	20	20	17,0	125	26,0	3,1	SN..120408	512.063	513.023	515.018	511.023	514.123	15 IP	
1244677	PSBNR2525M12	25	25	22,0	150	26,0	3,1	SN..120408	512.063	513.023	515.018	511.023	514.123	15 IP	
1244834	PSBNR2525M15	25	25	22,0	150	36,0	3,8	SN..150608	512.025	513.025	515.022	511.025	514.125	15 IP	
1244678	PSBNR3225P12	32	25	22,0	170	26,0	3,1	SN..120408	512.063	513.023	515.018	511.023	514.123	15 IP	
1244680	PSBNR3232P15	32	32	27,0	170	33,0	3,8	SN..150608	512.025	513.025	515.022	511.025	514.125	15 IP	
1244681	PSBNR3232P19	32	32	27,0	170	40,0	4,6	SN..190612	512.083	513.033	515.022	511.033	514.133	25 IP	
1244682	PSBNR4040S19	40	40	35,0	250	38,0	4,6	SN..190612	512.083	513.033	515.022	511.033	514.133	25 IP	
1244683	PSBNR4040S25	40	40	35,0	250	47,0	5,9	SN..250724	512.092	513.038	515.028	511.038	514.138	30 IP	
left hand															
1244774	PSBNL2020K12	20	20	17,0	125	26,0	3,1	SN..120408	512.063	513.023	515.018	511.023	514.123	15 IP	
1244668	PSBNL2525M12	25	25	22,0	150	26,0	3,1	SN..120408	512.063	513.023	515.018	511.023	514.123	15 IP	
1244669	PSBNL2525M15	25	25	22,0	150	36,0	3,8	SN..150608	512.025	513.025	515.022	511.025	514.125	15 IP	
1244672	PSBNL3232P15	32	32	27,0	170	33,0	3,8	SN..150608	512.025	513.025	515.022	511.025	514.125	15 IP	
1244673	PSBNL3232P19	32	32	27,0	170	40,0	4,6	SN..190612	512.083	513.033	515.022	511.033	514.133	25 IP	
1244674	PSBNL4040S19	40	40	35,0	250	38,0	4,6	SN..190612	512.083	513.033	515.022	511.033	514.133	25 IP	
1244675	PSBNL4040S25	40	40	35,0	250	47,0	5,9	SN..250724	512.092	513.038	515.028	511.038	514.138	30 IP	


PSDN 45°

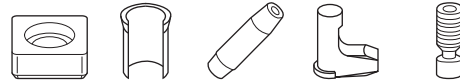

order number	catalogue number	H	B	F	L1	LH	gage insert	shim	shim pin	punch pin	lever	lever screw	Torx Plus
1244686	PSDNN1616H09	16	16	8,0	100	22,0	SN..090308	512.053	513.019	515.018	511.018	514.118	10 IP
1244863	PSDNN2020K12	20	20	10,0	125	26,0	SN..120408	512.063	513.023	515.018	511.023	514.123	15 IP
1156970	PSDNN2525M12	25	25	12,5	150	26,0	SN..120408	512.063	513.023	515.018	511.023	514.123	15 IP
1244687	PSDNN3225P12	32	25	12,5	170	28,0	SN..120408	512.063	513.023	515.018	511.023	514.123	15 IP
1244688	PSDNN3225P19	32	25	12,5	170	40,0	SN..190612	512.083	513.033	515.022	511.033	514.133	25 IP
1244835	PSDNN3232P19	32	32	16,0	170	40,0	SN..190612	512.083	513.033	515.022	511.033	514.133	25 IP
1147356	PSDNN4040S25	40	40	20,0	250	50,0	SN..250724	512.092	513.038	515.028	511.038	514.138	30 IP



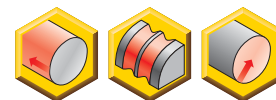
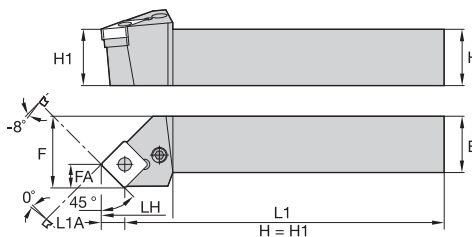
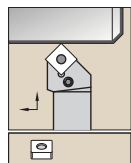
ISO Turning



■ **PSKN 75°**



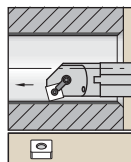
order number	catalogue number	H	B	F	L1	LH	L1A	gage insert	shim	shim pin	punch pin	lever	lever screw	Torx Plus
right hand														
1244699	PSKNR2020K12	20	20	25,0	125	23,0	3,1	SN..120408	512.063	513.023	515.018	511.023	514.123	15 IP
1244836	PSKNR2525M12	25	25	32,0	150	23,0	3,1	SN..120408	512.063	513.023	515.018	511.023	514.123	15 IP
1244701	PSKNR3232P15	32	32	40,0	170	32,0	3,8	SN..150608	512.025	513.025	515.022	511.025	514.125	15 IP
1244702	PSKNR3232P19	32	32	40,0	170	37,5	4,6	SN..190612	512.083	513.033	515.022	511.033	514.133	25 IP
left hand														
1244690	PSKNL2525M12	25	25	32,0	150	23,0	3,1	SN..120408	512.063	513.023	515.018	511.023	514.123	15 IP
1244693	PSKNL3232P19	32	32	40,0	170	37,5	4,6	SN..190612	512.083	513.033	515.022	511.033	514.133	25 IP


■ PSSN 45°

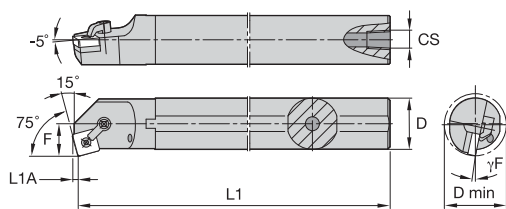

order number	catalogue number	H	B	F	L1	LH	FA	L1A	gage insert	shim	shim pin	punch pin	lever	lever screw	Torx Plus
right hand															
1244718	PSSNR2020K09	20	20	25,0	125	26,0	6,1	6,1	SN..090308	512.053	513.019	515.018	511.018	514.118	10 IP
1244837	PSSNR2020K12	20	20	25,0	125	28,0	8,3	8,3	SN..120408	512.063	513.023	515.018	511.023	514.123	15 IP
1156961	PSSNR2525M12	25	25	32,0	150	28,0	8,3	8,3	SN..120408	512.063	513.023	515.018	511.023	514.123	15 IP
1244719	PSSNR2525M15	25	25	32,0	150	32,0	10,2	10,2	SN..150608	512.025	513.025	515.022	511.025	514.125	15 IP
1244720	PSSNR3225P12	32	25	32,0	170	29,0	8,3	8,3	SN..120408	512.063	513.023	515.018	511.023	514.123	15 IP
1244722	PSSNR3232P15	32	32	40,0	170	32,0	10,0	11,5	SN..150612	512.025	513.025	515.022	511.025	514.125	15 IP
1244838	PSSNR3232P19	32	32	40,0	170	37,5	12,5	12,5	SN..190612	512.083	513.033	515.022	511.033	514.133	25 IP
1244723	PSSNR4040S19	40	40	50,0	250	37,5	12,5	12,5	SN..190612	512.083	513.033	515.022	511.033	514.133	25 IP
left hand															
1244709	PSSNL2020K12	20	20	25,0	125	28,0	8,3	8,3	SN..120408	512.063	513.023	515.018	511.023	514.123	15 IP
1244789	PSSNL2525M12	25	25	32,0	150	28,0	8,3	8,3	SN..120408	512.063	513.023	515.018	511.023	514.123	15 IP
1244710	PSSNL2525M15	25	25	32,0	150	32,0	10,2	10,2	SN..150608	512.025	513.025	515.022	511.025	514.125	15 IP
1244711	PSSNL3225P12	32	25	32,0	170	29,0	8,3	8,3	SN..120408	512.063	513.023	515.018	511.023	514.123	15 IP
1244714	PSSNL3232P19	32	32	40,0	170	37,5	12,5	12,5	SN..190612	512.083	513.033	515.022	511.033	514.133	25 IP
1244715	PSSNL4040S19	40	40	50,0	250	37,5	12,5	12,5	SN..190612	512.083	513.033	515.022	511.033	514.133	25 IP



ISO Turning



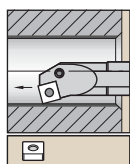
Steel shank with through coolant.



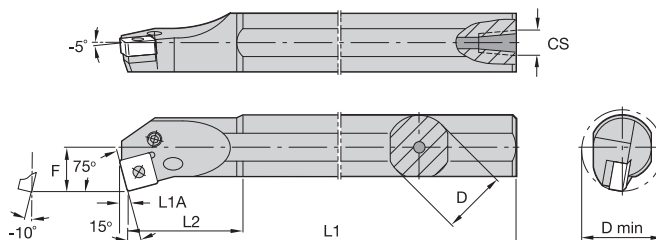
■ **A-MSKN 75°**



order number	catalogue number	D	D min	F	L1	L1A	CS	γF°	gage insert	shim	lock pin	hex	clamp	clamp screw	hex
right hand															
1098116	A40TMSKNR12	40	50,0	27,0	300	3,1	1/4-18 NPT	-10.0	SN..120408	ISSN432	KLM46	2.5 mm	CKM21	STCM20	3 mm
1098120	A50UMSKNR19	50	63,0	35,0	350	4,6	1/4-18 NPT	-12.0	SN..190608	ISSN633	KLM68	4 mm	CKM12	STCM4	4 mm
left hand															
1098115	A32SMSKNL12	32	40,0	22,0	250	3,1	1/4-18 NPT	-14.0	SN..120408	ISSN432	KLM46	2.5 mm	CKM21	STCM20	3 mm
1098117	A40TMSKNL12	40	50,0	27,0	300	3,1	1/4-18 NPT	-10.0	SN..120408	ISSN432	KLM46	2.5 mm	CKM21	STCM20	3 mm



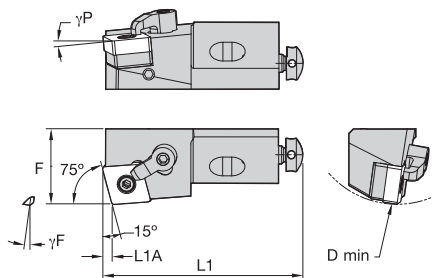
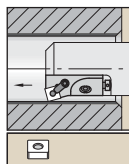
Steel shank with through coolant.



■ **A-PSKN 75°**



order number	catalogue number	D	D min	F	L1	L2	L1A	CS	gage insert	shim	shim pin	pin	toggle lever	lever screw	Torx Plus
right hand															
2447480	A25TPSKNR12	25	30,0	17,0	300	43	3,0	1/4-18 NPT	SN..120408	—	—	—	511.022	514.122	10 IP
2447482	A32UPSKNR12	32	40,0	22,0	350	52	3,0	1/4-18 NPT	SN..120408	512.063	513.023	515.018	511.023	514.124	15 IP


MSKN 75°

order number	catalogue number	D min	F	L1	L1A	γF°	γP°	gage insert
right hand								
2114011	MSKNR10CA09	40	14,0	50	2,2	-9,0	-5,0	SN..090308/SN..322
2114013	MSKNR12CA12	50	20,0	55	3,0	-9,0	-5,0	SN..120408/SN..432
2074430	MSKNR16CA12	60	25,0	63	3,0	-9,0	-5,0	SN..120408/SN..432
2072222	MSKNR20CA15	70	25,0	70	3,7	-9,0	-5,0	SN..150612/SN..543
2987166	MSKNR25CA19	100	32,0	100	4,6	-9,0	-5,0	SN..190612/SN..543
left hand								
3346242	MSKNL12CA12	50	20,0	55	3,0	-9,0	-5,0	SN..120408/SN..432
3330202	MSKNL20CA15	70	25,0	70	3,7	-9,0	-5,0	SN..150612/SN..543

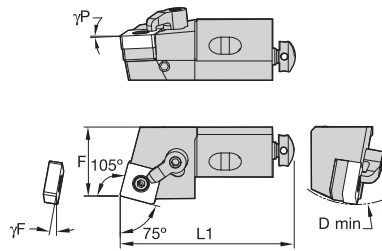
NOTE: Select spare parts based off of D min and the insert size selected.

Spare Parts


D min	shim	lock pin	hex	clamp	clamp screw	hex	radial adjusting screw	hex	axial adjusting screw	mounting screw	mounting screw	mounting screw	hex	washer
40	—	KLM33	2 mm	CKM36	STCM38	2 mm	KUAM28	2 mm	KUAM30	191.405	—	—	4 mm	CSWM 060 050
50	—	KLM43	2 mm	CKM34	STCM38	2 mm	KUAM22	2 mm	KUAM31	—	191.406	—	4 mm	CSWM 060 050
60	ISSN432	KLM46S	2.5 mm	CKM34	STCM9	2.5 mm	KUAM25	2.5 mm	KUAM32	—	191.407	—	5 mm	CSWM 080 050
70	SKSN566K	KLM54	2.5 mm	CKM37	STCM40	2.5 mm	KUAM25	2.5 mm	KUAM32	—	191.407	—	5 mm	CSWM 080 050
100	ISSN633	KLM68	4 mm	CKM35	STCM8	4 mm	KUAM27	4 mm	KUAM32	—	—	MS364	8 mm	CSWM 100 080



ISO Turning



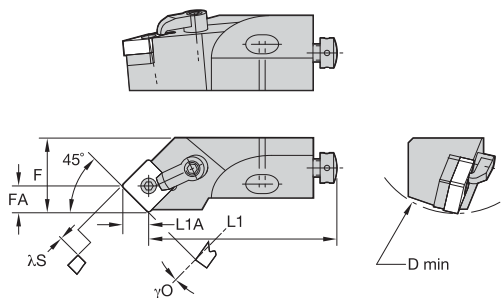
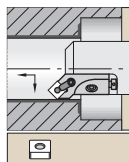
■ **MSRN 75°**

order number	catalogue number	D min	F	L1	γF°	γP°	gage insert
right hand							
1098436	MSRNR10CA09	40	14,0	50	-9.0	-5.0	SN..090308/SN..322
2078231	MSRNR12CA12	50	20,0	55	-9.0	-5.0	SN..120408/SN..432
2074432	MSRNR16CA12	60	25,0	63	-9.0	-5.0	SN..120408/SN..432
left hand							
1282803	MSRNL12CA12	50	20,0	55	-9.0	-5.0	SN..120408/SN..432
3330279	MSRNL16CA12	60	25,0	63	-9.0	-5.0	SN..120408/SN..432
3330203	MSRNL20CA15	70	25,0	70	-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	mounting screw	hex	washer
40	—	KLM33	2 mm	CKM36	STCM38	2 mm	KUAM28	2 mm	KUAM30	191.405	—	4 mm	CSWM 060 050
50	—	KLM43	2 mm	CKM34	STCM38	2 mm	KUAM22	2 mm	KUAM31	—	191.406	4 mm	CSWM 060 050
60	ISSN432	KLM46S	2.5 mm	CKM34	STCM9	2.5 mm	KUAM25	2.5 mm	KUAM32	—	191.407	5 mm	CSWM 080 050
70	SKSN566K	KLM54	2.5 mm	CKM37	STCM40	2.5 mm	KUAM25	2.5 mm	KUAM32	—	191.407	5 mm	CSWM 080 050


MSSN 45°

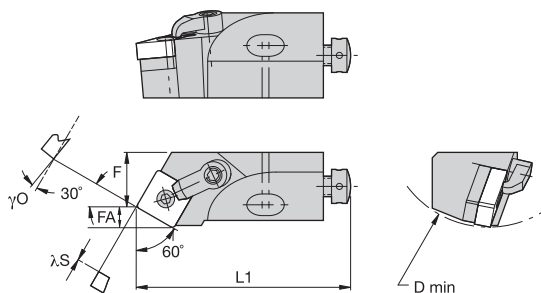
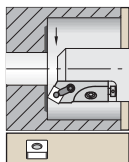
order number	catalogue number	D min	F	L1	L1A	λS°	γO°	gage insert
right hand								
1339367	MSSNR10CA09	40	14,0	44	6,1	-13.0	0.0	SN..090308/SN..322
1282807	MSSNR12CA12	50	20,0	47	8,3	-13.0	0.0	SN..120408/SN..432
3330281	MSSNR16CA12	60	25,0	53	8,3	-13.0	0.0	SN..120408/SN..432
3330206	MSSNR20CA15	70	25,0	60	10,3	-13.0	0.0	SN..150612/SN..543
left hand								
2071758	MSSNL10CA09	40	14,0	44	6,1	-13.0	0.0	SN..090308/SN..322
2071739	MSSNL12CA12	50	20,0	47	8,3	-13.0	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	mounting screw	hex	washer
40	—	KLM33	2 mm	CKM36	STCM38	2 mm	KUAM28	2 mm	KUAM30	191.405	—	4 mm	CSWM 060 050
50	—	KLM43	2 mm	CKM34	STCM38	2 mm	KUAM22	2 mm	KUAM31	—	191.406	4 mm	CSWM 060 050
60	ISSN432	KLM46S	2.5 mm	CKM36	STCM9	2.5 mm	KUAM25	2.5 mm	KUAM32	—	191.407	5 mm	CSWM 080 050
70	SKSN566K	KLM54	2.5 mm	CKM37	STCM40	2.5 mm	KUAM25	2.5 mm	KUAM32	—	191.407	5 mm	CSWM 080 050



ISO Turning



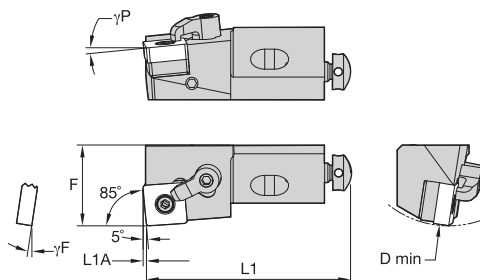
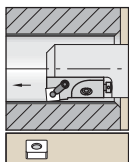
■ **MSTN 60°**

order number	catalogue number	D min	F	L1	FA	λS°	γ0°	gage insert
right hand								
3331149	MSTNR10CA09	40,0	9,0	50	13,3	-11.0	0.0	SN..090308/SN..322
2074904	MSTNR12CA12	50,0	13,0	55	5,9	-11.0	0.0	SN..120408/SN..432

■ **Spare Parts**



D min	lock pin	hex	clamp	clamp screw	hex	radial adjusting screw	hex	axial adjusting screw	mounting screw	mounting screw	hex	washer
40	KLM33	2 mm	CKM36	STCM38	2 mm	KUAM28	2 mm	KUAM30	191.405	—	4 mm	CSWM 060 050
50	KLM43	2 mm	CKM34	STCM38	2 mm	KUAM22	2 mm	KUAM31	—	191.406	4 mm	CSWM 060 050


MSYN 85°

order number	catalogue number	D min	F	L1	L1A	γF°	γP°	gage insert
right hand								
2114015	MSYNR10CA09	40	14,0	50	0,8	-9.0	-5.0	SN..090308/SN..322
3346274	MSYNR12CA12	50	20,0	55	1,0	-9.0	-5.0	SN..120408/SN..432
3330283	MSYNR16CA12	60	25,0	63	1,0	-9.0	-5.0	SN..120408/SN..432
1098465	MSYNR25CA19	100	32,0	100	1,5	-9.0	-5.0	SN..190612/SN..643
left hand								
3331150	MSYNL10CA09	40	14,0	50	0,8	-9.0	-5.0	SN..090308/SN..322
3346273	MSYNL12CA12	50	20,0	55	1,0	-9.0	-5.0	SN..120408/SN..432
1098691	MSYNL20CA15	70	25,0	70	1,3	-9.0	-5.0	SN..150612/SN..543

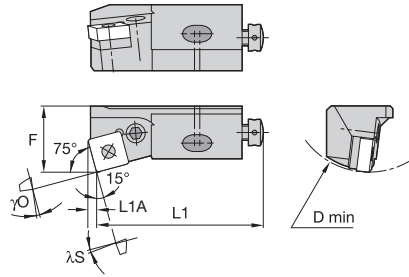
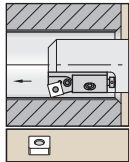
NOTE: Select spare parts based off of D min and insert size selected.

Spare Parts


D min	shim	lock pin	hex	clamp	clamp screw	hex	radial adjusting screw	hex	axial adjusting screw	mounting screw	mounting screw	mounting screw	hex	washer
40	—	KLM33	2 mm	CKM36	STCM38	2 mm	KUAM28	2 mm	KUAM30	191.405	—	—	4 mm	CSWM 060 050
50	—	KLM43	2 mm	CKM34	STCM38	2 mm	KUAM22	2 mm	KUAM31	—	191.406	—	4 mm	CSWM 060 050
60	ISSN432	KLM46S	2.5 mm	CKM36	STCM9	2.5 mm	KUAM25	2.5 mm	KUAM32	—	191.407	—	5 mm	CSWM 080 050
70	SKSN566K	KLM54	2.5 mm	CKM37	STCM40	2.5 mm	KUAM25	2.5 mm	KUAM33	—	191.407	—	6 mm	CSWM 080 050
100	ISSN633	KLM68	4 mm	CKM34	STCM8	4 mm	KUAM27	4 mm	KUAM33	—	—	MS364	8 mm	CSWM 100 080



ISO Turning



■ PSKN 75°

order number	catalogue number	D min	F	L1	L1A	λS°	γO°	gage insert
right hand								
1188639	PSKNR12CA-12	50	20,0	55	3,1	-8.0	-6.0	SN..120408/SN..432

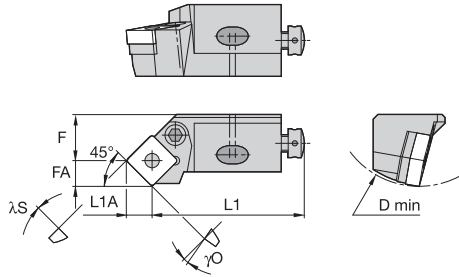
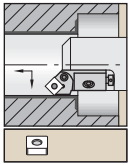
■ Spare Parts



D min	toggle lever	lever screw	wrench size lever screw	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
50	511.022	514.122	10 IP	KUAM28	2 mm	KUAM31	191.406	4 mm	CSWM 060 050



ISO Turning

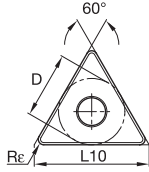
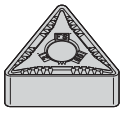

■ PSSN 45°

order number	catalogue number	D min	F	L1	FA	L1A	λS°	γO°	γP°	gage insert
right hand										
1244455	PSSNR12CA-12	50,0	20,0	47	8,7	8,3	-10.0	0.0	—	SN..120408/SN..432
left hand										
1244452	PSSNL12CA12	50,0	11,3	47	8,7	8,3	0.0	0.0	-10.0 deg	SN..120408/SN..432

■ Spare Parts

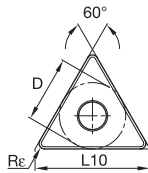
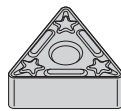

D min	toggle lever	lever screw	wrench size lever screw	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
50	511.022	514.122	10 IP	KUAM28	2 mm	KUAM31	191.406	4 mm	CSWM 060 050

- first choice
- alternate choice



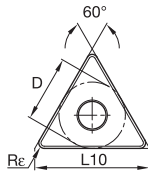
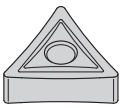
■ TNGG-FS

ISO catalogue number	D	L10	Re
TNGG160402FS	9,53	16,50	0,2
TNGG160404FS	9,53	16,50	0,4
TNGG220408FS	12,70	22,00	0,8



■ TNGG-LF

ISO catalogue number	D	L10	Re
TNGG160402LF	9,53	16,50	0,2
TNGG160404LF	9,53	16,50	0,4
TNGG160408LF	9,53	16,50	0,8

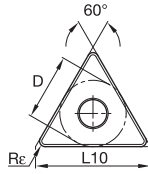
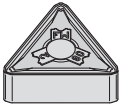


■ TNGP

ISO catalogue number	D	L10	Re
TNGP160402	9,53	16,50	0,2
TNGP160404	9,53	16,50	0,4
TNGP160408	9,53	16,50	0,8

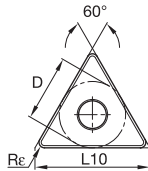
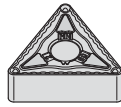
P	M	K	N	S	H	
●	●	○				KCP05B
●	●	○				KCP05
●	●	○				KCP10B
●	●	○				KCP10
●	●	○				KCP25B
●	●	○				KCP25
●	●	○				KCP30B
●	●	○				KCP30
●	●	○				KCP40B
●	○	○				KCP40
●	○	○				KCK05B
○						KCK05
○						KCK15B
○						KCK15
○						KCK20B
○						KCK20
○						KCM15B
○	●					KCM15
○	●					KCM25B
○	●					KCM25
○	●					KCM35B
○	●					KCM35
○	●					KCPK05
○	●					K313
○	●					K68
○	●					KCU10
○	●					KCU25
○	●					KC5010
○	●					KC5025
○	●					KC5410
○	●					KT315

- first choice
- alternate choice



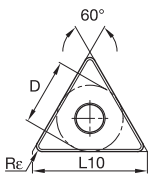
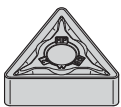
TNMG-FW

ISO catalogue number	D	L10	Re
TNMG160404FW	9,53	16,50	0,2
TNMG160408FW	9,53	16,50	0,4
TNMG160412FW	9,53	16,50	1,2



TNMG-MN

ISO catalogue number	D	L10	Re
TNMG160404MN	9,53	16,50	0,4
TNMG160408MN	9,53	16,50	0,8
TNMG160412MN	9,53	16,50	1,2
TNMG220404MN	12,70	22,00	0,4
TNMG220408MN	12,70	22,00	0,8
TNMG220412MN	12,70	22,00	1,2



TNMG-MP

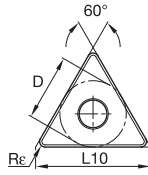
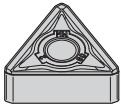
ISO catalogue number	D	L10	Re
TNMG160404MP	9,53	16,50	0,4
TNMG160408MP	9,53	16,50	0,8
TNMG160412MP	9,53	16,50	1,2
TNMG220408MP	12,70	22,00	0,8
TNMG220412MP	12,70	22,00	1,2
TNMG220416MP	12,70	22,00	1,6

	P	M	K	N	S	H
KCP05B	●					
KCP05	●					
KCP10B	●					
KCP10	●					
KCP25B	●					
KCP25	●					
KCP30B	●					
KCP30	●					
KCP40B	●					
KCP40	●					
KCK05B	●					
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KCK15B	●					
KCK15	●					
KCK20B	●					
KCK20	●					
KCM15B	●					
KCM15	●					
KCM25B	●					
KCM25	●					
KCM35B	●					
KCM35	●					
KCPK05	●					
K313	●					
K68	●					
KCU10	●					
KCU25	●					
KC5010	●					
KC5025	●					
KC5410	●					
KT315	●					



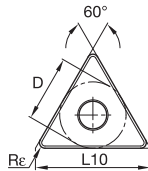
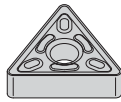
ISO Turning

● first choice
○ alternate choice



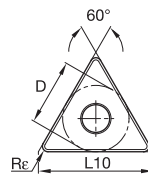
TNMG-MW

ISO catalogue number	D	L10	Re	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
TNMG160408MW	9,53	16,50	0,8	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TNMG160412MW	9,53	16,50	1,2	-	-	●	●	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



TNMG-P

ISO catalogue number	D	L10	Re	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
TNMG160404P	9,53	16,50	0,4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TNMG160408P	9,53	16,50	0,8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TNMG220404P	12,70	22,00	0,4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TNMG220408P	12,70	22,00	0,8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TNMG220412P	12,70	22,00	1,2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



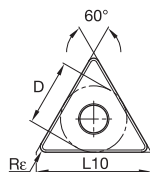
TNMG-RN

ISO catalogue number	D	L10	Re	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
TNMG160408RN	9,53	16,50	0,8	-	-	-	●	●	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TNMG160412RN	9,53	16,50	1,2	-	-	-	●	●	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TNMG220408RN	12,70	22,00	0,8	-	-	-	●	●	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TNMG220412RN	12,70	22,00	1,2	-	-	-	●	●	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TNMG220416RN	12,70	22,00	1,6	-	-	-	-	●	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TNMG270608RN	15,88	27,50	0,8	-	-	-	●	●	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TNMG270612RN	15,88	27,50	1,2	-	-	-	●	●	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TNMG270616RN	15,88	27,50	1,6	-	-	-	●	●	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TNMG330924RN	19,05	33,00	2,4	-	-	-	●	●	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

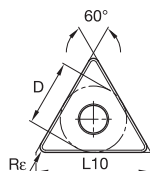
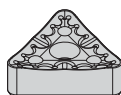


ISO Turning

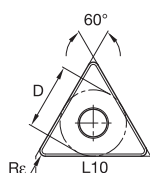
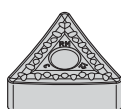
- first choice
- alternate choice


TNMG-UP

ISO catalogue number	D	L10	Re
TNMG160404UP	9,53	16,50	0,4
TNMG160408UP	9,53	16,50	0,8
TNMG220408UP	12,70	22,00	0,8


TNMM-MR

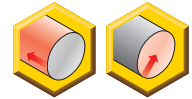
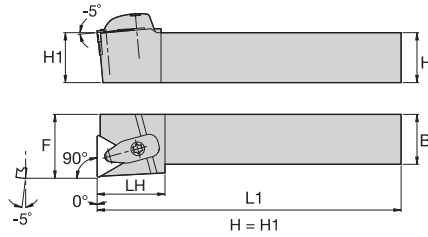
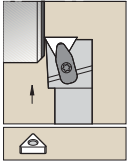
ISO catalogue number	D	L10	Re
TNMM330924MR	19,05	33,00	2,4


TNMM-RM

ISO catalogue number	D	L10	Re
TNMM160408RM	9,53	16,50	0,8
TNMM160412RM	9,53	16,50	1,2
TNMM220408RM	12,70	22,00	0,8
TNMM220412RM	12,70	22,00	1,2
TNMM220416RM	12,70	22,00	1,6
TNMM270612RM	15,88	27,50	1,2
TNMM270616RM	15,88	27,50	1,6

	P	M	K	N	S	H
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KCP05	●					
KCP10B	●					
KCP10	●					
KCP25B	●					
KCP25	●					
KCP30B	●					
KCP30	●					
KCP40B	●					
KCP40	●					
KCK05B	○					
KCK05	○					
KCK15B						
KCK15						
KCK20B						
KCK20						
KCM15B						
KCM15						
KCM25B						
KCM25						
KCM35B						
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KC5010						
KC5025						
KC5410						
KT315						

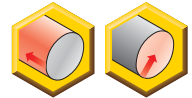
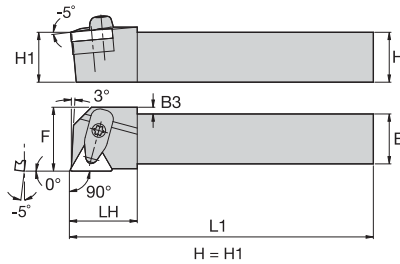
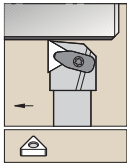
ISO Turning



■ DTFN-KC 90°



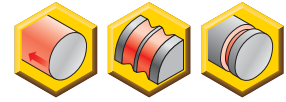
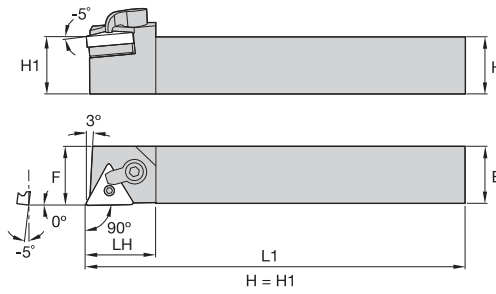
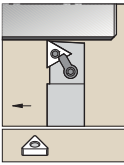
order number	catalogue number	H	B	F	L1	LH	gage insert	shim	shim screw	Torx Plus	clamp assembly	Torx Plus	slotted pin	optional lock pin
right hand														
2273392	DTFNR2020K16KC04	20	20	25,0	125	32,0	TN..160408	ITSN323	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM34L9IP
left hand														
1875233	DTFNL2525M22KC04	25	25	32,0	150	34,0	TN..220408	ITSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP



■ DTGN-KC 90°



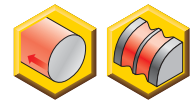
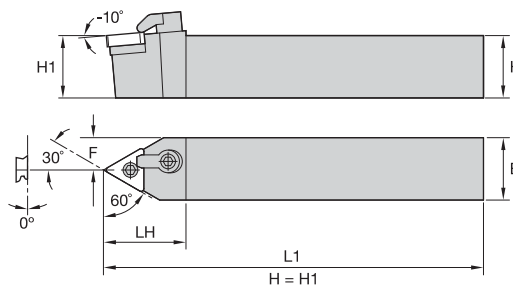
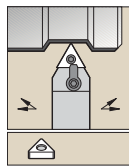
order number	catalogue number	H	B	F	L1	LH	B3	gage insert	shim	shim screw	Torx Plus	clamp assembly	Torx Plus	slotted pin	optional lock pin
right hand															
2273440	DTGNR2020K16KC04	20	20	25,0	125	25,0	6,5	TN..160408	ITSN323	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM34L9IP
2273441	DTGNR2525M16KC04	25	25	32,0	150	25,0	—	TN..160408	ITSN323	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM34L9IP
1875222	DTGNR2525M22KC04	25	25	32,0	150	32,0	3,0	TN..220408	ITSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP
left hand															
1875234	DTGNL2525M22KC04	25	25	32,0	150	32,0	3,0	TN..220408	ITSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP



ISO Turning

MTAN-S 90°

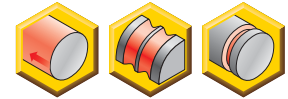
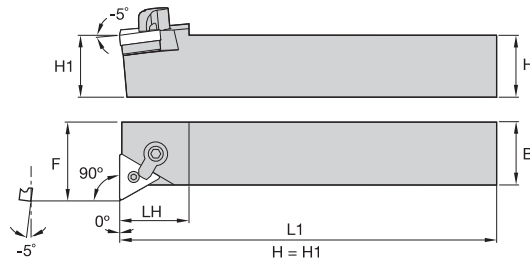
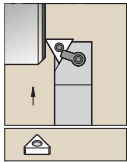

order number	catalogue number	H	B	F	L1	LH	gage insert	shim	lock pin	hex	clamp	clamp screw	hex
right hand													
1102172	MTANRS2020K16	20	20	20,5	125	32,0	TN..160408	ITSN322	KLM34L	2 mm	CKM21	STCM20	3 mm
1102173	MTANRS2525M16	25	25	25,5	150	30,0	TN..160408	ITSN322	KLM34L	2 mm	CKM21	STCM20	3 mm
left hand													
1102726	MTANLS2525M16	25	25	25,5	150	32,0	TN..160408	ITSN322	KLM34L	2 mm	CKM21	STCM20	3 mm


MTEN-S 60°


order number	catalogue number	H	B	F	L1	LH	gage insert	shim	lock pin	hex	clamp	clamp screw	hex
1102169	MTENNS2020K16	20	20	10,0	125	32,0	TN..160408	ITSN322	KLM34L	2 mm	CKM21	STCM20	3 mm
1102170	MTENNS2525M16	25	25	12,0	150	32,0	TN..160408	ITSN322	KLM34L	2 mm	CKM21	STCM20	3 mm
1102171	MTENNS2525M22	25	25	12,0	150	35,0	TN..220408	ITSN433	KLM46	2.5 mm	CKM9	STCM4	4 mm
1102168	MTENNS3225P22	32	25	12,0	170	35,0	TN..220408	ITSN433	KLM46	2.5 mm	CKM9	STCM4	4 mm

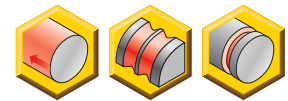
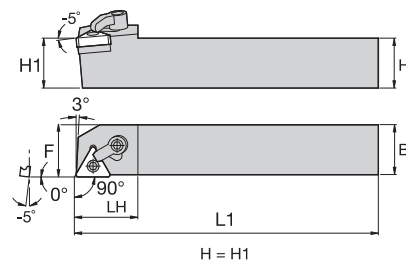
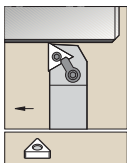


ISO Turning



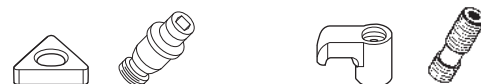
■ MTFN 90°

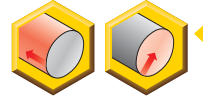
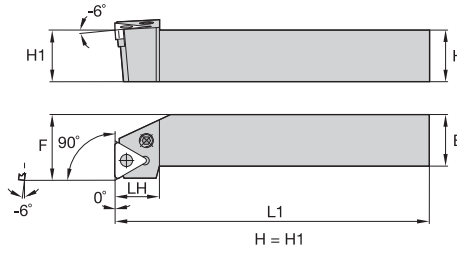
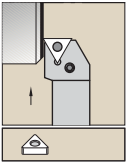
order number	catalogue number	H	B	F	L1	LH	gage insert	shim	lock pin	hex	clamp	clamp screw	hex
right hand													
1101961	MTFNR2525M16	25	25	32,0	150	32,0	TN..160408	ITSN322	KLM34L	2 mm	CKM20	STCM11	3 mm
left hand													
1102643	MTFNL2020K16	20	20	25,0	125	32,0	TN..160408	ITSN322	KLM34L	2 mm	CKM20	STCM11	3 mm
1102694	MTFNL2525M16	25	25	32,0	150	32,0	TN..160408	ITSN322	KLM34L	2 mm	CKM20	STCM11	3 mm



■ MTGN 90°

order number	catalogue number	H	B	F	L1	LH	gage insert	shim	lock pin	hex	clamp	clamp screw	hex
right hand													
1102088	MTGNR1616H16	36	25	20,0	100	32,0	TN..160408	ITSN322	KLM34L	2 mm	CKM20	STCM11	3 mm
1102090	MTGNR2525M16	86	32	32,0	150	32,0	TN..160408	ITSN322	KLM34L	2 mm	CKM21	STCM20	3 mm
1102091	MTGNR2525M22	86	38	32,0	150	32,0	TN..220408	ITSN433	KLM46	2.5 mm	CKM9	STCM4	4 mm
1102093	MTGNR3232P22	106	32	40,0	170	32,0	TN..220408	ITSN433	KLM46	2.5 mm	CKM9	STCM4	4 mm
left hand													
1102714	MTGNL2525M16	86	32	32,0	150	32,0	TN..160408	ITSN322	KLM34L	2 mm	CKM21	STCM20	3 mm
1102715	MTGNL2525M22	86	38	32,0	150	32,0	TN..220408	ITSN433	KLM46	2.5 mm	CKM9	STCM4	4 mm
1102716	MTGNL3232P22	106	25	40,0	170	32,0	TN..220408	ITSN433	KLM46	2.5 mm	CKM9	STCM4	4 mm

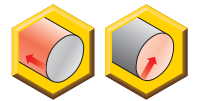
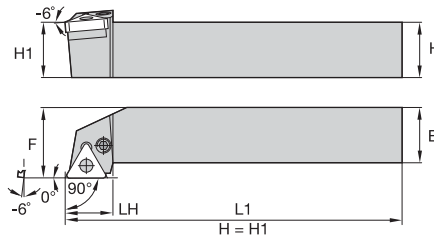
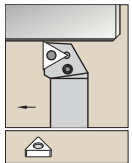




ISO Turning

PTFN 90°

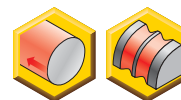
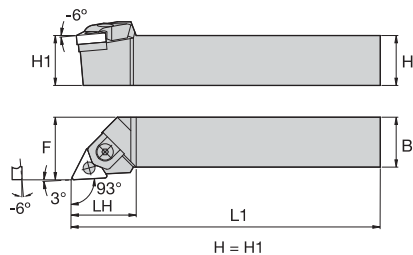
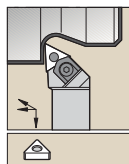
order number	catalogue number	H	B	F	L1	LH	gage insert	shim	shim pin	punch pin	lever	lever screw	hex
right hand													
1244843	PTFNR2020K16	20	20	25,0	125	20,0	TN..160408	512.013	513.018	515.018	511.018	514.118	10 IP
1244844	PTFNR2525M16	25	25	32,0	150	20,0	TN..160408	512.013	513.018	515.018	511.018	514.118	10 IP
left hand													
1244839	PTFNL2020K16	20	20	25,0	125	20,0	TN..160408	512.013	513.018	515.018	511.018	514.118	10 IP
1244726	PTFNL2525M16	25	25	32,0	150	20,0	TN..160408	512.013	513.018	515.018	511.018	514.118	10 IP


PTGN 90°

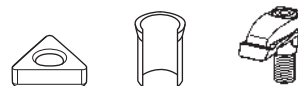
order number	catalogue number	H	B	F	L1	LH	gage insert	shim	shim pin	punch pin	lever	lever screw	hex
right hand													
1156972	PTGNR1616H16	16	16	20,0	100	20,0	TN..160408	512.013	513.018	515.018	511.018	514.118	10 IP
1244850	PTGNR2020K16	20	20	25,0	125	20,0	TN..160408	512.013	513.018	515.018	511.018	514.118	10 IP
1192394	PTGNR2525M16	25	25	32,0	150	20,0	TN..160408	512.013	513.018	515.018	511.018	514.118	10 IP
1244851	PTGNR2525M22	25	25	32,0	150	26,0	TN..220408	512.023	513.023	515.018	511.023	514.123	15 IP
left hand													
1244791	PTGNL1616H16	16	16	20,0	100	20,0	TN..160408	512.013	513.018	515.018	511.018	514.118	10 IP
1244848	PTGNL2020K16	20	20	25,0	125	20,0	TN..160408	512.013	513.018	515.018	511.018	514.118	10 IP
1244792	PTGNL2525M16	25	25	32,0	150	20,0	TN..160408	512.013	513.018	515.018	511.018	514.118	10 IP
1244778	PTGNL2525M22	25	25	32,0	150	26,0	TN..220408	512.023	513.023	515.018	511.023	514.123	15 IP



ISO Turning



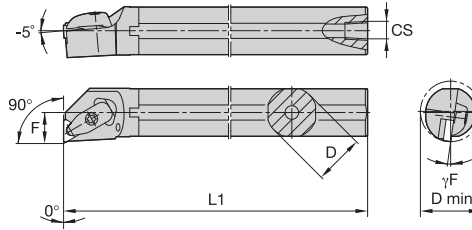
■ **MTJN 93°**



order number	catalogue number	H	B	F	L1	LH	gage insert	shim	shim pin	clamp assembly	hex
right hand											
1192350	MTJNR2020K16H4	20	20	25,0	125	32,0	TN..160408	512.125	513.125	551.125	3 mm
1192352	MTJNR2525M16H4	25	25	32,0	150	32,0	TN..160408	512.125	513.125	551.125	3 mm
1245000	MTJNR2525M22H4	25	25	32,0	150	36,0	TN..220408	512.126	513.126	551.126	3 mm
1244998	MTJNR3225P16H4	32	25	32,0	170	32,0	TN..160408	512.125	513.125	551.125	3 mm
1244999	MTJNR3225P22H4	32	25	32,0	170	36,0	TN..220408	512.126	513.126	551.126	3 mm
left hand											
1244996	MTJNL2020K16H4	20	20	25,0	125	32,0	TN..160408	512.125	513.125	551.125	3 mm
1245002	MTJNL2525M16H4	25	25	32,0	150	32,0	TN..160408	512.125	513.125	551.125	3 mm
1245001	MTJNL2525M22H4	25	25	32,0	150	36,0	TN..220408	512.126	513.126	551.126	3 mm
1244997	MTJNL3225P16H4	32	25	32,0	170	32,0	TN..160408	512.125	513.125	551.125	3 mm



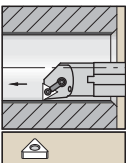
Steel shank with through coolant.



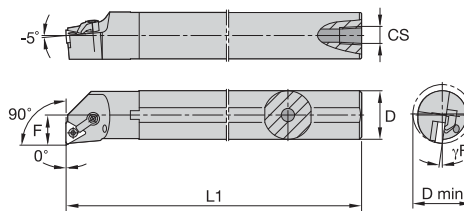
ISO Turning

A-DTFN-KC 90°


order number	catalogue number	D	D min	F	L1	CS	γF°	gage insert	shim	shim screw	Torx Plus	clamp assembly	slotted pin	Torx Plus
right hand														
2441866	A25RDTFNR16KC04	25	32,0	17,0	200	1/4-18 NPT	-14.0	TN..160408	ITSN323	KMSP315IP	15 IP	CM234R ASSY	SSP025016M	15 IP
2441870	A32SDTFNR16KC04	32	40,0	22,0	250	1/4-18 NPT	-12.0	TN..160408	ITSN323	KMSP315IP	15 IP	CM234R ASSY	SSP025016M	15 IP
left hand														
2441869	A25RDTFNL16KC04	25	32,0	17,0	200	1/4-18 NPT	-14.0	TN..160408	ITSN323	KMSP315IP	15 IP	CM234R ASSY	SSP025016M	15 IP

Kenloc™ Boring Bars


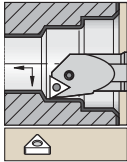
Steel shank with through coolant.


A-MTFN 90°

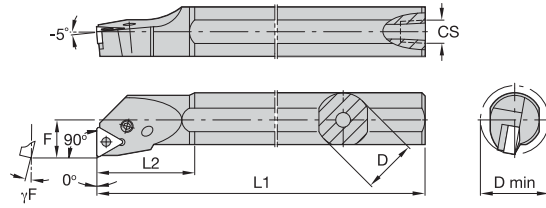

order number	catalogue number	D	D min	F	L1	CS	γF°	gage insert	shim	lock pin	hex	clamp	clamp screw	hex
right hand														
1098121	A25RMTFNR16	25	32,0	17,0	200	1/4-18 NPT	-14.0	TN..160408	ITSN322	KLM34L	2 mm	CKM21	STCM20	3 mm
1098123	A32SMTFNR16	32	40,0	22,0	250	1/4-18 NPT	-12.0	TN..160408	ITSN322	KLM34L	2 mm	CKM21	STCM20	3 mm
1098125	A40TMTFNR16	40	50,0	27,0	300	1/4-18 NPT	-9.0	TN..160408	ITSN322	KLM34L	2 mm	CKM21	STCM20	3 mm
left hand														
1098122	A25RMTFNL16	25	32,0	17,0	200	1/4-18 NPT	-14.0	TN..160408	ITSN322	KLM34L	2 mm	CKM21	STCM20	3 mm
1098124	A32SMTFNL16	32	40,0	22,0	250	1/4-18 NPT	-12.0	TN..160408	ITSN322	KLM34L	2 mm	CKM21	STCM20	3 mm



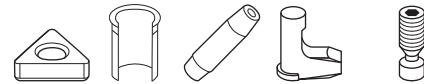
ISO Turning



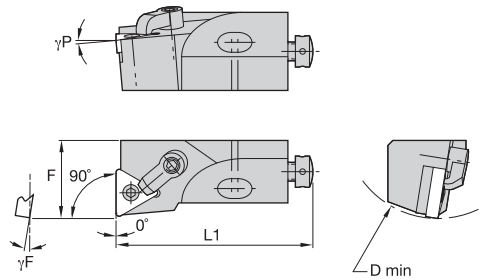
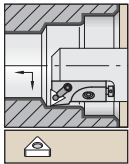
Steel shank with through coolant.



■ **A-PTFN 90°**



order number	catalogue number	D	D min	F	L1	L2	CS	γ_F°	gage insert	shim	shim pin	pin	toggle lever	lever screw	Torx Plus
right hand															
2447535	A16RPTFNR11	16	20,0	11,0	200	28	1/8-27 NPT	-14,0	TN..110304	—	—	—	511.011	514.111	8 IP
2447536	A20SPTFNR11	20	25,0	13,0	250	30	1/8-27 NPT	-12,0	TN..110304	—	—	—	511.011	514.111	8 IP
2447537	A25TPTFNR16	25	32,0	17,0	300	40	1/4-18 NPT	-12,0	TN..160408	512.013	513.018	515.018	511.018	514.118	10 IP
2447539	A32UPTFNR16	32	40,0	22,0	350	50	1/4-18 NPT	-10,0	TN..160408	512.013	513.018	515.018	511.018	514.118	10 IP
2447504	A40VPTFNR22	40	48,0	27,0	400	55	1/4-18 NPT	-10,0	TN..220408	512.023	513.023	515.018	511.023	514.123	15 IP
left hand															
2447489	A20SPTFNL11	20	25,0	13,0	250	30	1/8-27 NPT	-12,0	TN..110304	—	—	—	511.011	514.111	8 IP
2447538	A25TPTFNL16	25	32,0	17,0	300	40	1/4-18 NPT	-12,0	TN..160408	512.013	513.018	515.018	511.018	514.118	10 IP
2447503	A32UPTFNL16	32	40,0	22,0	350	50	1/4-18 NPT	-10,0	TN..160408	512.013	513.018	515.018	511.018	514.118	10 IP


MTFN 90°

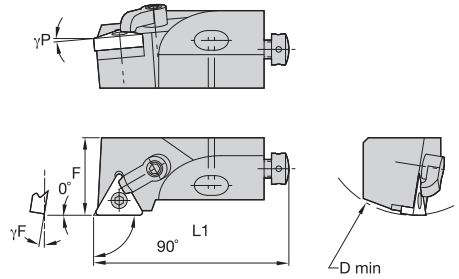
order number	catalogue number	D min	F	L1	γF°	γP°	gage insert
right hand							
2078236	MTFNR12CA16	50	20,0	55	-9.0	-5.0	TN..160408/TN..332
2074429	MTFNR16CA16	60	25,0	63	-9.0	-5.0	TN..160408/TN..332
3330208	MTFNR20CA22	70	25,0	70	-9.0	-5.0	TN..220408/TN..432
left hand							
2057426	MTFNL12CA16	50	20,0	55	-9.0	-5.0	TN..160408/TN..332
2193621	MTFNL16CA16	60	25,0	63	-9.0	-5.0	TN..160408/TN..332
3330207	MTFNL20CA22	70	25,0	70	-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
50	—	KLM33L	2 mm	CKM34	STCM38	2 mm	KUAM22	2 mm	KUAM31	191.406	4 mm	CSWM 060 050
60	ITSN322	KLM34L	2 mm	CKM34	STCM9	2 mm	KUAM25	2 mm	KUAM32	191.407	5 mm	CSWM 080 050
70	ITSN433	KLM46	2.5 mm	CKM35	STCM37	2.5 mm	KUAM25	2.5 mm	KUAM32	191.407	5 mm	CSWM 080 050



ISO Turning



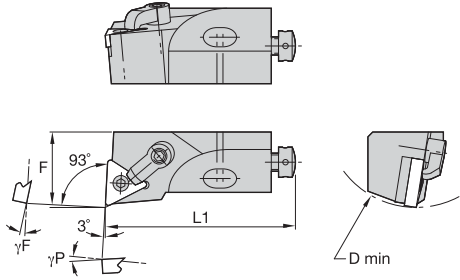
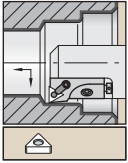
■ **MTGN 90°**

order number	catalogue number	D min	F	L1	γ_F°	γ_P°	gage insert
right hand							
2114041	MTGNR12CA16	50	20,0	55	-9.0	-5.0	TN..160408/TN..332
3330285	MTGNR16CA16	60	25,0	63	-9.0	-5.0	TN..160408/TN..332
left hand							
3346275	MTGNL12CA16	50	20,0	55	-9.0	-5.0	TN..160408/TN..332
3330209	MTGNL20CA22	70	25,0	70	-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
50	—	KLM33L	2 mm	CKM34	STCM38	2 mm	KUAM22	2 mm	KUAM31	191.406	4 mm	CSWM 060 050
60	ITSN322	KLM34L	2 mm	CKM34	STCM9	2.5 mm	KUAM25	2.5 mm	KUAM32	191.407	5 mm	CSWM 080 050
70	ITSN433	KLM46	2.5 mm	CKM35	STCM37	2.5 mm	KUAM25	2.5 mm	KUAM32	191.407	5 mm	CSWM 080 050


■ MTUN 93°

order number	catalogue number	D min	F	L1	γF°	γP°	gage insert
right hand							
1098536	MTUNR20CA22	70	25,0	70	-9.0	-5.0	TN..220408/TN..432
left hand							
1098529	MTUNL12CA16	50	20,0	55	-9.0	-5.0	TN..160408/TN..332
1098535	MTUNL16CA16	60	25,0	63	-9.0	-5.0	TN..160408/TN..332

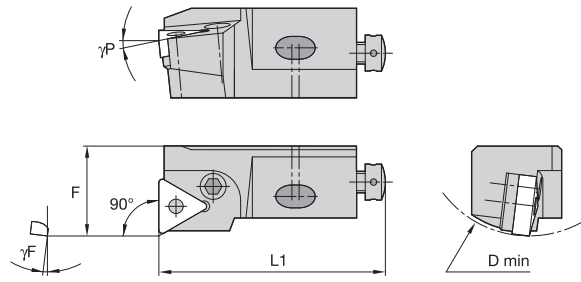
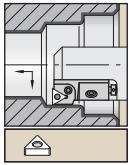
NOTE: Select spare parts based off of D min and the insert size selected.

■ Spare Parts


D min	shim	lock pin	hex	clamp	clamp screw	hex	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
50	—	KLM33L	2 mm	CKM34	STCM38	2 mm	KUAM22	2 mm	KUAM31	191.406	4 mm	CSWM 060 050
60	ITSN322	KLM34L	2 mm	CKM34	STCM9	2.5 mm	KUAM25	2.5 mm	KUAM32	191.407	5 mm	CSWM 080 050
70	ITSN433	KLM46	—	CKM35	STCM37	2.5 mm	KUAM25	2.5 mm	KUAM33	191.407	5 mm	CSWM 080 050



ISO Turning



■ PTFN 90°

order number	catalogue number	D min	F	L1	γF°	γP°	gage insert
right hand							
1188641	PTFNR12CA-16	50	20,0	55	-7.0	-6.0	TN..160408/TN..332
left hand							
1244457	PTFNL12CA-16	50	20,0	55	-7.0	-6.0	TN..160408/TN..332

■ Spare Parts

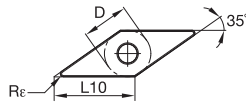
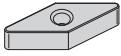


D min	toggle lever	lever screw	wrench size lever screw	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
50	511.030	514.112	8 IP	KUAM28	2 mm	KUAM31	191.406	4 mm	CSWM 060 050



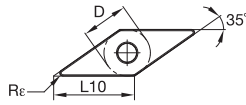
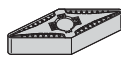
ISO Turning

- first choice
- alternate choice



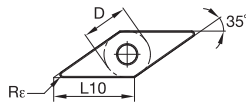
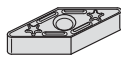
VNGA

ISO catalogue number	D	L10	Re	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KGK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
VNGA160404	9,53	16,61	0,4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VNGA160408	9,53	16,61	0,8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



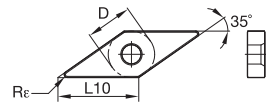
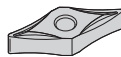
VNGG-FS

ISO catalogue number	D	L10	Re	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KGK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
VNGG160401FS	9,53	16,61	0,1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VNGG160402FS	9,53	16,61	0,2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VNGG160404FS	9,53	16,61	0,4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VNGG160408FS	9,53	16,61	0,8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



VNGG-LF

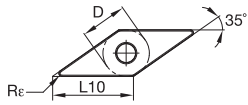
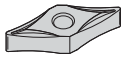
ISO catalogue number	D	L10	Re	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KGK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
VNGG160402LF	9,53	16,61	0,2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VNGG160404LF	9,53	16,61	0,4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VNGG160408LF	9,53	16,61	0,8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VNGG220408LF	12,70	22,14	0,8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



VNGP

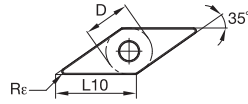
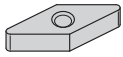
ISO catalogue number	D	L10	Re	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KGK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
VNGP160401	9,53	16,61	0,1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VNGP160402	9,53	16,61	0,2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VNGP220404	12,70	22,14	0,4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VNGP220408	12,70	22,14	0,8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

ISO Turning



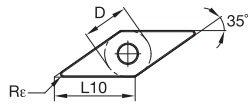
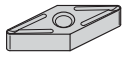
■ VNGP-K

ISO catalogue number	D	L10	Re
VNGP160404K	9,53	16,61	0,4
VNGP160408K	9,53	16,61	0,8
VPGP443K	12,70	22,14	1,2



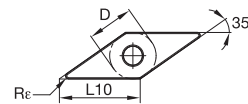
■ VNMA

ISO catalogue number	D	L10	Re
VNMA160408	9,53	16,61	0,8



■ VNMG

ISO catalogue number	D	L10	Re
VNMG160408	9,53	16,61	0,8
VNMG160412	9,53	16,61	1,2
VNMG220408	12,70	22,14	0,8
VNMG220412	12,70	22,14	1,2



■ VNMG-LF

ISO catalogue number	D	L10	Re
VNMG160408LF	9,53	16,61	0,8
VNMG220404LF	12,70	22,14	0,4
VNMG220408LF	12,70	22,14	0,8

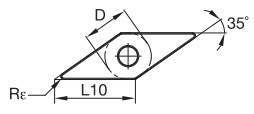
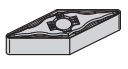
● first choice
○ alternate choice

P	M	K	N	S	H	
●	●	○	○	○	○	KCP05B
●	●	○	○	○	○	KCP05
●	●	○	○	○	○	KCP10B
●	●	○	○	○	○	KCP10
●	●	○	○	○	○	KCP25B
●	●	○	○	○	○	KCP25
●	●	○	○	○	○	KCP30B
●	●	○	○	○	○	KCP30
●	○	○	○	○	○	KCP40B
●	○	○	○	○	○	KCP40
○	○	○	○	○	○	KCK05B
○	○	○	○	○	○	KCK05
○	○	○	○	○	○	KCK15B
○	○	○	○	○	○	KCK15
○	○	○	○	○	○	KCK20B
○	○	○	○	○	○	KCK20
○	○	○	○	○	○	KCM15B
○	○	○	○	○	○	KCM15
○	○	○	○	○	○	KCM25B
○	○	○	○	○	○	KCM25
○	○	○	○	○	○	KCM35B
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○	○	○	○	○	○	K313
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○	○	○	○	○	○	KCU10
○	○	○	○	○	○	KCU25
○	○	○	○	○	○	KC5010
○	○	○	○	○	○	KC5025
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○	○	○	○	○	○	KT315



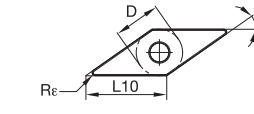
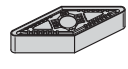
ISO Turning

● first choice
○ alternate choice



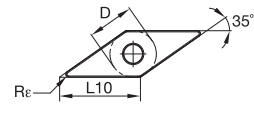
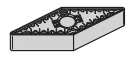
■ VNMG-FF

ISO catalogue number	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
VNMG160404FF	9,53	16,61	0,4	-	●	●	●	-	-	-	-	-	-	-	-	-	-	-	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VNMG160408FF	9,53	16,61	0,8	-	●	●	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



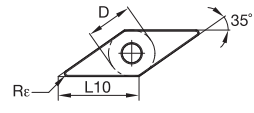
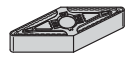
■ VNMG-FN

ISO catalogue number	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
VNMG160404FN	9,53	16,61	0,4	-	●	●	●	●	●	-	-	-	-	-	●	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	●
VNMG160408FN	9,53	16,61	0,8	-	●	●	●	●	●	-	-	-	-	-	●	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	●



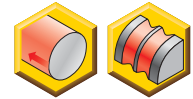
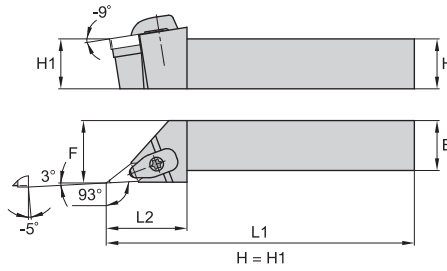
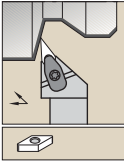
■ VNMG-FP

ISO catalogue number	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
VNMG160404FP	9,53	16,61	0,4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-
VNMG160408FP	9,53	16,61	0,8	-	-	-	-	●	●	-	-	-	-	-	-	-	-	-	-	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-



■ VNMG-MN

ISO catalogue number	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
VNMG160404MN	9,53	16,61	0,4	-	-	-	-	●	●	●	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VNMG160408MN	9,53	16,61	0,8	-	●	●	●	●	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VNMG160412MN	9,53	16,61	1,2	-	-	-	-	●	●	●	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



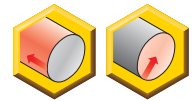
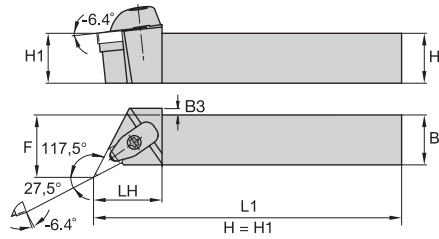
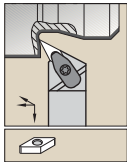
ISO Turning

DVJN-KC 93°


order number	catalogue number	H	B	F	L1	LH	gage insert	shim	shim screw	Torx Plus	clamp assembly	Torx Plus	slotted pin	optional lock pin	
right hand															
2439399	DVJNR2020K16KC04	20	20	25,0	125	46,0	VN..160408	IVSN322	KMSP315IP	15 IP	CM215R ASSY	15 IP	SSP025016M	KLM34L9IP	
2439401	DVJNR2525M16KC04	25	25	32,0	150	46,0	VN..160408	IVSN322	KMSP315IP	15 IP	CM215R ASSY	15 IP	SSP025016M	KLM34L9IP	
2439443	DVJNR3225P16KC04	32	25	32,0	170	46,0	VN..160408	IVSN322	KMSP315IP	15 IP	CM215R ASSY	15 IP	SSP025016M	KLM34L9IP	
left hand															
2439400	DVJNL2020K16KC04	20	20	25,0	125	46,0	VN..160408	IVSN322	KMSP315IP	15 IP	CM215R ASSY	15 IP	SSP025016M	KLM34L9IP	
2439402	DVJNL2525M16KC04	25	25	32,0	150	46,0	VN..160408	IVSN322	KMSP315IP	15 IP	CM215R ASSY	15 IP	SSP025016M	KLM34L9IP	
2439444	DVJNL3225P16KC04	32	25	32,0	170	46,0	VN..160408	IVSN322	KMSP315IP	15 IP	CM215R ASSY	15 IP	SSP025016M	KLM34L9IP	



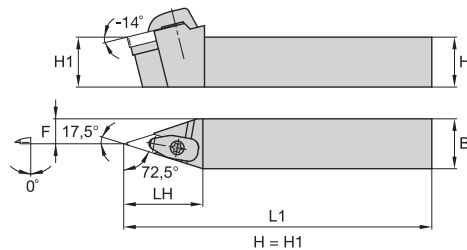
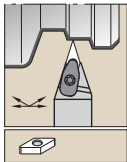
ISO Turning



■ DVON-KC 117,5°



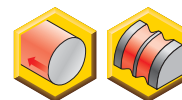
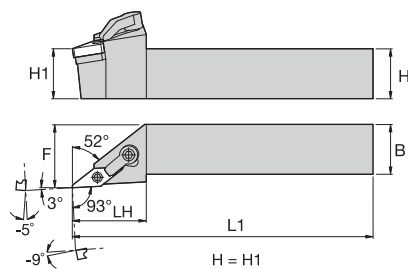
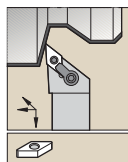
order number	catalogue number	H	B	F	L1	LH	B3	gage insert	shim	shim screw	Torx Plus	clamp assembly	Torx Plus	slotted pin	optional lock pin
right hand															
2439449	DVONR2020K16KC04	20	20	27,0	125	38,0	5,0	VN..160408	IVSN322	KMSP315IP	15 IP	CM215R ASSY	15 IP	SSP025016M	KLM34L9IP
2439451	DVONR2525M16KC04	25	25	32,0	150	38,0	—	VN..160408	IVSN322	KMSP315IP	15 IP	CM215R ASSY	15 IP	SSP025016M	KLM34L9IP
2439453	DVONR3225P16KC04	32	25	32,0	170	38,0	—	VN..160408	IVSN322	KMSP315IP	15 IP	CM215R ASSY	15 IP	SSP025016M	KLM34L9IP
left hand															
2439450	DVONL2020K16KC04	20	20	27,0	125	38,0	5,0	VN..160408	IVSN322	KMSP315IP	15 IP	CM215R ASSY	15 IP	SSP025016M	KLM34L9IP
2439452	DVONL2525M16KC04	25	25	32,0	150	38,0	—	VN..160408	IVSN322	KMSP315IP	15 IP	CM215R ASSY	15 IP	SSP025016M	KLM34L9IP
2439454	DVONL3225P16KC04	32	25	32,0	170	38,0	—	VN..160408	IVSN322	KMSP315IP	15 IP	CM215R ASSY	15 IP	SSP025016M	KLM34L9IP



■ DVVN-KC 72,5°



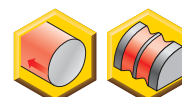
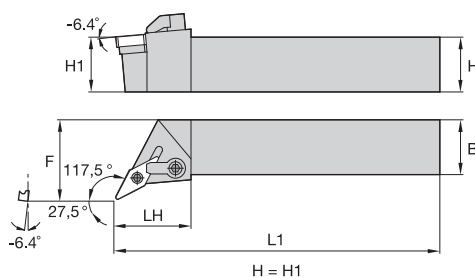
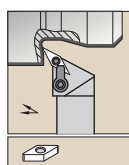
order number	catalogue number	H	B	F	L1	LH	gage insert	shim	shim screw	Torx Plus	clamp assembly	Torx Plus	slotted pin	optional lock pin
2439455	DVVNN2020K16KC04	20	20	10,0	150	48,0	VN..160408	IVSN322	KMSP315IP	15 IP	CM215R ASSY	15 IP	SSP025016M	KLM34L9IP
2439456	DVVNN2525M16KC04	25	25	12,0	150	48,0	VN..160408	IVSN322	KMSP315IP	15 IP	CM215R ASSY	15 IP	SSP025016M	KLM34L9IP



ISO Turning

MVJN 93°

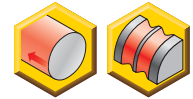
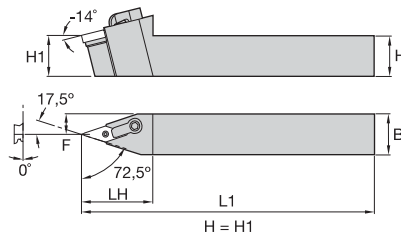
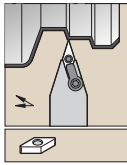
order number	catalogue number	H	B	F	L1	LH	gage insert	shim	lock pin	hex	clamp	clamp screw	hex
right hand													
1101362	MVJNR2020K16	20	20	25,0	125	37,0	VN..160408	IVSN322	KLM34L	2 mm	CKM31	STCM20	3 mm
1101634	MVJNR2525M16	25	25	32,0	150	37,0	VN..160408	IVSN322	KLM34L	2 mm	CKM31	STCM20	3 mm
1101363	MVJNR3225P16	32	25	32,0	170	37,0	VN..160408	IVSN322	KLM34L	2 mm	CKM31	STCM20	3 mm
1101635	MVJNR3225P22	32	25	32,0	170	50,0	VN..220408	IVSN432	KLM46	2.5 mm	CKM26	STCM4	4 mm
3612649	MVJNR3232P16	32	32	40,5	171	37,0	VN..160408	IVSN322	KLM34L	2 mm	CKM31	STCM20	3 mm
left hand													
1102320	MVJNL2020K16	20	20	25,0	125	37,0	VN..160408	IVSN322	KLM34L	2 mm	CKM31	STCM20	3 mm
1102321	MVJNL2525M16	25	25	32,0	150	37,0	VN..160408	IVSN322	KLM34L	2 mm	CKM31	STCM20	3 mm
1102322	MVJNL3225P16	32	25	32,0	170	37,0	VN..160408	IVSN322	KLM34L	2 mm	CKM31	STCM20	3 mm
1102323	MVJNL3225P22	32	25	32,0	170	50,0	VN..220408	IVSN432	KLM46	2.5 mm	CKM26	STCM4	4 mm
3612650	MVJNL3232P16	32	32	40,5	170	37,0	VN..160408	IVSN322	KLM34L	2 mm	CKM31	STCM20	3 mm


MVON 117,5°

order number	catalogue number	H	B	F	L1	wLH	gage insert	shim	lock pin	hex	clamp	clamp screw	hex
right hand													
1102238	MVONR2525M16	25	25	32,0	150	30,0	VN..160408	IVSN322	KLM34L	2 mm	CKM6	STCM5	2.5 mm
left hand													
1102730	MVONL2525M16	25	25	32,0	150	30,0	VN..160408	IVSN322	KLM34L	2 mm	CKM6	STCM5	2.5 mm



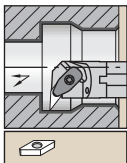
ISO Turning



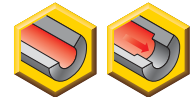
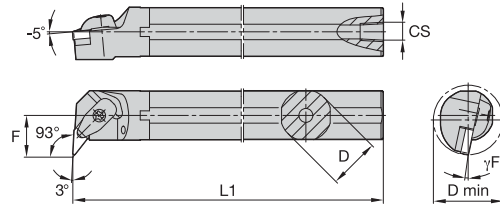
■ MVVN 72,5°



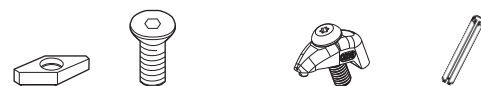
order number	catalogue number	H	B	F	L1	LH	gage insert	shim	lock pin	hex	clamp	clamp screw	hex
1102723	MVVNN2525M22	25	25	12,0	150	55,0	VN..220408	IVSN432	KLM46	2.5 mm	CKM26	STCM4	4 mm
1102720	MVVNN2020K16	42	20	10,0	125	42,0	VN..160408	IVSN322	KLM34L	2 mm	CKM31	STCM20	3 mm
1102721	MVVNN2525M16	66	25	12,5	150	42,0	VN..160408	IVSN322	KLM34L	2 mm	CKM31	STCM20	3 mm
1102722	MVVNN3225P16	86	32	12,5	170	42,0	VN..160408	IVSN322	KLM34L	2 mm	CKM31	STCM20	3 mm



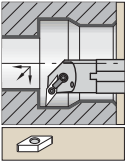
Steel shank with through coolant.



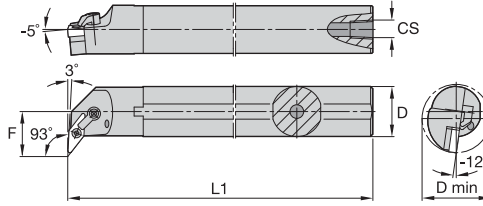
■ A-DVUN-KC 93°



order number	catalogue number	D	D min	F	L1	CS	γF°	gage insert	shim	shim screw	Torx Plus	clamp assembly	slotted pin	Torx Plus
right hand														
2441916	A32SDVUNR16KC04	32	40,0	22,0	250	1/4-18 NPT	-9,0	VN..160408	IVSN322	KMSP315IP	15 IP	CM234R ASSY	SSP025016M	15 IP
2441918	A40TDVUNR16KC04	40	50,0	27,0	300	1/4-18 NPT	-8,0	VN..160408	IVSN322	KMSP315IP	15 IP	CM215R ASSY	SSP025016M	15 IP
left hand														
2441917	A32SDVUNL16KC04	32	40,0	22,0	250	1/4-18 NPT	-9,0	VN..160408	IVSN322	KMSP315IP	15 IP	CM234R ASSY	SSP025016M	15 IP
2441919	A40TDVUNL16KC04	40	50,0	27,0	300	1/4-18 NPT	-8,0	VN..160408	IVSN322	KMSP315IP	15 IP	CM215R ASSY	SSP025016M	15 IP



Steel shank with through coolant.

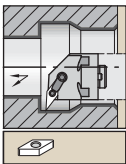


ISO Turning

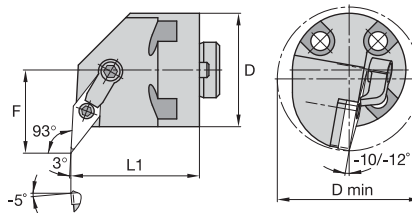
■ **A-MVUN 93°**



order number	catalogue number	D	D min	F	L1	CS	gage insert	shim	lock pin	hex	clamp	clamp screw	hex
right hand													
1098128	A25RMVUNR16	25	37,0	22,0	200	1/4-18 NPT	VN..160408	IVSN322	KLM34L	2 mm	CKM31	STCM26	3 mm
1098130	A32SMVUNR16	32	40,0	22,0	250	1/4-18 NPT	VN..160408	IVSN322	KLM34L	2 mm	CKM31	STCM20	3 mm
left hand													
1098129	A25RMVUNL16	25	37,0	22,0	200	1/4-18 NPT	VN..160408	IVSN322	KLM34L	2 mm	CKM31	STCM26	3 mm
1098131	A32SMVUNL16	32	40,0	22,0	250	1/4-18 NPT	VN..160408	IVSN322	KLM34L	2 mm	CKM31	STCM20	3 mm



With through coolant.

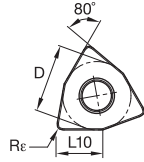
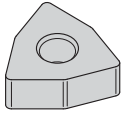


■ **H-MVUN 93°**



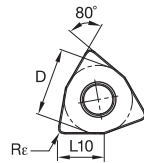
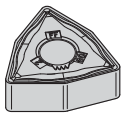
order number	catalogue number	D	D min	F	L1	gage insert	shim	lock pin	hex	clamp	clamp screw	hex
right hand												
3612215	H40MVUNR16	40	50,0	27,0	41	VN..160408	IVSN322	KLM34L	2 mm	CKM22	STCM20	3 mm
3612219	H50MVUNR16	50	63,0	35,0	41	VN..160408	IVSN322	KLM34L	2 mm	CKM22	STCM20	3 mm

● first choice
○ alternate choice



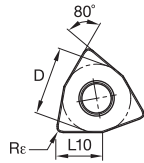
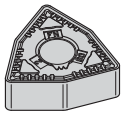
■ WNMA

ISO catalogue number	D	L10	Re	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
WNMA060408	9,53	6,52	0,8	-	-	-	-	-	-	-	-	-	-	-	-	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WNMA060412	9,53	6,52	1,2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WNMA080408	12,70	8,69	0,8	-	-	-	-	-	-	-	-	-	-	-	●	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WNMA080412	12,70	8,69	1,2	-	-	-	-	-	-	-	-	-	-	-	-	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WNMA080416	12,70	8,69	1,6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



■ WNMG-FF

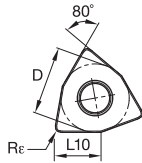
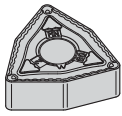
ISO catalogue number	D	L10	Re	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	
WNMG060404FF	9,53	6,52	0,4	-	-	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	●	-	-	-	-	-	
WNMG060408FF	9,53	6,52	0,8	-	-	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	●	-	-	-	-	-
WNMG080404FF	12,70	8,69	0,4	-	-	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	●	-	-	-	-	-	-
WNMG080408FF	12,70	8,69	0,8	-	-	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	●	-	-	-	-	-	-



■ WNMG-FN

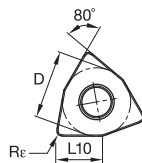
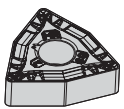
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WNMG060404FN	9,53	6,52	0,4	-	-	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WNMG060408FN	9,53	6,52	0,8	-	-	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WNMG080404FN	12,70	8,69	0,4	-	●	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WNMG080408FN	12,70	8,69	0,8	-	●	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

● first choice
○ alternate choice



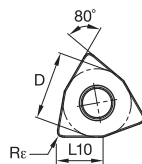
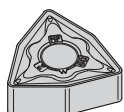
■ WNMG-MN

ISO catalogue number	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
WNMG060404MN	9,53	6,52	0,4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WNMG060408MN	9,53	6,52	0,8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WNMG060412MN	9,53	6,52	1,2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WNMG080408MN	12,70	8,69	0,8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WNMG080412MN	12,70	8,69	1,2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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■ WNMG-MR

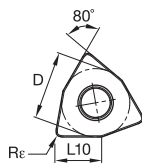
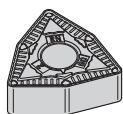
ISO catalogue number	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
WNMG060408MR	9,53	6,52	0,8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
WNMG080408MR	12,70	8,69	0,8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WNMG080412MR	12,70	8,69	1,2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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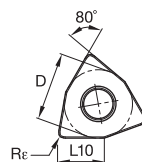
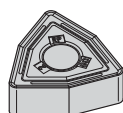
■ WNMG-MP

ISO catalogue number	D	L10	Rε	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
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WNMG060412MP	9,53	6,52	1,2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
WNMG080408MP	12,70	8,69	0,8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
WNMG080412MP	12,70	8,69	1,2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

- first choice
- alternate choice

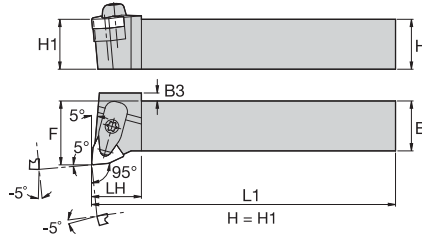
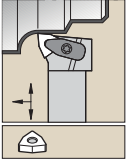

WNMG-RN

ISO catalogue number	D	L10	Re	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
WNMG060408RN	9,53	6,52	0,8	-	-	●	-	●	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WNMG060412RN	9,53	6,52	1,2	-	-	●	-	●	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WNMG080408RN	12,70	8,69	0,8	-	-	●	●	●	●	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WNMG080412RN	12,70	8,69	1,2	-	●	●	●	●	●	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	●	-	-	-	-	-	-	-	-
WNMG080416RN	12,70	8,69	1,6	-	-	●	●	●	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-


WNMG-RP

ISO catalogue number	D	L10	Re	KCP05B	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30B	KCP30	KCP40B	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35B	KCM35	KCPK05	K313	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KT315
WNMG060408RP	9,53	6,52	0,8	-	-	-	●	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WNMG060412RP	9,53	6,52	1,2	-	-	-	●	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WNMG080408RP	12,70	8,69	0,8	-	●	●	●	●	●	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WNMG080412RP	12,70	8,69	1,2	-	●	●	●	●	●	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	●	-	-	-	-	-	-	-	-
WNMG080416RP	12,70	8,69	1,6	-	-	●	●	●	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



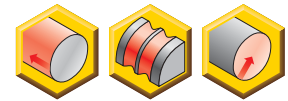
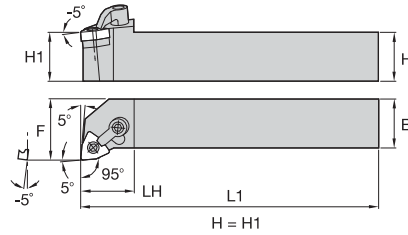
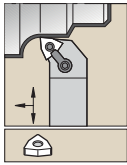


■ DWLN-KC 95°

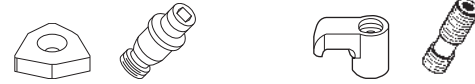


order number	catalogue number	H	B	F	L1	LH	B3	gage insert	shim	shim screw	Torx Plus	clamp assembly	Torx Plus	slotted pin	optional lock pin
right hand															
2439476	DWLN2020K06KC04	20	20	25,0	125	31,0	—	WN..060408	IWSN322	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM34L9IP
2439471	DWLN2020K08KC04	20	20	25,0	125	33,0	—	WN..080408	IWSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM4615IP
2273451	DWLN2525M06KC04	25	25	32,0	150	25,0	—	WN..060408	IWSN322	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM34L9IP
1908860	DWLN2525M08KC04	25	25	32,0	150	25,0	4,0	WN..080408	IWSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM4615IP
1908862	DWLN3232P08KC04	32	32	40,0	170	25,0	—	WN..080408	IWSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM4615IP
left hand															
2439470	DWLN2020K06KC04	20	20	25,0	125	31,0	—	WN..060408	IWSN322	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM34L9IP
2439472	DWLN2020K08KC04	20	20	25,0	125	33,0	—	WN..080408	IWSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM4615IP
2273455	DWLN2525M06KC04	25	25	32,0	150	25,0	—	WN..060408	IWSN322	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM34L9IP
1908861	DWLN2525M08KC04	25	25	32,0	150	25,0	4,0	WN..080408	IWSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM4615IP
1908893	DWLN3232P08KC04	32	32	40,0	170	25,0	—	WN..080408	IWSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM4615IP

ISO Turning

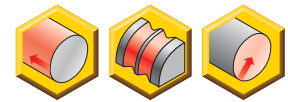
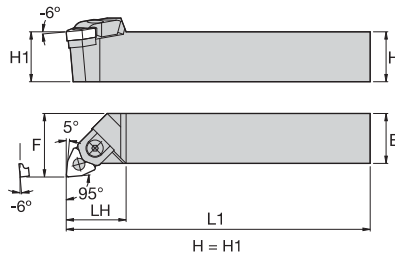
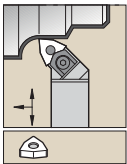


■ MWLN 95°



order number	catalogue number	H	B	F	L1	LH	gage insert	shim	lock pin	hex	clamp	clamp screw	hex
right hand													
1101293	MWLN2020K06	20	20	25,0	125	25,0	WN..060408	IWSN322	KLM34L	2 mm	CKM6	STCM5	2.5 mm
1101355	MWLN2525M06	25	25	32,0	150	25,0	WN..060408	IWSN322	KLM34L	2 mm	CKM6	STCM5	2.5 mm
3612259	MWLN3232P08	32	32	40,0	170	32,0	WNMA080408	IWSN433	KLM46	2.5 mm	CKM7	STCM5	2.5 mm
left hand													
1101292	MWLN2020K06	20	20	25,0	125	25,0	WN..060408	IWSN322	KLM34L	2 mm	CKM6	STCM5	2.5 mm
1101354	MWLN2525M06	25	25	32,0	150	25,0	WN..060408	IWSN322	KLM34L	2 mm	CKM6	STCM5	2.5 mm
3612260	MWLN3232P08	32	32	40,0	170	32,0	WNMA080408	IWSN433	KLM46	2.5 mm	CKM7	STCM5	2.5 mm

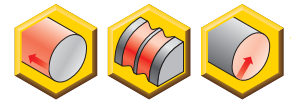
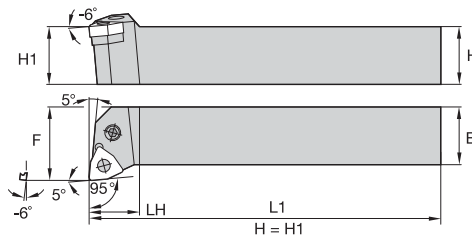
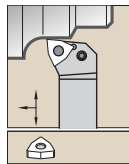
Wedglock™ Toolholders • Wedglock Inserts



■ MWLN 95°



order number	catalogue number	H	B	F	L1	LH	gage insert	shim	lock pin	set screw	Torx	clamp assembly	hex
right hand													
1244924	MWLN2020K08H4	20	20	25,0	125	32,0	WN..080408	512.131	513.132	192.636	T15	551.131	3 mm
1192355	MWLN2525M08H4	25	25	32,0	150	36,0	WN..080408	512.131	513.132	192.636	T15	551.131	3 mm
1244925	MWLN3225P08H4	32	25	32,0	170	36,0	WN..080408	512.131	513.132	192.636	T15	551.131	3 mm
left hand													
1244921	MWLN2020K08H4	20	20	25,0	125	32,0	WN..080408	512.131	513.132	192.636	T15	551.131	3 mm
1244922	MWLN2525M08H4	25	25	32,0	150	36,0	WN..080408	512.131	513.132	192.636	T15	551.131	3 mm
1244923	MWLN3225P08H4	32	25	32,0	170	36,0	WN..080408	512.131	513.132	192.636	T15	551.131	3 mm



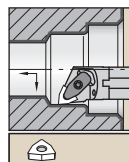
ISO Turning

■ PWLN 95°

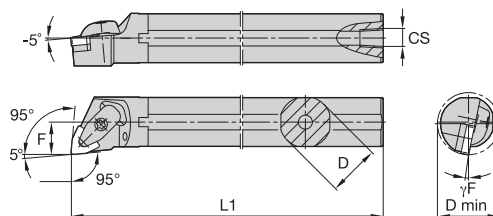


order number	catalogue number	H	B	F	L1	LH	gage insert	shim	shim pin	punch pin	lever	lever screw	Torx Plus
right hand													
1244771	PWLN1616H06	16	16	20,0	100	14,0	WN..060404	512.134	513.018	515.018	511.018	514.118	10 IP
1192397	PWLN2020K06	20	20	25,0	125	14,0	WN..060404	512.134	513.018	515.018	511.018	514.118	10 IP
1192398	PWLN2020K08	20	20	25,0	125	20,0	WN..080408	512.135	513.023	515.018	511.023	514.123	15 IP
1192399	PWLN2525M08	25	25	32,0	150	26,0	WN..080408	512.135	513.023	515.018	511.023	514.123	15 IP
1244772	PWLN3225P08	32	25	32,0	170	26,0	WN..080408	512.135	513.023	515.018	511.023	514.123	15 IP
left hand													
1192396	PWLN1616H06	16	16	20,0	100	14,0	WN..060404	512.134	513.018	515.018	511.018	514.118	10 IP
1244767	PWLN2020K06	20	20	25,0	125	14,0	WN..060404	512.134	513.018	515.018	511.018	514.118	10 IP
1244768	PWLN2020K08	20	20	25,0	125	20,0	WN..080408	512.135	513.023	515.018	511.023	514.123	15 IP
1244769	PWLN2525M08	25	25	32,0	150	26,0	WN..080408	512.135	513.023	515.018	511.023	514.123	15 IP
1244770	PWLN3225P08	32	25	32,0	170	26,0	WN..080408	512.135	513.023	515.018	511.023	514.123	15 IP

Kenclamp™ Boring Bars



Steel shank with through coolant.



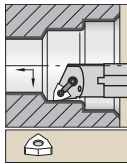
■ A-DWLN-KC 95°



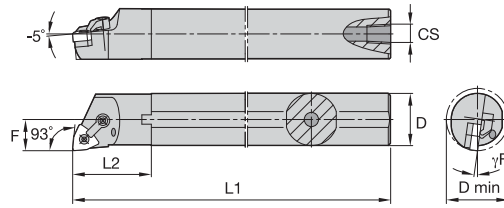
order number	catalogue number	D	D min	F	L1	CS	γF°	gage insert	shim	shim screw	Torx Plus	clamp assembly	slotted pin	Torx Plus
right hand														
2441921	A25RDWLN06KC04	25	32,0	17,0	200	1/4-18 NPT	-14,0	WN..060408	—	—	—	CM234R ASSY	SSP025016M	15 IP
2441923	A25RDWLN08KC04	25	32,0	17,0	200	1/4-18 NPT	-12,0	WN..080408	—	—	—	CM234R ASSY	SSP025016M	15 IP
2441925	A32SDWLN08KC04	32	40,0	22,0	250	1/4-18 NPT	-14,0	WN..080408	IWSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP
2441927	A40TDWLN08KC04	40	50,0	27,0	300	1/4-18 NPT	-14,0	WN..080408	IWSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP
left hand														
2441922	A25RDWLN06KC04	25	32,0	17,0	200	1/4-18 NPT	-14,0	WN..060408	—	—	—	CM234R ASSY	SSP025016M	15 IP
2441924	A25RDWLN08KC04	25	32,0	17,0	200	1/4-18 NPT	-12,0	WN..080408	—	—	—	CM234R ASSY	SSP025016M	15 IP
2441926	A32SDWLN08KC04	32	40,0	22,0	250	1/4-18 NPT	-14,0	WN..080408	IWSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP



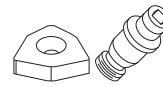
ISO Turning



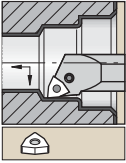
Steel shank with through coolant.



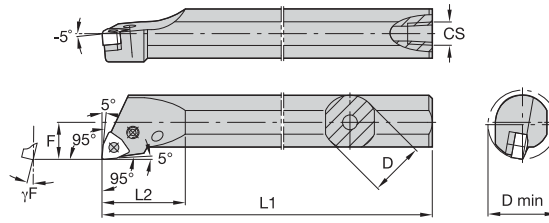
■ **A-MWLN 95°**



order number	catalogue number	D	D min	F	L1	LH	CS	γF°	gage insert	shim	lock pin	hex	clamp	clamp screw	hex
right hand															
1098771	A25RMWLN06	25	32,0	17,0	200	—	1/4-18 NPT	-12.0	WN..060408	—	KLM33L	2 mm	CKM6	STCM5	2.5 mm
1098773	A25RMWLN08	25	32,0	17,0	200	39,0	1/4-18 NPT	-12.0	WN..080408	—	KLM43	2 mm	CKM20	STCM11	3 mm
1098772	A32SMWLN06	32	40,0	22,0	250	—	1/4-18 NPT	-10.0	WN..060408	IWSN322	KLM34L	2 mm	CKM6	STCM5	2.5 mm
1098774	A32SMWLN08	32	40,0	22,0	250	39,7	1/4-18 NPT	-14.0	WN..080408	IWSN433	KLM46	2.5 mm	CKM20	STCM20	3 mm
1098775	A40TMWLN08	40	50,0	27,0	300	41,6	1/4-18 NPT	-12.0	WN..080408	IWSN433	KLM46	2.5 mm	CKM20	STCM20	3 mm
left hand															
1098783	A25RMWLN08	25	32,0	17,0	200	39,0	1/4-18 NPT	-12.0	WN..080408	—	KLM43	2 mm	CKM20	STCM11	3 mm
1098782	A32SMWLN06	32	40,0	22,0	250	—	1/4-18 NPT	-10.0	WN..060408	IWSN322	KLM34L	2 mm	CKM6	STCM5	2.5 mm
1098784	A32SMWLN08	32	40,0	22,0	251	39,7	1/4-18 NPT	-14.0	WN..080408	IWSN433	KLM46	2.5 mm	CKM20	STCM20	3 mm
1098785	A40TMWLN08	40	50,0	27,0	300	41,6	1/4-18 NPT	-12.0	WN..080408	IWSN433	KLM46	2.5 mm	CKM20	STCM20	3 mm

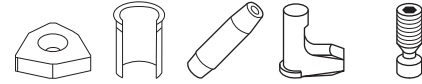


Steel shank with through coolant.



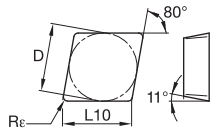
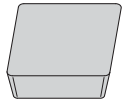
ISO Turning

■ A-PWLN 95°



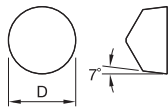
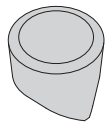
order number	catalogue number	D	D min	F	L1	L2	CS	γF°	gage insert	shim	shim pin	pin	toggle lever	lever screw	Torx Plus
right hand															
1244113	A16RPWLN06	16	27,0	11,0	200	32	1/8-27 NPT	-12.0	WN..060404	—	—	—	511.030	514.112	—
1244115	A20SPWLN06	20	25,0	13,0	250	—	1/8-27 NPT	-14.0	WN..060408	—	—	—	511.030	514.112	8 IP
1194440	A25RPWLN08	25	32,0	17,0	200	—	1/4-18 NPT	-12.0	WN..080408	512.135	513.023	515.018	511.023	514.123	15 IP
1244118	A32SPWLN08	32	40,0	22,0	250	50	1/4-18 NPT	-10.0	WN..080408	512.135	513.023	515.018	511.023	514.123	—
1244120	A40TPWLN08	40	50,0	27,0	300	54	1/4-18 NPT	-8.0	WN..080408	512.135	513.023	515.018	511.023	514.123	—
left hand															
1191396	A16RPWLN06	16	27,0	11,0	200	32	1/8-27 NPT	-12.0	WN..060404	—	—	—	511.030	514.112	—
1244114	A20SPWLN06	20	25,0	13,0	250	—	1/8-27 NPT	-14.0	WN..060408	—	—	—	511.030	514.112	8 IP
1244116	A25RPWLN08	25	32,0	17,0	200	—	1/4-18 NPT	-12.0	WN..080408	512.135	513.023	515.018	511.023	514.123	15 IP
1244117	A32SPWLN08	32	40,0	22,0	250	50	1/4-18 NPT	-10.0	WN..080408	512.135	513.023	515.018	511.023	514.123	—
1244119	A40TPWLN08	40	50,0	27,0	300	54	1/4-18 NPT	-8.0	WN..080408	512.135	513.023	515.018	511.023	514.123	—

ISO Turning



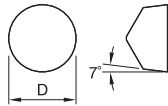
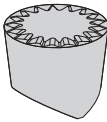
■ CPGN

ISO catalogue number	D	L10	Rε	KCP25B	KCK15B	KCK15	K313	K68	KCS10	KCU10	KC5010
CPGN120304	12,70	12,90	0,4	-	-	-	●	●	-	-	-
CPGN120308	12,70	12,90	0,8	-	-	●	●	●	-	-	-



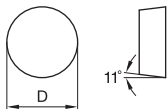
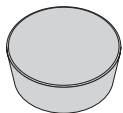
■ RCGV

ISO catalogue number	D	L10	Rε	KCP25B	KCK15B	KCK15	K313	K68	KCS10	KCU10	KC5010
RCGV060400	6,35	-	-	-	-	-	-	-	-	-	-
RCGV090700	9,53	-	-	-	-	-	-	-	-	●	-
RCGV120700	12,70	-	-	-	-	●	-	-	-	-	●



■ RCGV-MP

ISO catalogue number	D	L10	Rε	KCP25B	KCK15B	KCK15	K313	K68	KCS10	KCU10	KC5010
RCGX060400MP	6,35	-	-	-	-	-	-	-	-	-	-
RCGX120700MP	12,70	-	-	-	-	-	-	-	●	-	-

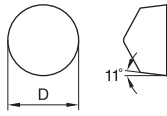
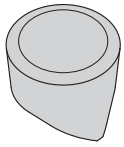


■ RPGN

ISO catalogue number	D	L10	Rε	KCP25B	KCK15B	KCK15	K313	K68	KCS10	KCU10	KC5010
RPGN120300	12,70	-	-	-	-	-	●	-	-	-	-

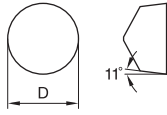
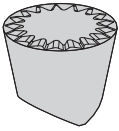
● first choice
○ alternate choice

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



■ RPGV

ISO catalogue number	D	L10	R _ε	KCP25B	KCK15B	KCK15	K313	K68	KCS10	KCU10	KC5010
RPGV060400	6,35	—	—	—	—	—	—	—	—	—	—
RPGV090700	9,53	—	—	—	—	—	—	—	—	—	—
RPGV120700	12,70	—	—	—	—	—	—	—	—	—	—



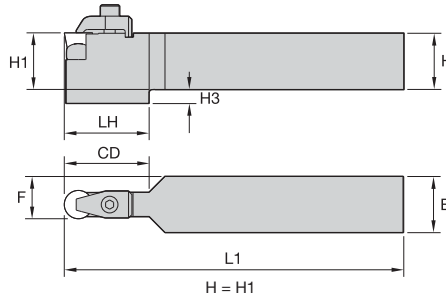
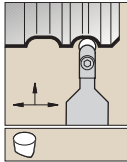
■ RPGV-MP

ISO catalogue number	D	L10	R _ε	KCP25B	KCK15B	KCK15	K313	K68	KCS10	KCU10	KC5010
RPGX060400MP	6,35	—	—	—	—	—	—	—	—	—	—
RPGX090700MP	9,53	—	—	—	—	—	—	—	—	—	—
RPGV120700MP	12,70	—	—	—	—	—	—	—	—	—	—
RPGX120700MP	12,70	—	—	—	—	—	—	—	—	—	—

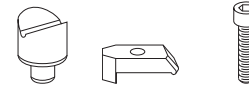
● first choice
○ alternate choice

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

ISO Turning

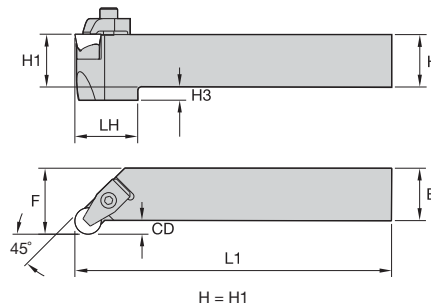
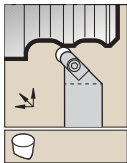


CRDP

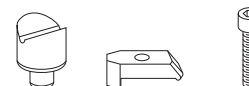


order number	catalogue number	H	B	F	L1	LH	H3	CD	gage insert	nest	clamp	clamp screw	hex
3642247	CRDPN2525M06V	25	25	12,5	151	—	—	19,0	RPGX060400E	NST1	CM214	MS1321	2.5 mm
3642249	CRDPN3232P09V	32	32	16,0	171	—	—	29,0	RPGX090700E	NST2	CM219	CS412	3.5 mm
3642248	CRDPN2525M09V	25	25	12,5	151	—	—	29,0	RPGX090700E	NST2	CM219	CS412	3.5 mm
3642251	CRDPN3232P12V	32	32	16,0	171	—	—	38,0	RPGX120700E	NST3	CM216	CS412	3.5 mm
3642252	CRDPN3232P15V	32	32	16,0	171	38,1	6,4	38,0	RPGX151000	NST4	CM217	MS1294	6 mm

NOTE: CRDP toolholders are able to use RPGX and RCGX insert styles.

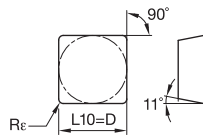
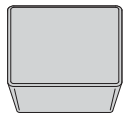


CRGP



order number	catalogue number	H	B	F	L1	CD	gage insert	nest	clamp	clamp screw	hex
right hand											
3642276	CRGPR2525M06V	25	25	32,0	151	7,0	RPGX060400E	NST1	CM214	MS1321	2.5 mm
3642280	CRGPR3232P09V	32	32	40,0	171	8,0	RPGX090700E	NST2	CM219	CS412	3.5 mm
left hand											
3642277	CRGPL2525M06V	25	25	32,0	151	7,0	RPGX060400E	NST1	CM214	MS1321	2.5 mm
3642281	CRGPL3232P09V	32	32	40,0	171	8,0	RPGX090700E	NST2	CM219	CS412	3.5 mm

NOTE: CRGP toolholders are able to use RPGX and RCGX insert styles.

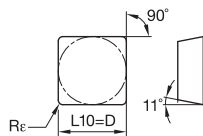
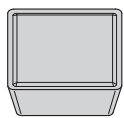


● first choice
○ alternate choice

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

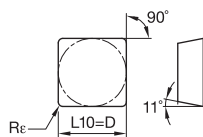
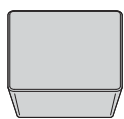
■ SPGN

ISO catalogue number	D	L10	Rε	KCP25B	KCK15B	KCK15	K313	K68	KCS10	KCU10	KC5010
SPGN090304	9,53	9,53	0,4	-	-	-	-	-	-	-	-
SPGN090308	9,53	9,53	0,8	-	-	●	-	-	-	-	●
SPGN120304	12,70	12,70	0,4	-	-	-	-	-	-	-	-
SPGN120308	12,70	12,70	0,8	-	-	-	●	●	-	-	●
SPGN120312	12,70	12,70	1,2	-	-	-	-	●	-	-	-
SPGN120412	12,70	12,70	1,2	-	-	-	-	-	●	-	-
SPGN120316	12,70	12,70	1,6	-	-	-	-	-	-	-	●
SPGN190408	19,05	19,05	0,8	-	-	-	●	-	-	-	-
SPGN190412	19,05	19,05	1,2	-	-	●	-	-	-	●	-



■ SPGR-K

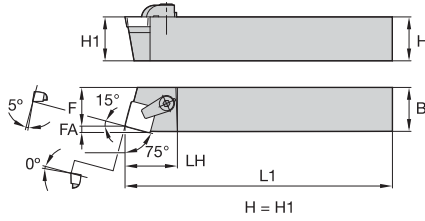
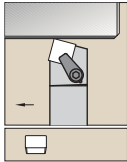
ISO catalogue number	D	L10	Rε	KCP25B	KCK15B	KCK15	K313	K68	KCS10	KCU10	KC5010
SPGR090308K	9,53	9,53	0,8	-	-	-	-	-	-	●	●
SPGR120308K	12,70	12,70	0,8	●	-	-	-	-	-	-	-



■ SPUN

ISO catalogue number	D	L10	Rε	KCP25B	KCK15B	KCK15	K313	K68	KCS10	KCU10	KC5010
SPUN120304	12,70	12,70	0,4	●	-	-	-	-	-	-	-
SPUN120308	12,70	12,70	0,8	●	-	-	-	●	-	-	-
SPUN120312	12,70	12,70	1,2	●	-	-	-	-	-	-	-

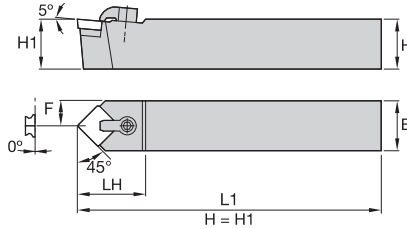
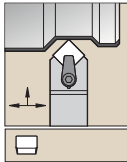
ISO Turning



■ **CSBP 75°**



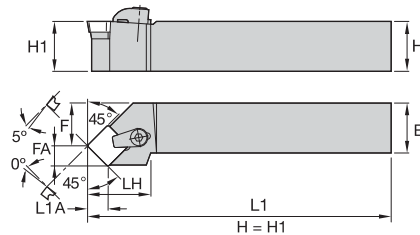
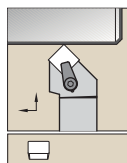
order number	catalogue number	H	B	F	L1	LH	FA	gage insert	shim	shim screw	hex	clamp	clamp screw	hex
right hand														
1097750	CSBPR2020K12	20	20	17,0	125	30,0	3,1	SP..120308	SM840	MS111	2 mm	CKM10	STCM8	4 mm



■ **CSDP 45°**



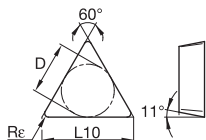
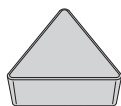
order number	catalogue number	H	B	F	L1	LH	FA	gage insert	shim	shim screw	hex	clamp	clamp screw	hex
1097754	CSDPN2020K12	20	20	10,0	125	32,0		SP..120308	SM840	MS111	2 mm	CKM10	STCM8	4 mm
1097755	CSDPN2525M12	25	25	12,5	150	32,0		SP..120308	SM840	MS111	2 mm	CKM9	STCM4	4 mm



■ **CSSP 45°**



order number	catalogue number	H	B	F	L1	LH	FA	L1A	gage insert	shim	shim screw	hex	clamp	clamp screw	hex
right hand															
1244605	CSSPR2020K12	20	20	25,0	125	32,0	8,7	8,3	SP..120308	SM840	MS111	2 mm	CKM10	STCM8	4 mm
1244606	CSSPR2525M12	25	25	32,0	150	32,0	8,7	8,3	SP..120308	SM840	MS111	2 mm	CKM9	STCM4	4 mm
left hand															
1244604	CSSPL2525M12	25	25	32,0	150	32,0	8,7	8,3	SP..120308	SM840	MS111	2 mm	CKM9	STCM4	4 mm

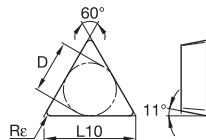


● first choice
○ alternate choice

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

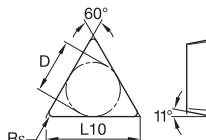
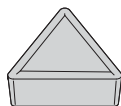
TPGN/TPG

ISO catalogue number	D	L10	Rε	KCP25B	KCK15B	KCK15	K313	K68	KCS10	KCU10	KC5010
TPGN110304	6,35	11,00	0,4	-	-	-	●	●	-	●	●
TPGN110308	6,35	11,00	0,8	-	-	-	○	○	-	○	○
TPGN160302	9,53	16,50	0,2	-	-	-	○	○	-	○	○
TPGN160304	9,53	16,50	0,4	-	-	-	○	○	-	○	○
TPGN160308	9,53	16,50	0,8	-	-	-	○	○	-	○	○
TPGN160312	9,53	16,50	1,2	-	-	-	○	○	-	○	○
TPGN160316	9,53	16,50	1,6	-	-	-	○	○	-	○	○
TPGN220404	12,70	22,00	0,4	-	-	-	○	○	-	○	○
TPGN220408	12,70	22,00	0,8	●	-	-	○	○	-	○	○
TPGN220412	12,70	22,00	1,2	-	-	-	○	○	-	○	○
TPGN220416	12,70	22,00	1,6	-	-	-	○	○	-	○	○



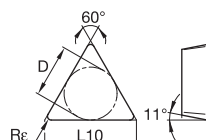
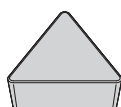
TPGR-K

ISO catalogue number	D	L10	Rε	KCP25B	KCK15B	KCK15	K313	K68	KCS10	KCU10	KC5010
TPGR110304K	6,35	11,00	0,4	-	-	-	-	-	-	-	●
TPGR110308K	6,35	11,00	0,8	-	-	-	-	-	-	-	○
TPGR160304K	9,53	16,50	0,4	-	-	-	-	-	-	-	○
TPGR160308K	9,53	16,50	0,8	●	-	-	-	-	-	-	○
TPGR220404K	12,70	22,00	0,4	-	-	-	-	-	-	-	○
TPGR220408K	12,70	22,00	0,8	-	-	-	-	-	-	-	○



TPMR

ISO catalogue number	D	L10	Rε	KCP25B	KCK15B	KCK15	K313	K68	KCS10	KCU10	KC5010
TPMR110304	6,35	11,00	0,4	●	●	-	-	-	-	-	-
TPMR110308	6,35	11,00	0,8	○	○	-	-	-	-	-	-
TPMR160304	9,53	16,50	0,4	●	●	-	-	-	-	-	-
TPMR160308	9,53	16,50	0,8	●	●	-	-	-	-	-	-
TPMR220408	12,70	22,00	0,8	●	●	-	-	-	-	-	-

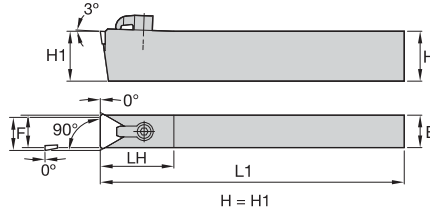
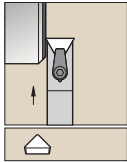


TPUN

ISO catalogue number	D	L10	Rε	KCP25B	KCK15B	KCK15	K313	K68	KCS10	KCU10	KC5010
TPUN110304	6,35	11,00	0,4	-	●	-	-	-	-	-	-
TPUN110308	6,35	11,00	0,8	-	○	-	-	-	-	-	-
TPUN160304	9,53	16,50	0,4	●	●	-	-	-	-	-	-
TPUN160308	9,53	16,50	0,8	●	●	-	-	-	-	-	-
TPUN220408	12,70	22,00	0,8	●	●	-	-	-	-	-	-
TPUN220412	12,70	22,00	1,2	-	-	-	-	-	-	-	-



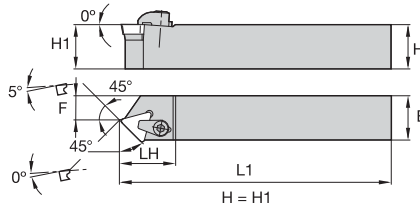
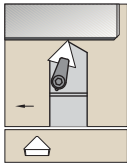
ISO Turning



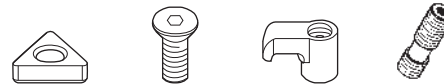
■ CTCP 90°



order number	catalogue number	H	B	F	L1	LH	gage insert	shim	shim screw	hex	clamp	clamp screw	hex
1097775	CTCPN2510M11	25	10	10,0	150	26,0	TP..110304	SM819	MS960	—	CKM7	STCM5	2.5 mm
1097776	CTCPN2514M16	25	14	14,4	150	28,0	TP..160308	SM841	MS111	2 mm	CKM13	STCM4	4 mm
1097781	CTCPN2518M22	25	18	19,2	150	41,0	TP..220408	SM837	MS125	2.5 mm	CKM13	STCM4	4 mm
1097778	CTCPN2520M22	25	20	20,2	150	41,0	TP..220408	SM837	MS125	2.5 mm	CKM13	STCM4	4 mm



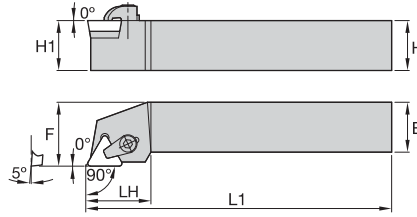
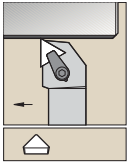
■ CTDTP 45°



order number	catalogue number	H	B	F	L1	LH	gage insert	shim	shim screw	clamp	clamp screw	hex
right hand 1244613	CTDPR1212F11	12	12	6,0	80	22,0	TP..110304	SM819	MS960	CKM19	STCM9	2.5 mm



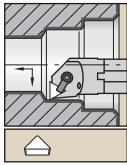
ISO Turning


CTGP 90°

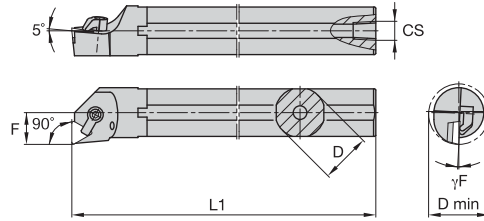

order number	catalogue number	H	B	F	L1	LH	gage insert	shim	shim screw	hex	clamp	clamp screw	hex
right hand													
1097762	CTGPR1212F11	12	12	16,0	80	20,0	TP..110304	SM819	MS960	—	CKM19	STCM9	2.5 mm
1097763	CTGPR1616H11	16	16	20,0	100	20,0	TP..110304	SM819	MS960	—	CKM19	STCM9	2.5 mm
1244595	CTGPR2020K11	20	20	25,0	125	20,0	TP..110304	SM819	MS960	—	CKM19	STCM9	2.5 mm
1097764	CTGPR2020K16	20	20	25,0	125	26,0	TP..160308	SM841	MS111	2 mm	CKM10	STCM8	4 mm
1097765	CTGPR2525M16	25	25	32,0	150	26,0	TP..160308	SM841	MS111	2 mm	CKM9	STCM4	4 mm
left hand													
1097916	CTGPL1212F11	12	12	16,0	80	20,0	TP..110304	SM819	MS960	—	CKM19	STCM9	2.5 mm
1097918	CTGPL2020K16	20	20	25,0	125	26,0	TP..160308	SM841	MS111	2 mm	CKM10	STCM8	4 mm
1097919	CTGPL2525M16	25	25	32,0	150	26,0	TP..160308	SM841	MS111	2 mm	CKM9	STCM4	4 mm



ISO Turning



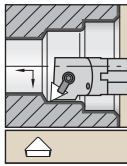
Steel shank with through coolant.



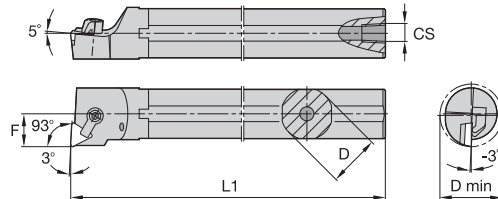
■ **A-CTFP 90°**



order number	catalogue number	D	D min	F	L1	CS	γF°	gage insert	shim	shim screw	hex	clamp	clamp screw	hex
right hand														
1886492	A16RCTFPR11	16	20,0	11,0	200	1/8-27 NPT	-4.0	TP..110304	—	—	—	CKM19	STCM9	2.5 mm
1098051	A20QCTFPR11	20	25,0	13,0	180	1/8-27 NPT	0.0	TP..110304	SM815	MS961	—	CKM19	STCM9	2.5 mm
1098053	A25RCTFPR16	25	32,0	17,0	200	1/4-18 NPT	-3.0	TP..160308	SM841	MS110	2 mm	CKM10	STCM8	4 mm
1098055	A32SCTFPR16	32	40,0	22,0	250	1/4-18 NPT	-3.0	TP..160308	SM841	MS110	2 mm	CKM10	STCM8	4 mm
1886494	A40VCTFPR16	40	48,0	27,0	400	1/4-18 NPT	-3.0	TP..160308	SM841	MS110	2 mm	CKM10	STCM8	4 mm
left hand														
1098054	A25RCTFPL16	25	32,0	17,0	200	1/4-18 NPT	-3.0	TP..160308	SM841	MS110	2 mm	CKM10	STCM8	4 mm
1098056	A32SCTFPL16	32	40,0	22,0	250	1/4-18 NPT	-3.0	TP..160308	SM841	MS110	2 mm	CKM10	STCM8	4 mm



Steel shank with through coolant.

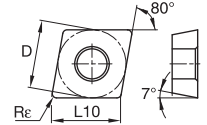
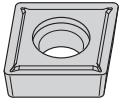


■ **A-CTUP 93°**



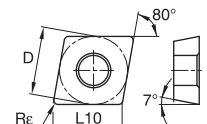
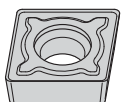
order number	catalogue number	D	D min	F	L1	CS	gage insert	shim	shim screw	clamp	clamp screw	hex
right hand												
1098057	A16MCTUPR11	16	20,0	11,0	150	1/8-27 NPT	TP..110304	SM815	MS961	CKM19	STCM9	2.5 mm
left hand												
1098058	A16MCTUPL11	16	20,0	11,0	150	1/8-27 NPT	TP..110304	SM815	MS961	CKM19	STCM9	2.5 mm

● first choice
○ alternate choice



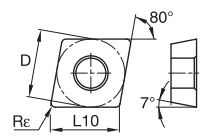
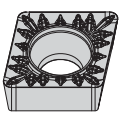
■ CCMT-LF

ISO catalogue number	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KCU50	KC5010	KC5025	KC5410	KT315	KTP10
CCMT060202LF	6,35	6,45	0,2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CCMT060204LF	6,35	6,45	0,4	-	●	○	○	○	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CCMT060208LF	6,35	6,45	0,8	-	●	○	○	○	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CCMT09T302LF	9,53	9,67	0,2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CCMT09T304LF	9,53	9,67	0,4	-	●	○	○	○	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CCMT09T308LF	9,53	9,67	0,8	-	●	○	○	○	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CCMT120404LF	12,70	12,90	0,4	-	-	○	○	○	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CCMT120408LF	12,70	12,90	0,8	-	●	○	○	○	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CCMT120412LF	12,70	12,90	1,2	-	-	○	○	○	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



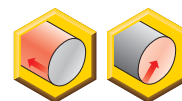
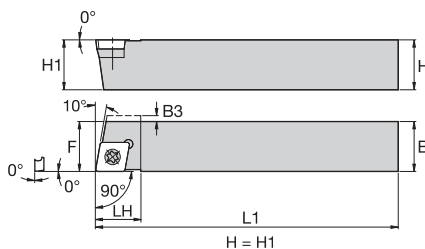
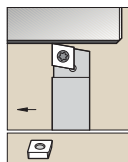
■ CCMT-MF

ISO catalogue number	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KCU50	KC5010	KC5025	KC5410	KT315	KTP10
CCMT060204MF	6,35	6,45	0,4	-	●	○	○	○	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CCMT09T304MF	9,53	9,67	0,4	-	●	○	○	○	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CCMT09T308MF	9,53	9,67	0,8	-	●	○	○	○	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CCMT09T312MF	9,53	9,67	1,2	-	●	○	○	○	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CCMT120408MF	12,70	12,90	0,8	-	●	○	○	○	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CCMT120412MF	12,70	12,90	1,2	-	●	○	○	○	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



■ CCMT-MP

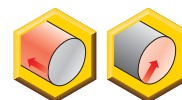
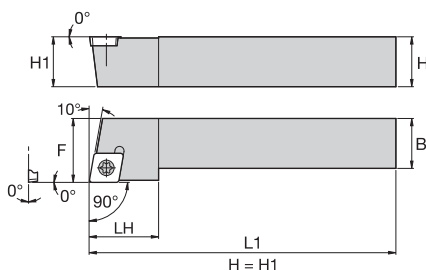
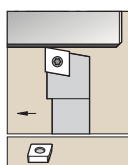
ISO catalogue number	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KCU50	KC5010	KC5025	KC5410	KT315	KTP10
CCMT060204MP	6,35	6,45	0,4	-	●	○	○	○	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CCMT09T304MP	9,53	9,67	0,4	-	●	○	○	○	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CCMT09T308MP	9,53	9,67	0,8	-	●	○	○	○	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CCMT09T312MP	9,53	9,67	1,2	-	●	○	○	○	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CCMT120408MP	12,70	12,90	0,8	-	●	○	○	○	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CCMT120412MP	12,70	12,90	1,2	-	●	○	○	○	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



■ SCAC 90°



order number	catalogue number	H	B	F	L1	LH	gage insert	shim	shim screw	hex	insert screw	hex
right hand												
1097708	SCACR1010M06Q	10	10	10,0	150	11,0	CC..060204	—	—	—	MS1153	T7
1097710	SCACR1212M06Q	12	12	12,0	150	11,0	CC..060204	—	—	—	MS1153	T7
1097714	SCACR1616K09Q	16	16	16,0	125	16,0	CC..09T308	SKCP343	SRS3	3.5 mm	MS1156	T15



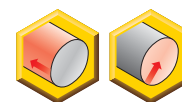
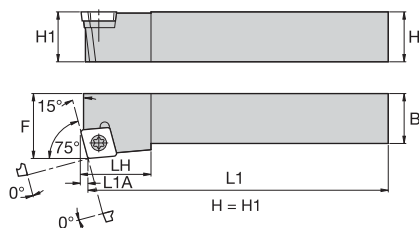
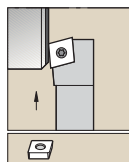
■ SCGC 90°



order number	catalogue number	H	B	F	L1	LH	gage insert	insert screw	Torx
right hand									
1097824	SCGCR1010M06	10	10	12,0	150	11,0	CC..060204	MS1153	T7
1097825	SCGCR1212N09	12	12	16,0	160	16,0	CC..09T308	MS1155	T15
left hand									
1097970	SCGCL1212N09	12	12	16,0	160	16,0	CC..09T308	MS1155	T15



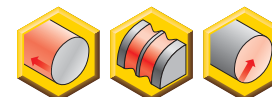
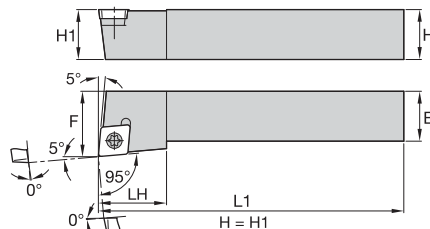
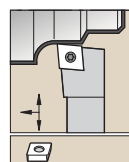
ISO Turning



■ SCKC 75°



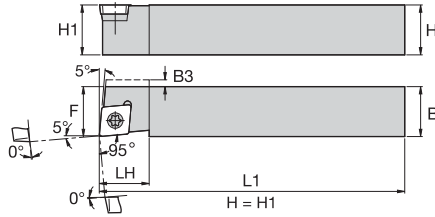
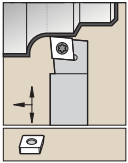
order number	catalogue number	H	B	F	L1	LH	L1A	gage insert	shim	shim screw	hex	insert screw	Torx
right hand													
1097840	SCKCR2020K09	20	20	25,0	125	16,0	2,3	CC..09T308	SKCP343	SRS3	3.5 mm	MS1156	T15



■ SCLC 95°



order number	catalogue number	H	B	F	L1	LH	gage insert	shim	shim screw	hex	insert screw	Torx
right hand												
1097814	SCLCR0808L06	8	8	10,0	140	12,0	CC..060204	—	—	—	MS1153	T7
1097816	SCLCR1010M06	10	10	12,0	150	12,0	CC..060204	—	—	—	MS1153	T7
1097818	SCLCR1212N09	12	12	16,0	160	16,0	CC..09T308	—	—	—	MS1155	T15
1097819	SCLCR1616H09	16	16	20,0	100	15,8	CC..09T308	SKCP343	SRS3	3.5 mm	MS1156	T15
1097821	SCLCR2020K09	20	20	25,0	125	15,8	CC..09T308	SKCP343	SRS3	3.5 mm	MS1156	T15
1097820	SCLCR2020K12	20	20	25,0	125	19,8	CC..120408	SKCP453	SRS4	4 mm	MS1158	T15
1244995	SCLCR2525M09	25	25	32,0	150	15,8	CC..09T308	SKCP343	SRS3	3.5 mm	MS1156	T15
1097822	SCLCR2525M12	25	25	32,0	150	20,0	CC..120408	SKCP453	SRS4	4 mm	MS1158	T15
left hand												
1097959	SCLCL0808L06	8	8	10,0	140	12,0	CC..060204	—	—	—	MS1153	T7
1097961	SCLCL1010M06	10	10	12,0	150	12,0	CC..060204	—	—	—	MS1153	T7
1097963	SCLCL1212N09	12	12	16,0	160	16,0	CC..09T308	—	—	—	MS1155	T15
1097964	SCLCL1616H09	16	16	20,0	100	15,8	CC..09T308	SKCP343	SRS3	3.5 mm	MS1156	T15
1097966	SCLCL2020K09	20	20	25,0	125	15,8	CC..09T308	SKCP343	SRS3	3.5 mm	MS1156	T15
1097965	SCLCL2020K12	20	20	25,0	125	19,8	CC..120408	SKCP453	SRS4	4 mm	MS1158	T15
1318353	SCLCL2525M09	25	25	32,0	150	15,8	CC..09T308	SKCP343	SRS3	3.5 mm	MS1156	T15
1097967	SCLCL2525M12	25	25	32,0	150	20,0	CC..120408	SKCP453	SRS4	4 mm	MS1158	T15

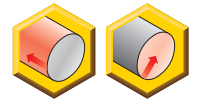
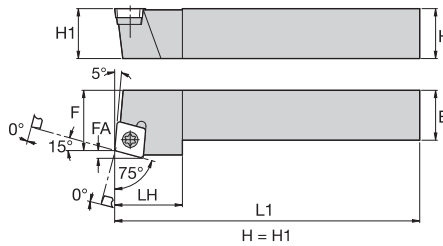
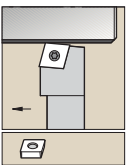


ISO Turning

■ SCLC-F 95°



order number	catalogue number	H	B	F	L1	LH	B3	gage insert	shim	shim screw	hex	insert screw	Torx
right hand													
1772152	SCLCRF0808M06Q	8	8	8,0	150	12,0	1,5	CC..060204	—	—	—	MS1153	T7
1097812	SCLCRF1010M06Q	10	10	10,0	150	11,0	—	CC..060204	—	—	—	MS1153	T7
1097813	SCLCRF1212M06Q	12	12	12,0	150	11,0	—	CC..060204	—	—	—	MS1153	T7
1097817	SCLCRF1616K09Q	16	16	16,0	125	16,0	—	CC..09T308	SKCP343	SRS3	3.5 mm	MS1156	T15

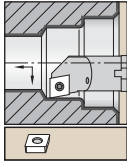


■ SCRC 75°

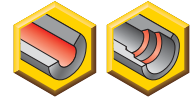
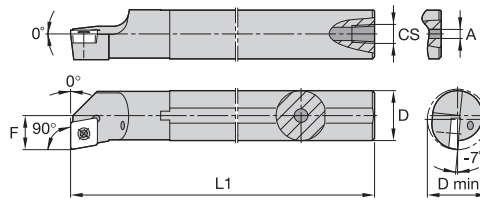


order number	catalogue number	H	B	F	L1	LH	FA	gage insert	shim	shim screw	hex	insert screw	Torx
right hand													
1097828	SCRCR1212N09	12	12	13,0	160	14,0	2,3	CC..09T308	—	—	—	MS1155	T15
1097829	SCRCR1616H09	16	16	17,0	100	14,0	2,3	CC..09T308	SKCP343	SRS3	3.5 mm	MS1156	T15

ISO Turning



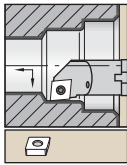
Steel shank with through coolant.



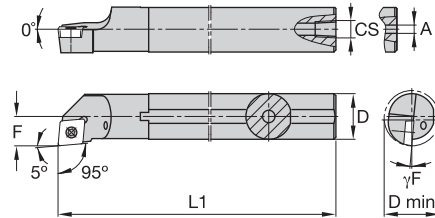
■ A-SCFC 90°



order number	catalogue number	D	D min	F	L1	CS	gage insert	insert screw	Torx
right hand									
1098266	A25TSCFCR12	25	32,0	17,0	300	1/4-18 NPT	CC..120408	MS1157	T15
left hand									
1098270	A25TSCFCL12	25	32,0	17,0	300	1/4-18 NPT	CC..120408	MS1157	T15



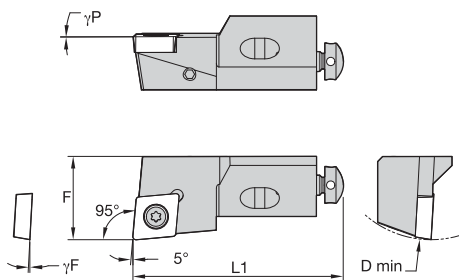
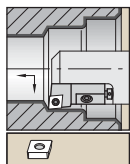
Steel shank with through coolant.



■ A-SCLC 95°



order number	catalogue number	D	D min	F	L1	A	CS	γF°	gage insert	shim	shim screw	hex	insert screw	Torx
right hand														
1098159	A08JSCLCR06	8	11,0	6,0	110	2,4	—	-8.0	CC..060204	—	—	—	MS1939	T7
1098168	A10KSCLCR06	10	13,0	7,0	125	3,2	—	-7.0	CC..060204	—	—	—	MS1153	T7
1098178	A12MSCLCR06	12	16,0	9,0	150	4,0	1/16-27 NPT	-6.0	CC..060204	—	—	—	MS1153	T7
1098225	A16RSCLCR09	16	20,0	11,0	200	4,0	1/8-27 NPT	-7.0	CC..09T308	—	—	—	MS1155	T15
1098239	A20SSCLCR09	20	25,0	13,0	250	4,0	1/8-27 NPT	-5.0	CC..09T308	—	—	—	MS1155	T15
1098268	A25TSCLCR12	25	32,0	17,0	300	6,4	1/4-18 NPT	-7.0	CC..120408	—	—	—	MS1157	T15
1098280	A32TSCLCR12	32	40,0	22,0	300	6,4	1/4-18 NPT	-7.0	CC..120408	SKCP453	SRS4	4 mm	MS1158	T15
left hand														
1098163	A08JSCLCL06	8	11,0	6,0	110	2,4	—	-8.0	CC..060204	—	—	—	MS1939	T7
1098173	A10KSCLCL06	10	13,0	7,0	125	3,2	—	-7.0	CC..060204	—	—	—	MS1153	T7
1098183	A12MSCLCL06	12	16,0	9,0	150	4,0	1/16-27 NPT	-6.0	CC..060204	—	—	—	MS1153	T7
1098231	A16RSCLCL09	16	20,0	11,0	200	4,0	1/8-27 NPT	-7.0	CC..09T308	—	—	—	MS1155	T15
1098244	A20SSCLCL09	20	25,0	13,0	250	4,0	1/8-27 NPT	-5.0	CC..09T308	—	—	—	MS1155	T15
1098272	A25TSCCL12	25	32,0	17,0	300	6,4	1/4-18 NPT	-7.0	CC..120408	—	—	—	MS1157	T15
1098282	A32TSCCL12	32	40,0	22,0	300	6,4	1/4-18 NPT	-7.0	CC..120408	SKCP453	SRS4	4 mm	MS1158	T15



■ SCLC 95°

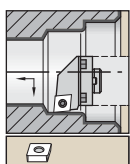
order number	catalogue number	D min	F	L1	γF°	γP°	gage insert
right hand							
1098544	SCLCR12CA12	50	20,0	55	-3.0	0.0	CC..120408/CC..432
1098545	SCLCR16CA12	60	25,0	63	-3.0	0.0	CC..120408/CC..432
left hand							
1098732	SCLCL12CA12	50	20,0	55	-3.0	0.0	CC..120408/CC..432

■ Spare Parts

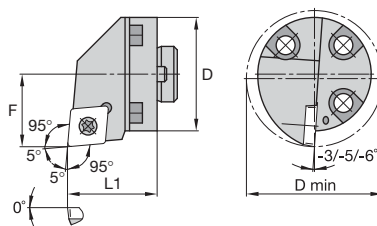


D min	insert screw	Torx	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
50	MS1157	T15	KUAM23	2.5 mm	KUAM31	191.406	4 mm	CSWM 060 050
60	MS1157	T15	KUAM25	2.5 mm	KUAM32	191.407	5 mm	CSWM 080 050

Screw-On Boring Heads



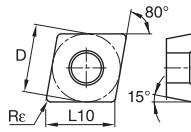
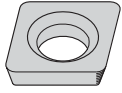
With through coolant.



■ H-SCLC 95°



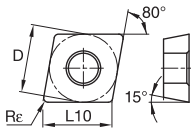
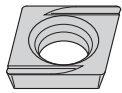
order number	catalogue number	D	D min	F	L1	gage insert	insert screw	Torx
right hand								
1772253	H32SCLCR09	32	40,0	21,9	25	CC..09T308	MS1155	T15
3612090	H40SCLCR12	40	50,0	27,0	41	CC..120408	MS1158	T15



- first choice
- alternate choice

CDHB

ISO catalogue number	D	L10	Rε
CDHBS4T0S0	3,97	4,03	0,1
CDHBS4T0X0	3,97	4,03	0,1
CDHBS4T002	3,97	4,03	0,2
CDHBS4T004	3,97	4,03	0,4

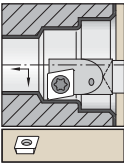


CDHH

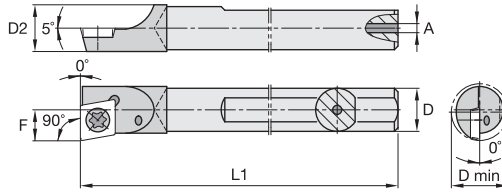
ISO catalogue number	D	L10	Rε
CDHHS4T002L	3,97	4,03	0,2
CDHHS4T002R	3,97	4,03	0,2
CDHHS4T004L	3,97	4,03	0,4
CDHHS4T004R	3,97	4,03	0,4

NOTE: Right-hand insert uses left-hand bars.
Left-hand insert uses right-hand bars.

P	M	K	N	S	H	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10	
●	●	●	●	●	●	●	●	○	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
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Carbide shank with through coolant.

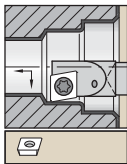


ISO Turning

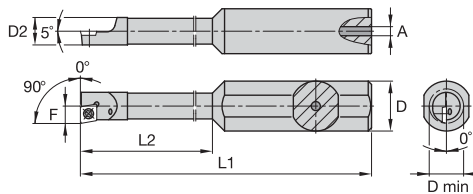
■ E-SCFD 90°



order number	catalogue number	D	D min	F	L1	A	gage insert	insert screw	Torx
right hand									
1930354	E05HSCFDRS4	5	5,9	3,2	101	1,0	CD..S4T002	CC11	T6
1930360	E06HSCFDRS4	6	7,1	3,7	100	1,2	CD..S4T002	CC11	T6



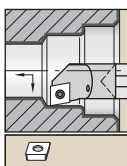
Necked steel shank with through coolant.



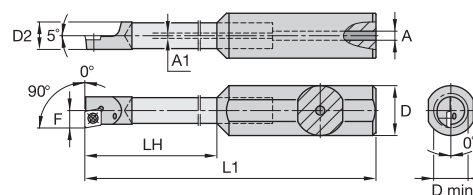
■ A-SCFD 90° • Stepped



order number	catalogue number	D	D min	D2	F	L1	L2	A	gage insert	insert screw	Torx
right hand											
1930376	A0510ESCFDRS412	10	5,9	5,2	3,1	70	12,7	1,0	CD..S4T002	CC11	T6
1930380	A0510ESCFDRS425	10	5,9	5,2	3,1	70	25,4	1,0	CD..S4T002	CC11	T6
1930404	A0612ESCFDRS431	12	7,4	6,6	3,9	70	31,8	1,0	CD..S4T002	CC11	T6



Necked carbide shank with through coolant.



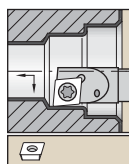
■ E-SCFD 90° • Stepped



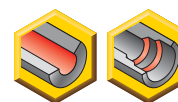
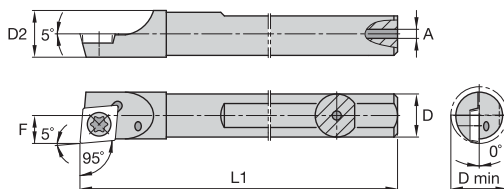
order number	catalogue number	D	D min	D2	F	L1	LH	A	A1	gage insert	insert screw	Torx
right hand												
1930408	E0512XSCFDRS425	12	5,9	5,0	3,2	64	10,0	1,0	1,2	CD..S4T002	CC11	T6
1930412	E0512XSCFDRS450	12	5,9	5,0	3,2	89	10,0	3,2	1,2	CD..S4T002	CC11	T6
1930436	E0616XSCFDRS463	16	7,4	6,3	3,9	127	12,3	3,2	1,2	CD..S4T002	CC11	T6



ISO Turning



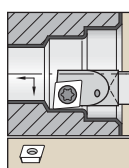
Steel shank with through coolant.



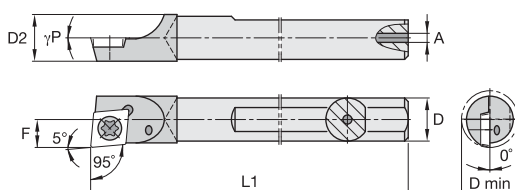
■ A-SCLD 95°



order number	catalogue number	D	D min	D2	F	L1	A	gage insert	insert screw	Torx
right hand										
1288877	A04XSCLDRS4	4	4,6	4,2	2,4	65	1,0	CD..S4T002	CC09	T6
1930298	A05XSCLDRS4	5	5,8	5,2	3,0	64	1,0	CD..S4T002	CC09	T6
1288893	A06XSCLDRS4	6	7,1	6,2	3,7	64	1,0	CD..S4T002	CC11	T6
1288906	A08XSCLDRS4	8	9,0	8,2	4,7	76	1,5	CD..S4T002	CC11	T6
left hand										
1288876	A04XSCLDLS4	4	4,6	4,2	2,4	65	1,0	CD..S4T002	CC09	T6
1930297	A05XSCLDLS4	5	5,8	5,2	3,0	64	1,0	CD..S4T002	CC09	T6
1288892	A06XSCLDLS4	6	7,1	6,2	3,7	64	1,0	CD..S4T002	CC11	T6
1288905	A08XSCLDLS4	8	9,0	8,2	4,7	76	1,5	CD..S4T002	CC11	T6



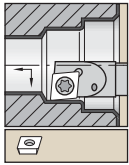
Carbide shank with through coolant.



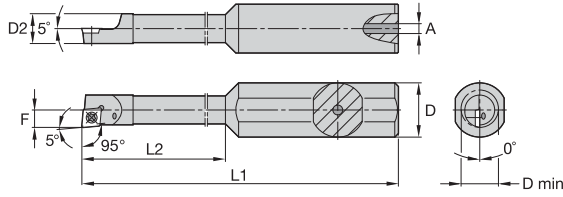
■ E-SCLD 95°



order number	catalogue number	D	D min	D2	F	L1	A	γP°	gage insert	insert screw	Torx
right hand											
1930300	E04HSCLDRS4	4	4,6	4,2	2,4	100	1,0	0.0	CD..S4T002	CC09	T6
1270967	E04MSCLDRS4	4	4,6	4,2	2,4	152	1,0	0.0	CD..S4T002	CC09	T6
1930356	E05HSCLDRS4	5	5,9	—	3,0	101	1,0	5.0	CD..S4T002	CC09	T6
1930358	E05MSCLDRS4	5	5,9	—	3,0	152	1,0	5.0	CD..S4T002	CC09	T6
1930362	E06HSCLDRS4	6	7,1	—	3,7	100	1,2	5.0	CD..S4T002	CC11	T6
1270978	E06MSCLDRS4	6	6,9	—	3,7	152	1,2	5.0	CD..S4T002	CC09	T6
1270988	E08MSCLDRS4	8	9,1	—	4,7	150	2,4	5.0	CD..120605	CC11	T6
left hand											
1930299	E04HSCLDLS4	4	4,6	4,2	2,4	100	1,0	0.0	CD..S4T002	CC09	T6
1270966	E04MSCLDLS4	4	4,6	4,2	2,4	152	1,0	0.0	CD..S4T002	CC09	T6
1930355	E05HSCLDLS4	5	5,9	—	3,0	101	1,0	5.0	CD..S4T002	CC11	T6
1930357	E05MSCLDLS4	5	5,9	—	3,0	152	1,0	5.0	CD..S4T002	CC09	T6
1930361	E06HSCLDLS4	6	7,1	—	3,7	100	1,2	5.0	CD..S4T002	CC11	T6
1270977	E06MSCLDLS4	6	7,1	—	3,7	152	1,2	5.0	CD..S4T002	CC11	T6
1270987	E08MSCLDLS4	8	9,0	—	4,7	152	2,4	5.0	CD..S4T002	CC11	T6



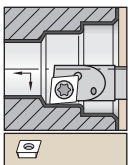
Necked steel shank with through coolant.



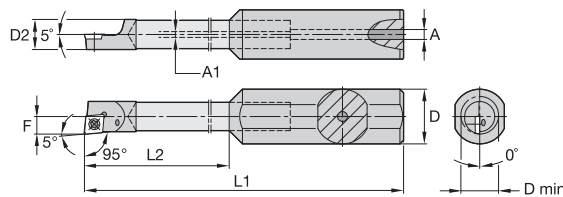
■ A-SCLD 95° • Stepped



order number	catalogue number	D	D min	F	L1	L2	A	gage insert	insert screw	Torx
right hand										
1930372	A0410ESCLDRS412	10	5,2	2,6	70	12,7	1,0	CD..S4T002	CC09	T6
1930374	A0410ESCLDRS425	10	5,2	2,6	70	25,4	1,0	CD..S4T002	CC09	T6
1289129	A0412ESCLDRS412	12	5,2	2,6	70	12,7	1,0	CD..S4T002	CC09	T6
1289130	A0412ESCLDRS425	12	5,2	2,6	70	25,4	1,0	CD..S4T002	CC09	T6
1930378	A0510ESCLDRS412	10	5,8	3,0	70	12,3	1,0	CD..S4T002	CC11	T6
1930382	A0510ESCLDRS425	10	5,8	3,0	70	25,0	1,0	CD..S4T002	CC09	T6
1098071	A0510GSCLDRS4	10	6,0	3,2	90	25,0	3,2	CD..S4T002	MS1454	T5
1098073	A0610HSCLDRS4	10	7,6	3,8	100	32,0	3,2	CD..S4T002	MS1454	T5
1930402	A0612ESCLDRS419	12	7,2	3,7	70	19,1	1,0	CD..S4T002	CC11	T6



Necked carbide shank with through coolant.

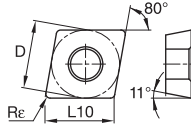
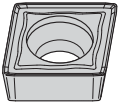


■ E-SCLD 95° • Stepped



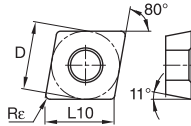
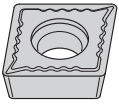
order number	catalogue number	D	D min	D2	F	L1	L2	A	gage insert	insert screw	Torx
right hand											
1930406	E0412DSCLDRS422	12	5,3	5,0	2,6	60	22,2	3,2	CD..S4T002	CC09	T6
1262129	E0412XSCLDRS447	12	5,3	5,0	2,6	86	47,6	3,2	CD..S4T002	CC09	T6
1262131	E0416KSCLDRS447	16	5,3	5,0	2,6	111	47,6	3,2	CD..S4T002	CC09	T6
1930410	E0512XSCLDRS425	12	5,9	—	3,0	64	25,4	1,0	CD..S4T002	CC11	T6
1930418	E0612ESCLDRS431	12	7,2	—	3,7	70	31,8	3,2	CD..S4T002	CC11	T6
1262178	E0612HSCLDRS463	12	7,2	—	3,7	102	63,5	3,2	CD..S4T002	CC11	T6
1930434	E0616HSCLDRS431	16	7,2	—	3,7	95	31,8	3,2	CD..S4T002	CC11	T6
1262175	E0616XSCLDRS463	16	7,2	—	3,7	127	63,5	3,2	CD..120605	CC11	T6

● first choice
○ alternate choice



■ CPMT-MW

ISO catalogue number	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
CPMT09T304MW	9,53	9,67	0,4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CPMT09T308MW	9,53	9,67	0,8	-	-	-	-	●	-	-	-	-	-	-	●	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



■ CPMT-UF

ISO catalogue number	D	L10	Rε	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10
CPMT060204UF	6,35	6,45	0,4	-	●	-	●	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CPMT09T304UF	9,53	9,67	0,4	-	-	-	●	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	●	-	-	-	-	-

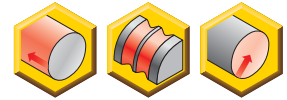
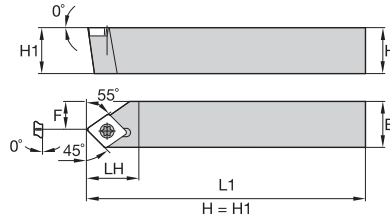
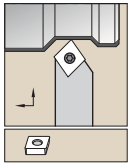
P	M	K	N	S	H	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10	
●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
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ISO Turning



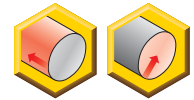
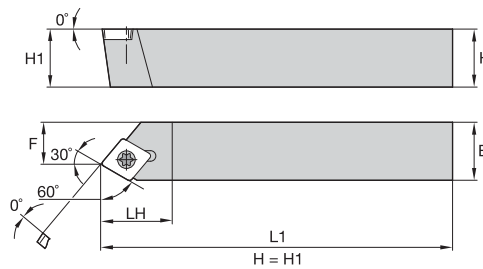
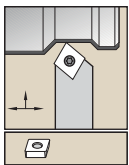
ISO Turning



■ SCDP 45°



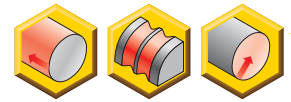
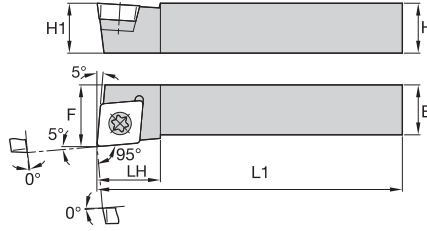
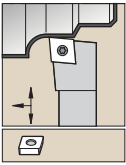
order number	catalogue number	H	B	F	L1	LH	gage insert	insert screw	Torx
right hand									
1244893	SCDPR1212H06	12	12	7,0	100	14,0	CP..060203	MS1153	T7



■ SCEP 60°



order number	catalogue number	H	B	F	L1	LH	gage insert	insert screw	Torx
right hand									
1244896	SCEPR1010H06	10	10	6,5	100	12,0	CP..060203R.	MS1153	T7
1250901	SCEPR1212H06	12	12	8,5	100	12,0	CP..060203R.	MS1153	T7

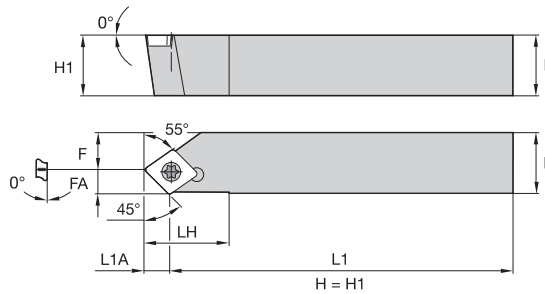
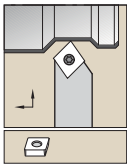


ISO Turning

■ SCLP 95°



order number	catalogue number	H	B	F	L1	LH	gage insert	insert screw	Torx
right hand									
1192469	SCLPR1212M06	12	12	13,0	150	11,4	CP..060203	MS1153	T7
left hand									
1244913	SCLPL1212M06	12	12	13,0	150	11,4	CP..060203	MS1153	T7



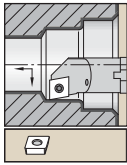
■ SCSP 45°



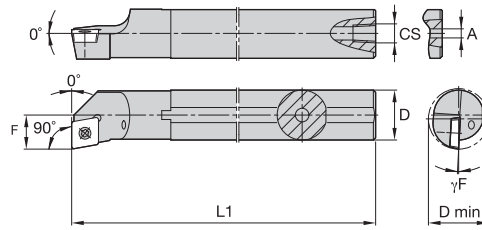
order number	catalogue number	H	B	F	L1	LH	FA	L1A	gage insert	insert screw	Torx
right hand											
1244917	SCSPR1010H06	10	10	6,0	100	14,0	4,2	4,2	CP..060203	MS1153	T7



ISO Turning



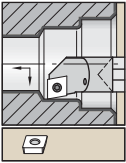
Steel shank with through coolant.



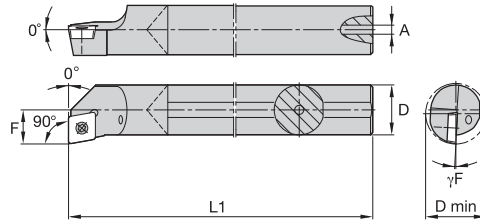
■ A-SCFP 90°



order number	catalogue number	D	D min	F	L1	A	CS	γF°	gage insert	insert screw	Torx
right hand											
1098157	A08JSCFPR06	8	11,0	6,0	110	2,4	—	-8.0	CP..060204	MS1153	T7
1098165	A10KSCFPR06	10	13,0	7,0	125	3,2	—	-6.0	CP..060204	MS1153	T7
1098175	A12MSCFPR06	12	16,0	9,0	150	4,0	1/16-27 NPT	-4.0	CP..060204	MS1153	T7
1886498	A16RSCFPR06	16	20,0	11,0	200	—	1/8-27 NPT	-5.0	CP..060203	MS1153	T7
1098221	A16RSCFPR09	16	20,0	11,0	200	4,0	1/8-27 NPT	-4.0	CP..09T308	MS1155	T15
1098235	A20SSCFPR09	20	25,0	13,0	250	4,0	1/8-27 NPT	-2.0	CP..09T308	MS1155	T15
left hand											
1098161	A08JSCFPL06	8	11,0	6,0	110	2,4	—	-8.0	CP..060204	MS1153	T7
1098170	A10KSCFPL06	10	13,0	7,0	125	3,2	—	-6.0	CP..060204	MS1153	T7
1098180	A12MSCFPL06	12	16,0	9,0	150	4,0	1/16-27 NPT	-4.0	CP..060204	MS1153	T7
1098227	A16RSCFPL09	16	20,0	11,0	200	4,0	1/8-27 NPT	-4.0	CP..09T308	MS1155	T15
1098241	A20SSCFPL09	20	25,0	13,0	250	4,0	1/8-27 NPT	-2.0	CP..09T308	MS1155	T15



Carbide shank with through coolant.

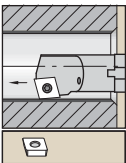


ISO Turning

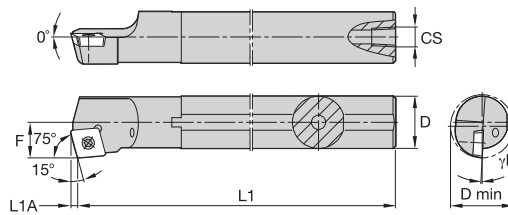
■ E-SCFP 90°



order number	catalogue number	D	D min	F	L1	A	γF°	gage insert	insert screw	Torx
right hand										
1152852	E08KSCFPR06A	8	11,0	6,0	125	2,4	-8.0	CP..060204	MS1939	T7
1152854	E10MSCFPR06A	10	13,0	7,0	150	3,2	-4.0	CP..060204	MS1939	T7
1152888	E12QSCFPR06	12	16,0	9,0	180	4,8	-3.0	CP..060204	MS1153	T7
left hand										
1152853	E08KSCFPL06A	8	11,0	6,0	125	2,4	-8.0	CP..060204	MS1939	T7



Steel shank with through coolant.



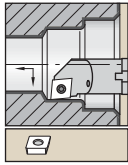
■ A-SCKP 75°



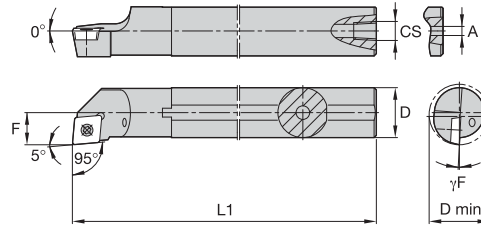
order number	catalogue number	D	D min	F	L1	L1A	CS	γF°	gage insert	insert screw	Torx
right hand											
1098236	A20SSCKPR09	20	25,0	13,0	250	2,3	1/8-27 NPT	-3.0	CP..09T308	MS1155	T15



ISO Turning



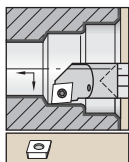
Steel shank with through coolant.



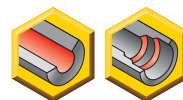
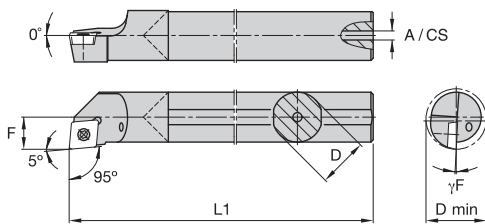
■ A-SCLP 95°



order number	catalogue number	D	D min	F	L1	A	CS	γF°	gage insert	insert screw	Torx
right hand											
1098156	A08JSCLPR06	.315	.433	.236	4.33	.09	—	-6.0	CP..060204	MS1939	T7
1098164	A10KSCLPR06	.390	.512	.276	4.92	.13	—	-4.0	CP..060204	MS1939	T7
1098174	A12MSCLPR06	.472	.630	.354	5.91	.16	1/16-27 NPT	-3.0	CP..060204	MS1153	T7
1886502	A16RSCLPR06	.630	.787	.433	7.87	—	1/8-27 NPT	-5.0	CP..060203	MS1153	T7
1098220	A16RSCLPR09	.630	.787	.433	7.87	.16	1/8-27 NPT	-4.0	CP..09T308	MS1155	T15
1098234	A20SSCLPR09	.787	.984	.512	9.84	.16	1/8-27 NPT	-2.0	CP..09T308	MS1155	T15
1886504	A20SSCLPR06	.787	.984	.512	9.84	—	1/8-27 NPT	-3.0	CP..060203	MS1153	T7
left hand											
1098160	A08JSCLPL06	.315	.433	.236	4.33	.09	—	-6.0	CP..060204	MS1939	T7
1098169	A10KSCLPL06	.390	.512	.276	4.92	.13	—	-4.0	CP..060204	MS1939	T7
1098179	A12MSCLPL06	.472	.630	.354	5.91	.16	1/16-27 NPT	-3.0	CP..060204	MS1153	T7
1886501	A16RSCLPL06	.630	.787	.433	7.87	—	1/8-27 NPT	-5.0	CP..060203	MS1153	T7
1098226	A16RSCLPL09	.630	.787	.433	7.87	.16	1/8-27 NPT	-4.0	CP..09T308	MS1155	T15
1098240	A20SSCLPL09	.787	.984	.512	9.84	.16	1/8-27 NPT	-2.0	CP..09T308	MS1155	T15



Carbide shank with through coolant.

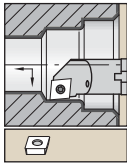


■ E-SCLP 95°

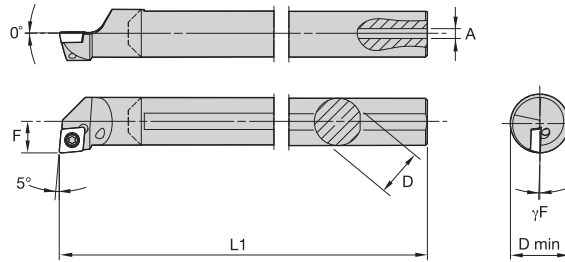


order number	catalogue number	D	D min	F	L1	A	γF°	gage insert	insert screw	Torx
right hand										
1152856	E08KSCLPR06A	8	11,0	6,0	122	2,4	-6.0	CP..060204	MS1939	T7
1152858	E10MSCLPR06A	10	13,0	7,0	150	3,2	-4.0	CP..060204	MS1939	T7
1152889	E12QSCLPR06	12	16,0	9,0	180	4,8	-3.0	CP..060204	MS1153	T7
1152897	E16RSCLPR09	16	20,0	11,0	200	5,5	-4.0	CP..09T308	MS1155	T15
1152902	E20SSCLPR09	20	25,0	13,0	250	7,1	-2.0	CP..09T308	MS1155	T15
left hand										
1152857	E08KSCLPL06A	8	11,0	6,0	122	2,4	-6.0	CP..060204	MS1939	T7
1152859	E10MSCLPL06A	10	13,0	7,0	150	3,2	-4.0	CP..060204	MS1939	T7
1152891	E12QSCLPL06	12	16,0	9,0	180	4,8	-3.0	CP..060204	MS1153	T7
1152899	E16RSCLPL09	16	20,0	11,0	200	5,5	-4.0	CP..09T308	MS1155	T15
1152905	E20SSCLPL09	20	25,0	13,0	250	7,1	-2.0	CP..09T308	MS1155	T15

ISO Turning



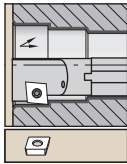
Heavy metal bar with through coolant.



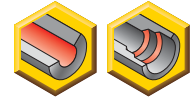
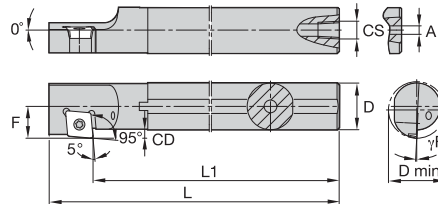
L-SCLP 95°



order number	catalogue number	D	D min	F	L1	A	γF°	gage insert	insert screw	Torx
right hand										
3331115	L08KSCCLPR06	8	11,0	6,0	123	2,4	-6.0	CP..060204..	MS1939	T7
3331107	L10MSCCLPR06	10	13,0	7,0	149	3,2	-4.0	CP..060204..	MS1939	T7
3331110	L12QSCCLPR06	12	16,0	9,0	181	4,0	-3.0	CP..060204..	MS1153	T7
3331108	L16RSCCLPR09	16	20,0	11,0	203	4,0	-4.0	CP..09T308..	MS1155	T15
3331106	L20SSCCLPR09	20	25,0	13,0	251	4,0	-2.0	CP..09T308..	MS1155	T15
left hand										
3331112	L12QSCCLPL06	12	16,0	9,0	181	4,0	-3.0	CP..060204..	MS1153	T7
3331114	L16RSCCLPL09	16	20,0	11,0	203	4,0	-4.0	CP..09T308..	MS1155	T15
3331109	L20SSCCLPL09	20	25,0	13,0	251	4,0	-2.0	CP..09T308..	MS1155	T15



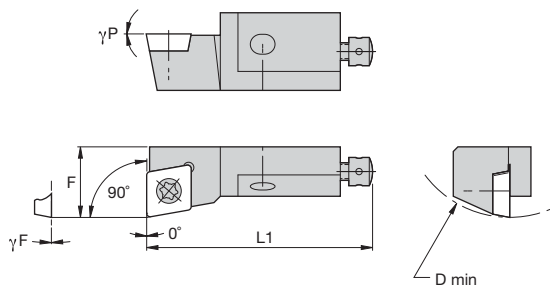
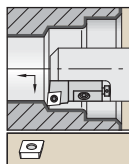
Steel shank with through coolant.



A-SCXP 95°



order number	catalogue number	D	D min	F	L1	L	A	CS	γF°	gage insert	insert screw	Torx
right hand												
1098167	A10KSCXPR06	10	13,0	7,0	125	136,0	3,2	—	-4.0	CP..060204	MS1153	T7
1098177	A12MSCXPR06	12	16,0	9,0	150	161,0	4,0	1/16-27 NPT	-3.0	CP..060204	MS1153	T7
1098223	A16RSCXPR09	16	20,0	11,0	200	218,0	4,0	1/8-27 NPT	-4.0	CP..09T308	MS1155	T15



■ SCFP 90°

order number	catalogue number	D min	F	L1	γ_F°	γ_P°	gage insert
right hand							
1098551	SCFPR06CA05	20	8,0	25	0.0	0.0	CP..050204/CP..18151
1082671	SCFPR08CA06	25	10,0	32	0.0	0.0	CP..060204/CP..2151
1797235	SCFPR10CA09	40	14,0	50	0.0	0.0	CP..09T308/CP..3252
left hand							
1098766	SCFPL08CA06	25	10,0	32	0.0	0.0	CP..060204/CP..2151

NOTE: ANSI/ISO compatible 60° countersunk hole inserts.
This tool also accepts CPGM/CPGT/CPGW-21.5_ inserts.

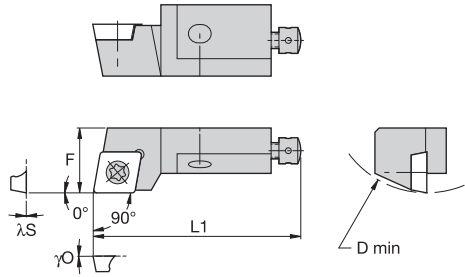
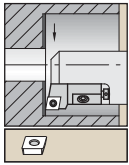
■ Spare Parts



D min	insert screw	Torx	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
20	MS1933	T7	KUAM34	1.5 mm	KUAM35	MS2173	2 mm	CSWM 035 040
25	MS1153	T7	KUAM34	1.5 mm	KUAM20	MS2175	2.5 mm	CSWM 040 050
40	MS1155	T15	KUAM28	2 mm	KUAM30	191.405	4 mm	CSWM 060 050



ISO Turning



■ SCGP 90°

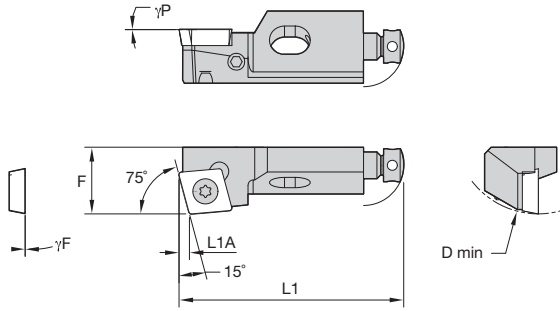
order number	catalogue number	D min	F	L1	λS°	$\gamma 0^\circ$	gage insert
right hand							
1098554	SCGPR08CA06	25	10,0	32	0.0	0.0	CP..060204/CP..2151

NOTE: ANSI/ISO compatible 60° countersunk hole inserts.
This tool also accepts CPGM/CPGT/CPGW-21.5_ inserts.

■ Spare Parts



D min	insert screw	Torx	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
25	MS1153	T7	KUAM34	1.5 mm	KUAM20	MS2175	2.5 mm	CSWM 040 050



■ SCKP 75°

order number	catalogue number	D min	F	L1	L1A	γF°	γP°	gage insert
right hand								
1098552	SCKPR08CA06	25	10,0	32	1,6	0.0	0.0	CP..060204/CP..2151
left hand								
1098763	SCKPL08CA06	25	10,0	32	1,6	0.0	0.0	CP..060204/CP..2151

NOTE: ANSI/ISO compatible 60° countersunk hole inserts.
This tool also accepts CPGM/CPGT/CPGW-21.5_ inserts.

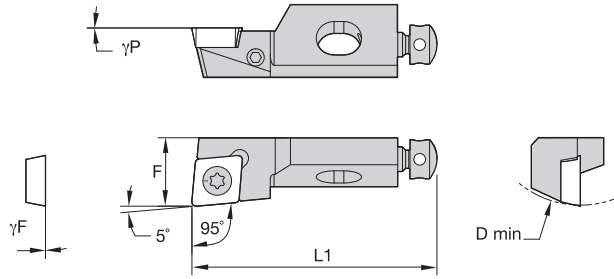
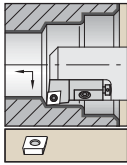
■ Spare Parts



D min	insert screw	Torx	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
25	MS1153	T7	KUAM34	1.5 mm	KUAM20	MS2175	2.5 mm	CSWM 040 050



ISO Turning



■ SCLP 95°

order number	catalogue number	D min	F	L1	γF°	γP°	gage insert
right hand							
1098541	SCLPR06CA05	20	8,0	25	0.0	0.0	CP..050204/CP..18151
1098542	SCLPR08CA06	25	10,0	32	0.0	0.0	CP..060204/CP..2151
1098543	SCLPR10CA09	40	14,0	50	0.0	0.0	CP..09T308/CP..3252
left hand							
1098730	SCLPL08CA06	25	10,0	32	0.0	0.0	CP..060204/CP..2151
1098731	SCLPL10CA09	40	14,0	50	0.0	0.0	CP..09T308/CP..3252

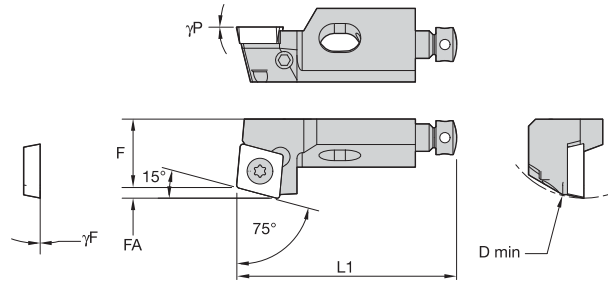
NOTE: ANSI/ISO compatible 60° countersunk hole inserts. This tool also accepts CPGM/CPGT/CPGW-21.5_ inserts.

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

■ Spare Parts



D min	insert screw	Torx	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
20	MS1933	T7	KUAM34	1.5 mm	KUAM35	MS2173	2 mm	CSWM 035 040
25	MS1153	T7	KUAM34	1.5 mm	KUAM20	MS2175	2.5 mm	CSWM 040 050
40	MS1155	T15	KUAM28	2 mm	KUAM30	191.405	4 mm	CSWM 060 050



■ SCRP 75°

order number	catalogue number	D min	F	L1	FA	γF°	γP°	gage insert
right hand								
1098555	SCRPR08CA06	25	10,0	32	1,5	0.0	0.0	CP..060204/CP..2151

NOTE: ANSI/ISO compatible 60° countersunk hole inserts.
This tool also accepts CPGM/CPGT/CPGW-21.5_ inserts.

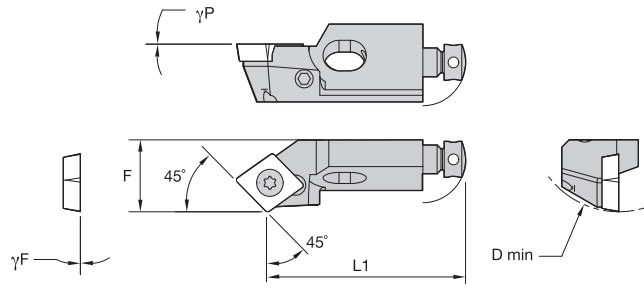
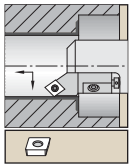
■ Spare Parts



D min	insert screw	Torx	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
25	MS1153	T7	KUAM34	1.5 mm	KUAM20	MS2175	2.5 mm	CSWM 040 050



ISO Turning



■ SCSP 45°

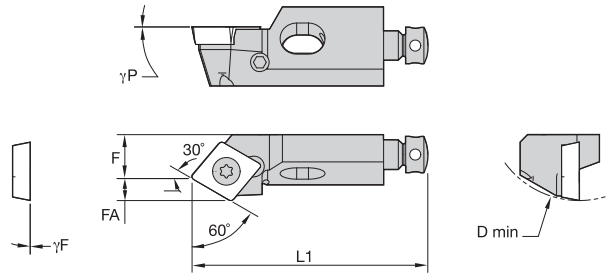
order number	catalogue number	D min	F	L1	γF°	γP°	gage insert
right hand							
1098328	SCSPR06CA05	20	8,0	21	0.0	0.0	CP..050204/CP..18151
1086536	SCSPR08CA06	25	10,0	28	0.0	0.0	CP..060204/CP..2151
left hand							
1098548	SCSPL06CA05	20	8,0	21	0.0	0.0	CP..050204/CP..18151
1098549	SCSPL08CA06	25	10,0	28	0.0	0.0	CP..060204/CP..2151

NOTE: ANSI/ISO compatible 60° countersunk hole inserts.
This tool also accepts CPGM/CPGT/CPGW-21.5_ inserts.

■ Spare Parts



D min	insert screw	Torx	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
20	MS1933	T7	—	—	KUAM35	MS2173	2 mm	CSWM 035 040
25	MS1153	T7	KUAM34	1.5 mm	KUAM20	MS2175	2.5 mm	CSWM 040 050



■ SCTP 60°

order number	catalogue number	D min	F	L1	FA	γF°	γP°	gage insert
right hand								
1098556	SCTPR06CA05	20	5,5	25	2,6	0.0	0.0	CP..050204/CP..18151
1098557	SCTPR08CA06	25	6,0	32	3,0	0.0	0.0	CP..060204/CP..2151
left hand								
1098736	SCTPL08CA06	25	6,0	32	3,0	0.0	0.0	CP..060204/CP..2151

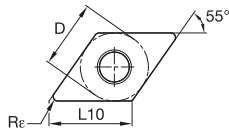
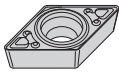
NOTE: ANSI/ISO compatible 60° countersunk hole inserts.
This tool also accepts CPGM/CPGT/CPGW-21.5_ inserts.

■ Spare Parts



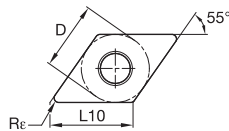
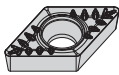
D min	insert screw	Torx	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
20	MS1933	T7	—	—	KUAM35	MS2173	2 mm	CSWM 035 040
25	MS1153	T7	KUAM34	1.5 mm	KUAM20	MS2175	2.5 mm	CSWM 040 050

ISO Turning



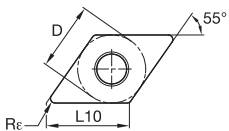
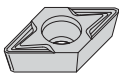
■ DCMT-MF

ISO catalogue number	D	L10	Rε
DCMT11T304MF	9,53	11,63	0,4
DCMT11T308MF	9,53	11,63	0,8
DCMT11T312MF	9,53	11,63	1,2



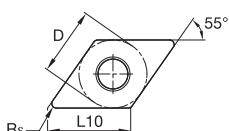
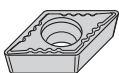
■ DCMT-MP

ISO catalogue number	D	L10	Rε
DCMT11T304MP	9,53	11,63	0,4
DCMT11T308MP	9,53	11,63	0,8
DCMT11T312MP	9,53	11,63	1,2



■ DCMT-MW

ISO catalogue number	D	L10	Rε
DCMT11T304MW	9,53	11,63	0,4
DCMT11T308MW	9,53	11,63	0,8

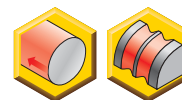
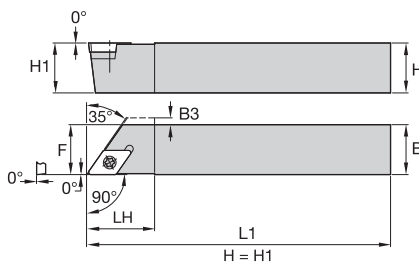
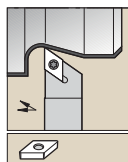


■ DCMT-UF

ISO catalogue number	D	L10	Rε
DCMT070204UF	6,35	7,75	0,4
DCMT11T302UF	9,53	11,63	0,2
DCMT11T304UF	9,53	11,63	0,4
DCMT11T308UF	9,53	11,63	0,8

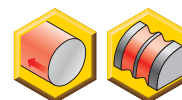
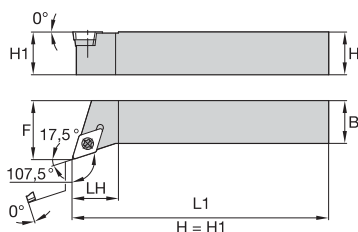
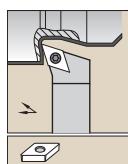
● first choice
○ alternate choice

P	M	K	N	S	H	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10	
●	●	○	○	○	○	-	●	●	●	●	●	-	-	-	-	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
○	○	○	○	○	○	-	○	○	○	○	○	-	-	-	-	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
○	○	○	○	○	○	-	○	○	○	○	○	-	-	-	-	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
○	○	○	○	○	○	-	○	○	○	○	○	-	-	-	-	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
○	○	○	○	○	○	-	○	○	○	○	○	-	-	-	-	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



■ SDAC 90°

order number	catalogue number	H	B	F	L1	LH	B3	gage insert	shim	shim screw	hex	insert screw	Torx
right hand													
1772159	SDACR1212M11Q	12	12	12,0	150	22,0	1,5	DC..11T308	—	—	—	MS1155	T15
1097720	SDACR1616K11Q	16	16	16,0	125	22,0	—	DC..11T308	SKDP343	SRS3	3.5 mm	MS1156	T15
left hand													
1772160	SDACL1212M11Q	12	12	12,0	150	22,0	1,5	DC..11T308	—	—	—	MS1155	T15

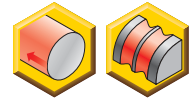
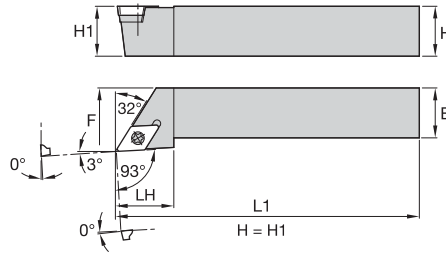
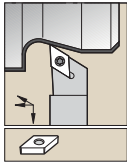


■ SDHC 107,5°

order number	catalogue number	H	B	F	L1	LH	gage insert	shim	shim screw	hex	insert screw	Torx
right hand												
1097841	SDHCR1616H11	16	16	20,0	100	20,0	DC..11T308	SKDP343	SRS3	3.5 mm	MS1156	T15
1097989	SDHCR2020K11	20	20	25,0	125	20,0	DC..11T308	SKDP343	SRS3	3.5 mm	MS1156	T15
1130381	SDHCR2525M11	25	25	32,0	150	20,0	DC..11T308	SKDP343	SRS3	3.5 mm	MS1156	T15
1097843	SDHCR2525M15	25	25	32,0	150	25,0	DC..150408	SKDP453	SRS4	4 mm	MS1158	T15
left hand												
1097986	SDHCL1616H11	16	16	20,0	100	20,0	DC..11T308	SKDP343	SRS3	3.5 mm	MS1156	T15
1097930	SDHCL2020K11	20	20	25,0	125	20,0	DC..11T308	SKDP343	SRS3	3.5 mm	MS1156	T15
1124630	SDHCL2525M11	25	25	32,0	150	20,0	DC..11T308	SKDP343	SRS3	3.5 mm	MS1156	T15
1097988	SDHCL2525M15	25	25	32,0	150	25,0	DC..150408	SKDP453	SRS4	4 mm	MS1158	T15



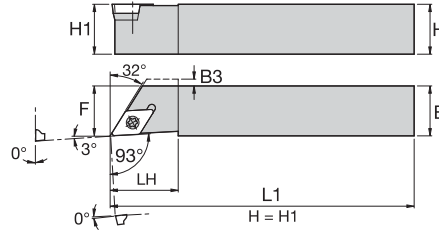
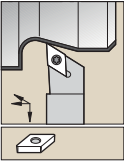
ISO Turning



■ SDJC 93°



order number	catalogue number	H	B	F	L1	LH	gage insert	shim	shim screw	hex	insert screw	Torx
right hand												
1097847	SDJCR0808L07	8	8	10,0	140	16,0	DC..070204	—	—	—	MS1153	T7
1097848	SDJCR1010M07	10	10	12,0	150	16,0	DC..070204	—	—	—	MS1153	T7
1097849	SDJCR1212N07	12	12	16,0	160	16,0	DC..070204	—	—	—	MS1153	T7
1097850	SDJCR1212N11	12	12	16,0	160	22,0	DC..11T308	—	—	—	MS1155	T15
1244972	SDJCR1616H07	16	16	20,0	100	16,0	DC..070204	—	—	—	MS1153	T7
1097851	SDJCR1616H11	16	16	20,0	100	22,0	DC..11T308	SKDP343	SRS3	3.5 mm	MS1156	T15
1244974	SDJCR2020K07	20	20	25,0	125	16,0	DC..070204	—	—	—	MS1153	T7
1097853	SDJCR2020K11	20	20	25,0	125	22,0	DC..11T308	SKDP343	SRS3	3.5 mm	MS1156	T15
1097852	SDJCR2020K15	20	20	25,0	125	32,0	DC..150408	SKDP453	SRS4	4 mm	MS1158	T15
1097854	SDJCR2525M11	25	25	32,0	150	22,0	DC..11T308	SKDP343	SRS3	3.5 mm	MS1156	T15
1097855	SDJCR2525M15	25	25	32,0	150	32,0	DC..150408	SKDP453	SRS4	4 mm	MS1158	T15
left hand												
1097997	SDJCL0808L07	8	8	10,0	140	16,0	DC..070204	—	—	—	MS1153	T7
1097998	SDJCL1010M07	10	10	12,0	150	16,0	DC..070204	—	—	—	MS1153	T7
1097999	SDJCL1212N07	12	12	16,0	160	16,0	DC..070204	—	—	—	MS1153	T7
1098000	SDJCL1212N11	12	12	16,0	160	22,0	DC..11T308	—	—	—	MS1155	T15
1244966	SDJCL1616H07	16	16	20,0	100	16,0	DC..070204	—	—	—	MS1153	T7
1098001	SDJCL1616H11	16	16	20,0	100	22,0	DC..11T308	SKDP343	SRS3	3.5 mm	MS1156	T15
1244968	SDJCL2020K07	20	20	25,0	125	16,0	DC..070204	—	—	—	MS1153	T7
1098003	SDJCL2020K11	20	20	25,0	125	22,0	DC..11T308	SKDP343	SRS3	3.5 mm	MS1156	T15
1192473	SDJCL2525M11	25	25	32,0	150	22,0	DC..11T308	SKDP343	SRS3	3.5 mm	MS1156	T15
1098004	SDJCL2525M15	25	25	32,0	150	32,0	DC..150408	SKDP453	SRS4	4 mm	MS1158	T15

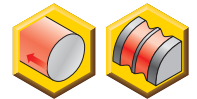
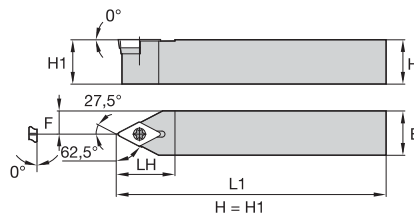
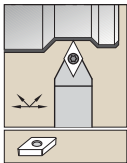


ISO Turning

■ SDJC-F 93°



order number	catalogue number	H	B	F	L1	LH	B3	gage insert	shim	shim screw	hex	insert screw	Torx
right hand													
1772157	SDJCRF0808M07Q	8	8	8,0	150	16,0	1,5	DC..070204	—	—	—	MS1153	T7
1097844	SDJCRF1010M07Q	10	10	10,0	150	16,0	—	DC..070204	—	—	—	MS1153	T7
1097845	SDJCRF1212M07Q	12	12	12,0	150	16,0	—	DC..070204	—	—	—	MS1153	T7
1097846	SDJCRF1616K11Q	16	16	16,0	125	22,0	—	DC..11T308	SKDP343	SRS3	3.5 mm	MS1156	T15
left hand													
1097996	SDJCLF1616K11Q	16	16	16,0	125	22,0	—	DC..11T308	SKDP343	SRS3	3.5 mm	MS1156	T15



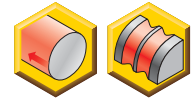
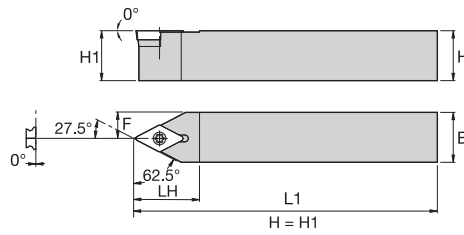
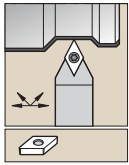
■ SDNC 62,5°



order number	catalogue number	H	B	F	L1	LH	gage insert	shim	shim screw	hex	insert screw	Torx
left hand												
1097856	SDNCN0808L07	8	8	4,0	140	16,0	DC..070204	—	—	—	MS1153	T7
1097857	SDNCN1010M07	10	10	5,0	150	16,0	DC..070204	—	—	—	MS1153	T7
1097858	SDNCN1212N07	12	12	6,0	160	16,0	DC..070204	—	—	—	MS1153	T7
1097859	SDNCN1616H11	16	16	8,0	100	22,0	DC..11T308	SKDP343	SRS3	3.5 mm	MS1156	T15
1097861	SDNCN2020K11	20	20	10,0	125	22,0	DC..11T308	SKDP343	SRS3	3.5 mm	MS1156	T15
1097860	SDNCN2020K15	20	20	10,0	125	28,0	DC..150408	SKDP453	SRS4	4 mm	MS1158	T15
1097862	SDNCN2525M15	25	25	12,5	150	28,0	DC..150408	SKDP453	SRS4	4 mm	MS1158	T15



ISO Turning

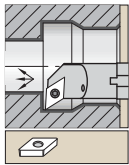


■ SDPC 62,5°

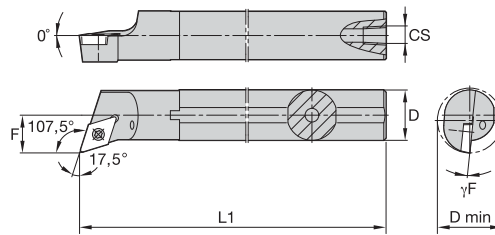


order number	catalogue number	H	B	F	L1	LH	gage insert	insert screw	Torx
1772173	SDPCN1212M11Q	12	12	6,0	150	22,0	DC..11T308	MS1155	T15

Screw-On Boring Bars



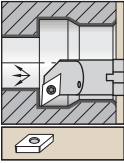
Steel shank with through coolant.



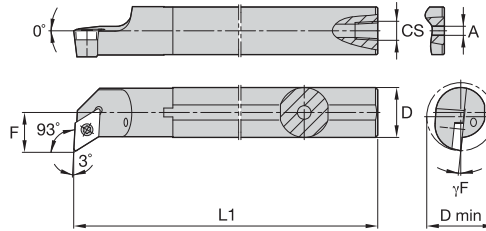
■ A-SDQC 107,5°



order number	catalogue number	D	D min	F	L1	CS	γF°	gage insert	insert screw	Torx
right hand										
1098188	A12MSDQCR07	12	16,0	9,0	150	1/16-27 NPT	-6,0	DC..070204	MS1153	T7
1098198	A16RSDQCR07	16	20,0	11,0	200	1/8-27 NPT	-5,0	DC..070204	MS1153	T7
1098147	A20SSDQCR11	20	25,0	13,0	250	1/8-27 NPT	-5,0	DC..11T308	MS1155	T15
1098260	A25TSDQCR11	25	32,0	17,0	300	1/4-18 NPT	-4,0	DC..11T308	MS1155	T15
left hand										
1098193	A12MSDQCL07	12	16,0	9,0	150	1/16-27 NPT	-6,0	DC..070204	MS1153	T7
1098203	A16RSDQCL07	16	20,0	11,0	200	1/8-27 NPT	-5,0	DC..070204	MS1153	T7
1098149	A20SSDQCL11	20	25,0	13,0	250	1/8-27 NPT	-5,0	DC..11T308	MS1155	T15
1098264	A25TSDQCL11	25	32,0	17,0	300	1/4-18 NPT	-4,0	DC..11T308	MS1155	T15



Steel shank with through coolant.



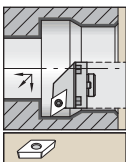
ISO Turning

■ A-SDUC 93°

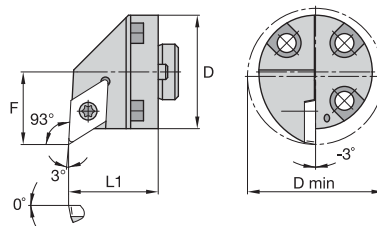


order number	catalogue number	D	D min	F	L1	A	CS	γF°	gage insert	shim	shim screw	hex	insert screw	Torx
right hand														
1886506	A10KSDUCR07	10	13,0	7,0	125	3,2	—	-7.0	DC..070204	—	—	—	MS1153	T7
1098187	A12MSDUCR07	12	16,0	9,0	150	—	1/16-27 NPT	-4.0	DC..070204	—	—	—	MS1153	T7
1098197	A16RSDUCR07	16	20,0	11,0	200	—	1/8-27 NPT	-4.0	DC..070204	—	—	—	MS1153	T7
1886508	A16RSDUCR11	16	20,0	11,0	200	—	1/8-27 NPT	-6.0	DC..11T308	—	—	—	MS1155	T15
1098146	A20SSDUCR11	20	25,0	13,0	250	—	1/8-27 NPT	-5.0	DC..11T308	—	—	—	MS1155	T15
1098259	A25TSDUCR11	25	32,0	17,0	300	—	1/4-18 NPT	-4.0	DC..11T308	—	—	—	MS1155	T15
1098283	A32TSDUCR15	32	40,0	22,0	300	—	1/4-18 NPT	-7.0	DC..150408	SKDP453	SRS4	4 mm	MS1158	T15
left hand														
1886505	A10KSDUCL07	10	13,0	7,0	125	3,2	—	-7.0	DC..070204	—	—	—	MS1153	T7
1098192	A12MSDUCL07	12	16,0	9,0	150	—	1/16-27 NPT	-4.0	DC..070204	—	—	—	MS1153	T7
1098202	A16RSDUCL07	16	20,0	11,0	200	—	1/8-27 NPT	-4.0	DC..070204	—	—	—	MS1153	T7
1886507	A16RSDUCL11	16	20,0	11,0	200	—	1/8-27 NPT	-6.0	DC..11T308	—	—	—	MS1155	T15
1098148	A20SSDUCL11	20	25,0	13,0	250	—	1/8-27 NPT	-5.0	DC..11T308	—	—	—	MS1155	T15
1098263	A25TSDUCL11	25	32,0	17,0	300	—	1/4-18 NPT	-4.0	DC..11T308	—	—	—	MS1155	T15
1098284	A32TSDUCL15	32	40,0	22,0	300	—	1/4-18 NPT	-7.0	DC..150408	SKDP453	SRS4	4 mm	MS1158	T15

Screw-On Boring Heads



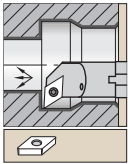
With through coolant.



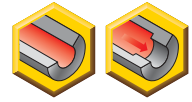
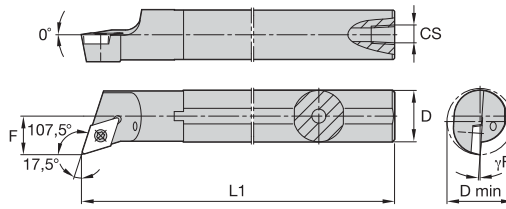
■ H-SDUC 93°



order number	catalogue number	D	D min	F	L1	gage insert	insert screw	Torx
right hand								
1772255	H25SDUCR11	25	32,0	17,0	20	DC..11T308	MS1155	T15
1772257	H32SDUCR11	32	40,0	22,0	25	DC..11T308	MS1155	T15
3612136	H40SDUCR11	40	50,0	27,0	41	DC..11T308	MS1156	T15
3612138	H50SDUCR11	50	63,0	35,0	41	DC..11T308	MS1156	T15
left hand								
1772256	H25SDUCL11	25	32,0	17,0	20	DC..11T308	MS1155	T15
1772258	H32SDUCL11	32	40,0	22,0	25	DC..11T308	MS1155	T15
3612139	H50SDUCL11	50	63,0	35,0	41	DC..11T308	MS1156	T15



Steel shank with through coolant.

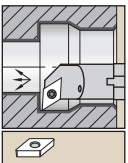


ISO Turning

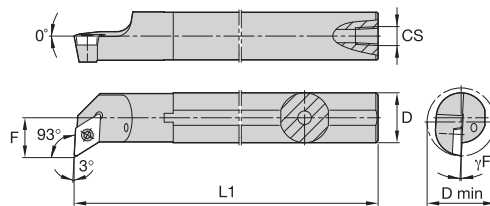
■ A-SDQP 107,5°



order number	catalogue number	D	D min	F	L1	CS	γF°	gage insert	insert screw	Torx
right hand										
1098186	A12MSDQPR07	12	16,0	9,0	150	1/16-27 NPT	-2.0	DP..070204	MS1153	T7
1098196	A16RSDQPR07	16	20,0	11,0	200	1/8-27 NPT	0.0	DP..070204	MS1153	T7
1098247	A20SSDQPR11	20	25,0	13,0	250	1/8-27 NPT	-2.0	DP..11T308	MS1155	T15
1098258	A25TSDQPR11	25	32,0	17,0	300	1/4-18 NPT	0.0	DP..11T308	MS1155	T15
left hand										
1098191	A12MSDQPL07	12	16,0	9,0	150	1/16-27 NPT	-2.0	DP..070204	MS1153	T7
1098201	A16RSDQPL07	16	20,0	11,0	200	1/8-27 NPT	0.0	DP..070204	MS1153	T7
1098252	A20SSDQPL11	20	25,0	13,0	250	1/8-27 NPT	-2.0	DP..11T308	MS1155	T15
1098262	A25TSDQPL11	25	32,0	17,0	300	1/4-18 NPT	0.0	DP..11T308	MS1155	T15



Steel shank with through coolant.

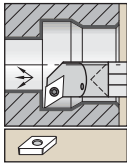


■ A-SDUP 93°

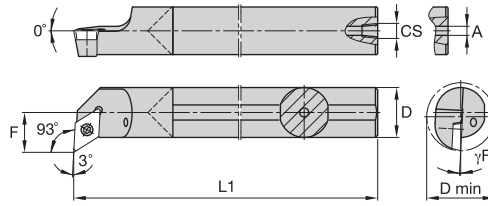


order number	catalogue number	D	D min	F	L1	CS	γF°	gage insert	insert screw	Torx
right hand										
1098184	A12MSDUPR07	12	16,0	9,0	150	1/16-27 NPT	-2.0	DP..070204	MS1153	T7
1098194	A16RSDUPR07	16	20,0	11,0	200	1/8-27 NPT	0.0	DP..070204	MS1153	T7
1098245	A20SSDUPR11	20	25,0	13,0	250	1/8-27 NPT	-2.0	DP..11T308	MS1155	T15
1098257	A25TSDUPR11	25	32,0	17,0	300	1/4-18 NPT	0.0	DP..11T308	MS1155	T15
left hand										
1098189	A12MSDUPL07	12	16,0	9,0	150	1/16-27 NPT	-2.0	DP..070204	MS1153	T7
1098199	A16RSDUPL07	16	20,0	11,0	200	1/8-27 NPT	0.0	DP..070204	MS1153	T7
1098250	A20SSDUPL11	20	25,0	13,0	250	1/8-27 NPT	-2.0	DP..11T308	MS1155	T15

ISO Turning



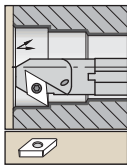
Carbide shank with through coolant.



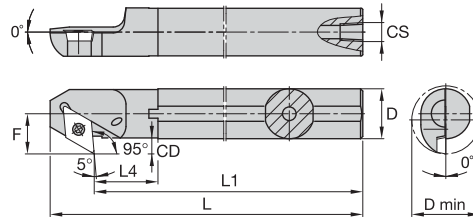
■ E-SDUP 93°



order number	catalogue number	D	D min	F	L1	A	γF°	gage insert	insert screw	Torx
right hand										
1152892	E12QSDUPR07	12	16,0	9,0	180	4,8	-2,0	DP..070204	MS1153	T7
1152894	E16RSDUPR07	16	20,0	11,0	200	5,5	0,0	DP..070204	MS1153	T7
1152906	E20SSDUPR11	20	25,0	13,0	250	7,1	-2,0	DP..11T308	MS1155	T15
left hand										
1152893	E12QSDUPL07	12	16,0	9,0	180	4,8	-2,0	DP..070204	MS1153	T7
1152895	E16RSDUPL07	16	20,0	11,0	200	5,5	0,0	DP..070204	MS1153	T7
1152907	E20SSDUPL11	20	25,0	13,0	250	7,1	-2,0	DP..11T308	MS1155	T15



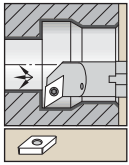
Steel shank with through coolant.



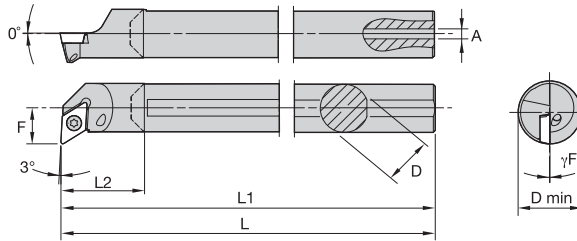
■ A-SDXP 95°



order number	catalogue number	D	D min	F	L1	L	L4	CD	CS	gage insert	insert screw	Torx
right hand												
1098185	A12MSDXPR07	12	16,0	9,0	150	162,0	—	3,09	1/16-27 NPT	DP..070204	MS1153	T7
1098195	A16RSDXPR07	16	20,0	11,0	200	212,0	—	3,20	1/8-27 NPT	DP..070204	MS1153	T7
1098246	A20SSDXPR11	20	25,0	13,0	250	270,0	48,44	4,31	1/8-27 NPT	DP..11T308	MS1155	T15
left hand												
1098190	A12MSDXPL07	12	16,0	9,0	150	162,0	—	3,09	1/16-27 NPT	DP..070204	MS1153	T7
1098200	A16RSDXPL07	16	20,0	11,0	200	212,0	—	3,20	1/8-27 NPT	DP..070204	MS1153	T7
1098251	A20SSDXPL11	20	25,0	13,0	250	270,0	48,44	4,31	1/8-27 NPT	DP..11T308	MS1155	T15



Heavy metal bar with through coolant.



ISO Turning

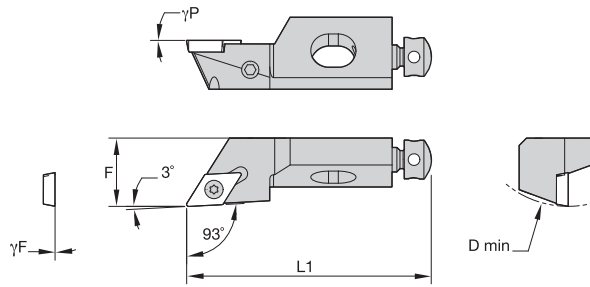
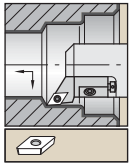
■ L-SDUP 93°



order number	catalogue number	D	D min	F	L1	L	L2	A	γF°	gage insert	insert screw	Torx
right hand												
3331116	L12QSDUPR07	12	16,0	9,0	181	181,2	22,4	4,0	-2,0	DP..070204..	MS1153	T7
3331117	L20SSDUPR11	20	25,0	13,0	251	251,5	33,6	4,0	-2,0	DP..11T308..	MS1155	T15
left hand												
3331121	L12QSDUPL07	12	16,0	9,0	181	181,2	22,4	4,0	-2,0	DP..070204..	MS1153	T7



ISO Turning



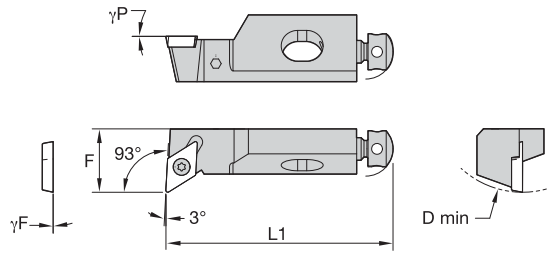
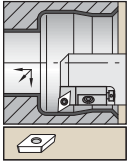
■ SDJP 93°

order number	catalogue number	D min	F	L1	γF°	γP°	gage insert
right hand							
1098757	SDJPR10CA07	40	14,0	50	0.0	0.0	DP..070204/DP..2151
left hand							
1098758	SDJPL10CA07	40	14,0	50	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
40	MS1153	T7	KUAM28	2 mm	KUAM30	191.405	4 mm	CSWM 060 050



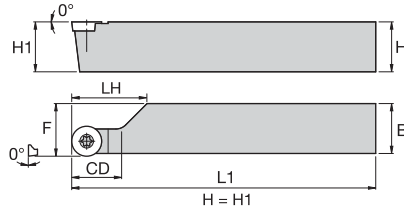
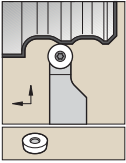
■ SDUP 93°

order number	catalogue number	D min	F	L1	γF°	γP°	gage insert
right hand 1098728	SDUPR10CA07	40	14,0	50	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
40	MS1153	T7	KUAM28	2 mm	KUAM30	191.405	4 mm	CSWM 060 050

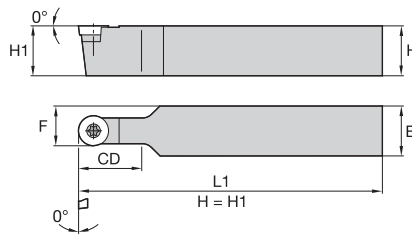
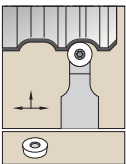


ISO Turning

■ SRAC



order number	catalogue number	H	B	F	L1	LH	CD	gage insert	insert screw	Torx
right hand										
1097887	SRACR1212N08	12	12	13,0	160	31,0	12,0	RC..0803M0	MS1154	T9
1097888	SRACR1616Q08	16	16	17,0	180	35,0	16,0	RC..0803M0	MS1154	T9



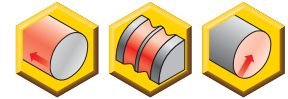
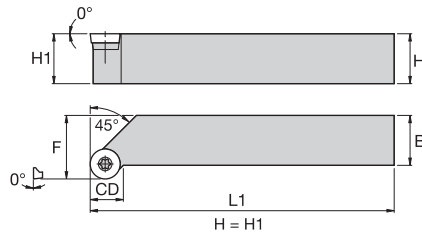
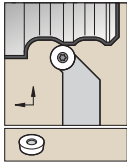
■ SRDC



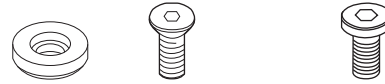
order number	catalogue number	H	B	F	L1	CD	gage insert	shim	shim screw	hex	insert screw	Torx
1097892	SRDCN1212N06	12	12	9,0	160	12,0	RC..0602M0	—	—	—	MS1153	T7
1097891	SRDCN1212N08	12	12	10,0	160	12,0	RC..0803M0	—	—	—	MS1154	T9
1097899	SRDCN1616H06	16	16	11,0	100	16,0	RC..0602M0	—	—	—	MS1153	T7
1097897	SRDCN1616H08	16	16	12,0	100	16,0	RC..0803M0	—	—	—	MS1154	T9
1097898	SRDCN1616H10	16	16	13,0	100	16,0	RC..10T3M0	SKRN100300	SRS3	3.5 mm	MS1156	T15
1097893	SRDCN1616Q08	16	16	12,0	180	16,0	RC..0803M0	—	—	—	MS1154	T9
1097900	SRDCN2020K08	20	20	14,0	125	20,0	RC..0803M0	—	—	—	MS1154	T9
1097901	SRDCN2020K10	20	20	15,0	125	20,0	RC..10T3M0	SKRN100300	SRS3	3.5 mm	MS1156	T15
1097894	SRDCN2020K12	20	20	16,0	125	20,0	RC..1204M0	SKRN1203M0	SRS3	3.5 mm	MS1156	T15
1097903	SRDCN2525M08	25	25	16,5	150	25,0	RC..0803M0	—	—	—	MS1154	T9
1097902	SRDCN2525M10	25	25	17,5	150	25,0	RC..10T3M0	SKRN100300	SRS3	3.5 mm	MS1156	T15
1097895	SRDCN2525M12	25	25	18,5	150	25,0	RC..1204M0	SKRN1203M0	SRS3	3.5 mm	MS1156	T15
1097896	SRDCN2525M16	25	25	20,5	150	25,0	RC..1605M0	SKRN160400	SRS5	4 mm	MS1160	T15



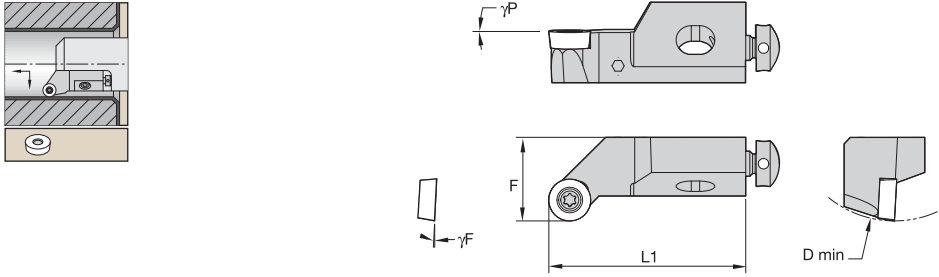
ISO Turning



■ SRGC



order number	catalogue number	H	B	F	L1	CD	gage insert	shim	shim screw	hex	insert screw	Torx
right hand												
1097792	SRGCR1616H06	16	16	20,0	100	7,0	RC..0602M0	—	—	—	MS1153	T7
1097791	SRGCR1616H10	16	16	20,0	100	7,9	RC..10T3M0	SKRN100300	SRS3	3.5 mm	MS1156	T15
1097793	SRGCR2020K08	20	20	25,0	125	9,0	RC..0803M0	—	—	—	MS1154	T9
1097794	SRGCR2020K10	20	20	25,0	125	9,3	RC..10T3M0	SKRN100300	SRS3	3.5 mm	MS1156	T15
1097796	SRGCR2525M08	25	25	32,0	150	11,8	RC..0803M0	—	—	—	MS1154	T9
1097795	SRGCR2525M10	25	25	32,0	150	12,1	RC..10T3M0	SKRN100300	SRS3	3.5 mm	MS1156	T15
1097788	SRGCR2525M12	25	25	32,0	150	12,7	RC..1204M0	SKRN1203M0	SRS3	3.5 mm	MS1156	T15
left hand												
1097937	SRGCL1616H06	16	16	20,0	100	7,0	RC..0602M0	—	—	—	MS1153	T7
1097936	SRGCL1616H10	16	16	20,0	100	7,9	RC..10T3M0	SKRN100300	SRS3	3.5 mm	MS1156	T15
1097938	SRGCL2020K08	20	20	25,0	125	9,0	RC..0803M0	—	—	—	MS1154	T9
1097941	SRGCL2525M08	25	25	32,0	150	11,8	RC..0803M0	—	—	—	MS1154	T9
1097940	SRGCL2525M10	25	25	32,0	150	12,1	RC..10T3M0	SKRN100300	SRS3	3.5 mm	MS1156	T15
1097933	SRGCL2525M12	25	25	32,0	150	12,7	RC..1204M0	SKRN1203M0	SRS3	3.5 mm	MS1156	T15



■ SRGC

order number	catalogue number	D min	F	L1	γF°	γP°	gage insert
right hand							
1098711	SRGCR08CA06	25	10,0	32	-4.0	0.0	RC..0602M0/RC..215
1098713	SRGCR12CA10	50	20,0	55	-3.0	0.0	RC..10T3M0/RC..10T3M0

■ Spare Parts



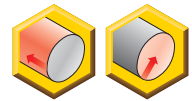
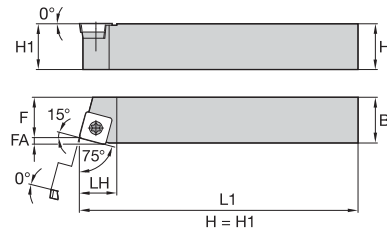
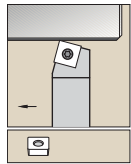
D min	insert screw	Torx	radial adjusting screw	hex	axial adjusting screw	mounting screw	mounting screw	hex	washer
25	MS1153	T7	KUAM34	1.5 mm	KUAM20	MS2175	—	2.5 mm	CSWM 040 050
50	MS1155	T15	KUAM23	2.5 mm	KUAM31	—	191.406	4 mm	CSWM 060 050

ISO Carbide Inserts

● first choice
○ alternate choice

	P	M	K	N	S	H	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KGM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10	
ISO catalogue number																																				
D																																				
L10																																				
Re																																				
RPGT060400MP																																				

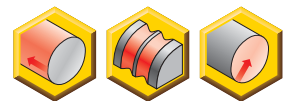
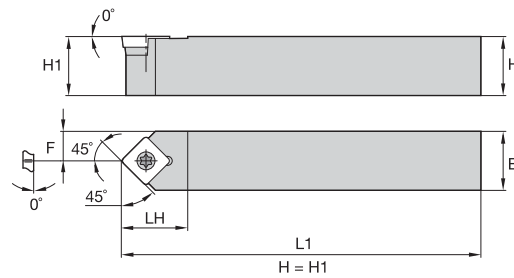
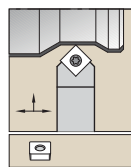
NOTE: For V-Bottom style holders, please see page B370.



■ SSBC 75°



order number	catalogue number	H	B	F	L1	LH	FA	gage insert	shim	shim screw	hex	insert screw	Torx
right hand													
1097863	SSBCR1212N09	12	12	11,0	160	16,0	2,2	SC..09T308	—	—	—	MS1155	T15
1097867	SSBCR2525M12	25	25	22,0	150	21,0	3,1	SC..120408	SKSP453	SRS4	4 mm	MS1158	T15
left hand													
1098009	SSBCL1616H09	16	16	13,0	100	16,0	2,2	SC..09T308	SKSP343	SRS3	3.5 mm	MS1156	T15



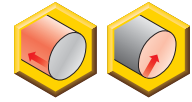
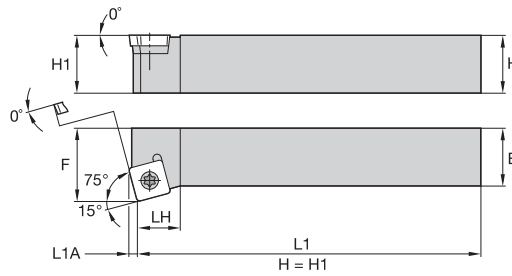
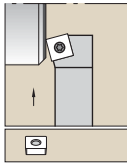
■ SSDC 45°



order number	catalogue number	H	B	F	L1	LH	gage insert	shim	shim screw	hex	insert screw	Torx
1098005	SSDCN1212N09	12	12	6,0	160	18,0	SC..09T308	—	—	—	MS1155	T15
1098006	SSDCN1616H09	16	16	8,0	100	18,0	SC..09T308	SKSP343	SRS3	3.5 mm	MS1156	T15
1098007	SSDCN2020K09	20	20	10,0	125	18,0	SC..09T308	SKSP343	SRS3	3.5 mm	MS1156	T15



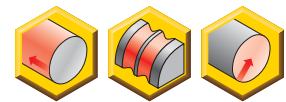
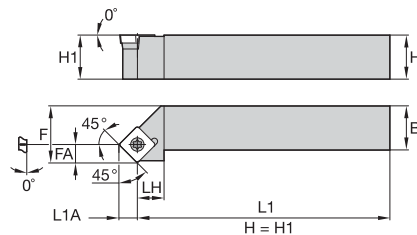
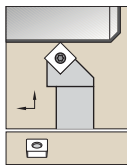
ISO Turning



■ SSKC 75°



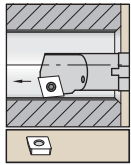
order number	catalogue number	H	B	F	L1	LH	L1A	gage insert	shim	shim screw	hex	insert screw	Torx
right hand													
1097882	SSKCR1616H09	16	16	20,0	100	16,0	2,2	SC..09T308	SKSP343	SRS3	3.5 mm	MS1156	T15
left hand													
1098027	SSKCL2020K12	20	20	25,0	125	22,0	3,1	SC..120408	SKSP453	SRS4	4 mm	MS1158	T15



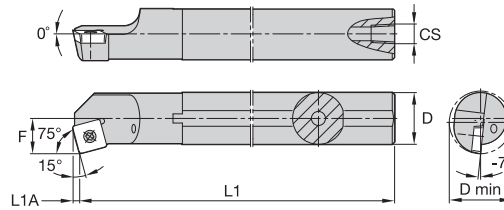
■ SSSC 45°



order number	catalogue number	H	B	F	L1	LH	FA	L1A	gage insert	shim	shim screw	hex	insert screw	Torx
right hand														
1097808	SSSCR1212N09	12	12	16,0	160	18,0	5,8	6,1	SC..09T308	—	—	—	MS1155	T15
1097809	SSSCR1616H09	16	16	20,0	100	18,0	6,1	6,1	SC..09T308	SKSP343	SRS3	3.5 mm	MS1156	T15
1097811	SSSCR1616H12	16	16	20,0	100	25,0	8,3	8,3	SC..120408	SKSP453	SRS4	4 mm	MS1158	T15
1097810	SSSCR2020K12	20	20	25,0	125	25,0	8,1	8,3	SC..120408	SKSP453	SRS4	4 mm	MS1158	T15
1244982	SSSCR2525M12	25	25	32,0	150	25,0	8,1	8,3	SC..120408	SKSP453	SRS4	4 mm	MS1158	T15
left hand														
1097953	SSSCL1212N09	12	12	16,0	160	18,0	5,8	6,1	SC..09T308	—	—	—	MS1155	T15
1097954	SSSCL1616H09	16	16	20,0	100	18,0	5,8	6,1	SC..09T308	SKSP343	SRS3	3.5 mm	MS1156	T15
1097956	SSSCL1616H12	16	16	20,0	100	25,0	8,1	8,3	SC..120408	SKSP453	SRS4	4 mm	MS1158	T15
1097955	SSSCL2020K12	20	20	25,0	125	25,0	8,1	8,3	SC..120408	SKSP453	SRS4	4 mm	MS1158	T15
1514473	SSSCL2525M12	25	25	32,0	150	25,0	8,1	8,3	SC..120408	SKSP453	SRS4	4 mm	MS1158	T15



Steel shank with through coolant.



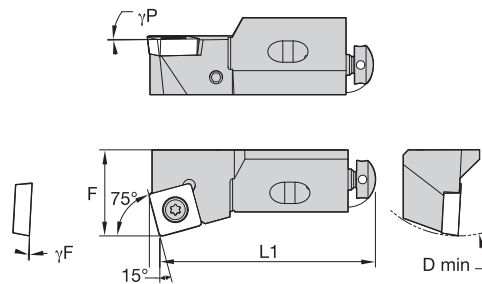
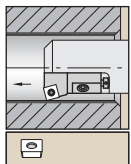
ISO Turning

■ A-SSKC 75°



order number	catalogue number	D	D min	F	L1	L1A	CS	gage insert	insert screw	Torx
right hand										
1886510	A16RSSKCR09	16	20,0	11,0	200	2,2	1/8-27 NPT	SC..09T308	MS1155	T15

Screw-On Cartridges



■ SSKC 75°

order number	catalogue number	D min	F	L1	γF°	γP°	gage insert
right hand							
1098719	SSKCR12CA12	50	20,0	55	-3.0	0.0	SC..120408/SC..432
1098720	SSKCR16CA12	60	25,0	63	-3.0	0.0	SC..120408/SC..432
left hand							
1098721	SSKCL12CA12	50	20,0	55	-3.0	0.0	SC..120408/SC..432

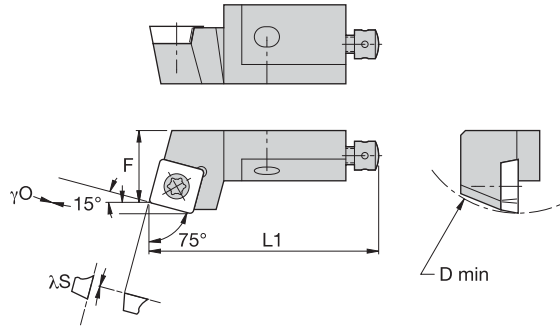
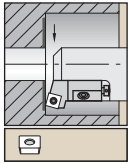
■ Spare Parts



D min	insert screw	Torx	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
50	MS1157	T15	KUAM23	2.5 mm	KUAM31	191.406	4 mm	CSWM 060 050
60	MS1157	T15	KUAM25	2.5 mm	KUAM32	191.407	5 mm	CSWM 080 050



ISO Turning



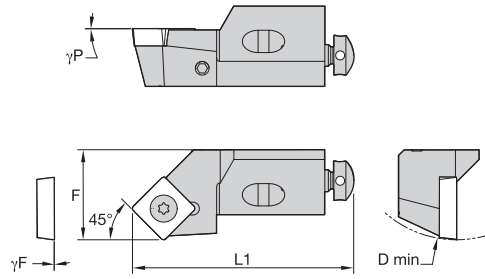
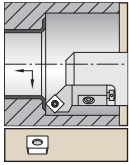
■ SSRC 75°

order number	catalogue number	D min	F	L1	λS°	γO°	gage insert
right hand							
1098723	SSRCR12CA12	50	20,0	55	-3.0	0.0	SC..120408/SC..432
left hand							
1098725	SSRCL12CA12	50	20,0	55	-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
50	MS1157	T15	KUAM23	2.5 mm	KUAM31	191.406	4 mm	CSWM 060 050



■ SSSC 45°

order number	catalogue number	D min	F	L1	γ_F°	γ_P°	gage insert
right hand							
1098737	SSSCR12CA12	50	20,0	47	-3.0	0.0	SC..120408/SC..432
left hand							
1098739	SSSCL12CA12	50	20,0	47	-3.0	0.0	SC..120408/SC..432

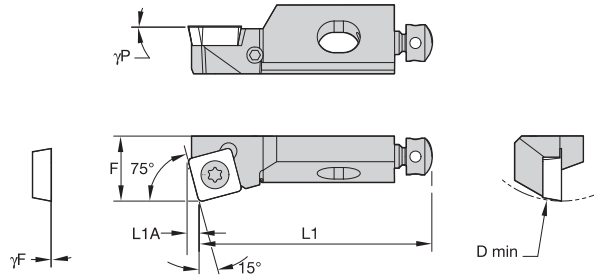
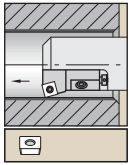
■ Spare Parts



D min	insert screw	Torx	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
50	MS1157	T15	KUAM23	2.5 mm	KUAM31	191.406	4 mm	CSWM 060 050



ISO Turning



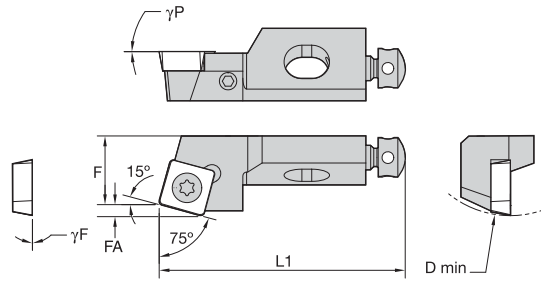
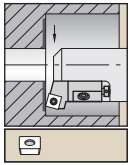
■ SSKP 75°

order number	catalogue number	D min	F	L1	λS°	γF°	γP°	gage insert
right hand								
1098570	SSKPR10CA09	40	14,0	50	0.0	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
40	MS1155	T15	KUAM28	2 mm	KUAM30	191.405	4 mm	CSWM 060 050



■ SSRP 75°

order number	catalogue number	D min	F	FA	L1	γF°	γP°	gage insert
right hand 1098574	SSRPR10CA09	40	14,0	2,2	50	0.0	0.0	SP..09T308/SP..3252

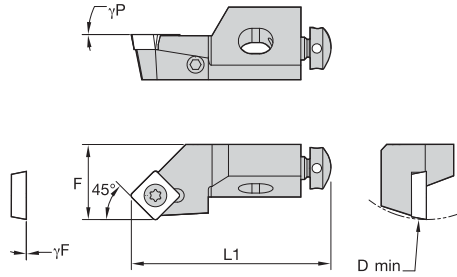
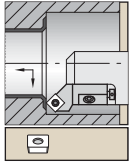
■ Spare Parts



D min	insert screw	Torx	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
40	MS1155	T15	KUAM28	2 mm	KUAM30	191.405	4 mm	CSWM 060 050



ISO Turning



SSSP 45°

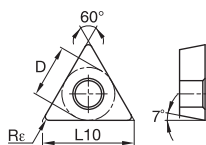
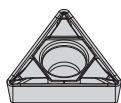
order number	catalogue number	D min	F	L1	γF°	γP°	gage insert
right hand							
1098572	SSSPR10CA09	40	14,0	44	0.0	0.0	SP..09T308/SP..3252
left hand							
1098764	SSSPL10CA09	40	14,0	44	0.0	0.0	SP..09T308/SP..3252

Spare Parts



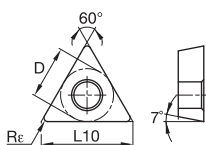
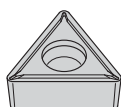
D min	insert screw	Torx	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
40	MS1155	T15	KUAM28	2 mm	KUAM30	191.405	4 mm	CSWM 060 050

ISO Turning



■ TCMT-FP

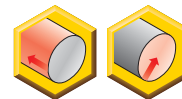
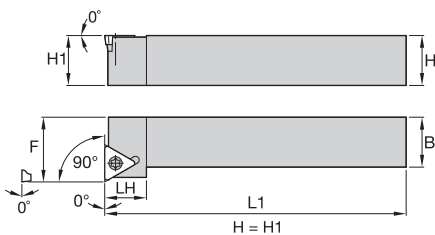
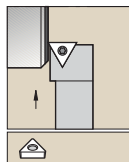
ISO catalogue number	D	L10	Rε
TCMT090204FP	5,56	9,63	0,4
TCMT090208FP	5,56	9,63	0,8
TCMT110202FP	6,35	11,00	0,2
TCMT110204FP	6,35	11,00	0,4
TCMT110304FP	6,35	11,00	0,4
TCMT110208FP	6,35	11,00	0,8
TCMT110308FP	6,35	11,00	0,8
TCMT110312FP	6,35	11,00	1,2
TCMT16T304FP	9,53	16,50	0,4
TCMT16T308FP	9,53	16,50	0,8
TCMT16T312FP	9,53	16,50	1,2
TCMT220408FP	12,70	22,00	0,8



■ TCMT-LF

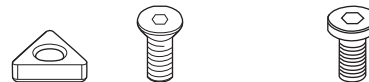
ISO catalogue number	D	L10	Rε
TCMT110202LF	6,35	11,00	0,2
TCMT110204LF	6,35	11,00	0,4
TCMT110208LF	6,35	11,00	0,8
TCMT16T302LF	9,53	16,50	0,2
TCMT16T304LF	9,53	16,50	0,4
TCMT16T308LF	9,53	16,50	0,8
TCMT16T312LF	9,53	16,50	1,2
TCMT220408LF	12,70	22,00	0,8

	P	M	K	N	S	H	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10	
TCMT090204FP	●	●	●	●	●	○	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TCMT090208FP	●	●	●	●	●	○	-	-	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TCMT110202FP	●	●	●	●	●	○	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	●
TCMT110204FP	●	●	●	●	●	○	-	-	●	-	●	-	-	-	-	-	-	●	-	-	-	-	●	-	-	-	-	-	-	-	-	-	-	-	-	●
TCMT110304FP	●	●	●	●	●	○	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TCMT110208FP	●	●	●	●	●	○	-	-	-	●	-	-	-	-	-	-	-	-	-	-	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TCMT110308FP	●	●	●	●	●	○	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TCMT110312FP	●	●	●	●	●	○	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TCMT16T304FP	●	●	●	●	●	○	-	-	●	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TCMT16T308FP	●	●	●	●	●	○	-	-	●	-	●	-	-	-	-	-	-	-	-	-	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	●
TCMT16T312FP	●	●	●	●	●	○	-	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TCMT220408FP	●	●	●	●	●	○	●	-	-	-	●	-	-	-	-	-	-	-	-	-	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-

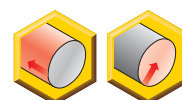
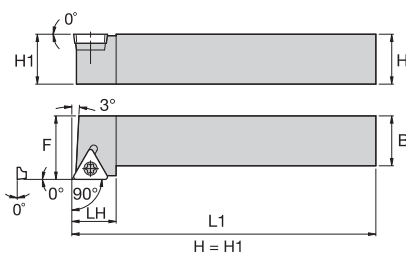
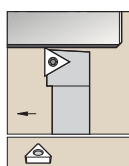


ISO Turning

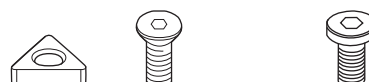
■ STFC 90°



order number	catalogue number	H	B	F	L1	LH	gage insert	shim	shim screw	hex	insert screw	Torx
right hand												
1244940	STFCR1616H11	16	16	20,0	100	16,0	TC..110204	—	—	—	MS1153	T7
1097880	STFCR1616H16	16	16	20,0	100	20,0	TC..16T308	SKTP343	SRS3	3.5 mm	MS1156	T15
1097877	STFCR2020K16	20	20	25,0	125	20,0	TC..16T308	SKTP343	SRS3	3.5 mm	MS1156	T15
1097878	STFCR2525M16	25	25	32,0	150	20,0	TC..16T308	SKTP343	SRS3	3.5 mm	MS1156	T15
left hand												
1098022	STFCL2020K16	20	20	25,0	125	20,0	TC..16T308	SKTP343	SRS3	3.5 mm	MS1156	T15
1098023	STFCL2525M16	25	25	32,0	150	20,0	TC..16T308	SKTP343	SRS3	3.5 mm	MS1156	T15



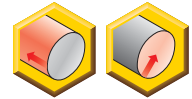
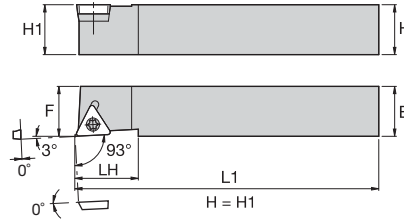
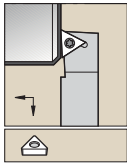
■ STGC 90°



order number	catalogue number	H	B	F	L1	LH	gage insert	shim	shim screw	hex	insert screw	Torx
right hand												
1097869	STGCR1212N11	12	12	16,0	160	16,0	TC..110204	—	—	—	MS1153	T7
1244944	STGCR1616H11	16	16	20,0	100	16,0	TC..110204	—	—	—	MS1153	T7
1097874	STGCR1616H16	16	16	20,0	100	20,0	TC..16T308	SKTP343	SRS3	3.5 mm	MS1156	T15
1097870	STGCR2020K16	20	20	25,0	125	20,0	TC..16T308	SKTP343	SRS3	3.5 mm	MS1156	T15
1097871	STGCR2525M16	25	25	32,0	150	20,0	TC..16T308	SKTP343	SRS3	3.5 mm	MS1156	T15
left hand												
1098014	STGCL1212N11	12	12	16,0	160	16,0	TC..110204	—	—	—	MS1153	T7
1244943	STGCL1616H11	16	16	20,0	100	16,0	TC..110204	—	—	—	MS1153	T7
1098019	STGCL1616H16	16	16	20,0	100	20,0	TC..16T308	SKTP343	SRS3	3.5 mm	MS1156	T15
1098015	STGCL2020K16	20	20	25,0	125	20,0	TC..16T308	SKTP343	SRS3	3.5 mm	MS1156	T15
1098016	STGCL2525M16	25	25	32,0	150	20,0	TC..16T308	SKTP343	SRS3	3.5 mm	MS1156	T15



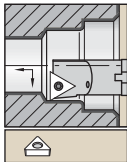
ISO Turning



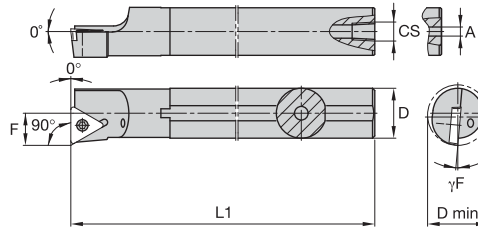
STJC-F 90°



order number	catalogue number	H	B	F	L1	LH	gage insert	insert screw	Torx
right hand									
1772197	STJCRF1212M11Q	12	12	12,0	150	16,0	TC..110204	MS1153	T7
left hand									
1772198	STJCLF1212M11Q	12	12	12,0	150	16,0	TC..110204	MS1153	T7



Steel shank with through coolant.

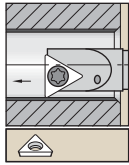


A-STFC 90°

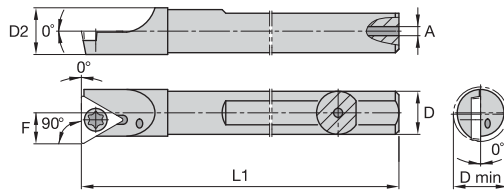


order number	catalogue number	D	D min	F	L1	A	CS	γF°	gage insert	shim	shim screw	hex	insert screw	Torx
right hand														
1098207	A10KSTFCR11	10	13,0	7,0	125	3,2	—	-7.0	TC..110204	—	—	—	MS1153	T7
1098211	A12MSTFCR11	12	16,0	9,0	150	—	1/16-27 NPT	-6.0	TC..110204	—	—	—	MS1153	T7
1098286	A32TSTFCR16	32	40,0	22,0	300	—	1/4-18 NPT	-2.0	TC..16T308	SKTP343	SRS3	3.5 mm	MS1156	T15
left hand														
1098209	A10KSTFCL11	10	13,0	7,0	125	3,2	—	-7.0	TC..110204	—	—	—	MS1153	T7
1098213	A12MSTFCL11	12	16,0	9,0	150	—	1/16-27 NPT	-6.0	TC..110204	—	—	—	MS1153	T7

ISO Turning



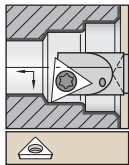
Steel shank with through coolant.



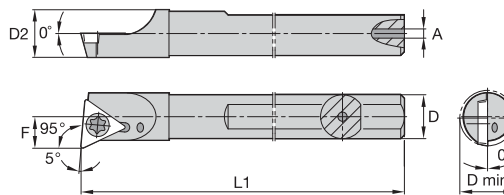
■ A-STFD 90°



order number	catalogue number	D	D min	D2	F	L1	A	gage insert	insert screw	Torx
right hand										
1288884	A06HSTFDR07	6	7,1	6,2	3,7	100	1,0	TD..07S102	FC11	T7
1288898	A08HSTFDR07	8	9,1	8,2	4,8	102	1,5	TD..07S102	FC14	T7
left hand										
1930573	A12MSTFDL11	12	13,2	12,2	6,8	152	3,0	TP..110202	QC26	T9



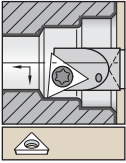
Steel shank with through coolant.



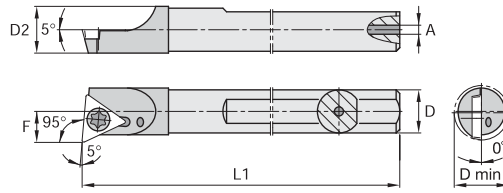
■ A-STLD 95°



order number	catalogue number	D	D min	D2	F	L1	A	gage insert	insert screw	Torx
right hand										
1288886	A06HSTLDR07	6	7,1	6,2	3,7	100	1,0	TD..07S102	FC11	T7
1288900	A08HSTLDR07	8	9,1	8,2	4,8	102	1,5	TD..07S102	FC14	T7



Carbide shank with through coolant.

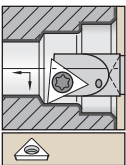


ISO Turning

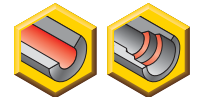
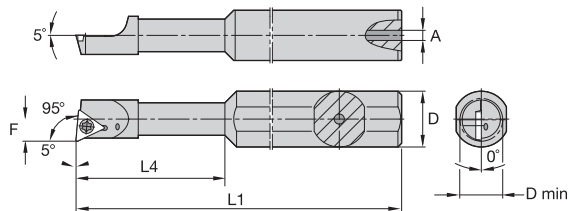
■ E-STLD 95°



order number	catalogue number	D	D min	F	L1	A	gage insert	insert screw	Torx
right hand									
1270982	E06MSTLDR07	6	7,1	3,7	152	1,2	TD..07S102	FC11	T7
1270992	E08MSTLDR07	8	9,2	4,8	152	2,4	TD..07S102	FC11	T7
left hand									
1270981	E06MSTLDL07	6	7,1	3,7	152	1,2	TD..130805	FC11	T7
1270991	E08MSTLDL07	8	9,1	4,8	152	2,4	TD..07S102	FC14	T7



Necked steel shank with through coolant.



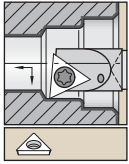
■ A-STLD 95° • Stepped



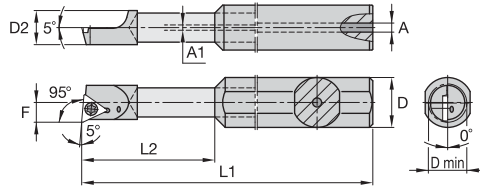
order number	catalogue number	D	D min	F	L1	L4	A	gage insert	insert screw	Torx
right hand										
1289155	A0612XSTLDR0731	12	7,5	4,0	76	31,75	1,0	TD..07T1202	FC11	T7
left hand										
1930492	A0616HSTLDR0731	16	7,5	4,0	102	31,75	1,0	TD..07S102	FC14	T7



ISO Turning



Necked carbide shank with through coolant.

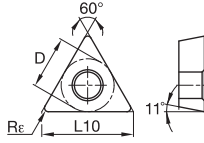
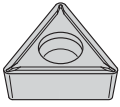


■ E-STLD 95° • Stepped



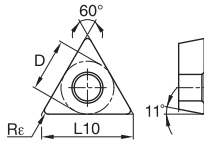
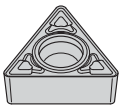
order number	catalogue number	D	D min	D2	F	L1	L2	A	A1	gage insert	insert screw	Torx
right hand												
1930512	E0812XSTLDR0738	12	9,1	7,9	4,8	76	38,1	3,2	2,0	TD..07S102	FC14	T7

● first choice
○ alternate choice



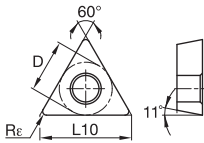
TPMT-LF

ISO catalogue number	D	L10	Re
TPMT090202LF	5,56	9,63	0,2
TPMT090204LF	5,56	9,63	0,4
TPMT110202LF	6,35	11,00	0,2
TPMT110204LF	6,35	11,00	0,4
TPMT110208LF	6,35	11,00	0,8
TPMT16T304LF	9,53	16,50	0,4
TPMT16T308LF	9,53	16,50	0,8
TPMT220408LF	12,70	22,00	0,8



TPMT-MF

ISO catalogue number	D	L10	Re
TPMT110208MF	6,35	11,00	0,8
TPMT16T308MF	9,53	16,50	0,8
TPMT16T312MF	9,53	16,50	1,2

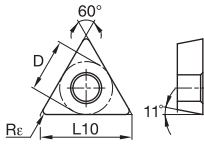
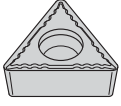


TPMT-MP

ISO catalogue number	D	L10	Re
TPMT110208MP	6,35	11,00	0,8
TPMT16T308MP	9,53	16,50	0,8
TPMT16T312MP	9,53	16,50	1,2

	P	M	K	N	S	H	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KGM15B	KGM15	KGM25B	KGM25	KCM35	KU10	K313	K68	KCS10	KGU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10		
TPMT090202LF	●	●	○	○	○	○																															
TPMT090204LF	●	●	○	○	○	○																															
TPMT110202LF	●	●	○	○	○	○																															
TPMT110204LF	●	●	○	○	○	○																															
TPMT110208LF	●	●	○	○	○	○																															
TPMT16T304LF	●	●	○	○	○	○																															
TPMT16T308LF	●	●	○	○	○	○																															
TPMT220408LF	●	●	○	○	○	○																															
TPMT110208MF	●	●	○	○	○	○																															
TPMT16T308MF	●	●	○	○	○	○																															
TPMT16T312MF	●	●	○	○	○	○																															
TPMT110208MP	●	●	○	○	○	○																															
TPMT16T308MP	●	●	○	○	○	○																															
TPMT16T312MP	●	●	○	○	○	○																															

ISO Turning

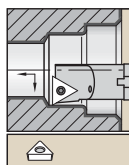


- first choice
- alternate choice

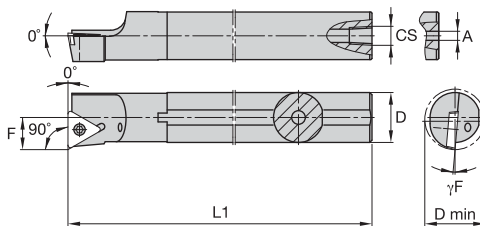
■ TPMT-UF

ISO catalogue number	D	L10	R _e
TPMT110202UF	6,35	11,00	0,2
TPMT110204UF	6,35	11,00	0,4
TPMT16T308UF	9,53	16,50	0,8

	P	M	K	N	S	H	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10	
P	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
M	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
K	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
N	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
S	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
H	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



Steel shank with through coolant.



ISO Turning

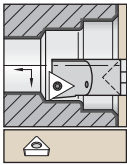
■ A-STFP 90°



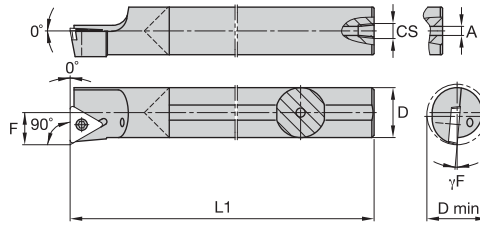
order number	catalogue number	D	D min	F	L1	A	CS	γF°	gage insert	shim	shim screw	hex	insert screw	Torx
right hand														
1098154	A08JSTFPR09	8	11,0	6,0	110	2,4	—	-8.0	TP..090204	—	—	—	MS1933	T7
1098204	A10KSTFPR11	10	13,0	7,0	125	3,2	—	-4.0	TP..110204	—	—	—	MS1153	T7
1098210	A12MSTFPR11	12	16,0	9,0	150	4,0	1/16-27 NPT	-2.0	TP..110204	—	—	—	MS1153	T7
1098214	A16RSTFPR11	16	20,0	11,0	200	4,0	1/8-27 NPT	0.0	TP..110204	—	—	—	MS1153	T7
1098255	A20SSTFPR16	20	25,0	13,0	250	4,0	1/8-27 NPT	-2.0	TP..16T308	—	—	—	MS1155	T15
1098273	A25TSTFPR16	25	32,0	17,0	300	6,4	1/4-18 NPT	0.0	TP..16T308	—	—	—	MS1155	T15
1098285	A32TSTFPR16	32	40,0	22,0	300	—	1/4-18 NPT	-2.0	TP..16T308	SKTP343	SRS3	3.5 mm	MS1156	T15
left hand														
1098155	A08JSTFPL09	8	11,0	6,0	110	2,4	—	-8.0	TP..090204	—	—	—	MS1933	T7
1098208	A10KSTFPL11	10	13,0	7,0	125	3,2	—	-4.0	TP..110204	—	—	—	MS1153	T7
1098212	A12MSTFPL11	12	16,0	9,0	150	4,0	1/16-27 NPT	-2.0	TP..110204	—	—	—	MS1153	T7
1098215	A16RSTFPL11	16	20,0	11,0	200	4,0	1/8-27 NPT	0.0	TP..110204	—	—	—	MS1153	T7
1098256	A20SSTFPL16	20	25,0	13,0	250	4,0	1/8-27 NPT	-2.0	TP..16T308	—	—	—	MS1155	T15
1098276	A25TSTFPL16	25	32,0	17,0	300	6,4	1/4-18 NPT	0.0	TP..16T308	—	—	—	MS1155	T15



ISO Turning



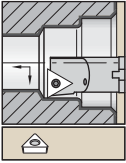
Carbide shank with through coolant.



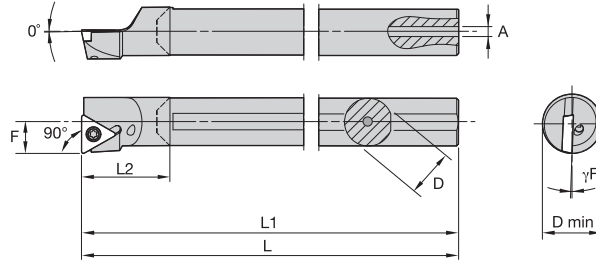
■ E-STFP 90°



order number	catalogue number	D	D min	F	L1	A	γF°	gage insert	insert screw	Torx
right hand										
1152860	E08KSTFPR09A	8	11,0	6,0	125	2,4	-6.0	TP..090204	MS1933	T7
1152862	E10MSTFPR11A	10	13,0	7,0	150	3,2	-4.0	TP..110204	MS1153	T7
1104311	E12QSTFPR11	12	16,0	9,0	180	4,8	-2.0	TP..110204	MS1153	T7
1152874	E16RSTFPR11	16	20,0	11,0	200	5,5	0.0	TP..110204	MS1153	T7
1152908	E20SSTFPR16	20	25,0	13,0	250	7,1	-2.0	TP..16T308	MS1155	T15
left hand										
1152863	E10MSTFPL11A	10	13,0	7,0	150	3,2	-4.0	TP..110204	MS1153	T7
1152873	E12QSTFPL11	12	16,0	9,0	180	4,8	-2.0	TP..110204	MS1153	T7
1152875	E16RSTFPL11	16	20,0	11,0	200	5,5	0.0	TP..110204	MS1153	T7
1152909	E20SSTFPL16	20	25,0	13,0	250	7,1	-2.0	TP..16T308	MS1155	T15



Heavy-metal bar with through coolant.

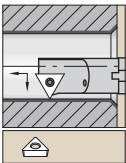


ISO Turning

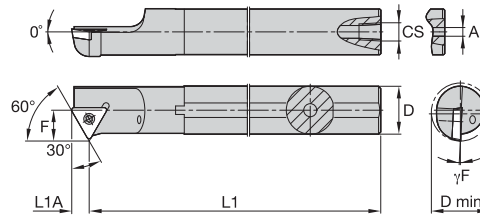
■ L-STFP 90°



order number	catalogue number	D	D min	F	L1	L2	A	γF°	gage insert	insert screw	Torx
right hand											
3331128	L08KSTFPR09	8	11,0	6,0	125	19,1	2,4	-6,0	TP..090204..	MS1933	T7
3331123	L12QSTFPR11	12	16,0	9,0	183	24,4	4,0	-2,0	TP..110204..	MS1153	T7
left hand											
3331131	L08KSTFPL09	8	11,0	6,0	125	19,1	2,4	-6,0	TP..090204..	MS1933	T7



Steel shank with through coolant.



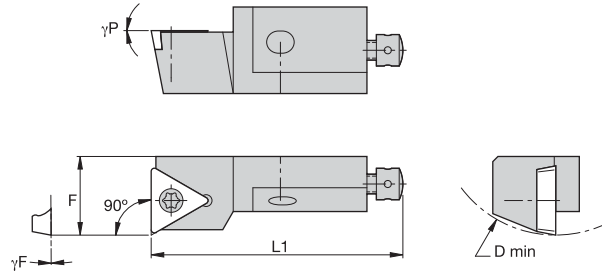
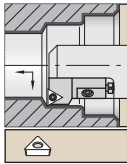
■ A-STWP 60°



order number	catalogue number	D	D min	F	L1	L1A	A	CS	γF°	gage insert	insert screw	Torx
right hand												
1098205	A10KSTWPR11	10	13,0	7,0	125	5,0	3,2	—	-4,0	TP..110204	MS1153	T7
1098216	A12MSTWPR11	12	16,0	9,0	150	—	4,0	1/16-27 NPT	-2,0	TP..110204	MS1153	T7
1098218	A16RSTWPR11	16	20,0	11,0	200	—	4,0	1/8-27 NPT	-2,0	TP..110204	MS1153	T7
left hand												
1098206	A10KSTWPL11	10	13,0	7,0	125	—	3,2	—	-4,0	TP..110204	MS1153	T7



ISO Turning



STFP 90°

order number	catalogue number	D min	F	L1	γF°	γP°	gage insert
right hand							
1098565	STFPR08CA09	25	10,0	32	0.0	0.0	TP..090204/TP..18151
1098563	STFPR10CA11	40	14,0	50	0.0	0.0	TP..110204/TP..2151
1098562	STFPR12CA16	50	20,0	55	0.0	0.0	TP..16T308/TP..3252
left hand							
1098561	STFPL08CA09	25	10,0	32	0.0	0.0	TP..090204/TP..18151
1098559	STFPL10CA11	40	14,0	50	0.0	0.0	TP..110204/TP..2151
1098558	STFPL12CA16	50	20,0	55	0.0	0.0	TP..16T308/TP..3252

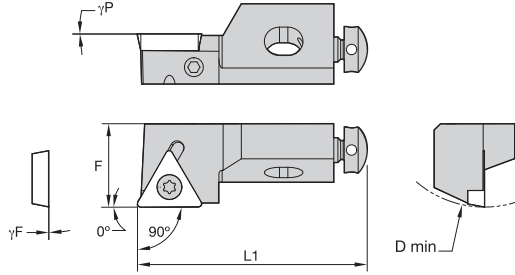
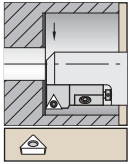
NOTE: ANSI/ISO compatible 60° countersunk hole inserts. This tool also accepts TPGM/TPGT/TPGW-21.5_ inserts.

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.

Spare Parts



D min	insert screw	Torx	radial adjusting screw	hex	axial adjusting screw	mounting screw	mounting screw	hex	washer
25	MS1152	T7	KUAM34	1.5 mm	KUAM20	MS2175	—	2.5 mm	CSWM 040 050
40	MS1153	T7	KUAM28	2 mm	KUAM30	191.405	—	4 mm	CSWM 060 050
50	MS1155	T15	KUAM23	2.5 mm	KUAM31	—	191.406	4 mm	CSWM 060 050



■ **STGP 90°**

order number	catalogue number	D min	F	L1	γ^F °	γ^P °	gage insert
right hand							
1098567	STGPR10CA11	40	14,0	50	0.0	0.0	TP..110204/TP..2151
1098566	STGPR12CA16	50	20,0	55	0.0	0.0	TP..16T308/TP..3252
left hand							
1098762	STGPL08CA09	25	10,0	32	0.0	0.0	TP..090204/TP..18151
1098760	STGPL10CA11	40	14,0	50	0.0	0.0	TP..110204/TP..2151

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.

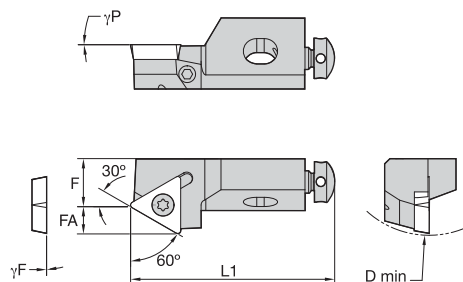
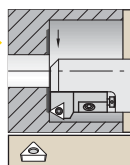
■ **Spare Parts**



D min	insert screw	Torx	radial adjusting screw	hex	axial adjusting screw	mounting screw	mounting screw	hex	washer
25	MS1152	T7	KUAM34	1.5 mm	KUAM20	MS2175	—	2.5 mm	CSWM 040 050
40	MS1153	T7	KUAM28	2 mm	KUAM30	191.405	—	4 mm	CSWM 060 050
50	MS1155	T15	KUAM23	2.5 mm	KUAM31	—	191.406	4 mm	CSWM 060 050



ISO Turning

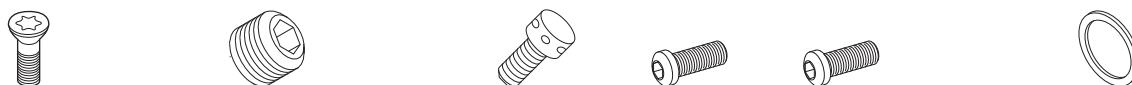


■ STTP 60°

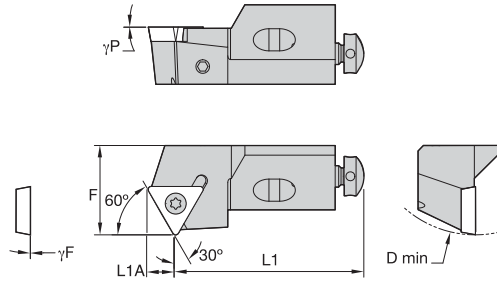
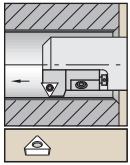
order number	catalogue number	D min	F	L1	γF°	γP°	gage insert
right hand							
1098744	STTPR08CA09	25	6,0	32	0.0	0.0	TP..090204/TP..18151
1098742	STTPR10CA11	40	9,0	50	0.0	0.0	TP..110204/TP..2151
1098741	STTPR12CA16	50	13,0	55	0.0	0.0	TP..16T308/TP..3252

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

■ Spare Parts



D min	insert screw	Torx	radial adjusting screw	hex	axial adjusting screw	mounting screw	mounting screw	hex	washer
25	MS1152	T7	KUAM34	1.5 mm	KUAM20	MS2175	—	2.5 mm	CSWM 040 050
40	MS1153	T7	KUAM28	2 mm	KUAM30	191.405	—	4 mm	CSWM 060 050
50	MS1155	T15	KUAM23	2.5 mm	KUAM31	—	191.406	4 mm	CSWM 060 050



■ STWP 60°

order number	catalogue number	D min	F	L1	γF°	γP°	gage insert
right hand							
1098750	STWPR10CA11	40	14,0	44	0.0	0.0	TP..110204/TP..2151
1098749	STWPR12CA16	50	20,0	47	0.0	0.0	TP..16T308/TP..3252

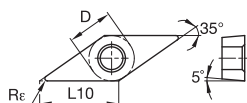
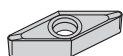
NOTE: ANSI/ISO compatible 60° countersunk hole inserts.
This tool also accepts TPGM/TPGT/TPGW-21.5_ inserts.

■ Spare Parts



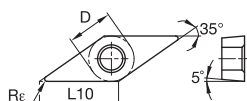
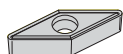
D min	insert screw	Torx	radial adjusting screw	hex	axial adjusting screw	mounting screw	mounting screw	hex	washer
40	MS1153	T7	KUAM28	2 mm	KUAM30	191.405	—	4 mm	CSWM 060 050
50	MS1155	T15	KUAM23	2.5 mm	KUAM31	—	191.406	4 mm	CSWM 060 050

ISO Turning



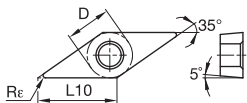
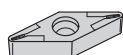
■ VBGT-HP

ISO catalogue number	D	L10	Re
VBGT110302HP	6,35	11,07	0,2
VBGT110304HP	6,35	11,07	0,4
VBGT160404HP	9,53	16,61	0,4
VBGT160408HP	9,53	16,61	0,8



■ VBGT-LF

ISO catalogue number	D	L10	Re
VBGT1103X0LF	6,35	11,07	0,0
VBGT110301LF	6,35	11,07	0,1
VBGT110302LF	6,35	11,07	0,2
VBGT110304LF	6,35	11,07	0,4
VBGT1604X0LF	9,53	16,61	0,0
VBGT160401LF	9,53	16,61	0,1
VBGT160402LF	9,53	16,61	0,2
VBGT160404LF	9,53	16,61	0,4



■ VBMT-11

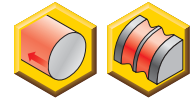
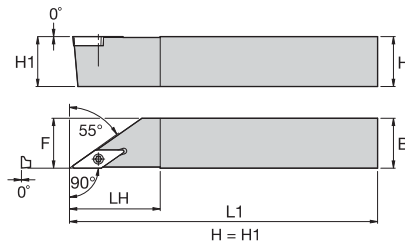
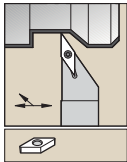
ISO catalogue number	D	L10	Re
VBMT11030211	6,35	11,07	0,2
VBMT11030411	6,35	11,07	0,4
VBMT16040411	9,53	16,61	0,4
VBMT16040811	9,53	16,61	0,8

P	M	K	N	S	H	KCP05	KCP10B	KCP10	KCP25B	KCP25	KCP30	KCP40	KCK05B	KCK05	KCK15B	KCK15	KCK20B	KCK20	KCM15B	KCM15	KCM25B	KCM25	KCM35	KU10	K313	K68	KCS10	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KTP10		
●	●	○				●	●	●	●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
○		○																																		

● first choice
○ alternate choice



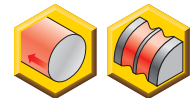
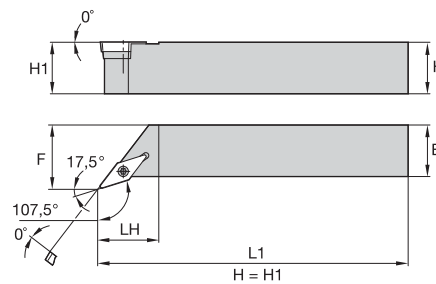
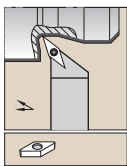
ISO Turning



SVAB 90°



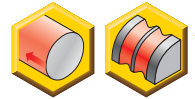
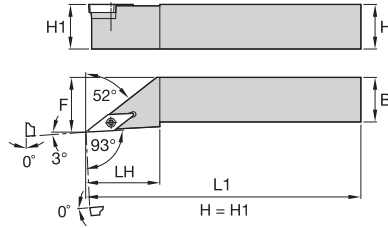
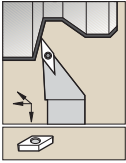
order number	catalogue number	H	B	F	L1	LH	gage insert	insert screw	Torx
right hand									
1097722	SVABR1010M11Q	10	10	10,0	150	22,0	VB..110304	MS1153	T7
1097724	SVABR1212M11Q	12	12	12,0	150	22,0	VB..110304	MS1153	T7
1097726	SVABR1616K16Q	16	16	16,0	125	30,0	VB..160408	MS1155	T15
left hand									
1097725	SVABL1212M11Q	12	12	12,0	150	22,0	VB..110304	MS1153	T7
1097727	SVABL1616K16Q	16	16	16,0	125	30,0	VB..160408	MS1155	T15



SVHB 107,5°



order number	catalogue number	H	B	F	L1	LH	gage insert	shim	shim screw	hex	insert screw	Torx
right hand												
1097804	SVHBR1212N11	12	12	16,0	160	19,0	VB..110304	—	—	—	MS1153	T7
1097805	SVHBR1616H11	16	16	20,0	100	19,0	VB..110304	—	—	—	MS1153	T7
1244953	SVHBR2020K11	20	20	25,0	125	26,0	VB..110304	—	—	—	MS1153	T7
1097806	SVHBR2020K16	20	20	25,0	125	28,0	VB..160408	SKVN343	SRS3	3.5 mm	MS1156	T15
1097807	SVHBR2525M16	25	25	32,0	150	28,0	VB..160408	SKVN343	SRS3	3.5 mm	MS1156	T15
left hand												
1097949	SVHBL1212N11	12	12	16,0	160	19,0	VB..110304	—	—	—	MS1153	T7
1097950	SVHBL1616H11	16	16	20,0	100	19,0	VB..110304	—	—	—	MS1153	T7
1244949	SVHBL2020K11	20	20	25,0	125	26,0	VB..110304	—	—	—	MS1153	T7
1097951	SVHBL2020K16	20	20	25,0	125	28,0	VB..160408	SKVN343	SRS3	3.5 mm	MS1156	T15
1097952	SVHBL2525M16	25	25	32,0	150	28,0	VB..160408	SKVN343	SRS3	3.5 mm	MS1156	T15

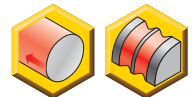
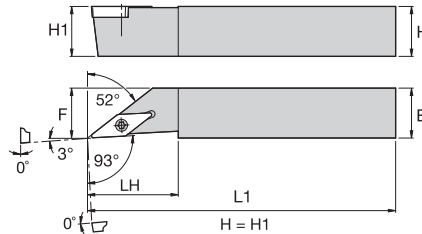
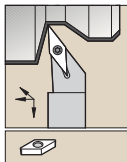


ISO Turning

■ SVJB 93°



order number	catalogue number	H	B	F	L1	LH	gage insert	shim	shim screw	hex	insert screw	Torx
right hand												
1097800	SVJBR1212N11	12	12	16,0	160	22,0	VB..110304	—	—	—	MS1153	T7
1097801	SVJBR1616H11	16	16	20,0	100	22,0	VB..110304	—	—	—	MS1153	T7
1244959	SVJBR1616H16	16	16	20,0	100	35,0	VB..160408	SKVN343	SRS3	3.5 mm	MS1156	T15
1252235	SVJBR2020K11	20	20	25,0	125	26,0	VB..110304	—	—	—	MS1153	T7
1097802	SVJBR2020K16	20	20	25,0	125	35,0	VB..160408	SKVN343	SRS3	3.5 mm	MS1156	T15
1097803	SVJBR2525M16	25	25	32,0	150	35,0	VB..160408	SKVN343	SRS3	3.5 mm	MS1156	T15
1244992	SVJBR3225P16	32	25	32,0	170	35,0	VB..160408	SKVN343	SRS3	3.5 mm	MS1156	T15
left hand												
1097945	SVJBL1212N11	12	12	16,0	160	22,0	VB..110304	—	—	—	MS1153	T7
1097946	SVJBL1616H11	16	16	20,0	100	22,0	VB..110304	—	—	—	MS1153	T7
1244957	SVJBL1616H16	16	16	20,0	100	35,0	VB..160408	SKVN343	SRS3	3.5 mm	MS1156	T15
1252234	SVJBL2020K11	20	20	25,0	125	26,0	VB..110304	—	—	—	MS1153	T7
1097947	SVJBL2020K16	20	20	25,0	125	35,0	VB..160408	SKVN343	SRS3	3.5 mm	MS1156	T15
1097948	SVJBL2525M16	25	25	32,0	150	35,0	VB..160408	SKVN343	SRS3	3.5 mm	MS1156	T15
1192560	SVJBL3225P16	32	25	32,0	170	35,0	VB..160408	SKVN343	SRS3	3.5 mm	MS1156	T15

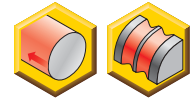
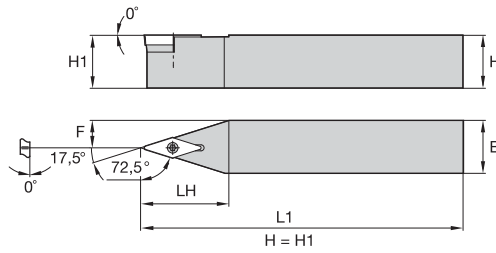
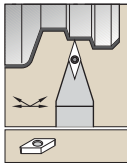


■ SVJB-F 93°



order number	catalogue number	H	B	F	L1	LH	gage insert	insert screw	Torx
right hand									
1097797	SVJBRF1010M11Q	10	10	10,0	150	23,0	VB..110304	MS1153	T7
1097798	SVJBRF1212M11Q	12	12	12,0	150	23,0	VB..110304	MS1153	T7
1097799	SVJBRF1616K16Q	16	16	16,0	125	31,0	VB..160408	MS1155	T15
left hand									
1097942	SVJBLF1010M11Q	10	10	10,0	150	23,0	VB..110304	MS1153	T7
1097943	SVJBLF1212M11Q	12	12	12,0	150	23,0	VB..110304	MS1153	T7
1097944	SVJBLF1616K16Q	16	16	16,0	125	31,0	VB..160408	MS1155	T15

ISO Turning

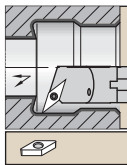


SVB 72,5°

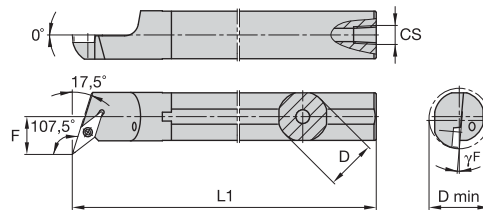


order number	catalogue number	H	B	F	L1	LH	gage insert	shim	shim screw	hex	insert screw	Torx
1097990	SVBN1212N11	12	12	6,0	160	26,0	VB..110304	—	—	—	MS1153	T7
1097991	SVBN1616H11	16	16	8,0	100	26,0	VB..110304	—	—	—	MS1153	T7
1244961	SVBN1616H16	16	16	8,0	100	33,0	VB..160408	SKVN343	SRS3	3.5 mm	MS1156	T15
1244962	SVBN2020K11	20	20	10,0	125	26,0	VB..110304	—	—	—	MS1153	T7
1097992	SVBN2020K16	20	20	10,0	125	33,0	VB..160408	SKVN343	SRS3	3.5 mm	MS1156	T15
1097993	SVBN2525M16	25	25	12,5	150	33,0	VB..160408	SKVN343	SRS3	3.5 mm	MS1156	T15
1192561	SVBN3225P16	32	25	12,5	170	33,0	VB..160408	SKVN343	SRS3	3.5 mm	MS1156	T15

Screw-On Boring Bars



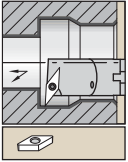
Steel shank with through coolant.



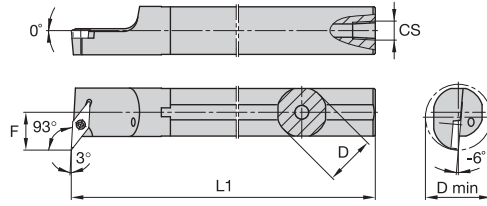
A-SVQB 107,5°



order number	catalogue number	D	D min	F	L1	CS	γF°	gage insert	insert screw	Torx
right hand										
1098232	A16RSVQBR11	16	20,0	11,0	200	1/8-27 NPT	-7.0	VB..110304	MS1153	T7
1098248	A20SSVQBR11	20	25,0	13,0	250	1/8-27 NPT	-6.0	VB..110304	MS1153	T7
1098274	A25TSVQBR16	25	32,0	17,0	300	1/4-18 NPT	-6.0	VB..160408	MS1155	T15
left hand										
1098233	A16RSVQBL11	16	20,0	11,0	200	1/8-27 NPT	-7.0	VB..110304	MS1153	T7
1098253	A20SSVQBL11	20	25,0	13,0	250	1/8-27 NPT	-6.0	VB..110304	MS1153	T7
1098277	A25TSVQBL16	25	32,0	17,0	300	1/4-18 NPT	-6.0	VB..160408	MS1155	T15



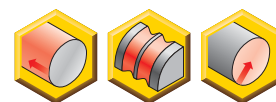
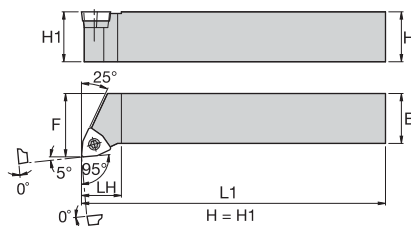
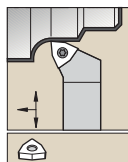
Steel shank with through coolant.



■ A-SVUB 93°



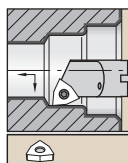
order number	catalogue number	D	D min	F	L1	CS	gage insert	insert screw	Torx
right hand									
1098249	A20SSVUBR11	20	25,0	13,0	250	1/8-27 NPT	VB..110304	MS1153	T7
1098275	A25TSVUBR16	25	32,0	17,0	300	1/4-18 NPT	VB..160408	MS1155	T15
left hand									
1098254	A20SSVUBL11	20	25,0	13,0	250	1/8-27 NPT	VB..110304	MS1153	T7
1098278	A25TSVUBL16	25	32,0	17,0	300	1/4-18 NPT	VB..160408	MS1155	T15



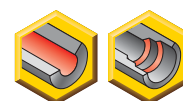
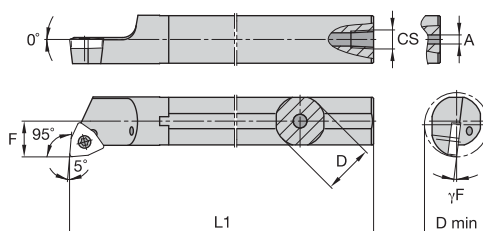
■ SWLC 95°

order number	catalogue number	H	B	F	L1	LH	gage insert	shim	shim screw	hex	insert screw	Torx
right hand												
1097732	SWLCR2020K06	20	20	25,0	125	16,0	WC..06T308	SKWP343	SRS3	3.5 mm	MS1156	T15

Screw-On Boring Bars



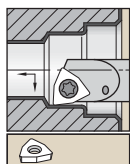
Steel shank with through coolant.



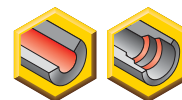
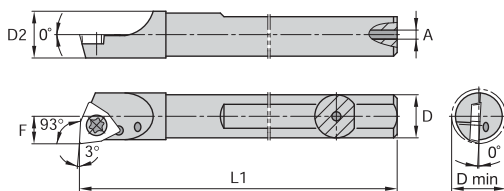
■ A-SWLC 95°

order number	catalogue number	D	D min	F	L1	A	CS	γF°	gage insert	insert screw	Torx
right hand											
1328642	A06MSWLCR2	10	12,2	6,4	152	3,2	—	-8.0	WC..2151	MS1939	T7
1328644	A08RSWLCR2	13	15,2	7,9	203	4,0	1/16-27 NPT	-6.0	WC..2151	MS1153	T7
1098062	A10KSWLCR04	10	13,0	7,0	125	3,0	—	-7.0	WC..040204	MS1153	T7
1328646	A10SSWLCR3	16	19,6	10,3	254	4,0	1/8-27 NPT	-7.0	WC..3252	MS1155	T15
1098063	A12MSWLCR04	12	16,0	9,0	150	—	1/16-27 NPT	-6.0	WC..040204	MS1153	T7
1098064	A16RSWLCR06	16	20,0	11,0	200	4,0	1/8-27 NPT	-7.0	WC..06T308	MS1155	T15
1098065	A20SSWLCR06	20	25,0	13,0	250	4,0	1/8-27 NPT	-5.0	WC..06T308	MS1155	T15
left hand											
1098069	A16RSWLCR06	16	20,0	11,0	200	4,0	1/8-27 NPT	-7.0	WC..06T308	MS1155	T15





Steel shank with through coolant.

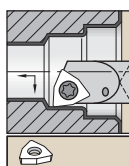


ISO Turning

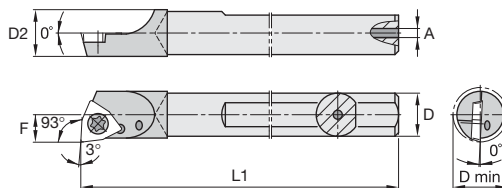
■ A-SWUP 93°



order number	catalogue number	D	D min	D2	F	L1	A	gage insert	insert screw	Torx
right hand										
1930544	A06HSWUPRS3	6	6,8	6,2	3,4	102	1,0	WP..S30104	CT11	T6
1930546	A08HSWUPRS3	8	8,8	8,2	4,4	102	2,4	WP..S30104	CT11	T6
1930556	A12MSWUPR04	12	12,9	12,2	6,6	152	4,0	WP..040204	QTM20	T7



Carbide shank with through coolant.



■ E-SWUP 93°



order number	catalogue number	D	D min	D2	F	L1	A	gage insert	insert screw	Torx
right hand										
1930550	E06MSWUPRS3	6	6,8	6,2	3,4	152	1,2	WP..S30104	CT11	T6
1930552	E08MSWUPRS3	8	8,8	—	4,4	152	2,4	WP..S30104	CT11	T6
1930558	E10SSWUPR04	10	11,0	—	5,6	254	3,2	WP..040204	QTM20	T7
1930560	E12SSWUPR04	12	12,9	—	6,6	254	4,7	WP..040204	QTM20	T7
left hand										
1930549	E06MSWUPLS3	6	6,8	6,2	3,4	152	1,2	WP..S30104	CT11	T6

➤ Turning with Advanced Material Inserts

Ceramic, PcBN, and PCD Inserts

Turning inserts made from advanced materials, such as ceramics, PcBN (polycrystalline cubic boron nitride), and PCD (polycrystalline diamond), can be applied in hard-part turning and machining of cast irons, hardened materials, high-temp alloys, and non-ferrous materials.

Ceramic, PcBN, and PCD inserts offer:

- Improved performance.
- Greater wear resistance.



Ceramic Inserts

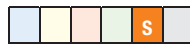
- Silicon-nitride based ceramic for cast iron machining.
- Mixed ceramic for hard machining and finishing of cast iron.
- Whisker ceramic for high-temp alloys and hard machining.



KYK25



KYS30™



PcBN

Solid Inserts

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

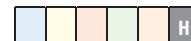
KBK45



Tipped Inserts

- Require a carrier and a PcBN tip.
- The tips are brazed to a carrier.
- The substrate has to have a pocket that will accommodate and support the tip.

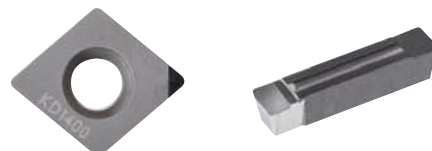
KBH20™



PCD

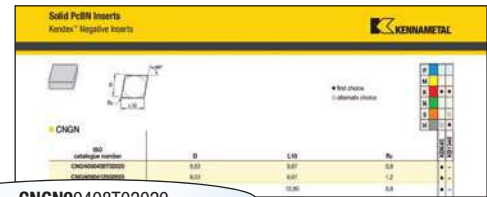
- Targeted machining of non-ferrous materials.
- Significant advantage in hardness over carbide tools.
- Increased productivity through higher speeds and longer tool life.
- Best used in processing materials that are un-machinable with conventional tooling.

KD1400



How Do Catalogue Numbers Work?

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

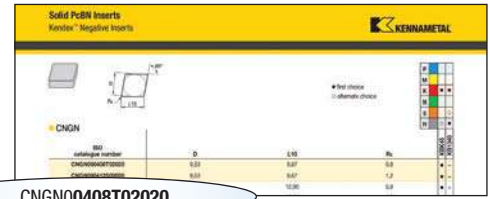


CNGN00408T02020

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Insert Shape		Insert Clearance Angle		Tolerance Class		Insert Features		Size																																																																																																																																																																																																	
H	Hexagon 120°	A	3°	<p>Tolerances apply prior to edge prep and coating</p> <p>D = Theoretical diameter of the insert inscribed circle S = Thickness B = See figures below</p>	N		<p>Code for metric cutting edge length "L10"</p> <table border="1"> <thead> <tr> <th>"D"</th> <th>C</th> <th>D</th> <th>R</th> <th>S</th> <th>T</th> <th>V</th> <th>W</th> </tr> </thead> <tbody> <tr><td>3,97</td><td>S4</td><td>04</td><td>03</td><td>03</td><td>06</td><td>—</td><td>—</td></tr> <tr><td>4,76</td><td>04</td><td>05</td><td>04</td><td>04</td><td>08</td><td>08</td><td>S3</td></tr> <tr><td>5,56</td><td>05</td><td>06</td><td>05</td><td>05</td><td>09</td><td>09</td><td>03</td></tr> <tr><td>6,00</td><td>—</td><td>—</td><td>06</td><td>—</td><td>—</td><td>—</td><td>—</td></tr> <tr><td>6,35</td><td>06</td><td>07</td><td>06</td><td>06</td><td>11</td><td>11</td><td>04</td></tr> <tr><td>7,94</td><td>08</td><td>09</td><td>07</td><td>07</td><td>13</td><td>13</td><td>05</td></tr> <tr><td>8,00</td><td>—</td><td>—</td><td>08</td><td>—</td><td>—</td><td>—</td><td>—</td></tr> <tr><td>9,52</td><td>09</td><td>11</td><td>09</td><td>09</td><td>16</td><td>16</td><td>06</td></tr> <tr><td>10,00</td><td>—</td><td>—</td><td>10</td><td>—</td><td>—</td><td>—</td><td>—</td></tr> <tr><td>11,11</td><td>11</td><td>13</td><td>11</td><td>11</td><td>19</td><td>19</td><td>07</td></tr> <tr><td>12,00</td><td>—</td><td>—</td><td>12</td><td>—</td><td>—</td><td>—</td><td>—</td></tr> <tr><td>12,70</td><td>12</td><td>15</td><td>12</td><td>12</td><td>22</td><td>22</td><td>08</td></tr> <tr><td>14,29</td><td>14</td><td>17</td><td>14</td><td>14</td><td>24</td><td>24</td><td>09</td></tr> <tr><td>15,88</td><td>16</td><td>19</td><td>15</td><td>15</td><td>27</td><td>27</td><td>10</td></tr> <tr><td>16,00</td><td>—</td><td>—</td><td>16</td><td>—</td><td>—</td><td>—</td><td>—</td></tr> <tr><td>17,46</td><td>17</td><td>21</td><td>17</td><td>17</td><td>30</td><td>30</td><td>11</td></tr> <tr><td>19,05</td><td>19</td><td>23</td><td>19</td><td>19</td><td>33</td><td>33</td><td>13</td></tr> <tr><td>20,00</td><td>—</td><td>—</td><td>20</td><td>—</td><td>—</td><td>—</td><td>—</td></tr> <tr><td>22,22</td><td>22</td><td>27</td><td>22</td><td>22</td><td>38</td><td>38</td><td>15</td></tr> <tr><td>25,00</td><td>—</td><td>—</td><td>25</td><td>—</td><td>—</td><td>—</td><td>—</td></tr> <tr><td>25,40</td><td>25</td><td>31</td><td>25</td><td>25</td><td>44</td><td>44</td><td>17</td></tr> <tr><td>31,75</td><td>32</td><td>38</td><td>31</td><td>31</td><td>54</td><td>54</td><td>21</td></tr> <tr><td>32,00</td><td>—</td><td>—</td><td>32</td><td>—</td><td>—</td><td>—</td><td>—</td></tr> </tbody> </table>	"D"	C	D	R	S	T	V	W	3,97	S4	04	03	03	06	—	—	4,76	04	05	04	04	08	08	S3	5,56	05	06	05	05	09	09	03	6,00	—	—	06	—	—	—	—	6,35	06	07	06	06	11	11	04	7,94	08	09	07	07	13	13	05	8,00	—	—	08	—	—	—	—	9,52	09	11	09	09	16	16	06	10,00	—	—	10	—	—	—	—	11,11	11	13	11	11	19	19	07	12,00	—	—	12	—	—	—	—	12,70	12	15	12	12	22	22	08	14,29	14	17	14	14	24	24	09	15,88	16	19	15	15	27	27	10	16,00	—	—	16	—	—	—	—	17,46	17	21	17	17	30	30	11	19,05	19	23	19	19	33	33	13	20,00	—	—	20	—	—	—	—	22,22	22	27	22	22	38	38	15	25,00	—	—	25	—	—	—	—	25,40	25	31	25	25	44	44	17	31,75	32	38	31	31	54	54	21	32,00	—	—	32	—	—	—	—	R	
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*Tolerances apply prior to edge prep and coating.

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



CNGN00408T02020

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Thickness "S"	Corner Radius "Re"	Hand of Insert (optional)	Cutting Edge (optional)	T-Land Width (optional)	T-Land Angle (optional)	Tip Style (optional)	Chipbreaker (optional)																																																																																												
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"D"	± Tolerance on "D"				"D"	± Tolerance on "B"			
	Shapes S, T, C, R, & W	Class M Tolerance		Class U Tolerance		Shapes S, T, C, R, & W	Class M Tolerance		Class U Tolerance
		Shape D	Shape V	Shapes S, T, & C			Shape D	Shape V	Shapes S, T, & C
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6,35	0,05	0,05	0,05	0,08	6,35	0,08	0,11	—	0,13
7,94	0,05	0,05	0,05	0,08	7,94	0,08	0,11	—	0,13
9,52	0,05	0,05	0,05	0,08	9,52	0,08	0,11	0,18	0,13
11,11	0,08	0,08	0,08	0,13	11,11	0,13	0,15	—	—
12,70	0,08	0,08	0,08	0,13	12,70	0,13	0,15	0,25	0,20
14,29	0,08	0,08	0,08	0,13	14,29	0,13	0,15	—	—
15,88	0,10	0,10	0,10	0,18	15,88	0,15	0,18	—	0,27
17,46	0,10	0,10	0,10	0,18	17,46	0,15	0,18	—	0,27
19,05	0,10	0,10	0,10	0,18	19,05	0,15	0,18	—	0,27
22,22	0,13	—	—	0,25	22,22	0,15	—	—	0,38
25,40	0,13	—	—	0,25	25,40	0,18	—	—	0,38
31,75	0,15	—	—	0,25	31,75	0,20	—	—	0,38

➤ Advanced Materials for Cast Iron Machining



Primary Application

The Kennametal advanced materials, utilising 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 an extended application range. Combining grades 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.

The Kennametal SiAlON grades, such as KYK10 grade, can be applied at high cutting speeds up to the PcBN range and at varying cast iron material machinability. Combining SiAlON material science, CVD coating technology, and PcBN grades for cast iron machining, Kennametal provides a complete high-performance portfolio that can reduce cycle time and lower machining costs.

Features and Benefits

Solid PcBN Inserts

KBK45™ Grade

- Designed for elevated abrasion-resistance.
- Go-to grade for cost-per-part manufacturing.
- For roughing and finishing.
- Gold colour for improved usage monitoring.

KB1340™ Grade

- Designed for elevated abrasion-resistance.
- High-temperature resistance.
- For roughing and finishing.

Tipped PcBN Inserts

KB5630™ Grade

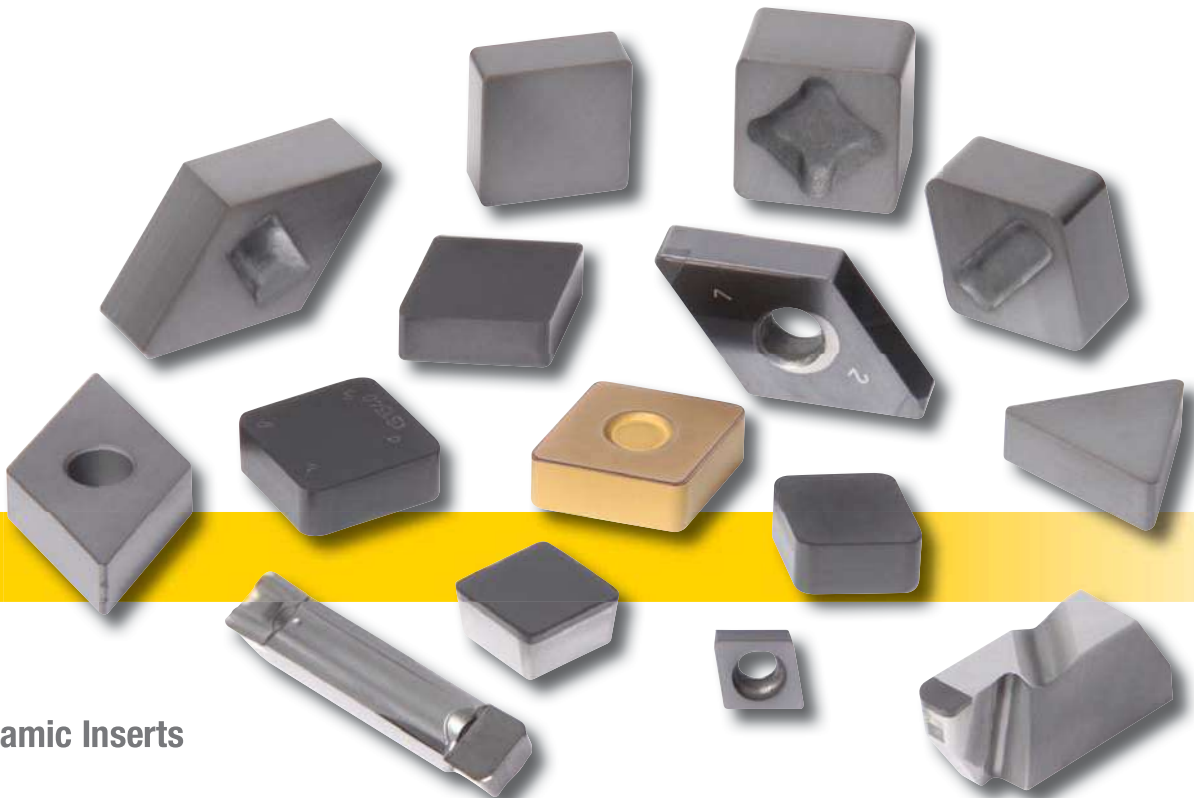
- Laminated material for fine finishing.
- Excellent edge stability.
- PVD coating for reliable tool life, even at varying material machinability.

KB1345™ Grade

- Abrasion-resistant high CBN content tipped grade.
- Very fine PcBN structure suitable for fine finishing applications.

KBK45™ grade provides the best cost-per-part in cast irons.

KB5630™ grade has greater abrasion resistance for chilled and hardened irons.



Ceramic Inserts

KYK10™ Grade

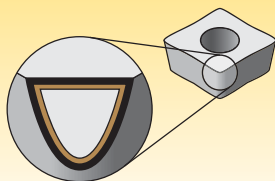
- Improved wear resistance and toughness with up to 20% longer tool life than current KY1310™ grade.
- Best suited for continuous turning of cast iron materials and in lightly interrupted cuts.

KYK25™ Grade

- 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.

KY3500™ Grade

- Excellent for roughing to finishing operations in wet or dry cuts with speeds up to 1000 m/min.
- Performs well in difficult interrupted cuts in ductile or malleable cast iron (<70 KSI tensile strength) at speeds of 250–450 m/min.



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

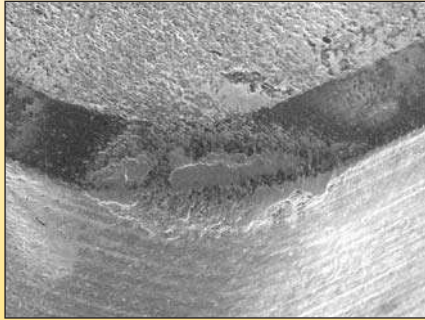
P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous
S	High-Temp Alloys
H	Hardened Materials

wear resistance ← → toughness

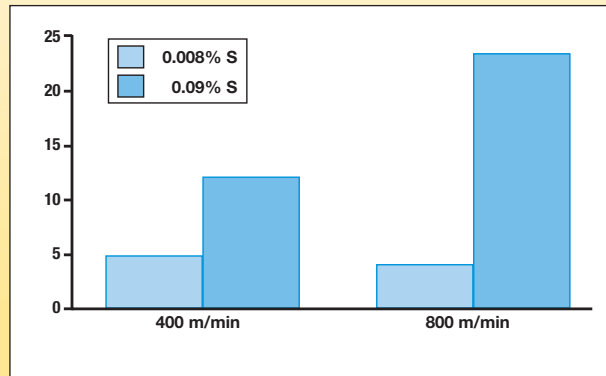
Coating		Grade Description		05	10	15	20	25	30	35	40	45
Solid PcbN Grades	 KBK45 —	Composition: A PVD TiN coated high CBN content, solid PcBN insert having multiple cutting edges. Application: Applied in roughing to finishing of grey and hard cast irons. Also used for finishing chilled cast iron and fully 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.										
	beyond											
Solid PcbN Grades	 KB1340 —	Composition: A high CBN content, solid PcBN insert having multiple cutting edges. Application: Applied in roughing to finishing of fully pearlitic grey cast iron, chilled irons, high-chrome alloyed steels, and heavy cuts in hardened steels (>45 HRC). The solid PcBN insert offers better security and shock resistance compared to tipped PcBN inserts, while also enabling deeper depth-of-cut capabilities.										
	beyond											
Tipped PcbN Grades	 KB1345 —	Composition: A high CBN content, PcBN tip brazed onto a carbide insert. Application: Applied in roughing to finishing of fully pearlitic grey cast iron, chilled irons, high-chrome alloyed steels, sintered powdered metals, and heavy cuts in hardened steels (>45 HRC). Also used 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.										
	beyond											
Tipped PcbN Grades	 KB5630 —	Composition: A high content PcBN with a PVD AlTiN coating for added wear resistance. Application: Designed for roughing to finishing of hardened steels (>45 HRC), abrasive workpiece materials such as sintered valve seat materials, powder metallurgy steels, and hard high-alloy cast irons. The PVD coating provides resistance to crater wear and increased resistance to chipping. A wide range of styles are available, including Screw-On geometries that are ideal for boring applications.										
	beyond											
Ceramic Grades	 KYK10 —	Composition: An advanced SiAlON ceramic grade. Application: Provides maximum wear resistance. Used for high-speed continuous turning of grey cast iron, including through scale. To be used for varying cast iron machinability.										
	beyond											
Ceramic Grades	 KYK25 —	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 grey, ductile, or nodular cast irons. To be used for varying cast iron machinability.										
	beyond											
Ceramic Grades	 KY3500 —	Composition: Pure silicon nitride grade. Application: Maximum toughness. Used at high feed rates for rough machining of grey cast iron, including machining through interruptions.										
	beyond											

■ Machinability of Cast Iron

- Unaged casting is difficult to machine and leads to shorter tool life.
- Low sulphur content leads to shorter tool life.
- High titanium content decreases the tool life significantly.
- Increased ferrite content leads to high chemical wear and a substantially shorter tool life.
- Compacted graphite cast iron shows high chemical wear.



Proper application of KB1340™ — formation of protective layer; tool life should exceed 70 km sliding distance.

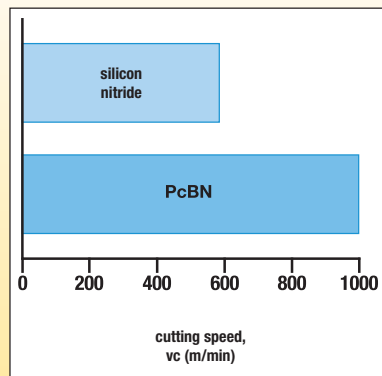


Comparison of the life of PcBN cutting tools in machining two different grey cast irons, primarily differing in sulphur content.

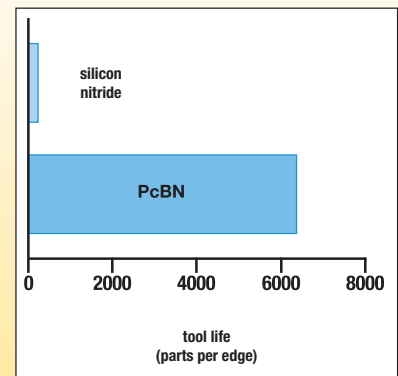
■ Grey Cast Iron Brake Disk Machining • Ceramic vs. PcBN



(a)



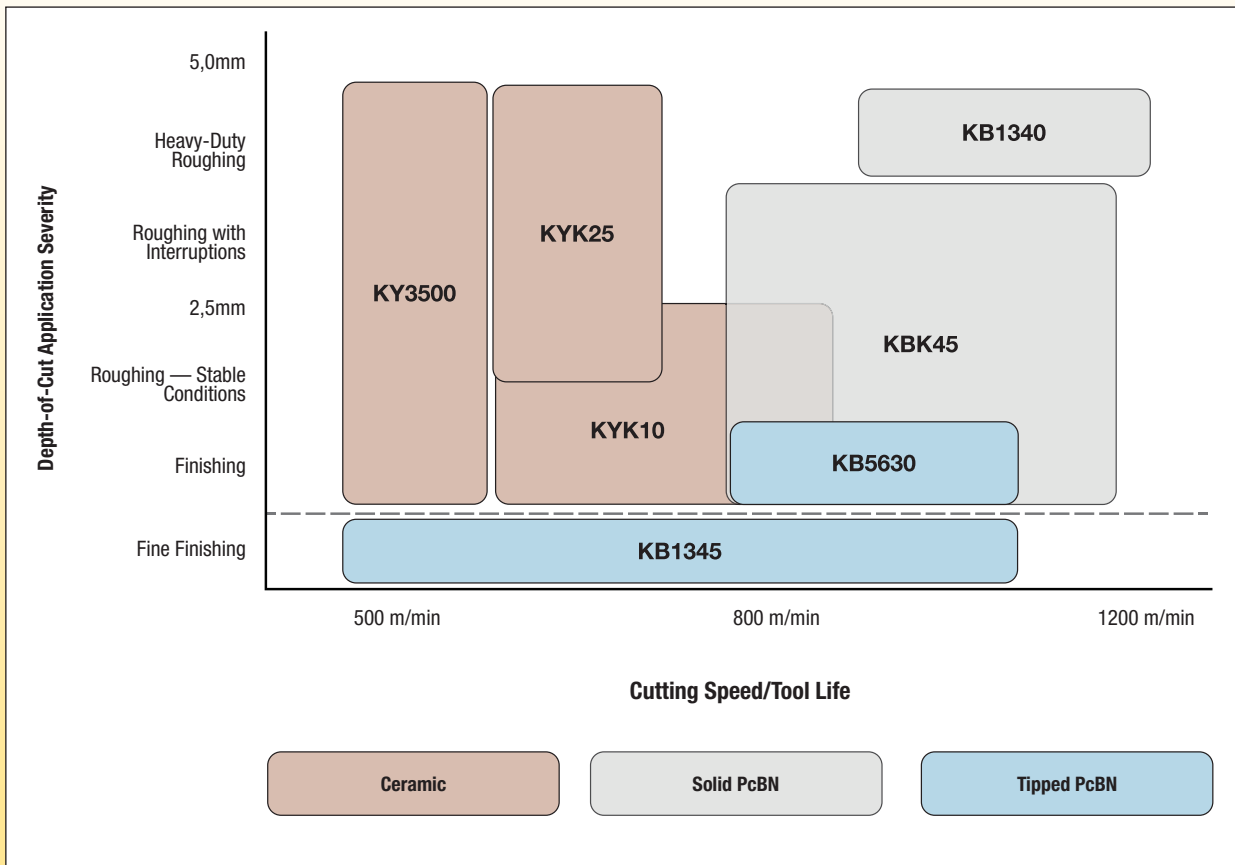
(b)



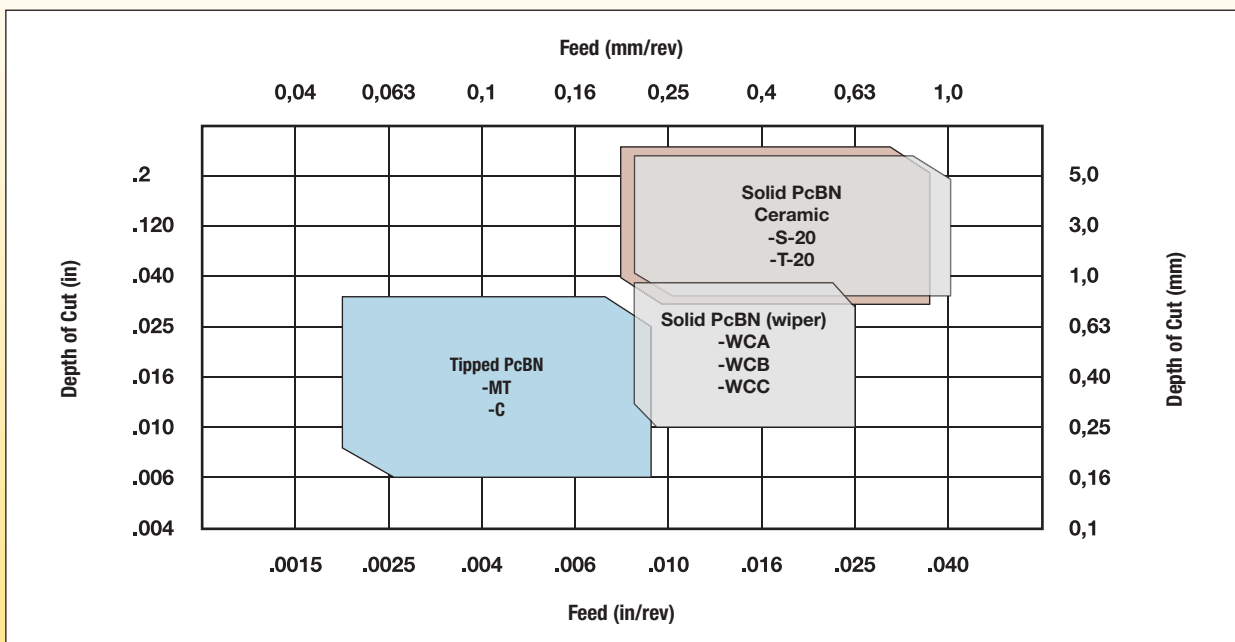
(c)

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

■ Select the Cutting Material



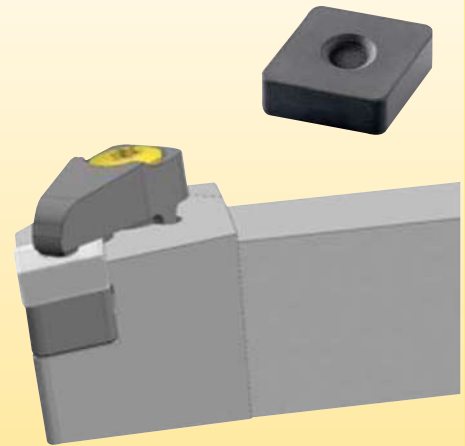
■ Depth of Cut



■ Dimple Clamps for Added Stability

Typical Application

Continuous cost pressures force manufacturers of grey 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 grey 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 4,76mm (3/16") inserts.
- Round dimple design works with custom tooling where clamping direction must be offset due to space limitations.

■ Clamp Selection Chart

inserts		clamp	
ANSI Catalogue Number	ISO Catalogue number	Catalogue Number	Order Number
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

■ Wipers for Cast Iron Machining

WCA

Wiper for cast iron machining for a feed rate up to $f = 0,25$ mm/rev.

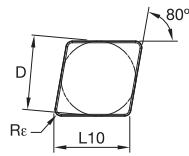
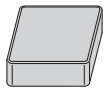
WCB

Wiper for cast iron machining for a feed rate up to $f = 0,45$ mm/rev.

WCC

Wiper for cast iron machining for a feed rate up to $f = 0,65$ mm/rev.

ISO Turning

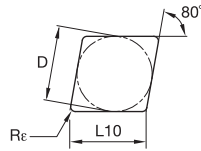
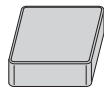


● first choice
○ alternate choice

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

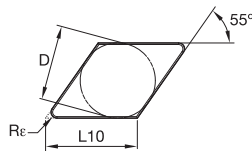
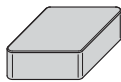
■ CNGN

ISO catalogue number	D	L10	Rε	KBK45	KB1340
CNGN090408T02020	9,53	9,67	0,8	●	-
CNGN090412S02020	9,53	9,67	1,2	●	-
CNGN120408T02020	12,70	12,90	0,8	●	-
CNGN120412S02020	12,70	12,90	1,2	●	-
CNGN120416S02020	12,70	12,90	1,6	●	-



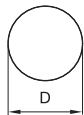
■ CNMN

ISO catalogue number	D	L10	Rε	KBK45	KB1340
CNMN120408S02020	12,70	12,90	0,8	-	●
CNMN120412S02020	12,70	12,90	1,2	-	●



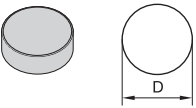
■ DNGN

ISO catalogue number	D	L10	Rε	KBK45	KB1340
DNGN120408S02020	10,00	12,21	0,8	●	-
DNGN120412S02020	10,00	12,21	1,2	●	-



■ RNGN

ISO catalogue number	D	L10	Rε	KBK45	KB1340
RNGN090400S02020	9,53	-	-	●	-
RNGN120400S02020	12,70	-	-	●	-



RNMN

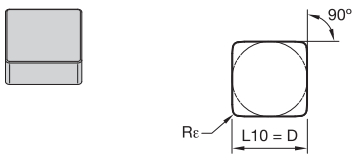
● first choice
○ alternate choice

P	■	■	■
M	■	■	■
K	■	●	●
N	■	■	■
S	■	○	○
H	■	○	●
		KBK45	KB1340
		-	●
		-	●
		-	○

ISO catalogue number	D	L10	Re	KBK45	KB1340
RNMN090300S02020	9,53	—	—	-	●
RNMN120300S02020	12,70	—	—	-	●
RNMN120400S02020	12,70	—	—	-	○



Kendex Positive Inserts

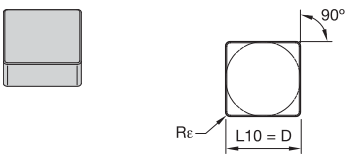


SNGN

P	■	■	■
M	■	■	■
K	■	●	●
N	■	■	■
S	■	○	○
H	■	○	●
		KBK45	KB1340
		●	-
		●	-
		●	-

ISO catalogue number	D	L10	Re	KBK45	KB1340
SNGN120408T02020	12,70	12,70	0,8	●	-
SNGN120412S02020	12,70	12,70	1,2	●	-
SNGN120416S02020	12,70	12,70	1,6	●	-

Kendex Positive Wiper Inserts

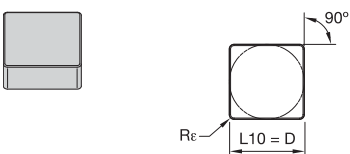


SNGN-WCB

● first choice
○ alternate choice

P	■	■	■
M	■	■	■
K	■	●	●
N	■	■	■
S	■	○	○
H	■	○	●
		KBK45	KB1340
		●	-

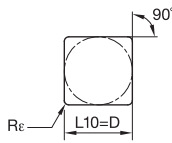
ISO catalogue number	D	L10	Re	KBK45	KB1340
SNGN090408S01015WCB	9,53	9,52	0,8	●	-



SNGN-WCC

ISO catalogue number	D	L10	Re	KBK45	KB1340
SNGN090408S01015WCC	9,53	9,53	0,8	●	-

ISO Turning

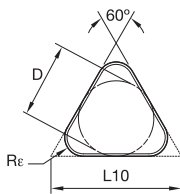


● first choice
○ alternate choice

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

■ SNMN

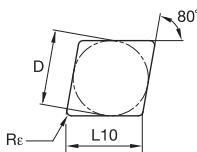
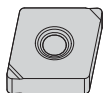
ISO catalogue number	D	L10	Re	KBK45	KB1340
SNMN090308S02020	9,53	9,53	0,8	-	●
SNMN090316S02020	9,53	9,53	1,6	-	●
SNMN120316S02020	12,70	12,70	1,6	-	●
SNMN120416T02020	12,70	12,70	1,6	-	●



■ TNGN

ISO catalogue number	D	L10	Re	KBK45	KB1340
TNGN110416S02020	6,35	11,00	1,6	●	-
TNGN160416S02020	9,53	16,50	1,6	●	-

Kendex™ Negative Dimple Inserts



● first choice
○ alternate choice

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

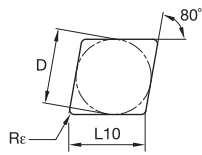
■ CNGF

ISO catalogue number	D	L10	Re	KBK45	KB1340
CNGF120408	12,70	12,90	0,8	-	●

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

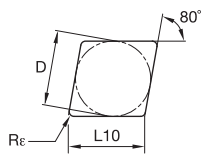
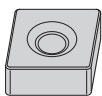
ISO Turning

● first choice
○ alternate choice



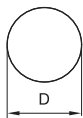
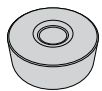
■ CNGX

ISO catalogue number	D	L10	Rε	KBK45	KB1340
CNGX120408T02020	12,70	12,90	0,8	●	-
CNGX120412S01015	12,70	12,90	1,2	-	●
CNGX120412S02020	12,70	12,90	1,2	●	-
CNGX120416S02020	12,70	12,90	1,6	●	●



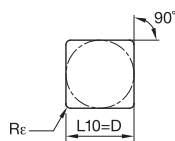
■ CNGX-FW

ISO catalogue number	D	L10	Rε	KBK45	KB1340
CNGX120412S01015FW	12,70	12,90	1,2	-	●



■ RNGX

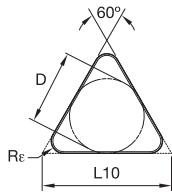
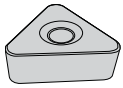
ISO catalogue number	D	L10	Rε	KBK45	KB1340
RNGX120400S02020	12,70	-	-	●	-



■ SNGX

ISO catalogue number	D	L10	Rε	KBK45	KB1340
SNGX120408T02020	12,70	12,70	0,8	●	-
SNGX120412S02020	12,70	12,70	1,2	●	-
SNGX120416S02020	12,70	12,70	1,6	●	●

ISO Turning



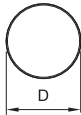
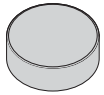
● first choice
○ alternate choice

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

■ TNGX

ISO catalogue number	D	L10	Re	KBK45	KB1340
TNGX160416S02020	9,53	16,50	1,6	●	-

Kendex™ Positive Inserts



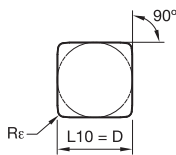
● first choice
○ alternate choice

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

■ RCGN

ISO catalogue number	D	L10	Re	KBK45	KB1340
RCGN090400T01015	9,53	-	-	●	-

Kendex™ Negative Wiper Inserts

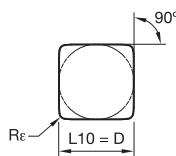


● first choice
○ alternate choice

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

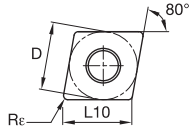
■ SCGN-WCB

ISO catalogue number	D	L10	Re	KBK45	KB1340
SCGN090408S01015WCB	9,53	9,52	0,8	●	-



■ SCGN-WCC

ISO catalogue number	D	L10	Re	KBK45	KB1340
SCGN090408S01015WCC	9,53	9,52	0,8	●	-



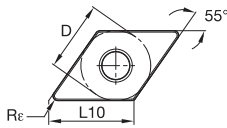
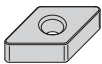
- first choice
- alternate choice

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

■ CNMA

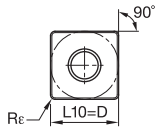
ISO catalogue number	D	L10	Rε	KBK45	KB1340
CNMA120408S02020	12,70	12,90	0,8	-	●
CNMA120412S02020	12,70	12,90	1,2	-	●

NOTE: For toolholders and boring bars, see pages B58–B73.


■ DNMA

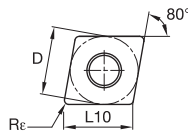
ISO catalogue number	D	L10	Rε	KBK45	KB1340
DNMA110408S02020	9,53	11,63	0,8	-	●
DNMA110412S02020	9,53	11,63	1,2	-	●

NOTE: For toolholders and boring bars, see pages B85–B93.


■ SNMA

ISO catalogue number	D	L10	Rε	KBK45	KB1340
SNMA120412S02020	12,70	12,70	1,2	-	●

NOTE: For toolholders and boring bars, see pages B105–B121.

Advanced Material Inserts • Hard Turning Materials


- first choice
- alternate choice

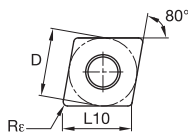
P	■	■	■
M	■	■	■
K	■	●	●
N	■	■	■
S	■	○	○
H	■	●	●

■ CNGA-FWMT

ISO catalogue number	D	L10	Rε	KB1345	KB5630
CNGA120404S01025FWMT	12,70	12,90	0,4	-	●
CNGA120408S01025FWMT	12,70	12,90	0,8	-	●

NOTE: For toolholders and boring bars, see pages B58–B73.

ISO Turning



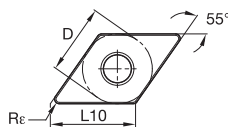
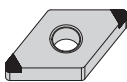
- first choice
- alternate choice

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

■ CNGA-MT

ISO catalogue number	D	L10	Rε	KB1345	KB5630
CNGA120404S01025MT	12,70	12,90	0,4	-	●
CNGA120408S01020MT	12,70	12,90	0,8	●	-
CNGA120408S01025MT	12,70	12,90	0,8	-	●
CNGA120408S02020MT	12,70	12,90	0,8	●	-
CNGA120412S01020MT	12,70	12,90	1,2	-	●
CNGA120412S01025MT	12,70	12,90	1,2	-	●

NOTE: For toolholders and boring bars, see pages B58–B73.

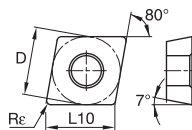


■ DNGA-MT

ISO catalogue number	D	L10	Rε	KB1345	KB5630
DNGA150404S01025MT	12,70	15,50	0,4	-	●
DNGA150408S01020MT	12,70	15,50	0,8	●	-
DNGA150408S01025MT	12,70	15,50	0,8	-	●

NOTE: For toolholders and boring bars, see pages B85–B93.

Advanced Material Inserts • Hard Turning Materials



- first choice
- alternate choice

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

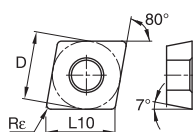
■ CCGW-C

ISO catalogue number	D	L10	Rε	KB1345	KB5630
CCGW060202S01015C	6,35	6,45	0,2	-	●
CCGW060204S01015C	6,35	6,45	0,4	-	●
CCGW09T308EC	9,53	9,67	0,8	●	-

NOTE: For toolholders and boring bars, see pages B179–B183.

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

ISO Turning

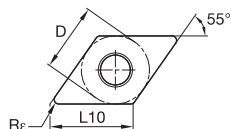
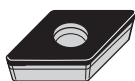


- first choice
- alternate choice

CCGW-MT

ISO catalogue number	D	L10	Re	KB1345	KB5630
CCGW09T304S01015MT	9,53	9,67	0,4	-	●
CCGW09T308S01015MT	9,53	9,67	0,8	-	●

NOTE: For toolholders and boring bars, see pages B179–B183.

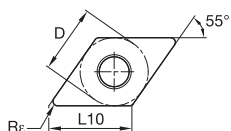
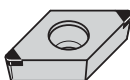

DCGW-C

ISO catalogue number	D	L10	Re	KB1345	KB5630
DCGW070202S01015C	6,35	7,75	0,2	-	●
DCGW070204S01015C	6,35	7,75	0,4	-	●

NOTE: For toolholders and boring bars, see pages B209–B213.

Tipped PcBN Inserts • Screw-On Inserts

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

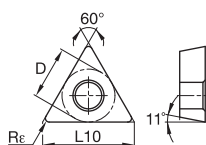


- first choice
- alternate choice

DCGW-MT

ISO catalogue number	D	L10	Re	KB1345	KB5630
DCGW11T304S01015MT	9,53	11,63	0,4	●	●
DCGW11T308S01015MT	9,53	11,63	0,8	●	●

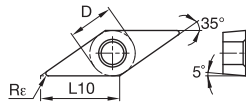
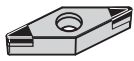
NOTE: For toolholders and boring bars, see pages B209–B213.


TPGW-C

ISO catalogue number	D	L10	Re	KB1345	KB5630
TPGW110204EC	6,35	11,00	0,4	●	-
TPGW110208S01015C	6,35	11,00	0,8	-	●

NOTE: For toolholders and boring bars, see pages B257–B263.

ISO Turning



● first choice
○ alternate choice

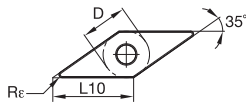
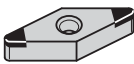
P	■	■	■
M	■	■	■
K	■	●	●
N	■	■	■
S	■	○	●
H	■	●	●

■ VBGW-MT

ISO catalogue number	D	L10	Rε	KB1345	KB5630
VBGW160404S01015MT	9,53	16,61	0,4	-	●
VBGW160408S01015MT	9,53	16,61	0,8	-	●

NOTE: For toolholders and boring bars, see pages B266–B269.

Kenloc™ Inserts



● first choice
○ alternate choice

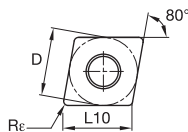
P	■	■	■
M	■	■	■
K	■	●	●
N	■	■	■
S	■	○	●
H	■	●	●

■ VNGA-MT

ISO catalogue number	D	L10	Rε	KB1345	KB5630
VNGA160404S01025MT	9,53	16,61	0,4	-	●
VNGA160408S01025MT	9,53	16,61	0,8	-	●

NOTE: For toolholders and boring bars, see pages B149–B153.

ISO Ceramic Inserts • Kenloc™ Inserts



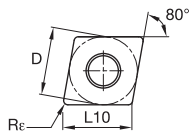
● first choice
○ alternate choice

P	■	■	■
M	■	■	■
K	■	●	●
N	■	■	■
S	■	■	■
H	■	■	■

■ CNGA

ISO catalogue number	D	L10	Rε	KYK25	KYK10	KY3500
CNGA120408T02020	12,70	12,90	0,8	●	●	●
CNGA120412T02020	12,70	12,90	1,2	●	●	●
CNGA120416T02020	12,70	12,90	1,6	●	●	●
CNGA160612T02020	15,88	16,12	1,2	●	-	●
CNGA160616T02020	15,88	16,12	1,6	-	-	●
CNGA190612T02020	19,05	19,34	1,2	-	-	●
CNGA190616T02020	19,05	19,34	1,6	●	-	●

NOTE: For toolholders and boring bars, see pages B58–B73.



- first choice
- alternate choice

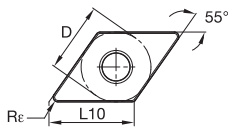
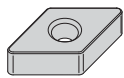
P	■	■	■
M	■	■	■
K	●	●	●
N	■	■	■
S	■	■	■
H	■	■	■

ISO Turning

■ CNGA-FW

ISO catalogue number	D	L10	R _ε	KYK25	KYK10	KY3500
CNGA120408T01020FW	12,70	12,90	0,8	●	-	●
CNGA120412T01020FW	12,70	12,90	1,2	●	●	●
CNGA120412T02020FW	12,70	12,90	1,2	-	●	-
CNGA120416T01020FW	12,70	12,90	1,6	-	-	●

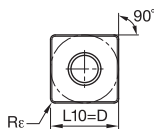
NOTE: For toolholders and boring bars, see pages B58–B73.



■ DNGA

ISO catalogue number	D	L10	R _ε	KYK25	KYK10	KY3500
DNGA150408T02020	12,70	15,50	0,8	-	-	●
DNGA150412T02020	12,70	15,50	1,2	-	-	●
DNGA150416T02020	12,70	15,50	1,6	●	●	●
DNGA150608T02020	12,70	15,50	0,8	-	-	●
DNGA150612T02020	12,70	15,50	1,2	-	-	●

NOTE: For toolholders and boring bars, see pages B85–B93.

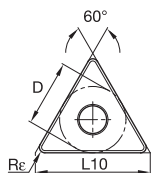
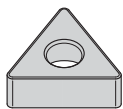


■ SNGA

ISO catalogue number	D	L10	R _ε	KYK25	KYK10	KY3500
SNGA120408T02020	12,70	12,70	0,8	●	●	●
SNGA120412T02020	12,70	12,70	1,2	●	-	●
SNGA120416T02020	12,70	12,70	1,6	-	-	●
SNGA150612T02020	15,88	15,88	1,2	-	-	●
SNGA150612T02020	15,88	15,88	1,2	●	-	-
SNGA150616T02020	15,88	15,88	1,6	-	-	●
SNGA190612T02020	19,05	19,05	1,2	-	-	●

NOTE: For toolholders and boring bars, see pages B105–B121.

ISO Turning



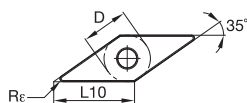
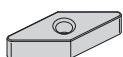
● first choice
○ alternate choice

P			
M			
K	●	●	●
N			
S			
H			

■ TNGA

ISO catalogue number	D	L10	Rε	KYK25	KYK10	KY3500
TNGA160408T02020	9,53	16,50	0,8	-	●	●
TNGA160412T02020	9,53	16,50	1,2	-	●	●
TNGA160416T02020	9,53	16,50	1,6	-	●	

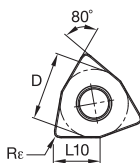
NOTE: For toolholders and boring bars, see pages B132–B142.



■ VNGA

ISO catalogue number	D	L10	Rε	KYK25	KYK10	KY3500
VNGA160408T02020	9,53	16,61	0,8	-	-	●
VNGA220408T02020	12,70	22,14	0,8	●	-	-

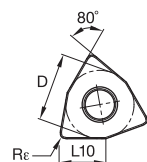
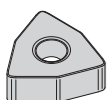
NOTE: For toolholders and boring bars, see pages B149–B153.



■ WNGA

ISO catalogue number	D	L10	Rε	KYK25	KYK10	KY3500
WNGA080408T02020	12,70	8,69	0,8	●	-	●
WNGA080412T02020	12,70	8,69	1,2	●	-	●
WNGA080416T02020	12,70	8,69	1,6	-	-	●

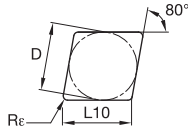
NOTE: For toolholders and boring bars, see pages B161–B165.



■ WNGA-FW

ISO catalogue number	D	L10	Rε	KYK25	KYK10	KY3500
WNGA080408T01020FW	12,70	8,69	0,8	-	-	●

NOTE: For toolholders and boring bars, see pages B161–B165.



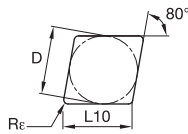
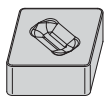
● first choice
○ alternate choice

P			
M			
K	●	●	●
N			
S			
H			

ISO Turning

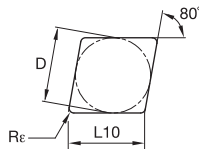
■ CNGN

ISO catalogue number	D	L10	Rε	KYK25	KYK10	KY3500
CNGN120408T02020	12,70	12,90	0,8	-	-	●
CNGN120412T02020	12,70	12,90	1,2	-	-	●
CNGN120416T02020	12,70	12,90	1,6	-	-	●
CNGN120712T02020	12,70	12,90	1,2	-	-	●
CNGN120716T02020	12,70	12,90	1,6	-	●	-



■ CNGX-FW

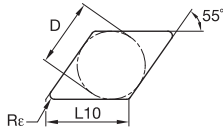
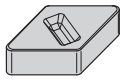
ISO catalogue number	D	L10	Rε	KYK25	KYK10	KY3500
CNGX120708T01020FW	12,70	12,90	0,8	-	-	●
CNGX120712T01020FW	12,70	12,90	1,2	-	-	●
CNGX120716T01020FW	12,70	12,90	1,6	-	-	●



■ CNMX

ISO catalogue number	D	L10	Rε	KYK25	KYK10	KY3500
CNMX120708T02020	12,70	12,90	0,8	-	-	●
CNMX120712T02020	12,70	12,90	1,2	-	-	●
CNMX120716T02020	12,70	12,90	1,6	-	-	●

ISO Turning

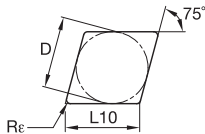


● first choice
○ alternate choice

P			
M			
K	●	●	●
N			
S			
H			

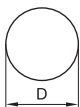
■ DNGX

ISO catalogue number	D	L10	Rε	KYK25	KYK10	KY3500
DNGX120708T02020	10,00	12,21	0,8	-	-	●
DNGX120712T02020	10,00	12,21	1,2	●	-	●
DNGX120716T02020	10,00	12,21	1,6	-	-	●
DNGX150708T02020	12,70	15,50	0,8	-	-	●
DNGX150712T02020	12,70	15,50	1,2	●	-	●
DNGX150716T02020	12,70	15,50	1,6	-	-	●



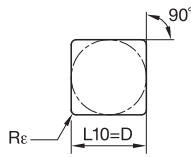
■ ENGX

ISO catalogue number	D	L10	Rε	KYK25	KYK10	KY3500
ENGX130716T02020	12,70	13,15	1,6	-	-	●



■ RNGN

ISO catalogue number	D	L10	Rε	KYK25	KYK10	KY3500
RNGN120400T02020	12,70	-	-	-	●	●
RNGN120700T02020	12,70	-	-	-	●	●
RNGN190700T02020	19,05	-	-	-	-	●



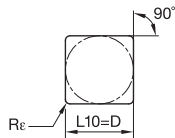
- first choice
- alternate choice

P			
M			
K	●	●	●
N			
S			
H			

ISO Turning

■ SNGN

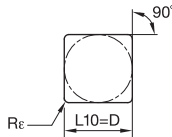
ISO catalogue number	D	L10	Rε	KYK25	KYK10	KY3500
SNGN090308T02020	9,53	9,53	0,8	-	-	●
SNGN120408T02020	12,70	12,70	0,8	●	-	●
SNGN120412T02020	12,70	12,70	1,2	●	-	●
SNGN120416T02020	12,70	12,70	1,6	-	-	●
SNGN120432T02020	12,70	12,70	3,2	-	-	●
SNGN120712T02020	12,70	12,70	1,2	●	-	-
SNGN120716T02020	12,70	12,70	1,6	-	-	●
SNGN190416T02020	19,05	19,05	1,6	-	-	●



■ SNGX

ISO catalogue number	D	L10	Rε	KYK25	KYK10	KY3500
SNGX120712T02020	12,70	12,70	1,2	●	●	●
SNGX120716T02020	12,70	12,70	1,6	●	●	●
SNGX150716T02020	15,88	15,88	1,6	-	-	●
SNGX150724T02020	15,88	15,88	2,4	-	-	●

ISO Turning

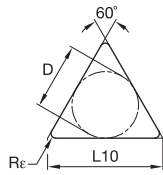
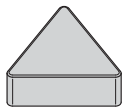


● first choice
○ alternate choice

P	■	■	■	■
M	■	■	■	■
K	■	●	●	●
N	■	■	■	■
S	■	■	■	■
H	■	■	■	■

■ SNMX

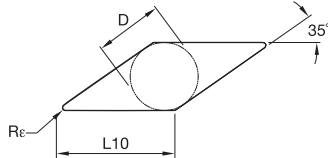
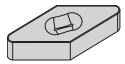
ISO catalogue number	D	L10	Rε	KYK25	KYK10	KY3500
SNMX120712T02020	12,70	12,70	1,2	-	-	●
SNMX120716T02020	12,70	12,70	1,6	-	-	●
SNMX150716T02020	15,88	15,88	1,6	-	-	●



■ TNGN

ISO catalogue number	D	L10	Rε	KYK25	KYK10	KY3500
TNGN160408T02020	9,53	16,50	0,8	-	-	●
TNGN220416T02020	12,70	22,00	1,6	-	-	●

Kendex™ Negative Dimple Inserts

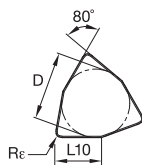


● first choice
○ alternate choice

P	■	■	■	■
M	■	■	■	■
K	■	●	●	●
N	■	■	■	■
S	■	■	■	■
H	■	■	■	■

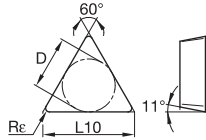
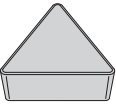
■ VNGX

ISO catalogue number	D	L10	Rε	KYK25	KYK10	KY3500
VNGX160712T02020	9,52	16,61	1,2	-	-	●
VNGX160716T02020	9,53	16,61	1,6	-	-	●



■ WNGX

ISO catalogue number	D	L10	Rε	KYK25	KYK10	KY3500
WNGX080712T02020	12,70	8,69	1,2	-	●	●

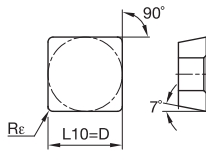
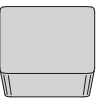


■ TPGN

● first choice
○ alternate choice

P	■	■	■
M	■	■	■
K	■	●	●
N	■	■	■
S	■	■	■
H	■	■	■

ISO catalogue number	D	L10	Rε	KYK25	KYK10	KY3500
TPGN160308T02020	9,53	16,50	0,8	-	-	●
TPGN160312T02020	9,53	16,50	1,2	-	●	●
TPGN220408T02020	12,70	22,00	0,8	-	-	●
TPGN220412T02020	12,70	22,00	1,2	-	-	●



■ SCGN-FW

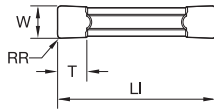
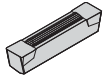
ISO catalogue number	D	L10	Rε	KYK25	KYK10	KY3500
SCGN090408EFW	9,53	9,53	0,8	-	-	●

■ Clamp Selection Chart

order number	catalogue number	clamp	
3960807	CNGX120412S01015	551.718-100° Corner	551.716-80° Corner
3960808	CNGX120412S01015FW	551.718-100° Corner	551.716-80° Corner
3960806	CNGX120416S02020	551.718-100° Corner	551.716-80° Corner
3960811	DNGX150416S02020	551.720	551.720
3960812	SNGX120416S02020	551.718	551.718
3960823	SNGX150416S02020	551.718	551.718
3876843	CNGF120408	551.718-100° Corner	551.716-80° Corner
3960825	TNGX160412EFW	551.733	551.733



ISO Turning



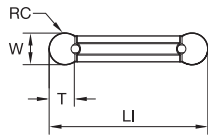
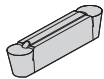
- first choice
- alternate choice

P	■
M	■
K	●
N	■
S	■
H	■

■ A4G-P-T

ISO catalogue number	seat size	W	RR	LI	T	KY3500
A4G0300M03P04T01025	3	3,00	0,4	20	3,4	●
A4G125I03P1T0425	3	3,18	0,4	20	3,4	●
A4G0400M04P04T01025	4	4,00	0,4	20	3,4	●
A4G0500M05P08T01025	5	5,00	0,8	25	4,2	●
A4G0600M06P08T01025	6	6,00	0,8	30	4,8	●
A4G250I06P2T0425	6	6,35	0,8	30	4,9	●
A4G0800M08P08T01025	8	8,00	0,8	30	6,4	●

NOTE: For A4 holder, boring bars, and blades, see pages C104–C135.



■ A4R-P-T

ISO catalogue number	seat size	W	RC	LI	T	KY3500
A4R0300M03P00T01025	3	3,00	1,5	20	2,4	●
A4R0500M05P00T01025	5	5,00	2,5	25	4,1	●
A4R0600M06P00T01025	6	6,00	3,0	30	4,3	●
A4R250I06P00T0425	6	6,35	3,2	30	4,8	●
A4R0800M08P00T01025	8	8,00	4,0	30	6,4	●

NOTE: For A4 holder, boring bars, and blades, see pages C104–C135.

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➤ Hard Turning

High- and Low-Content PcBN Inserts

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. For the end user this translates into increased productivity (higher cutting speeds, longer tool life, etc.), lower tooling cost per part, and the ability to process materials that were previously not machinable with conventional tooling.

Kennametal is at the forefront of developing and implementing superhard materials in our standard and special tooling solutions across all our product lines. Our approach to superhard tooling starts with customer needs and constraints. We then develop the best superhard solutions for the customer's specific needs.



PcBN is thermally stable up to approximately 1200° C and has high resistance to chemical attack. As a result, extreme temperatures like those that occur when machining hard ferrous metals do not cause difficulties and can be used to promote self-induced hot cutting. This adds technical and productivity benefits, especially when compared with grinding. In most cases, performance is significantly better than that attained 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, which can cause increased PcBN edge wear.

PcBN Inserts

KBH10™ Grade

High Volume

- A new patented low PcBN content grade for continuous turning operations.
- Excellent performance in the machining of hardened steels with lower carbide inclusion content.
- Available as tipped and solid PcBN inserts.

KBH20™ Grade

Higher Productivity and Profitability

- Newly developed substrate allows application in a wide variety of demanding applications.
- Nano-composite coating enhances speed capabilities and tool life. Improved edge preparation technology for longer tool life, reliable performance, better surface finish, and tighter workpiece tolerances.
- Large standard portfolio.
- CB1 chipbreaker in positive and negative geometry, solving chipbreaking and chip control issues.



KB5630™ Grade

- Best applied in severe cutting conditions and heavy interruptions.
- Excellent abrasion resistance.
- PVD coating provides a thermal barrier to reduce crater wear and extend tool life.
- Excellent performance in machining of hardened steels and powder metals.
- Available as tipped and full face PcBN inserts.



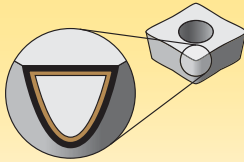
Ceramic Inserts

KY1615 Grade

Low Volume and Higher Process Variations

- Mixed (black) ceramic.
- Excellent wear resistance combined with good toughness properties.
- Excellent performance in the finishing and semi-finishing of hardened steels and iron-based materials.





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

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


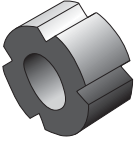
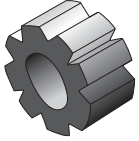
wear resistance ← → toughness


PcBN — Polycrystalline Cubic Boron Nitride Grades

Coating	Grade Description		05	10	15	20	25	30	35	40	45	
KBH20	<p>Composition: A low content PcBN grade with a PVD TiN/AlTiN coating for added wear resistance.</p> <p>Application: KBH20™ is the ideal PcBN hard turning grade for continuous to lightly interrupted cutting applications. The structure, as well as the different edge preparations, enable repeatable workpiece tolerances, excellent surface finishes, and surface integrity. Typical applications are case-hardened steel components such as gears, shafts, and other drive-train components.</p>											
		H										
KBH10	<p>Composition: A low content PcBN grade with a patented binder structure.</p> <p>Application: Designed for the precision machining of hardened steels (>45 HRC). It can be effectively applied on bearing steels, hot and cold work tool steels, high speed steels, die steels, case hardened steels, carburised and nitrided irons, and some hard coatings. Available in a multi-tip format with a wide range of edge preps, insert styles, and wiper geometries.</p>											
		H										
KB5630	<p>Composition: A high content PcBN with a PVD AlTiN coating for added wear resistance.</p> <p>Application: Designed for roughing to finishing of hardened steels (>45 HRC), abrasive workpiece materials such as sintered valve seat materials, powder metallurgy steels, and hard high-alloy cast irons. The PVD coating provides resistance to crater wear and increased resistance to chipping. A wide range of styles are available, including Screw-On geometries that are ideal for boring applications.</p>											
		K										
		S										
H												
KY1615	<p>Composition: An advanced lumina/TiC black ceramic grade.</p> <p>Application: Great combination of toughness and wear resistance; used for machining alloy steels, tool steels, and stainless steels to 60 HRC (653 HB). It is also applied in finish turning and boring of cast irons.</p>											
		H										

Ceramic Grades

■ Tool Testing Information

	Grade	Sharp	Light Cut Edge Metric Inch	Standard Cut Edge Metric Inch	Strong Cut Edge Metric Inch
	KBH10*	E	10 15 04 15	12 25 05 25	custom
	KBH20*	custom	10 15 04 15	12 25 05 25	17 35 07 35
	KB5630***	custom	custom	10 25 04 25	17 35 07 35



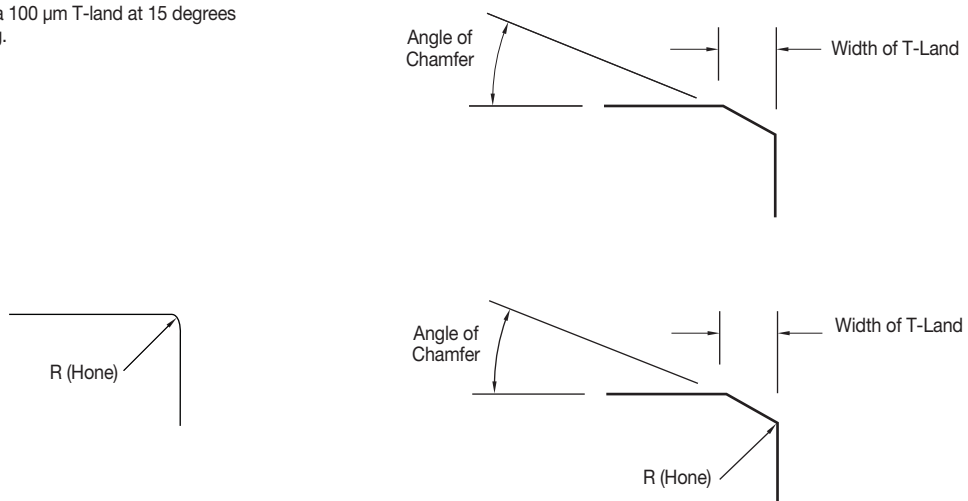
- ✗ Crater Wear
- ✓ Chipping
- ✓ Breakages
- ✓ Stability

- ✓ Crater Wear
- ✗ Chipping
- ✓ Breakages
- ✗ Stability

NOTE: KBH20™ Inserts with 1225 (0525 in inch) are the inserts of choice for initial testing.
 For fine tuning, stay in the same grade but use either sharper edges in light cuts or heavier edges if need to overcome interruptions and variations.
 If KBH20 is failing, change grade to either a more wear-resistant or fracture-resistant grade.
 * Lowest toughness
 ** Medium toughness
 *** Highest toughness

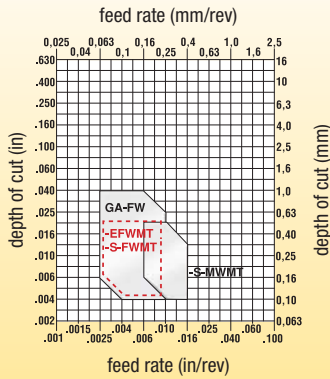
E = Hone
 T = T-land with angle
 S = T-land with angle and hone

Example: S01015 is a 100 µm T-land at 15 degrees with honing.

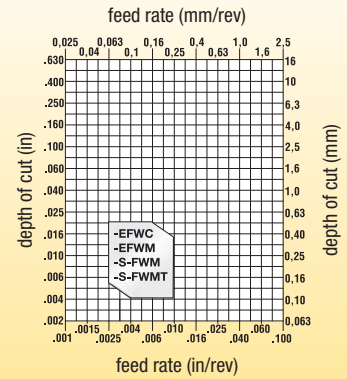


Step 1 • Select the insert geometry

Negative Wiper Inserts



Positive Wiper Inserts

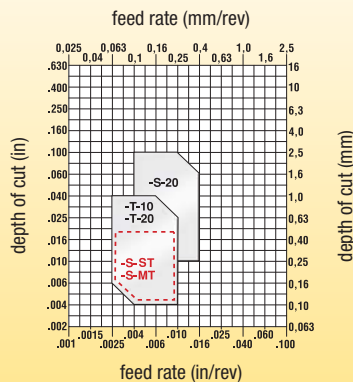
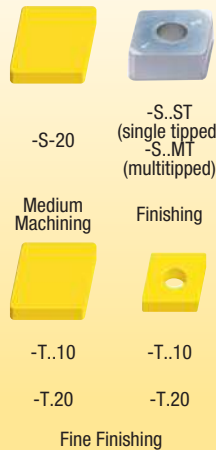


Step 2 • Select the grade

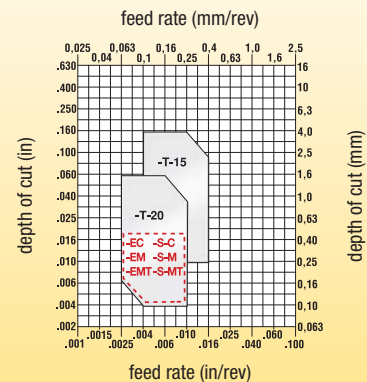
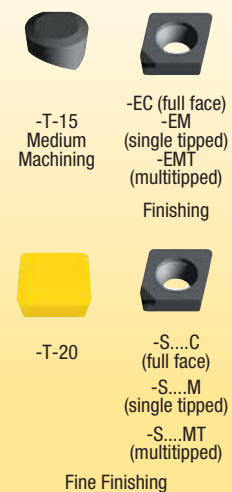
cutting condition	Negative Insert Geometry			Positive Insert Geometry		
	-S..FWMT	-EFWMT	-S..FWMT	-S..FWM	-S..FWMT	-EFWM
heavily interrupted cut	KB5630	KB5630	–	–	–	–
lightly interrupted cut	KB5630/KBH20	KBH20	KBH20	KBH20	KBH20	KBH20
varying depth of cut, casting, or forging skin	KBH20	KB1610/KBH10	KBH20	KBH20	KBH20	KBH20
smooth cut, pre-turned surface	KBH10	KBH10	KBH10	KBH10	KBH10	KBH10

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
	-T..10	-T..20	-T-15
heavily interrupted cut	–	–	–
lightly interrupted cut	–	–	KY1615
varying depth of cut, casting, or forging skin	KY1615	–	KY1615
smooth cut, pre-turned surface	KY1615	–	KY1615

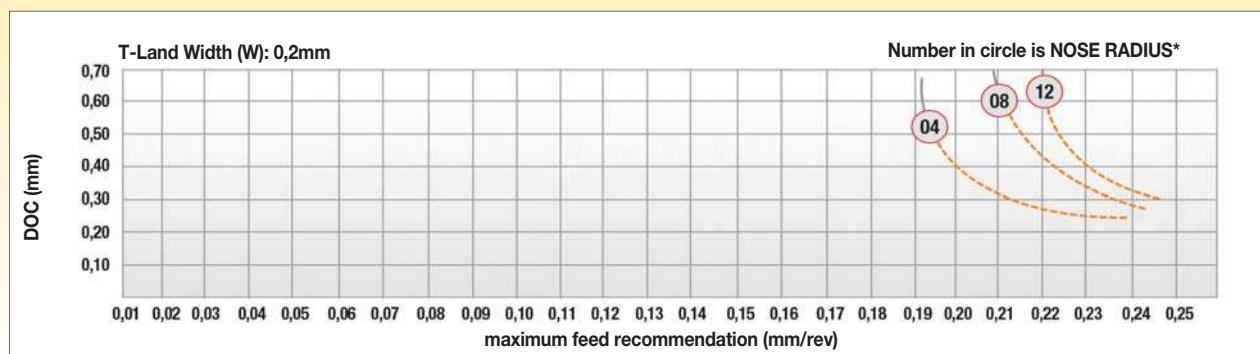
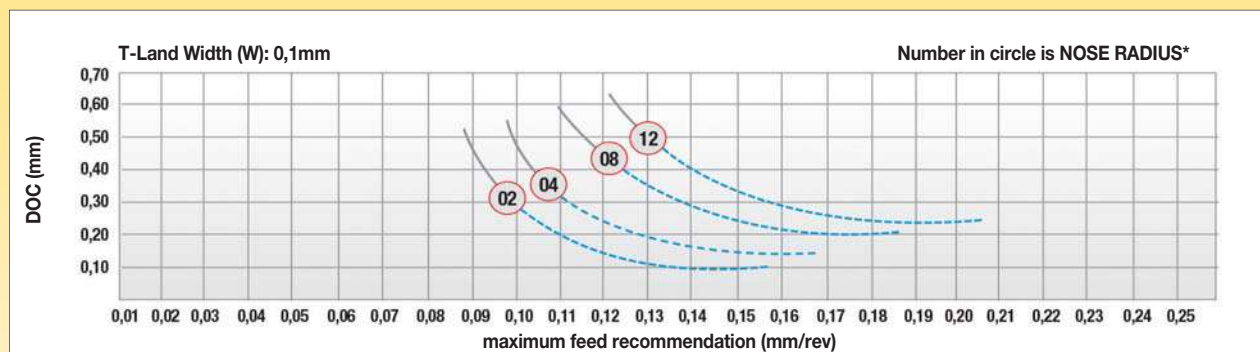
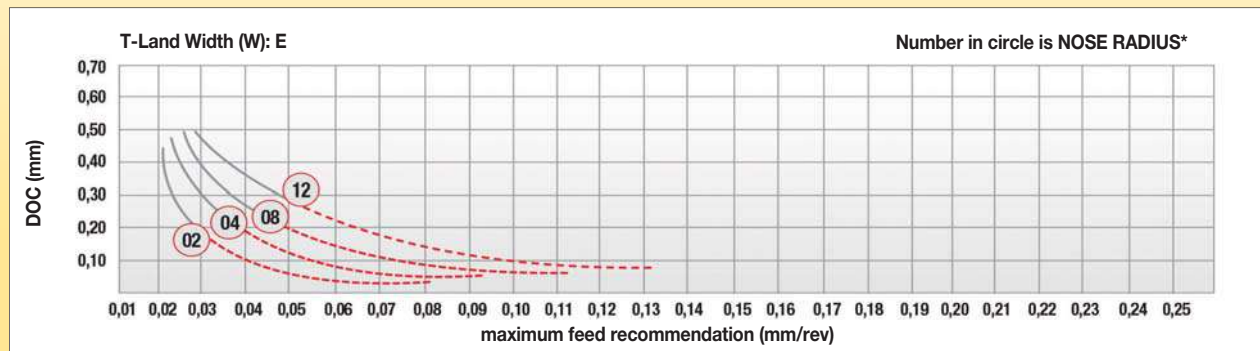
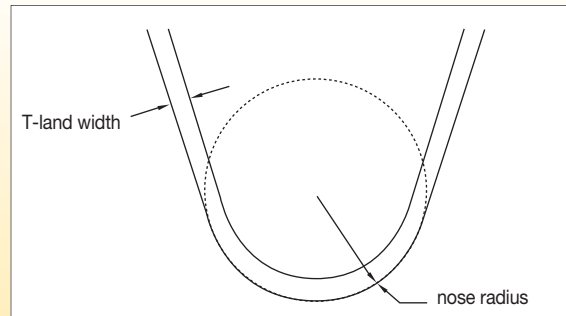
Step 1 • Select the cutting speed

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	KBH20	◊										155	510
	KBH10	◊										150	490
	KB5630	◊										105	345
	KY1615	◊										100	325

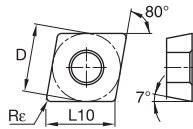
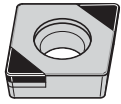
T-Land Width

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.



ISO Turning



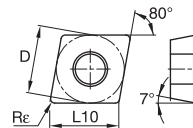
● first choice
○ alternate choice

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

■ CCGM

ISO catalogue number	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
CCGM09T304S01325MTCB1	9,53	9,67	0,4	-	●	-	-
CCGM09T308S01325MTCB1	9,53	9,67	0,8	-	●	-	-

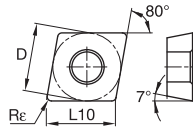
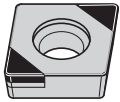
NOTE: For toolholders and boring bars, see pages B179–B183.



■ CCGW-C

ISO catalogue number	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
CCGW060202S01015C	6,35	6,45	0,2	-	-	●	-
CCGW060204S01015C	6,35	6,45	0,4	-	-	●	-

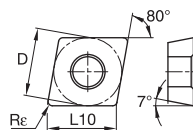
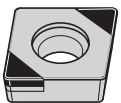
NOTE: For toolholders and boring bars, see pages B179–B183.



■ CCGW-FWMT

ISO catalogue number	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
CCGW09T304S01015FWMT	9,53	9,67	0,4	-	●	-	-
CCGW09T308S01015FWMT	9,53	9,67	0,8	●	●	-	-

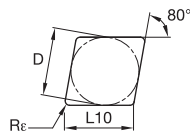
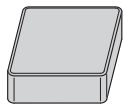
NOTE: For toolholders and boring bars, see pages B179–B183.



■ CCGW-MT

ISO catalogue number	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
CCGW060202S01015MT	6,35	6,45	0,2	●	-	-	-
CCGW060202S01225MT	6,35	6,45	0,2	-	●	-	-
CCGW060204S01015MT	6,35	6,45	0,4	●	-	-	-
CCGW060204S01225MT	6,35	6,45	0,4	-	●	-	-
CCGW09T302S01015MT	9,53	9,67	0,2	●	-	-	-
CCGW09T302S01225MT	9,53	9,67	0,2	-	●	-	-
CCGW09T304S01015MT	9,53	9,67	0,4	●	●	●	-
CCGW09T304S01225MT	9,53	9,67	0,4	●	●	-	-
CCGW09T308S01015MT	9,53	9,67	0,8	●	●	●	-
CCGW09T308S01225MT	9,53	9,67	0,8	●	●	-	-
CCGW120408S01015MT	12,70	12,90	0,8	-	●	-	-

NOTE: For toolholders and boring bars, see pages B179–B183.



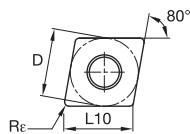
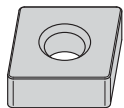
- first choice
- alternate choice

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



■ CNGN

ISO catalogue number	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
CNGN120404T02020	12,70	12,90	0,4	-	-	-	●
CNGN120408T02020	12,70	12,90	0,8	-	-	-	●
CNGN120708T02020	12,70	12,90	0,8	-	-	-	●
CNGN120412T02020	12,70	12,90	1,2	-	-	-	●
CNGN120712T02020	12,70	12,90	1,2	-	-	-	●
CNGN120716T02020	12,70	12,90	1,6	-	-	-	●
CNGN160716T02020	15,88	16,12	1,6	-	-	-	●
CNGN160716T05015	15,88	16,12	1,6	-	-	-	●

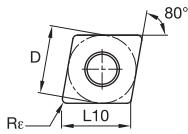
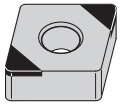


■ CNGA

ISO catalogue number	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
CNGA120404T02020	12,70	12,90	0,4	-	-	-	●
CNGA120408T00520	12,70	12,90	0,8	-	-	-	●
CNGA120408T02020	12,70	12,90	0,8	-	-	-	●
CNGA120412T02020	12,70	12,90	1,2	-	-	-	●
CNGA120416T02020	12,70	12,90	1,6	-	-	-	●
CNGA160612T02020	15,88	16,12	1,2	-	-	-	●
CNGA190612T02020	19,05	19,34	1,2	-	-	-	●
CNGA190616T02020	19,05	19,34	1,6	-	-	-	●

NOTE: For toolholders and boring bars, see pages B58–B73.

ISO Turning



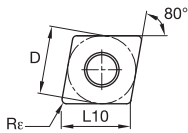
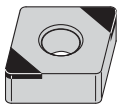
● first choice
○ alternate choice

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

■ CNGA-FWMT

ISO catalogue number	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
CNGA120404S01015FWMT	12,70	12,90	0,4	●	●	-	-
CNGA120404S01025FWMT	12,70	12,90	0,4	-	-	●	-
CNGA120408S01015FWMT	12,70	12,90	0,8	●	●	-	-
CNGA120408S01025FWMT	12,70	12,90	0,8	-	-	●	-
CNGA120408S01225FWMT	12,70	12,90	0,8	●	●	-	-
CNGA120412S01015FWMT	12,70	12,90	1,2	-	●	-	-
CNGA120412S01225FWMT	12,70	12,90	1,2	●	-	-	-

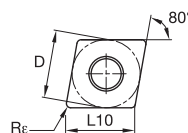
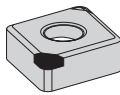
NOTE: For toolholders and boring bars, see pages B58–B73.



■ CNGA-MT

ISO catalogue number	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
CNGA120404S01015MT	12,70	12,90	0,4	●	●	-	-
CNGA120404S01025MT	12,70	12,90	0,4	-	-	●	-
CNGA120404S01225MT	12,70	12,90	0,4	-	●	-	-
CNGA120404S01735MT	12,70	12,90	0,4	-	●	-	-
CNGA120408S01015MT	12,70	12,90	0,8	●	●	-	-
CNGA120408S01025MT	12,70	12,90	0,8	-	-	●	-
CNGA120408S01225MT	12,70	12,90	0,8	●	●	-	-
CNGA120408S01735MT	12,70	12,90	0,8	●	●	-	-
CNGA120412S01015MT	12,70	12,90	1,2	●	●	-	-
CNGA120412S01020MT	12,70	12,90	1,2	-	-	●	-
CNGA120412S01025MT	12,70	12,90	1,2	-	-	●	-
CNGA120412S01225MT	12,70	12,90	1,2	●	●	-	-
CNGA120412S01735MT	12,70	12,90	1,2	●	●	-	-

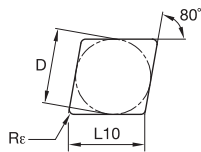
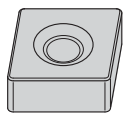
NOTE: For toolholders and boring bars, see pages B58–B73.



■ CNGM-CB1

ISO catalogue number	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
CNGM120404S01325MTCB1	12,70	12,90	0,4	-	●	-	-
CNGM120408S01325MTCB1	12,70	12,90	0,8	-	●	-	-
CNGM120412S01325MTCB1	12,70	12,90	1,2	-	●	-	-

NOTE: For toolholders and boring bars, see pages B58–B73.



● first choice
○ alternate choice

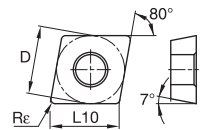
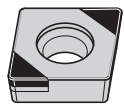
P	■			●
M	■			
K	■			●
N	■			
S	■			●
H	■	●	●	●

ISO Turning

■ CNGX

ISO catalogue number	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
CNGX120708T02020	12,70	12,90	0,8	-	-	-	●
CNGX120712T02020	12,70	12,90	1,2	-	-	-	●

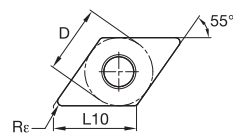
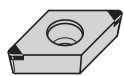
NOTE: For toolholders and boring bars, see pages B58–B73.



■ CPGW-MT

ISO catalogue number	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
CPGW09T304S01015MT	9,53	9,67	0,4	-	-	●	-
CPGW09T308S01015MT	9,53	9,67	0,8	-	-	●	-

NOTE: For toolholders and boring bars, see pages B192–B205.

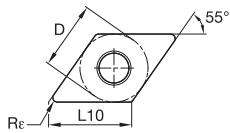
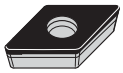


■ DCGM

ISO catalogue number	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
DCGM11T304S01325MTCB1	9,53	11,63	0,4	-	●	-	-

NOTE: For toolholders and boring bars, see pages B209–B213.

ISO Turning



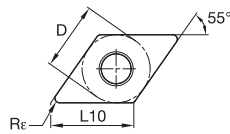
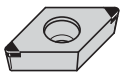
● first choice
○ alternate choice

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

■ DCGW-C

ISO catalogue number	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
DCGW070202S01015C	6,35	7,75	0,2	-	-	●	-
DCGW070204S01015C	6,35	7,75	0,4	-	-	●	-

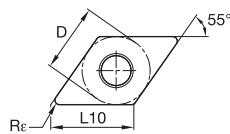
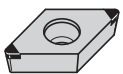
NOTE: For toolholders and boring bars, see pages B209–B213.



■ DCGW-FWMT

ISO catalogue number	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
DCGW11T308S01015FWMT	9,53	11,63	0,4	●	●	-	-
DCGW11T308S01225FWMT	9,53	11,63	0,4	●	-	-	-

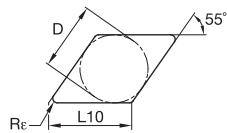
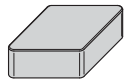
NOTE: For toolholders and boring bars, see pages B209–B213.



■ DCGW-MT

ISO catalogue number	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
DCGW070202S01225MT	6,35	7,75	0,2	-	●	-	-
DCGW070204S01015MT	6,35	7,75	0,4	-	●	-	-
DCGW070204S01225MT	6,35	7,75	0,4	-	●	-	-
DCGW070202S01015MT	6,35	7,75	0,4	●	-	-	-
DCGW070204S01015MT	6,35	7,75	0,4	●	-	-	-
DCGW070204S01225MT	6,35	7,75	0,4	●	-	-	-
DCGW11T302S01015MT	9,53	11,63	0,2	●	-	-	-
DCGW11T302S01225MT	9,53	11,63	0,2	-	●	-	-
DCGW11T304S01225MT	9,53	11,63	0,4	●	●	-	-
DCGW11T304S01015MT	9,53	11,63	0,4	●	●	●	-
DCGW11T308S01015MT	9,53	11,63	0,8	●	●	●	-
DCGW11T308S01225MT	9,53	11,63	0,8	●	●	-	-

NOTE: For toolholders and boring bars, see pages B209–B213.



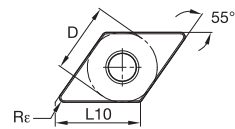
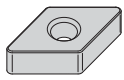
● first choice
○ alternate choice

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

ISO Turning

■ DNGN/DNG

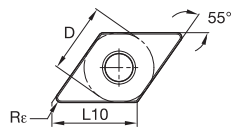
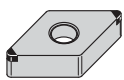
ISO catalogue number	D	L10	Re	KBH10	KBH20	KB5630	KY1615
DNGN150704T02020	12,70	15,50	0,4	○	○	○	○
DNGN150708T02020	12,70	15,50	0,8	○	○	○	○
DNGN150712T02020	12,70	15,50	1,2	○	○	○	○
DNGN150716T02020	12,70	15,50	1,6	○	○	○	○



■ DNGA

ISO catalogue number	D	L10	Re	KBH10	KBH20	KB5630	KY1615
DNGA150404T02020	12,70	15,50	0,4	○	○	○	○
DNGA150604T02020	12,70	15,50	0,4	○	○	○	○
DNGA150408T02020	12,70	15,50	0,8	○	○	○	○
DNGA150608T02020	12,70	15,50	0,8	○	○	○	○
DNGA150412T02020	12,70	15,50	1,2	○	○	○	○
DNGA150612T02020	12,70	15,50	1,2	○	○	○	○
DNGA150416T02020	12,70	15,50	1,6	○	○	○	○

NOTE: For toolholders and boring bars, see pages B85–B93.

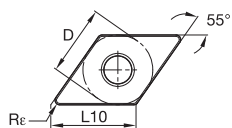
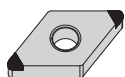


■ DNGA-FWMT

ISO catalogue number	D	L10	Re	KBH10	KBH20	KB5630	KY1615
DNGA150408S01015FWMT	12,70	15,50	0,4	○	○	○	○
DNGA150408S01225FWMT	12,70	15,50	0,4	○	○	○	○
DNGA150412S01015FWMT	12,70	15,50	0,8	○	○	○	○
DNGA150412S01225FWMT	12,70	15,50	0,8	○	○	○	○

NOTE: For toolholders and boring bars, see pages B85–B93.

ISO Turning



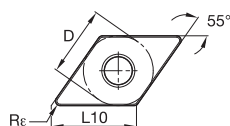
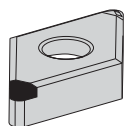
● first choice
○ alternate choice

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

■ DNGA-MT

ISO catalogue number	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
DNGA150404S01015MT	12,70	15,50	0,4	●	●	-	-
DNGA150404S01025MT	12,70	15,50	0,4	-	-	●	-
DNGA150404S01225MT	12,70	15,50	0,4	-	●	-	-
DNGA150404S01735MT	12,70	15,50	0,4	-	●	-	-
DNGA150604S01015MT	12,70	15,50	0,4	●	●	-	-
DNGA150604S01225MT	12,70	15,50	0,4	-	●	-	-
DNGA150604S01735MT	12,70	15,50	0,4	-	●	-	-
DNGA150408S01735MT	12,70	15,50	0,8	●	●	-	-
DNGA150408S01015MT	12,70	15,50	0,8	●	●	-	-
DNGA150408S01025MT	12,70	15,50	0,8	-	-	●	-
DNGA150408S01225MT	12,70	15,50	0,8	●	●	-	-
DNGA150608S01015MT	12,70	15,50	0,8	●	●	-	-
DNGA150608S01225MT	12,70	15,50	0,8	●	●	-	-
DNGA150608S01735MT	12,70	15,50	0,8	-	●	-	-
DNGA150412S01015MT	12,70	15,50	1,2	●	●	-	-
DNGA150412S01225MT	12,70	15,50	1,2	●	●	-	-
DNGA150412S01735MT	12,70	15,50	1,2	●	●	-	-
DNGA150612S01015MT	12,70	15,50	1,2	●	●	-	-
DNGA150612S01225MT	12,70	15,50	1,2	●	●	-	-
DNGA150612S01735MT	12,70	15,50	1,2	-	●	-	-

NOTE: For toolholders and boring bars, see pages B85–B93.



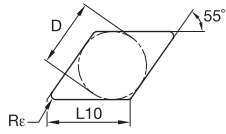
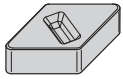
■ DNGM-CB1

ISO catalogue number	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
DNGM150408S01325MTCB1	12,70	15,50	0,8	-	●	-	-
DNGM150412S01325MTCB1	12,70	15,50	1,2	-	●	-	-
DNGM150608S01325MTCB1	12,70	15,50	0,8	-	●	-	-
DNGM150612S01325MTCB1	12,70	15,50	1,2	-	●	-	-

NOTE: For toolholders and boring bars, see pages B85–B93.

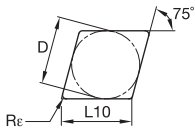
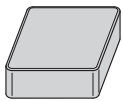
P	●				●
M	●				
K	●				●
N	●				
S	●				●
H	●	●	●	●	●

● first choice
○ alternate choice



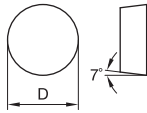
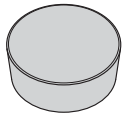
■ DNGX

ISO catalogue number	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
DNGX150708T02020	12,70	15,50	0,8	-	-	-	●



■ ENGN

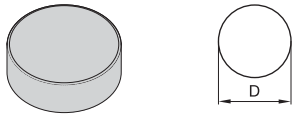
ISO catalogue number	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
ENGN130704T02020	12,70	13,15	0,4	-	-	-	●
ENGN130708T02020	12,70	13,15	0,8	-	-	-	●
ENGN130712T02020	12,70	13,15	1,2	-	-	-	●
ENGN130716T02020	12,70	13,15	1,6	-	-	-	●



■ RCGX

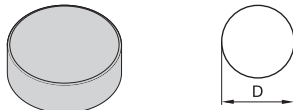
ISO catalogue number	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
RCGX090700T01020	9,53	-	-	-	-	-	●
RCGX090700T02020	9,53	-	-	-	-	-	●
RCGX090700T10015	9,53	-	-	-	-	-	●
RCGX090700T20015	9,53	-	-	-	-	-	●
RCGX120700T02020	12,70	-	-	-	-	-	●
RCGX120700T10015	12,70	-	-	-	-	-	●
RCGX120700T20015	12,70	-	-	-	-	-	●
RCGX151000T20015	15,88	-	-	-	-	-	●
RCGX191000T20015	19,05	-	-	-	-	-	●
RCGX251200T20015	25,40	-	-	-	-	-	●

ISO Turning



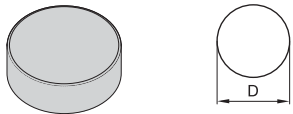
■ RCGW-T

ISO catalogue number	D	L10	R _ε	KBH10	KBH20	KB5630	KY1615
RCGW1204M0T01020	12,00	—	—	-	-	-	●



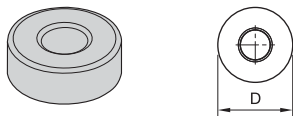
■ RCGX

ISO catalogue number	D	L10	R _ε	KBH10	KBH20	KB5630	KY1615
RCGX0907-001	9,53	—	—	-	-	-	●



■ RNGN

ISO catalogue number	D	L10	R _ε	KBH10	KBH20	KB5630	KY1615
RNGN090300T02020	9,53	—	—	-	-	-	●
RNGN090400T02020	9,53	—	—	-	-	-	●
RNGN120300T02020	12,70	—	—	-	-	-	●
RNGN120400T02020	12,70	—	—	-	-	-	●
RNGN120700T02020	12,70	—	—	-	-	-	●
RNGN120700T10015	12,70	—	—	-	-	-	●
RNGN120700T20015	12,70	—	—	-	-	-	●
RNGN190700T02020	19,05	—	—	-	-	-	●



■ RNGA

ISO catalogue number	D	L10	R _ε	KBH10	KBH20	KB5630	KY1615
RNGA090300T02020	9,53	—	—	-	-	-	●
RNGA120400T02020	12,70	—	—	-	-	-	●

NOTE: For toolholders and boring bars, see page B95.

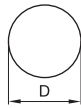
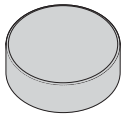
P	●				
M	●				
K	●				
N	●				
S	●				
H	●	●	●	●	●

● first choice
○ alternate choice

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

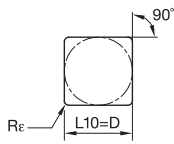
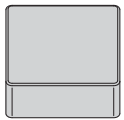
● first choice
○ alternate choice

ISO Turning



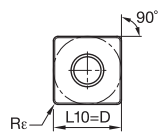
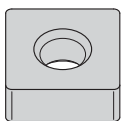
■ RNGN-C

ISO catalogue number	D	L10	R _ε	KBH10	KBH20	KB5630	KY1615
RNGN090300S02015C	9,53	—	—	—	—	●	—



■ SNGN

ISO catalogue number	D	L10	R _ε	KBH10	KBH20	KB5630	KY1615
SNGN090308T02020	9,53	9,53	0,8	—	—	—	●
SNGN120704T02020	12,70	12,70	0,4	—	—	—	●
SNGN120408T00520	12,70	12,70	0,8	—	—	—	●
SNGN120408T02020	12,70	12,70	0,8	—	—	—	●
SNGN120708T02020	12,70	12,70	0,8	—	—	—	●
SNGN120412T02020	12,70	12,70	1,2	—	—	—	●
SNGN120712T02020	12,70	12,70	1,2	—	—	—	●
SNGN120416T02020	12,70	12,70	1,6	—	—	—	●
SNGN120716T02020	12,70	12,70	1,6	—	—	—	●
SNGN120720T02020	12,70	12,70	2,0	—	—	—	●
SNGN120720T10015	12,70	12,70	2,0	—	—	—	●
SNGN120720T20015	12,70	12,70	2,0	—	—	—	●
SNGN150716T02020	15,88	15,88	1,6	—	—	—	●

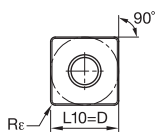
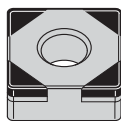


■ SNGA

ISO catalogue number	D	L10	R _ε	KBH10	KBH20	KB5630	KY1615
SNGA120408T02020	12,70	12,70	0,8	—	—	—	●
SNGA120412T02020	12,70	12,70	1,2	—	—	—	●

NOTE: For toolholders and boring bars, see pages B105–B121.

ISO Turning



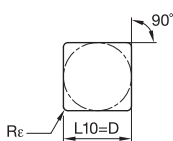
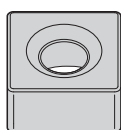
● first choice
○ alternate choice

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

■ SNGA-MT

ISO catalogue number	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
SNGA120408S01015MT	12,70	12,70	0,8	●	-	-	-
SNGA120408S01225MT	12,70	12,70	0,8	●	●	-	-
SNGA120412S01225MT	12,70	12,70	1,2	●	●	-	-

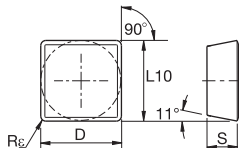
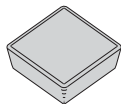
NOTE: For toolholders and boring bars, see pages B105–B121.



■ SNGX

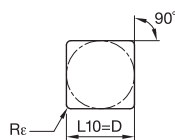
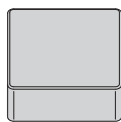
ISO catalogue number	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
SNGX120712T02020	12,70	12,70	1,2	-	-	-	●

NOTE: For toolholders and boring bars, see pages B105–B121.



■ SPG-T

ISO catalogue number	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
SPGN090308T01020	9,53	9,53	0,8	-	-	-	●
SPGN120308T01020	12,70	12,70	0,8	-	-	-	●



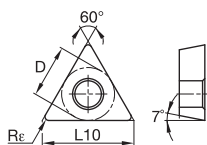
■ SPU-T

ISO catalogue number	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
SPUN120308T00520	12,70	12,70	0,8	-	-	-	●

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

● first choice
○ alternate choice

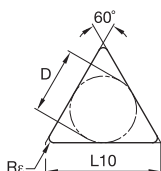
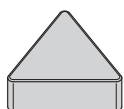
ISO Turning



TCGW-MT

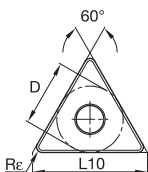
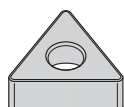
ISO catalogue number	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
TCGW090202S01015MT	5,56	9,62	0,2	-	●	-	-
TCGW090204S01015 MT	5,56	9,62	0,4	-	●	-	-
TCGW110202S01015MT	6,35	11,00	0,2	●	●	-	-
TCGW110204S01015MT	6,35	11,00	0,4	●	●	-	-
TCGW110204S01225MT	6,35	11,00	0,4	●	-	-	-
TCGW110208S01015MT	6,35	11,00	0,8	●	●	-	-
TCGW110208S01225MT	6,35	11,00	0,8	●	-	-	-

NOTE: For toolholders and boring bars, see pages B247–B248.



TNGN

ISO catalogue number	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
TNGN110308T02020	6,35	11,00	0,8	-	-	-	●
TNGN160404T02020	9,53	16,50	0,4	-	-	-	●
TNGN160408T02020	9,53	16,50	0,8	-	-	-	●
TNGN160708T02020	9,53	16,50	0,8	-	-	-	●
TNGN160412T02020	9,53	16,50	1,2	-	-	-	●
TNGN160712T02020	9,53	16,50	1,2	-	-	-	●
TNGN160416T02020	9,53	16,50	1,6	-	-	-	●
TNGN220408T02020	12,70	22,00	0,8	-	-	-	●

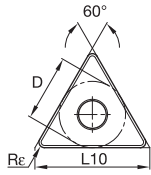
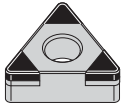


TNGA

ISO catalogue number	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
TNGA160408T02020	9,53	16,50	0,8	-	-	-	●
TNGA160412T02020	9,53	16,50	1,2	-	-	-	●
TNGA220408T02020	12,70	22,00	0,8	-	-	-	●
TNGA220412T02020	12,70	22,00	1,2	-	-	-	●

NOTE: For toolholders and boring bars, see pages B132–B142.

ISO Turning



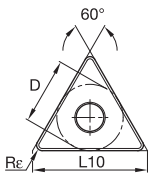
● first choice
○ alternate choice

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

■ TNGA-MT

ISO catalogue number	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
TNGA160404S01015MT	9,53	16,50	0,4	●	●	-	-
TNGA160404S01225MT	9,53	16,50	0,4	-	●	-	-
TNGA160404S01735MT	9,53	16,50	0,4	-	●	-	-
TNGA160408S01015MT	9,53	16,50	0,8	●	●	-	-
TNGA160408S01225MT	9,53	16,50	0,8	●	●	-	-
TNGA160408S01735MT	9,53	16,50	0,8	●	●	-	-
TNGA160412S01015MT	9,53	16,50	1,2	●	●	-	-
TNGA160412S01225MT	9,53	16,50	1,2	●	●	-	-
TNGA160412S01735MT	9,53	16,50	1,2	●	●	-	-

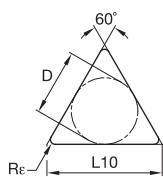
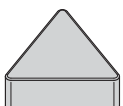
NOTE: For toolholders and boring bars, see pages B132–B142.



■ TNGM • Medium Machining

ISO catalogue number	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
TNGM160408S01325MTCB1	9,53	16,50	0,8	-	●	-	-

NOTE: For toolholders and boring bars, see pages B132–B142.

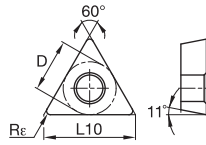


■ TPGN

ISO catalogue number	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
TPGN110304T01020	6,35	11,00	0,4	-	-	-	●
TPGN110308T01020	6,35	11,00	0,8	-	-	-	●
TPGN110312T01020	6,35	11,00	1,2	-	-	-	●
TPGN160304T00520	9,53	16,50	0,4	-	-	-	●
TPGN160304T01020	9,53	16,50	0,4	-	-	-	●
TPGN160308T00520	9,53	16,50	0,8	-	-	-	●
TPGN160308T01020	9,53	16,50	0,8	-	-	-	●
TPGN160312T01020	9,53	16,50	1,2	-	-	-	●

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

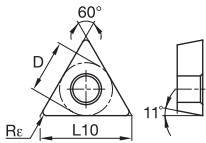
● first choice
○ alternate choice



■ TPGW-C

ISO catalogue number	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
TPGW110208S01015C	6,35	11,00	0,8	-	-	●	-

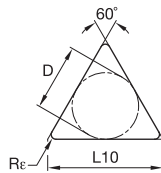
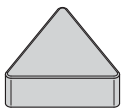
NOTE: For toolholders and boring bars, see pages B257–B263.



■ TPGW-MT

ISO catalogue number	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
TPGW110308S01225MT	6,35	10,96	0,8	-	-	-	-
TPGW110202S01015MT	6,35	11,00	0,2	●	-	-	-
TPGW110304S01015MT	6,35	11,00	0,4	●	-	-	-
TPGW110304S01225MT	6,35	11,00	0,4	●	-	-	-
TPGW110204S01015MT	6,35	11,00	0,4	-	●	-	-
TPGW110208S01015MT	6,35	11,00	0,8	-	●	-	-
TPGW160404S01015MT	9,53	16,50	0,4	●	-	-	-
TPGW160404S01225MT	9,53	16,50	0,4	●	-	-	-
TPGW16T304S01015MT	9,53	16,50	0,4	-	●	-	-
TPGW160408S01015MT	9,53	16,50	0,8	●	-	-	-
TPGW160408S01225MT	9,53	16,50	0,8	●	-	-	-
TPGW16T308S01015MT	9,53	16,50	0,8	-	●	-	-
TPGW16T308S01225MT	9,53	16,50	0,8	-	●	-	-

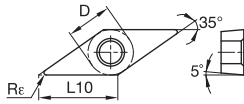
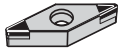
NOTE: For toolholders and boring bars, see pages B257–B263.



■ TPU-T

ISO catalogue number	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
TPUN110304T00520	6,35	11,00	0,4	-	-	-	●
TPUN110308T00520	6,35	11,00	0,8	-	-	-	●
TPUN160304T00520	9,53	16,50	0,4	-	-	-	●
TPUN160308T00520	9,53	16,50	0,8	-	-	-	●
TPUN160312T00520	9,53	16,50	1,2	-	-	-	●

ISO Turning



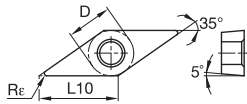
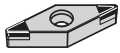
● first choice
○ alternate choice

P	■	■	■	●
M	■	■	■	■
K	■	■	■	●
N	■	■	■	■
S	■	■	■	●
H	■	●	●	●

■ VBGW-MT

ISO catalogue number	D	L10	Re	KBH10	KBH20	KB5630	KY1615
VBGW110304S01015MT	6,35	11,07	0,4	●	●	-	-
VBGW110304S01225MT	6,35	11,07	0,4	-	●	-	-
VBGW110308S01015MT	6,35	11,07	0,8	●	-	-	-
VBGW110308S01225MT	6,35	11,07	0,8	-	-	-	-
VBGW160404S01015MT	9,53	16,61	0,4	●	-	●	-
VBGW160408S01015MT	9,53	16,61	0,8	●	●	-	-
VBGW160412S01015MT	9,53	16,61	1,2	-	●	-	-

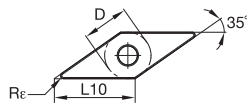
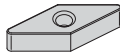
NOTE: For toolholders and boring bars, see pages B266–B269.



■ VCGW • Light Machining

ISO catalogue number	D	L10	Re	KBH10	KBH20	KB5630	KY1615
VCGW160404S01015MT	9,53	16,61	0,4	-	●	-	-
VCGW160404S01225MT	9,53	16,61	0,4	-	●	-	-
VCGW160408S01015MT	9,53	16,61	0,8	-	●	-	-
VCGW160408S01225MT	9,53	16,61	0,8	-	●	-	-

NOTE: For toolholders and boring bars, see pages B266–B269.



■ VNGA

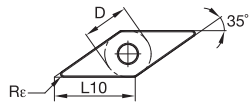
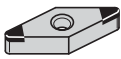
ISO catalogue number	D	L10	Re	KBH10	KBH20	KB5630	KY1615
VNGA160404T02020	9,53	16,61	0,4	-	-	-	●
VNGA160408T02020	9,53	16,61	0,8	-	-	-	●
VNGA160412T02020	9,53	16,61	1,2	-	-	-	●
VNGA220408T02020	12,70	22,14	0,8	-	-	-	●

NOTE: For toolholders and boring bars, see pages B149–B153.

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

● first choice
○ alternate choice

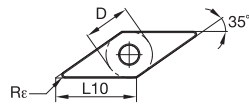
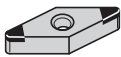
ISO Turning



■ VNGA-MT

ISO catalogue number	D	L10	R _ε	KBH10	KBH20	KB5630	KY1615
VNGA160404S01015MT	9,53	16,61	0,4	●	●	-	-
VNGA160404S01025MT	9,53	16,61	0,4	-	-	●	-
VNGA160404S01225MT	9,53	16,61	0,4	●	●	-	-
VNGA160404S01735MT	9,53	16,61	0,4	-	●	-	-
VNGA160408S01015MT	9,53	16,61	0,8	●	●	-	-
VNGA160408S01025MT	9,53	16,61	0,8	-	-	●	-
VNGA160408S01225MT	9,53	16,61	0,8	●	●	-	-
VNGA160408S01735MT	9,53	16,61	0,8	-	●	-	-
VNGA160412S01225MT	9,53	16,61	1,2	-	●	-	-

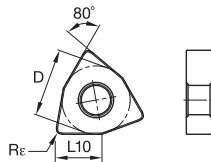
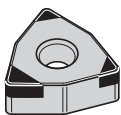
NOTE: For toolholders and boring bars, see pages B149–B153.



■ VNGM

ISO catalogue number	D	L10	R _ε	KBH10	KBH20	KB5630	KY1615
VNGM160408S01325MTCB1	9,53	16,61	0,8	-	●	-	-
VNGM160412S01325MTCB1	9,53	16,61	1,2	-	●	-	-

NOTE: For toolholders and boring bars, see pages B149–B153.

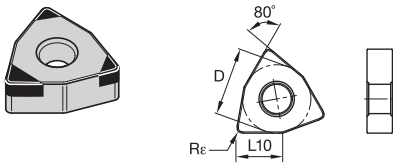


■ WNGA

ISO catalogue number	D	L10	R _ε	KBH10	KBH20	KB5630	KY1615
WNGA080408S01015FWMT	12,70	8,69	0,8	-	●	-	-

NOTE: For toolholders and boring bars, see pages B161–B165.

ISO Turning



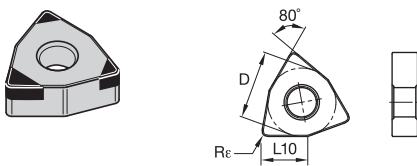
● first choice
○ alternate choice

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

■ WNGA-FWMT

ISO catalogue number	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
WNGA080408S01015FWHBMT	12,70	8,69	0,8	-	●	-	-

NOTE: For toolholders and boring bars, see pages B161–B165.



■ WNGA-MT

ISO catalogue number	D	L10	Rε	KBH10	KBH20	KB5630	KY1615
WNGA080404S01015MT	12,70	8,69	0,4	-	●	-	-
WNGA080408S01015MT	12,70	8,69	0,8	-	●	-	-
WNGA080408S01225MT	12,70	8,69	0,8	-	●	-	-
WNGA080408S01735MT	12,70	8,69	0,8	-	●	-	-
WNGA80408S01015MT	12,70	8,69	0,8	●	-	-	-
WNGA80408S01225MT	12,70	8,69	0,8	●	-	-	-

NOTE: For toolholders and boring bars, see pages B161–B165.

A4™ Tooling and Beyond™ Inserts



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 delivers a very high metal removal rate.

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.

Experience the advantages at your Authorised Kennametal Distributor or at kennametal.com.



kennametal.com

➤ Machining High-Temp Alloys with **Ceramics** and **PcBN**

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

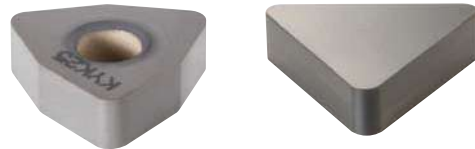
KYS ceramic inserts are the first choice for high-speed applications in high-temp alloys. The multilayer coating offers enhanced chemical wear resistance versus uncoated grades. A superior SiAlON ceramic substrate provides excellent depth of cut notching resistance versus whisker-reinforced ceramics.



Ceramic Inserts

KYS25™ Grade

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



KYS30™ Grade

- 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.

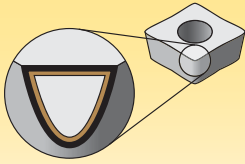


Tipped PcBN Inserts

KB1630 Grade

- 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.


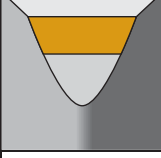




Coatings provide high-speed capability and are engineered for finishing to light roughing.

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

wear resistance ← → toughness

Coating		Grade Description		05	10	15	20	25	30	35	40	45	
Ceramic Grades	 KYS25 —	Composition: SiAlON ceramic with a multilayered alumina-TiCN CVD coating. Application: Complements 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.											
PcBN – Polycrystalline Cubic Boron Nitride Grades	 KB1630 —	Composition: An uncoated high content PcBN grade. PcBN tips are 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 grey cast iron, chilled irons, high chrome alloyed steels, high temp alloys and sintered powder metals. The tipped PcBN inserts are available in a wide range of insert styles, including Top Notch™ and Screw-On geometries.											

NOVO KNOWS SEARCH

Searching for a tool has been enhanced by Advise and Select functions from NOVO™ applications — saving you time and money.

ADVISE

Uses a rules-based approach to provide cutting tool recommendations:

- Define Machining Feature (face milling, slotting, blind hole, etc.)
- Apply Constraint Requirements (geometric, material, tolerance, etc.)
- Set Machining Sequence (single or multi-step operations, rough then finish, etc.)
- Receive Ranked Results

SELECT

A method of selecting cutting tools from a tree structure via a hierarchy or parametric search:

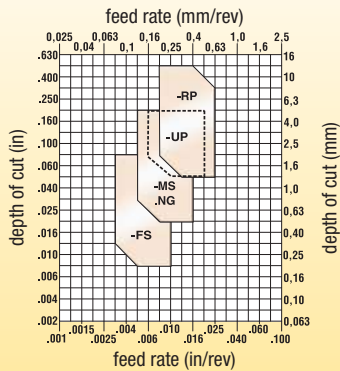
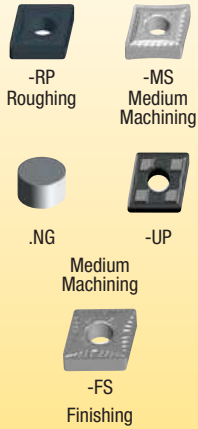
- If you know which product you are looking for, a quick search can be performed by just the catalogue number or product description.
- Smart filters significantly reduce the amount of potential tooling solutions.
- After the tool is selected, NOVO also provides cutting and adaptive item options that fit with your solution.

NOVO applications can ensure you have the right tools on your machines, in the right sequence. Resulting in flawless execution that accelerates every job, and maximises every shift. kennametal.com/novo

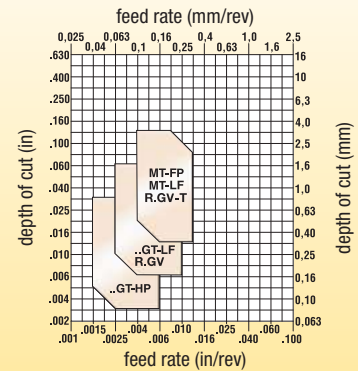
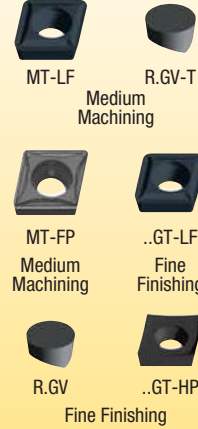
Step 1 • Select the insert geometry



Negative Inserts



Positive Inserts



Step 2 • Select the grade

		Negative Insert Geometry
		.NG
cutting condition		
heavily interrupted cut		-
lightly interrupted cut		KYS30/KY1540
varying depth of cut, casting, or forging skin		KYS30/KY1540/KYS25/KY4300
smooth cut, pre-turned surface		KYS25/KY4300
		Positive Insert Geometry
		R.GV-T
cutting condition		
heavily interrupted cut		-
lightly interrupted cut		KYS30/KY1540
varying depth of cut, casting, or forging skin		KYS30/KY1540/KYS25/KY4300
smooth cut, pre-turned surface		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	KB1630													260	850	
	KYS25/KY4300													200	650	
	KYS30/KY1540													170	550	

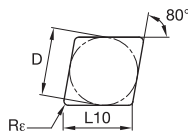
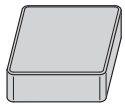
Cobalt-Based, Heat-Resistant Alloys (150–425 HB) (≤45 HRC) speed — m/min (SFM) Starting Conditions

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	KB1630													260	850	
	KYS25/KY4300													220	720	
	KYS30/KY1540													185	600	

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	KB1630													260	850	
	KYS25/KY4300													250	820	
	KYS30/KY1540													215	700	

ISO Turning

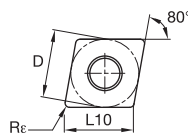
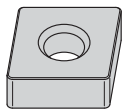


● first choice
○ alternate choice

P			
M			
K			
N			
S	●	●	○
H	○	●	●

■ CNGN

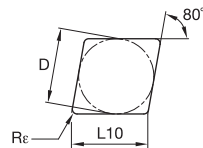
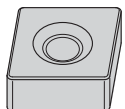
ISO catalogue number	D	L10	Rε	KYS25	KYS30	KB1630
CNGN120416T01020	12,70	12,90	1,6	●	-	-
CNGN120712T01020	12,70	12,90	1,2	●	●	-
CNGN120716T01020	12,70	12,90	1,6	-	●	-



■ CNGA

ISO catalogue number	D	L10	Rε	KYS25	KYS30	KB1630
CNGA120408E	12,70	12,90	0,8	●	●	-
CNGA120408T01020	12,70	12,90	0,8	●	●	-
CNGA120412T01020	12,70	12,90	1,2	●	●	-

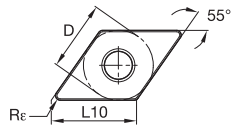
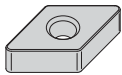
NOTE: For toolholders and boring bars, see pages B58–B73.



■ CNGX

ISO catalogue number	D	L10	Rε	KYS25	KYS30	KB1630
CNGX120708T01020	12,70	12,90	0,8	●	●	-
CNGX120712T01020	12,70	12,90	1,2	●	●	-
CNGX120716E	12,70	12,90	1,6	-	●	-

NOTE: For toolholders and boring bars, see pages B58–B73.



- first choice
- alternate choice

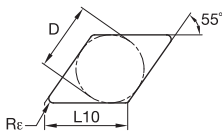
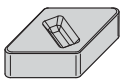
P	■	■	■
M	■	■	■
K	■	■	■
N	■	■	■
S	●	●	○
H	○	○	●

ISO Turning

■ DNGA

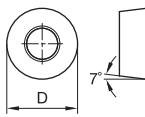
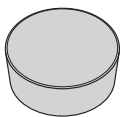
ISO catalogue number	D	L10	Rε	KYS25	KYS30	KB1630
DNGA150408T01020	12,70	15,50	0,8	-	●	-
DNGA150412T01020	12,70	15,50	1,2	-	●	-

NOTE: For toolholders and boring bars, see pages B85–B93.



■ DNGX

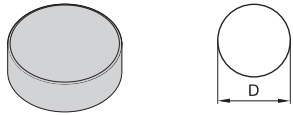
ISO catalogue number	D	L10	Rε	KYS25	KYS30	KB1630
DNGX150708T01020	12,70	15,50	0,8	●	-	-
DNGX150712T01020	12,70	15,50	1,2	●	●	-
DNGX150716T01020	12,70	15,50	1,6	-	●	-



■ RCGX

ISO catalogue number	D	L10	Rε	KYS25	KYS30	KB1630
RCGX060400E	6,35	-	-	●	●	-
RCGX090700E	9,53	-	-	●	●	-
RCGX090700T00525	9,53	-	-	-	●	-
RCGX090700T01020	9,53	-	-	●	●	-
RCGX120700E	12,70	-	-	●	●	-
RCGX120700T01020	12,70	-	-	●	●	-
RCGX120700T01025	12,70	-	-	●	●	-

ISO Turning

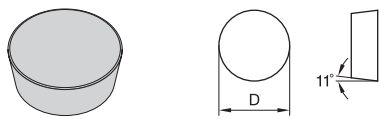


■ RGNG

● first choice
○ alternate choice

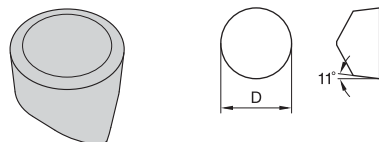
P	■	■	■
M	■	■	■
K	■	■	■
N	■	■	■
S	●	●	○
H	○	○	●

ISO catalogue number	D	L10	Rε	KYS25	KYS30	KB1630
RNGN120400T01020	12,70	—	—	—	●	—
RNGN120700T00525	12,70	—	—	—	●	—
RNGN120700T01020	12,70	—	—	—	●	—
RNGN120700T01025	12,70	—	—	●	●	—
RNGN190700T01020	19,05	—	—	—	●	—



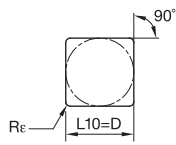
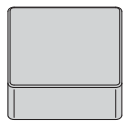
■ RPGN

ISO catalogue number	D	L10	Rε	KYS25	KYS30	KB1630
RPGN060200E	6,35	—	—	—	●	—
RPGN090300E	9,53	—	—	—	●	—
RPGN090300T01020	9,53	—	—	—	●	—
RPGN120400E	12,70	—	—	—	●	—
RPGN120400T01020	12,70	—	—	—	●	—



■ RPGX

ISO catalogue number	D	L10	Rε	KYS25	KYS30	KB1630
RPGX090700E	9,53	—	—	●	●	—
RPGX090700T01020	9,53	—	—	—	●	—
RPGX120700E	12,70	—	—	●	●	—
RPGX120700T01020	12,70	—	—	—	●	—



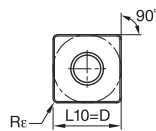
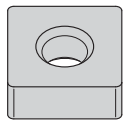
- first choice
- alternate choice

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

ISO Turning

■ SNGN

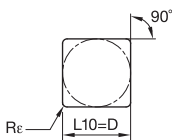
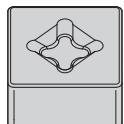
ISO catalogue number	D	L10	Rε	KYS25	KYS30	KB1630
SNGN120408T01020	12,70	12,70	0,8	-	●	-
SNGN120412T01020	12,70	12,70	1,2	-	●	-
SNGN120416T01020	12,70	12,70	1,6	●	●	-
SNGN120716T01020	12,70	12,70	1,6	-	●	-
SNGN190616E	19,05	19,05	1,6	●	-	-
SNGN190616T01020	19,05	19,05	1,6	-	●	-
SNGN190724E	19,05	19,05	2,4	-	●	-



■ SNGA

ISO catalogue number	D	L10	Rε	KYS25	KYS30	KB1630
SNGA120412T01020	12,70	12,70	1,2	●	●	-

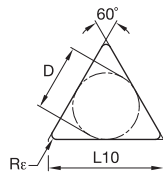
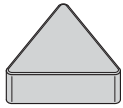
NOTE: For toolholders and boring bars, see pages B105–B121.



■ SNGX

ISO catalogue number	D	L10	Rε	KYS25	KYS30	KB1630
SNGX120712T01020	12,70	12,70	1,2	-	●	-
SNGX120716T01020	12,70	12,70	1,6	-	●	-

ISO Turning

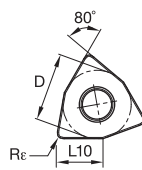
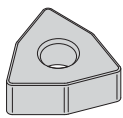


● first choice
○ alternate choice

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

■ TNGN

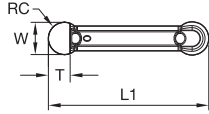
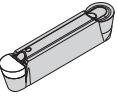
ISO catalogue number	D	L10	Rε	KYS25	KYS30	KB1630
TNGN220412T01020	12,70	22,00	1,2	●	-	-
TNGN220416T01020	12,70	22,00	1,6	●	-	-



■ WNGA

ISO catalogue number	D	L10	Rε	KYS25	KYS30	KB1630
WNGA080408T01020	12,70	8,69	0,8	-	●	-
WNGA080416T01020	12,70	8,69	1,6	-	●	-

NOTE: For toolholders and boring bars, see pages B161–B165.



- first choice
- alternate choice

■ Flat Top Full Radius Precision Ground • PcBN

catalogue number	seat size	W	RC	LI	T	KCU10	KCU25	KCP10	KCP25	KCK20	K313	KC5010	KC5025	KY3500	KT315	KB1630	KB5625	KD1405
A4R0300M03P00EST	3	3,00	1,5	20	2,2	-	-	-	-	-	-	-	-	-	-	●	-	-
A4R0400M04P00EST	4	4,00	2,0	20	2,9	-	-	-	-	-	-	-	-	-	-	●	-	-
A4R0500M05P00EST	5	5,00	2,5	25	3,7	-	-	-	-	-	-	-	-	-	-	●	-	-
A4R0600M06P00EST	6	6,00	3,0	30	4,4	-	-	-	-	-	-	-	-	-	-	●	-	-

NOTE: For A4 holder, boring bars, and blades, see pages C104–C135.

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



➤ Polycrystalline Diamond Inserts



Polycrystalline Diamond (PCD) Inserts

- Use for machining high-temperature alloys and in targeted machining of non-ferrous materials.
- Significant hardness advantage compared to carbide inserts.
- Increased productivity through higher speeds and longer tool life.
- Best used in processing materials that cannot be machined with conventional tooling.

KD1400™ Grade

- Ideal for general-purpose turning of non-ferrous materials.
- Use on low to medium silicon-content aluminium alloys, non-metallics, copper, and brass- and zinc-based alloys.
- Excellent mechanical shock resistance.
- Use in a wide range of continuous to interrupted cuts where superior surface finished is needed.



KD1405™ Grade

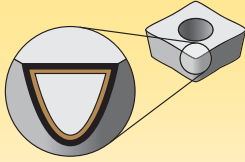
- The most abrasion-resistant tool material for non-ferrous and non-metallic materials from Kennametal.
- Use when abrasion resistance is needed in the application.
- CVD diamond grade.



KD1425™ Grade

- Engineered for extreme abrasion resistance.
- Good edge strength in demanding applications.
- Ideal choice for high-silicon aluminium alloys, bi-metallic materials, carbon-fibre reinforced plastics, and other abrasive non-metallic materials.





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

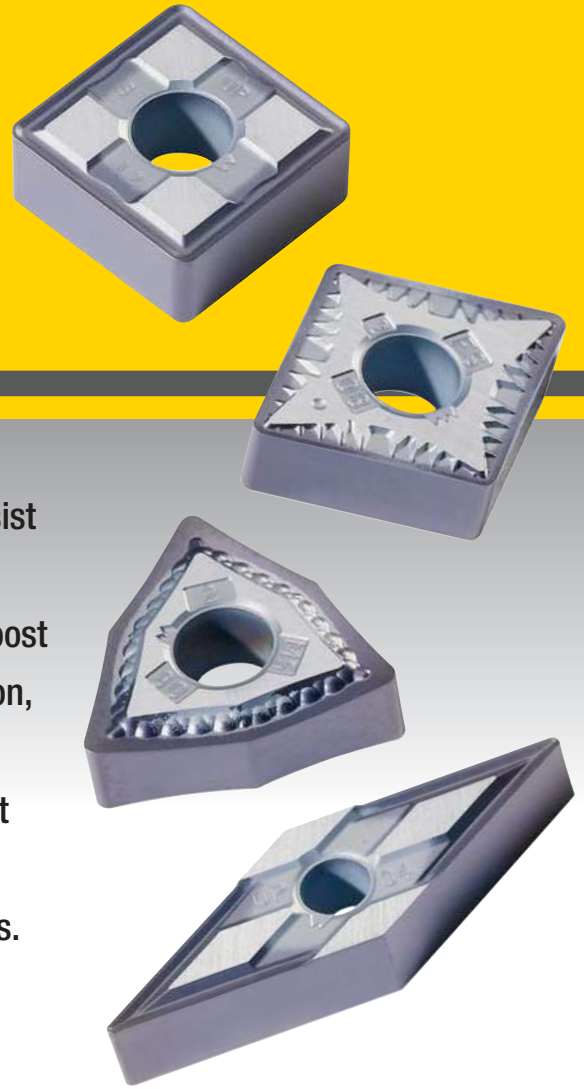
P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous
S	High-Temp Alloys
H	Hardened Materials

wear resistance ← → toughness

PCD — Polycrystalline Diamond Grades

Coating	Grade Description		05	10	15	20	25	30	35	40	45
KD1400	<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 aluminium 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>										
KD1405	<p>Composition: A pure CVD-deposited diamond-sheet tool brazed directly to a carbide substrate.</p> <p>Application: KD1405™ is the best Kennametal abrasion-resistant tool material for non-ferrous and non-metallic materials. Best applied when abrasion resistance is the desired benefit.</p>										
KD1425	<p>Composition: A multimodal PCD grade with a range of grain sizes brazed onto a carbide substrate.</p> <p>Application: Engineered for extreme abrasion resistance, combined with good edge strength for demanding applications. An ideal choice for high-silicon aluminium alloys, bi-metallic (AL/GC) materials, MMC, carbon-fibre reinforced plastics, and other abrasive non-metallic materials.</p>										

Beyond™ PVD Grades



Beyond™ advanced PVD coatings are well suited to resist high temperatures associated with machining tough alloys. These coatings offer increased tool life and a boost in productivity to the general engineering, transportation, aerospace, energy, and earthworks markets. Use the strength of Beyond PVD coatings and the broad product offering to perform turning, grooving, and cut-off operations in a wide array of materials and applications. Beyond PVD coatings help to maintain consistent chip control and minimise insert edge wear.



KCU10™ Grade

- PVD-coated grade with excellent wear resistance. Finishing to medium applications.
- Use in all materials, especially stainless steels and high-temp alloys.

KCU25™ Grade

- PVD-coated grade with superior edge toughness and excellent wear resistance. Medium to roughing applications.
- Use in all materials.

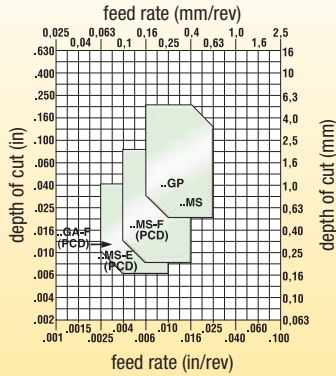
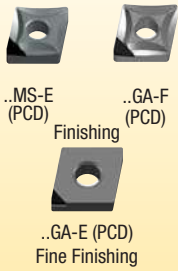
Experience the advantages at your Authorised Kennametal Distributor or at kennametal.com.



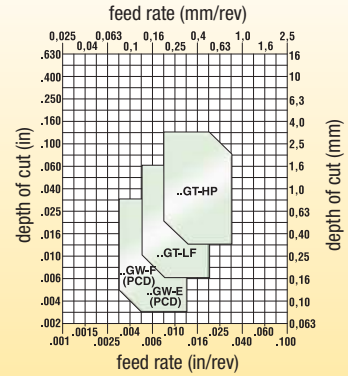
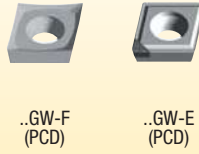
kennametal.com

Step 1 • Select the insert geometry

Negative Inserts



Positive Inserts



Step 2 • Select the grade

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

Step 3 • Selecting the cutting speed

Low-Silicon Aluminium Alloys

(hypoeutectic <12.2% Si) and Magnesium Alloys

speed — m/min (SFM)

Starting Conditions

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
N1	KD1400											765	2500

High-Silicon Aluminium Alloys

(hypereutectic >12.2% Si) and Magnesium Alloys

speed — m/min (SFM)

Starting Conditions

material group	grade	speed — m/min (SFM)				Starting Conditions	
		250 (800)	500 (1600)	750 (2400)	1000 (3200)	m/min	SFM
N3	KD1405					550	1800
	KD1425					765	2500

■ 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

Nylon, Plastics, Rubbers, Phenolics, Resins, Fibreglass, 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

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

MMCs (Aluminium-Based Metal Matrix Composites)

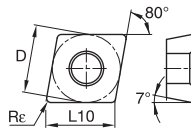
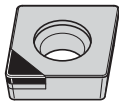
speed — m/min (SFM)

Starting Conditions



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

ISO Turning



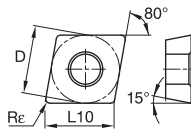
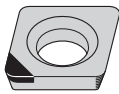
- first choice
- alternate choice

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

■ CCGW-FST

ISO catalogue number	D	L10	Rε	KD1400	KD1405	KD1425
CCGW060204FST	6,35	6,45	0,4	●	-	●
CCGW09T304FST	9,53	9,67	0,4	●	-	●
CCGW09T308FST	9,53	9,67	0,8	●	-	●

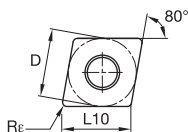
NOTE: For toolholders and boring bars, see pages B179–B183.



■ CDHB-FST

ISO catalogue number	D	L10	Rε	KD1400	KD1405	KD1425
CDHBS4T002FST	3,97	4,03	0,2	●	-	●
CDHBS4T0X0FST	3,97	4,03	0,1	●	-	-

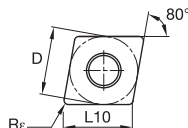
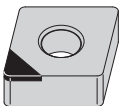
NOTE: For toolholders and boring bars, see pages B185–B187.



■ CNGA

ISO catalogue number	D	L10	Rε	KD1400	KD1405	KD1425
CNGA120404E	12,70	12,90	0,4	-	●	-
CNGA120408E	12,70	12,90	0,8	-	●	-

NOTE: For toolholders and boring bars, see pages B58–B73.



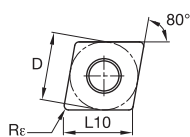
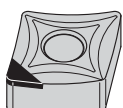
■ CNGA-FST

ISO catalogue number	D	L10	Rε	KD1400	KD1405	KD1425
CNGA120404FST	12,70	12,90	0,4	●	-	●
CNGA120408FST	12,70	12,90	0,8	●	-	●

NOTE: For toolholders and boring bars, see pages B58–B73.

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

ISO Turning

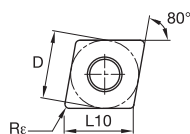
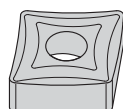


- first choice
- alternate choice

■ CNMS-E

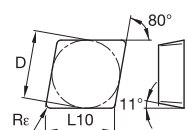
ISO catalogue number	D	L10	Rε	KD1400	KD1405	KD1425
CNMS120408E	12,70	12,90	0,8	-	●	-

NOTE: For toolholders and boring bars, see pages B58–B73.

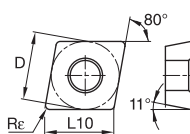
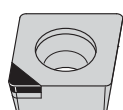

■ CNMS-FST

ISO catalogue number	D	L10	Rε	KD1400	KD1405	KD1425
CNMS120404FST	12,70	12,90	0,4	●	-	-
CNMS120408FST	12,70	12,90	0,8	●	-	●

NOTE: For toolholders and boring bars, see pages B58–B73.


■ CPGN

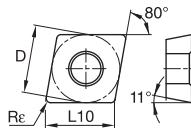
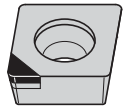
ISO catalogue number	D	L10	Rε	KD1400	KD1405	KD1425
CPGN120304F	12,70	12,90	0,4	-	-	●
CPGN120308F	12,70	12,90	0,8	-	-	●


■ CPGW-E-F

ISO catalogue number	D	L10	Rε	KD1400	KD1405	KD1425
CPGW060204E	6,35	6,45	0,4	-	●	-
CPGW09T304E	9,53	9,67	0,4	-	●	-

NOTE: For toolholders and boring bars, see pages B192–B205.

ISO Turning



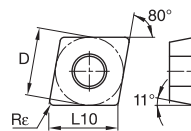
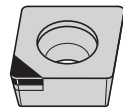
- first choice
- alternate choice

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

■ CPGW-FWST

ISO catalogue number	D	L10	Rε	KD1400	KD1405	KD1425
CPGW060204FWST	6,35	6,45	0,4	●	-	●
CPGW09T308FWST	9,53	9,67	0,8	●	-	●
CPGW120408FWST	12,70	12,90	0,8	●	-	●

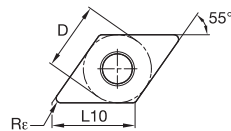
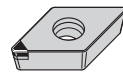
NOTE: For toolholders and boring bars, see pages B192–B205.



■ CPGW-ST

ISO catalogue number	D	L10	Rε	KD1400	KD1405	KD1425
CPGW060202FST	6,35	6,45	0,2	●	-	●
CPGW060204FST	6,35	6,45	0,4	●	-	●
CPGW060208FST	6,35	6,45	0,8	●	-	●
CPGW09T304FST	9,53	9,67	0,4	●	-	●
CPGW09T308FST	9,53	9,67	0,8	●	-	●

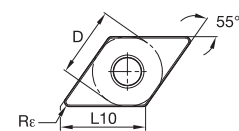
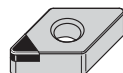
NOTE: For toolholders and boring bars, see pages B192–B205.



■ DCGW-ST

ISO catalogue number	D	L10	Rε	KD1400	KD1405	KD1425
DCGW070204FST	6,35	7,75	0,4	●	-	●
DCGW11T304FST	9,53	11,63	0,4	●	-	●

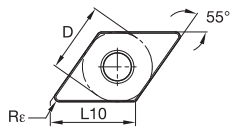
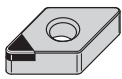
NOTE: For toolholders and boring bars, see pages B209–B213.



■ DNGA

ISO catalogue number	D	L10	Rε	KD1400	KD1405	KD1425
DNGA150404E	12,70	15,50	0,4	-	●	-

NOTE: For toolholders and boring bars, see pages B85–B93.



- first choice
- alternate choice

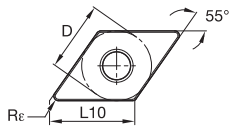
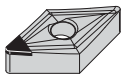
P	■	■	■
M	■	■	■
K	■	■	■
N	●	○	●
S	■	■	■
H	■	■	■

ISO Turning

■ DNGA-FST

ISO catalogue number	D	L10	Rε	KD1400	KD1405	KD1425
DNGA150404FST	12,70	15,50	0,4	●	-	●
DNGA150408FST	12,70	15,50	0,8	●	-	●

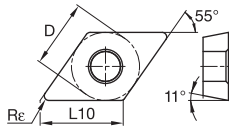
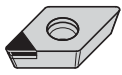
NOTE: For toolholders and boring bars, see pages B192–B205.



■ DNMS-FST

ISO catalogue number	D	L10	Rε	KD1400	KD1405	KD1425
DNMS150404FST	12,70	15,50	0,4	●	-	-
DNMS150408FST	12,70	15,50	0,8	●	-	●

NOTE: For toolholders and boring bars, see pages B192–B205.

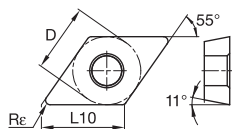
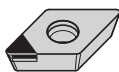


■ DPGW-E

ISO catalogue number	D	L10	Rε	KD1400	KD1405	KD1425
DPGW11T304E	9,53	11,63	0,4	-	●	-

NOTE: For toolholders and boring bars, see pages B217–B221.

ISO Turning



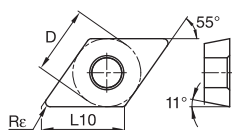
● first choice
○ alternate choice

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

■ DPGW-FST

ISO catalogue number	D	L10	Rε	KD1400	KD1405	KD1425
DPGW070202FST	6,35	7,75	0,2	●	-	●
DPGW070204FST	6,35	7,75	0,4	●	-	●
DPGW11T304FST	9,53	11,63	0,4	●	-	●

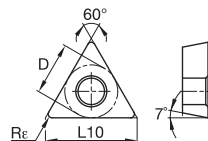
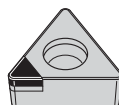
NOTE: For toolholders and boring bars, see pages B217–B221.



■ DPGW-FWST

ISO catalogue number	D	L10	Rε	KD1400	KD1405	KD1425
DPGW11T304FWST	9,53	11,63	0,2	-	-	●

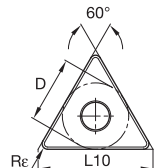
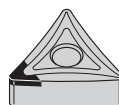
NOTE: For toolholders and boring bars, see pages B217–B221.



■ TCGW-FST

ISO catalogue number	D	L10	Rε	KD1400	KD1405	KD1425
TCGW110204FST	6,35	11,00	0,4	●	-	●
TCGW16T304FST	9,53	16,50	0,4	●	-	-

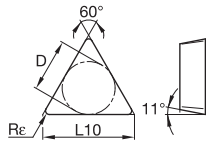
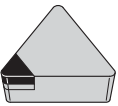
NOTE: For toolholders and boring bars, see pages B247–B248.



■ TNMS-FST

ISO catalogue number	D	L10	Rε	KD1400	KD1405	KD1425
TNMS160404FST	9,53	16,50	0,4	●	-	●
TNMS160408FST	9,53	16,50	0,8	●	-	●

NOTE: For toolholders and boring bars, see pages B132–B142.

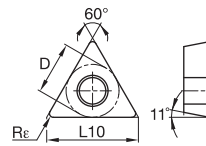
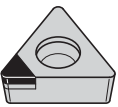


- first choice
- alternate choice

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

■ TPGN

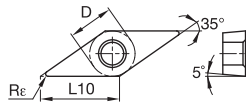
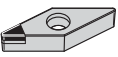
ISO catalogue number	D	L10	Rε	KD1400	KD1405	KD1425
TPGN110304F	6,35	11,00	0,4	-	-	●
TPGN160304F	9,53	16,50	0,4	-	-	●
TPGN160308F	9,53	16,50	0,8	-	-	●
TPGN220408F	12,70	22,00	0,8	-	-	●



■ TPGW-FST

ISO catalogue number	D	L10	Rε	KD1400	KD1405	KD1425
TPGW110204FST	6,35	11,00	0,4	●	-	●
TPGW110208FST	6,35	11,00	0,8	●	-	-
TPGW16T304FST	9,53	16,50	0,4	-	-	●
TPGW16T308FST	9,53	16,50	0,8	●	-	●

NOTE: For toolholders and boring bars, see pages B257–B263.



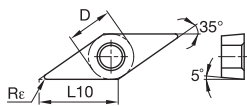
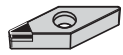
■ VBGW-E

ISO catalogue number	D	L10	Rε	KD1400	KD1405	KD1425
VBGW160408E	9,53	16,61	0,8	-	●	-

NOTE: For toolholders and boring bars, see pages B266–B269.



ISO Turning



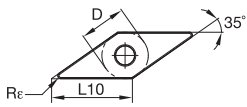
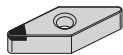
● first choice
○ alternate choice

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

■ VBGW-FST

ISO catalogue number	D	L10	Rε	KD1400	KD1405	KD1425
VBGW110304FST	6,35	11,07	0,4	●	-	●
VBGW160404FST	9,53	16,61	0,4	●	-	●

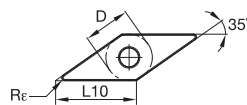
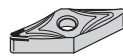
NOTE: For toolholders and boring bars, see pages B266–B269.



■ VNGA-FST

ISO catalogue number	D	L10	Rε	KD1400	KD1405	KD1425
VNGA160404FST	9,53	16,61	0,4	●	-	-
VNGA160408FST	9,53	16,61	0,8	●	-	●

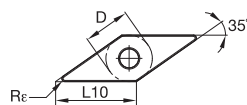
NOTE: For toolholders and boring bars, see pages B149–B153.



■ VNMS-E

ISO catalogue number	D	L10	Rε	KD1400	KD1405	KD1425
VNMS160404E	9,53	16,61	0,4	-	●	-
VNMS160408E	9,53	16,61	0,8	-	●	-

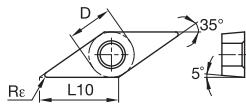
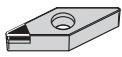
NOTE: For toolholders and boring bars, see pages B149–B153.



■ VNMS-FST

ISO catalogue number	D	L10	Rε	KD1400	KD1405	KD1425
VNMS160404FST	9,53	16,61	0,4	●	-	●
VNMS160408FST	9,53	16,61	0,8	●	-	●

NOTE: For toolholders and boring bars, see pages B149–B153.

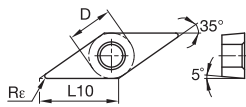
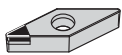


- first choice
- alternate choice

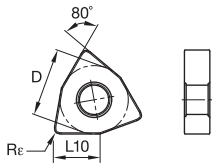
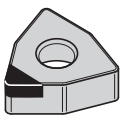
P	■	■	■
M	■	■	■
K	■	■	■
N	●	○	○
S	■	○	○
H	■	■	■


■ VPGN

ISO catalogue number	D	L10	Rε	KD1400	KD1405	KD1425
VCGN160404	9,53	16,61	0,4	-	-	●
VCGN160408	9,53	16,61	0,8	-	-	●

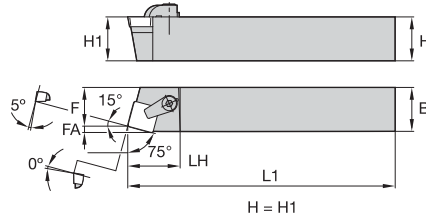
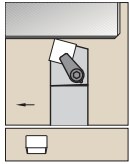

■ VPGR

ISO catalogue number	D	L10	Rε	KD1400	KD1405	KD1425
VCGR160404	9,53	16,61	0,4	-	-	●
VCGR160408	9,52	16,61	0,8	-	-	●
VCGR160412	9,53	16,61	1,2	-	-	●

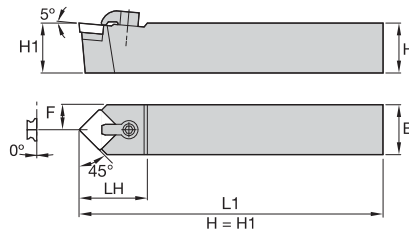
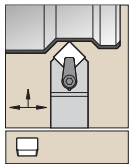

■ WNGA-FST

ISO catalogue number	D	L10	Rε	KD1400	KD1405	KD1425
WNGA080408FST	12,70	8,69	0,8	-	-	●

NOTE: For toolholders and boring bars, see pages B161–B165.


CSBP 75°

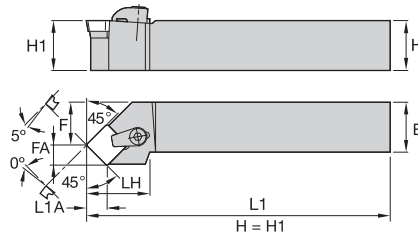
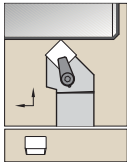

order number	catalogue number	H	B	F	L1	LH	FA	gage insert	shim	shim screw	hex	clamp	clamp screw	hex
right hand 1097750	CSBPR2020K12	20	20	17,0	125	30,0	3,1	SP..120308	SM840	MS111	2 mm	CKM10	STCM8	4 mm


CSDP 45°


order number	catalogue number	H	B	F	L1	LH	gage insert	shim	shim screw	hex	clamp	clamp screw	hex
1097754	CSDPN2020K12	20	20	10,0	125	32,0	SP..120308	SM840	MS111	2 mm	CKM10	STCM8	4 mm
1097755	CSDPN2525M12	25	25	12,5	150	32,0	SP..120308	SM840	MS111	2 mm	CKM9	STCM4	4 mm



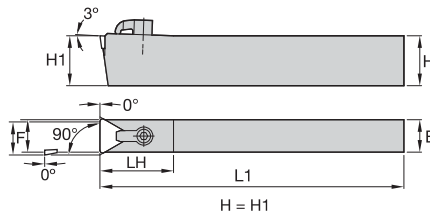
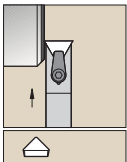
ISO Turning



■ **CSSP 45°**



order number	catalogue number	H	B	F	L1	LH	FA	L1A	gage insert	shim	shim screw	hex	clamp	clamp screw	hex
right hand															
1244605	CSSPR2020K12	20	20	25,0	125	32,0	8,7	8,3	SP..120308	SM840	MS111	2 mm	CKM10	STCM8	4 mm
1244606	CSSPR2525M12	25	25	32,0	150	32,0	8,7	8,3	SP..120308	SM840	MS111	2 mm	CKM9	STCM4	4 mm
left hand															
1244604	CSSPL2525M12	25	25	32,0	150	32,0	8,7	8,3	SP..120308	SM840	MS111	2 mm	CKM9	STCM4	4 mm



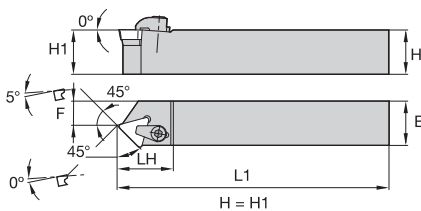
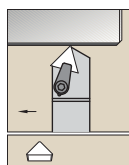
■ **CTCF 90°**



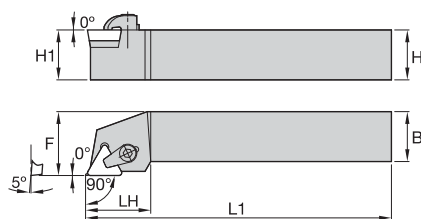
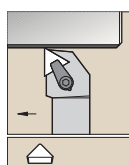
order number	catalogue number	H	B	F	L1	LH	gage insert	shim	shim screw	hex	clamp	clamp screw	hex
1097775	CTCPN2510M11	25	10	10,0	150	26,0	TP..110304	SM819	MS960	—	CKM7	STCM5	2.5 mm
1097776	CTCPN2514M16	25	14	14,4	150	28,0	TP..160308	SM841	MS111	2 mm	CKM13	STCM4	4 mm
1097781	CTCPN2518M22	25	18	19,2	150	41,0	TP..220408	SM837	MS125	2.5 mm	CKM13	STCM4	4 mm
1097778	CTCPN2520M22	25	20	20,2	150	41,0	TP..220408	SM837	MS125	2.5 mm	CKM13	STCM4	4 mm



ISO Turning


CTDP 45°

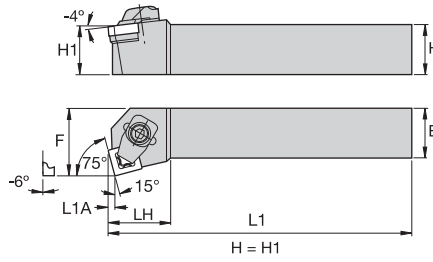
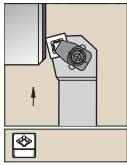
order number	catalogue number	H	B	F	L1	LH	gage insert	shim	shim screw	clamp	clamp screw	hex
right hand												
1244613	CTDPR1212F11	12	12	6,0	80	22,0	TP..110304	SM819	MS960	CKM19	STCM9	2.5 mm


CTGP 90°

order number	catalogue number	H	B	F	L1	LH	gage insert	shim	shim screw	hex	clamp	clamp screw	hex
right hand													
1097762	CTGPR1212F11	12	12	16,0	80	20,0	TP..110304	SM819	MS960	—	CKM19	STCM9	2.5 mm
1097763	CTGPR1616H11	16	16	20,0	100	20,0	TP..110304	SM819	MS960	—	CKM19	STCM9	2.5 mm
1244595	CTGPR2020K11	20	20	25,0	125	20,0	TP..110304	SM819	MS960	—	CKM19	STCM9	2.5 mm
1097764	CTGPR2020K16	20	20	25,0	125	26,0	TP..160308	SM841	MS111	2 mm	CKM10	STCM8	4 mm
1097765	CTGPR2525M16	25	25	32,0	150	26,0	TP..160308	SM841	MS111	2 mm	CKM9	STCM4	4 mm
left hand													
1097916	CTGPL1212F11	12	12	16,0	80	20,0	TP..110304	SM819	MS960	—	CKM19	STCM9	2.5 mm
1097918	CTGPL2020K16	20	20	25,0	125	26,0	TP..160308	SM841	MS111	2 mm	CKM10	STCM8	4 mm
1097919	CTGPL2525M16	25	25	32,0	150	26,0	TP..160308	SM841	MS111	2 mm	CKM9	STCM4	4 mm



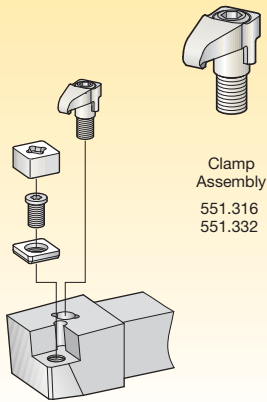
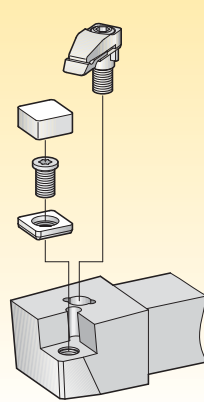
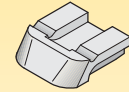
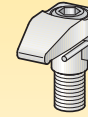
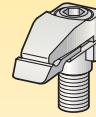
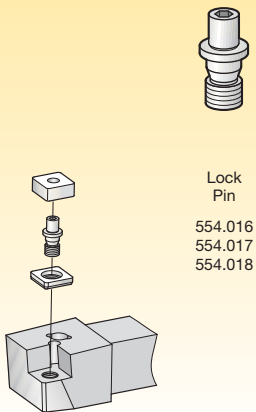
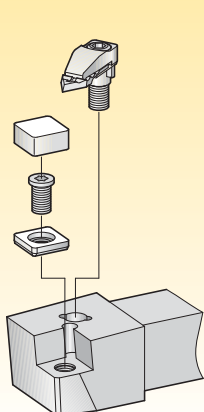
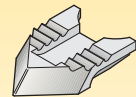
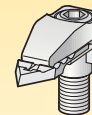
ISO Turning



■ CCKN 75° • MX

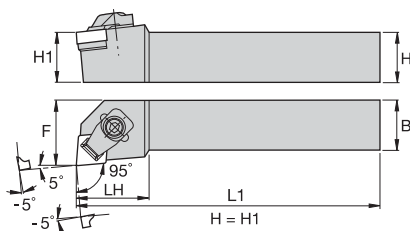
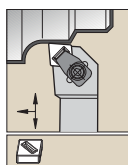


order number	catalogue number	H	B	F	L1	LH	L1A	gage insert	shim	shim screw	hex	clamp assembly	hex
right hand													
2891706	CCKNR2525M12MX7	25	25	32,0	150	32,0	3,1	CNGX120708	552.221	554.252	2.5 mm	551.013	4 mm
left hand													
2891727	CCKNL2525M12MX7	25	25	32,0	150	32,0	3,1	CNGX120708	552.221	554.252	2.5 mm	551.013	4 mm

■ Spare Parts • -MX, -MN, -MF, and -MA Clamping Version
**Clamping Mode
MX**

**Clamping Mode
MN**

 Individual
Clamping Elements

**Clamping Mode
MA**

**Clamping Mode
MF**

 Individual
Clamping Elements




ISO Turning



■ CCLN 95° • MX



order number	catalogue number	H	B	F	L1	LH	gage insert	shim	shim screw	hex	clamp assembly	hex
right hand												
1260025	CCLNR2525M12-MX7	25	25	32,0	150	32,0	CN.X120708	552.221	554.252	2.5 mm	551.316	4 mm
1260028	CCLNR3225P12-MX7	32	25	32,0	170	32,0	CN.X120708	552.221	554.252	2.5 mm	551.316	4 mm
left hand												
1260017	CCLNL2525M12-MX7	25	25	32,0	150	30,0	CN.X120708	552.221	554.252	2.5 mm	551.316	4 mm
1260020	CCLNL3225P12-MX7	32	25	32,0	170	32,0	CN.X120708	552.221	554.252	2.5 mm	551.316	4 mm

■ CCLN 95° • MN



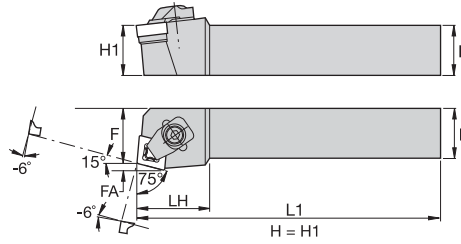
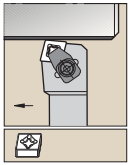
order number	catalogue number	H	B	F	L1	LH	gage insert	shim	shim screw	hex	thrust plate	clamp assembly	hex
right hand													
1260023	CCLNR2525M12-MN4	25	25	32,0	150	32,0	CN.N120408	552.220	554.252	2.5 mm	557.111	551.317	4 mm
1260024	CCLNR2525M12-MN7	25	25	32,0	150	32,0	CN.N120708	552.221	554.252	2.5 mm	557.111	551.317	4 mm
1504937	CCLNR3225P12-MN4	32	25	32,0	170	32,0	CN.N120408	552.220	554.252	2.5 mm	557.111	551.317	4 mm
1260027	CCLNR3225P12-MN7	32	25	32,0	170	32,0	CN.N120708	552.221	554.252	2.5 mm	557.111	551.317	4 mm
left hand													
1260015	CCLNL2525M12-MN4	25	25	32,0	150	32,0	CN.N120408	552.220	554.252	2.5 mm	557.111	551.317	4 mm
1260016	CCLNL2525M12-MN7	25	25	32,0	150	32,0	CN.N120708	552.221	554.252	2.5 mm	557.111	551.317	4 mm
1504931	CCLNL3225P12-MN7	32	25	32,0	170	32,0	CN.N120708	552.221	554.252	2.5 mm	557.111	551.317	4 mm

■ CCLN 95° • MF



order number	catalogue number	H	B	F	L1	LH	gage insert	shim	shim screw	hex	chipbreaker	clamp assembly	hex
right hand													
1260022	CCLNR2525M12-MF4	25	25	32,0	150	32,0	CN.N120408	552.220	554.252	2.5 mm	557.125	551.317	4 mm
1503826	CCLNR2525M12-MF7	25	25	32,0	150	32,0	CN.N120708	552.221	554.252	2.5 mm	557.125	551.317	4 mm
left hand													
1260014	CCLNL2525M12-MF4	25	25	32,0	150	32,0	CN.N120408	552.220	554.252	2.5 mm	557.125	551.317	4 mm
1504935	CCLNL2525M12-MF7	25	25	32,0	150	32,0	CN.N120708	552.221	554.252	2.5 mm	557.125	551.317	4 mm

NOTE: MX — clamping version is shown.
 Basic holder may be ordered separately:
 V.CLN R/L 2525M12
 V.CLN R/L 3225P12
 V.CLN R/L 3225P16


■ CCRN 75° • MN


order number	catalogue number	H	B	F	L1	LH	FA	gage insert	shim	shim screw	hex	thrust plate	clamp assembly	hex
right hand														
1504885	CCRNR3225P12-MN7	32	25	27,0	170	35,0	3,1	CN.N120708	552.221	554.252	2.5 mm	557.111	551.317	4 mm
left hand														
1503827	CCRNL2525M12-MN7	25	25	27,0	150	35,0	3,1	CN.N120708	552.221	554.252	2.5 mm	557.111	551.317	4 mm

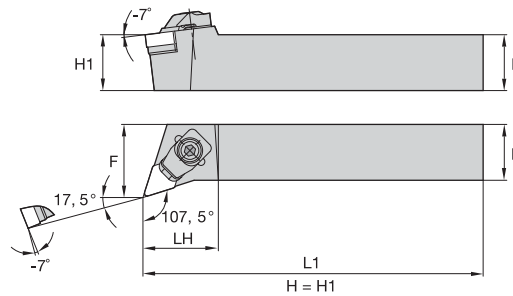
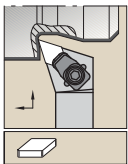
NOTE: MX — clamping version is shown.

Basic holder may be ordered separately:

V.CRN R/L 2525M12

V.CRN R/L 3225P12

V.CRN R/L 3225P16


■ CDHN 107,5° • MX


order number	catalogue number	H	B	F	L1	LH	gage insert	shim	shim screw	hex	clamp assembly	hex
right hand												
1505504	CDHNR2525M12-MX7	25	25	32,0	150	30,0	DN.X120708	552.225	554.254	2.5 mm	551.316	4 mm

NOTE: MN — clamping version is shown.

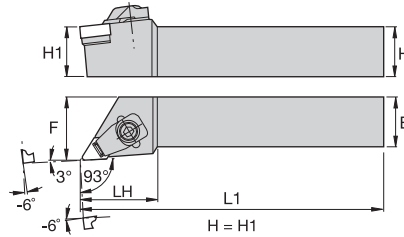
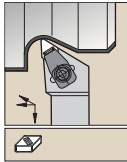
Basic holder may be ordered separately:

V.DHN R/L 2525M12

V.DHN R/L 2525M15

V.DHN R/L 3225P15

ISO Turning



■ CDJN 93° • MX

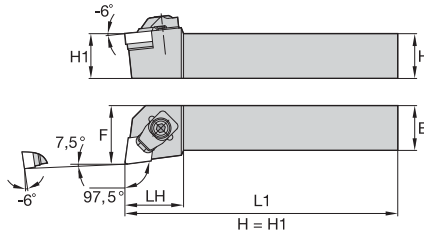
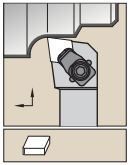


order number	catalogue number	H	B	F	L1	LH	gage insert	shim	shim screw	hex	clamp assembly	hex
right hand												
1260177	CDJNR2525M15-MX7	25	25	32,0	150	38,0	DN.X150708	552.228	554.252	2.5 mm	551.332	4 mm
left hand												
1260172	CDJNL2525M12-MX7	25	25	32,0	150	38,0	DN.X120708	552.225	554.254	2.5 mm	551.316	4 mm
1504968	CDJNL2525M15MX7	25	25	32,0	150	38,0	DN.X150708	552.228	554.252	2.5 mm	551.332	4 mm

■ CDJN 93° • MN



order number	catalogue number	H	B	F	L1	LH	gage insert	shim	shim screw	hex	thrust plate	clamp assembly	hex
right hand													
1260176	CDJNR2525M15MN7	25	25	32,0	150	38,0	DN.N150708	552.228	554.252	2.5 mm	557.111	551.317	4 mm
1327362	CDJNR3225P15MN7	32	25	32,0	170	38,0	DN.N150708	552.228	554.252	2.5 mm	557.111	551.317	4 mm
left hand													
1504969	CDJNL2525M15MN7	25	25	32,0	150	38,0	DN.N150708	552.228	554.252	2.5 mm	557.111	551.317	4 mm
1327363	CDJNL3225P15MN7	32	25	32,0	170	38,0	DN.N150708	552.228	554.252	2.5 mm	557.111	551.317	4 mm

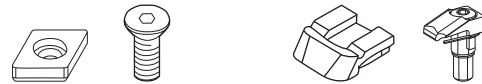


■ **CELN 97,5° • MX**



order number	catalogue number	H	B	F	L1	LH	gage insert	shim	shim screw	hex	clamp assembly	hex
right hand 1505803	CELNR2525M13-MX7	25	25	32,0	150	32,0	EN.X130708	552.240	554.252	2.5 mm	551.316	4 mm

■ **CELN 97,5° • MN**



order number	catalogue number	H	B	F	L1	LH	gage insert	shim	shim screw	hex	thrust plate	clamp assembly	hex
right hand 1501222	CELNR2525M13MN7	25	25	32,0	150	32,0	EN.N130708	552.240	554.252	2.5 mm	557.111	551.317	4 mm
left hand 1501221	CELNL2525M13MN7	25	25	32,0	150	32,0	EN.N130708	552.240	554.252	2.5 mm	557.111	551.317	4 mm

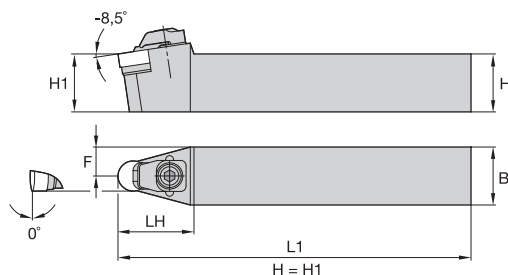
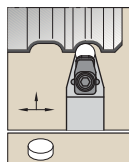
■ **CELN 97,5° • MF**



order number	catalogue number	H	B	F	L1	LH	gage insert	shim	shim screw	hex	chipbreaker	clamp assembly	hex
right hand 1331458	CELNR2525M13MF7	25	25	32,0	150	32,0	EN.N130708	552.240	554.252	2.5 mm	557.125	551.317	4 mm

NOTE: MN — clamping version is shown.
Basic holder may be ordered separately:
V.ELN R/L 2525M13
V.ELN R/L 3225P13

ISO Turning

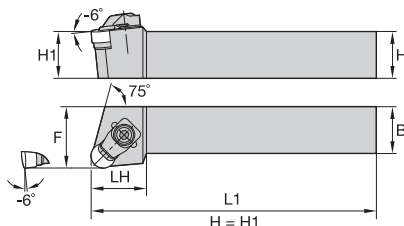
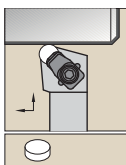


■ CRDN • MN



order number	catalogue number	H	B	F	L1	LH	gage insert	shim	shim screw	hex	thrust plate	clamp assembly	hex
1510281	CRDNN2525M12MN4	25	25	12,5	150	30,0	RN.N120400	552.229	554.252	2.5 mm	557.111	551.333	4 mm
1313053	CRDNN2525M12MN7	25	25	12,5	150	30,0	RN.N120700	552.230	554.252	2.5 mm	557.111	551.333	4 mm
1502204	CRDNN3225P12MN4	32	25	12,5	170	30,0	RN.N120400	552.229	554.252	2.5 mm	557.111	551.333	4 mm
1320407	CRDNN3225P12MN7	32	25	12,5	170	30,0	RN.N120700	552.230	554.252	2.5 mm	557.111	551.333	4 mm

NOTE: MN — clamping version is shown.
 Basic holder may be ordered separately:
 V.RDN N 2525M12
 V.RDN N 3225M12

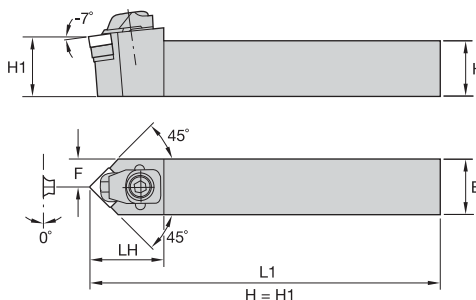
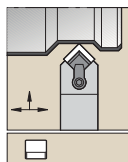


■ CRSN • MN

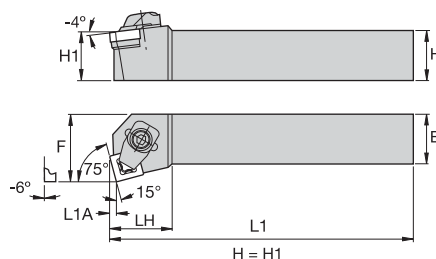
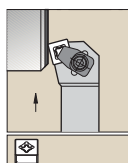


order number	catalogue number	H	B	F	L1	LH	gage insert	shim	shim screw	hex	thrust plate	clamp assembly	hex
right hand													
1510285	CRSNR2525M12-MN4	25	25	32,0	150	26,0	RN.N120400	552.229	554.252	2.5 mm	557.111	551.333	4 mm
1324116	CRSNR2525M12MN7	25	25	32,0	150	26,0	RN.N120700	552.230	554.252	2.5 mm	557.111	551.333	4 mm
1510286	CRSNR3225P12MN4	32	25	32,0	170	26,0	RN.N120400	552.229	554.252	2.5 mm	557.111	551.333	4 mm
1261273	CRSNR3225P12MN7	32	25	32,0	170	26,0	RN.N120700	552.230	554.252	2.5 mm	557.111	551.333	4 mm
left hand													
1510282	CRSNL2525M12-MN4	25	25	32,0	150	26,0	RN.N120400	552.229	554.252	2.5 mm	557.111	551.333	4 mm
1510283	CRSNL2525M12MN7	25	25	32,0	150	26,0	RN.N120700	552.230	554.252	2.5 mm	557.111	551.333	4 mm
1510284	CRSNL3225P12MN4	32	25	32,0	170	26,0	RN.N120400	552.229	554.252	2.5 mm	557.111	551.333	4 mm
1331597	CRSNL3225P12MN7	32	25	32,0	170	26,0	RN.N120700	552.230	554.252	2.5 mm	557.111	551.333	4 mm

NOTE: MN — clamping version is shown.
 Basic holder may be ordered separately:
 V.RSN R/L 2525M12
 V.RSN R/L 3225P12


■ CSDN • MX


order number	catalogue number	H	B	F	L1	LH	gage insert	shim	shim screw	hex	clamp assembly	hex
2891696	CSDNN2525M12MX7	25	25	12,5	151	36,0	SNGX120708	552.232	554.252	2.5 mm	551.316	4 mm

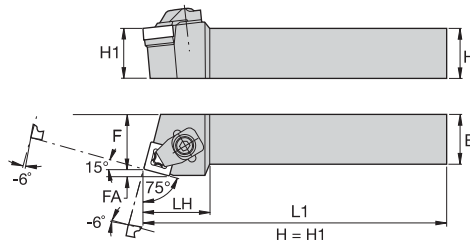
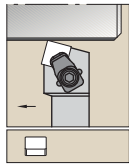

■ CSKN 75° • MN


order number	catalogue number	H	B	F	L1	LH	L1A	gage insert	shim	shim screw	hex	thrust plate	clamp assembly	hex
right hand														
1261315	CSKNR2525M12-MN7	25	25	32,0	150	27,0	3,0	SN.N120708	552.232	554.252	2.5 mm	557.111	551.317	4 mm
left hand														
1261299	CSKNL2525M12-MN4	25	25	32,0	150	27,0	3,0	SN.N120408	552.231	554.252	2.5 mm	557.111	551.317	4 mm
1261300	CSKNL2525M12-MN7	25	25	32,0	150	27,0	3,0	SN.N120708	552.232	554.252	2.5 mm	557.111	551.317	4 mm

NOTE: MX — clamping version is shown.
 Basic holder may be ordered separately:
 V.SKN R/L 2525M12



ISO Turning



■ CSRN 75° • MX



order number	catalogue number	H	B	F	L1	LH	FA	gage insert	shim	shim screw	hex	clamp assembly	hex
left hand													
1510300	CSRNL3225P15-MX7	32	25	27,0	170	34,0	4,1	SN.X150708	552.234	554.253	3 mm	551.316	4 mm

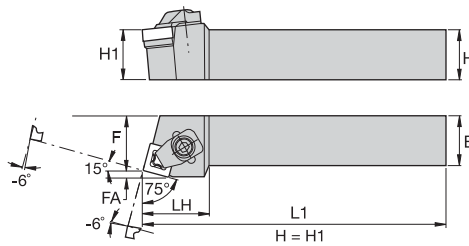
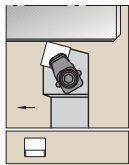
NOTE: MX — clamping version is shown.

Basic holder may be ordered separately:

V.SRN R/L 2525M12

V.SRN R/L 3225P12

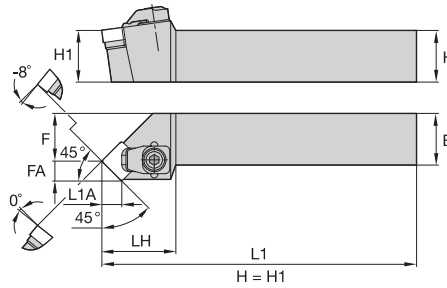
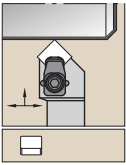
V.SRN R/L 3225P15



■ CSRN 75° • MN



order number	catalogue number	H	B	F	L1	LH	FA	gage insert	shim	shim screw	hex	thrust plate	clamp assembly	hex
right hand														
1510303	CSRNR2525M12-MN4	25	25	27,0	150	32,0	3,1	SN.N120408	552.231	554.252	2.5 mm	557.111	551.317	4 mm
1261336	CSRNR2525M12-MN7	25	25	27,0	150	32,0	3,1	SN.N120708	552.232	554.252	2.5 mm	557.111	551.317	4 mm
left hand														
1510291	CSRNL2525M12-MN4	25	25	27,0	150	32,0	3,1	SN.N120408	552.231	554.252	2.5 mm	557.111	551.317	4 mm
1510292	CSRNL2525M12-MN7	25	25	27,0	150	32,0	3,1	SN.N120708	552.232	554.252	2.5 mm	557.111	551.317	4 mm
1261334	CSRNL3225P12-MN7	32	25	27,0	170	32,0	3,1	SN.N120708	552.232	554.252	2.5 mm	557.111	551.317	4 mm



ISO Turning

■ CSSN 45° • MX

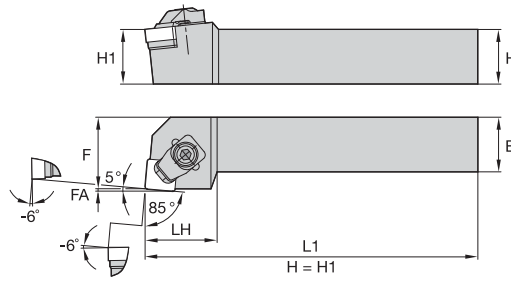
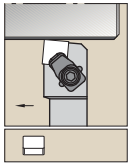

order number	catalogue number	H	B	F	L1	LH	FA	L1A	gage insert	shim	shim screw	hex	clamp assembly	hex
right hand														
1261367	CSSNR2525M12-MX7	25	25	32,0	150	35,0	8,3	8,3	SN.X120708	552.232	554.252	2.5 mm	551.316	4 mm
1261378	CSSNR3225P15-MX7	32	25	32,0	159	37,0	10,6	10,6	SN.X150708	552.234	554.253	3 mm	551.316	4 mm
left hand														
1261350	CSSNL2525M12-MX7	25	25	23,7	150	35,0	8,6	8,3	SN.X120708	552.232	554.252	2.5 mm	551.316	4 mm

■ CSSN 45° • MN


order number	catalogue number	H	B	F	L1	LH	FA	L1A	gage insert	shim	shim screw	hex	thrust plate	clamp assembly	hex
right hand															
1261366	CSSNR2525M12-MN7	25	25	32,0	142	35,0	8,3	8,3	SN.N120708	552.232	554.252	2.5 mm	557.111	551.317	4 mm
1261370	CSSNR3225P12-MN4	32	25	32,0	162	35,0	8,3	8,3	SN.N120408	552.231	554.252	2.5 mm	557.111	551.317	4 mm
1261371	CSSNR3225P12-MN7	32	25	32,0	162	35,0	8,3	8,3	SN.N120708	552.232	554.252	2.5 mm	557.111	551.317	4 mm
left hand															
1261349	CSSNL2525M12-MN7	25	25	32,0	142	35,0	8,3	8,3	SN.N120708	552.232	554.252	2.5 mm	557.111	551.317	4 mm
1261353	CSSNL3225P12-MN4	32	25	32,0	162	35,0	8,3	8,3	SN.N120408	552.231	554.252	2.5 mm	557.111	551.317	4 mm
1261354	CSSNL3225P12-MN7	32	25	32,0	162	35,0	8,3	8,3	SN.N120708	552.232	554.252	2.5 mm	557.111	551.317	4 mm



ISO Turning



■ CSXN 85° • MX

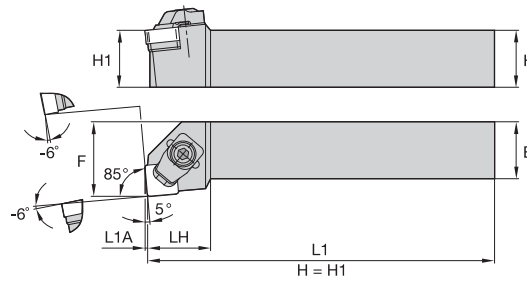
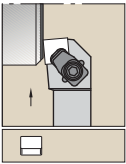


order number	catalogue number	H	B	F	L1	LH	FA	gage insert	shim	shim screw	hex	clamp assembly	hex
right hand 1510334	CSXNR3225P12-MX7	32	25	32,0	170	30,0	1,1	SN.X120708	552.232	554.252	2.5 mm	551.316	4 mm

■ CSXN 85° • MN



order number	catalogue number	H	B	F	L1	LH	FA	gage insert	shim	shim screw	hex	thrust plate	clamp assembly	hex
right hand 1510327	CSXNR2525M12-MN4	25	25	32,0	150	30,0	1,1	SN.N120408	552.231	554.252	2.5 mm	557.111	551.317	4 mm
left hand 1510313	CSXNL2525M12-MN4	25	25	32,0	150	30,0	1,1	SN.N120408	552.231	554.252	2.5 mm	557.111	551.317	4 mm


■ CSYN 85° • MX


order number	catalogue number	H	B	F	L1	LH	L1A	gage insert	shim	shim screw	hex	clamp assembly	hex
left hand													
1261414	CSYNL3225P12-MX7	32	25	32,0	170	27,0	1,0	SN.X120708	552.232	554.252	2.5 mm	551.316	4 mm

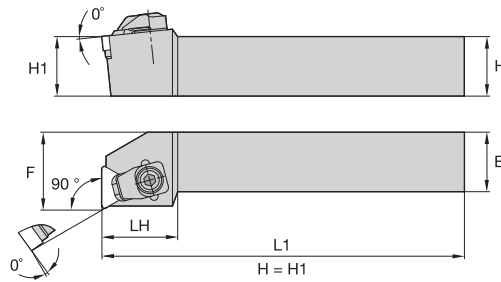
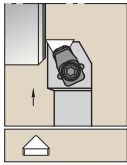
■ CSYN 85° • MN


order number	catalogue number	H	B	F	L1	LH	L1A	gage insert	shim	shim screw	hex	thrust plate	clamp assembly	hex
right hand														
1261423	CSYNR2525M12-MN7	25	25	32,0	150	27,0	1,1	SN.N120708	552.232	554.252	2.5 mm	557.111	551.317	4 mm
left hand														
1261408	CSYNL2525M12-MN7	25	25	32,0	150	27,0	1,1	SN.N120708	552.232	554.252	2.5 mm	557.111	551.317	4 mm

NOTE: MN — clamping version is shown.
 Basic holder may be ordered separately:
 V.SYN R/L 2525M12
 V.SYN R/L 3225P12



ISO Turning

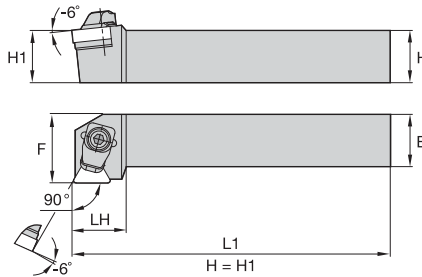
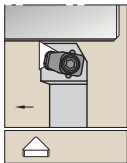


■ CTFN 90° • MN



order number	catalogue number	H	B	F	L1	LH	gage insert	shim	shim screw	hex	thrust plate	clamp assembly	hex
right hand													
1510344	CTFN2525M16-MN4	25	25	32,0	150	29,0	TN.N160408	552.235-H	554.254	2.5 mm	557.111	551.333	4 mm
left hand													
1510341	CTFNL2525M16-MN4	25	25	32,0	150	29,0	TN.N160408	552.235-H	554.254	2.5 mm	557.111	551.333	4 mm

NOTE: MN — clamping version is shown.
Basic holder may be ordered separately:
V.TFN R/L 2525M16

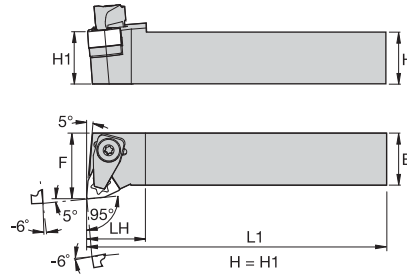
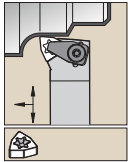


■ CTGN 90° • MN



order number	catalogue number	H	B	F	L1	LH	gage insert	shim	shim screw	hex	thrust plate	clamp assembly	hex
right hand													
1261482	CTGNR2525M16-MN4	25	25	32,0	150	20,0	TN.N160408	552.235-H	554.254	2.5 mm	557.111	551.333	4 mm
1261483	CTGNR2525M16-MN7	25	25	32,0	150	20,0	TN.N160708	552.236	554.254	2.5 mm	557.111	551.333	4 mm
left hand													
1261478	CTGNL2525M16-MN4	25	25	32,0	150	20,0	TN.N160408	552.235-H	554.254	2.5 mm	557.111	551.333	4 mm
1261479	CTGNL2525M16-MN7	25	25	32,0	150	20,0	TN.N160708	552.236	554.254	2.5 mm	557.111	551.333	4 mm

NOTE: MN — clamping version is shown.
Basic holder may be ordered separately:
V.TGN R/L 2525M16

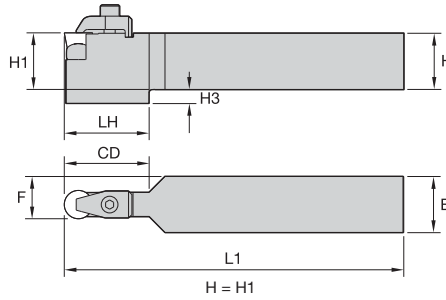
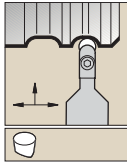


■ CWLN 95° • MX

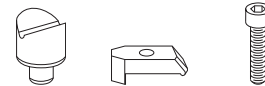


order number	catalogue number	H	B	F	L1	LH	gage insert	shim	shim screw	hex	clamp assembly	hex
right hand												
1873227	CWLN3225P08-MX7	32	25	32,0	170	32,0	WN.X080708	552.210	554.252	2.5 mm	551.316	4 mm
left hand												
1873224	CWLN2525M08-MX7	25	25	32,0	150	32,0	WN.X080708	552.210	554.252	2.5 mm	551.316	4 mm

ISO Turning

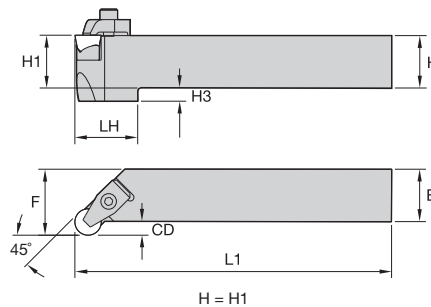
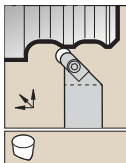


■ CRDP

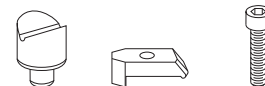


order number	catalogue number	H	B	F	L1	LH	H3	CD	gage insert	nest	clamp	clamp screw	hex
3642247	CRDPN2525M06V	25	25	12,5	151	—	—	19,0	RPGX060400E	NST1	CM214	MS1321	2.5 mm
3642249	CRDPN3232P09V	32	32	16,0	171	—	—	29,0	RPGX090700E	NST2	CM219	CS412	3.5 mm
3642248	CRDPN2525M09V	25	25	12,5	151	—	—	29,0	RPGX090700E	NST2	CM219	CS412	3.5 mm
3642251	CRDPN3232P12V	32	32	16,0	171	—	—	38,0	RPGX120700E	NST3	CM216	CS412	3.5 mm
3642252	CRDPN3232P15V	32	32	16,0	171	38,1	6,4	38,0	RPGX151000	NST4	CM217	MS1294	6 mm

NOTE: CRDP toolholders are able to use RPGX and RCGX insert styles.

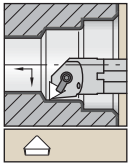


■ CRGP

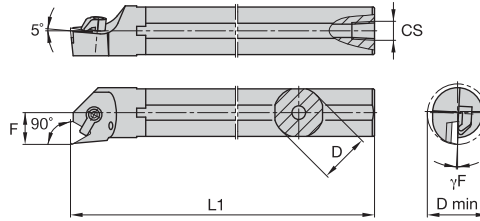


order number	catalogue number	H	B	F	L1	CD	gage insert	nest	clamp	clamp screw	hex
right hand											
3642276	CRGPR2525M06V	25	25	32,0	151	7,0	RPGX060400E	NST1	CM214	MS1321	2.5 mm
3642280	CRGPR3232P09V	32	32	40,0	171	8,0	RPGX090700E	NST2	CM219	CS412	3.5 mm
left hand											
3642277	CRGPL2525M06V	25	25	32,0	151	7,0	RPGX060400E	NST1	CM214	MS1321	2.5 mm
3642281	CRGPL3232P09V	32	32	40,0	171	8,0	RPGX090700E	NST2	CM219	CS412	3.5 mm

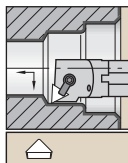
NOTE: CRGP toolholders are able to use RPGX and RCGX insert styles.



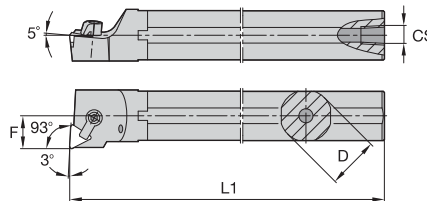
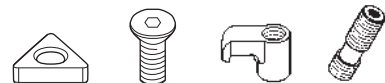
Steel shank with through coolant.


A-CTFP 90°


order number	catalogue number	D	D min	F	L1	CS	γF°	gage insert	shim	shim screw	hex	clamp	clamp screw	hex	
right hand															
1886492	A16RCTFPR11	16	20,0	11,0	200	1/8-27 NPT	-4.0	TP..110304	—	—	—	CKM19	STCM9	2.5 mm	
1098051	A20QCTFPR11	20	25,0	13,0	180	1/8-27 NPT	0.0	TP..110304	SM815	MS961	—	CKM19	STCM9	2.5 mm	
1098053	A25RCTFPR16	25	32,0	17,0	200	1/4-18 NPT	-3.0	TP..160308	SM841	MS110	2 mm	CKM10	STCM8	4 mm	
1098055	A32SCTFPR16	32	40,0	22,0	250	1/4-18 NPT	-3.0	TP..160308	SM841	MS110	2 mm	CKM10	STCM8	4 mm	
1886494	A40VCTFPR16	40	48,0	27,0	400	1/4-18 NPT	-3.0	TP..160308	SM841	MS110	2 mm	CKM10	STCM8	4 mm	
left hand															
1098054	A25RCTFPL16	25	32,0	17,0	200	1/4-18 NPT	-3.0	TP..160308	SM841	MS110	2 mm	CKM10	STCM8	4 mm	
1098056	A32SCTFPL16	32	40,0	22,0	250	1/4-18 NPT	-3.0	TP..160308	SM841	MS110	2 mm	CKM10	STCM8	4 mm	

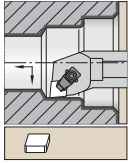


Steel shank with through coolant.

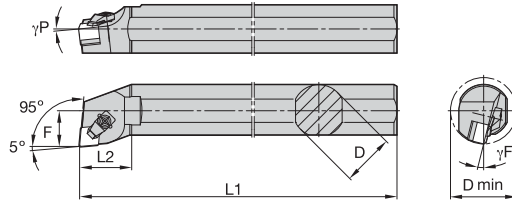

A-CTUP 93°


order number	catalogue number	D	D min	F	L1	CS	gage insert	shim	shim screw	clamp	clamp screw	hex
right hand												
1098057	A16MCTUPR11	16	20,0	11,0	150	1/8-27 NPT	TP..110304	SM815	MS961	CKM19	STCM9	2.5 mm
left hand												
1098058	A16MCTUPL11	16	20,0	11,0	150	1/8-27 NPT	TP..110304	SM815	MS961	CKM19	STCM9	2.5 mm

ISO Turning



Steel shank without through coolant.



■ **S-CCLN 95° • MX**



order number	catalogue number	D	D min	F	L1	L2	γF°	γP°	gage insert	shim	shim screw	hex	clamp assembly	hex
right hand														
2890773	S32SCCLNR12MX7	32	40,0	22,0	251	43	-14.0	-5.0	CN.X120708	—	—	—	551.316	4 mm
1289077	S40T-CCLNR12-MX7	40	55,0	27,0	300	40	-14.0	-6.0	CN.X120708	552.221	554.252	2.5 mm	551.316	4 mm
left hand														
1510401	S40T-CCLNL12-MX7	40	55,0	27,0	300	40	-14.0	-6.0	CN.X120708	552.221	554.252	2.5 mm	551.316	4 mm

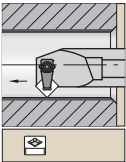
NOTE: MN – clamping version is shown.
Basic holder may be ordered separately:
S40T-V.CLN R/L 12

■ **S-CCLN 95° • MN**

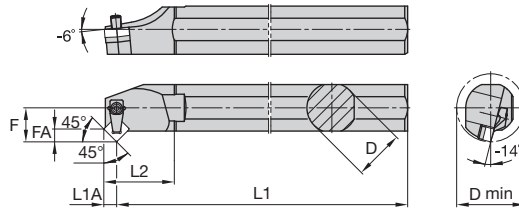


order number	catalogue number	D	D min	F	L1	L2	γF°	γP°	gage insert	shim	shim screw	hex	thrust plate	clamp assembly	hex
right hand															
1289075	S40T-CCLNR12-MN4	40	55,0	27,0	300	40	-14.0	-6.0	CN.N120408	552.220	554.252	2.5 mm	557.111	551.317	4 mm
1289076	S40T-CCLNR12-MN7	40	55,0	27,0	300	40	-14.0	-6.0	CN.N120708	552.221	554.252	2.5 mm	557.111	551.317	4 mm
left hand															
1289072	S40T-CCLNL12-MN7	40	55,0	27,0	300	40	-14.0	-6.0	CN.N120708	552.221	554.252	2.5 mm	557.111	551.317	4 mm

NOTE: MN – clamping version is shown.
Basic holder may be ordered separately:
S40T-V.SSN R/L 12



Steel shank without through coolant.

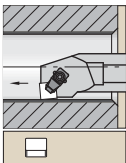


ISO Turning

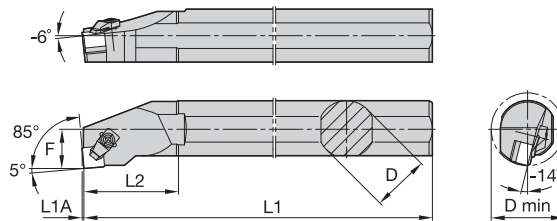
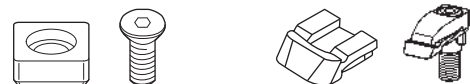
S-CSSN 45° • MX


order number	catalogue number	D	D min	F	L1	L2	L1A	FA	gage insert	shim	shim screw	hex	clamp assembly	hex
right hand														
1873498	S40T-CSSNR12-MX7	40	55,0	27,0	300	67,0	8,3	8,3	SN.X120708	552.232	554.252	2.5 mm	551.316	4 mm
left hand														
1873499	S40T-CSSNL12-MX7	40	55,0	27,0	300	67,0	8,3	8,3	SN.X120708	552.232	554.252	2.5 mm	551.316	4 mm

NOTE: MX – clamping version is shown.
Basic holder may be ordered separately:
S40T-V.SSN R/L 12



Steel shank without through coolant.

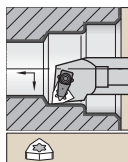

S-CSYN 85° • MN


order number	catalogue number	D	D min	F	L1	L2	L1A	gage insert	shim	shim screw	hex	thrust plate	clamp assembly	hex
right hand														
1245016	S40T-CSYNR12-MN7	40	55,0	27,0	300	67,0	1,0	SN.N120708	552.232	554.252	2.5 mm	557.111	551.317	4 mm

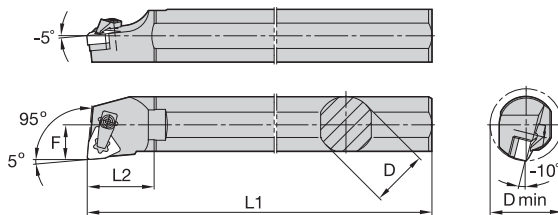
NOTE: MN – clamping version is shown.
Basic holder may be ordered separately:
S40T-V.SYN R/L 08



ISO Turning



Steel shank without through coolant.

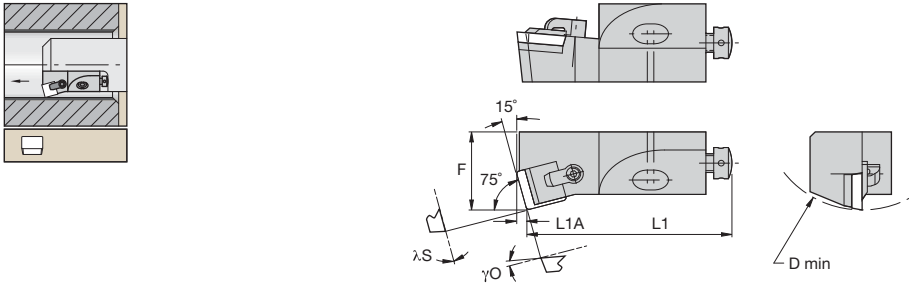


■ **S-CWLN 95° • MX**



order number	catalogue number	D	D min	F	L1	L2	γ_F°	gage insert	shim	shim screw	hex	clamp assembly	hex
left hand													
1873496	S40T-CWLN08-MX7	40	80,0	27,0	300	55,0	-10.0 deg	WN.X080708	552.210	554.252	2.5 mm	551.316	4 mm

NOTE: Basic holder may be ordered separately:
S40T-V. WLN R/L 12


■ CSKP 75°

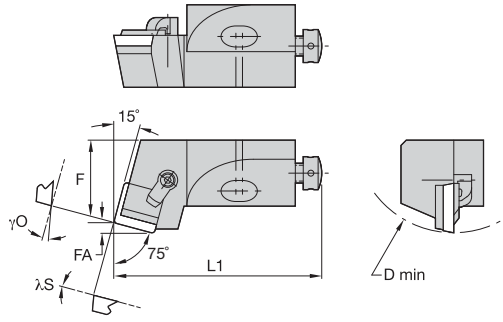
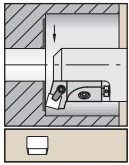
order number	catalogue number	D min	F	L1	L1A	λS°	γO°	gage insert
right hand 1261328	CSKPR12CA12	50	20,0	55	3,1	0.0	5.0	SP..120308/SP..422

■ Spare Parts


D min	shim	clamp	clamp screw	hex	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
50	—	CKM34	STCM38	2 mm	KUAM22	2 mm	KUAM31	191.406	4 mm	CSWM 060 050



ISO Turning



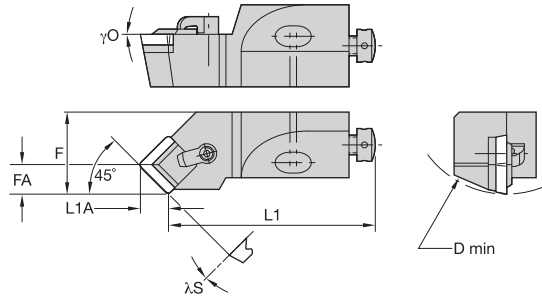
■ CSRPR 75°

order number	catalogue number	D min	F	L1	FA	λS°	γO°	gage insert
right hand								
3331132	CSRPR10CA09	40	14,0	50	2,2	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
40	CKM34	STCM38	2 mm	KUAM28	2 mm	KUAM30	191.405	4 mm	CSWM 060 050


■ CSSP 45°

order number	catalogue number	D min	F	L1	FA	L1A	λS°	γ0°	gage insert
right hand									
1261379	CSSPR10CA09	40	14,0	44	6,5	6,1	0.0	0.0	SP..090308/SP..322
left hand									
3331143	CSSPL10CA09	40	14,0	44	6,5	6,1	0.0	0.0	SP..090308/SP..322

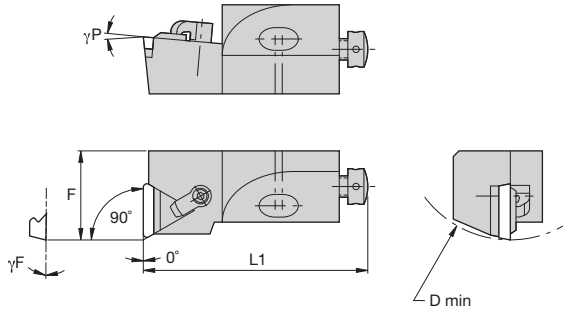
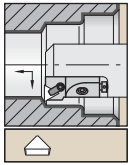
NOTE: Select spare parts based off of D min and insert size selected.

■ Spare Parts


D min	clamp	clamp screw	hex	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
40	CKM34	STCM38	2 mm	KUAM28	2 mm	KUAM30	191.405	4 mm	CSWM 060 050



ISO Turning



■ CTFP 90°

order number	catalogue number	D min	F	L1	γ_F°	γ_P°	gage insert
right hand							
2116588	CTFPR10CA11	40	14,0	50	0.0	5.0	TP..110304/TP..221
1746442	CTFPR12CA16	50	20,0	55	0.0	5.0	TP..160308/TP..322
2582207	CTFPR20CA22	70	25,0	70	0.0	5.0	TP..220408/TP..432
left hand							
2114034	CTFPL10CA11	40	14,0	50	0.0	5.0	TP..110304/TP..221

■ Spare Parts



D min	shim	shim screw	hex	clamp	clamp screw	hex	radial adjusting screw	hex	axial adjusting screw	mounting screw	mounting screw	hex	washer
40	—	—	—	CKM34	STCM38	2 mm	KUAM28	2 mm	KUAM30	191.405	—	4 mm	CSWM 060 050
50	—	—	—	CKM34	STCM38	2 mm	KUAM22	2 mm	KUAM31	—	191.406	4 mm	CSWM 060 050
70	SM837	MS125	2.5 mm	CKM35	STCM8	4 mm	KUAM25	2.5 mm	KUAM32	—	191.407	5 mm	CSWM 080 050

Beyond™ Drive™ Inserts

- Designed for increased productivity.
- Post-coat treatment reduces stress, improves coating adhesion.
- Excellent toughness and wear resistance.
- Better insert wear detection.

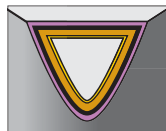
beyond DRIVE™

Post-Coat Grinding — Top and Bottom

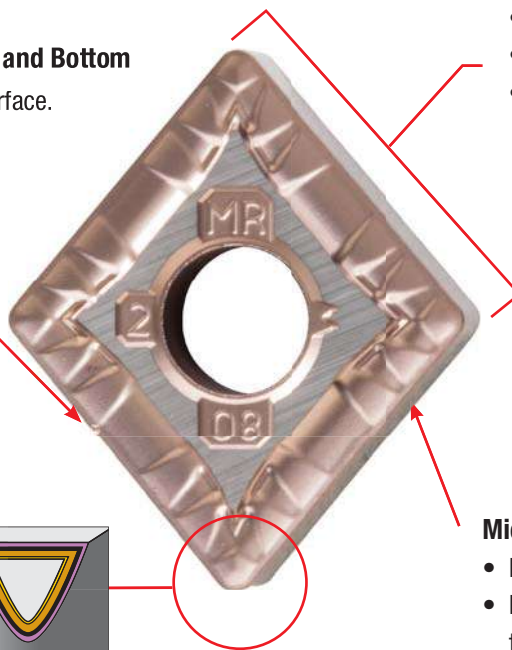
- Provides secure seating surface.

Fine-Grained Alumina Layer

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



TiN/MT-TiCN/TiCN/Al₂O₃/TiCN



Post-Coat Treatment

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

Micro-Polished Edges

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

Experience the advantages at your Authorised Kennametal Distributor or at kennametal.com.

 **KENNAMETAL®**

kennametal.com

➤ Tunable Boring Bars

With Front End KM™ Quick-Change Adaptor

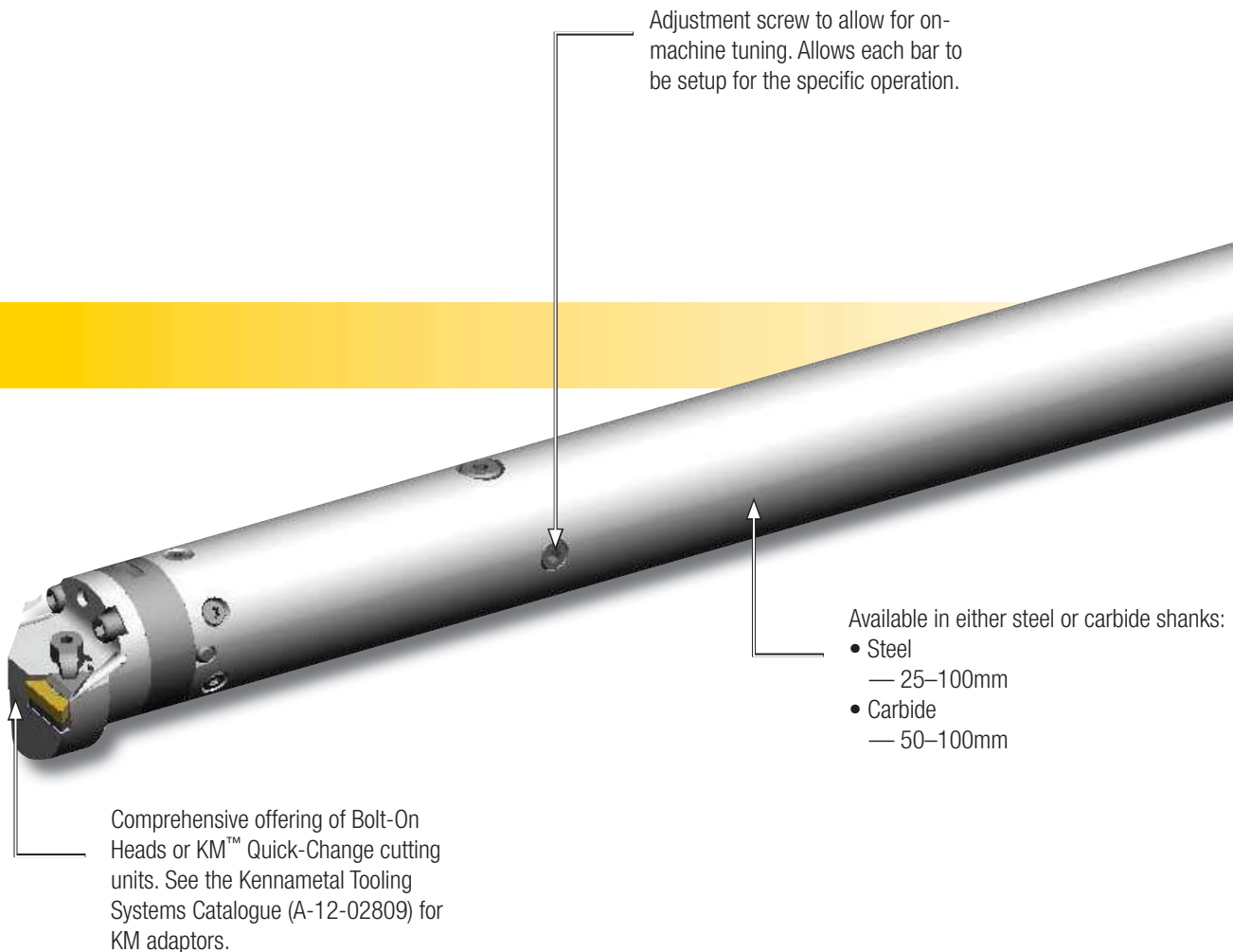
Kennametal offers a portfolio of tunable boring bars to increase productivity and solve chatter and other issues in long-boring operations.

Features, Functions, and Benefits

Features	Functions	Benefits
Robust internal clamping package	<ul style="list-style-type: none"> • Eliminates chatter and vibration. • Higher metal removal rate. • Larger depths of cut. 	<ul style="list-style-type: none"> • High surface quality. • Low scrap rate. • Increased productivity. • Reduced noise exposure.
Tunable clamping mechanism	Bar can be tuned on the machine with just the turn of a screw.	Optimised damping characteristics for all kinds of machining conditions.
KM Quick-Change front end adaptor	<ul style="list-style-type: none"> • Ridged clamping system. • Wide selection of KM Quick-Change cutting units. 	Flexible system reduces tooling inventory and setup times.

Kennametal has made several key improvements to our current tunable boring bar portfolio:

- Enhanced standardised tuning process at the manufacturing plant ensures bars are accurately tuned at the maximum overhang.
- Nitriding of steel tunable boring bars to eliminate the effects of chip wash.
- Elimination of flats on tunable boring bars enhances stability and promotes proper toolholding.
- Addition of a small flat on the connection collar enables the use of a centre-height tool.
- Enhanced assembly process.



■ Appearance of the Tunable Boring Bars

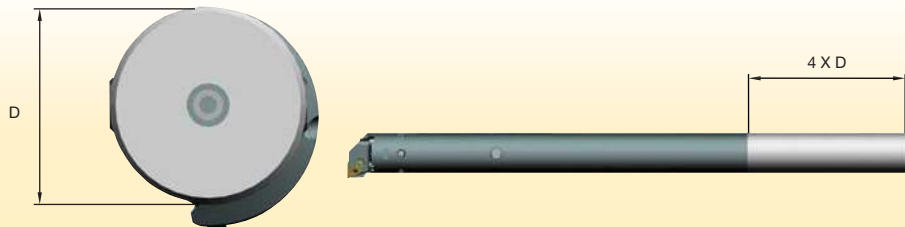
- **NEW** All tunable boring bars are tuned at the manufacturing plant and delivered to the customer with the tune specified at the maximum overhang of the bar.
- **NEW** All steel tunable bars undergo a nitriding process to help prevent chip wash damage to the bar and extend the bar's tool life.
- The nitride process of the black oxide steel tunable boring bars gives the shanks a bluish tint. These bars are through-coolant capable and use bolt-on heads or KM™ Quick-Change cutting adaptors. There is a set screw to tune the bar.
- Tunable boring bars with carbide shanks will appear grey in colour. They are through-coolant capable and use KM Quick-Change cutting adaptors. There is a set screw to tune the bar.

■ Application Recommendations

- Choose a boring bar as big as possible, but make sure there is adequate space for the chip evacuation.
- Balance the machining settings to avoid uncontrollable vibrations.
- Keep the L/D ratio as small as possible.
- Bar comes pre-tuned, but can be adjusted by hand.

1 Holding the Bar

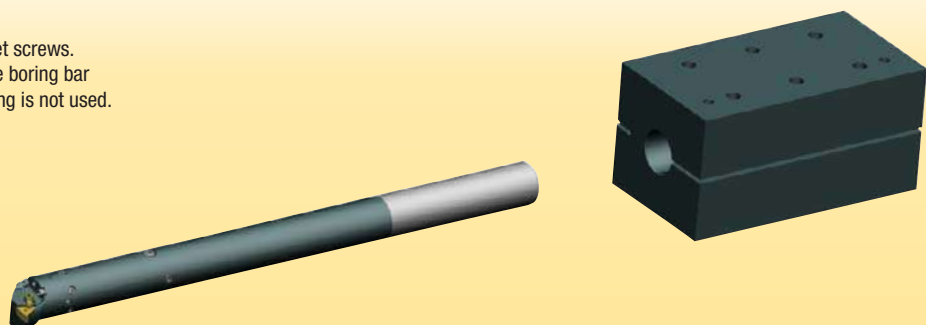
- Hold the bar correctly. Kennametal recommends holding the bar at $4 \times D$.



2 Kennametal recommends holding the boring bar in a split-style holder, with a split-style reducer if needed, with an ISO H7 diametral tolerance.

3 **NEW:** All flats have been removed from steel tunable boring bars.

- Do not clamp the bars with set screws.
- Kennametal cannot guarantee boring bar performance if proper clamping is not used.

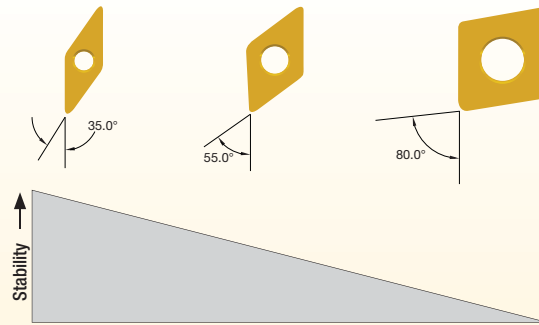


4 Tunable boring bars are designed and pre-tuned at the maximum overhang.

- Steel bars: pre-tuned to $10 \times D$; use as low as $6 \times D$.
- Carbide composite bars: pre-tuned to $15 \times D$; use as low as $12 \times D$.
- Re-tuning may be necessary if the boring bar is not used at its pre-tuned overhang.
- Never clamp or use the boring bar below its minimum overhang.

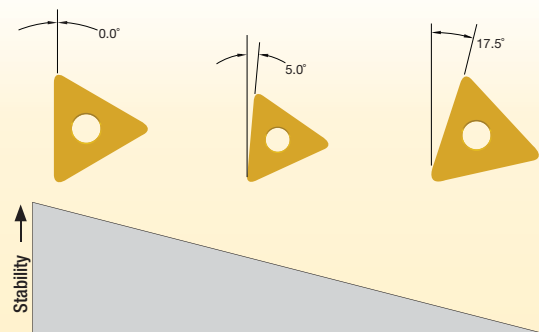
5 Insert Angle

- Smaller point angles produce consistent chip sizes and increase bore clearance for better chip evacuation.
- Larger point angles may cause rubbing due to larger cutting edge, which can result in vibration.



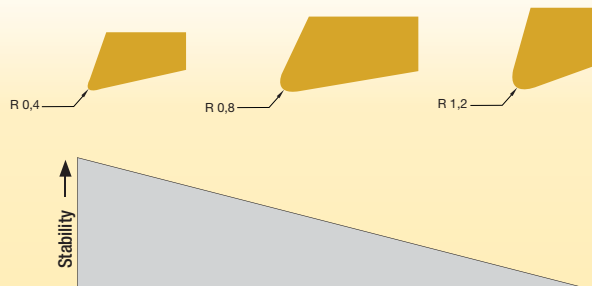
6 Lead Angle

- Choose a lead angle as close to 90° as possible for increased stability.



7 Nose Radius

- Choose a small nose radius for better stability.
- Depth of cut should be larger than the nose radius.



8 Insert Geometries

- Use positive, free-flowing insert geometries and sharp edge preps to reduce cutting forces.
- Use PVD inserts as a first choice because thinner coating keeps edge prep smaller.

9 Centre Cutting Height

- Cutting height tolerances are +/- .005".
- Kennametal recommends using our new centre height alignment tool kit. The kit includes a magnet, a seat, and an angle finder that can be mounted onto a small flat located on the connection collar of the tunable boring bar.

10 Chip Evacuation

- Chip packing and re-cutting can cause unwanted vibration while boring.
- Use coolant to flush out chips and to keep the damping element cool.
- Use insert geometries and cutting parameters that produce small chips.
- The boring bar can be used upside down to improve chip evacuation.

Tuning Recommendations

- Loosen the two locking screws on the bar.
- Turn the adjusting screw clockwise until the screw stops turning freely and the mass is in the locked-down position.
- You are now ready to tune the bar.
- Turn the adjusting screw in the anti-clockwise direction in quarter turn increments to adjust.
- After the adjustment has been completed, tighten the locking screws.

■ Kennametal Tunable Boring Bar Centre Height Alignment Procedure

The following procedure will walk the user through setting up a tunable boring bar on centre without the use of flats on the shank.

Equipment

- Digital angle finder
- Angle finder seat
- Boring bar to be used



Figure 1: Angle finder seat (left) and digital angle finder (right)

Assembly

- Clean any dirt, chips, debris, etc. from the mounting surfaces of the digital angle finder and the corresponding surfaces of the angle finder seat.
- Assemble the digital angle finder onto the angle finder seat, making sure it is flush against the back of the angle finder seat.

Calibration

- Clean an area on the X-axis of the lathe to create a reference surface for calibration.
- Clean any dirt, chips, debris, etc. from the magnet on the bottom of the angle finder seat.
- Place the angle finder assembly onto the X-axis of the lathe.
 - Keep the angle finder assembly parallel to the axis.
 - It is helpful to butt the assembly up against the turret housing to keep it parallel to the X-axis.
- Turn the digital angle finder on by pressing the on/off button.
- Zero the digital angle finder by pressing the zero button.

NOTE: The angle finder is now calibrated to the X-axis of the lathe and will measure angles corresponding to this axis.



Figure 2: X-axis calibration

Boring Bar Alignment

- With the boring bar already placed in the holder and set to the correct overhang, clean any dirt, chips, debris, etc. from the small flat on the collar of the boring bar.
- Place the angle finder assembly onto the boring bar by aligning the small magnet on the bottom of the assembly with the small flat on the collar of the boring bar.
 - Be sure the angle finder assembly is perpendicular to the axis of the boring bar.
 - Be sure the angle finder assembly is oriented in the same direction it was when it was calibrated to the X-axis of the lathe.



Figure 3: Boring bar collar flat

- Rotate the boring bar until the digital angle finder reads zero degrees.



Figure 4: Aligning the boring bar

- Tighten the boring bar holder to lock the boring bar position.
 - Be sure the digital angle finder still reads zero after clamping the bar.
- The boring bar should now be on centre.



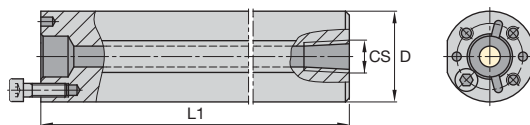
Figure 5: Boring bar centre height

Order the Kennametal Centre Height Alignment Tool Kit

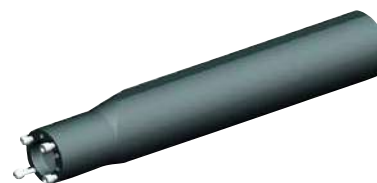
The centre height alignment tool kit is available to order. Use order number 6141867, or catalogue number KIT-BB-AF.



ISO Turning

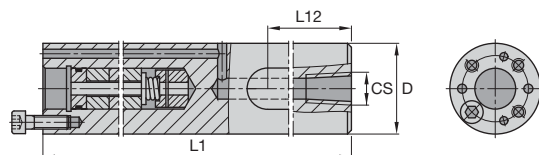


Steel shank with through coolant.
Max 4:1 overhang ratio.



■ BS

order number	catalogue number	D	L1	CS	screw 3 required	screw	hex
1098078	BS32S	32	210	RP3/8	MS412	MS330	4 mm
1098079	BS40T	40	260	RP3/8	MS412	MS330	4 mm
1098080	BS50U	50	310	RP3/8	MS337	MS339	5 mm

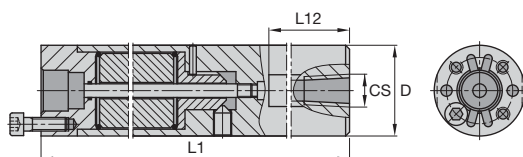


Steel shank DeVibrator with through coolant.
Max 6:1 overhang ratio.



■ BSD

order number	catalogue number	D	L1	CS	L12	L1 min	screw 3 required	screw	hex
1098150	BSD32U	32	310	RP3/8	200	200	MS330	MS412	4 mm
1098151	BSD40V	40	360	RP3/8	248	228	MS330	MS412	4 mm
1098152	BSD50W	50	410	RP3/8	280	276	MS339	MS337	5 mm

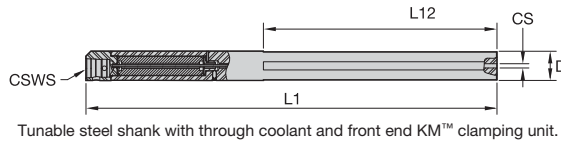


Tunable steel shank with through coolant.



■ D...TTB

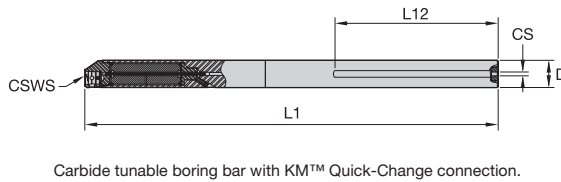
order number	catalogue number	D	L1	CS	L12	L1 min	screw 3 required	screw	hex
1772222	D25MTTB400	25	381	RP1/4	203	227	MS1499	MS319	3 mm
1772223	D32MTTB447	32	422	RP3/8	267	332	MS325	MS1130	4 mm
1772224	D40MTTB530	40	492	RP3/8	305	300	MS326	MS330	4 mm
1772230	D50MTTB700	50	670	RP3/8	470	309	MS337	MS337	5 mm



ISO Turning

■ D...TTB-KM • Metric

order number	catalogue number	D	L1	CS	L12	L1 min	CSWS system size
3637636	D40MTTB560KM40	40	520	RP 3/8-19	305	330	KM40
3637637	D50MTTB737KM40	50	697	RP 3/8-19	470	337	KM40
3637638	D60MTTB1000KM40	60	976	RP 3/8-19	686	396	KM40
3642134	D80MTTB1120KM63	80	1060	RP 3/8-19	610	560	KM63
3642135	D100MTTB1330KM63	100	1384	RP 3/8-19	622	695	KM63



■ G-TTB-KM • Metric

order number	catalogue number	D	L1	CS	L12	CSWS system size
3954298	G50MTTB1026KM40	50	986	RP 3/8-19	300	KM40
3954300	G80MTTB1564KM63	80	1504	RP 3/8-19	480	KM63



Grooving and Cut-Off

Beyond Evolution • Grooving, Turning, and Cut-Off	C2–C77
Application Guidelines	C76–C77
A4 Groove and Turn	C78–C135
Top Notch • Shallow Grooving	C136–C179
Application Guidelines	C172–C179

Getting started made **EASY**

beyond™ EVOLUTION™

Your day made **EASY**

Choosing the right tooling can be complicated and time-consuming. Built on simplicity, we have engineered a new tool that makes every machine operator's life EASY.

Unwilling to sacrifice performance or applications, Kennametal introduces Beyond™ Evolution™.

Beyond™ Evolution™ is the new single-side grooving and cut-off tool that also performs multi-directional turning.

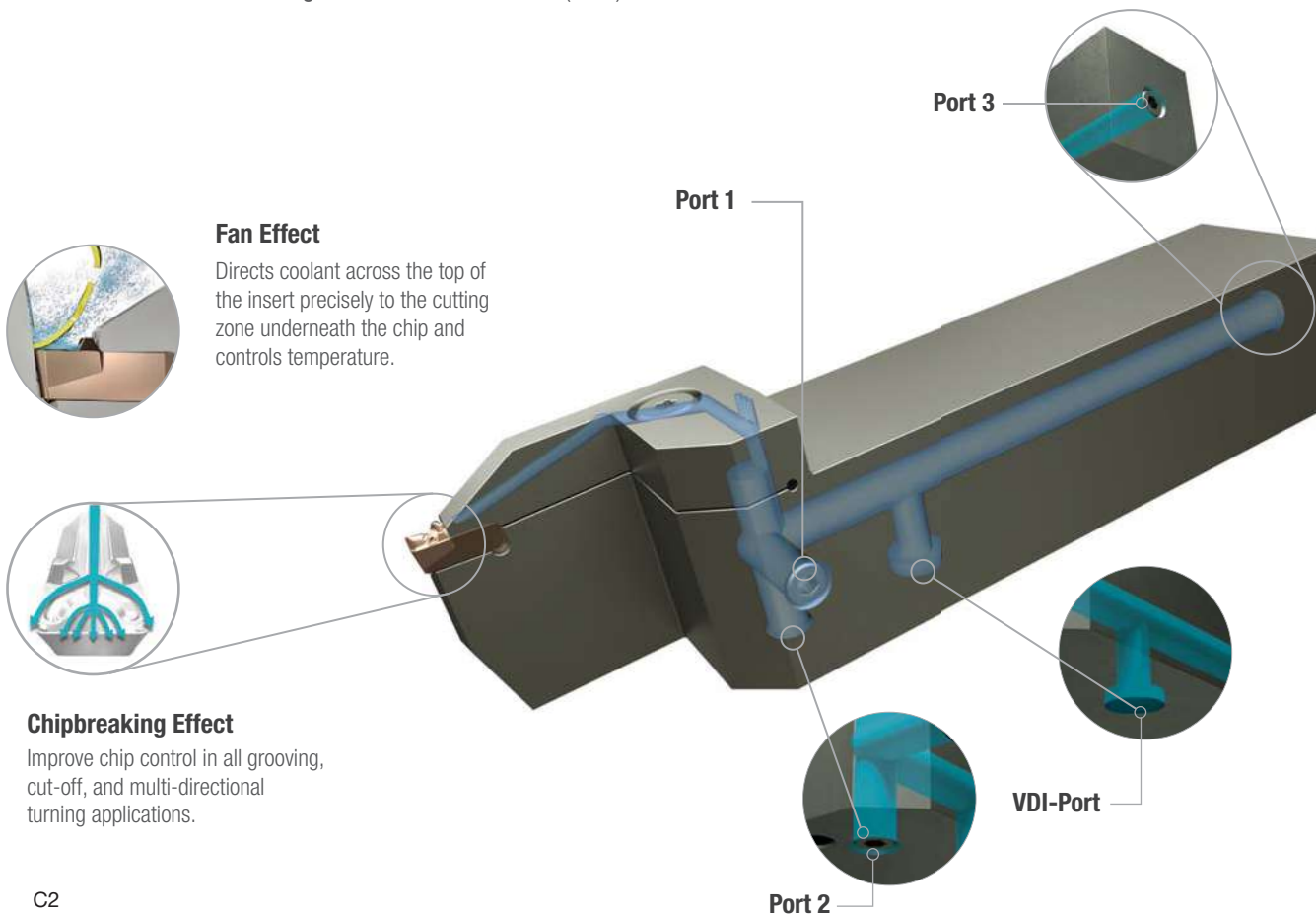


Productivity made **EASY**

Active Coolant Control

If your coolant delivery is typical to the market, you may be applying more heat to the cutting edge than you think. This reduces tool life and increases cycle time.

With Beyond™ Evolution™, you won't have to change your existing equipment. Whether you are using a high-pressure or low-pressure coolant supply, Beyond™ Evolution™, featuring Active Coolant Control, delivers more tool life and higher Metal Removal Rates (MRR).

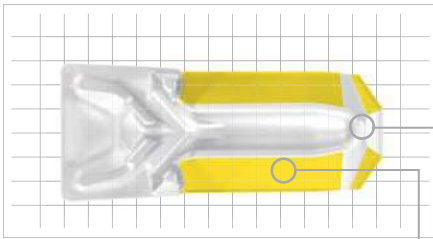


Smooth surface finish made EASY Triple-V Seating

Problem: Traditional single-sided grooving and cut-off systems cannot deliver smooth surface finish due to lack of stability.

Solution: The Beyond™ Evolution™ proprietary new Triple-V Seating feature provides functional stability and minimises vibration.

Three contact surfaces provide unmatched stability:
When combined with GUP and CF chipbreakers, Triple-V Seating provides excellent surface finish.

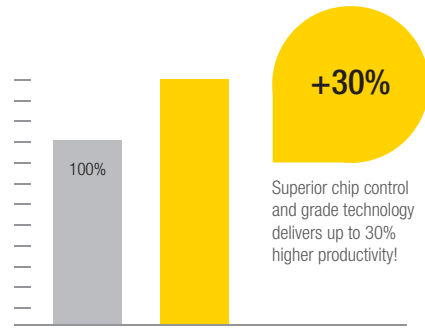


Top and Bottom-V

Precise and secure insert positioning for increased rigidity and dimensional accuracy

V-Back Design

Unsurpassed grooving, cut-off, and multi-directional turning load stability.



Saving money made EASY

Beyond™ Evolution™, featuring Active Coolant Control, Triple-V Seating, and Beyond™ Drive™ grades with Wear Detection Technology, provides longer tool life, maximum stability, and higher Metal Removal Rates (MRR), resulting in up to 30% higher productivity.



You can also use our NOVO app to guide you to the correct choice!

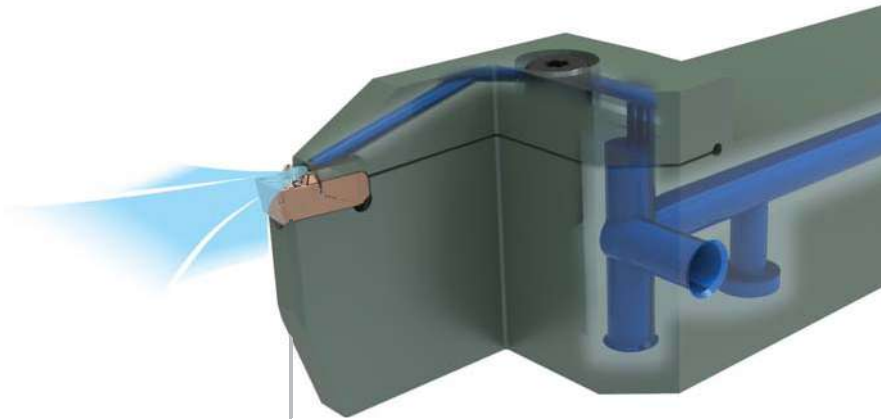
For more information, please visit kenametal.com/novo.

NOVO: The Digital Source for Delivering Smart Machining Solutions

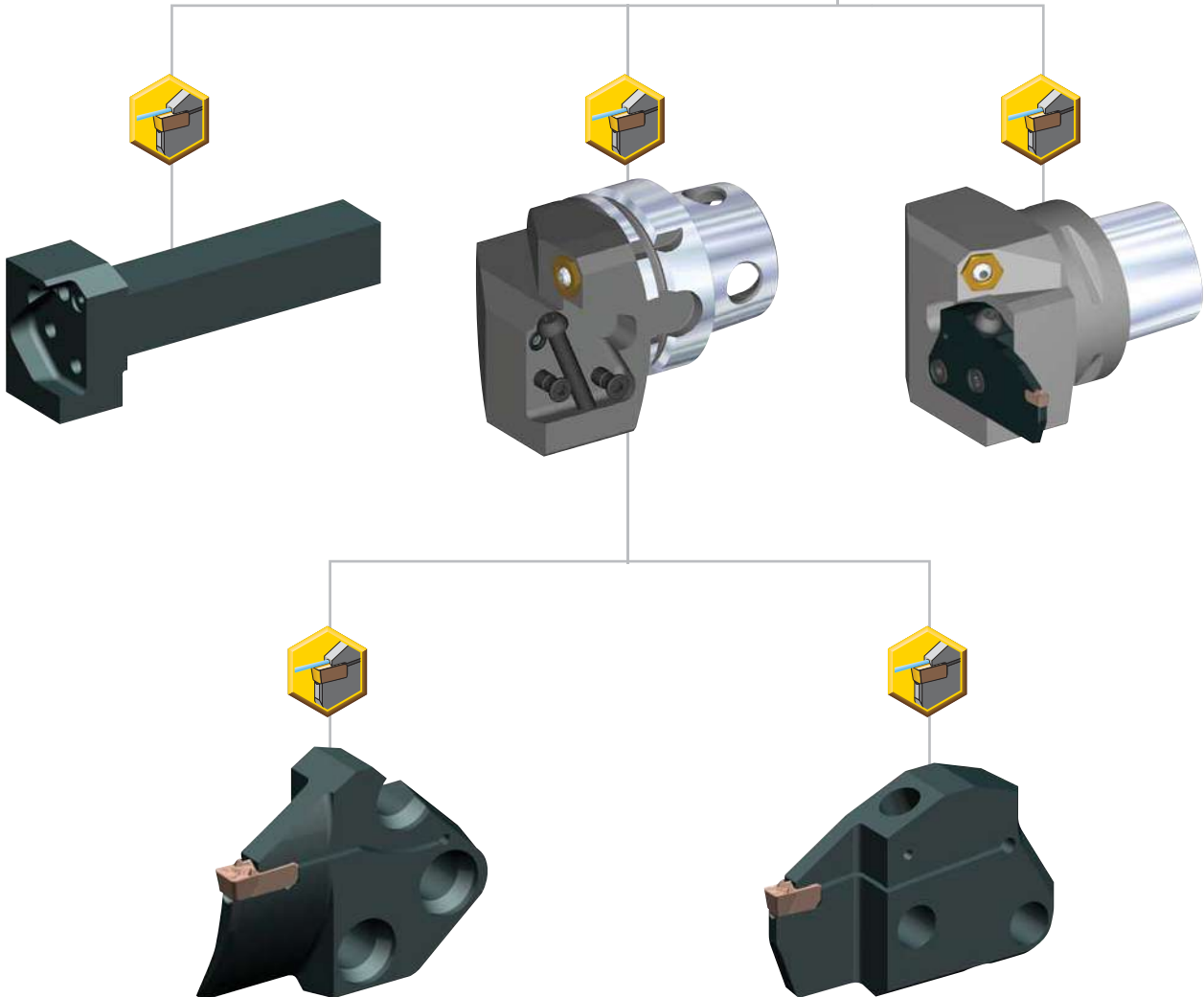
Your day made **EASY** —



Efficient coolant delivery.
Available in seat sizes
3 and higher.

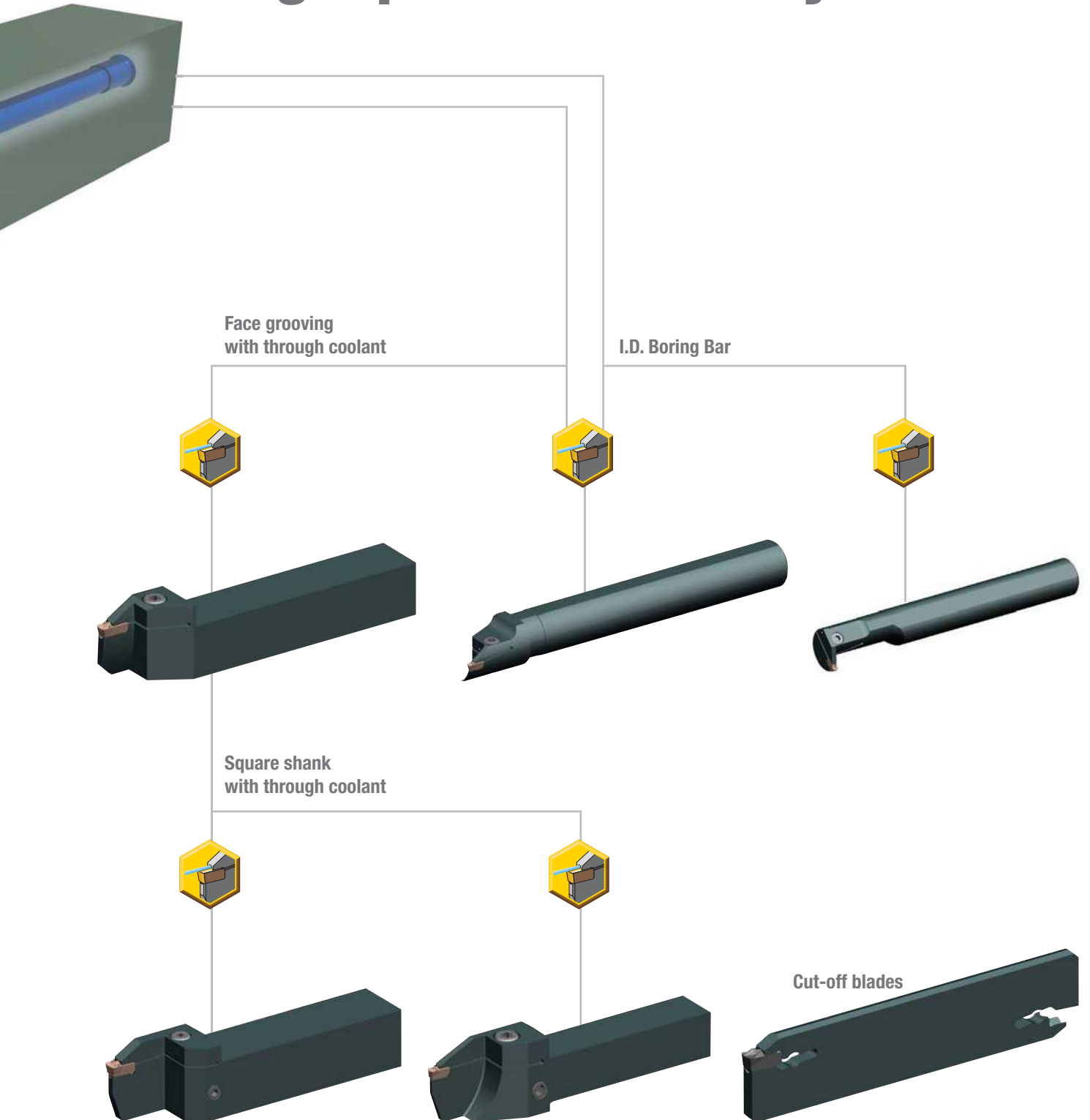


Modular with
through coolant



beyond™ EVOLUTION™

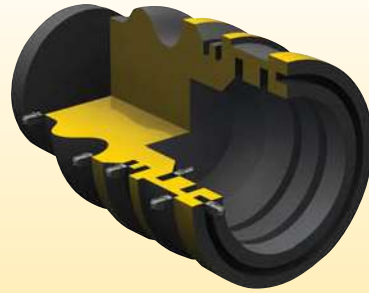
high-performance system.



Step 1 • Identify your grooving or cut-off application

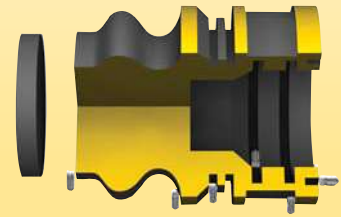
What you need to know:

- Groove depth, width, and profile.
- Material being machined.
- Application to be performed (O.D. and I.D. grooving, turning, face grooving, and cut-off).
- Shank size requirements of the machine.



General Recommendation to Select the Insert Size

for workpiece diameters	insert seat size
<25mm	3
25–50mm	4
>50mm	5–10



Step 2 • Select chipbreaker style and feed rate

Based on the application and seat size, determine the recommended geometry and starting feed rate.

Plunge feed rates

■ Steel
■ Stainless Steel
■ Cast Iron
■ Non-Ferrous
■ High-Temp Alloys
■ Hardened Materials

● first choice
 ○ alternate choice

Chip Control	Description	Insert Geometry	Seat Size	Corner Radius mm	Starting Conditions mm	Plunge Feed Rates mm/rw							
						0,05	0,10	0,15	0,20	0,25	0,30	0,35	
-GUP	Positive rake angle for lower cutting forces.		1F	0,2	0,06								
			2	0,2	0,08								
			3	0,2	0,09								
			4	0,4	0,11								
			5	0,4	0,12								
			6	0,8	0,15								
			8	0,4	0,15								
			10	0,8	0,16								
			12	0,4	0,16								
			14	0,8	0,18								
-GUN	Stable negative cutting edge allowing for more aggressive applications.		1F	0,2	0,06								
			2	0,2	0,08								
			3	0,2	0,09								
			4	0,4	0,11								
			5	0,4	0,12								
			6	0,8	0,15								
			8	0,4	0,15								
			10	0,8	0,16								
			12	0,4	0,16								
			14	0,8	0,18								

Maximum Feed Rate Values

Material Group	Feed Factor
M	.8
N	1.2
S	.8
H	.5

Data above is for P and K material groups. Maximum feed rates should be adjusted by multiplying max feed rate values by following factors for shown material groups.

I.D. and Face Grooving
For I.D. and face grooving applications, reduce feed rate by 20%.

Step 3 • Select the starting speed

Based on material and grade, identify starting speed (vc). First choice is in **bold** type.

- A Based on material group and grade, identify starting speed (vc).
- B First choice starting speed is in **bold**.

		Recommended Starting Speeds [m/min]																	
Material Group		K313			KCU10			KCU25			KCM35B			KCP10B			KCP25B ^A		
P	0-1	-	-	-	140	280	350	110	225	270	90	180	213	185	400	450	145	290	365
	2	-	-	-	140	200	300	110	160	260	90	130	155	185	270	350	145	200	305
	3	-	-	-	140	155	245	110	125	235	90	100	155	170	190	260	140	155	245
	4	-	-	-	75	110	170	60	90	160	50	70	110	90	145	200	75	110	180
	5	-	-	-	120	200	260	100	160	210	80	130	165	150	220	305	120	200	270
	6	-	-	-	110	150	230	85	120	185	70	100	145	120	180	275	110	150	230
M	1	60	90	120	140	210	280	90	170	245	75	120	135	-	-	-	-	-	-
	2	45	75	110	120	200	245	90	150	245	75	110	135	-	-	-	-	-	-
	3	35	65	100	120	180	245	90	140	210	75	90	135	-	-	-	-	-	-
K	1	30	75	120	120	180	245	100	145	225	-	-	-	170	245	440	140	200	360
	2	25	70	110	90	150	240	70	120	170	-	-	-	120	195	340	100	160	280
	3	20	60	90	60	110	150	50	85	120	-	-	-	120	170	270	100	140	220
1-2	150	370	610	150	550	975	120	440	780	-	-	-	-	-	-	-	-	-	

Step 4 • Select toolholder based on application

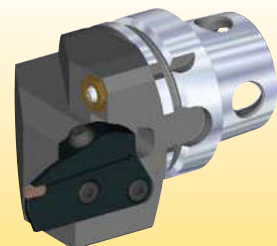
Choose the high-performance holder based on your specific grooving or cut-off application, with the corresponding seat size.

Style		Application
	Boring Bar	• For use in I.D. grooving applications.
	Cut-Off Blade	• Allows user to vary the depth of cut.
	Toolholder – Integral	• Offers the most stability over other styles.
	Toolholder – Modular	• Interchangeable blades for versatility.
	KM™ – Modular KM4X™ – Modular	• Best-in-class KM™ Quick-Change platform.
	PSC – Modular	• The modular system in the PSC Quick-Change platform.

Step 5 • Select the insert and holder from catalogue page

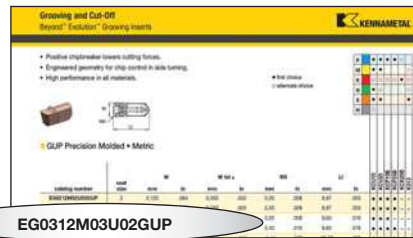
Congratulations!

You have successfully maximised your productivity by selecting the best insert geometry, grade, and cutting specifications for your application!



How Do Catalogue Numbers Work?

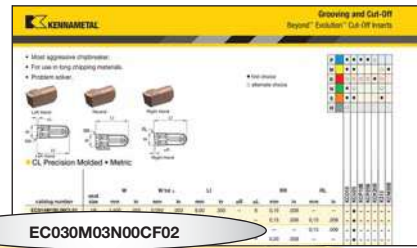
Each character in our catalogue number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.



EG0312M03U02GUP

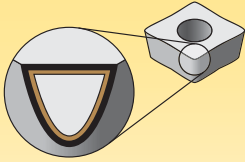
E	G	0312	M	03	U	02	GUP																																																								
Family Name	Insert Type	Groove Width	Unit	Seat Size	Tolerance	Corner Radius	Chipbreaker/ Edge Condition																																																								
Beyond™ Evolution™	G = Square R = Full Radius	Metric = 1/100mm Inch = 1/1000"	M = Metric I = Inch		U = Precision Moulded P = Precision Ground		GUP = Groove-Turn Universal Positive GUN = Groove-Turn Universal Negative FB = Flat Top Blank PB = Positive Chip Control Blank																																																								
				<table border="1"> <thead> <tr> <th rowspan="2">seat size</th> <th colspan="2">groove width</th> </tr> <tr> <th>mm</th> <th>inch</th> </tr> </thead> <tbody> <tr> <td>1B</td> <td>1,40</td> <td>.055</td> </tr> <tr> <td>1F</td> <td>1,60–1,99</td> <td>.063–.078</td> </tr> <tr> <td>02</td> <td>2,00–2,99</td> <td>.079–.117</td> </tr> <tr> <td>03</td> <td>3,00–3,99</td> <td>.118–.156</td> </tr> <tr> <td>04</td> <td>4,00–4,99</td> <td>.157–.196</td> </tr> <tr> <td>05</td> <td>5,00–5,99</td> <td>.197–.235</td> </tr> <tr> <td>06</td> <td>6,00–7,99</td> <td>.236–.314</td> </tr> <tr> <td>08</td> <td>8,00–8,99</td> <td>.315–.353</td> </tr> <tr> <td>10</td> <td>9,00–10,12</td> <td>.354–.398</td> </tr> </tbody> </table> <p>*.312" = seat size 08</p>	seat size	groove width		mm	inch	1B	1,40	.055	1F	1,60–1,99	.063–.078	02	2,00–2,99	.079–.117	03	3,00–3,99	.118–.156	04	4,00–4,99	.157–.196	05	5,00–5,99	.197–.235	06	6,00–7,99	.236–.314	08	8,00–8,99	.315–.353	10	9,00–10,12	.354–.398	<table border="1"> <thead> <tr> <th colspan="2">mm</th> </tr> </thead> <tbody> <tr> <td>00</td> <td>full radius</td> </tr> <tr> <td>01</td> <td>0,1</td> </tr> <tr> <td>02</td> <td>0,2</td> </tr> <tr> <td>04</td> <td>0,4</td> </tr> <tr> <td>08</td> <td>0,8</td> </tr> <tr> <td>12</td> <td>1,2</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th colspan="2">inch</th> </tr> </thead> <tbody> <tr> <td>00</td> <td>full radius</td> </tr> <tr> <td>05</td> <td>.008</td> </tr> <tr> <td>1</td> <td>.016</td> </tr> <tr> <td>2</td> <td>.032</td> </tr> <tr> <td>3</td> <td>.047</td> </tr> </tbody> </table>	mm		00	full radius	01	0,1	02	0,2	04	0,4	08	0,8	12	1,2	inch		00	full radius	05	.008	1	.016	2	.032	3	.047
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By referencing this easy-to-use guide, you can identify the correct product to meet your needs.



EC030M03N00CF02

E	C	030	M	03	N	00	CF	02																																																																	
Family Name	Insert Type	Cutting Edge Width	Unit	Seat Size	Hand of Insert	Approach Angle	Chipbreaker	Corner Radius																																																																	
Beyond™ Evolution™	C = Cut-Off		M = Metric I = Inch		N = Neutral L = Left hand R = Right hand	00 = Neutral 06 = 6°	CL = Cut-Off Low Feed CF = Cut-Off Fine CM = Cut-Off Medium CR = Cut-Off Rough																																																																		
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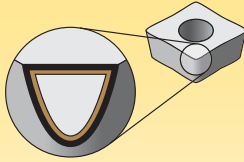
Coatings provide high-speed capability and are engineered for finishing to light roughing.

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

wear resistance ← → toughness

Grades	Coating	Grade Description	Performance Matrix																			
				05	10	15	20	25	30	35	40	45										
K313		<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																			
KCU10		<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																			
KCU25		<p>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.</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 cuts and high feed rates.</p>																				
			P																			
			M																			









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

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

CVD-Coated Carbide Grades

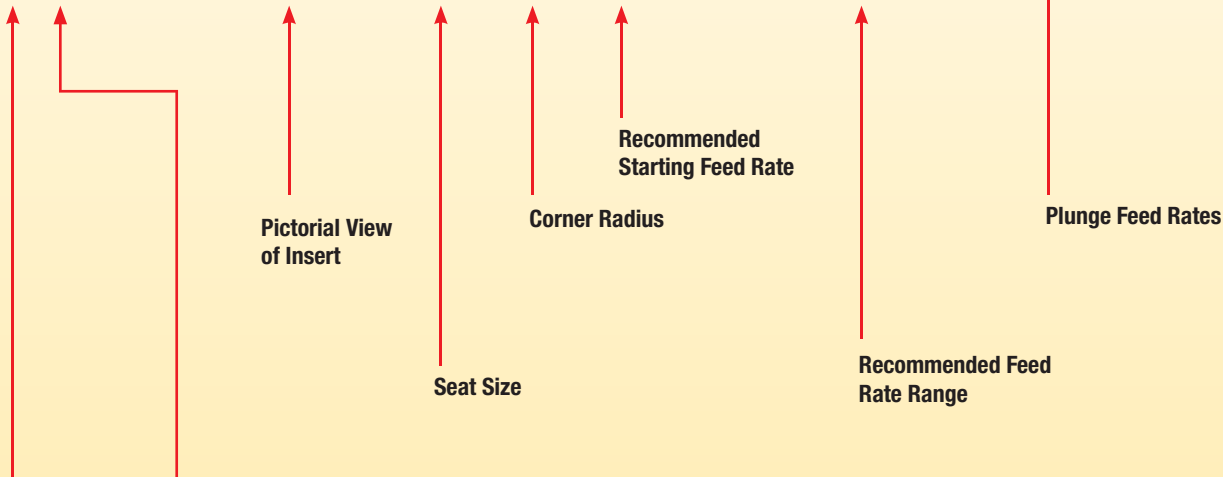
Coating	Grade Description	wear resistance ← → toughness									
		05	10	15	20	25	30	35	40	45	
 KCP10B —	<p>Composition: A specially engineered wear-resistant carbide grade with a newly designed multilayer MTCVD-TiCN-Al₂O₃-TiOCN coating with superior interlayer adhesion.</p> <p>Application: An excellent 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>	P									
		K									
beyond DRIVE™											
 KCP25B —	<p>Composition: A tough cobalt-enriched carbide grade with a newly designed multilayer MTCVD-TiCN-Al₂O₃-TiOCN 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 minimises microchipping and improves coating adhesion to substrate leading to long tool life and improved workpiece finishes.</p>	P									
		K									
beyond DRIVE™											
 KCK20B —	<p>Composition: A multilayered coating with thick MTCVD TiCN-Al₂O₃-TiOCN layers applied over a carbide substrate specifically engineered for cast irons.</p> <p>Application: Delivers consistent performance in high-speed machining of grey 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									
beyond DRIVE™											
 KCM35B —	<p>Composition: A multilayer TiN-MT-TiCN-Al₂O₃-TiOCN CVD coating over a super-tough substrate.</p> <p>Application: KCM35B is an excellent general purpose to roughing grade for machining stainless steels and roughing steels in turning and cut-off applications. The substrate provides improved toughness while the coating layers offer improved abrasion resistance and dependability at high cutting temperatures, along with wear identification. The polished surface improves edge toughness and provides a smooth outer surface to reduce forces and resist workpiece build-up on the cutting edge even at low cutting speeds. The grade is available in multiple sizes and geometries appropriate for increased feeds and large depths of cut.</p>	P									
		M									
	S										
beyond DRIVE™											

Select the geometry

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

- first choice
- alternate choice

Chip Control	Description	Insert Geometry	Seat Size	Corner Radius	Starting Conditions	Plunge Feed Rates inch/rev (mm/rev)						
				in (mm)	in (mm)	.0020 (0,05)	.0040 (0,10)	.0060 (0,15)	.0080 (0,20)	.0100 (0,25)	.0120 (0,30)	
-GUP	Positive rake angle for lower cutting forces.		1F	.008 (0,2)	.0024 (0,06)	◊						
			2	.008 (0,2)	.0031 (0,08)		◊					
			3	.008 (0,2)	.0035 (0,09)			◊				
				.016 (0,4)	.0043 (0,11)				◊			
			4	.016 (0,4)	.0047 (0,12)					◊		
				.031 (0,8)	.0059 (0,15)							



Primary Workpiece Material Group

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

- first choice
- alternate choice

Chip Control Geometry Designation

Maximum Feed Rate Values

Data above is for P and K material groups. Maximum feed rates should be adjusted by multiplying max feed rate values by following factors for shown material groups.	Material Group	Feed Factor
	M	.8
	N	1.2
	S	.8
	H	.5

■ Plunge feed rates

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

- first choice
- alternate choice

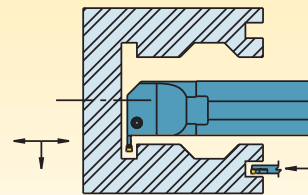
Chip Control	Description	Insert Geometry	Seat Size	Corner Radius	Starting Conditions	Plunge Feed Rates mm/rev						
						0,05	0,10	0,15	0,20	0,25	0,30	0,35
-GUP	Positive rake angle for lower cutting forces.		1F	0,2	0,06	0,05	0,10	0,15	0,20	0,25	0,30	0,35
			2	0,2	0,08	0,05	0,10	0,15	0,20	0,25	0,30	0,35
			3	0,2	0,09	0,05	0,10	0,15	0,20	0,25	0,30	0,35
				0,4	0,11	0,05	0,10	0,15	0,20	0,25	0,30	0,35
			4	0,4	0,12	0,05	0,10	0,15	0,20	0,25	0,30	0,35
				0,8	0,15	0,05	0,10	0,15	0,20	0,25	0,30	0,35
			5	0,4	0,15	0,05	0,10	0,15	0,20	0,25	0,30	0,35
				0,8	0,16	0,05	0,10	0,15	0,20	0,25	0,30	0,35
			6	0,4	0,16	0,05	0,10	0,15	0,20	0,25	0,30	0,35
				0,8	0,18	0,05	0,10	0,15	0,20	0,25	0,30	0,35
8	0,8	0,20	0,05	0,10	0,15	0,20	0,25	0,30	0,35			
	1,2	0,22	0,05	0,10	0,15	0,20	0,25	0,30	0,35			
10	1,2	0,24	0,05	0,10	0,15	0,20	0,25	0,30	0,35			
-GUN	Stable negative cutting edge allowing for more aggressive applications.		1F	0,2	0,06	0,05	0,10	0,15	0,20	0,25	0,30	0,35
			2	0,2	0,08	0,05	0,10	0,15	0,20	0,25	0,30	0,35
			3	0,2	0,09	0,05	0,10	0,15	0,20	0,25	0,30	0,35
				0,4	0,11	0,05	0,10	0,15	0,20	0,25	0,30	0,35
			4	0,4	0,12	0,05	0,10	0,15	0,20	0,25	0,30	0,35
				0,8	0,15	0,05	0,10	0,15	0,20	0,25	0,30	0,35
			5	0,4	0,15	0,05	0,10	0,15	0,20	0,25	0,30	0,35
				0,8	0,16	0,05	0,10	0,15	0,20	0,25	0,30	0,35
			6	0,4	0,16	0,05	0,10	0,15	0,20	0,25	0,30	0,35
				0,8	0,18	0,05	0,10	0,15	0,20	0,25	0,30	0,35
8	0,8	0,20	0,05	0,10	0,15	0,20	0,25	0,30	0,35			
	1,2	0,22	0,05	0,10	0,15	0,20	0,25	0,30	0,35			
10	1,2	0,24	0,05	0,10	0,15	0,20	0,25	0,30	0,35			

Maximum Feed Rate Values

Data above is for P and K material groups. Maximum feed rates should be adjusted by multiplying max feed rate values by following factors for shown material groups.	Material Group	Feed Factor
	M	.8
	N	1.2
	S	.8
	H	.5

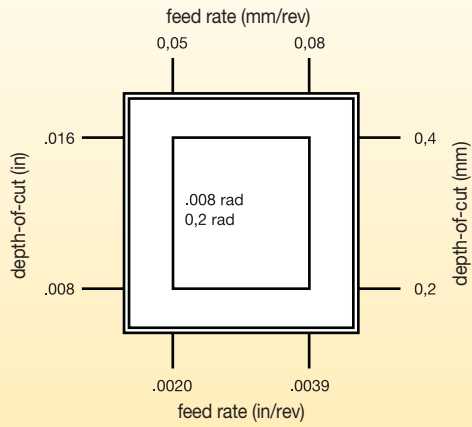
I.D. and Face Grooving

For I.D. and face grooving applications, reduce feed rate by 20%.

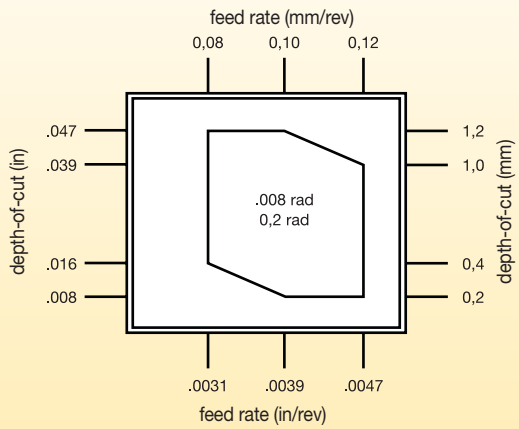


Turn and profile feed rates

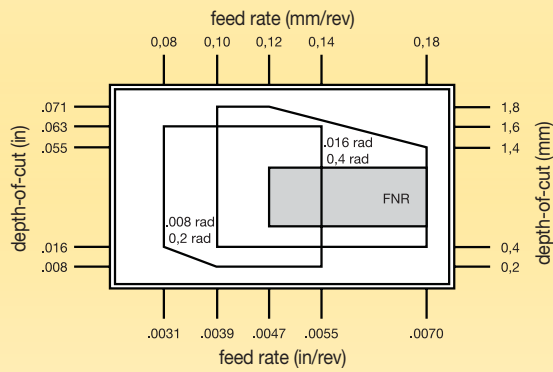
Seat Size 1F



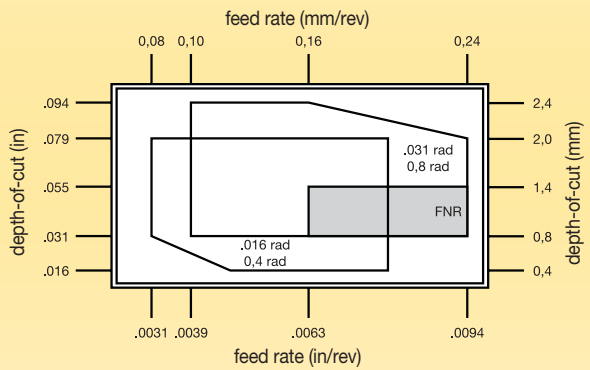
Seat Size 2



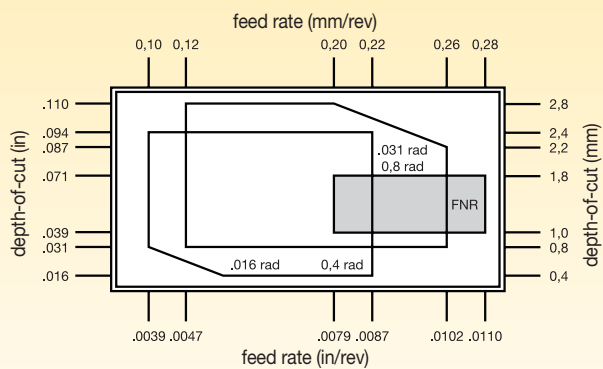
Seat Size 3



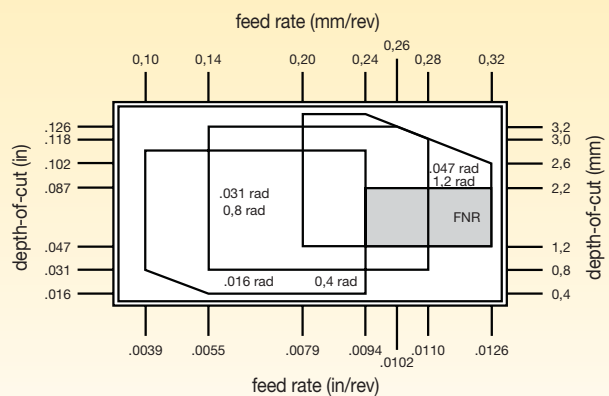
Seat Size 4



Seat Size 5



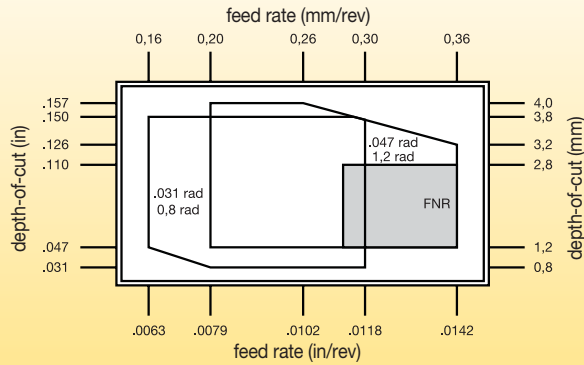
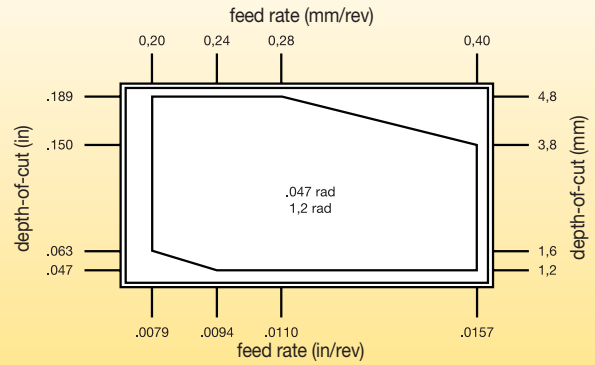
Seat Size 6



* FNR = Full Nose Radius

(continued)

(Turn and profile feed rates — continued)

Seat Size 8

Seat Size 10

Cut-Off Feed Rates
■ Plunge feed rates

- first choice
- alternate choice

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

Geometry	Description	Insert Geometry	Seat Size	Starting Conditions mm	Cut-Off Feed Rates mm/rev								
					0,05	0,10	0,15	0,20	0,25	0,30	0,35	0,40	
-CL	Aggressive geometry for hard to break chips.		1B	0,06	●								
			2	0,07	●	○							
			3	0,08	●	○	○						
			4	0,09	●	○	○	○					
-CF	Positive geometry for reduced cutting forces.		1B	0,06	●								
			2	0,07	●	○							
			3	0,09	●	○	○						
			4	0,11	●	○	○	○					
			5	0,13	●	○	○	○	○				
-CM	Stable cutting edge for aggressive feed rates. Primarily in cast iron.		1B	0,06	●								
			2	0,07	●	○							
			3	0,09	●	○	○						
			4	0,11	●	○	○	○					
			5	0,14	●	○	○	○	○				
			6	0,16	●	○	○	○	○	○			
-CR	Most stable cutting edge for steel.		2	0,10	○	○							
			3	0,14	○	○	○						
			4	0,16	○	○	○	○					
			5	0,19	○	○	○	○	○				
6	0,21	○	○	○	○	○	○						
8	0,23	○	○	○	○	○	○	○					

NOTE: For cut-off inserts with a lead angle, maximum feed rate should be reduced by up to 40%.

Maximum Feed Rate Values

Data above is for P and K material groups. Maximum feed rates should be adjusted by multiplying max feed rate values by following factors for shown material groups.	Material Group	Feed Factor
	M	.8
	N	1.2
	S	.8
	H	.5

Recommended Starting Speeds [m/min]

Grooving and Cut-Off

Material Group	K313			KCU10			KCU25			KCM35B			KCP10B			KCP25B			KCK20B			
P	0-1	-	-	-	140	280	350	110	225	270	90	180	213	185	400	450	145	290	365	200	440	490
	2	-	-	-	140	200	300	110	160	260	90	130	155	185	270	350	145	200	305	200	300	380
	3	-	-	-	140	155	245	110	125	235	90	100	155	170	190	260	140	155	245	600	200	280
	4	-	-	-	75	110	170	60	90	160	50	70	110	90	145	200	75	110	180	100	160	220
	5	-	-	-	120	200	260	100	160	210	80	130	165	150	220	305	120	200	270	165	240	330
	6	-	-	-	110	150	230	85	120	185	70	100	145	120	180	275	110	150	230	130	190	300
M	1	60	90	120	140	210	280	90	170	245	75	120	135	-	-	-	-	-	-	-	-	-
	2	45	75	110	120	200	245	90	150	245	75	110	135	-	-	-	-	-	-	-	-	-
	3	35	65	100	120	180	245	90	140	210	75	90	135	-	-	-	-	-	-	-	-	-
K	1	30	75	120	120	180	245	100	145	225	-	-	-	170	245	440	140	200	360	210	305	550
	2	25	70	110	90	150	240	70	120	170	-	-	-	120	195	340	100	160	280	150	245	430
	3	20	60	90	60	110	150	50	85	120	-	-	-	120	170	270	100	140	220	150	210	335
N	1-2	150	370	610	150	550	975	120	440	780	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4	120	275	430	120	365	700	100	290	490	-	-	-	-	-	-	-	-	-	-	-	-
	5	45	90	150	90	170	245	70	135	195	-	-	-	-	-	-	-	-	-	-	-	-
	6	40	75	150	120	210	305	100	170	245	-	-	-	-	-	-	-	-	-	-	-	-
S	1	8	30	75	15	55	135	8	40	60	8	35	60	-	-	-	-	-	-	-	-	-
	2	8	35	75	15	60	135	8	30	75	8	30	60	-	-	-	-	-	-	-	-	-
	3	8	40	75	15	70	150	15	40	75	15	35	60	-	-	-	-	-	-	-	-	-
	4	8	45	75	15	70	170	8	50	110	15	45	90	-	-	-	-	-	-	-	-	-
H	1	-	-	-	30	45	60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	15	30	45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

Mobile Apps

The Kennametal mobile app provides easy access to product information and calculators on both iPhone® and Android™ devices. We've highlighted a few of the key features...

There's an app for that.

SPEEDS & FEEDS

View speeds and feeds information for metalworking products.

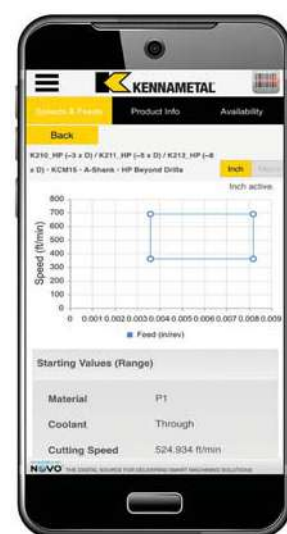
PRODUCT AVAILABILITY

Check global availability of products. View available quantities by providing your Konnect login credentials.

CALCULATORS

Utilise our machining calculators for milling and drilling applications.

By just scanning the bar code on the insert packet, you can find the most productive cutting conditions for tool life, process time, and chip control.



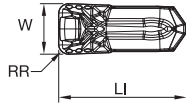
NOTE: The app is currently only available in the English-language version. We have plans to translate the app in different languages with future releases.



- Positive chipbreaker lowers cutting forces.
- Engineered geometry for chip control in side turning.
- High performance in all materials.

● first choice
○ alternate choice

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



■ GUP Precision Moulded • Metric

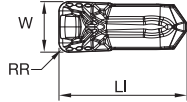
catalogue number	seat size	W	W tol ±	RR	LI	KCU10	KCU25	KCP10B	KCP25B	KCK20B	KCM35B	K313
EG0212M02U02GUP	2	2,125	0,050	0,20	8,97	●	●	●	●	-	-	-
EG0251M02U02GUP	2	2,511	0,050	0,20	8,97	●	●	●	●	-	-	-
EG0312M03U02GUP	3	3,125	0,075	0,20	9,60	●	●	●	-	-	-	-
EG0312M03U04GUP	3	3,125	0,075	0,40	9,60	●	●	●	-	-	-	-
EG0412M04U04GUP	4	4,125	0,075	0,40	10,19	●	●	●	-	-	-	-
EG0412M04U08GUP	4	4,125	0,075	0,80	10,19	●	●	●	-	-	-	-
EG0512M05U04GUP	5	5,125	0,075	0,40	12,25	●	●	●	-	-	-	-
EG0512M05U08GUP	5	5,125	0,075	0,80	12,25	●	●	●	-	-	-	-
EG0612M06U04GUP	6	6,125	0,075	0,40	14,60	●	●	●	-	-	-	-
EG0612M06U08GUP	6	6,125	0,075	0,80	14,60	●	●	●	-	-	-	-
EG0712M06U08GUP	6	7,125	0,075	0,80	14,60	●	●	●	-	-	-	-
EG0812M08U08GUP	8	8,125	0,075	0,80	17,47	●	●	●	-	-	-	-
EG0812M08U12GUP	8	8,125	0,075	1,18	17,45	●	●	●	-	-	-	-
EG1012M10U12GUP	10	10,125	0,075	1,20	20,80	●	●	●	-	-	-	-



- Positive chipbreaker lowers cutting forces.
- Engineered geometry for chip control in side turning.
- High performance in all materials.

● first choice
○ alternate choice

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



■ GUP Precision Moulded • Inch

catalogue number	seat size	W	W tol ±	RR	LI	KCU10	KCU25	KCP10B	KCP25B	KCK20B	KCM35B	K313
EG130I03U05GUP	3	3,301	0,075	0,20	9,60	●	●	●	●	-	-	-
EG130I03U1GUP	3	3,301	0,075	0,40	9,60	●	●	●	●	-	-	-
EG192I04U1GUP	4	4,877	0,075	0,40	10,19	●	●	●	●	-	-	-
EG192I04U2GUP	4	4,877	0,075	0,79	10,19	●	●	●	●	-	-	-
EG255I06U1GUP	6	6,478	0,075	0,40	14,58	●	●	●	●	-	-	-
EG255I06U2GUP	6	6,478	0,075	0,80	14,58	●	●	●	●	-	-	-
EG317I08U3GUP	8	8,051	0,075	1,19	17,46	●	●	●	●	-	-	-
EG380I10U3GUP	10	9,651	0,075	1,19	20,80	●	●	●	●	-	-	-

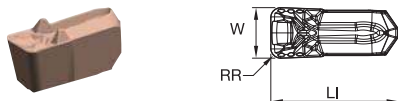


- Positive chipbreaker lowers cutting forces.
- Engineered geometry for chip control in side turning.
- High performance in all materials.
- More precise widths and better repeatability.

● first choice
○ alternate choice

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

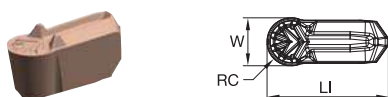
Grooving and Cut-Off



■ GUP Precision Ground • Inch

catalogue number	seat size	W	W tol ±	RR	LI	KCU10	KCU25	KCP10B	KCP25B	KCK20B	KCM35B	K313
EG06311FP05GUP	1F	1,600	0,025	0,20	9,00	●	●	-	-	-	-	●
EG094I02P05GUP	2	2,388	0,025	0,20	8,88	●	●	-	-	-	-	●
EG125I03P05GUP	3	3,175	0,025	0,20	9,40	●	●	-	-	-	-	●
EG125I03P1GUP	3	3,175	0,025	0,40	9,40	●	●	-	-	-	-	●
EG187I04P1GUP	4	4,760	0,025	0,40	10,10	●	●	-	-	-	-	●
EG187I04P2GUP	4	4,762	0,025	0,79	10,10	●	●	-	-	-	-	●
EG250I06P1GUP	6	6,350	0,025	0,40	14,50	●	●	-	-	-	-	●
EG250I06P2GUP	6	6,350	0,025	0,80	14,50	●	●	-	-	-	-	●
EG312I08P3GUP	8	7,920	0,025	1,20	17,40	●	●	-	-	-	-	●
EG375I10P3GUP	10	9,525	0,025	1,20	20,70	●	●	-	-	-	-	●

- First choice in profiling.
- >180° cutting edge.
- High performance in all materials.



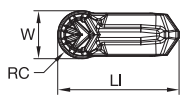
■ GUP Full Radius Precision Moulded • Metric

catalogue number	seat size	W	W tol ±	RC	LI	KCU10	KCU25	KCP10B	KCP25B	KCK20B	KCM35B	K313
ER0312M03U00GUP	3	3,125	0,075	1,560	9,60	●	●	●	●	-	-	-
ER0412M04U00GUP	4	4,125	0,075	2,060	10,20	●	●	●	●	-	-	-
ER0512M05U00GUP	5	5,125	0,075	2,560	12,20	●	●	●	●	-	-	-
ER0612M06U00GUP	6	6,125	0,075	3,060	14,60	●	●	●	●	-	-	-
ER0812M08U00GUP	8	8,125	0,075	4,060	17,50	●	●	●	●	-	-	-

- First choice in profiling.
- >180° cutting edge.
- High performance in all materials.
- More precise widths and better repeatability.

● first choice
○ alternate choice

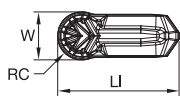
P	●	●	●	○	○	○	○
M	●	●	○	○	○	○	○
K	○	○	○	○	○	○	○
N	●	○	○	○	○	○	○
S	●	●	○	○	○	○	○
H	○	○	○	○	○	○	○



■ GUP Full Radius Precision Ground • Metric

catalogue number	seat size	W	W tol ±	RC	LI	KCU10	KCU25	KCP10B	KCP25B	KCK20B	KCM35B	K313
ER0300M03P00GUP	3	3,000	0,025	1,500	9,50	●	●	-	-	-	-	●
ER0400M04P00GUP	4	4,000	0,025	2,000	10,10	●	●	-	-	-	-	●
ER0500M05P00GUP	5	5,000	0,025	2,500	12,20	●	●	-	-	-	-	●
ER0600M06P00GUP	6	6,000	0,025	3,000	14,50	●	●	-	-	-	-	●
ER0800M08P00GUP	8	8,000	0,025	4,000	17,40	●	●	-	-	-	-	●

- First choice in profiling.
- >180° cutting edge.
- High performance in all materials.



■ GUP Full Radius Precision Moulded • Inch

catalogue number	seat size	W	W tol ±	RC	LI	KCU10	KCU25	KCP10B	KCP25B	KCK20B	KCM35B	K313
ER130I03U00GUP	3	3,302	0,075	1,650	9,60	●	●	●	●	-	-	-
ER192I04U00GUP	4	4,878	0,075	2,440	10,20	●	●	●	●	-	-	-
ER255I06U00GUP	6	6,478	0,075	3,240	14,60	●	●	●	●	-	-	-
ER317I08U00GUP	8	8,052	0,075	4,030	17,50	●	●	●	●	-	-	-

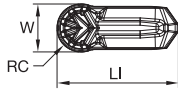
Grooving and Cut-Off

- First choice in profiling.
- >180° cutting edge.
- High performance in all materials.
- More precise widths and better repeatability.

- first choice
- alternate choice

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

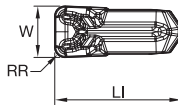
Grooving and Cut-Off



■ GUP Full Radius Precision Ground • Inch

catalogue number	seat size	W	W tol ±	RC	LI	KCU10	KCU25	KCP10B	KCP25B	KCK20B	KCM35B	K313
ER125I03P00GUP	3	3,175	0,025	1,590	9,50	●	●	-	-	-	-	●
ER187I04P00GUP	4	4,762	0,025	2,380	10,10	●	●	-	-	-	-	●
ER250I06P00GUP	6	6,350	0,025	3,170	14,50	●	●	-	-	-	-	●
ER312I08P00GUP	8	7,920	0,025	3,960	17,40	●	●	-	-	-	-	●

- Negative rake face for strongest cutting edge.
- More aggressive applications.
- Advantages in low-feed and depth-of-cut applications.



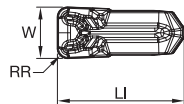
■ GUN Precision Moulded • Metric

catalogue number	seat size	W	W tol ±	RR	LI	KCU10	KCU25	KCP10B	KCP25B	KCK20B	KCM35B	K313
EG0212M02U02GUN	2	2,125	0,050	0,20	8,97	●	●	●	●	●	-	-
EG0251M02U02GUN	2	2,510	0,050	0,20	8,97	●	●	●	●	●	-	-
EG0312M03U02GUN	3	3,125	0,075	0,20	9,60	●	●	●	●	●	-	-
EG0312M03U04GUN	3	3,125	0,075	0,40	9,60	●	●	●	●	●	-	-
EG0412M04U04GUN	4	4,125	0,075	0,40	10,19	●	●	●	●	●	-	-
EG0412M04U08GUN	4	4,125	0,075	0,80	10,19	●	●	●	●	●	-	-
EG0512M05U04GUN	5	5,125	0,075	0,40	12,20	●	●	●	●	●	-	-
EG0512M05U08GUN	5	5,125	0,075	0,80	12,20	●	●	●	●	●	-	-
EG0612M06U04GUN	6	6,125	0,075	0,40	14,60	●	●	-	●	●	-	-
EG0612M06U08GUN	6	6,125	0,075	0,80	14,60	●	●	-	●	●	-	-
EG0812M08U08GUN	8	8,125	0,075	0,80	17,50	●	●	●	●	●	-	-
EG0812M08U12GUN	8	8,125	0,075	1,20	17,50	●	●	●	●	●	-	-
EG1012M10U12GUN	10	10,125	0,075	1,20	20,80	●	●	●	●	●	-	-

- Negative rake face for strongest cutting edge.
- More aggressive applications.
- Advantages in low-feed and depth-of-cut applications.

● first choice
○ alternate choice

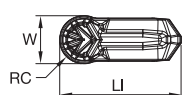
P	●	●	●	●	○	○	○	○
M	●	●	○	○	○	○	○	○
K	○	○	○	○	○	○	○	○
N	●	○	○	○	○	○	○	○
S	●	●	○	○	○	○	○	○
H	○	○	○	○	○	○	○	○



■ GUN Precision Moulded • Inch

catalogue number	seat size	W	W tol ±	RR	LI	KCU10	KCU25	KCP10B	KCP25B	KCK20B	KCM35B	K313
EG06311FU05GUN	1F	1,600	0,050	0,20	9,00	●	●	●	●	○	○	○
EG130I03U05GUN	3	3,302	0,075	0,20	9,60	●	●	●	●	○	○	○
EG130I03U1GUN	3	3,302	0,075	0,40	9,60	●	●	●	●	○	○	○
EG192I04U1GUN	4	4,877	0,075	0,40	10,19	●	●	●	●	○	○	○
EG192I04U2GUN	4	4,878	0,075	0,79	10,19	●	●	●	●	○	○	○
EG255I06U1GUN	6	6,477	0,075	0,40	14,58	●	●	●	●	○	○	○
EG255I06U2GUN	6	6,477	0,075	0,80	14,58	●	●	●	●	○	○	○
EG317I08U3GUN	8	8,052	0,075	1,19	17,46	●	●	●	●	○	○	○
EG380I10U3GUN	10	9,651	0,075	1,20	20,80	●	●	●	●	○	○	○

- Negative rake face for strongest cutting edge.
- First choice in profiling.
- >180° cutting edge.
- High performance in all materials.



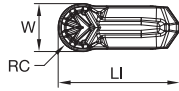
■ GUN Full Radius Precision Moulded • Metric

catalogue number	seat size	W	W tol ±	RC	LI	KCU10	KCU25	KCP10B	KCP25B	KCK20B	KCM35B	K313
ER0312M03U00GUN	3	3,125	0,075	1,560	9,60	●	●	●	●	○	○	○
ER0412M04U00GUN	4	4,125	0,075	2,060	10,20	●	●	●	●	○	○	○
ER0512M05U00GUN	5	5,125	0,075	2,560	12,20	●	●	●	●	○	○	○
ER0612M06U00GUN	6	6,125	0,075	3,060	14,60	●	●	●	●	○	○	○
ER0812M08U00GUN	8	8,125	0,075	4,060	17,47	●	●	●	●	○	○	○

- Negative rake face for strongest cutting edge.
- First choice in profiling.
- >180° cutting edge.
- High performance in all materials.

● first choice
○ alternate choice

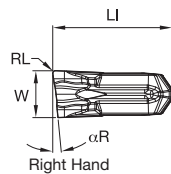
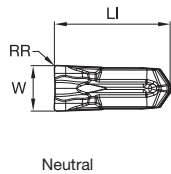
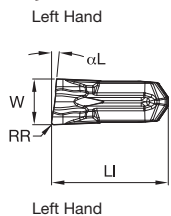
P	●	●	●	●	○						
M	●	●	●	●	○						
K	○	○	○	○	●						
N	●	○	○	○	○						
S	●	●	○	○	○						
H	○										



■ GUN Full Radius Precision Moulded • Inch

catalogue number	seat size	W	W tol ±	RC	LI	KCU10	KCU25	KCP10B	KCP25B	KCK20B	KCM35B	K313
ER094I02U00GUN	2	2,387	0,050	1,190	8,97	●	●	●	●	○	-	-
ER125I03U00GUN	3	3,177	0,075	1,590	9,60	●	●	●	●	○	-	-
ER130I03U00GUN	3	3,300	0,075	1,650	9,60	●	●	●	●	○	-	-
ER187I04U00GUN	4	4,750	0,075	2,370	10,20	●	●	●	●	○	-	-
ER192I04U00GUN	4	4,873	0,075	2,440	10,20	●	●	●	●	○	-	-
ER250I06U00GUN	6	6,346	0,075	3,170	14,60	●	●	●	●	○	-	-
ER255I06U00GUN	6	6,473	0,075	3,240	14,60	●	●	●	●	○	-	-
ER312I08U00GUN	8	7,925	0,075	3,960	17,50	●	●	●	●	○	-	-
ER317I08U00GUN	8	8,052	0,075	4,030	17,50	●	●	●	●	○	-	-

- Positive chipbreaker lowers cutting forces.
- First choice for steel and stainless steel.
- Excellent surface finish.



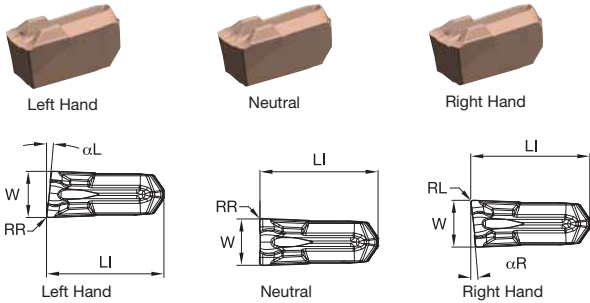
■ CF Precision Moulded • Metric

catalogue number	seat size	W	W tol ±	LI	αR	αL	RR	RL	KCU10	KCU25	KCP10B	KCP25B	KCK20B	KCM35B	K313
EC014M1BL06CF01	1B	1,404	0,050	9,00	—	6	0,15	—	-	●	-	-	-	●	-
EC014M1BN00CF01	1B	1,400	0,050	9,00	—	—	0,15	0,15	-	●	-	-	-	●	-
EC014M1BR06CF01	1B	1,404	0,050	9,00	6	—	—	0,15	-	●	-	-	-	●	-
EC020M02L06CF02	2	2,000	0,050	8,97	—	6	0,20	—	-	●	-	-	-	●	-
EC020M02N00CF02	2	2,000	0,050	8,97	—	—	0,20	0,20	-	●	-	-	-	●	-
EC020M02R06CF02	2	2,000	0,050	8,97	6	—	—	0,20	-	●	-	-	-	●	-
EC030M03L06CF02	3	3,000	0,075	9,60	—	6	0,20	—	-	●	-	-	-	●	-
EC030M03N00CF02	3	3,000	0,075	9,60	—	—	0,20	0,20	-	●	-	-	-	●	-
EC030M03R06CF02	3	3,000	0,075	9,60	6	—	—	0,20	-	●	-	-	-	●	-
EC040M04L06CF02	4	4,000	0,075	10,19	—	6	0,20	—	-	●	-	-	-	●	-
EC040M04N00CF02	4	4,000	0,075	10,19	—	—	0,20	0,20	-	●	-	-	-	●	-
EC040M04R06CF02	4	4,000	0,075	10,19	6	—	—	0,20	-	●	-	-	-	●	-
EC050M05N00CF03	5	5,000	0,075	12,20	—	—	0,30	0,30	-	●	-	-	-	●	-

- Most aggressive chipbreaker.
- For use in long chipping materials.
- Problem solver.

● first choice
○ alternate choice

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



CL Precision Moulded • Metric

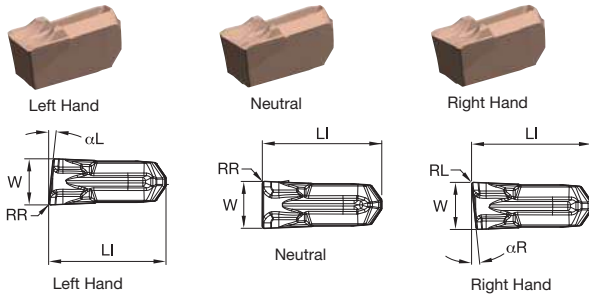
catalogue number	seat size	W	W tol ±	LI	αR	αL	RR	RL	KCU10	KCU25	KCP10B	KCP25B	KCK20B	KCM35B	K313
EC014M1BL06CL01	1B	1,400	0,050	9,00	—	6	0,15	—	—	●	—	—	—	●	—
EC014M1BN00CL01	1B	1,400	0,050	9,00	—	—	0,15	0,15	—	●	—	—	—	●	—
EC014M1BR06CL01	1B	1,400	0,050	9,00	6	—	—	0,15	—	●	—	—	—	●	—
EC020M02L06CL02	2	2,000	0,050	8,96	—	6	0,20	—	—	●	—	—	—	●	—
EC020M02N00CL02	2	2,000	0,050	8,97	—	—	0,20	0,20	—	●	—	—	—	●	—
EC020M02R06CL02	2	2,000	0,050	8,96	6	—	—	0,20	—	●	—	—	—	●	—
EC030M03L06CL02	3	3,000	0,075	9,59	—	6	0,20	—	—	●	—	—	—	●	—
EC030M03N00CL02	3	3,000	0,075	9,60	—	—	0,20	0,20	—	●	—	—	—	●	—
EC030M03R06CL02	3	3,000	0,075	9,59	6	—	—	0,20	—	●	—	—	—	●	—
EC040M04L06CL02	4	4,000	0,075	10,19	—	6	0,20	—	—	●	—	—	—	●	—
EC040M04N00CL02	4	4,000	0,075	10,20	—	—	0,20	0,20	—	●	—	—	—	●	—
EC040M04R06CL02	4	4,000	0,075	10,19	6	—	—	0,20	—	●	—	—	—	●	—

- Ultimate solution in edge stability.
- Leverage for interrupted cuts or hardened skin.
- First choice for cast iron.

● first choice
○ alternate choice

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

Grooving and Cut-Off



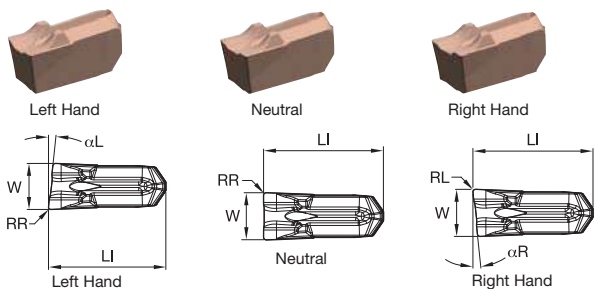
CM Precision Moulded • Metric

catalogue number	seat size	W	W tol ±	LI	αR	αL	RR	RL	KCU10	KCU25	KCP10B	KCP25B	KCK20B	KCM35B	K313
EC014M1BL06CM01	1B	1,400	0,050	9,00	—	6	0,20	—	—	●	—	—	—	—	—
EC014M1BN00CM01	1B	1,400	0,050	9,00	—	—	0,15	0,15	—	●	—	—	—	—	—
EC014M1BR06CM01	1B	1,400	0,050	9,00	6	—	—	0,20	—	●	—	—	—	—	—
EC020M02L06CM02	2	2,000	0,050	9,00	—	6	0,20	—	—	●	—	—	—	—	—
EC020M02N00CM02	2	2,000	0,050	8,98	—	—	0,20	0,20	—	●	—	—	—	—	—
EC020M02R06CM02	2	2,000	0,050	9,00	6	—	—	0,20	—	●	—	—	—	—	—
EC030M03L06CM02	3	3,000	0,075	9,60	—	6	0,20	—	—	●	—	—	—	—	—
EC030M03N00CM02	3	3,000	0,075	9,60	—	—	0,20	0,20	—	●	—	—	—	—	—
EC030M03R06CM02	3	3,000	0,075	9,60	6	—	—	0,20	—	●	—	—	—	—	—
EC040M04L06CM02	4	4,000	0,075	10,20	—	6	0,20	—	—	●	—	—	—	—	—
EC040M04N00CM02	4	4,000	0,075	10,20	—	—	0,20	0,20	—	●	—	—	—	—	—
EC040M04R06CM02	4	4,000	0,075	10,20	6	—	—	0,20	—	●	—	—	—	—	—
EC050M05N00CM03	5	5,000	0,075	12,20	—	—	0,30	0,30	—	●	—	—	—	—	—
EC060M06N00CM03	6	6,000	0,075	14,59	—	—	0,30	0,30	—	●	—	—	—	—	—
EC070M06N00CM04	6	7,000	0,075	14,60	—	—	0,40	0,40	—	●	—	—	—	—	—
EC080M08N00CM04	8	8,000	0,075	17,50	—	—	0,40	0,40	—	●	—	—	—	—	—

- Strong chip control due to concave edge.
- First choice in steel when additional stability is required.
- Can apply most aggressive speed rates.

● first choice
○ alternate choice

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



■ CR Precision Moulded • Metric

catalogue number	seat size	W	W tol ±	LI	αR	αL	RR	RL	KCU10	KCU25	KCP10B	KCP25B	KCK20B	KCM35B	K313
EC020M02L06CR02	2	2,000	0,050	9,00	—	6	0,20	—	—	●	—	—	—	—	—
EC020M02N00CR02	2	2,000	0,050	8,98	—	—	0,20	0,20	—	●	—	—	—	—	—
EC020M02R06CR02	2	2,000	0,050	9,00	6	—	—	0,20	—	●	—	—	—	—	—
EC030M03L06CR02	3	3,000	0,075	9,60	—	6	0,20	—	—	●	—	—	—	—	—
EC030M03N00CR02	3	3,000	0,075	9,60	—	—	0,20	0,20	—	●	—	—	—	—	—
EC030M03R06CR02	3	3,000	0,075	9,60	6	—	—	0,20	—	●	—	—	—	—	—
EC040M04L06CR02	4	4,000	0,075	10,20	—	6	0,20	—	—	●	—	—	—	—	—
EC040M04N00CR02	4	4,000	0,075	10,20	—	—	0,20	0,20	—	●	—	—	—	—	—
EC040M04R06CR02	4	4,000	0,075	10,20	6	—	—	0,20	—	●	—	—	—	—	—
EC050M05N00CR03	5	5,000	0,075	12,25	—	—	0,30	0,30	—	●	—	—	—	—	—
EC060M06L06CR04	6	6,000	0,075	14,59	—	6	0,40	—	—	●	—	—	—	—	—
EC060M06N00CR03	6	6,000	0,075	14,59	—	—	0,30	0,30	—	●	—	—	—	—	—
EC060M06R06CR04	6	6,000	0,075	14,59	6	—	—	0,40	—	●	—	—	—	—	—
EC070M06N00CR04	6	7,000	0,075	14,60	—	—	0,40	0,40	—	●	—	—	—	—	—
EC080M08L06CR04	8	8,000	0,075	17,50	—	6	0,40	—	—	●	—	—	—	—	—
EC080M08N00CR04	8	8,000	0,075	17,50	—	—	0,40	0,40	—	●	—	—	—	—	—
EC080M08R06CR04	8	8,000	0,075	17,50	6	—	—	0,40	—	●	—	—	—	—	—

How Do Catalogue Numbers Work?

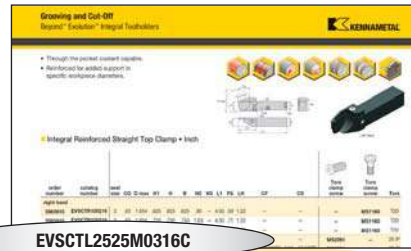
Each character in our catalogue number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.



EVSML2525M0316030035C

EV	S	M	L	2525M	03	16	030035	C	
Family Name	Tool Style	Support Type	Hand	Shank Size	Seat Size	Max Groove Depth	Face Grooving Diameters	Coolant	
Beyond™ Evolution™	S = Straight mount		L = Left hand R = Right hand		1B 1F 02 03 04 05 06 08 10	in millimetres	030 = Minimum diameter in mm 035 = Maximum diameter in mm	C = Through the pocket coolant capable	
<p>M = Maximum support for specific groove width and straight clearance for unlimited workpiece diameter</p> <p>A = Face grooving — inboard sweep</p> <p>B = Face grooving — outboard sweep</p>				<p>Metric = Height x Width in mm letter indicates tool length according to ISO</p>					

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

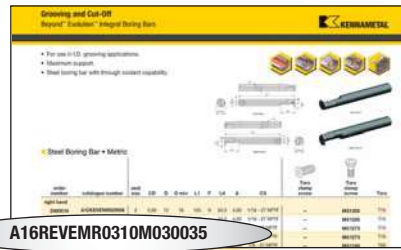


EVSCTL2525M0316C

EV	S	C	T	L	2525M	03	16	C
Family Name	Tool Style	Support Type	Clamping Screw Position	Hand	Shank Size	Seat Size	Max Groove Depth	Coolant
Beyond™ Evolution™	S = Straight mount		T = Top F = Front	L = Left hand R = Right hand		1B 1F 02 03 04 05 06 08 10	in millimetres	C = Through the pocket coolant capable
C = Reinforced support			Metric = Height x Width in mm letter indicates tool length according to ISO					

How Do Catalogue Numbers Work?

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



A16REVEMR0310M030035

A	16	R	EV	E	M	R	03	10	M	030035																							
Steel Bar with Coolant	Bar Diameter	Bar Length	Platform	Tool Type	Support Type	Hand of Tool	Insert Seat Size	Max Cutting Depth	Tool Units	Face Grooving Diameters																							
Steel boring bar with through coolant capability.			Beyond™ Evolution™	E = End mount (90°) S = Straight Mount	M = Maximum support A = Face Grooving-inboard sweep	R = Right hand L = Left hand	1F 02 03 04 05 06 08 10	in millimetres	M = Metric I = Inch	030 = Minimum diameter in mm 035 = Maximum diameter in mm																							
Metric = Diameter in mm Inch = Diameter in 1/16" increments		<table border="1"> <thead> <tr> <th>symbol</th> <th>mm</th> <th>inch</th> </tr> </thead> <tbody> <tr> <td>K</td> <td>125</td> <td>5</td> </tr> <tr> <td>M</td> <td>150</td> <td>6</td> </tr> <tr> <td>Q</td> <td>180</td> <td>7</td> </tr> <tr> <td>R</td> <td>200</td> <td>8</td> </tr> <tr> <td>S</td> <td>250</td> <td>10</td> </tr> <tr> <td>T</td> <td>300</td> <td>12</td> </tr> </tbody> </table>			symbol	mm	inch	K	125	5	M	150	6	Q	180	7	R	200	8	S	250	10	T	300	12								
symbol	mm	inch																															
K	125	5																															
M	150	6																															
Q	180	7																															
R	200	8																															
S	250	10																															
T	300	12																															



EVBSL32J0320

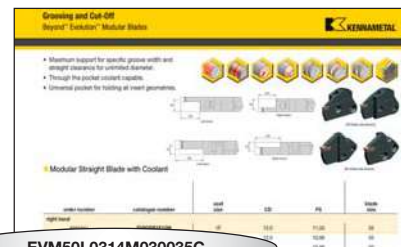
EV	B	S	L	32	J	03	20
Family Name	Tool Style	Support Type	Hand	Blade Height	Overall Length	Seat Size	Max Cutting Depth
Beyond™ Evolution™	B = 2 pocket blade	S = Standard C = Reinforced	N = Neutral L = Left hand R = Right hand	in millimetres	According to ISO G = 90mm J = 110mm M = 150mm X = Special	1B 1F 02 03 04 05 06 08 10	in millimetres

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



KGMSL2525M50C

KGM	S	L	2525M	50	C
Family Name	Tool Style	Hand	Shank Size	Blade Size	Coolant
Grooving Modular System	S = Straight mount E = End mount (90°)	L = Left hand R = Right hand	Metric = Height x Width in mm letter indicates tool length according to ISO	50 65	C = Through coolant capable

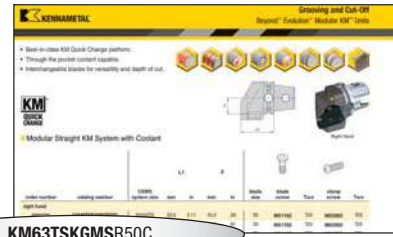



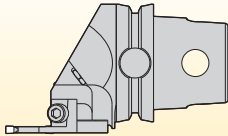
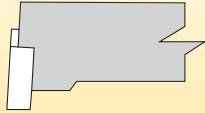
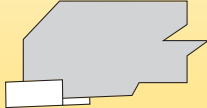
EVM50L0314M030035C

EVM	50	L	03	14	M	030035	C
Family Name	Blade Size	Hand	Seat Size	Max Groove Depth	Support Type	Face Grooving Diameters	Coolant
Beyond™ Evolution™ Modular Blade	50 65	L = Left hand R = Right hand	1B 1F 02 03 04 05 06 08 10	in millimetres	M = Maximum support for specific groove width and straight clearance for unlimited diameter A = Face grooving-inboard sweep B = Face grooving-outboard sweep	030 = Minimum diameter in mm 035 = Maximum diameter in mm	C = Through the pocket coolant capable

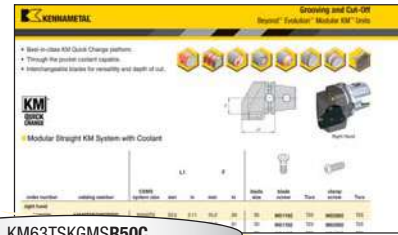
How Do Catalogue Numbers Work?

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



KM	63	TS	KGM	S
KM™ Quick-Change	System Size	Feature	Insert Holding Method	Insert Location
KM KM4X™ PSC	40 = 40mm 50 = 50mm 63 = 63mm 80 = 80mm 100 = 100mm 	TS XMZ	KGM  Modular Grooving	E = End mount S = Side mount  

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



KM63TSKGMRS50C

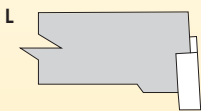
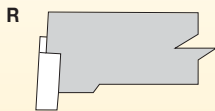
R

Hand of Tool

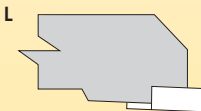
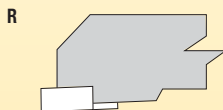
R = Right hand

L = Left hand

End Mount



Side Mount



50

Blade Size

50

60

C

Coolant

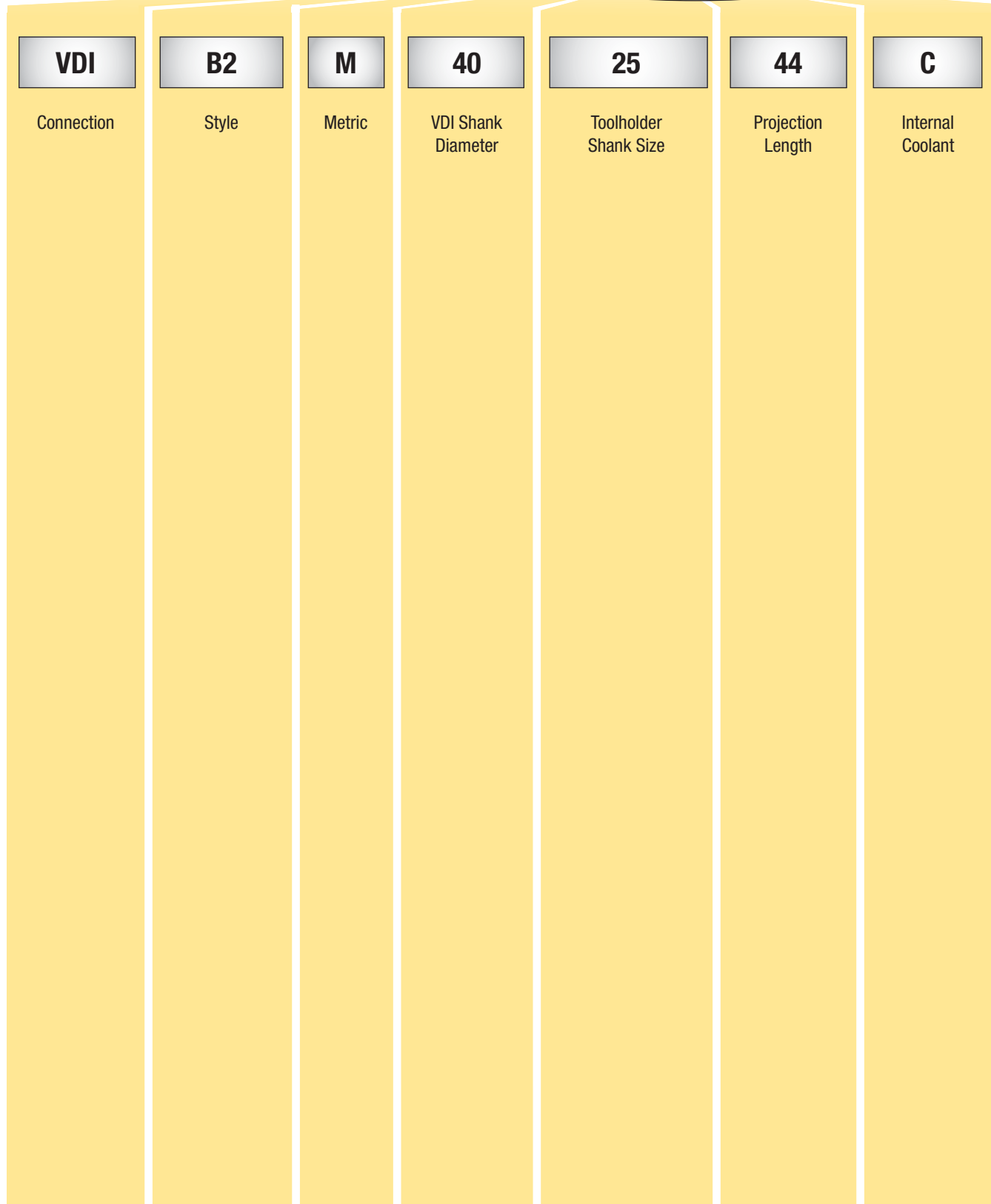
C = Through the pocket coolant capable

Special Features

Y = Mazak®
 INTEGREX®

How Do Catalogue Numbers Work?

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



NOVO KNOWS SEARCH

Searching for a tool has been enhanced by Advise and Select functions from NOVO™ applications — saving you time and money.

ADVISE

Uses a rules-based approach to provide cutting tool recommendations:

- Define Machining Feature (face milling, slotting, blind hole, etc.)
- Apply Constraint Requirements (geometric, material, tolerance, etc.)
- Set Machining Sequence (single or multi-step operations, rough then finish, etc.)
- Receive Ranked Results

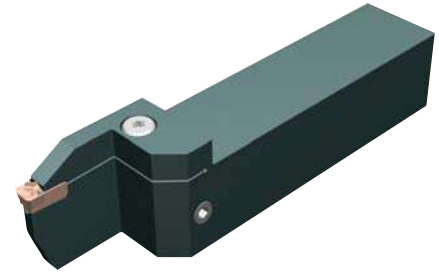
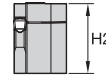
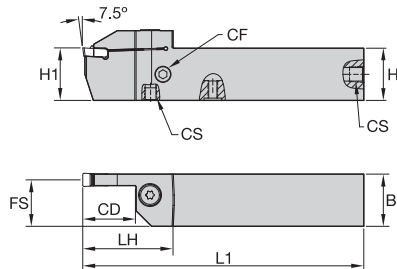
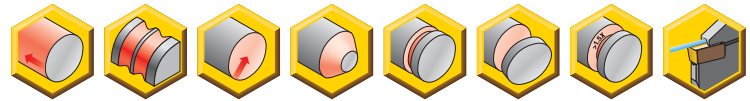
SELECT

A method of selecting cutting tools from a tree structure via a hierarchy or parametric search:

- If you know which product you are looking for, a quick search can be performed by just the catalogue number or product description.
- Smart filters significantly reduce the amount of potential tooling solutions.
- After the tool is selected, NOVO also provides cutting and adaptive item options that fit with your solution.

NOVO applications can ensure you have the right tools on your machines, in the right sequence. Resulting in flawless execution that accelerates every job, and maximises every shift. kennametal.com/novo

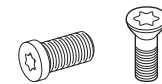
- Offers the greatest stability.
- Straight clearance for unlimited workpiece diameters.
- Through the pocket coolant capable.



Left Hand

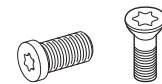
■ Integral Straight • Metric

order number	catalogue number	seat size	CD	H1	H	B	H2	L1	FS	LH	CF	CS	Torx clamp screw	Torx clamp screw	Torx
right hand															
5953960	EVSMR2020K0216	2	16	20	20	20	27	125	19	31	—	—	—	MS1160	T20
5953958	EVSMR2525M0216	2	16	25	25	25	32	150	24	31	—	—	—	MS1160	T20
6401854	EVSMR2020K0216C	2	16	20	20	20	28	125	19	35	M8X1	M8X1	MS2091	—	25 IP
6401855	EVSMR2525M0216C	2	16	25	25	25	33	150	24	35	G1/8 - 28	G1/8 - 28	MS2091	—	25 IP
5953959	EVSMR2020K0222	2	22	20	20	20	29	125	19	38	—	—	MS2091	—	25 IP
6401857	EVSMR2020K0222C	2	22	20	20	20	29	125	19	41	M8X1	M8X1	MS2091	—	25 IP
5953957	EVSMR2525M0226	2	26	25	25	25	34	150	24	42	—	—	MS2091	—	25 IP
6401856	EVSMR2525M0226C	2	26	25	25	25	34	150	24	45	G1/8 - 28	G1/8 - 28	MS2091	—	25 IP
5939452	EVSMR2020K0316C	3	16	20	20	20	29	125	19	37	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	—	T30
5939448	EVSMR2525M0316C	3	16	25	25	25	34	150	24	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1595	—	T30
5939451	EVSMR2020K0322C	3	22	20	20	20	29	125	19	43	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	—	T30
5939447	EVSMR2525M0326C	3	26	25	25	25	34	150	24	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1595	—	T30
5939450	EVSMR2020K0416C	4	16	20	20	20	29	125	18	37	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	—	T30
5939446	EVSMR2525M0416C	4	16	25	25	25	34	150	23	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1595	—	T30
5939449	EVSMR2020K0422C	4	22	20	20	20	29	125	18	43	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	—	T30
5939445	EVSMR2525M0426C	4	26	25	25	25	34	150	23	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1595	—	T30
5939444	EVSMR3232P0426C	4	26	32	32	32	42	170	30	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	—	T30
5939443	EVSMR3232P0432C	4	32	32	32	32	42	170	30	53	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	—	T30
5954258	EVSMR2020K0516C	5	16	20	20	20	29	125	18	37	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	—	T30
5954254	EVSMR2525M0516C	5	16	25	25	25	34	150	23	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	—	T30
5954257	EVSMR2020K0522C	5	22	20	20	20	29	125	18	43	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	—	T30
5954253	EVSMR2525M0526C	5	26	25	25	25	34	150	23	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	—	T30
5954249	EVSMR3232P0526C	5	26	32	32	32	42	170	30	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	—	T30



(continued)

(Integral Straight • Metric — continued)

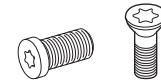


order number	catalogue number	seat size	CD	H1	H	B	H2	L1	FS	LH	CF	CS	Torx clamp screw	Torx clamp screw	Torx
5954248	EVSMR3232P0532C	5	32	32	32	32	42	170	30	53	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	—	T30
5954256	EVSMR2020K0616C	6	16	20	20	20	29	125	20	37	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	—	T30
5954252	EVSMR2525M0616C	6	16	25	25	25	34	150	25	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	—	T30
5954255	EVSMR2020K0622C	6	22	20	20	20	29	125	20	43	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	—	T30
5954251	EVSMR2525M0626C	6	26	25	25	25	34	150	25	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	—	T30
5954247	EVSMR3232P0626C	6	26	32	32	32	42	170	32	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	—	T30
5954246	EVSMR3232P0632C	6	32	32	32	32	43	170	29	55	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	—	T45
5954242	EVSMR4040R0640C	6	40	40	40	40	51	200	37	63	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	—	T45
5954250	EVSMR2525M0826C	8	26	25	25	25	35	150	21	49	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	—	T45
5954245	EVSMR3232P0826C	8	26	32	32	32	43	170	28	49	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	—	T45
5954244	EVSMR3232P0832C	8	32	32	32	32	43	170	28	55	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	—	T45
5954241	EVSMR4040R0840C	8	40	40	40	40	51	200	36	63	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	—	T45
5954243	EVSMR3232P1032C	10	32	32	32	32	43	170	28	55	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	—	T45
5954240	EVSMR4040R1040C	10	40	40	40	40	51	200	36	63	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	—	T45
left hand															
5953956	EVSMML2020K0216	2	16	20	20	20	27	125	19	31	—	—	—	MS1160	T20
5953954	EVSMML2525M0216	2	16	25	25	25	32	150	24	31	—	—	—	MS1160	T20
6401881	EVSMML2525M0216C	2	16	25	25	25	33	150	24	35	G1/8 - 28	G1/8 - 28	MS2091	—	25 IP
5953955	EVSMML2020K0222	2	22	20	20	20	29	125	19	38	—	—	MS2091	—	25 IP
5953953	EVSMML2525M0226	2	26	25	25	25	34	150	24	42	—	—	MS2091	—	25 IP
5939442	EVSMML2020K0316C	3	16	20	20	20	29	125	19	37	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	—	T30
5939438	EVSMML2525M0316C	3	16	25	25	25	34	150	24	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1595	—	T30
5939441	EVSMML2020K0322C	3	22	20	20	20	29	125	19	43	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	—	T30
5939437	EVSMML2525M0326C	3	26	25	25	25	34	150	24	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1595	—	T30
5939440	EVSMML2020K0416C	4	16	20	20	20	29	125	18	37	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	—	T30
5939436	EVSMML2525M0416C	4	16	25	25	25	34	150	23	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1595	—	T30
5939439	EVSMML2020K0422C	4	22	20	20	20	29	125	18	43	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	—	T30
5939435	EVSMML2525M0426C	4	26	25	25	25	34	150	23	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1595	—	T30
5939433	EVSMML3232P0426C	4	26	32	32	32	42	170	30	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	—	T30
5939432	EVSMML3232P0432C	4	32	32	32	32	42	170	30	53	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	—	T30
5954239	EVSMML2020K0516C	5	16	20	20	20	29	125	18	37	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	—	T30
5954235	EVSMML2525M0516C	5	16	25	25	25	34	150	23	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	—	T30
5954238	EVSMML2020K0522C	5	22	20	20	20	29	125	18	43	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	—	T30
5954234	EVSMML2525M0526C	5	26	25	25	25	34	150	23	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	—	T30
5954220	EVSMML3232P0526C	5	26	32	32	32	42	170	30	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	—	T30
5954219	EVSMML3232P0532C	5	32	32	32	32	42	170	30	53	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	—	T30
5954237	EVSMML2020K0616C	6	16	20	20	20	29	125	17	37	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	—	T30
5954233	EVSMML2525M0616C	6	16	25	25	25	34	150	22	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	—	T30
5954236	EVSMML2020K0622C	6	22	20	20	20	29	125	17	43	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	—	T30
5954232	EVSMML2525M0626C	6	26	25	25	25	34	150	22	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	—	T30

(continued)

(Integral Straight • Metric — continued)

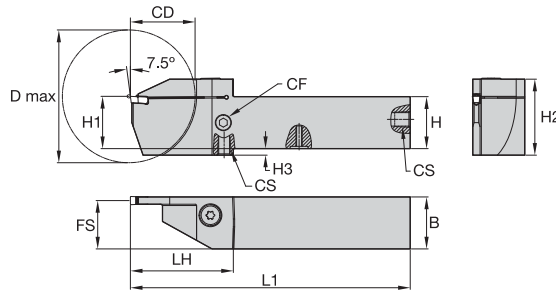
Grooving and Cut-Off



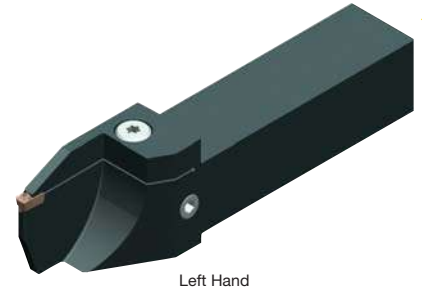
order number	catalogue number	seat size	CD	H1	H	B	H2	L1	FS	LH	CF	CS	Torx clamp screw	Torx clamp screw	Torx
													MS1970	MS1490	T30
5954218	EVSML3232P0626C	6	26	32	32	32	42	170	29	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	—	T30
5954217	EVSML3232P0632C	6	32	32	32	32	43	170	29	55	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	—	T45
5954213	EVSML4040R0640C	6	40	40	40	40	51	200	37	63	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	—	T45
5954231	EVSML2525M0826C	8	26	25	25	25	35	150	21	49	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	—	T45
5954216	EVSML3232P0826C	8	26	32	32	32	43	170	28	49	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	—	T45
5954215	EVSML3232P0832C	8	32	32	32	32	43	170	28	55	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	—	T45
5954212	EVSML4040R0840C	8	40	40	40	40	51	200	36	63	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	—	T45
5954214	EVSML3232P1032C	10	32	32	32	32	43	170	28	55	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	—	T45
5954211	EVSML4040R1040C	10	40	40	40	40	51	200	36	63	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	—	T45

screw catalogue number	screw order number	torque		thread	socket	wrench catalogue number	wrench order number
		Nm	in. lbs.				
MS1160	1099645	7	62	M5	T20	KT20	1022703
MS1162	1127019	9	80	M6	T25	KT25	1022725
MS1163	1124104	18	159	M8	T30	KT30L	1099676
MS1273	1020977	4	35.4	M4	T15	KT15	1022701
MS1490	2263299	17	151	M8	T45	KT45	1018227
MS1595	1094300	12	106	M6	T30	KT30	1099676
MS1970	1106668	12	106	M6	T30	KT30	1099676
MS2002	1621087	9	80	M6	T25	KT25	1022725
MS2091	1931147	9	80	M5	25IP	K25IP	2050113

- Through the pocket coolant capable.
- Reinforced for added support in specific workpiece diameters.

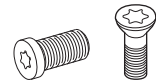


CD = Maximum cut-off depth for solid bars.
D max = Maximum bar diameter for deep grooving or cut-off of tubes.



Grooving and Cut-Off

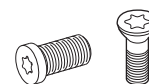
■ Integral Straight Top Clamp • Metric



order number	catalogue number	seat size	CD	D max	H1	H	B	H2	H3	L1	FS	LH	CF	CS	Torx clamp screw	Torx clamp screw	Torx
right hand																	
6179757	EVSCTR1212K1B16	1B	16	42	12	12	12	23	4	125	11	31	—	—	—	MS1160	T20
6179758	EVSCTR1212K1F16	1F	16	42	12	12	12	23	4	125	11	31	—	—	—	MS1160	T20
6179759	EVSCTR1212K0216	2	16	42	12	12	12	23	4	125	11	31	—	—	—	MS1160	T20
5980139	EVSCTR1616K0216	2	16	42	16	16	16	23	—	125	15	31	—	—	—	MS1160	T20
5980762	EVSCTR2020K0216	2	16	42	20	20	20	27	—	125	19	31	—	—	—	MS1160	T20
5980767	EVSCTR2525M0216	2	16	42	25	25	25	32	—	150	24	31	—	—	—	MS1160	T20
5980768	EVSCTR2525M0226	2	26	62	25	25	25	34	—	150	24	42	—	—	MS2091	—	25 IP
6179755	EVSCTR1212K0316C	3	16	52	12	12	12	23	4	125	11	34	M8X1.25	M8X1.25	MS1944	—	T25
5980140	EVSCTR1616K0316C	3	16	52	16	16	16	24	—	125	15	36	1/16 - 27 NPTF	1/16 - 27 NPTF	MS2091	—	25 IP
5980763	EVSCTR2020K0316C	3	16	52	20	20	20	29	—	125	19	37	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	—	T30
5980138	EVSCTR2525M0316C	3	16	62	25	25	25	34	—	150	24	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1595	—	T30
5980764	EVSCTR2020K0326C	3	26	62	20	20	20	33	4	125	19	47	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	—	T30
5980769	EVSCTR2525M0326C	3	26	62	25	25	25	34	—	150	24	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1595	—	T30
5980761	EVSCTR1616K0416C	4	16	52	16	16	16	24	—	125	14	36	1/16 - 27 NPTF	1/16 - 27 NPTF	MS2091	—	25 IP
5980765	EVSCTR2020K0416C	4	16	52	20	20	20	29	—	125	18	37	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	—	T30
5980766	EVSCTR2020K0426C	4	26	62	20	20	20	33	—	125	18	47	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	—	T30
5980770	EVSCTR2525M0426C	4	26	62	25	25	25	34	—	150	23	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1595	—	T30
5980771	EVSCTR2525M0432C	4	32	64	25	25	25	38	4	150	23	53	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1595	—	T30
5980774	EVSCTR3232P0432C	4	32	64	32	32	32	42	—	170	30	53	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	—	T30
5980772	EVSCTR2525M0526C	5	26	62	25	25	25	34	—	150	23	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	—	T30
5980773	EVSCTR2525M0532C	5	32	64	25	25	25	39	4	150	23	53	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	—	T30
5980775	EVSCTR3232P0540C	5	40	82	32	32	32	47	4	170	30	63	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	—	T45

(continued)

(Integral Straight Top Clamp • Metric — continued)

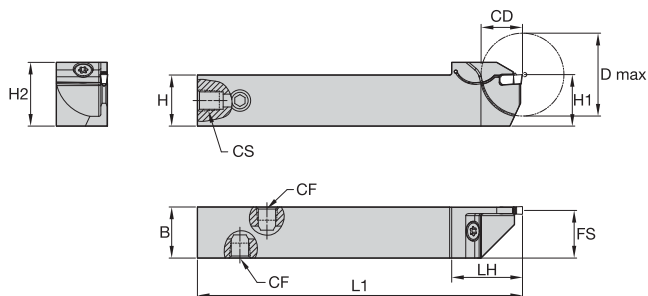


Grooving and Cut-Off

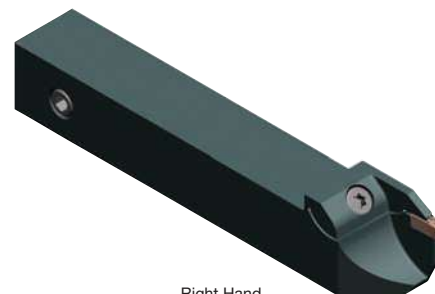
order number	catalogue number	seat size	CD	D max	H1	H	B	H2	H3	L1	FS	LH	CF	CS	Torx clamp screw	Torx clamp screw	Torx
															MS1160	MS1160	T20
left hand																	
6179760	EVSCTL1212K1B16	1B	16	42	12	12	12	23	4	125	11	31	—	—	—	MS1160	T20
6179761	EVSCTL1212K1F16	1F	16	42	12	12	12	23	4	125	11	31	—	—	—	MS1160	T20
6179762	EVSCTL1212K0216	2	16	42	12	12	12	23	4	125	11	31	—	—	—	MS1160	T20
5980777	EVSCTL1616K0216	2	16	42	16	16	16	23	—	125	15	31	—	—	—	MS1160	T20
5980780	EVSCTL2020K0216	2	16	42	20	20	20	27	—	125	19	31	—	—	—	MS1160	T20
5980805	EVSCTL2525M0216	2	16	42	25	25	25	32	—	150	24	31	—	—	—	MS1160	T20
5980806	EVSCTL2525M0226	2	26	62	25	25	25	34	—	150	24	42	—	—	MS2091	—	25 IP
6179756	EVSCTL1212K0316C	3	16	52	12	12	12	23	4	125	11	34	M8X1.25	M8X1.25	MS1944	—	T25
5980778	EVSCTL1616K0316C	3	16	52	16	16	16	24	—	125	15	36	1/16 - 27 NPTF	1/16 - 27 NPTF	MS2091	—	25 IP
5980801	EVSCTL2020K0316C	3	16	52	20	20	20	29	—	125	19	37	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	—	T30
5980776	EVSCTL2525M0316C	3	16	62	25	25	25	34	—	150	24	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1595	—	T30
5980802	EVSCTL2020K0326C	3	26	62	20	20	20	33	4	125	19	47	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	—	T30
5980807	EVSCTL2525M0326C	3	26	62	25	25	25	34	—	150	24	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1595	—	T30
5980779	EVSCTL1616K0416C	4	16	52	16	16	16	24	—	125	14	36	1/16 - 27 NPTF	1/16 - 27 NPTF	MS2091	—	25 IP
5980803	EVSCTL2020K0416C	4	16	52	20	20	20	29	—	125	18	37	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	—	T30
5980804	EVSCTL2020K0426C	4	26	62	20	20	20	33	—	125	18	47	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	—	T30
5980808	EVSCTL2525M0426C	4	26	62	25	25	25	34	—	150	23	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1595	—	T30
5980809	EVSCTL2525M0432C	4	32	64	25	25	25	38	4	150	23	53	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1595	—	T30
5980812	EVSCTL3232P0432C	4	32	64	32	32	32	42	—	170	30	53	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	—	T30
5980810	EVSCTL2525M0526C	5	26	62	25	25	25	34	—	150	23	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	—	T30
5980811	EVSCTL2525M0532C	5	32	64	25	25	25	39	4	150	23	53	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	—	T30
5980813	EVSCTL3232P0540C	5	40	82	32	32	32	47	4	170	30	63	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	—	T45

NOTE: Through the pocket coolant available in seat sizes 3 and higher.

screw catalogue number	screw order number	torque		thread	socket	wrench catalogue number	wrench order number
		Nm	in. lbs.				
MS1160	1099645	7	62	M5	T20	KT20	1022703
MS1162	1127019	9	80	M6	T25	KT25	1022725
MS1163	1124104	18	159	M8	T30	KT30L	1099676
MS1273	1020977	4	35.4	M4	T15	KT15	1022701
MS1490	2263299	17	151	M8	T45	KT45	1018227
MS1595	1094300	12	106	M6	T30	KT30	1099676
MS1970	1106668	12	106	M6	T30	KT30	1099676
MS2002	1621087	9	80	M6	T25	KT25	1022725
MS2091	1931147	9	80	M5	25IP	K25IP	2050113



CD = Maximum cut-off depth for solid bars.
D max = Maximum bar diameter for deep grooving or cut-off of tubes.



Grooving and Cut-Off

■ Integral Reinforced Front Clamp • Metric



order number	catalogue number	seat size	CD	D max	H1	H	B	H2	L1	FS	LH	CF	CS	Torx clamp screw	Torx
right hand															
6179763	EVSCFR1010K1B10	1B	10	20	10	10	10	14	125	9	21	—	—	191.916	T15
6179766	EVSCFR1212K1B10	1B	10	20	12	12	12	16	125	11	21	—	—	191.916	T15
6179767	EVSCFR1212K1B13	1B	13	26	12	12	12	16	125	11	24	—	—	191.916	T15
6179774	EVSCFR1616K1B16	1B	16	32	16	16	16	21	125	15	27	—	—	MS1160	T20
6179778	EVSCFR2020K1B16	1B	16	32	20	20	20	25	125	19	27	—	—	MS1160	T20
6179764	EVSCFR1010K1F10	1F	10	20	10	10	10	14	125	9	21	—	—	191.916	T15
6179768	EVSCFR1212K1F10	1F	10	20	12	12	12	16	125	11	21	—	—	191.916	T15
6179769	EVSCFR1212K1F13	1F	13	26	12	12	12	16	125	11	24	—	—	191.916	T15
6179775	EVSCFR1616K1F16	1F	16	32	16	16	16	21	125	15	27	—	—	MS1160	T20
6179779	EVSCFR2020K1F16	1F	16	32	20	20	20	25	125	19	27	—	—	MS1160	T20
6179765	EVSCFR1010K0210	2	10	20	10	10	10	14	125	9	21	—	—	191.916	T15
6179770	EVSCFR1212K0210	2	10	20	12	12	12	16	125	11	21	—	—	191.916	T15
6179771	EVSCFR1212K0216	2	16	32	12	12	12	16	125	11	27	—	—	191.916	T15
6179776	EVSCFR1616K0216	2	16	32	16	16	16	21	125	15	27	—	—	MS1160	T20
6179780	EVSCFR2020K0216	2	16	32	20	20	20	25	125	19	27	—	—	MS1160	T20
6179772	EVSCFR1212K0310C	3	10	20	12	12	12	17	125	11	22	M8X1.25	M8X1.25	191.916	T15
6179773	EVSCFR1212K0316C	3	16	32	12	12	12	17	125	11	28	M8X1.25	M8X1.25	191.916	T15
6179777	EVSCFR1616K0316C	3	16	32	16	16	16	21	125	15	28	M8X1.25	M8X1.25	MS1160	T20
6179781	EVSCFR2020K0316C	3	16	32	20	20	20	25	125	19	28	M8X1.25	M8X1.25	MS1160	T20

(continued)

(Integral Reinforced Front Clamp • Metric — continued)

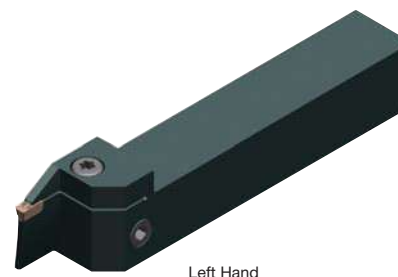
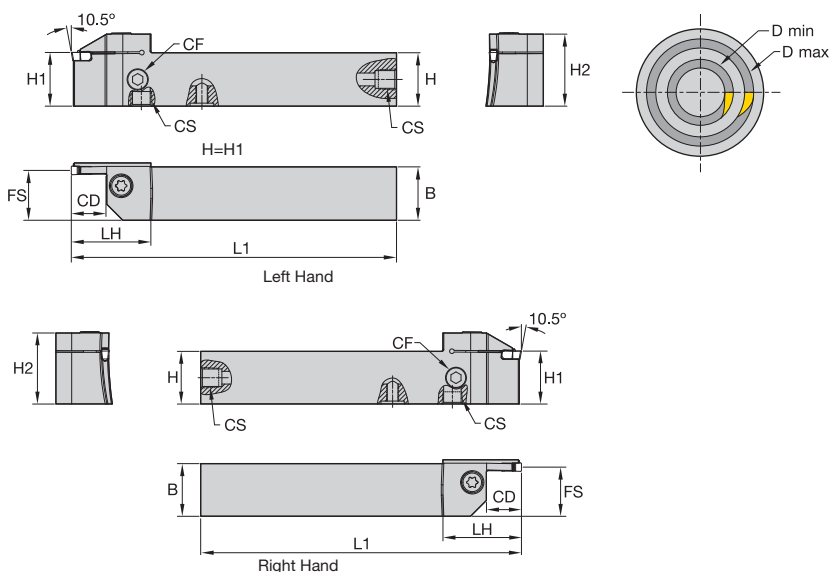


Grooving and Cut-Off

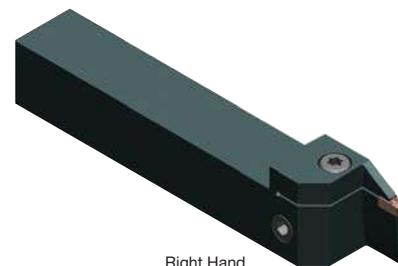
order number	catalogue number	seat size	CD	D max	H1	H	B	H2	L1	FS	LH	CF	CS	Torx clamp screw	Torx
left hand															
6179709	EVSCFL1010K1B10	1B	10	20	10	10	10	14	125	9	21	—	—	191.916	T15
6179922	EVSCFL1212K1B10	1B	10	20	12	12	12	16	125	11	21	—	—	191.916	T15
6179923	EVSCFL1212K1B13	1B	13	26	12	12	12	16	125	11	24	—	—	191.916	T15
6179930	EVSCFL1616K1B16	1B	16	32	16	16	16	21	125	15	27	—	—	MS1160	T20
6179934	EVSCFL2020K1B16	1B	16	32	20	20	20	25	125	19	27	—	—	MS1160	T20
6179710	EVSCFL1010K1F10	1F	10	20	10	10	10	14	125	9	21	—	—	191.916	T15
6179924	EVSCFL1212K1F10	1F	10	20	12	12	12	16	125	11	21	—	—	191.916	T15
6179925	EVSCFL1212K1F13	1F	13	26	12	12	12	16	125	11	24	—	—	191.916	T15
6179931	EVSCFL1616K1F16	1F	16	32	16	16	16	21	125	15	27	—	—	MS1160	T20
6179935	EVSCFL2020K1F16	1F	16	32	20	20	20	25	125	19	27	—	—	MS1160	T20
6179921	EVSCFL1010K0210	2	10	20	10	10	10	14	125	9	21	—	—	191.916	T15
6179926	EVSCFL1212K0210	2	10	20	12	12	12	16	125	11	21	—	—	191.916	T15
6179927	EVSCFL1212K0216	2	16	32	12	12	12	16	125	11	27	—	—	191.916	T15
6179932	EVSCFL1616K0216	2	16	32	16	16	16	21	125	15	27	—	—	MS1160	T20
6179936	EVSCFL2020K0216	2	16	32	20	20	20	25	125	19	27	—	—	MS1160	T20
6179928	EVSCFL1212K0310C	3	10	20	12	12	12	17	125	11	22	M8X1.25	M8X1.25	191.916	T15
6179929	EVSCFL1212K0316C	3	16	32	12	12	12	17	125	11	28	M8X1.25	M8X1.25	191.916	T15
6179933	EVSCFL1616K0316C	3	16	32	16	16	16	21	125	15	28	M8X1.25	M8X1.25	MS1160	T20
6179937	EVSCFL2020K0316C	3	16	32	20	20	20	25	125	19	28	M8X1.25	M8X1.25	MS1160	T20

NOTE: Through the pocket coolant available in seat sizes 3 and higher.

screw catalogue number	screw order number	torque		thread	socket	wrench catalogue number	wrench order number
		Nm	in. lbs.				
MS1160	1099645	7	62	M5	T20	KT20	1022703
MS1162	1127019	9	80	M6	T25	KT25	1022725
MS1163	1124104	18	159	M8	T30	KT30L	1099676
MS1273	1020977	4	35.4	M4	T15	KT15	1022701
MS1490	2263299	17	151	M8	T45	KT45	1018227
MS1595	1094300	12	106	M6	T30	KT30	1099676
MS1970	1106668	12	106	M6	T30	KT30	1099676
MS2002	1621087	9	80	M6	T25	KT25	1022725
MS2091	1931147	9	80	M5	25IP	K25IP	2050113



Left Hand



Right Hand

Grooving and Cut-Off

■ Integral Face Grooving Straight Outboard • Metric



order number	catalogue number	seat size	CD	D max	D min	W min	B	H2	L1	FS	LH	CF	CS	Torx clamp screw	Torx
right hand															
6080031	EVSBR2020K0312035040C	3	12	40	35	20	20	29	125	19	33	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	T30
6116561	EVSBR2020K0312040050C	3	12	50	40	20	20	29	125	19	33	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	T20
6116563	EVSBR2020K0312050060C	3	12	60	50	20	20	29	125	19	33	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	T30
6116567	EVSBR2020K0312060075C	3	12	75	60	20	20	29	125	19	33	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	T30
6116569	EVSBR2020K0312075100C	3	12	100	75	20	20	29	125	19	33	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	T30
6080067	EVSBR2525M0312100180C	3	12	180	100	25	25	34	150	24	33	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6080069	EVSBR2525M0312180250C	3	12	250	180	25	25	34	150	24	33	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6080053	EVSBR2525M0320060075C	3	20	75	60	25	25	34	150	24	41	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6080055	EVSBR2525M0320075100C	3	20	100	75	25	25	34	150	24	41	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6080057	EVSBR2525M0320100180C	3	20	180	100	25	25	34	150	24	41	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6080060	EVSBR2525M0320180250C	3	20	250	180	25	25	35	150	24	41	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6080033	EVSBR2020K0416040050C	4	16	50	40	20	20	29	125	18	37	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	T30
6080040	EVSBR2020K0416050060C	4	16	60	50	20	20	29	125	18	37	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	T30
6116571	EVSBR2020K0416060075C	4	16	75	60	20	20	29	125	18	37	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	T30
6116573	EVSBR2020K0416075100C	4	16	100	75	20	20	29	125	18	37	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	T30
6116587	EVSBR2525M0416100180C	4	16	180	100	25	25	34	150	23	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6116589	EVSBR2525M0416180250C	4	16	250	180	25	25	34	150	23	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6116575	EVSBR2525M0426060075C	4	26	75	60	25	25	34	150	23	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6116577	EVSBR2525M0426075100C	4	26	100	75	25	25	34	150	23	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6116579	EVSBR2525M0426100180C	4	26	180	100	25	25	34	150	23	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6116581	EVSBR2525M0426180250C	4	26	250	180	25	25	34	150	23	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6080035	EVSBR2525M0516050060C	5	16	60	50	25	25	34	150	23	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124200	EVSBR2525M0516060075C	5	16	60	60	25	25	34	150	23	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30

(continued)

(Integral Face Grooving Straight Outboard • Metric — continued)



Grooving and Cut-Off

order number	catalogue number	seat size	CD	D max	D min	W min	B	H2	L1	FS	LH	CF	CS	Torx clamp screw	Torx
6124214	EVSBR2525M0516075100C	5	16	100	75	25	25	34	150	23	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124218	EVSBR2525M0516100180C	5	16	180	100	25	25	34	150	23	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124222	EVSBR2525M0516180250C	5	16	250	180	25	25	34	150	23	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124226	EVSBR2525M0516250350C	5	16	350	250	25	25	34	150	23	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124230	EVSBR2525M0516350999C	5	16	999	350	25	25	34	150	23	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124198	EVSBR2525M0526050060C	5	26	60	50	25	25	35	150	23	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124212	EVSBR2525M0526060075C	5	26	60	60	25	25	35	150	23	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124216	EVSBR2525M0526075100C	5	26	100	75	25	25	35	150	23	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124235	EVSBR3232P0532100180C	5	32	180	100	32	32	42	170	30	53	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124237	EVSBR3232P0532180250C	5	32	250	180	32	32	42	170	30	53	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124239	EVSBR3232P0532250350C	5	32	350	250	32	32	42	170	30	53	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124241	EVSBR3232P0532350999C	5	32	999	350	32	32	42	170	30	53	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124605	EVSBR2525M0616060075C	6	16	75	60	25	25	35	150	22	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124609	EVSBR2525M0616075100C	6	16	100	75	25	25	35	150	22	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124673	EVSBR2525M0616100180C	6	16	180	100	25	25	31	150	22	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124677	EVSBR2525M0616180250C	6	16	250	180	25	25	34	150	22	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124681	EVSBR2525M0616250350C	6	16	350	250	25	25	34	150	22	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124685	EVSBR2525M0616350999C	6	16	999	350	25	25	34	150	22	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124607	EVSBR2525M0626060075C	6	26	75	60	25	25	35	150	22	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124671	EVSBR2525M0626075100C	6	26	100	75	25	25	35	150	22	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124689	EVSBR3232P0632100180C	6	32	180	100	32	32	43	170	29	55	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	T45
6124691	EVSBR3232P0632180250C	6	32	250	180	32	32	43	170	29	55	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	T45
6124693	EVSBR3232P0632250350C	6	32	350	250	32	32	43	170	29	55	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	T45
6124695	EVSBR3232P0632350999C	6	32	999	350	32	32	43	170	29	55	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	T45
left hand															
6080037	EVSBL2020K0312035040C	3	12	40	35	20	20	29	125	19	33	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	T30
6116562	EVSBL2020K0312040050C	3	12	50	40	20	20	29	125	19	33	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	T30
6116564	EVSBL2020K0312050060C	3	12	60	50	20	20	29	125	19	33	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	T30
6116568	EVSBL2020K0312060075C	3	12	75	60	20	20	29	125	19	33	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	T30
6116570	EVSBL2020K0312075100C	3	12	100	75	20	20	29	125	19	33	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	T30
6080068	EVSBL2525M0312100180C	3	12	180	100	25	25	34	150	24	33	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6080070	EVSBL2525M0312180250C	3	12	250	180	25	25	34	150	24	33	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6080054	EVSBL2525M0320060075C	3	20	75	60	25	25	35	150	24	41	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6080056	EVSBL2525M0320075100C	3	20	100	75	25	25	35	150	24	41	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6080059	EVSBL2525M0320100180C	3	20	180	100	25	25	35	150	24	41	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6080061	EVSBL2525M0320180250C	3	20	250	180	25	25	35	150	24	41	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6080038	EVSBL2020K0416040050C	4	16	50	40	20	20	29	125	18	37	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	T30
6080051	EVSBL2020K0416050060C	4	16	60	50	20	20	29	125	18	37	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	T30
6116572	EVSBL2020K0416060075C	4	16	75	60	20	20	29	125	18	37	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	T30
6116574	EVSBL2020K0416075100C	4	16	100	75	20	20	29	125	18	37	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	T30
6116588	EVSBL2525M0416100180C	4	16	180	100	25	25	34	150	23	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6116590	EVSBL2525M0416180250C	4	16	250	180	25	25	34	150	23	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6116576	EVSBL2525M0426060075C	4	26	75	60	25	25	35	150	23	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6116578	EVSBL2525M0426075100C	4	26	100	75	25	25	35	150	23	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30

(continued)

(Integral Face Grooving Straight Outboard • Metric — continued)

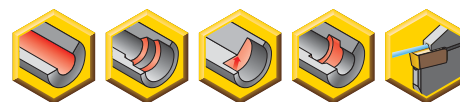


order number	catalogue number	seat size	CD	D max	D min	W min	B	H2	L1	FS	LH	CF	CS	Torx clamp screw	Torx
														MS1970	T30
6116580	EVSBL2525M0426100180C	4	26	180	100	25	25	35	150	23	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6116582	EVSBL2525M0426180250C	4	26	250	180	25	25	35	150	23	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6080039	EVSBL2525M0516050060C	5	16	60	50	25	25	34	150	23	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124211	EVSBL2525M0516060075C	5	16	60	60	25	25	34	150	23	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124215	EVSBL2525M0516075100C	5	16	100	75	25	25	34	150	23	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124219	EVSBL2525M0516100180C	5	16	180	100	25	25	34	150	23	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124223	EVSBL2525M0516180250C	5	16	250	180	25	25	34	150	23	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124227	EVSBL2525M0516250350C	5	16	350	250	25	25	34	150	23	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124232	EVSBL2525M0516350999C	5	16	999	350	25	25	34	150	23	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124199	EVSBL2525M0526050060C	5	26	60	50	25	25	35	150	23	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124213	EVSBL2525M0526060075C	5	26	60	60	25	25	35	150	23	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124217	EVSBL2525M0526075100C	5	26	100	75	25	25	35	150	23	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124236	EVSBL3232P0532100180C	5	32	180	100	32	32	42	170	30	53	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124238	EVSBL3232P0532180250C	5	32	250	180	32	32	42	170	30	53	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124240	EVSBL3232P0532250350C	5	32	350	250	32	32	42	170	30	53	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124242	EVSBL3232P0532350999C	5	32	999	350	32	32	42	170	30	53	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124606	EVSBL2525M0616060075C	6	16	75	60	25	25	35	150	22	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124610	EVSBL2525M0616075100C	6	16	100	75	25	25	35	150	22	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124674	EVSBL2525M0616100180C	6	16	180	100	25	25	35	150	22	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124678	EVSBL2525M0616180250C	6	16	250	180	25	25	35	150	22	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124682	EVSBL2525M0616250350C	6	16	350	250	25	25	35	150	22	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124686	EVSBL2525M0616350999C	6	16	999	350	25	25	35	150	22	37	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124608	EVSBL2525M0626060075C	6	26	75	60	25	25	35	150	22	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124672	EVSBL2525M0626075100C	6	26	100	75	25	25	35	150	22	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	T30
6124690	EVSBL3232P0632100180C	6	32	180	100	32	32	43	170	29	55	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	T45
6124692	EVSBL3232P0632180250C	6	32	250	180	32	32	43	170	29	55	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	T45
6124694	EVSBL3232P0632250350C	6	32	350	250	32	32	43	170	29	55	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	T45
6124696	EVSBL3232P0632350999C	6	32	999	350	32	32	43	170	29	55	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	T45

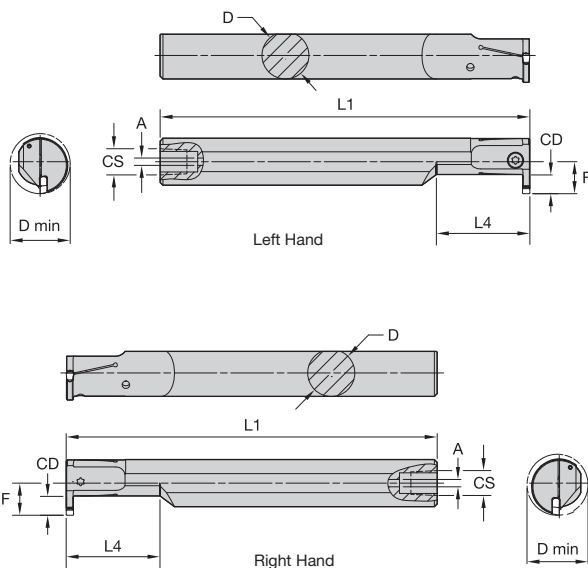
NOTE: Through the pocket coolant available in seat sizes 3 and higher.

screw catalogue number	screw order number	torque		thread	socket	wrench catalogue number	wrench order number
		Nm	in. lbs.				
MS1160	1099645	7	62	M5	T20	KT20	1022703
MS1162	1127019	9	80	M6	T25	KT25	1022725
MS1163	1124104	18	159	M8	T30	KT30L	1099676
MS1273	1020977	4	35.4	M4	T15	KT15	1022701
MS1490	2263299	17	151	M8	T45	KT45	1018227
MS1595	1094300	12	106	M6	T30	KT30	1099676
MS1970	1106668	12	106	M6	T30	KT30	1099676
MS2002	1621087	9	80	M6	T25	KT25	1022725
MS2091	1931147	9	80	M5	25IP	K25IP	2050113

- For use in I.D. grooving applications.
- Maximum support.
- Steel boring bar with through coolant capability.



Grooving and Cut-Off



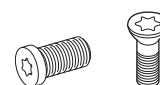
Left Hand



Right Hand

Steel Boring Bar • Metric

order number	catalogue number	seat size	CD	D	D min	L1	F	L4	A	CS	Torx clamp screw	Torx clamp screw	Torx
right hand													
5980518	A12KEVEMR1F05M	1F	5,00	12	16	125	9	24,0	4,00	1/16 - 27 NPT	—	MS1285	T15
5980520	A16MEVEMR1F07M	1F	7,00	16	20	150	11	32,0	4,00	1/8 - 27 NPT	—	MS1273	T15
5980622	A20QEVEMR1F07M	1F	7,00	20	25	180	13	40,0	4,00	1/8 - 27 NPTF	—	MS1160	T20
5980519	A12KEVEMR0205M	2	5,00	12	16	125	9	24,0	4,00	1/16 - 27 NPTF	—	MS1285	T15
5980621	A16MEVEMR0207M	2	7,00	16	20	150	11	32,0	4,00	1/8 - 27 NPTF	—	MS1273	T15
5980623	A20QEVEMR0207M	2	7,00	20	25	180	13	40,0	4,00	1/8 - 27 NPTF	—	MS1160	T20
5980624	A25REVEMR0210M	2	10,00	25	32	200	18	50,0	6,40	1/4 - 18 NPT	—	MS1162	T25
5954259	A16MEVEMR0307M	3	7,00	16	20	150	11	40,3	4,00	1/8 - 27 NPT	—	MS1273	T15
5954260	A20QEVEMR0307M	3	7,00	20	25	180	13	40,3	4,00	1/8 - 27 NPT	—	MS1160	T20
5954281	A25REVEMR0310M	3	10,00	25	32	200	17	50,3	6,40	1/4 - 18 NPT	—	MS1162	T25
5954283	A32SEVEMR0312M	3	12,00	32	40	250	22	64,0	6,40	1/4 - 18 NPT	MS1595	—	T30
5954282	A25REVEMR0410M	4	10,00	25	32	200	17	50,3	6,40	1/4 - 18 NPT	—	MS1162	T25
5954284	A32SEVEMR0412M	4	12,00	32	40	250	22	64,0	6,40	1/4 - 18 NPT	MS1595	—	T30



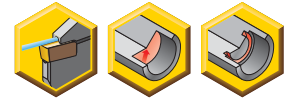
(continued)

(Steel Boring Bar • Metric — continued)

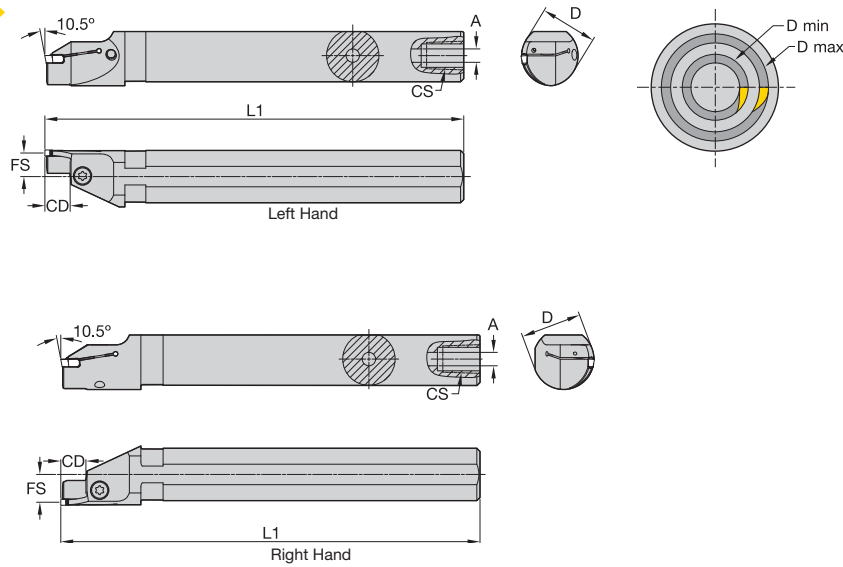


order number	catalogue number	seat size	CD	D	D min	L1	F	L4	A	CS	Torx clamp screw	Torx clamp screw	Torx
left hand													
5980625	A12KEVEML1F05M	1F	5,00	12	16	125	9	24,0	4,00	1/16 - 27 NPTF	—	MS1285	T15
5980627	A16MEVEML1F07M	1F	7,00	16	20	150	11	32,0	4,00	1/8 - 27 NPTF	—	MS1273	T15
5980629	A20QEVEML1F07M	1F	7,00	20	25	180	13	40,0	4,00	1/8 - 27 NPTF	—	MS1160	T20
5980626	A12KEVEML0205M	2	5,00	12	16	125	9	24,0	4,00	1/16 - 27 NPTF	—	MS1285	T15
5980628	A16MEVEML0207M	2	7,00	16	20	150	11	32,0	4,00	1/8 - 27 NPTF	—	MS1273	T15
5980630	A20QEVEML0207M	2	7,00	20	25	180	13	40,0	4,00	1/8 - 27 NPTF	—	MS1160	T20
5980631	A25REVEML0210M	2	10,00	25	32	200	18	50,0	6,40	1/4 - 18 NPT	—	MS1162	T25
5954285	A16MEVEML0307M	3	7,00	16	20	150	11	40,3	4,00	1/8 - 27 NPT	—	MS1273	T15
5954286	A20QEVEML0307M	3	7,00	20	25	180	13	40,3	4,00	1/8 - 27 NPT	—	MS1160	T20
5954287	A25REVEML0310M	3	10,00	25	32	200	17	50,3	6,40	1/4 - 27 NPT	—	MS1162	T25
5954289	A32SEVEML0312M	3	12,00	32	40	250	22	64,0	6,40	1/4 - 27 NPT	MS1595	—	T30
5954288	A25REVEML0410M	4	10,00	25	32	200	17	50,3	6,40	1/4 - 18 NPT	—	MS1162	T25
5954290	A32SEVEML0412M	4	12,00	32	40	250	22	64,0	6,40	1/4 - 18 NPT	MS1595	—	T30

screw catalogue number	screw order number	torque		thread	socket	wrench catalogue number	wrench order number
		Nm	in. lbs.				
MS1160	1099645	7	62	M5	T20	KT20	1022703
MS1162	1127019	9	80	M6	T25	KT25	1022725
MS1163	1124104	18	159	M8	T30	KT30L	1099676
MS1273	1020977	4	35.4	M4	T15	KT15	1022701
MS1490	2263299	17	151	M8	T45	KT45	1018227
MS1595	1094300	12	106	M6	T30	KT30	1099676
MS1970	1106668	12	106	M6	T30	KT30	1099676
MS2002	1621087	9	80	M6	T25	KT25	1022725
MS2091	1931147	9	80	M5	25IP	K25IP	2050113



Grooving and Cut-Off



Left Hand



Right Hand

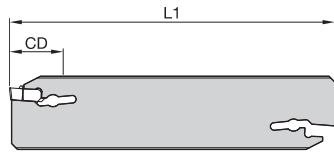
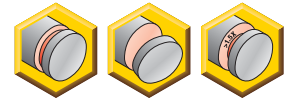
Steel Face Grooving Boring Bar • Metric



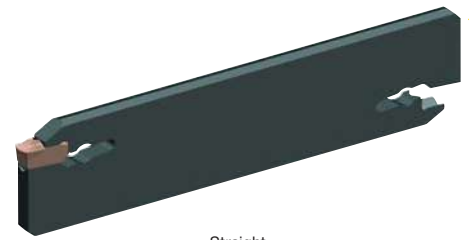
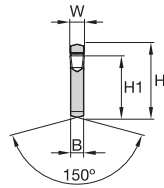
order number	catalogue number	seat size	CD	D	D min	D max	L1	F	CS	Torx clamp screw	Torx
right hand											
6116521	A25REVSAR0212M026030	2	12,00	25	26	30	200	13	1/4-18 NPT	MS1160	T20
6116522	A25REVSAR0312M030035	3	12,00	25	30	35	200	13	—	MS1162	T25
6116297	A32SEVSAR0312M033042	3	12,00	32	33	42	250	16	1/4-18 NPT	MS1162	T25
6116299	A40TEVSAR0312M041050	3	12,00	40	41	50	300	20	1/4-18 NPT	MS1162	T25
left hand											
6116527	A25REVSAL0212M026030	2	12,00	25	26	30	200	13	1/4-18 NPT	MS1160	T20
6116528	A25REVSAL0312M030035	3	12,00	25	30	35	200	13	1/4-18 NPT	MS1162	T25
6116298	A32SEVSAL0312M033042	3	12,00	32	33	42	250	16	1/4-18 NPT	—	T25
6116300	A40TEVSAL0312M041050	3	12,00	40	41	50	300	20	1/4-18 NPT	MS1162	T25

screw catalogue number	screw order number	torque		thread	socket	wrench catalogue number	wrench order number
		Nm	in. lbs.				
MS1160	1099645	7	62	M5	T20	KT20	1022703
MS1162	1127019	9	80	M6	T25	KT25	1022725
MS1163	1124104	18	159	M8	T30	KT30L	1099676
MS1273	1020977	4	35.4	M4	T15	KT15	1022701
MS1490	2263299	17	151	M8	T45	KT45	1018227
MS1595	1094300	12	106	M6	T30	KT30	1099676
MS1970	1106668	12	106	M6	T30	KT30	1099676
MS2002	1621087	9	80	M6	T25	KT25	1022725
MS2091	1931147	9	80	M5	25IP	K25IP	2050113

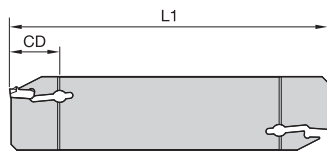
- For deep groove and cut-off applications.
- Universal pocket for holding all insert geometries.



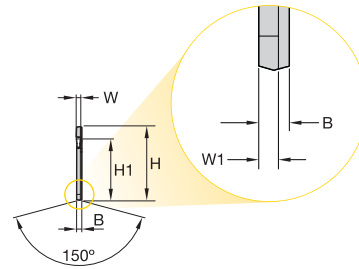
Straight



Straight



Reinforced



Reinforced

Grooving and Cut-Off

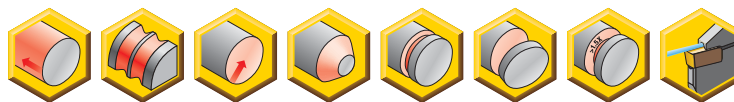
Double-Ended Cut-Off Blade



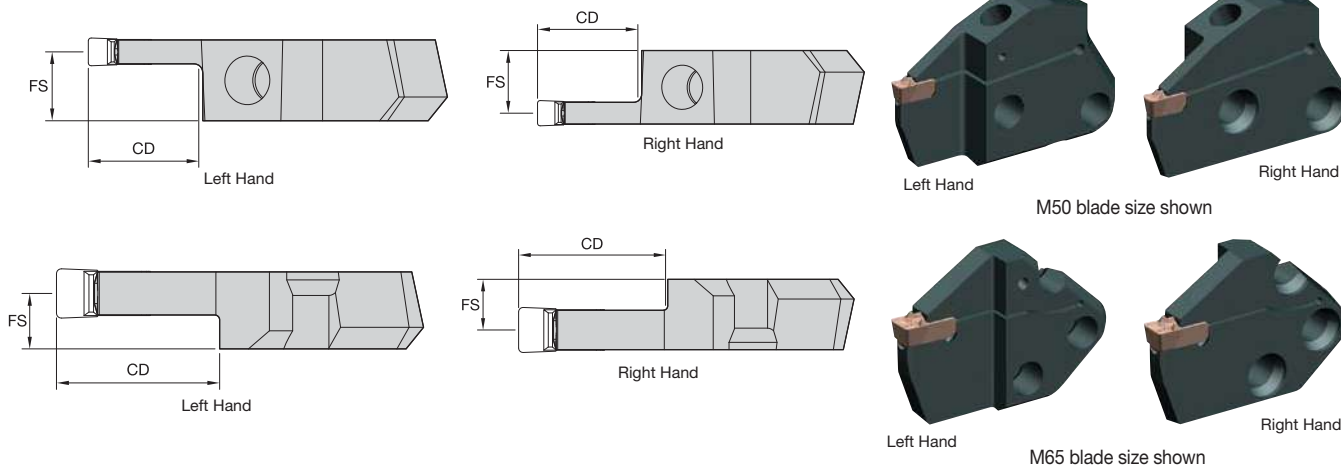
order number	catalogue number	seat size	H	W	W1	H1	L1	B	CD	assembly wrench
left hand										
5941706	EVBSN19G1B14	1B	19	1,4	1,15	15,5	90	1,80	14	SCW5E
5941708	EVBSN26J1B15	1B	26	1,4	1,15	21,5	110	1,80	15	SCW5E
5955391	EVBSN19G1F16	1F	19	1,6	1,30	15,5	90	1,80	16	SCW5E
5955392	EVBSN26J1F17	1F	26	1,6	1,30	21,5	110	1,80	17	SCW5E
5941707	EVBSN19G0220	2	19	2,0	—	15,5	90	1,65	—	SCW5E
5941709	EVBSN26J0230	2	26	2,0	—	21,5	110	1,65	—	SCW5E
5941710	EVBSN26M0230	2	26	2,0	—	21,5	150	1,65	—	SCW5E
5941724	EVBSN32M0250	2	32	2,0	—	25,1	150	1,65	—	SCW5E
5941721	EVBSN26J0340	3	26	3,0	—	21,5	110	2,40	—	SCW5E
5941722	EVBSN26M0340	3	26	3,0	—	21,5	150	2,40	—	SCW5E
5941725	EVBSN32M0350	3	32	3,0	—	25,1	150	2,40	—	SCW5E
5941723	EVBSN26J0440	4	26	4,0	—	21,5	110	3,40	—	SCW5E
5941726	EVBSN32M0450	4	32	4,0	—	25,1	150	3,40	—	SCW5E
5977635	EVBSN26J0540	5	26	5,0	—	21,5	110	4,40	—	SCW5E
5977637	EVBSN32M0560	5	32	5,0	—	25,1	150	4,40	—	SCW5E
5977636	EVBSN26J0640	6	26	6,0	—	21,5	110	5,40	—	SCW8E
5977638	EVBSN32M0660	6	32	6,0	—	25,1	150	5,40	—	SCW8E
5977640	EVBSN52X06120	6	53	6,0	—	45,3	260	5,40	—	SCW8E
5977639	EVBSN32M0860	8	32	8,0	—	25,1	150	7,00	—	SCW8E
5977721	EVBSN52X08120	8	53	8,0	—	45,3	260	7,00	—	SCW8E

NOTE: Assembly wrench supplied with blade.

- Maximum support for specific groove width and straight clearance for unlimited diameter.
- Through the pocket coolant capable.
- Universal pocket for holding all insert geometries.



Grooving and Cut-Off



■ Modular Straight Blade with Coolant

order number	catalogue number	seat size	CD	FS	blade size
right hand					
6031041	EVM50R1F12M	1F	12,0	11,00	50
6030969	EVM50R0212M	2	12,0	10,88	50
5955423	EVM50R0216M	2	16,0	10,88	50
5979200	EVM50R0312MC	3	12,0	10,43	50
5979010	EVM50R0316MC	3	16,0	10,43	50
5979181	EVM50R0322MC	3	22,0	10,43	50
5979201	EVM50R0412MC	4	12,0	9,93	50
5979182	EVM50R0416MC	4	16,0	9,93	50
5979183	EVM50R0422MC	4	22,0	9,93	50
5979198	EVM50R0426MC	4	26,0	9,93	50
5979184	EVM50R0432MC	4	32,0	9,93	50
6031031	EVM50R0512MC	5	12,0	9,43	50
6031033	EVM50R0516MC	5	16,0	9,43	50
5955415	EVM50R0526MC	5	26,0	9,43	50
5955416	EVM50R0532MC	5	32,0	9,43	50
6031035	EVM65R0616MC	6	16,0	9,88	65
5955417	EVM65R0626MC	6	26,0	9,88	65
6031037	EVM65R0632MC	6	32,0	9,88	65
6031039	EVM65R0816MC	8	16,0	9,00	65
5955418	EVM65R0826MC	8	26,0	9,00	65

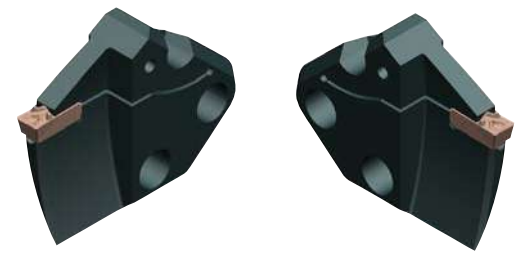
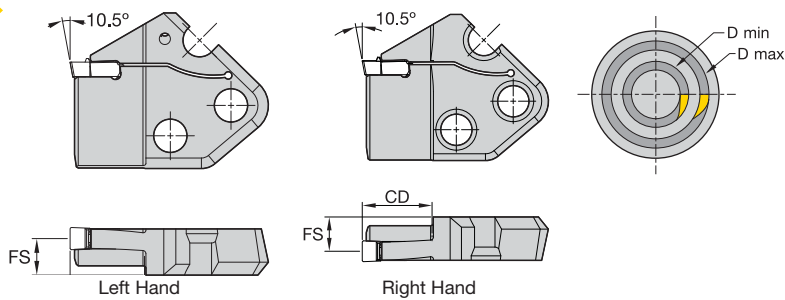
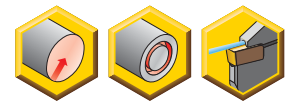
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(Modular Straight Blade with Coolant — continued)

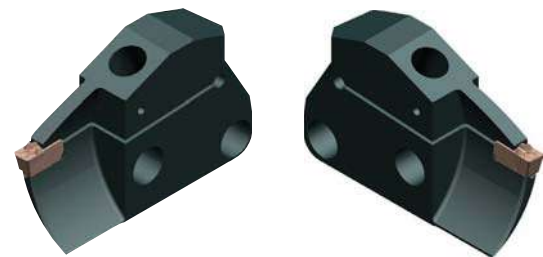
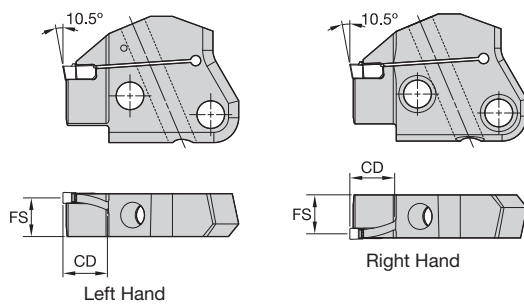
order number	catalogue number	seat size	CD	FS	blade size
left hand					
6031042	EVM50L1F12M	1F	12,0	11,00	50
6030970	EVM50L0212M	2	12,0	10,88	50
5955424	EVM50L0216M	2	16,0	10,88	50
5979202	EVM50L0312MC	3	12,0	10,43	50
5979185	EVM50L0316MC	3	16,0	10,43	50
5979186	EVM50L0322MC	3	22,0	10,43	50
5979203	EVM50L0412MC	4	12,0	9,93	50
5979187	EVM50L0416MC	4	16,0	9,93	50
5979188	EVM50L0422MC	4	22,0	9,93	50
5979199	EVM50L0426MC	4	26,0	9,93	50
5979189	EVM50L0432MC	4	32,0	9,93	50
6031032	EVM50L0512MC	5	12,0	9,93	50
6031034	EVM50L0516MC	5	16,0	9,43	50
5955419	EVM50L0526MC	5	26,0	9,43	50
5955420	EVM50L0532MC	5	32,0	9,43	50
6031036	EVM65L0616MC	6	16,0	9,88	65
5955421	EVM65L0626MC	6	26,0	9,88	65
6031038	EVM65L0632MC	6	32,0	9,88	65
6031040	EVM65L0816MC	8	16,0	9,00	65
5955422	EVM65L0826MC	8	26,0	9,00	65

NOTE: Through the pocket coolant available in seat sizes 3 and higher.





Left Hand Right Hand
M65 blade size shown



Left Hand Right Hand
M50 blade size shown

■ Modular Inboard Face Grooving Blade with Coolant

order number	catalogue number	seat size	D min	D max	CD	FS	blade size
right hand							
6097181	EVM50R0312A035040C	3	35	40	12,0	10,50	50
6097182	EVM50R0312A040050C	3	40	50	12,0	10,50	50
6097183	EVM50R0312A050060C	3	50	60	12,0	10,50	50
6097184	EVM50R0312A060075C	3	60	75	12,0	10,50	50
6116789	EVM50R0312A075100C	3	75	100	12,0	10,50	50
6117063	EVM50R0312A100180C	3	100	180	12,0	10,50	50
6117067	EVM50R0312A180250C	3	180	250	12,0	10,50	50
6117071	EVM50R0312A250350C	3	250	350	12,0	10,50	50
6117075	EVM50R0312A350999C	3	350	999	12,0	10,50	50
6097185	EVM50R0320A075100C	3	75	100	20,0	10,50	50
6097186	EVM50R0320A100180C	3	100	180	20,0	10,50	50
6097187	EVM50R0320A180250C	3	180	250	20,0	10,50	50
6097188	EVM50R0320A250350C	3	250	350	20,0	10,50	50
6097189	EVM50R0320A350999C	3	350	999	20,0	10,50	50
6079480	EVM50R0416A040050C	4	40	50	16,0	10,00	50
6079481	EVM50R0416A050060C	4	50	60	16,0	10,00	50
6079482	EVM50R0416A060075C	4	60	75	16,0	10,00	50
6079483	EVM50R0416A075100C	4	75	100	16,0	10,00	50
6117079	EVM50R0416A100180C	4	100	180	16,0	10,00	50
6117093	EVM50R0416A180250C	4	180	250	16,0	10,00	50
6117097	EVM50R0416A250350C	4	250	350	16,0	10,00	50
6117101	EVM50R0416A350999C	4	350	999	16,0	10,00	50
6079484	EVM50R0426A100180C	4	100	180	26,0	10,00	50

(continued)

(Modular Inboard Face Grooving Blade with Coolant — continued)

order number	catalogue number	seat size	D min	D max	CD	FS	blade size
6079485	EVM50R0426A180250C	4	180	250	26,0	10,00	50
6079486	EVM50R0426A250350C	4	250	350	26,0	10,00	50
6079487	EVM50R0426A350999C	4	350	999	26,0	10,00	50
6079488	EVM50R0520A050060C	5	50	60	20,0	9,50	50
6079489	EVM50R0520A060075C	5	60	75	20,0	9,50	50
6079490	EVM50R0520A075100C	5	75	100	20,0	9,50	50
6079491	EVM50R0520A100180C	5	100	180	20,0	9,50	50
6079492	EVM50R0520A180250C	5	180	250	20,0	9,50	50
6079493	EVM50R0520A250350C	5	250	350	20,0	9,50	50
6079494	EVM50R0520A350999C	5	350	999	20,0	9,50	50
6079223	EVM65R0620A060075C	6	60	75	20,0	9,88	65
6079224	EVM65R0620A075100C	6	75	100	20,0	9,88	65
6079225	EVM65R0620A100180C	6	100	180	20,0	9,88	65
6079226	EVM65R0620A180250C	6	180	250	20,0	9,88	65
6079227	EVM65R0620A250350C	6	250	350	20,0	9,88	65
6079228	EVM65R0620A350999C	6	350	999	20,0	9,88	65
6079229	EVM65R0820A080180C	8	80	180	20,0	9,00	65
6079230	EVM65R0820A180999C	8	180	999	20,0	9,00	65
left hand							
6097190	EVM50L0312A035040C	3	35	40	12,0	10,50	50
6097191	EVM50L0312A040050C	3	40	50	12,0	10,50	50
6097192	EVM50L0312A050060C	3	50	60	12,0	10,50	50
6097193	EVM50L0312A060075C	3	60	75	12,0	10,50	50
6116790	EVM50L0312A075100C	3	75	100	12,0	10,50	50
6117064	EVM50L0312A100180C	3	100	180	12,0	10,50	50
6117068	EVM50L0312A180250C	3	180	250	12,0	10,50	50
6117072	EVM50L0312A250350C	3	250	350	12,0	10,50	50
6117076	EVM50L0312A350999C	3	350	999	12,0	10,50	50
6097194	EVM50L0320A075100C	3	75	100	20,0	10,50	50
6097195	EVM50L0320A100180C	3	100	180	20,0	10,50	50
6097196	EVM50L0320A180250C	3	180	250	20,0	10,50	50
6097197	EVM50L0320A250350C	3	250	350	20,0	10,50	50
6097198	EVM50L0320A350999C	3	350	999	20,0	10,50	50
6079495	EVM50L0416A040050C	4	40	50	16,0	10,00	50
6079496	EVM50L0416A050060C	4	50	60	16,0	10,00	50
6079497	EVM50L0416A060075C	4	60	75	16,0	10,00	50
6079498	EVM50L0416A075100C	4	75	100	16,0	10,00	50
6117080	EVM50L0416A100180C	4	100	180	16,0	10,00	50
6117094	EVM50L0416A180250C	4	180	250	16,0	10,00	50
6117098	EVM50L0416A250350C	4	250	350	16,0	10,00	50
6117102	EVM50L0416A350999C	4	350	999	16,0	10,00	50
6079499	EVM50L0426A100180C	4	100	180	26,0	10,00	50
6079500	EVM50L0426A180250C	4	180	250	26,0	10,00	50
6079501	EVM50L0426A250350C	4	250	350	26,0	10,00	50

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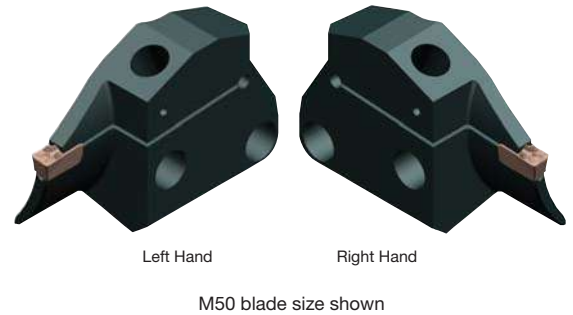
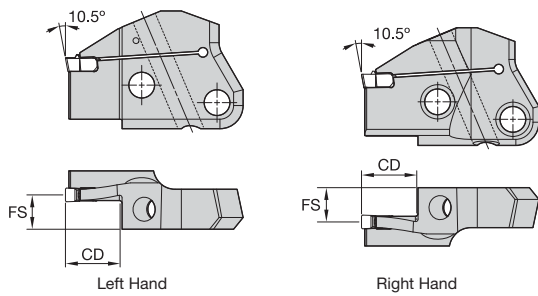
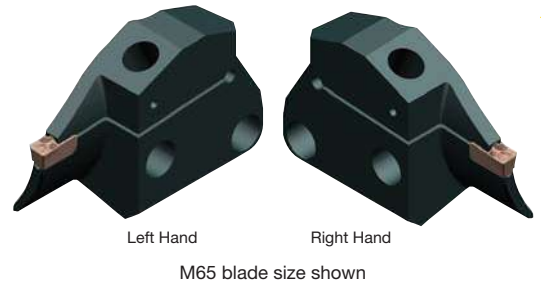
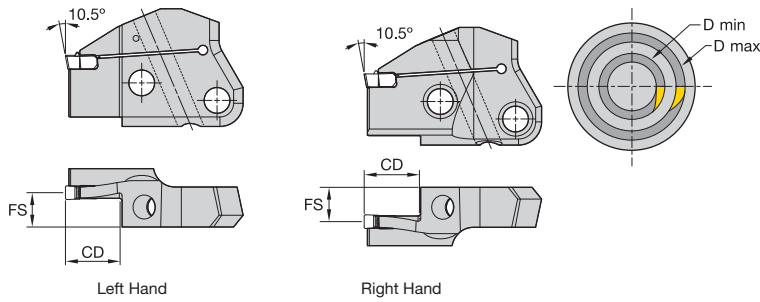
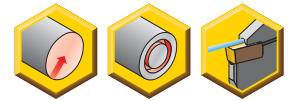


(Modular Inboard Face Grooving Blade with Coolant — continued)

Grooving and Cut-Off

order number	catalogue number	seat size	D min	D max	CD	FS	blade size
6079502	EVM50L0426A350999C	4	350	999	26,0	10,00	50
6079503	EVM50L0520A050060C	5	50	60	20,0	9,50	50
6079504	EVM50L0520A060075C	5	60	75	20,0	9,50	50
6079505	EVM50L0520A075100C	5	75	100	20,0	9,50	50
6079506	EVM50L0520A100180C	5	100	180	20,0	9,50	50
6079507	EVM50L0520A180250C	5	180	250	20,0	9,50	50
6079508	EVM50L0520A250350C	5	250	350	20,0	9,50	50
6079509	EVM50L0520A350999C	5	350	999	20,0	9,50	50
6079234	EVM65L0620A060075C	6	60	75	20,0	9,88	65
6079235	EVM65L0620A075100C	6	75	100	20,0	9,88	65
6079236	EVM65L0620A100180C	6	100	180	20,0	9,88	65
6079237	EVM65L0620A180250C	6	180	250	20,0	9,88	65
6079238	EVM65L0620A250350C	6	250	350	20,0	9,88	65
6079239	EVM65L0620A350999C	6	350	999	20,0	9,88	65
6079240	EVM65L0820A080180C	8	80	180	20,0	9,00	65
6079241	EVM65L0820A180999C	8	180	999	20,0	9,00	65

NOTE: Through the pocket coolant available in seat sizes 3 and higher.



Grooving and Cut-Off

■ Modular Outboard Face Grooving Blade with Coolant

order number	catalogue number	seat size	D min	D max	CD	FS	blade size
right hand							
6079340	EVM50R0312B035040C	3	35	40	12,0	10,50	50
6079411	EVM50R0312B040050C	3	40	50	12,0	10,50	50
6079412	EVM50R0312B050060C	3	50	60	12,0	10,50	50
6079413	EVM50R0312B060075C	3	60	75	12,0	10,50	50
6117061	EVM50R0312B075100C	3	75	100	12,0	10,50	50
6117065	EVM50R0312B100180C	3	100	180	12,0	10,50	50
6117069	EVM50R0312B180250C	3	180	250	12,0	10,50	50
6117073	EVM50R0312B250350C	3	250	350	12,0	10,50	50
6117077	EVM50R0312B350999C	3	350	999	12,0	10,50	50
6079414	EVM50R0320B075100C	3	75	100	20,0	10,50	50
6079415	EVM50R0320B100180C	3	100	180	20,0	10,50	50
6079416	EVM50R0320B180250C	3	180	250	20,0	10,50	50
6079417	EVM50R0320B250350C	3	250	350	20,0	10,50	50
6079418	EVM50R0320B350999C	3	350	999	20,0	10,50	50
6079429	EVM50R0416B040050C	4	40	50	16,0	10,00	50
6079430	EVM50R0416B050060C	4	50	60	16,0	10,00	50
6079451	EVM50R0416B060075C	4	60	75	16,0	10,00	50
6079452	EVM50R0416B075100C	4	75	100	16,0	10,00	50
6117091	EVM50R0416B100180C	4	100	180	16,0	10,00	50
6117095	EVM50R0416B180250C	4	180	250	16,0	10,00	50
6117099	EVM50R0416B250350C	4	250	350	16,0	10,00	50
6117103	EVM50R0416B350999C	4	350	999	16,0	10,00	50
6079453	EVM50R0426B100180C	4	100	180	26,0	10,00	50

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(Modular Outboard Face Grooving Blade with Coolant — continued)

Grooving and Cut-Off

order number	catalogue number	seat size	D min	D max	CD	FS	blade size
6079454	EVM50R0426B180250C	4	180	250	26,0	10,00	50
6079455	EVM50R0426B250350C	4	250	350	26,0	10,00	50
6079456	EVM50R0426B350999C	4	350	999	26,0	10,00	50
6079457	EVM50R0520B050060C	5	50	60	20,0	9,50	50
6079458	EVM50R0520B060075C	5	60	75	20,0	9,50	50
6079459	EVM50R0520B075100C	5	75	100	20,0	9,50	50
6079460	EVM50R0520B100180C	5	100	180	20,0	9,50	50
6079461	EVM50R0520B180250C	5	180	250	20,0	9,50	50
6079462	EVM50R0520B250350C	5	250	350	20,0	9,50	50
6079463	EVM50R0520B350999C	5	350	999	20,0	9,50	50
6079246	EVM65R0620B060075C	6	60	75	20,0	9,88	65
6079247	EVM65R0620B075100C	6	75	100	20,0	9,88	65
6079248	EVM65R0620B100180C	6	100	180	20,0	9,88	65
6079249	EVM65R0620B180250C	6	180	250	20,0	9,88	65
6079250	EVM65R0620B250350C	6	250	350	20,0	9,88	65
6079261	EVM65R0620B350999C	6	350	999	20,0	9,88	65
6079262	EVM65R0820B080180C	8	80	180	20,0	9,00	65
6079263	EVM65R0820B180999C	8	180	999	20,0	9,00	65
left hand							
6079420	EVM50L0312B035040C	3	35	40	12,0	10,50	50
6079421	EVM50L0312B040050C	3	40	50	12,0	10,50	50
6079422	EVM50L0312B050060C	3	50	60	12,0	10,50	50
6079423	EVM50L0312B060075C	3	60	75	12,0	10,50	50
6117062	EVM50L0312B075100C	3	75	100	12,0	10,50	50
6117066	EVM50L0312B100180C	3	100	180	12,0	10,50	50
6117070	EVM50L0312B180250C	3	180	250	12,0	10,50	50
6117074	EVM50L0312B250350C	3	250	350	12,0	10,50	50
6117078	EVM50L0312B350999C	3	350	999	12,0	10,50	50
6079424	EVM50L0320B075100C	3	75	100	20,0	10,50	50
6079425	EVM50L0320B100180C	3	100	180	20,0	10,50	50
6079426	EVM50L0320B180250C	3	180	250	20,0	10,50	50
6079427	EVM50L0320B250350C	3	250	350	20,0	10,50	50
6079428	EVM50L0320B350999C	3	350	999	20,0	10,50	50
6079464	EVM50L0416B040050C	4	40	50	16,0	10,00	50
6079465	EVM50L0416B050060C	4	50	60	16,0	10,00	50
6079466	EVM50L0416B060075C	4	60	75	16,0	10,00	50
6079467	EVM50L0416B075100C	4	75	100	16,0	10,00	50
6117092	EVM50L0416B100180C	4	100	180	16,0	10,00	50
6117096	EVM50L0416B180250C	4	180	250	16,0	10,00	50
6117100	EVM50L0416B250350C	4	250	350	16,0	10,00	50
6117104	EVM50L0416B350999C	4	350	999	16,0	10,00	50
6079468	EVM50L0426B100180C	4	100	180	26,0	10,00	50
6079469	EVM50L0426B180250C	4	180	250	26,0	10,00	50
6079470	EVM50L0426B250350C	4	250	350	26,0	10,00	50

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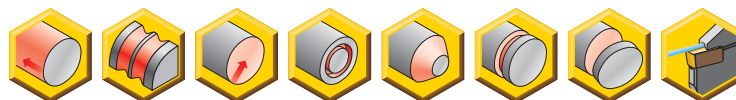
(Modular Outboard Face Grooving Blade with Coolant — continued)

order number	catalogue number	seat size	D min	D max	CD	FS	blade size
6079471	EVM50L0426B350999C	4	350	999	26,0	10,00	50
6079472	EVM50L0520B050060C	5	50	60	20,0	9,50	50
6079473	EVM50L0520B060075C	5	60	75	20,0	9,50	50
6079474	EVM50L0520B075100C	5	75	100	20,0	9,50	50
6079475	EVM50L0520B100180C	5	100	180	20,0	9,50	50
6079476	EVM50L0520B180250C	5	180	250	20,0	9,50	50
6079477	EVM50L0520B250350C	5	250	350	20,0	9,50	50
6079478	EVM50L0520B350999C	5	350	999	20,0	9,50	50
6079266	EVM65L0620B060075C	6	60	75	20,0	9,88	65
6079267	EVM65L0620B075100C	6	75	100	20,0	9,88	65
6079268	EVM65L0620B100180C	6	100	180	20,0	9,88	65
6079269	EVM65L0620B180250C	6	180	250	20,0	9,88	65
6079270	EVM65L0620B250350C	6	250	350	20,0	9,87	65
6079271	EVM65L0620B350999C	6	350	999	20,0	9,88	65
6079272	EVM65L0820B080180C	8	80	180	20,0	9,00	65
6079273	EVM65L0820B180999C	8	180	999	20,0	9,00	65

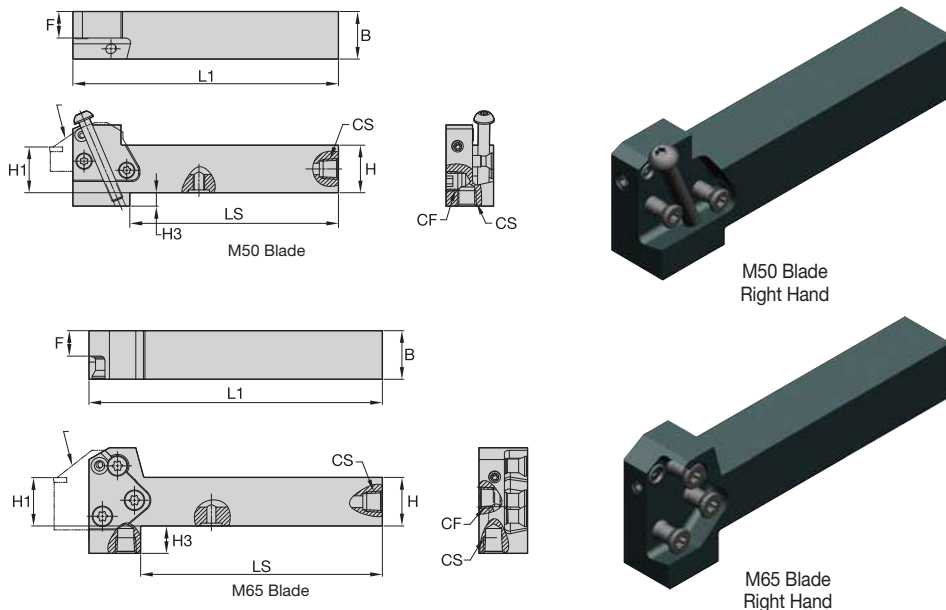
NOTE: Through the pocket coolant available in seat sizes 3 and higher.



- Interchangeable blades for versatility and depth of cut.
- Through the pocket coolant capable.



Grooving and Cut-Off



■ Modular Straight Toolholder with Coolant • Metric

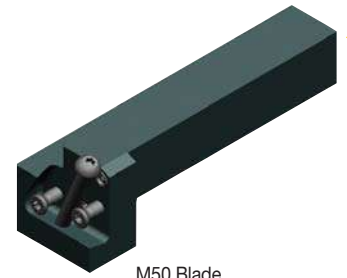
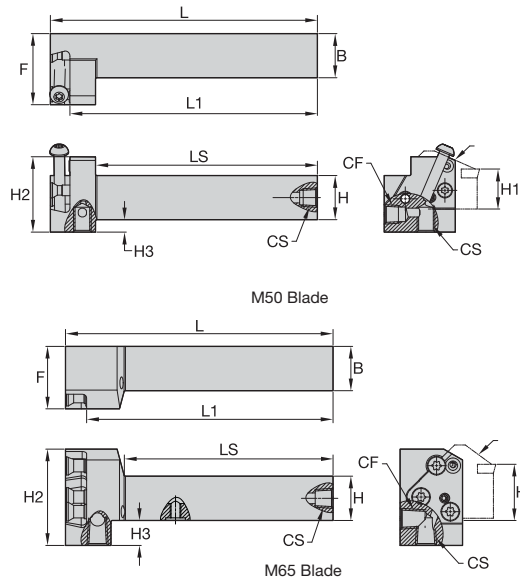
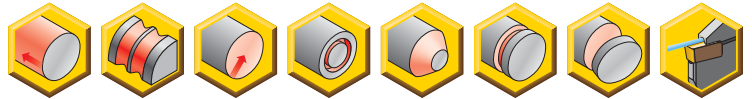


order number	catalogue number	B	H	H1	L1	F	CS	CF	LS	H3	blade size	blade screw	Torx	clamping screw	Torx
right hand															
5979190	KGMSR2525M50C	25	25	25	138,75	13,84	G 1/8	G 1/8	109,00	7,00	50	MS1162	T25	MS2002	T25
5979745	KGMSR2525M65C	25	25	25	150,00	13,00	G 1/8	G 1/8	122,00	14,00	65	MS1163	T30	—	—
5979746	KGMSR3232P50C	32	32	32	158,75	20,81	G 1/8	G 1/8	133,62	—	50	MS1162	T25	MS2002	T25
5979747	KGMSR3232P65C	32	32	32	170,00	20,00	G 1/8	G 1/8	138,50	7,00	65	MS1163	T30	—	—
left hand															
5979191	KGMSL2525M50C	25	25	25	138,75	13,84	G 1/8	G 1/8	109,00	7,00	50	MS1162	T25	MS2002	T25
5979748	KGMSL2525M65C	25	25	25	150,00	13,00	G 1/8	G 1/8	122,00	14,00	65	MS1163	T30	—	—
5979749	KGMSL3232P50C	32	32	32	158,75	20,80	G 1/8	G 1/8	133,62	—	50	MS1162	T25	MS2002	T25
5979750	KGMSL3232P65C	32	32	32	170,00	20,00	G 1/8	G 1/8	142,00	7,00	65	MS1163	T30	—	—

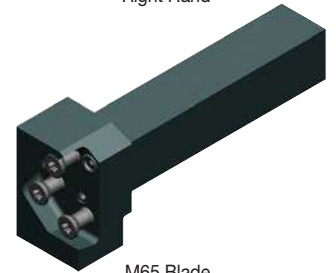
NOTE: KGMS.: Right-hand holder uses right-hand blades.
 KGME.: Right-hand holder uses left-hand blades.
 M50 blade and clamp screw torque equals 8–10 Nm (71–88 in. lbs.).
 M65 blade and clamp screw torque equals 18–20 Nm (159–177 in. lbs.).

screw catalogue number	screw order number	torque		thread	socket	wrench catalogue number	wrench order number
		Nm	in. lbs.				
MS1160	1099645	7	62	M5	T20	KT20	1022703
MS1162	1127019	9	80	M6	T25	KT25	1022725
MS1163	1124104	18	159	M8	T30	KT30L	1099676
MS1273	1020977	4	35.4	M4	T15	KT15	1022701
MS1490	2263299	17	151	M8	T45	KT45	1018227
MS1595	1094300	12	106	M6	T30	KT30	1099676
MS1970	1106668	12	106	M6	T30	KT30	1099676
MS2002	1621087	9	80	M6	T25	KT25	1022725
MS2091	1931147	9	80	M5	25IP	K25IP	2050113

- Interchangeable blades for versatility and depth of cut.
- Through the pocket coolant capable.



M50 Blade Right Hand



M65 Blade Right Hand

Grooving and Cut-Off

■ Modular End Mount Toolholder with Coolant • Metric

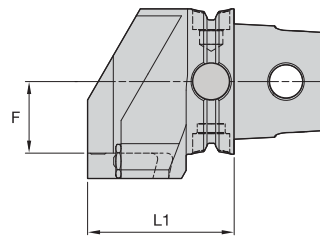
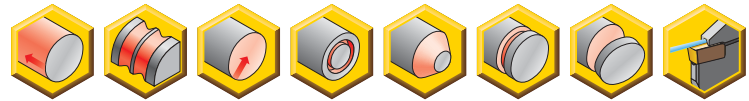


order number	catalogue number	B	H	H1	L1	F	CS	CF	LS	H3	blade size	blade screw	Torx	clamping screw	Torx
right hand															
5979765	KGMER2525M65C	25	25	25	138,15	35,00	G 1/8	G 1/8	117,00	14,00	65	MS1163	T30	—	—
5979192	KGMER2525M50C	25	25	25	139,25	40,00	G 1/8	G 1/8	124,85	7,00	50	MS1162	T25	MS2002	T25
5979767	KGMER3232P65C	32	32	32	158,15	35,00	G 1/8	G 1/8	137,00	7,00	65	MS1163	T30	—	—
5979766	KGMER3232P50C	32	32	32	159,25	40,00	G 1/8	G 1/8	145,25	—	50	MS1162	T25	MS2002	T25
left hand															
5979768	KGME2525M65C	25	25	25	138,15	35,00	G 1/8	G 1/8	117,00	14,00	65	MS1163	T30	—	—
5979193	KGME2525M50C	25	25	25	139,25	40,00	G 1/8	G 1/8	124,85	7,00	50	MS1162	T25	MS2002	T25
5979770	KGME3232P65C	32	32	32	158,15	35,00	G 1/8	G 1/8	137,00	7,00	65	MS1163	T30	—	—
5979769	KGME3232P50C	32	32	32	159,25	40,00	G 1/8	G 1/8	145,25	—	50	MS1162	T25	MS2002	T25

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.).

screw catalogue number	screw order number	torque		thread	socket	wrench catalogue number	wrench order number
		Nm	in. lbs.				
MS1160	1099645	7	62	M5	T20	KT20	1022703
MS1162	1127019	9	80	M6	T25	KT25	1022725
MS1163	1124104	18	159	M8	T30	KT30L	1099676
MS1273	1020977	4	35.4	M4	T15	KT15	1022701
MS1490	2263299	17	151	M8	T45	KT45	1018227
MS1595	1094300	12	106	M6	T30	KT30	1099676
MS1970	1106668	12	106	M6	T30	KT30	1099676
MS2002	1621087	9	80	M6	T25	KT25	1022725
MS2091	1931147	9	80	M5	25IP	K25IP	2050113

- Best-in-class KM Quick-Change platform.
- Through the pocket coolant capable.
- Interchangeable blades for versatility and depth of cut.



Right Hand



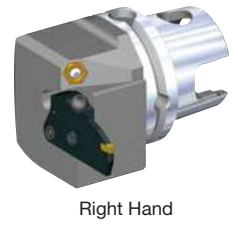
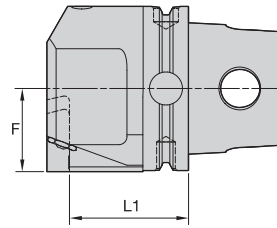
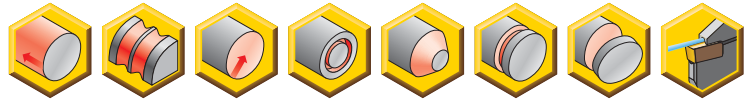
■ Modular Straight KM System with Coolant



order number	catalogue number	CSMS system size	L1	F	blade size	blade screw	Torx	clamp screw	Torx
right hand									
5999790	KM40TSKGMSR50C	KM40TS	53,5	15,0	50	MS1162	T25	MS2002	T25
6000422	KM50TSKGMSR65C	KM50TS	53,5	22,0	65	MS1163	T30	—	—
5999864	KM50TSKGMSR50C	KM50TS	58,5	23,0	50	MS1162	T25	MS2002	T25
6000431	KM63TSKGMSR65C	KM63TS	58,5	30,0	65	MS1163	T30	—	—
5999948	KM63TSKGMSR50C	KM63TS	63,5	31,0	50	MS1162	T25	MS2002	T25
5999972	KM63XMZKGMSR50CY	KM63XMZ	63,5	31,0	50	MS1162	T25	MS2002	T25
6017695	KM80TSKGMSR65C	KM80TS	63,5	40,0	65	MS1163	T30	—	—
6000018	KM80ATCKGMSR50C	KM80ATC	66,5	41,0	50	MS1162	T25	MS2002	T25
6000014	KM80TSKGMSR50C	KM80TS	66,5	41,0	50	MS1162	T25	MS2002	T25
left hand									
5999861	KM40TSKGMSL50C	KM40TS	53,5	15,0	50	MS1162	T25	MS2002	T25
6000424	KM50TSKGMSL65C	KM50TS	53,5	22,0	65	MS1163	T30	—	—
5999865	KM50TSKGMSL50C	KM50TS	58,5	23,0	50	MS1162	T25	MS2002	T25
6000433	KM63TSKGMSL65C	KM63TS	58,5	30,0	65	MS1163	T30	—	—
5999949	KM63TSKGMSL50C	KM63TS	63,5	31,0	50	MS1162	T25	MS2002	T25
5999973	KM63XMZKGMSLF50CY	KM63XMZ	63,5	31,0	50	MS1162	T25	MS2002	T25
6017696	KM80TSKGMSL65C	KM80TS	63,5	40,0	65	MS1163	T30	—	—
6000019	KM80ATCKGMSL50C	KM80ATC	66,5	41,0	50	MS1162	T25	MS2002	T25
6000015	KM80TSKGMSL50C	KM80TS	66,5	41,0	50	MS1162	T25	MS2002	T25

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.).

- Best-in-class KM Quick-Change platform.
- Through the pocket coolant capable.
- Interchangeable blades for versatility and depth of cut.



Right Hand



Grooving and Cut-Off

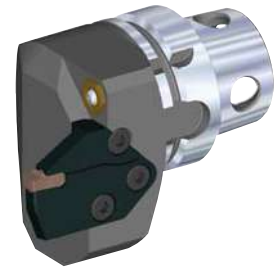
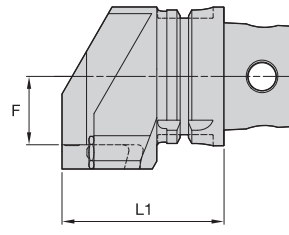
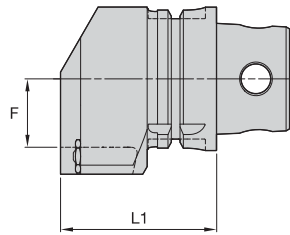
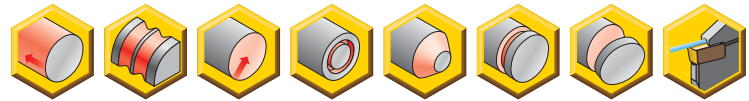
■ Modular End Mount KM System with Coolant • Metric



order number	catalogue number	CSMS system size	L1	F	blade size	blade screw	Torx	clamp screw	Torx
right hand									
5999788	KM40TSKGMER50C	KM40TS	28,0	20,50	50	MS1162	T25	MS2002	T25
5999862	KM50TSKGMER50C	KM50TS	38,0	25,50	50	MS1162	T25	MS2002	T25
6000410	KM50TSKGMER65C	KM50TS	47,0	25,50	65	MS1163	T30	—	—
6000425	KM63TSKGMER65C	KM63TS	47,0	32,52	65	MS1163	T30	—	—
5999946	KM63TSKGMER50C	KM63TS	48,0	32,50	50	MS1162	T25	MS2002	T25
6000434	KM63XMZKGMER65CY	KM63XMZ	47,0	32,50	65	MS1163	T30	—	—
5999950	KM63XMZKGMER50CY	KM63XMZ	48,0	32,50	50	MS1162	T25	MS2002	T25
6017697	KM80ATCKGMER65C	KM80ATC	57,0	40,50	65	MS1163	T30	—	—
6000016	KM80ATCKGMER50C	KM80ATC	58,0	40,50	50	MS1162	T25	MS2002	T25
6017693	KM80TSKGMER65C	KM80TS	57,0	40,50	65	MS1163	T30	—	—
6000012	KM80TSKGMER50C	KM80TS	58,0	40,50	50	MS1162	T25	MS2002	T25
left hand									
5999789	KM40TSKGMEL50C	KM40TS	28,0	20,50	50	MS1162	T25	MS2002	T25
5999863	KM50TSKGMEL50C	KM50TS	38,0	25,50	50	MS1162	T25	MS2002	T25
6000421	KM50TSKGMEL65C	KM50TS	47,0	25,50	65	MS1163	T30	—	—
6000430	KM63TSKGMEL65C	KM63TS	47,0	32,52	65	MS1163	T30	—	—
5999947	KM63TSKGMEL50C	KM63TS	48,0	32,50	50	MS1162	T25	MS2002	T25
6000436	KM63XMZKGMELF65CY	KM63XMZ	47,0	32,50	65	MS1163	T30	—	—
5999971	KM63XMZKGMELF50CY	KM63XMZ	48,0	32,50	50	MS1162	T25	MS2002	T25
6017698	KM80ATCKGMEL65C	KM80ATC	57,0	40,50	65	MS1163	T30	—	—
6000017	KM80ATCKGMEL50C	KM80ATC	58,0	40,50	50	MS1162	T25	MS2002	T25
6017694	KM80TSKGMEL65C	KM80TS	57,0	40,50	65	MS1163	T30	—	—
6000013	KM80TSKGMEL50C	KM80TS	58,0	40,50	50	MS1162	T25	MS2002	T25

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.).

- Through the pocket coolant capable.
- Interchangeable blades for versatility and depth of cut.



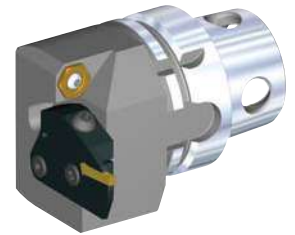
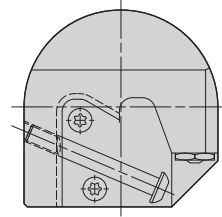
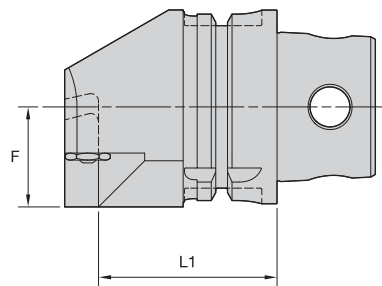
Right Hand

■ Modular Straight KM4X™ System with Coolant



order number	catalogue number	CSMS system size	L1	F	blade size	blade screw	Torx	clamp screw	Torx
right hand									
5543560	KM4X63KGMSR65C	KM4X63	68,5	30,0	65	MS1163	T30	—	—
6000407	KM4X63KGMSR50C	KM4X63	73,5	31,0	50	MS1162	T25	MS2002	T25
left hand									
5543558	KM4X63KGMSL65C	KM4X63	68,5	30,0	65	MS1163	T30	—	—
6000408	KM4X63KGMSL50C	KM4X63	73,5	31,0	50	MS1162	T25	MS2002	T25

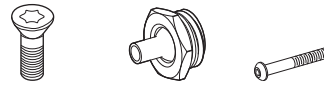
NOTE: KGMS... Right-hand holder uses right-hand blades.
 KGME... Right-hand holder uses left-hand blades.
 M50 blade and clamp screw torque equals 8–10 Nm (71–88 in. lbs.).
 M65 blade and clamp screw torque equals 18–20 Nm (159–177 in. lbs.).



Right Hand

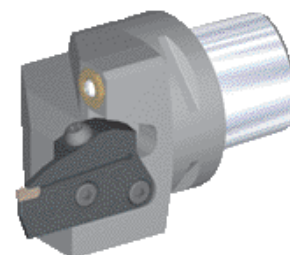
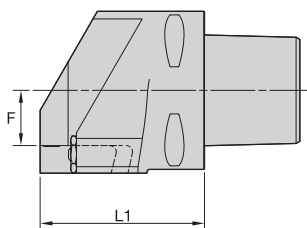
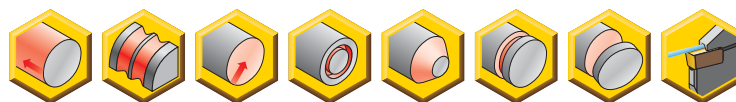
Grooving and Cut-Off

■ Modular End Mount KM4X™ System with Coolant



order number	catalogue number	CSMS system size			cartridge size	blade screw	nozzle	clamp screw	kg	lbs
		system size	L1	F						
right hand										
5543555	KM4X63KGMER65C	KM4X63	57,0	32,5	65	MS1163	PMT04525	—	1,87	4.13
6000404	KM4X63KGMER50C	KM4X63	58,0	32,5	50	MS1162	PMT04525	MS2002	1,85	4.08
6000407	KM4X63KGMSR50C	KM4X63	73,5	31,0	50	MS1162	PMT04525	MS2002	1,86	4.11
left hand										
5543553	KM4X63KGMEL65C	KM4X63	57,0	32,5	65	MS1163	PMT04525	—	1,87	4.13
6000405	KM4X63KGMEL50C	KM4X63	58,0	32,5	50	MS1162	PMT04525	MS2002	1,85	4.08
6000408	KM4X63KGMSL50C	KM4X63	73,5	31,0	50	MS1162	PMT04525	MS2002	1,86	4.11

- Standard PSC Quick-Change platform.
- Through the pocket coolant capable.
- Interchangeable blades for versatility and depth of cut.



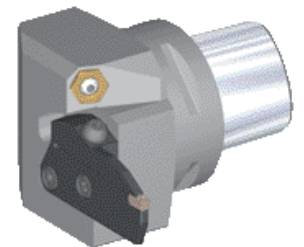
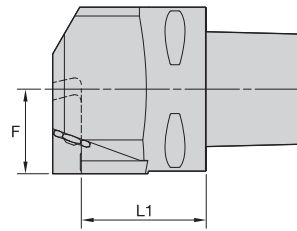
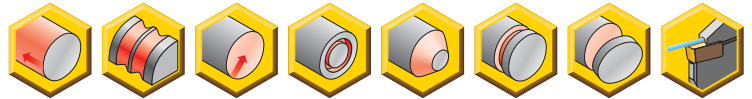
Right Hand

Modular Straight PSC System with Coolant



order number	catalogue number	CSMS system size	L1	F	blade size	blade screw	Torx	clamp screw	Torx
right hand									
6000028	PSC40KGMSR50C	PSC40	63,5	10,0	50	MS1162	T25	MS2002	T25
5405654	PSC50KGMSR65C	PSC50	49,0	25,5	65	MS1163	T30	—	—
6000152	PSC50KGMSR50C	PSC50	63,5	15,0	50	MS1162	T25	MS2002	T25
6000464	PSC63KGMSR65C	PSC63	60,5	21,0	65	MS1163	T30	—	—
6000211	PSC63KGMSR50C	PSC63	65,5	22,0	50	MS1162	T25	MS2002	T25
6000468	PSC80KGMSR65C	PSC80	68,5	29,0	65	MS1163	T30	—	—
6000216	PSC80KGMSR50C	PSC80	73,5	30,0	50	MS1162	T25	MS2002	T25
left hand									
6000029	PSC40KGMSL50C	PSC40	63,5	10,0	50	MS1162	T25	MS2002	T25
5405655	PSC50KGMSL65C	PSC50	49,0	25,5	65	MS1163	T30	—	—
6000153	PSC50KGMSL50C	PSC50	63,5	15,0	50	MS1162	T25	MS2002	T25
6000465	PSC63KGMSL65C	PSC63	60,5	21,0	65	MS1163	T30	—	—
6000213	PSC63KGMSL50C	PSC63	65,5	22,0	50	MS1162	T25	MS2002	T25
6000469	PSC80KGMSL65C	PSC80	68,5	29,0	65	MS1163	T30	—	—
6000217	PSC80KGMSL50C	PSC80	73,5	30,0	50	MS1162	T25	MS2002	T25

- Standard PSC Quick-Change platform.
- Through the pocket coolant capable.
- Interchangeable blades for versatility and depth of cut.



Right Hand

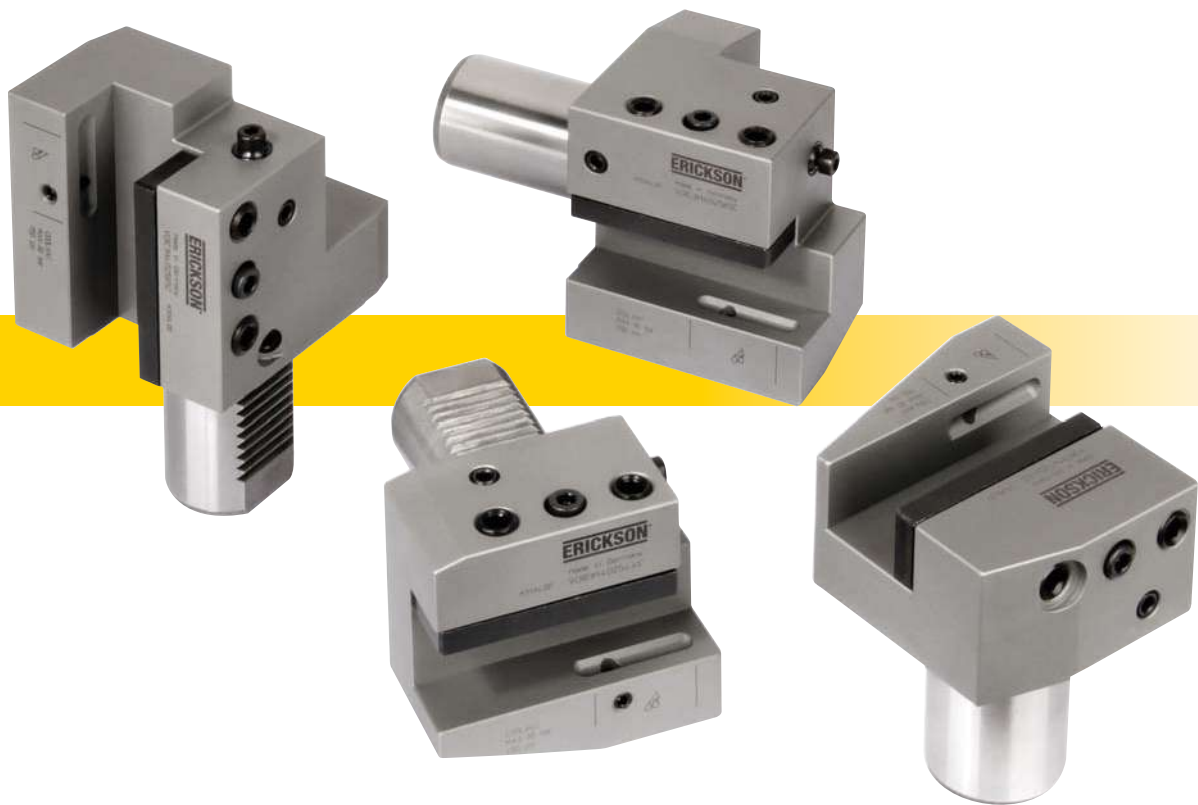
Grooving and Cut-Off

■ Modular End Mount PSC System with Coolant

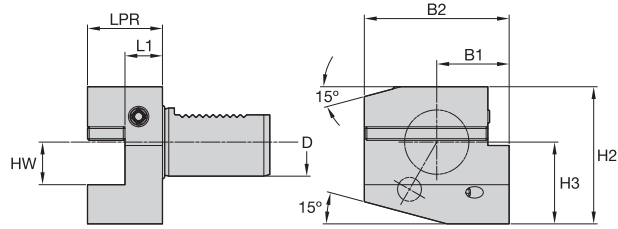


order number	catalogue number	CSMS system size	L1	F	blade size	blade screw	Torx	clamp screw	Torx
right hand									
6000026	PSC40KGMER50C	PSC40	33,0	20,5	50	MS1162	T25	MS2002	T25
6000030	PSC50KGMER50C	PSC50	43,0	25,5	50	MS1162	T25	MS2002	T25
5405652	PSC50KGMER65C	PSC50	55,5	22,0	65	MS1163	T30	—	—
6000159	PSC63KGMER50C	PSC63	48,0	32,5	50	MS1162	T25	MS2002	T25
6000462	PSC63KGMER65C	PSC63	49,0	32,5	65	MS1163	T30	—	—
6000466	PSC80KGMER65C	PSC80	57,0	40,5	65	MS1163	T30	—	—
6000214	PSC80KGMER50C	PSC80	58,0	40,5	50	MS1162	T25	MS2002	T25
left hand									
6000027	PSC40KGME50C	PSC40	33,0	20,5	50	MS1162	T25	MS2002	T25
6000151	PSC50KGME50C	PSC50	43,0	25,5	50	MS1162	T25	MS2002	T25
5405653	PSC50KGME65C	PSC50	55,5	22,0	65	MS1163	T30	—	—
6000160	PSC63KGME50C	PSC63	48,0	32,5	50	MS1162	T25	MS2002	T25
6000463	PSC63KGME65C	PSC63	49,0	32,5	65	MS1163	T30	—	—
6000467	PSC80KGME65C	PSC80	57,0	40,5	65	MS1163	T30	—	—
6000215	PSC80KGME50C	PSC80	58,0	40,5	50	MS1162	T25	MS2002	T25

➤ VDI Toolholders



- VDI adaptor with coolant support for square shank toolholder.
- ISO 10889.



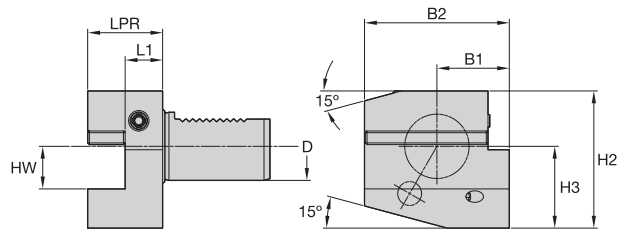
Grooving and Cut-Off

■ VDI Form B1 • HPC • Right Hand Short • Metric

order number	catalogue number	D	B2	B1	HW	H2	H3	L1	LPR
6151491	VDIB1M302040C	30,00	70,00	35,00	20,00	66,00	38,00	22,00	40,00
6151492	VDIB1M402544C	40,00	85,00	42,50	25,00	80,50	48,00	22,00	44,00

VDI Form B2 • Left Hand Short

- VDI adaptor with coolant support for square shank toolholder.
- ISO 10889.

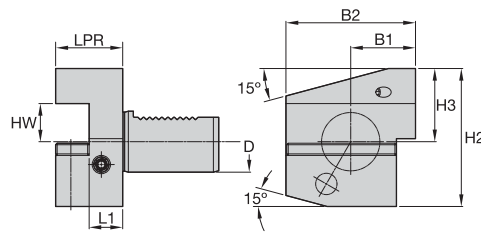


Artwork shows right hand tool.
Left hand tool mirror inverted.

■ VDI Form B2 • HPC • Left Hand Short • Metric

order number	catalogue number	D	B2	B1	HW	H2	H3	L1	LPR
6151493	VDIB2M302040C	30,00	70,00	35,00	20,00	66,00	38,00	22,00	40,00
6151494	VDIB2M402544C	40,00	85,00	42,50	25,00	80,50	48,00	22,00	44,00

- VDI adaptor with coolant support for square shank toolholder.
- ISO 10889.



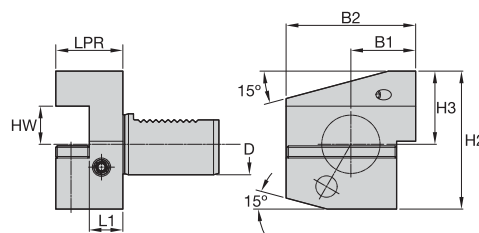
Grooving and Cut-Off

■ VDI Form B3 • HPC • Right Hand Short Inverted • Metric

order number	catalogue number	D	B2	B1	HW	H2	H3	L1	LPR
6151495	VDIB3M302040C	30,00	70,00	35,00	20,00	73,00	38,00	22,00	40,00
6151497	VDIB3M402544C	40,00	85,00	42,50	25,00	90,50	48,00	22,00	44,00

VDI Form B4 • Left Hand Short Inverted

- VDI adaptor with coolant support for square shank toolholder.
- ISO 10889.

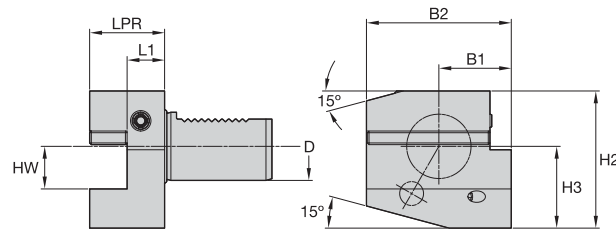


Artwork shows right hand tool.
Left hand tool mirror inverted.

■ VDI Form B4 • HPC • Left Hand Short Inverted • Metric

order number	catalogue number	D	B2	B1	HW	H2	H3	L1	LPR
6151498	VDIB4M302040C	30,00	70,00	35,00	20,00	73,00	38,00	22,00	40,00
6151499	VDIB4M402544C	40,00	85,00	42,50	25,00	90,50	48,00	22,00	44,00

- VDI adaptor with coolant support for square shank toolholder.
- ISO 10889.



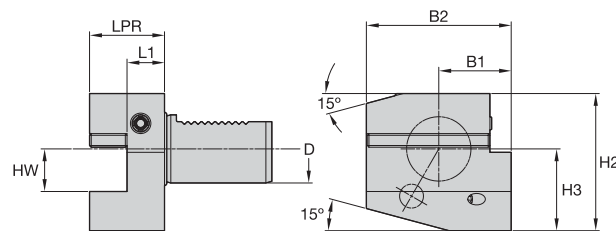
Grooving and Cut-Off

■ VDI Form B5 • HPC • Right Hand Long • Metric

order number	catalogue number	D	B2	B1	HW	H2	H3	L1	LPR
6151500	VDIB5M302040C	30,00	100,00	65,00	20,00	66,00	38,00	22,00	40,00
6151511	VDIB5M402544C	40,00	118,00	75,50	25,00	80,50	48,00	22,00	44,00

VDI Form B6 • Left Hand Long

- VDI adaptor with coolant support for square shank toolholder.
- ISO 10889.

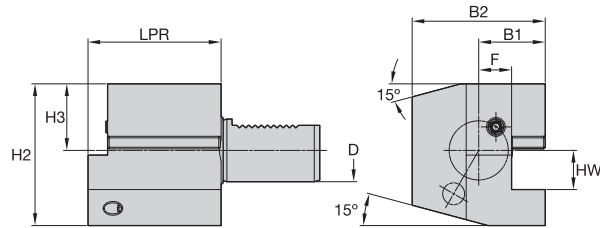


Artwork shows right hand tool. Left hand tool mirror inverted.

■ VDI Form B6 • HPC • Left Hand Long • Metric

order number	catalogue number	D	B2	B1	HW	H2	H3	L1	LPR
6151512	VDIB6M302040C	30,00	100,00	65,00	20,00	66,00	38,00	22,00	40,00
6151513	VDIB6M402544C	40,00	118,00	75,50	25,00	80,50	48,00	22,00	44,00

- VDI adaptor with coolant support for square shank toolholder.
- ISO 10889.



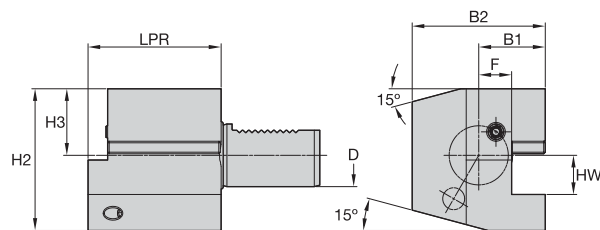
Grooving and Cut-Off

■ VDI Form C1 • HPC • Right Hand • Metric

order number	catalogue number	D	B2	B1	F	HW	H2	H3	LPR
6151514	VDIC1M302070C	30,00	70,00	35,00	17,00	20,00	66,00	38,00	70,00
6151515	VDIC1M402585C	40,00	85,00	42,50	21,00	25,00	80,50	48,00	85,00

VDI Form C2 • Left Hand

- VDI adaptor with coolant support for square shank toolholder.
- ISO 10889.

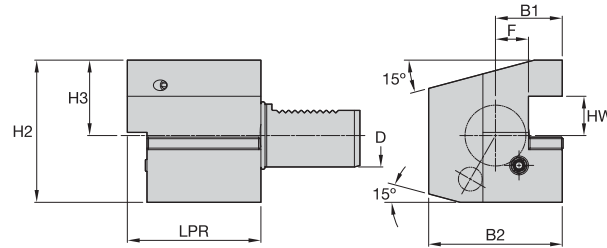


■ VDI Form C2 • HPC • Left Hand • Metric

Artwork shows right hand tool.
Left hand tool mirror inverted.

order number	catalogue number	D	B2	B1	F	HW	H2	H3	LPR
6151516	VDIC2M302070C	30,00	76,00	41,00	23,00	20,00	66,00	38,00	70,00
6151517	VDIC2M402585C	40,00	90,00	47,50	25,50	25,00	80,50	48,00	85,00

- VDI adaptor with coolant support for square shank toolholder.
- ISO 10889.



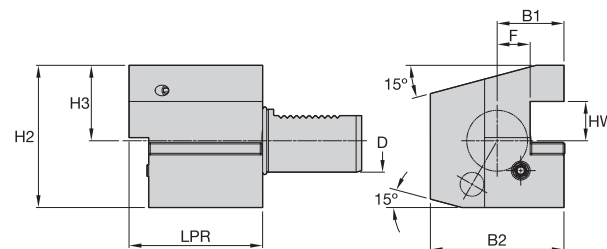
Grooving and Cut-Off

■ VDI Form C3 • HPC • Right Hand Inverted • Metric

order number	catalogue number	D	B2	B1	F	HW	H2	H3	LPR
6151518	VDIC3M302070C	30,00	70,00	35,00	17,00	20,00	73,00	38,00	70,00
6151519	VDIC3M402585C	40,00	85,00	42,50	21,00	25,00	90,50	48,00	85,00

VDI Form C4 • Left Hand Inverted

- VDI adaptor with coolant support for square shank toolholder.
- ISO 10889.

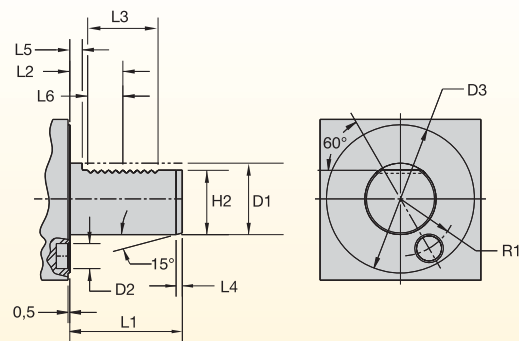


Artwork shows right hand tool.
Left hand tool mirror inverted.

■ VDI Form C4 • HPC • Left Hand Inverted • Metric

order number	catalogue number	D	B2	B1	F	HW	H2	H3	LPR
6151520	VDIC4M302070C	30,00	70,00	35,00	17,00	20,00	73,00	38,00	70,00
6151521	VDIC4M402585C	40,00	85,00	42,50	21,00	25,00	90,50	48,00	85,00

■ Shank Specifications



	D1	D2	D3	L1	L2	L3	L4	L5	L6	H2	R1
30	30,00	14,00	68,00	55,00	29,70	40,00	2,00	7,00	20,00	27,00	25,00
	1.181	0.551	2.677	2.165	1.169	1.575	0.079	0.276	0.787	1.063	0.984
40	40,00	14,00	83,00	63,00	29,70	40,00	3,00	7,00	20,00	36,00	32,00
	1.575	0.551	3.268	2.480	1.169	1.575	0.118	0.276	0.787	1.417	1.260
50	50,00	16,00	98,00	78,00	35,70	48,00	3,00	8,00	24,00	45,00	37,00
	1.969	0.630	3.858	3.071	1.406	1.890	0.118	0.315	0.945	1.772	1.457
60	60,00	16,00	123,00	94,00	43,70	56,00	4,00	10,00	28,00	55,00	48,00
	2.362	0.630	4.843	3.701	1.720	2.205	0.157	0.394	1.102	2.165	1.890

A4™ Tooling and Beyond™ Inserts



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 delivers a very high metal removal rate.

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.

Experience the advantages at your Authorised Kennametal Distributor or at kennametal.com.



kennametal.com



beyond™ EVOLUTION™

Connecting the tool to your machine is easy. Just select one of the two available hose packages, and Active Coolant Control will be keeping you cool in no time!

➤ Don't know exactly what you need?

To connect Beyond™ Evolution™ tooling to the industry's most common machines. The Kennametal universal coolant packs are ideal! Each pack contains the most common thread sizes with a variety of fitting styles for maximum flexibility.

■ Universal 200mm Coolant Pack

order number	catalogue number	quantity	description
6145372	COOL-KIT-101	1	1/16 NPTF male to 7/16 JIC male fitting
		1	1/8 NPTF male to 7/16 JIC male fitting
		1	G1/8 male to 7/16 JIC male fitting
		1	M10 x 1,5 male to 7/16 JIC male fitting
		2	Male JIC to Swivel Female JIC Elbow
		1	200mm Hose Female JIC to Female JIC

■ Universal 300mm Coolant Pack

order number	catalogue number	quantity	description
6145373	COOL-KIT-201	1	1/16 NPTF male to 7/16 JIC male fitting
		1	1/8 NPTF male to 7/16 JIC male fitting
		1	G1/8 male to 7/16 JIC male fitting
		1	M10 x 1,5 male to 7/16 JIC male fitting
		2	Male JIC to Swivel Female JIC Elbow
		1	300mm Hose Female JIC to Female JIC

➤ Know what you need?

Every component is individually available, including less common fittings.
Knowing the precise components required will allow you to choose only the fittings you need!

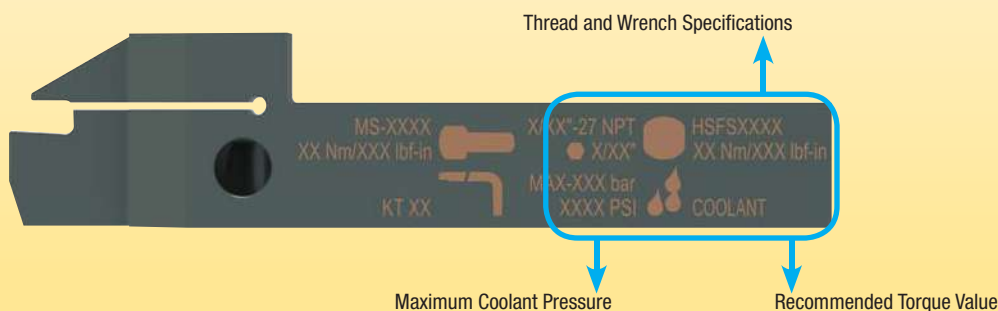
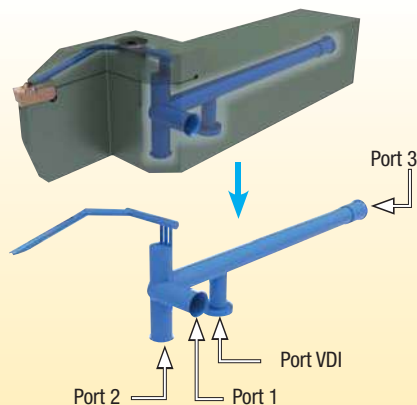
■ Coolant Hose Accessories

order number	catalogue number	description
6145374	1-16NPTF-JIC	1/16 NPTF male to 7/16 JIC male fitting
6145375	1-8NPTF-JIC	1/8 NPTF male to 7/16 JIC male fitting
6145376	G18-JIC	G1/8 male to 7/16 JIC male fitting
6145377	M10-JIC	M10 x 1,5 male to 7/16 JIC male fitting
6145379	JICM-JICF-ELB	Male JIC to Swivel Female JIC Elbow
6145380	COOL-HOSE-200	200mm Female JIC to Female JIC
6145381	COOL-HOSE-300	300mm Female JIC to Female JIC
6145382	M6-JIC	M6 x 1,0 male to 7/16 JIC male fitting
6145378	M8-JIC	M8 x 1,25 male to 7/16 JIC male fitting
6145383	JICM-JICM-STR	7/16 JIC male to 7/16 JIC male adaptor
6145386	G14-G18-RED	Male G1/4 to Female G1/8 reducer
6432549	COOL-HOSE-200-FLEX	Universal 200mm Flex Coolant Hose
6432550	COOL-HOSE-300-FLEX	Universal 300mm Flex Coolant Hose



Active Coolant Control Guidelines

1. Beyond™ Evolution™ system capable of 350 bar (5076 psi).
2. Toolholder delivered with four entry holes.
3. A quality filtration system is necessary to prevent blockages in the toolholder that will effect coolant flow and performance.
4. Machines without a proper filtering system may require modification or an inline filter.
 - For pressure >70 bar [1015 psi], use 10–20 µm filter.
 - For pressure <70 bar [1015 psi], 50–100 µm.
 - Using fine filters in low-pressure applications may affect flow rate.



General Safety Guidelines

1. All safety doors and mechanisms must be in place before trying out the internal coolant to avoid any danger to the operator in the event of a failure.
2. Use the correct pipe fittings to connect the holders to the system. Ensure the maximum pressure recommended for the fittings are not exceeded.
3. While implementing pressure >80 bar [1160 psi], increase the pressure in steps to ensure proper functioning of insert clamping and leak-free joints.
4. While indexing inserts, ensure the pocket is free from chips and/or dirt. Also, inspect the insert and make sure there are no blockages in the coolant canal.
5. Periodically check all hoses and fittings for damage and wear for proper functioning of the system. This check should also include filters.

Active Coolant Control Performance

Internal coolant offers a clear advantage in tool life and chip forming/evacuation vs. external coolant in difficult conditions and in high-pressure coolant.
Example: Chipbreaking in plunging of steel.



Material steel ST52;
Insert size 6mm; f = 0,25 mm/U

Low Pressure — If performance is at risk due to low coolant pressure, apply internal coolant in combination with external coolant to increase volume.

Recommendation to improve tool life and/or productivity: Apply high pressure coolant: 80–350 bar recommended.

VDI Assemblies

The Beyond™ Evolution™ Active Coolant Control can be leveraged with VDI holding systems with both traditional or Quick-Change coolant connections.



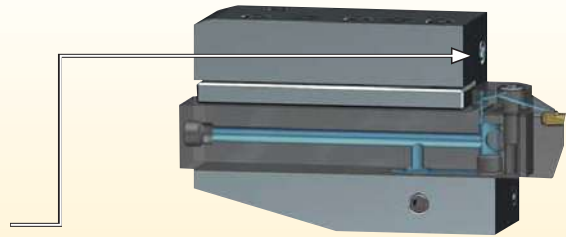
Coolant flow transfer from VDI adaptor to toolholder

A marker on the toolholder must remain within the coolant range indicated on the VDI system for uninterrupted coolant transfer.

■ Technical Details

Pressure limit 80 bar.

Nozzle set comes pre-assembled.
For the holder application with internal coolant only nozzle can be plugged by M5 screw (delivered). Use Loc Tite light, medium strength, or thread sealant.



Holder	Slide Area	Max. Pressure	Torque (Pressure Screws)
VDI 30	22mm	80 bar	20 Nm
VDI 40	30mm	80 bar	35 Nm
Spare sets			
Nozzle		PKG LAL 1205M	
Set Pressure Screw, Pressure Plate, Spring		See separately for each type in BOM	

➤ A4™ Tooling and Beyond™ Inserts

For All Your O.D. and I.D. Applications

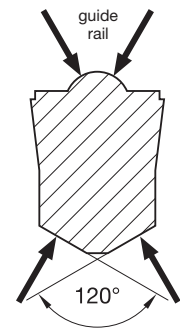
Primary Application

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 delivers a very high metal removal rate.

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

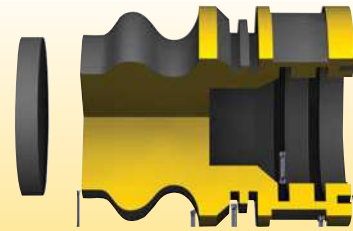
- Covers multiple applications.
- Reduces tool cost.
- Minimises machining time.



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 chipbreaker style and feed rate

Based on the application and seat size, determine the recommended geometry and starting feed rate.

Plunge Feed Rates

first choice
 alternate choice

Chip Control	Description	Insert Geometry	Seat Size	Corner Radius mm	Starting Conditions mm	Plunge Feed Rates mm/rev						
						0,05	0,10	0,15	0,20	0,25	0,30	0,35
-GUP	<ul style="list-style-type: none"> • Groove and turn inserts in new Beyond™ grades. • Available in moulded and precision-ground styles. • Positive rake angle with enhanced chip control. • Available in metric widths only. 		2	0,2	0,08	0,05	0,10	0,15	0,20	0,25	0,30	0,35
			3	0,2	0,09	0,05	0,10	0,15	0,20	0,25	0,30	0,35
			4	0,4	0,11	0,05	0,10	0,15	0,20	0,25	0,30	0,35
			5	0,8	0,15	0,05	0,10	0,15	0,20	0,25	0,30	0,35
			6	0,4	0,16	0,05	0,10	0,15	0,20	0,25	0,30	0,35
			8	0,8	0,18	0,05	0,10	0,15	0,20	0,25	0,30	0,35
			10	1,2	0,20	0,05	0,10	0,15	0,20	0,25	0,30	0,35
			10	0,4	0,17	0,05	0,10	0,15	0,20	0,25	0,30	0,35
			10	0,8	0,20	0,05	0,10	0,15	0,20	0,25	0,30	0,35
			10	1,2	0,22	0,05	0,10	0,15	0,20	0,25	0,30	0,35
-GMP	<ul style="list-style-type: none"> • Groove and turn inserts. • Available in moulded and precision-ground styles. • Positive rake angle. • Available in metric widths only. 		2	0,2	0,08	0,05	0,10	0,15	0,20	0,25	0,30	0,35
			3	0,2	0,09	0,05	0,10	0,15	0,20	0,25	0,30	0,35
			4	0,4	0,11	0,05	0,10	0,15	0,20	0,25	0,30	0,35
			5	0,8	0,15	0,05	0,10	0,15	0,20	0,25	0,30	0,35
			6	0,4	0,16	0,05	0,10	0,15	0,20	0,25	0,30	0,35
			8	0,8	0,18	0,05	0,10	0,15	0,20	0,25	0,30	0,35
			10	1,2	0,20	0,05	0,10	0,15	0,20	0,25	0,30	0,35
			10	0,4	0,17	0,05	0,10	0,15	0,20	0,25	0,30	0,35
			10	0,8	0,20	0,05	0,10	0,15	0,20	0,25	0,30	0,35
			10	1,2	0,22	0,05	0,10	0,15	0,20	0,25	0,30	0,35
-GMN	<ul style="list-style-type: none"> • Groove and turn moulded and precision ground inserts. • Stable cutting edge. • Available in metric and inch widths. 		2	0,2	0,08	0,05	0,10	0,15	0,20	0,25	0,30	0,35
			3	0,2	0,09	0,05	0,10	0,15	0,20	0,25	0,30	0,35
			4	0,4	0,11	0,05	0,10	0,15	0,20	0,25	0,30	0,35
			5	0,8	0,15	0,05	0,10	0,15	0,20	0,25	0,30	0,35
			6	0,4	0,16	0,05	0,10	0,15	0,20	0,25	0,30	0,35
			8	0,8	0,18	0,05	0,10	0,15	0,20	0,25	0,30	0,35
			10	1,2	0,20	0,05	0,10	0,15	0,20	0,25	0,30	0,35
			10	0,4	0,17	0,05	0,10	0,15	0,20	0,25	0,30	0,35
			10	0,8	0,20	0,05	0,10	0,15	0,20	0,25	0,30	0,35
			10	1,2	0,22	0,05	0,10	0,15	0,20	0,25	0,30	0,35

Material Group	Feed Factor
M	.8
N	.8
S	.5
H	1.2

Data is for P and K material groups. Maximum feed rates should be adjusted by multiplying feed rates by following factors for other material groups.

I.D. and Face Grooving
 For I.D. and face grooving applications, reduce feed rate by 20%.

■ Step 3 • Select the starting speed

Based on material and grade, identify starting speed (vc).
First choice is in **bold** type.

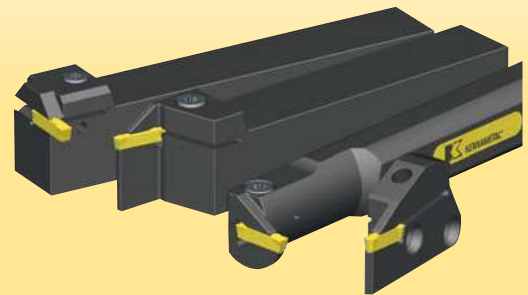
- A Based on material group and grade, identify starting speed (vc).
- B First choice starting speed is in **bold**.

Recommended Starting Speeds [m/min]																						
Material Group	K313			KCU10/KC5010		KCU25/KC5025			KCP10		KCP25		KCK20B		KY3500							
P	0-1	-	-	140	280	335	110	225	270	185	400	450	145	290	365	200	440	490	-	-	-	
	2	-	-	140	200	245	110	160	195	185	270	360	145	200	305	200	300	380	-	-	-	
	3	-	-	140	155	245	110	125	195	170	190	260	140	155	245	600	200	280	-	-	-	
	4	-	-	75	110	170	60	90	135	90	145	200	75	110	180	100	160	220	-	-	-	
	5	-	-	120	200	260	100	160	210	150	220	305	120	200	270	165	240	330	-	-	-	
	6	-	-	110	150	230	85	120	185	120	180	275	110	150	230	130	190	300	-	-	-	
M	1	60	90	120	140	210	260	90	170	245	-	-	-	-	-	-	-	-	-	-	-	
	2	45	75	110	120	200	245	90	150	245	-	-	-	-	-	-	-	-	-	-	-	
	3	35	65	100	120	180	245	90	140	210	-	-	-	-	-	-	-	-	-	-	-	
K	1	30	75	120	120	180	245	100	145	195	170	245	440	140	200	360	210	305	550	180	760	1040
	2	25	70	110	90	150	210	70	120	170	120	195	340	100	160	280	150	245	430	275	365	500
	3	20	60	90	60	110	150	50	85	120	120	170	270	100	140	220	150	210	335	-	-	-
N	1-2	150	370	610	150	550	975	120	440	780	-	-	-	-	-	-	-	-	-	-	-	
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	4	120	275	430	120	365	610	100	290	490	-	-	-	-	-	-	-	-	-	-	-	
	5	45	90	150	90	170	245	70	135	195	-	-	-	-	-	-	-	-	-	-	-	
	6	40	75	150	120	210	305	100	170	245	-	-	-	-	-	-	-	-	-	-	-	
	7	40	75	150	120	210	305	100	170	245	-	-	-	-	-	-	-	-	-	-	-	
S	1	8	30	75	15	55	135	8	40	60	-	-	-	-	-	-	-	-	-	-	-	
	2	8	35	75	15	60	135	8	30	75	-	-	-	-	-	-	-	-	-	-	-	
	3	8	40	75	15	70	135	15	40	75	-	-	-	-	-	-	-	-	-	-	-	
	4	8	45	75	15	70	170	8	50	110	-	-	-	-	-	-	-	-	-	-	-	
H	1	-	-	-	30	45	60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	2	-	-	-	15	30	45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

■ Step 4 • Select toolholder based on application

Choose the high-performance holder based on your specific grooving or cut-off application, with the corresponding seat size.

	conventional toolholders	modular blades
O.D. Grooving, Cut-Off, and Turning	1st Choice	2nd Choice
Face Grooving	1st Choice	2nd Choice
I.D. Grooving, Cut-Off, and Turning	1st Choice	—



NOTE: Insert seat size must match the seat size of the toolholder.

■ Step 5 • Select the insert and holder from catalogue page

Congratulations!

You have successfully maximised your productivity by selecting the best insert geometry, grade, and cutting specifications for your application!



How Do Catalogue 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 Turning Inserts

A4

Tooling System

A4 = Grooving and Turning

G

Insert Type

G = Square
R = Full radius
C = Cut-off

0405

Groove Width

Expressed in 1/100mm or .00"

M

Unit of Measurement for Grooving Width

M = Metric

04

Seat Size

U

Insert Tolerance

04

Corner Radii

GMN

Chipbreaker Type/Edge Prep

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 moulded grooving width tolerance:
3,05–4,05: $\frac{+0,15\text{mm}}{-0}$
5,05–10,05: $\frac{+0,25\text{mm}}{-0}$

metric

01 = 0,1

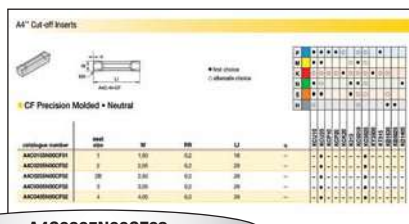
02 = 0,2

04 = 0,4

08 = 0,8

12 = 1,2

full radius = 00



A4C0305N00CF02

Grooving and Cut-Off

A4

Tooling System

A4 = Grooving and Turning

C

Insert Type

C = Cut-off

0305

Cutting Width

Expressed in 1/100mm

N

Hand of Insert

R = Right hand
L = Left hand
N = Neutral

00

Main Cutting Edge Lead Angle

00 = Neutral
06 = 6°
10 = 10°

CF

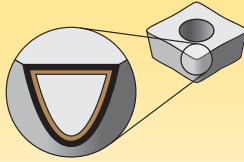
Chipbreaker Type

CF = Cut-off fine positive rake

02

Corner Radius

metric
02 = 0,2

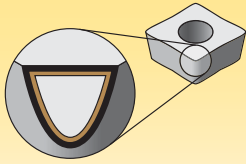


Coatings provide high-speed capability and are engineered for finishing to light roughing.

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

wear resistance ← → toughness

Grades	Coating	Grade Description	Material																		
			P	M	K	N	S	H	05	10	15	20	25	30	35	40	45				
KCUI10		<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 KCUI10™ 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 high-temp alloys with improved edge toughness, notch resistance, and higher cutting speed/feed capability.</p>	P																		
KCUI25		<p>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.</p> <p>Application: The KCUI25™ 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																		
KCP10		<p>Composition: A specially engineered cobalt-enriched carbide grade with thick MTCVD TiCN-Al₂O₃ coating for maximum wear resistance.</p> <p>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>	P																		
KCP25		<p>Composition: A tough cobalt-enriched carbide grade with a 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 minimises microchipping and improves coating adhesion to substrate leading to long tool life and improved workpiece finishes.</p>	P																		
KCK20		<p>Composition: A specially toughened MTCVD TiCN-Al₂O₃ coating over a wear-resistant substrate.</p> <p>Application: Specifically engineered to maximise coating adhesion and edge strength making this grade ideal in wet interrupted cutting of grey and ductile irons. It can be used in a wide range of applications from finishing to roughing to maximise productivity wherever strength and reliability are needed.</p>	P																		



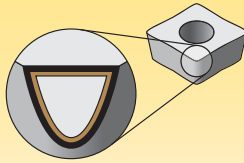
Coatings provide high-speed capability and are engineered for finishing to light roughing.

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

wear resistance ← → toughness

Grades

Coating	Grade Description		05	10	15	20	25	30	35	40	45		
K313	<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											
KC5010	<p>Composition: An advanced PVD AlTiN 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 high-temp alloys under stable conditions. It also performs well machining hardened and short chipping materials.</p>	P											
		M											
		K											
		N											
		S											
		H											
KC5025	<p>Composition: An advanced PVD-AlTiN-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											



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

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

wear resistance ← → toughness

Grades

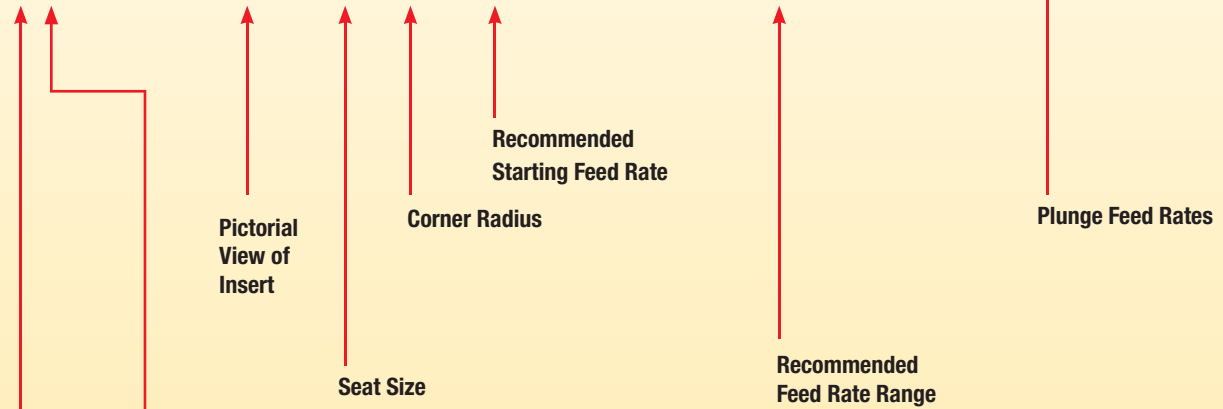
Coating	Grade Description		05	10	15	20	25	30	35	40	45
KY3500	<p>Composition: Pure silicon nitride grade.</p> <p>Application: Maximum toughness. Used at high feed rates for rough machining of grey cast iron, including machining through interruptions.</p>										
		K									
KT315	<p>Composition: A multilayer 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									
		K									
KB1630	<p>Composition: An uncoated high content PcBN grade. PcBN tips are brazed onto a carbide insert.</p> <p>Application: Designed for roughing to finishing in interrupted cuts on hardened steels (>45 HRC). It can also be applied on grey cast iron, chilled irons, high chrome alloyed steels, high temp alloys and sintered powder metals. The tipped PcBN inserts are available in a wide range of insert styles, including Top Notch™ and Screw-On geometries.</p>										
		K									
KB5625	<p>Composition: A medium content PcBN with a PVD-TiN/AlTiN coating for added wear resistance.</p> <p>Application: Designed for roughing to finishing of hardened steels (>45 HRC). Use on bearing steels, hot and cold work steels, die steels, case hardened steels, carburised and nitrided irons, and some hard coatings.</p>										
		H									
KD1405	<p>Composition: A pure CVD-deposited diamond-sheet tool brazed directly to a carbide substrate.</p> <p>Application: KD1405™ is the best Kennametal abrasion-resistant tool material for non-ferrous and non-metallic materials. Best applied when abrasion resistance is the desired benefit.</p>										
		N									

Select the geometry

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

- first choice
- alternate choice

Chip Control	Description	Insert Geometry	Seat Size	Corner Radius	Starting Conditions	Plunge Feed Rates mm/rev					
				mm	mm	0,05	0,10	0,15	0,20	0,25	0,30	0,35
-GUP	Groove and turn inserts in new Beyond™ grades.		2	0,2	0,08						
			3	0,2	0,09						
			3	0,4	0,11						
			4	0,4	0,12						
			4	0,8	0,15						



Primary Workpiece Material Group

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

- first choice
- alternate choice

Chip Control Geometry Designation

Maximum Feed Rate Values

Data above is for P and K material groups. Maximum feed rates should be adjusted by multiplying max feed rate values by following factors for shown material groups.	Material Group	Feed Factor
	M	.8
	N	1.2
	S	.8
	H	.5

Plunge Feed Rates

- first choice
- alternate choice

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

Chip Control	Description	Insert Geometry	Seat Size	Corner Radius mm	Starting Conditions mm	Plunge Feed Rates mm/rev										
						0,05	0,10	0,15	0,20	0,25	0,30	0,35				
-GUP	<ul style="list-style-type: none"> Groove and turn inserts in new Beyond™ grades. Available in moulded and precision-ground styles. Positive rake angle with enhanced chip control. Available in metric widths only. 		2	0,2	0,08	●	○									
				0,2	0,09	○	○									
			3	0,4	0,11		○	○								
				0,4	0,12			○	○							
			4	0,8	0,15				○	○						
				0,4	0,15					○	○					
			5	0,8	0,16						○	○				
				0,4	0,16							○	○			
			6	0,8	0,18								○	○		
				1,2	0,20									○	○	
			8	0,4	0,17										○	○
				0,8	0,20											○
10	1,2	0,22												○	○	
	0,4	0,18													○	○
-GMP	<ul style="list-style-type: none"> Groove and turn inserts. Available in moulded and precision-ground styles. Positive rake angle. Available in metric widths only. 		2	0,2	0,08	●	○									
				0,2	0,09	○	○									
			3	0,4	0,11		○	○								
				0,4	0,12			○	○							
			4	0,8	0,15				○	○						
				0,4	0,15					○	○					
			5	0,8	0,16						○	○				
				0,4	0,16							○	○			
			6	0,8	0,18								○	○		
				1,2	0,20									○	○	
			8	0,4	0,17										○	○
				0,8	0,20											○
10	1,2	0,22												○	○	
	0,4	0,18													○	○
-GMN	<ul style="list-style-type: none"> Groove and turn moulded and precision ground inserts. Stable cutting edge. Available in metric and inch widths. 		2	0,2	0,08	●	○									
				0,2	0,09	○	○									
			3	0,4	0,11		○	○								
				0,4	0,12			○	○							
			4	0,8	0,15				○	○						
				0,4	0,15					○	○					
			5	0,8	0,16						○	○				
				0,4	0,16							○	○			
			6	0,8	0,18								○	○		
				1,2	0,20									○	○	
			8	0,4	0,17										○	○
				0,8	0,20											○
10	1,2	0,22												○	○	
	0,4	0,18													○	○

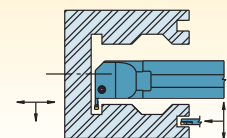
Maximum Feed Rate Values

Data above is for P and K material groups. **Maximum** feed rates should be adjusted by multiplying max feed rate values by following factors for shown material groups.

Material Group	Feed Factor
M	.8
N	.8
S	.5
H	1.2

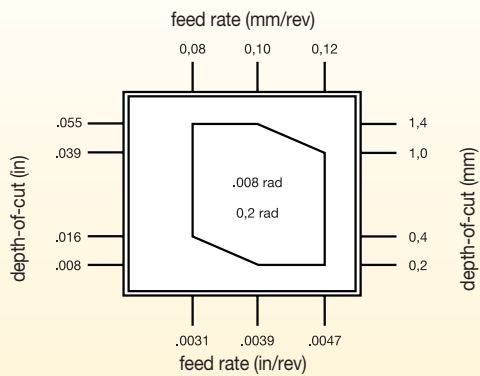
I.D. and Face Grooving

For I.D. and face grooving applications, reduce feed rate by 20%.

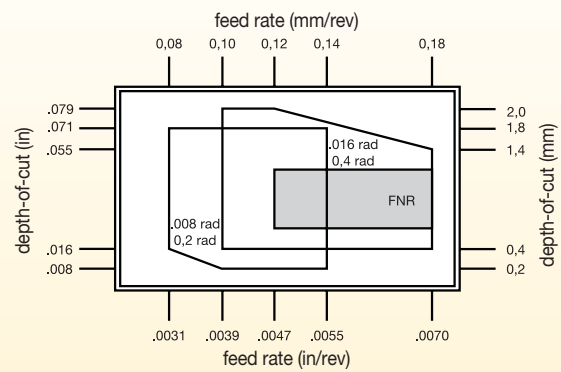


Turn and profile feed rates • GUP/GMP Geometries

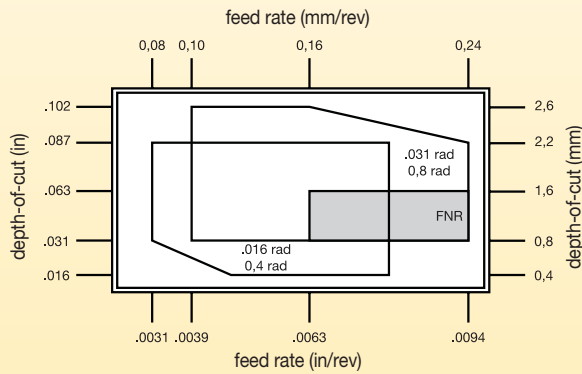
Seat Size 2



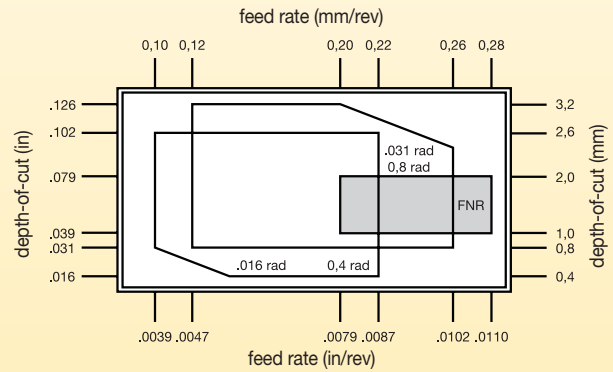
Seat Size 3



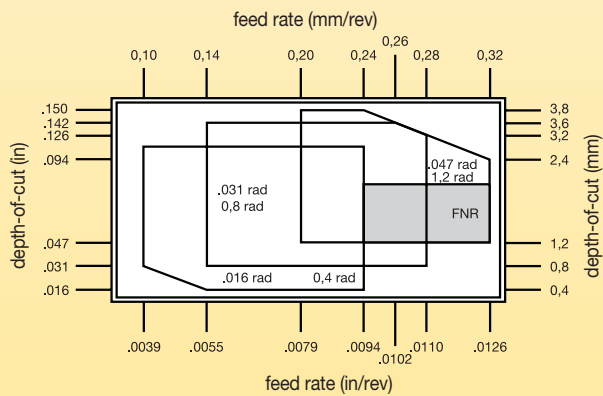
Seat Size 4



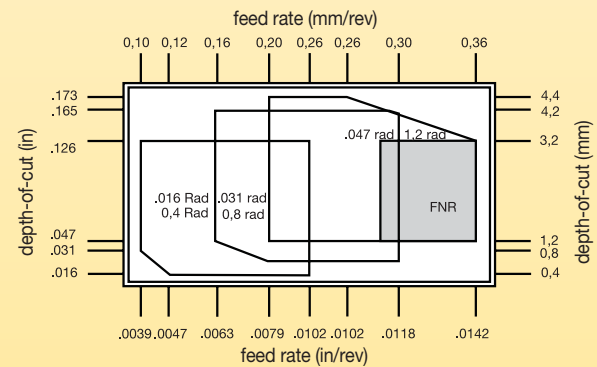
Seat Size 5



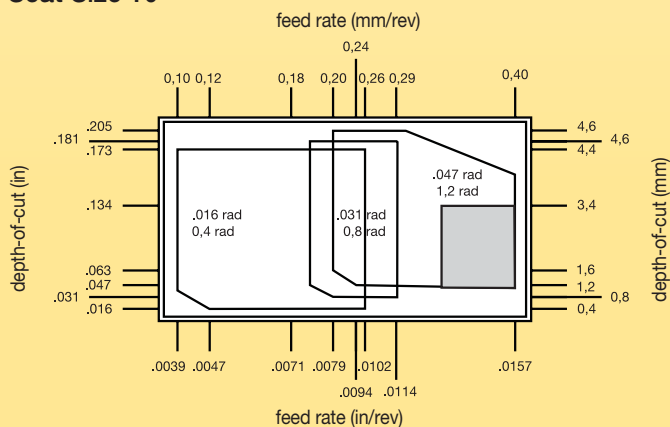
Seat Size 6



Seat Size 8

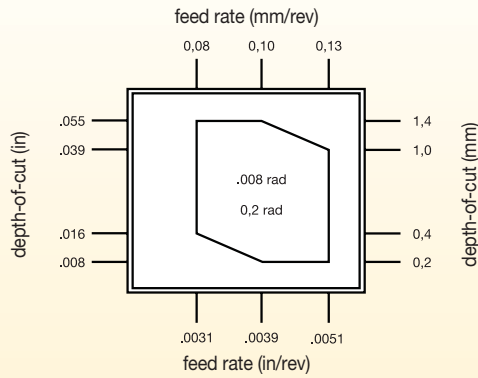


Seat Size 10

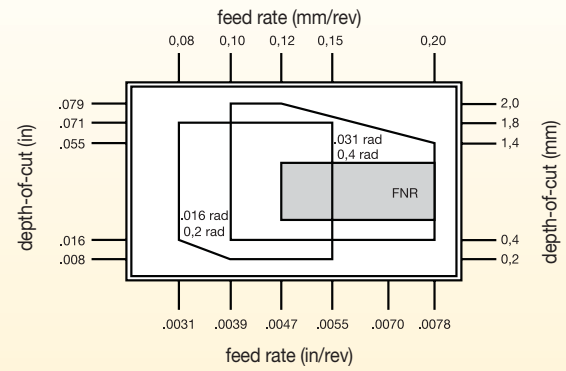


Turn and profile feed rates • GMN Geometries

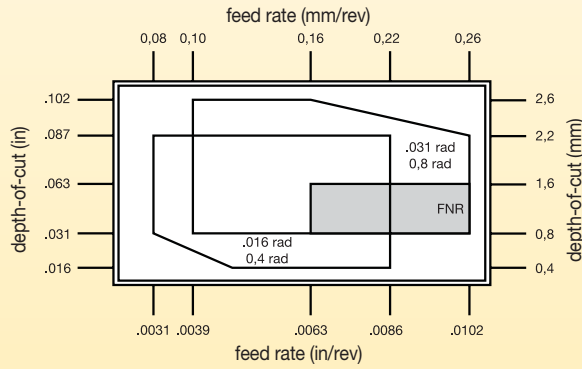
Seat Size 2



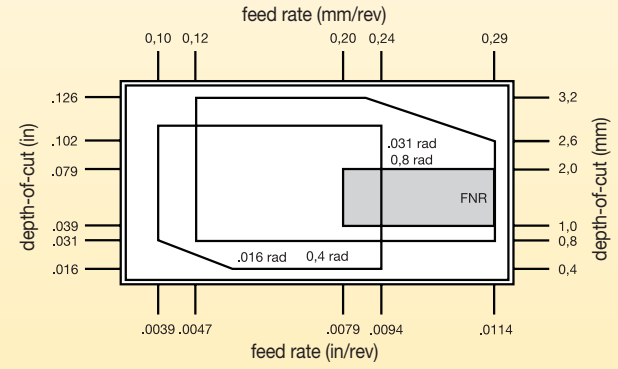
Seat Size 3



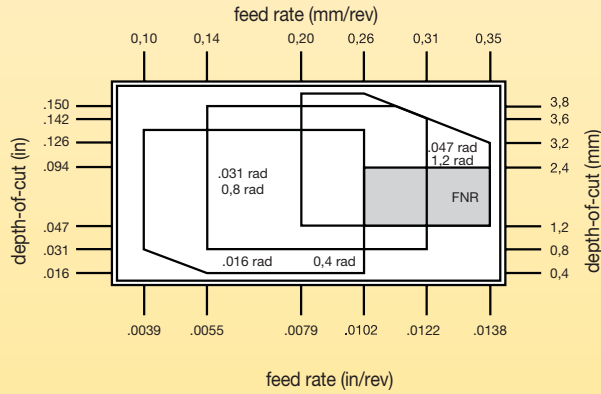
Seat Size 4



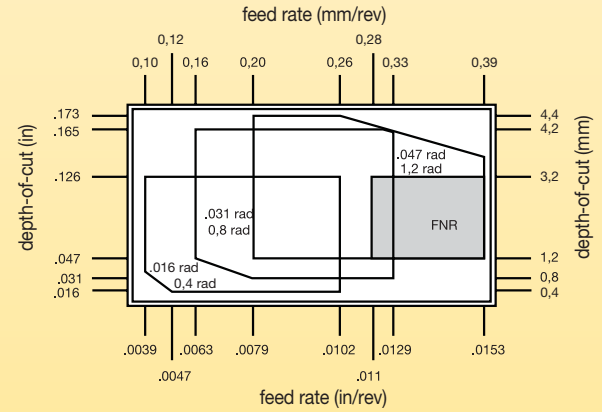
Seat Size 5



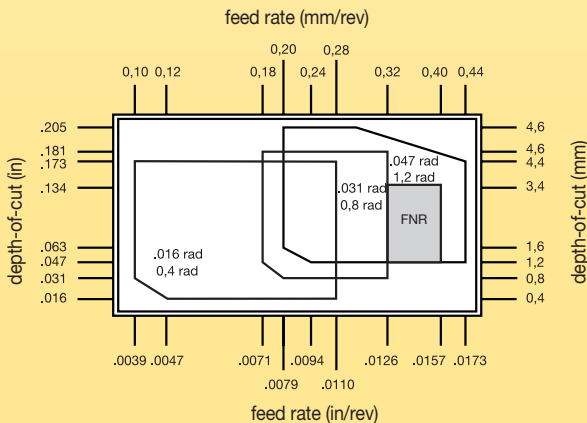
Seat Size 6



Seat Size 8



Seat Size 10



■ Cut-Off Feed Rates

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

- first choice
- alternate choice

Chip Control	Description	Insert Geometry	Seat Size	Starting Conditions mm	Cut-Off Feed Rates mm/rev			
					0,05	0,10	0,15	0,20
-A4C-CF 	<ul style="list-style-type: none"> • High positive rake angle. • Sharp cutting edge. • Available in neutral lead angle in 6° and 10° right- and left-hand styles. 		1	0,06				
			2/2B	0,07				
			3	0,09				
			4	0,11				

Maximum Feed Rate Values

	Material Group	Feed Factor
Data above is for P and K material groups. Maximum feed rates should be adjusted by multiplying max feed rate values by following factors for shown material groups.	M	.8
	N	.8
	S	.5
	H	1.2

Mobile Apps

The Kennametal mobile app provides easy access to product information and calculators on both iPhone® and Android™ devices. We've highlighted a few of the key features...

There's an app for that.

SPEEDS & FEEDS

View speeds and feeds information for metalworking products.

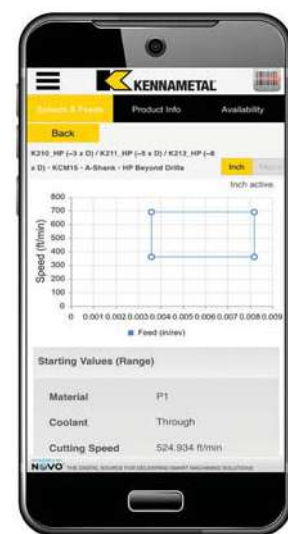
PRODUCT AVAILABILITY

Check global availability of products. View available quantities by providing your Kennect login credentials.

CALCULATORS

Utilise our machining calculators for milling and drilling applications.

➔ By just scanning the bar code on the insert packet, you can find the most productive cutting conditions for tool life, process time, and chip control.



NOTE: The app is currently only available in the English-language version. We have plans to translate the app in different languages with future releases.



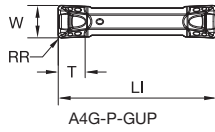
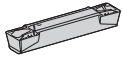
Recommended Starting Speeds [m/min]

Material Group		K313			KCU10/KC5010			KCU25/KC5025			KCP10			KCP25			KCK20B			KY3500		
P	0-1	-	-	-	140	280	335	110	225	270	185	400	450	145	290	365	200	440	490	-	-	-
	2	-	-	-	140	200	245	110	160	195	185	270	350	145	200	305	200	300	380	-	-	-
	3	-	-	-	140	155	245	110	125	195	170	190	260	140	155	245	600	200	280	-	-	-
	4	-	-	-	75	110	170	60	90	135	90	145	200	75	110	180	100	160	220	-	-	-
	5	-	-	-	120	200	260	100	160	210	150	220	305	120	200	270	165	240	330	-	-	-
	6	-	-	-	110	150	230	85	120	185	120	180	275	110	150	230	130	190	300	-	-	-
M	1	60	90	120	140	210	260	90	170	245	-	-	-	-	-	-	-	-	-	-	-	-
	2	45	75	110	120	200	245	90	150	245	-	-	-	-	-	-	-	-	-	-	-	-
	3	35	65	100	120	180	245	90	140	210	-	-	-	-	-	-	-	-	-	-	-	-
K	1	30	75	120	120	180	245	100	145	195	170	245	440	140	200	360	210	305	550	180	760	1040
	2	25	70	110	90	150	210	70	120	170	120	195	340	100	160	280	150	245	430	275	365	500
	3	20	60	90	60	110	150	50	85	120	120	170	270	100	140	220	150	210	335	-	-	-
N	1-2	150	370	610	150	550	975	120	440	780	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4	120	275	430	120	365	610	100	290	490	-	-	-	-	-	-	-	-	-	-	-	-
	5	45	90	150	90	170	245	70	135	195	-	-	-	-	-	-	-	-	-	-	-	-
	6	40	75	150	120	210	305	100	170	245	-	-	-	-	-	-	-	-	-	-	-	-
S	1	8	30	75	15	55	135	8	40	60	-	-	-	-	-	-	-	-	-	-	-	-
	2	8	35	75	15	60	135	8	30	75	-	-	-	-	-	-	-	-	-	-	-	-
	3	8	40	75	15	70	135	15	40	75	-	-	-	-	-	-	-	-	-	-	-	-
	4	8	45	75	15	70	170	8	50	110	-	-	-	-	-	-	-	-	-	-	-	-
H	1	-	-	-	30	45	60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	15	30	45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Material Group		KT315			KB5625			KB1630			KD1405		
P	0-1	180	440	475	-	-	-	-	-	-	-	-	-
	2	195	270	400	-	-	-	-	-	-	-	-	-
	3	180	210	275	-	-	-	-	-	-	-	-	-
	4	75	160	210	-	-	-	-	-	-	-	-	-
	5	150	250	310	-	-	-	-	-	-	-	-	-
	6	140	200	300	-	-	-	-	-	-	-	-	-
M	1	-	-	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-
K	1	60	275	550	-	-	-	180	760	1040	-	-	-
	2	135	275	360	-	-	-	-	-	-	-	-	-
	3	180	230	360	-	-	-	-	-	-	-	-	-
N	1-2	-	-	-	-	-	-	-	-	-	365	610	1040
	3	-	-	-	-	-	-	-	-	-	275	480	800
	4	-	-	-	-	-	-	-	-	-	300	550	920
	5	-	-	-	-	-	-	-	-	-	275	610	1070
	6	-	-	-	-	-	-	-	-	-	150	460	760
	6	-	-	-	-	-	-	-	-	-	-	-	-
S	1	-	-	-	-	-	-	120	200	275	-	-	-
	2	-	-	-	-	-	-	120	215	275	-	-	-
	3	-	-	-	-	-	-	120	250	275	-	-	-
	4	-	-	-	-	-	-	-	-	-	-	-	-
H	1	-	-	-	45	150	230	45	120	170	-	-	-
	2	-	-	-	45	140	230	45	110	170	-	-	-
	3	-	-	-	45	130	230	45	100	170	-	-	-
	4	-	-	-	45	120	230	45	90	170	-	-	-

NOTE: FIRST choice starting speeds are in **bold** type.
As the average chip thickness increases, the speed should be decreased.

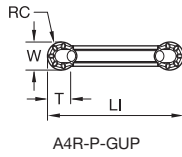
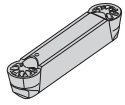


● first choice
○ alternate choice

	P	M	K	N	S	H	KCU10	KCU25	KCP10	KCP25	KCK20	K313	KC5010	KC5025	KY3500	KT315	KB1630	KB5625	KD1405	
P	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
M	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
K	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
N	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
S	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
H	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

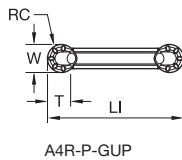
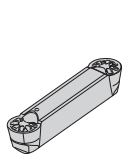
GUP Precision Ground

catalogue number	seat size	W	RR	LI	T	KCU10	KCU25	KCP10	KCP25	KCK20	K313	KC5010	KC5025	KY3500	KT315	KB1630	KB5625	KD1405	
A4G0200M02P02GUP	2	2,00	0,2	20	1,9	●	●	-	-	-	-	-	-	-	-	-	-	-	-
A4G094I2BP05GUP	2B	2,38	0,2	20	1,9	-	●	-	-	-	-	-	-	-	-	-	-	-	-
A4G0300M03P02GUP	3	3,00	0,2	20	2,9	●	●	-	-	-	-	-	-	-	-	-	-	-	-
A4G0300M03P04GUP	3	3,00	0,4	20	2,9	●	●	-	-	-	-	-	-	-	-	-	-	-	-
A4G125I03P05GUP	3	3,18	0,2	20	2,9	-	●	-	-	-	-	-	-	-	-	-	-	-	-
A4G125I03P1GUP	3	3,18	0,4	20	2,9	-	●	-	-	-	-	-	-	-	-	-	-	-	-
A4G0400M04P02GUP	4	4,00	0,2	20	3,3	●	●	-	-	-	-	-	-	-	-	-	-	-	-
A4G0400M04P04GUP	4	4,00	0,4	20	3,3	●	●	-	-	-	-	-	-	-	-	-	-	-	-
A4G0400M04P08GUP	4	4,00	0,8	20	3,3	●	●	-	-	-	-	-	-	-	-	-	-	-	-
A4G187I04P1GUP	4	4,76	0,4	20	3,3	-	●	-	-	-	-	-	-	-	-	-	-	-	-
A4G0500M05P04GUP	5	5,00	0,4	25	4,1	●	●	-	-	-	-	-	-	-	-	-	-	-	-
A4G0500M05P08GUP	5	5,00	0,8	25	4,1	●	●	-	-	-	-	-	-	-	-	-	-	-	-
A4G0600M06P04GUP	6	6,00	0,4	30	4,5	●	●	-	-	-	-	-	-	-	-	-	-	-	-
A4G0600M06P08GUP	6	6,00	0,8	30	4,5	●	●	-	-	-	-	-	-	-	-	-	-	-	-
A4G250I06P1GUP	6	6,35	0,4	30	4,4	-	●	-	-	-	-	-	-	-	-	-	-	-	-
A4G250I06P2GUP	6	6,35	0,8	30	4,4	-	●	-	-	-	-	-	-	-	-	-	-	-	-
A4G312I08P1GUP	8	7,94	0,4	30	5,9	-	●	-	-	-	-	-	-	-	-	-	-	-	-
A4G0800M08P08GUP	8	8,00	0,8	30	6,0	●	●	-	-	-	-	-	-	-	-	-	-	-	-
A4G0800M08P12GUP	8	8,00	1,2	30	6,0	●	●	-	-	-	-	-	-	-	-	-	-	-	-
A4G375I10P1GUP	10	9,53	0,4	30	5,9	-	●	-	-	-	-	-	-	-	-	-	-	-	-
A4G1000M10P08GUP	10	10,00	0,8	30	6,0	●	●	-	-	-	-	-	-	-	-	-	-	-	-
A4G1000M10P12GUP	10	10,00	1,2	30	6,0	●	●	-	-	-	-	-	-	-	-	-	-	-	-



■ GUP Full Radius Precision Moulded

catalogue number	seat size	W	RC	LI	T
A4R0305M03U00GUP	3	3,05	1,5	20	—
A4R0505M05U00GUP	5	5,05	2,5	25	—
A4R1005M10U00GUP	10	10,05	5,0	30	—

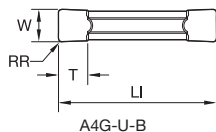
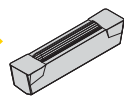


■ GUP Full Radius Precision Ground

catalogue number	seat size	W	RC	LI	T
A4R0300M03P00GUP	3	3,00	1,5	20	—
A4R125I03P00GUP	3	3,18	1,6	20	—
A4R0400M04P00GUP	4	4,00	2,0	20	—
A4R187I04P00GUP	4	4,76	2,4	20	—
A4R0500M05P00GUP	5	5,00	2,5	25	—
A4R0600M06P00GUP	6	6,00	3,0	30	—
A4R250I06P00GUP	6	6,35	3,2	30	—
A4R312I08P00GUP	8	7,94	4,0	30	—
A4R0800M08P00GUP	8	8,00	4,0	30	—
A4R1000M10P00GUP	10	10,00	5,0	30	—

● first choice
○ alternate choice

	KCU10	KCU25	KCP10	KCP25	KCK20	K313	KC5010	KC5025	KY3500	KT315	KB1630	KB5625	KD1405
P	●	●	●	●	○	○	○	○	○	○	○	○	○
M	●	●	○	○	○	○	○	○	○	○	○	○	○
K	○	○	○	○	○	○	○	○	○	○	○	○	○
N	●	○	○	○	○	○	○	○	○	○	○	○	○
S	●	●	○	○	○	○	○	○	○	○	○	○	○
H	○	○	○	○	○	○	○	○	○	○	○	○	○



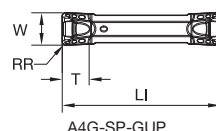
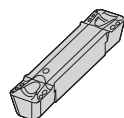
● first choice
○ alternate choice

	P	M	K	N	S	H	KCU10	KCU25	KCP10	KCP25	KCK20	K313	KC5010	KC5025	KY3500	KT315	KB1630	KB5625	KD1405	
P	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
M	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
K	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
N	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
S	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
H	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

Flat Top Precision Moulded

catalogue number	seat size	W	RR	LI	T	KCU10	KCU25	KCP10	KCP25	KCK20	K313	KC5010	KC5025	KY3500	KT315	KB1630	KB5625	KD1405	
A4G0305M03U02B	3	3,05	0,2	20	3,5	-	●	-	-	●	-	-	●	-	-	-	-	-	-
A4G0405M04U04B	4	4,05	0,4	20	3,4	-	-	-	-	●	-	-	●	-	-	-	-	-	-
A4G0505M05U04B	5	5,05	0,4	25	4,2	-	●	-	-	●	-	-	-	-	-	-	-	-	-
A4G0605M06U04B	6	6,05	0,4	30	4,9	-	●	-	-	●	-	-	-	-	-	-	-	-	-
A4G0805M08U08B	8	8,05	0,8	30	6,4	-	-	-	-	●	-	-	-	-	-	-	-	-	-
A4G1005M10U08B	10	10,05	0,8	30	8,1	-	-	-	-	●	-	-	-	-	-	-	-	-	-

A4™ Groove and Turn Inserts • Small Diameter Face Grooving



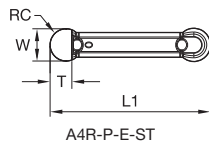
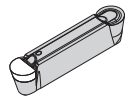
● first choice
○ alternate choice

	P	M	K	N	S	H	KCU10	KCU25	KCP10	KCP25	KCK20	K313	KC5010	KC5025	KY3500	KT315	KB1630	KB5625	KD1405	
P	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
M	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
K	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
N	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
S	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
H	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

GUP Precision Moulded • Small Diameter Face Grooving

catalogue number	seat size	W	RR	LI	T	KCU10	KCU25	KCP10	KCP25	KCK20	K313	KC5010	KC5025	KY3500	KT315	KB1630	KB5625	KD1405	
A4G0200M2SP02GUP	2S	2,00	0,2	20	1,9	●	●	-	-	-	-	-	-	-	-	-	-	-	-
A4G0300M3SP02GUP	3S	3,00	0,2	20	2,9	●	●	-	-	-	-	-	-	-	-	-	-	-	-
A4G0300M3SP04GUP	3S	3,00	0,4	20	2,9	●	●	-	-	-	-	-	-	-	-	-	-	-	-
A4G0400M4SP04GUP	4S	4,00	0,4	20	3,4	●	-	-	-	-	-	-	-	-	-	-	-	-	-
A4G0400M4SP08GUP	4S	4,00	0,8	20	3,4	●	-	-	-	-	-	-	-	-	-	-	-	-	-
A4G0500M5SP04GUP	5S	5,00	0,4	25	4,1	-	●	-	-	-	-	-	-	-	-	-	-	-	-
A4G0500M5SP08GUP	5S	5,00	0,8	25	4,1	●	-	-	-	-	-	-	-	-	-	-	-	-	-

NOTE: A4-S inserts are reduced-height A4 inserts. For example, a 2S seat size holder will not accept a seat size 2 insert.



A4R-P-E-ST

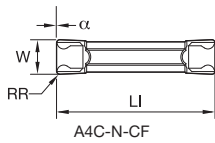
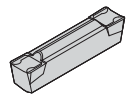
■ Flat Top Full Radius Precision Ground • PcBN

● first choice
○ alternate choice

catalogue number	seat size	W	RC	LI	T	KCU10	KCU25	KCP10	KCP25	KCK20	K313	KC5010	KC5025	KY3500	KT315	KB1630	KB5625	KD1405
A4R0300M03P00EST	3	3,00	1,5	20	2,2	-	-	-	-	-	-	-	-	-	-	●	-	-
A4R0400M04P00EST	4	4,00	2,0	20	2,9	-	-	-	-	-	-	-	-	-	-	●	-	-
A4R0500M05P00EST	5	5,00	2,5	25	3,7	-	-	-	-	-	-	-	-	-	-	●	-	-
A4R0600M06P00EST	6	6,00	3,0	30	4,4	-	-	-	-	-	-	-	-	-	-	●	-	-

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

A4™ Cut-off Inserts



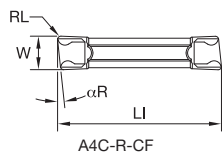
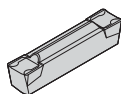
A4C-N-CF

■ CF Precision Moulded • Neutral

● first choice
○ alternate choice

catalogue number	seat size	W	RR	LI	α	KCU10	KCU25	KCP10	KCP25	KCK20	K313	KC5010	KC5025	KY3500	KT315	KB1630	KB5625	KD1405
A4C0155N00CF01	1	1,50	0,2	16	—	-	●	-	-	-	-	-	●	-	-	-	-	-
A4C0205N00CF02	2	2,05	0,2	20	—	-	●	-	-	-	-	-	●	-	-	-	-	-
A4C0255N00CF02	2B	2,50	0,2	20	—	-	●	-	-	-	-	-	●	-	-	-	-	-
A4C0305N00CF02	3	3,05	0,2	20	—	-	●	-	-	-	-	-	●	-	-	-	-	-
A4C0405N00CF02	4	4,05	0,2	20	—	-	●	-	-	-	-	-	●	-	-	-	-	-

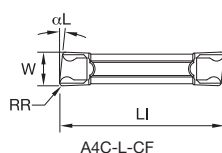
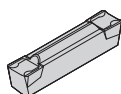
P	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
M	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
K	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
N	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
S	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
H	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



A4C-R-CF

CF Precision Moulded • Right Hand

catalogue number	seat size	W	RL	LI	αR	KCU10	KCU25	KCP10	KCP25	KCK20	K313	KC5010	KC5025	KY3500	KT315	KB1630	KB5625	KD1405	
A4C0155R06CF01	1	1,50	0,2	16	6.0	-	-	-	-	-	-	-	•	-	-	-	-	-	-
A4C0155R10CF01	1	1,50	0,2	16	10.0	-	•	-	-	-	-	-	-	-	-	-	-	-	-
A4C0155R16CF01	1	1,50	0,2	16	16.0	-	-	-	-	-	-	-	•	-	-	-	-	-	-
A4C0205R06CF02	2	1,99	0,2	20	6.0	-	•	-	-	-	-	-	•	-	-	-	-	-	-
A4C0205R10CF02	2	1,99	0,2	20	10.0	-	•	-	-	-	-	-	-	-	-	-	-	-	-
A4C0255R06CF02	2B	2,49	0,2	20	6.0	-	-	-	-	-	-	-	•	-	-	-	-	-	-
A4C0305R06CF02	3	3,05	0,2	20	6.0	-	•	-	-	-	-	-	•	-	-	-	-	-	-
A4C0305R10CF02	3	3,05	0,2	20	10.0	-	•	-	-	-	-	-	-	-	-	-	-	-	-
A4C0405R06CF02	4	4,05	0,2	20	6.0	-	•	-	-	-	-	-	-	-	-	-	-	-	-
A4C0405R10CF02	4	4,05	0,2	20	10.0	-	•	-	-	-	-	-	•	-	-	-	-	-	-



A4C-L-CF

CF Precision Moulded • Left Hand

catalogue number	seat size	W	RR	LI	αL	KCU10	KCU25	KCP10	KCP25	KCK20	K313	KC5010	KC5025	KY3500	KT315	KB1630	KB5625	KD1405	
A4C0155L06CF01	1	1,50	0,2	16	6.0	-	-	-	-	-	-	-	•	-	-	-	-	-	-
A4C0205L06CF02	2	1,99	0,2	20	6.0	-	•	-	-	-	-	-	-	-	-	-	-	-	-
A4C0205L10CF02	2	1,99	0,2	20	10.0	-	-	-	-	-	-	-	•	-	-	-	-	-	-
A4C0305L06CF02	3	3,05	0,2	20	6.0	-	•	-	-	-	-	-	•	-	-	-	-	-	-
A4C0305L10CF02	3	3,05	0,2	20	10.0	-	•	-	-	-	-	-	-	-	-	-	-	-	-
A4C0405L06CF02	4	4,05	0,2	20	6.0	-	•	-	-	-	-	-	-	-	-	-	-	-	-
A4C0405L10CF02	4	4,05	0,2	20	10.0	-	•	-	-	-	-	-	-	-	-	-	-	-	-

P	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
M	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
K	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
N	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
S	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
H	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•



• first choice
○ alternate choice

How Do Catalogue Numbers Work?

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



A4SMR2020M0214

A4	S	M	R	2020M	02	14
Tooling System	Tool Style	Support Type	Hand of Tool	Shank Size	Seat Size	Max Grooving Depth
<p>A4 = Grooving and Turning</p>	 <p>S = Straight</p>  <p>E = End mounted 90°</p>	<p>M = Maximum support for specific groove widths and straight clearance for unlimited workpiece diameters</p> <p>E = No steel support for face grooving</p> <p>C = Reinforced Support</p>	 <p>R = Right hand L = Left hand N = Neutral</p>	<p>metric: Height x width in mm, letter indicates tool length according to ISO</p> <p>metric tool length (mm)</p> <p>K = 125 M = 150 P = 170</p>	<p>02 03 04 05 06 08 10</p>	<p>in millimetres</p>

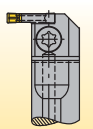
By referencing this easy-to-use guide, you can identify the correct product to meet your needs.



A20RA4EMR0207M

A

Steel Bar with Coolant



20

Bar Diameter

R

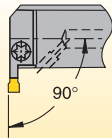
Bar Length

A4

A4™ Groove and Turn System

E

Tool Style



E = End mounted (90°)

M

Support Type

R

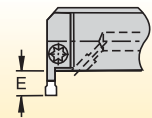
Hand of Tool

02

Insert Seat Size

07

Grooving Depth in mm

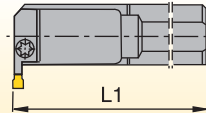


mm
7mm
10mm
12mm
16mm

M

Tool Units

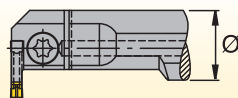
M = Metric



metric bars:

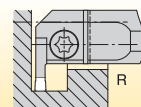
R = 200mm
S = 150mm
T = 300mm

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

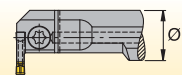


metric bars:

Bar diameter in millimetres



R = Right hand



L = Left hand

M = Maximum support

How Do Catalogue Numbers Work?

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



KGMSL2525M50C

KGM	S	L	2525M	50	C
Family Name	Tool Style	Hand	Shank Size	Blade Size	Coolant
Grooving Modular System	<p>S = Straight mount</p> <p>E = End mount (90°)</p>	<p>L = Left hand</p> <p>R = Right hand</p>	<p>Metric = Height x Width in mm</p> <p>letter indicates tool length according to ISO</p>	<p>50</p> <p>65</p>	<p>C = Through coolant capable</p>

Grooving Tools and **Beyond**[™] Inserts for Your Shallow Groove and Turn Operations

Top Notch[™]



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.

Experience the advantages at your Authorised Kennametal Distributor or at kennametal.com.



kennametal.com

How Do Catalogue Numbers Work?

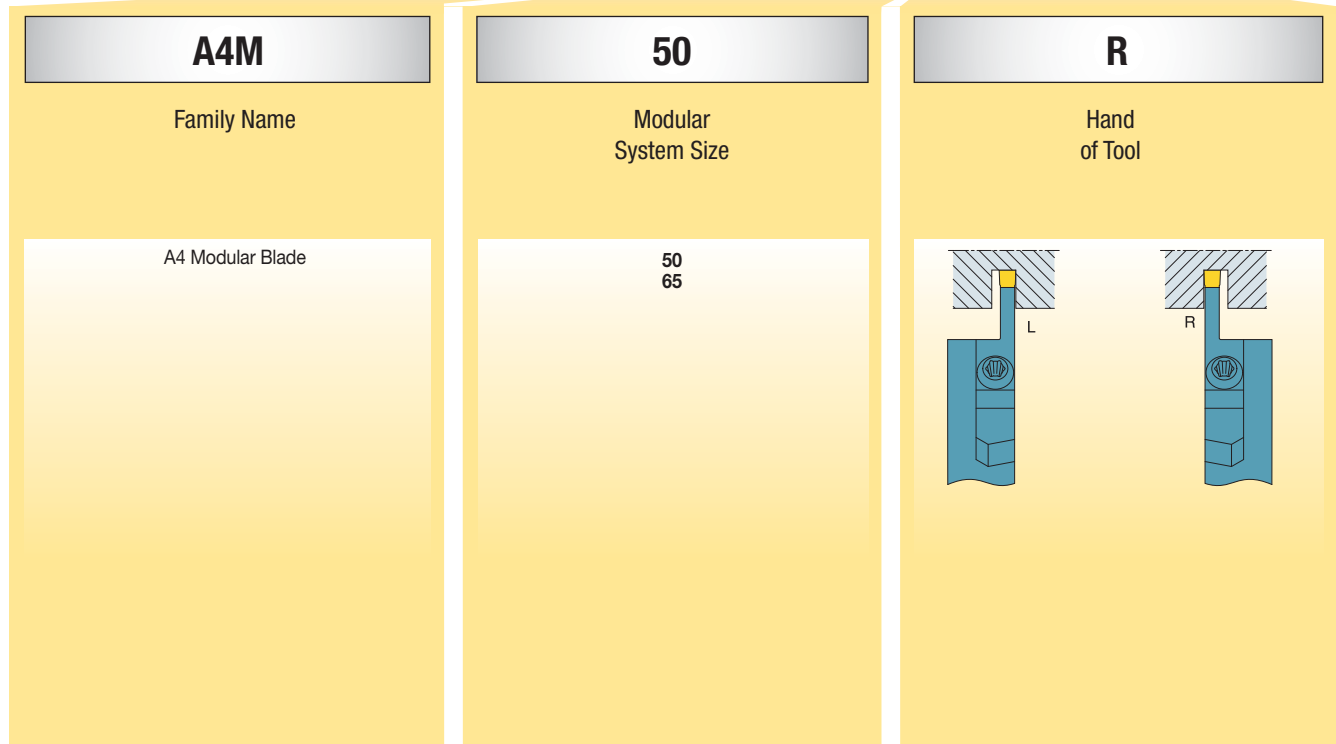
Each character in our catalogue number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.

Grooving and Cut-Off
A4™ Integral Toolholders

Integral Face Grooving • Outboard • Metric

Order number	Catalogue number	Head Size	Blade	Cl. Size	CD	W. Max	FR	Holder Size
280-077	A4M50R0414B048-072	3	38	38	12	3	15.90	30
280-078	A4M50R0414B048-073	3	42	42	12	3	16.50	30
280-079	A4M50R0414B048-074	3	50	50	12	3	18.00	30
280-080	A4M50R0414B048-075	3	60	60	12	3	19.50	30

A4M50R0414B048-072



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

A4M50R0414B048-072

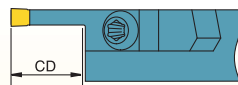
04

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



- mm
- 14mm
- 19mm
- 20mm
- 26mm

B

Tool Style



M = Maximum support for specific groove widths and straight clearance for unlimited workpiece diameters



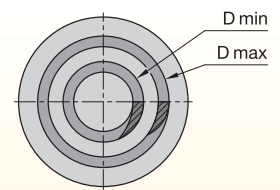
A = Inboard sweep face grooving toolholder



B = Outboard sweep face grooving toolholder

048-072

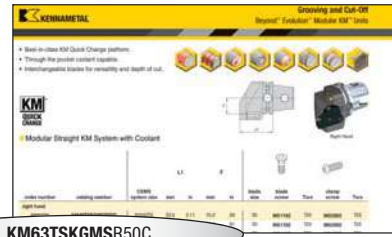
Face Grooving Diameter Range



diameters are min and max for outer face groove dia.
999 = unlimited D max

How Do Catalogue Numbers Work?

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



KM63TSKGMRS50C

KM

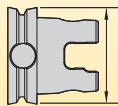
KM™
Quick-Change

KM
KM4X™
PSC

63

System
Size

40 = 40mm
50 = 50mm
63 = 63mm
80 = 80mm
100 = 100mm



TS

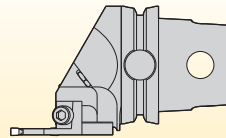
Feature

TS
XMZ

KGM

Insert
Holding Method

KGM



Modular Grooving

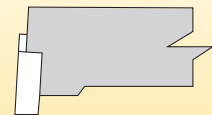
S

Insert
Location

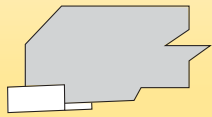
E = End mount

S = Side mount

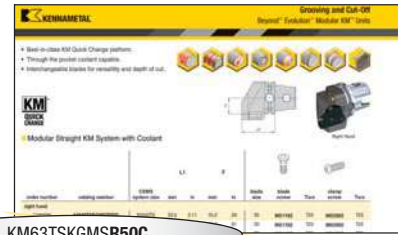
E



S



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



KM63TSKGMSR50C

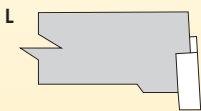
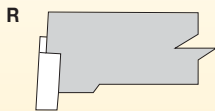
R

Hand of Tool

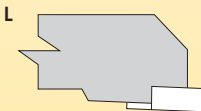
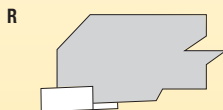
R = Right hand

L = Left hand

End Mount



Side Mount



50

Blade Size

50

60

C

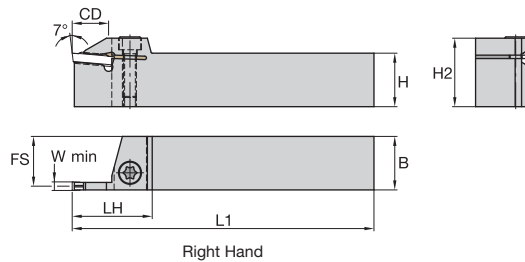
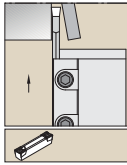
Coolant

C = Through the pocket coolant capable

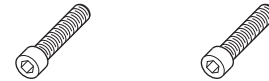
Special Features

Y = Mazak®
 INTEGREX®

Grooving and Cut-Off



Integral Straight • Metric



order number	catalogue number	seat size	CD	W min	H	B	H2	L1	FS	LH	clamp screw	clamp screw	Torx
right hand													
3017341	A4SMR2020K0214	2	14	—	20	20	25	125	19	30	—	MS1160	T20
3017342	A4SMR1616K0214	2	14	2	16	16	25	125	15	30	—	MS1160	T20
2974425	A4SMR2020K0217	2	17	2	20	20	31	125	19	34	MS1944	—	T25
3017340	A4SMR2525M0214	2	14	2	25	25	30	150	24	30	—	MS1160	T20
3017339	A4SMR2525M0217	2	17	2	25	25	31	150	24	34	MS1944	—	T25
1949633	A4SMR1616K0314	3	14	3	16	16	27	125	15	35	MS2091	—	T25
2503557	A4SMR2016K0317	3	17	3	20	16	32	125	15	37	MS1970	—	T30
1949635	A4SMR2020K0314	3	14	3	20	20	27	125	19	35	MS1595	—	T30
2503551	A4SMR2020K0317	3	17	3	20	20	32	125	19	37	MS1970	—	T30
1949637	A4SMR2525M0317	3	17	3	25	25	32	150	24	37	MS1970	—	T30
2503559	A4SMR2016K0417	4	17	4	20	16	32	125	14	37	MS1970	—	T30
1949639	A4SMR2020K0414	4	14	4	20	20	27	125	18	35	MS1595	—	T30
2503553	A4SMR2020K0417	4	17	4	20	20	32	125	18	37	MS1970	—	T30
1949641	A4SMR2525M0417	4	17	4	25	25	32	150	23	37	MS1970	—	T30
1949643	A4SMR3225P0417	4	17	4	32	25	40	170	23	37	MS1970	—	T30
1949645	A4SMR2020K0519	5	19	5	20	20	28	125	18	40	MS1595	—	T30
1949647	A4SMR2525M0520	5	20	5	25	25	33	150	23	40	MS1970	—	T30
1949649	A4SMR3225P0522	5	22	5	32	25	40	170	23	42	MS1970	—	T30
2503555	A4SMR2020K0620	6	20	6	20	20	33	125	17	40	MS1970	—	T30
2245484	A4SMR2525M0620	6	20	6	25	25	33	150	22	40	MS1970	—	T30
2263089	A4SMR3225P0626	6	26	6	32	25	40	170	22	45	MS1970	—	T30
2245485	A4SMR2525M0820	8	20	8	25	25	34	150	21	43	MS1490	—	T45
2263091	A4SMR3225P0826	8	26	8	32	25	41	170	21	47	MS1490	—	T45
2263173	A4SMR3225P1026	10	26	10	32	25	41	170	21	47	MS1490	—	T45

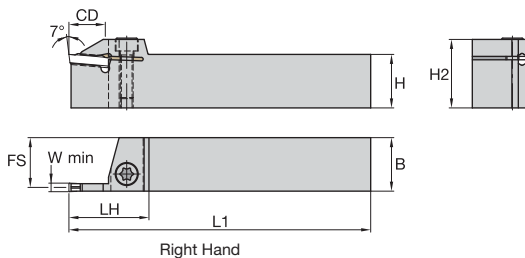
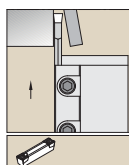
(continued)

(Integral Straight • Metric — continued)

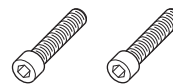


order number	catalogue number	seat size	CD	W min	H	B	H2	L1	FS	LH	clamp screw	clamp screw	Torx
left hand													
3017336	A4SML2020K0214	2	14	—	20	20	25	125	19	30	—	MS1160	T20
3017338	A4SML1616K0214	2	14	2	16	16	25	125	15	30	—	MS1160	T20
3017337	A4SML2020K0217	2	17	2	20	20	31	125	19	34	MS1944	—	T25
3017335	A4SML2525M0214	2	14	2	25	25	30	150	24	30	—	MS1160	T20
3017334	A4SML2525M0217	2	17	2	25	25	31	150	24	34	MS1944	—	T25
1949634	A4SML1616K0314	3	14	3	16	16	27	125	15	35	MS2091	—	T25
2503556	A4SML2016K0317	3	17	3	20	16	32	125	15	37	MS1970	—	T30
1949636	A4SML2020K0314	3	14	3	20	20	27	125	19	35	MS1595	—	T30
2503550	A4SML2020K0317	3	17	3	20	20	32	125	19	37	MS1970	—	T30
1949638	A4SML2525M0317	3	17	3	25	25	32	150	24	37	MS1970	—	T30
1949640	A4SML2020K0414	4	14	4	20	20	27	125	18	35	MS1595	—	T30
2503552	A4SML2020K0417	4	17	4	20	20	32	125	18	37	MS1970	—	T30
1949642	A4SML2525M0417	4	17	4	25	25	32	150	23	37	MS1970	—	T30
1949644	A4SML3225P0417	4	17	4	32	25	40	170	23	37	MS1970	—	T30
1949646	A4SML2020K0519	5	19	5	20	20	28	125	18	40	MS1595	—	T30
1949648	A4SML2525M0520	5	20	5	25	25	33	150	23	40	MS1970	—	T30
1949650	A4SML3225P0522	5	22	5	32	25	40	170	23	42	MS1970	—	T30
2503554	A4SML2020K0620	6	20	6	20	20	33	125	17	40	MS1970	—	T30
2245486	A4SML2525M0620	6	20	6	25	25	33	150	22	40	MS1970	—	T30
2263090	A4SML3225P0626	6	26	6	32	25	40	170	22	45	MS1970	—	T30
2245487	A4SML2525M0820	8	20	8	25	25	34	150	21	43	MS1490	—	T45
2263092	A4SML3225P0826	8	26	8	32	25	41	170	21	47	MS1490	—	T45
2263174	A4SML3225P1026	10	26	10	32	25	41	170	21	47	MS1490	—	T45

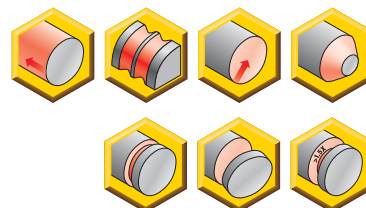
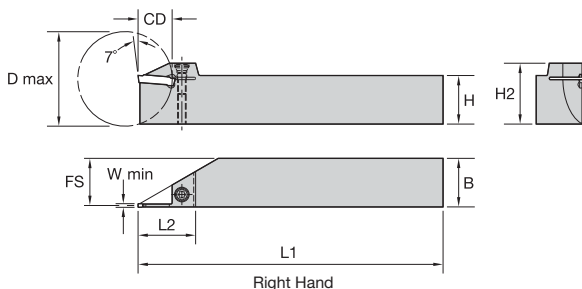
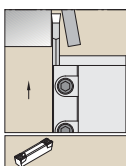
Grooving and Cut-Off



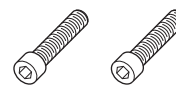
Integral Straight • Short Projection Toolholders • Metric



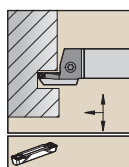
order number	catalogue number	seat size	CD	W min	H	B	H2	L1	FS	LH	clamp screw	clamp screw	Torx
right hand													
3854265	A4SMR2020K0208	2	8	2	20	20	24	125	19	26	—	MS1160	T20
3854267	A4SMR2020K0308	3	8	3	20	20	27	125	19	28	MS1595	—	T30
3854269	A4SMR2020K0408	4	8	4	20	20	27	125	18	28	MS1595	—	T30
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



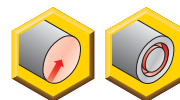
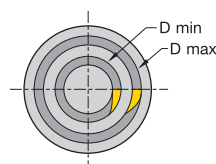
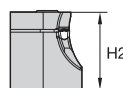
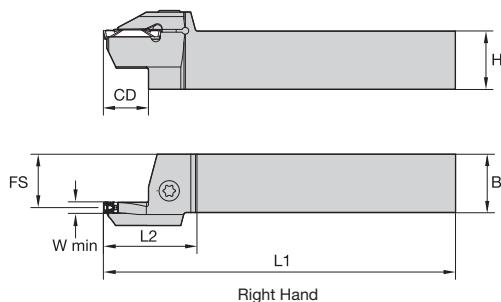
Integral Straight Top Clamp • Metric



order number	catalogue number	seat size	D max	CD	W min	H	B	H2	L1	FS	LH	clamp screw	clamp screw	wrench size clamp screw
right hand														
2982224	A4SCR1010K0113	1	27	13,500	1,50	10	10	21	125	9,40	25	MS1156	—	T15
2978378	A4SCR1212K0113	1	27	13,500	1,50	12	12	21	125	11,40	25	MS1156	—	T15
2982223	A4SCR1616K0113	1	27	13,500	1,50	16	16	21	125	15,40	25	MS1156	—	T15
2982172	A4SCR2020K0113	1	27	13,500	1,50	20	20	25	125	19,40	25	MS1156	—	T15
4169745	A4SCR1212K0214	2	28	14,000	2,00	12	12	21	125	11,17	28	MS1160	—	T20
4169746	A4SCR1616K0217	2	34	17,000	2,00	16	16	26	125	15,20	31	—	MS1944	T25
4169747	A4SCR1212K0314	3	28	14,000	3,00	12	12	23	125	10,72	30	—	MS2091	25 IP
4169748	A4SCR1616K0317	3	34	17,000	3,00	16	16	27	125	14,72	33	—	MS2091	25 IP
left hand														
2982170	A4SCL1212K0113	1	27	13,500	1,50	12	12	21	125	11,40	25	MS1156	—	T15
2982169	A4SCL1616K0113	1	27	13,500	1,50	16	16	21	125	15,40	25	MS1156	—	T15
2982168	A4SCL2020K0113	1	27	13,500	1,50	20	20	25	125	19,40	25	MS1156	—	T15
4169749	A4SCL1212K0214	2	28	14,000	2,00	12	12	21	125	11,17	28	MS1160	—	T20
4169750	A4SCL1616K0217	2	34	17,000	2,00	16	16	26	125	15,20	31	—	MS1944	T25
4169752	A4SCL1616K0317	3	34	17,000	3,00	16	16	27	125	14,72	33	—	MS2091	25 IP



Right hand shown.




Grooving and Cut-Off

Integral Face Grooving • Outboard • Metric


order number	catalogue number	seat size	CD	D min	D max	W min	H	B	H2	L1	FS	LH	clamp screw	Torx
right hand														
3865920	A4SBR2020K2S12016020	2S	12	16	20	2,00	20	20	25	125	19,20	28	—	T20
3865921	A4SBR2020K2S12020025	2S	12	20	25	2,00	20	20	25	125	19,20	28	—	T20
3865922	A4SBR2020K2S12025036	2S	12	25	36	2,00	20	20	25	125	19,20	28	—	T20
3865923	A4SBR2020K3S14020025	3S	14	20	25	3,00	20	20	28	125	18,70	35	MS1595	T30
3865924	A4SBR2020K3S14025036	3S	14	25	36	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
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	—	T20
3865931	A4SBL2020K2S12025036	2S	12	25	36	2,00	20	20	25	125	19,20	28	—	T20
3865932	A4SBL2020K3S14020025	3S	14	20	25	3,00	20	20	28	125	18,70	35	MS1595	T30
3865934	A4SBL2020K4S14025035	4S	14	25	35	4,00	20	20	28	125	18,20	35	MS1595	T30
3865937	A4SBL2525M5S19038058	5S	19	38	58	5,00	25	25	33	150	22,70	40	MS1970	T30

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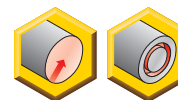
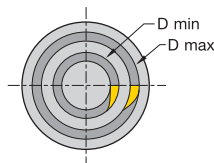
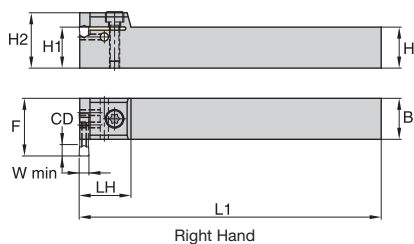
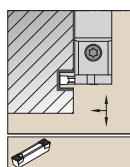


01

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■ Integral Face Grooving • End Mount • Dual Handed • Metric



order number	catalogue number	seat size	CD	W min	D min	H1	B	H2	L1	F	LH	clamp screw	Torx	hex seating screw	hex (mm)
2414136	A4ENN2020K0305	3	5	3,00	70	20	20	27	125,0	25,4	25	MS2091	T25	MS2090	1.5 mm
2414137	A4ENN2525M0305	3	5	3,00	70	25	25	32	150,0	30,4	25	MS2091	T25	MS2090	1.5 mm
1949651	A4ENN2020K0407	4	7	4,00	90	20	20	27	125,0	27,9	25	MS2091	T25	MS2090	1.5 mm
1949652	A4ENN2525M0407	4	7	4,00	90	25	25	32	150,0	33,1	25	MS2091	T25	MS2090	1.5 mm
1949654	A4ENN2525M0509	5	9	5,00	120	25	25	33	150,0	35,1	34	MS1970	T30	193.297	1.5 mm
2503543	A4ENN2020K0611	6	11	6,00	120	20	20	28	125,0	35,4	34	MS1595	T30	193.297	2 mm
2503544	A4ENN2525M0611	6	11	6,00	120	25	25	33	150,0	38,9	34	MS1970	T30	193.297	2 mm
2503545	A4ENN3232P0611	6	11	6,00	120	32	32	40	170,0	43,4	34	MS1970	T30	193.297	2 mm

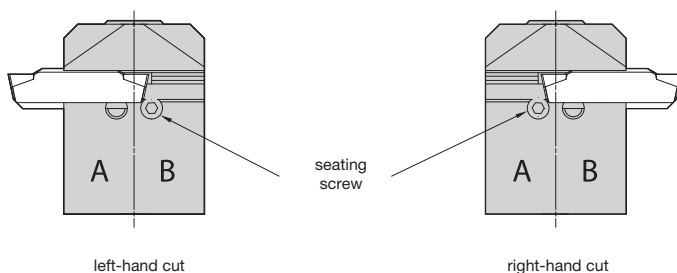
NOTE: D min for face grooving applications.

A4EN-style toolholders are designed without steel support for face grooving capacity. Cutting feed recommendations should be reduced by 25–30%.

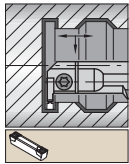
Recommended clamp screw torque, 50–70 in. lbs. (6–8 Nm).

Minimum cutting width supplied for reference only; see insert listing for actual width. Always match seat size of insert to seat size of holder.

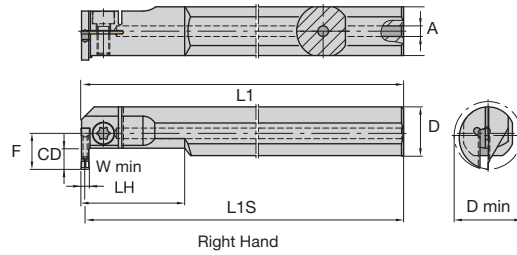
A4EN Insert Mounting



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.


Steel Boring Bar • Metric

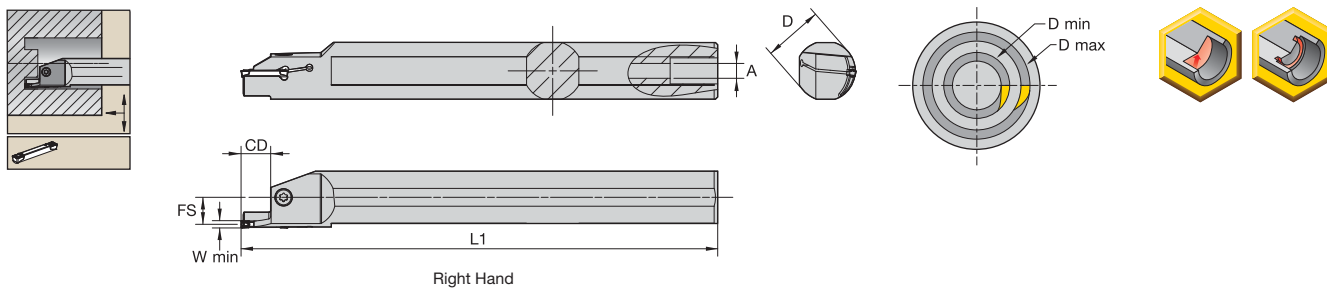

order number	catalogue number	seat size	CD	W min	D	D min	L1	F	L1S	A	clamp screw	wrench size clamp screw
right hand												
2979223	A20RA4EMR0207M	2	7,00	2,00	20	25	200	13	199,0	4,00	MS2089	25 IP
2979225	A25RA4EMR0210M	2	10,00	2,00	25	32	200	17	199,0	5,00	MS2089	25 IP
1949655	A20RA4EMR0307M	3	7,00	3,00	20	25	200	13	198,5	4,00	MS2089	25 IP
1949657	A25RA4EMR0310M	3	10,00	3,00	25	32	200	17	198,5	5,00	MS1595	T30
1949659	A32SA4EMR0312M	3	12,00	3,00	32	40	250	22	248,5	6,00	MS1595	T30
1949661	A20RA4EMR0407M	4	7,00	4,00	20	25	200	13	198,0	4,00	MS2089	25 IP
1949663	A25RA4EMR0410M	4	10,00	4,00	25	32	200	17	198,0	5,00	MS1595	T30
1949665	A32SA4EMR0412M	4	12,00	4,00	32	40	250	22	248,0	6,00	MS1595	T30
1949667	A40TA4EMR0416M	4	16,00	4,00	40	52	300	30	298,0	6,00	MS1970	T30
1949669	A32SA4EMR0516M	5	16,00	5,00	32	44	250	26	247,5	6,00	MS1595	T30
1949671	A40TA4EMR0516M	5	16,00	5,00	40	52	300	30	297,5	6,00	MS1970	T30
2263197	A40TA4EMR0616M	6	16,00	6,00	40	52	300	30	297,0	6,00	MS1970	T30
left hand												
2979192	A20RA4EML0207M	2	7,00	2,00	20	25	200	13	199,0	4,00	MS2089	25 IP
2979224	A25RA4EML0210M	2	10,00	2,00	25	32	200	17	199,0	5,00	MS2089	25 IP
1949656	A20RA4EML0307M	3	7,00	3,00	20	25	200	13	198,5	4,00	MS2089	25 IP
1949658	A25RA4EML0310M	3	10,00	3,00	25	32	200	17	198,5	5,00	MS1595	T30
1949660	A32SA4EML0312M	3	12,00	3,00	32	40	250	22	248,5	6,00	MS1595	T30
1949662	A20RA4EML0407M	4	7,00	4,00	20	25	200	13	198,0	4,00	MS2089	25 IP
1949664	A25RA4EML0410M	4	10,00	4,00	25	32	200	17	198,0	5,00	MS1595	T30
1949666	A32SA4EML0412M	4	12,00	4,00	32	40	250	22	248,0	6,00	MS1595	T30
1949668	A40TA4EML0416M	4	16,00	4,00	40	52	300	30	298,0	6,00	MS1970	T30
1949670	A32SA4EML0516M	5	16,00	5,00	32	44	250	26	247,5	6,00	MS1595	T30
1949672	A40TA4EML0516M	5	16,00	5,00	40	52	300	30	297,5	6,00	MS1970	T30
2263198	A40TA4EML0616M	6	16,00	6,00	40	52	300	30	297,0	6,00	MS1970	T30

Grooving and Cut-Off

A4™ Integral Face Grooving Boring Bars



Grooving and Cut-Off



Steel Face Grooving Boring Bar • Metric



order number	catalogue number	seat size	CD	D min	D max	W min	D	L1	FS	A	clamp screw	wrench size clamp screw
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
3871037	A25RA4SAL3S14M026036	3S	14,00	26	36	3,00	25	201	11	6,35	MS1160	T20

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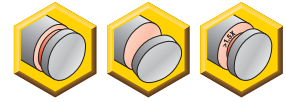
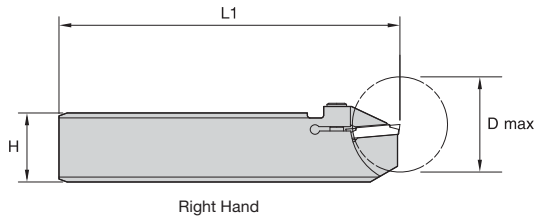
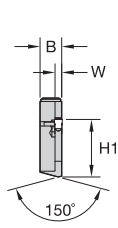
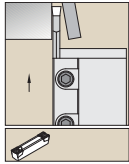


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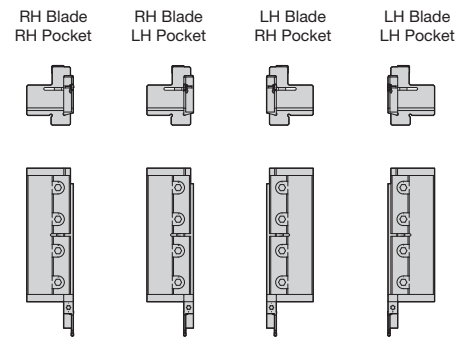


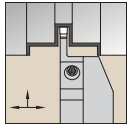
Single-Ended Cut-Off Blade • Metric



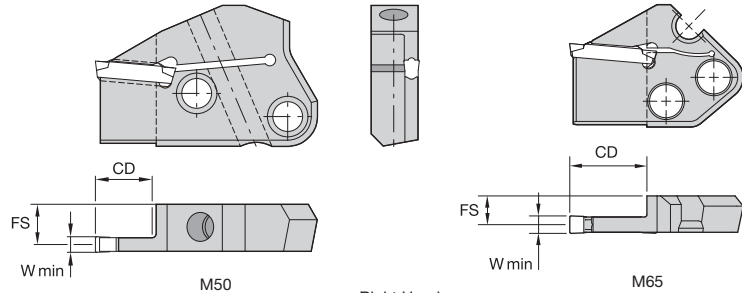
order number	catalogue number	seat size	H	W	H1	L1	B	D max	clamp screw	Torx
right hand										
3967127	A4BHCL26K0317R	3	26	3,0	21,4	125	7,95	35	MS1571	T20
3967124	A4BHCL32K0317R	3	32	3,0	25,0	125	7,95	35	MS1571	T20
3967117	A4BHCR32K0217R	2	32	2,0	25,0	125	7,95	35	MS1571	T20
left hand										
3967136	A4BHCL32K0217L	2	32	2,0	25,0	125	7,95	35	MS1571	T20
3967137	A4BHCL32K0317L	3	32	3,0	25,0	125	7,95	35	MS1571	T20
3967134	A4BHCR26K0317L	3	26	3,0	21,4	125	7,95	35	MS1571	T20

NOTE: Seat size 1 blades only.
 Assembly wrenches 170.137 and 170.130 must be ordered separately.





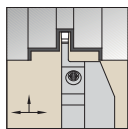
Right hand shown



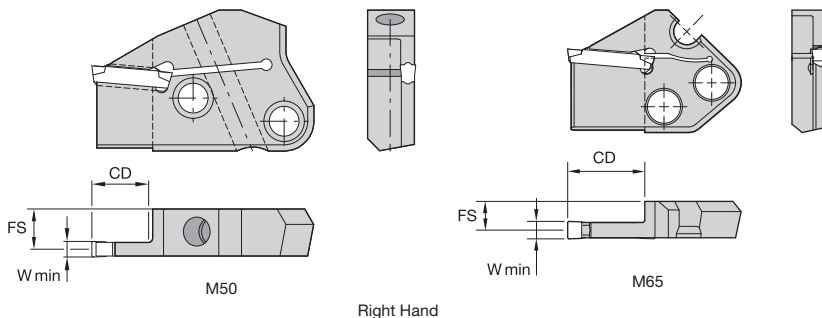
Grooving and Cut-Off

Modular Straight Blade with Coolant

order number	catalogue number	seat size	CD	FS	blade size
right hand					
6401815	A4M50R0314MC	3	14,0	10,42	50
6401817	A4M50R0414MC	4	14,0	9,92	50
6401819	A4M50R0519MC	5	19,0	9,42	50
6401834	A4M65R0620MC	6	20,0	9,88	65
6401838	A4M65R0820MC	8	20,0	9,00	65
6401852	A4M65R1020MC	10	20,0	8,35	65
6401831	A4M65R0522MC	5	22,0	10,28	65
6401835	A4M65R0626MC	6	26,0	9,88	65
6401839	A4M65R0826MC	8	26,0	9,00	65
6401853	A4M65R1026MC	10	26,0	8,35	65
left hand					
6401814	A4M50L0314MC	3	14,0	10,42	50
6401816	A4M50L0414MC	4	14,0	9,92	50
6401818	A4M50L0519MC	5	19,0	9,43	50
6401832	A4M65L0620MC	6	20,0	9,88	65
6401836	A4M65L0820MC	8	20,0	9,00	65
6401840	A4M65L1020MC	10	20,0	8,35	65
6401820	A4M65L0522MC	5	22,0	10,28	65
6401833	A4M65L0626MC	6	26,0	9,88	65
6401837	A4M65L0826MC	8	26,0	9,00	65
6401851	A4M65L1026MC	10	26,0	8,35	65



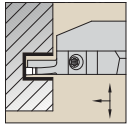
Right hand shown.



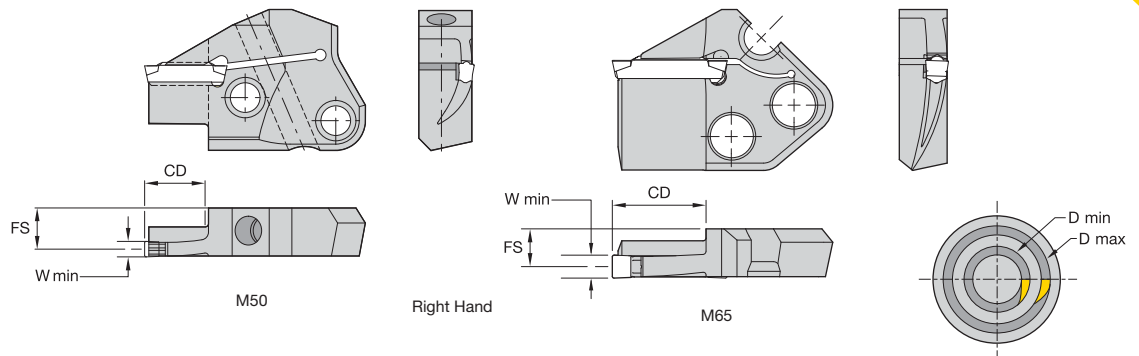
Modular Straight Blade

order number	catalogue number	seat size	W min	CD	FS	blade size
right hand						
3051624	A4M50R0214M	2	2,00	14,0	10,87	50
1989348	A4M50R0314M	3	3,00	14,0	10,43	50
1989350	A4M50R0414M	4	4,00	14,0	9,93	50
1989352	A4M50R0519M	5	5,00	19,0	9,43	50
3557114	A4M65R0620M	6	6,00	20,0	9,88	65
3557116	A4M65R0626M	6	6,00	26,0	9,88	65
3557120	A4M65R0826M	8	8,00	26,0	9,00	65
3557124	A4M65R1026M	10	10,00	26,0	8,35	65
left hand						
3022625	A4M50L0214M	2	2,00	14,0	10,87	50
1989347	A4M50L0314M	3	3,00	14,0	10,43	50
1989349	A4M50L0414M	4	4,00	14,0	9,93	50
3051623	A4M50L2B14M	2B	2,50	14,0	10,70	50
1989351	A4M50L0519M	5	5,00	19,0	9,43	50
3557115	A4M65L0620M	6	6,00	20,0	9,88	65
3557119	A4M65L0820M	8	8,00	20,0	9,00	65
3557123	A4M65L1020M	10	10,00	20,0	8,35	65
3557117	A4M65L0626M	6	6,00	26,0	9,88	65
3557121	A4M65L0826M	8	8,00	26,0	9,00	65
3557125	A4M65L1026M	10	10,00	26,0	8,35	65

NOTE: Seat size 2B only accepts 2B inserts. Seat size 2 accepts 2 or 2B inserts.



Right hand shown.



Grooving and Cut-Off

■ Modular Face Grooving Blade • Inboard

order number	catalogue number	seat size	D min	D max	cartridge size
right hand					
3051670	A4M50R0212A036046	2	36	46	50
3051671	A4M50R0212A042054	2	42	54	50
3051672	A4M50R0212A050064	2	50	64	50
3051673	A4M50R0212A060084	2	60	84	50
3051674	A4M50R0212A080124	2	80	124	50
3051675	A4M50R0212A120254	2	120	254	50
3051676	A4M50R0212A250999	2	250	—	50
2542517	A4M50R0314A036048	3	36	48	50
2542518	A4M50R0314A042058	3	42	58	50
2542519	A4M50R0314A052074	3	52	74	50
2542520	A4M50R0314A068100	3	68	100	50
2542521	A4M50R0314A090160	3	90	160	50
2542522	A4M50R0314A130300	3	130	300	50
2542523	A4M50R0314A290999	3	290	—	50
2542531	A4M50R0414A048072	4	48	72	50
2542532	A4M50R0414A064100	4	64	100	50
2542533	A4M50R0414A092150	4	92	150	50
2542534	A4M50R0414A132300	4	132	300	50
2542535	A4M50R0414A290999	4	290	—	50
2542541	A4M50R0519A058094	5	58	94	50
2542542	A4M50R0519A080136	5	80	136	50
2542543	A4M50R0519A120300	5	120	300	50
2542544	A4M50R0519A250999	5	250	—	50
3557131	A4M65R0624A070-112	6	70	112	65
3557163	A4M65R0624A100-212	6	100	212	65
3557165	A4M65R0624A200-999	6	200	999	65
3557167	A4M65R0824A090-200	8	90	200	65
3557169	A4M65R0824A184-999	8	184	999	65
3557173	A4M65R1024A200-999	10	200	999	65

(continued)

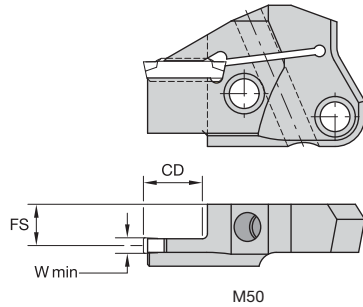
(Modular Face Grooving Blade • Inboard — continued)

Grooving and Cut-Off

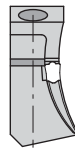
order number	catalogue number	seat size	D min	D max	cartridge size
left hand					
3051629	A4M50L0212A060084	2	60	84	50
3051631	A4M50L0212A120254	2	120	254	50
3051632	A4M50L0212A250999	2	250	—	50
2542524	A4M50L0314A036048	3	36	48	50
2542527	A4M50L0314A068100	3	68	100	50
2542528	A4M50L0314A090160	3	90	160	50
2542529	A4M50L0314A130300	3	130	300	50
2542530	A4M50L0314A290999	3	290	—	50
2542537	A4M50L0414A064100	4	64	100	50
2542538	A4M50L0414A092150	4	92	150	50
2542539	A4M50L0414A132300	4	132	300	50
2542540	A4M50L0414A290999	4	290	—	50
2542545	A4M50L0519A058094	5	58	94	50
2542546	A4M50L0519A080136	5	80	136	50
2542547	A4M50L0519A120300	5	120	300	50
2542548	A4M50L0519A250999	5	250	—	50
3557132	A4M65L0624A070-112	6	70	112	65
3557164	A4M65L0624A100-212	6	100	212	65
3557166	A4M65L0624A200-999	6	200	999	65
3557174	A4M65L1024A200-999	10	200	999	65



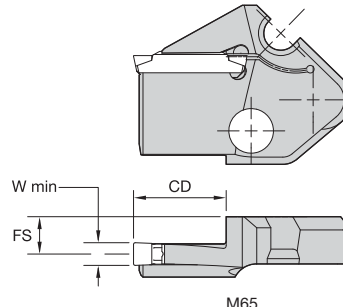
Right hand shown.



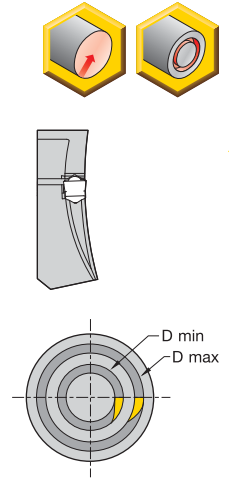
M50



Right Hand



M65



Grooving and Cut-Off

■ Modular Face Grooving Blade • Outboard

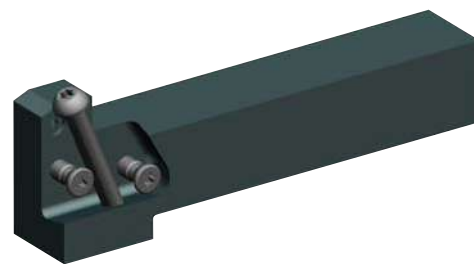
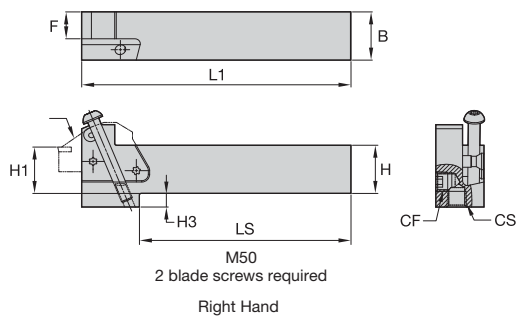
order number	catalogue number	seat size	D min	D max	CD	FS	cartridge size
right hand							
3051677	A4M50R0212B036046	2	36	46	12,00	10,900	50
3051678	A4M50R0212B042054	2	42	54	12,00	10,900	50
3051679	A4M50R0212B050064	2	50	64	12,00	10,900	50
3051680	A4M50R0212B060084	2	60	84	12,00	10,900	50
3051681	A4M50R0212B080124	2	80	124	12,00	10,900	50
3051682	A4M50R0212B120254	2	120	254	12,00	10,900	50
3051683	A4M50R0212B250999	2	250	—	12,00	10,900	50
3867457	A4M50R2S12B016020	2S	16	20	12,00	10,900	50
3867458	A4M50R2S12B020025	2S	20	25	12,00	10,900	50
3867459	A4M50R2S12B025036	2S	25	36	12,00	10,900	50
2398751	A4M50R0314B036048	3	36	48	14,00	10,500	50
2398752	A4M50R0314B042058	3	42	58	14,00	10,500	50
2398763	A4M50R0314B052074	3	52	74	14,00	10,500	50
2398764	A4M50R0314B068100	3	68	100	14,00	10,500	50
2398765	A4M50R0314B090160	3	90	160	14,00	10,500	50
2398766	A4M50R0314B130300	3	130	300	14,00	10,500	50
2398767	A4M50R0314B290999	3	290	—	14,00	10,500	50
2398775	A4M50R0414B048072	4	48	72	14,00	10,000	50
2398776	A4M50R0414B064100	4	64	100	14,00	10,000	50
2398777	A4M50R0414B092150	4	92	150	14,00	10,000	50
2398778	A4M50R0414B132300	4	132	300	14,00	10,000	50
2398779	A4M50R0414B290999	4	290	—	14,00	10,000	50
3867460	A4M50R3S14B020025	3S	20	25	14,00	10,490	50
3867461	A4M50R3S14B025036	3S	25	36	14,00	10,490	50
3867462	A4M50R4S14B025035	4S	25	35	14,00	10,000	50
3867464	A4M50R5S17B028038	5S	28	38	17,00	9,500	50
2398785	A4M50R0519B058094	5	58	94	19,00	9,500	50
2398786	A4M50R0519B080136	5	80	136	19,00	9,500	50
2398787	A4M50R0519B120300	5	120	300	19,00	9,500	50
2398788	A4M50R0519B250999	5	250	—	19,00	9,500	50
3557175	A4M65R0624B070-112	6	70	112	24,00	9,870	65
3557177	A4M65R0624B100-212	6	100	212	24,00	9,870	65
3557179	A4M65R0624B200-999	6	200	999	24,00	9,870	65
3557181	A4M65R0824B090-200	8	90	200	24,00	9,000	65
3557193	A4M65R0824B184-999	8	184	999	24,00	9,000	65
3557195	A4M65R1024B100-220	10	100	220	24,00	8,350	65
3557197	A4M65R1024B200-999	10	200	999	24,00	8,350	65

(continued)

(Modular Face Grooving Blade • Outboard – continued)

Grooving and Cut-Off

order number	catalogue number	seat size	D min	D max	CD	FS	cartridge size
left hand							
3051663	A4M50L0212B036046	2	36	46	12,00	10,900	50
3051664	A4M50L0212B042054	2	42	54	12,00	10,900	50
3051665	A4M50L0212B050064	2	50	64	12,00	10,900	50
3051666	A4M50L0212B060084	2	60	84	12,00	10,900	50
3051667	A4M50L0212B080124	2	80	124	12,00	10,900	50
3051668	A4M50L0212B120254	2	120	254	12,00	10,900	50
3867466	A4M50L2S12B016020	2S	16	20	12,00	10,900	50
3867467	A4M50L2S12B020025	2S	20	25	12,00	10,900	50
3867468	A4M50L2S12B025036	2S	25	36	12,00	10,900	50
2398768	A4M50L0314B036048	3	36	48	14,00	10,500	50
2398769	A4M50L0314B042058	3	42	58	14,00	10,500	50
2398770	A4M50L0314B052074	3	52	74	14,00	10,500	50
2398771	A4M50L0314B068100	3	68	100	14,00	10,500	50
2398772	A4M50L0314B090160	3	90	160	14,00	10,500	50
2398773	A4M50L0314B130300	3	130	300	14,00	10,500	50
2398774	A4M50L0314B290999	3	290	—	14,00	10,500	50
2398780	A4M50L0414B048072	4	48	72	14,00	10,000	50
2398781	A4M50L0414B064100	4	64	100	14,00	10,000	50
2398782	A4M50L0414B092150	4	92	150	14,00	10,000	50
2398783	A4M50L0414B132300	4	132	300	14,00	10,000	50
2398784	A4M50L0414B290999	4	290	—	14,00	10,000	50
3867469	A4M50L3S14B020025	3S	20	25	14,00	10,490	50
3867470	A4M50L3S14B025036	3S	25	36	14,00	10,490	50
3867472	A4M50L4S14B035048	4S	35	48	14,00	10,000	50
3867484	A4M50L5S17B028038	5S	28	38	17,00	9,500	50
2398789	A4M50L0519B058094	5	58	94	19,00	9,500	50
2398790	A4M50L0519B080136	5	80	136	19,00	9,500	50
2398791	A4M50L0519B120300	5	120	300	19,00	9,500	50
2398792	A4M50L0519B250999	5	250	—	19,00	9,500	50
3557176	A4M65L0624B070-112	6	70	112	24,00	9,870	65
3557178	A4M65L0624B100-212	6	100	212	24,00	9,870	65
3557180	A4M65L0624B200-999	6	200	999	24,00	9,870	65
3557182	A4M65L0824B090-200	8	90	200	24,00	9,000	65
3557194	A4M65L0824B184-999	8	184	999	24,00	9,000	65
3557198	A4M65L1024B200-999	10	200	999	24,00	8,350	65



Grooving and Cut-Off

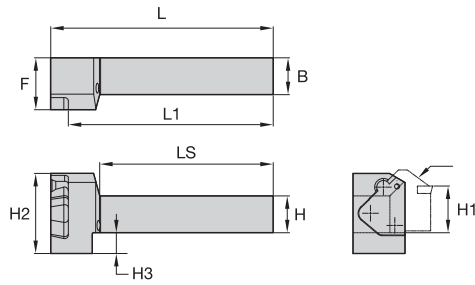
■ Modular Straight Toolholder • Metric

NOTE: For modular straight toolholder with coolant, see page C58.

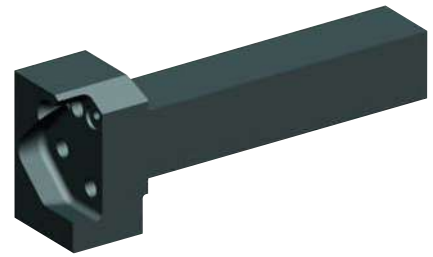


order number	catalogue number	B	H	L1	F	LS	H3	blade screw	Torx	clamp screw	Torx
right hand											
1600249	KGMSR2525M50	25	25	138,75	13,84	109,00	7,00	MS1162	T25	MS2002	T25
3553429	KGMSR2525M65	25	25	150,00	13,00	120,00	14,00	MS1163	T30	—	—
1621083	KGMSR3232P50	32	32	158,75	20,81	—	—	MS1162	T25	MS2002	T25
3553431	KGMSR3232P65	32	32	170,00	20,79	158,00	7,00	MS1163	T30	—	—
left hand											
1600250	KGMSL2525M50	25	25	138,75	13,84	109,00	7,00	MS1162	T25	MS2002	T25
3553430	KGMSL2525M65	25	25	150,00	13,00	120,00	14,00	MS1163	T30	—	—
1621084	KGMSL3232P50	32	32	158,75	20,81	—	—	MS1162	T25	MS2002	T25
3553432	KGMSL3232P65	32	32	170,00	20,79	158,00	7,00	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.).



M65
2 blade screws required
Right Hand



Grooving and Cut-Off

Modular End Mount Toolholders • Metric

NOTE: For modular end mount toolholder with coolant, see page C59.



order number	catalogue number	B	H	L1	F	LS	H3	L	blade screw (2 required)	Torx	clamp screw	Torx
right hand												
1600270	KGMER2525M50	25	25	139,25	42,75	125,25	6,84	150,25	MS1162	T25	MS2002	T25
3553453	KGMER2525M65	25	25	138,15	35,00	129,00	14,00	150,00	MS1163	T30	—	—
1621085	KGMER3232P50	32	32	159,25	42,75	145,25	—	170,25	MS1162	T25	MS2002	T25
3553455	KGMER3232P65	32	32	158,15	35,00	153,00	7,00	170,00	MS1163	T30	—	—
left hand												
1600271	KGME2525M50	25	25	139,25	42,75	125,25	6,84	150,25	MS1162	T25	MS2002	T25
3553454	KGME2525M65	25	25	138,15	35,00	129,00	14,00	150,00	MS1163	T30	—	—
1621086	KGME3232P50	32	32	159,25	42,75	145,25	—	170,25	MS1162	T25	MS2002	T25
3553456	KGME3232P65	32	32	158,15	35,00	153,00	7,00	170,00	MS1163	T30	—	—

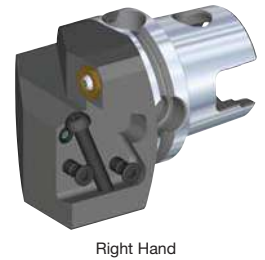
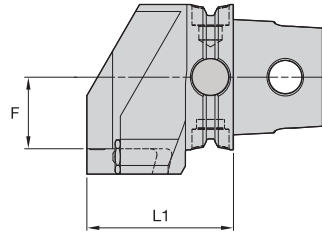
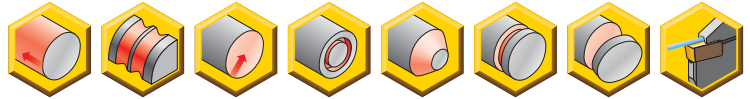
NOTE: KGMS.: Right-hand holder uses right-hand blades.

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.).

- Best-in-class KM Quick-Change platform.
- Through the pocket coolant capable.
- Interchangeable blades for versatility and depth of cut.



■ Modular Straight KM System with Coolant

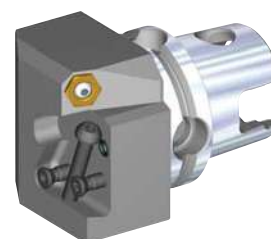
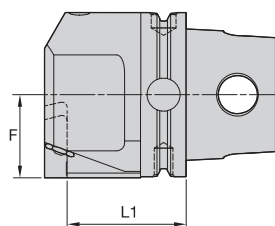
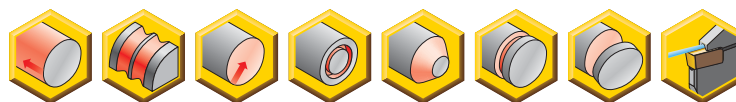


order number	catalogue number	CSMS system size	L1	F	blade size	blade screw	Torx	clamp screw	Torx
right hand									
5999790	KM40TSKGMSR50C	KM40TS	53,5	15,0	50	MS1162	T25	MS2002	T25
6000422	KM50TSKGMSR65C	KM50TS	53,5	22,0	65	MS1163	T30	—	—
5999864	KM50TSKGMSR50C	KM50TS	58,5	23,0	50	MS1162	T25	MS2002	T25
6000431	KM63TSKGMSR65C	KM63TS	58,5	30,0	65	MS1163	T30	—	—
5999948	KM63TSKGMSR50C	KM63TS	63,5	31,0	50	MS1162	T25	MS2002	T25
5999972	KM63XMZKGMSR50CY	KM63XMZ	63,5	31,0	50	MS1162	T25	MS2002	T25
6017695	KM80TSKGMSR65C	KM80TS	63,5	40,0	65	MS1163	T30	—	—
6000018	KM80ATCKGMSR50C	KM80ATC	66,5	41,0	50	MS1162	T25	MS2002	T25
6000014	KM80TSKGMSR50C	KM80TS	66,5	41,0	50	MS1162	T25	MS2002	T25
left hand									
5999861	KM40TSKGMSL50C	KM40TS	53,5	15,0	50	MS1162	T25	MS2002	T25
6000424	KM50TSKGMSL65C	KM50TS	53,5	22,0	65	MS1163	T30	—	—
5999865	KM50TSKGMSL50C	KM50TS	58,5	23,0	50	MS1162	T25	MS2002	T25
6000433	KM63TSKGMSL65C	KM63TS	58,5	30,0	65	MS1163	T30	—	—
5999949	KM63TSKGMSL50C	KM63TS	63,5	31,0	50	MS1162	T25	MS2002	T25
5999973	KM63XMZKGMSLF50CY	KM63XMZ	63,5	31,0	50	MS1162	T25	MS2002	T25
6017696	KM80TSKGMSL65C	KM80TS	63,5	40,0	65	MS1163	T30	—	—
6000019	KM80ATCKGMSL50C	KM80ATC	66,5	41,0	50	MS1162	T25	MS2002	T25
6000015	KM80TSKGMSL50C	KM80TS	66,5	41,0	50	MS1162	T25	MS2002	T25

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.).

Grooving and Cut-Off

- Best-in-class KM Quick-Change platform.
- Through the pocket coolant capable.
- Interchangeable blades for versatility and depth of cut.



Right Hand



Grooving and Cut-Off

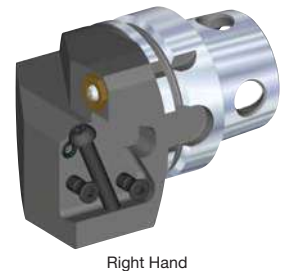
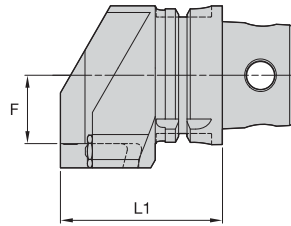
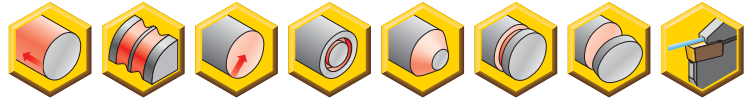
■ Modular End Mount KM System with Coolant • Metric



order number	catalogue number	CSMS system size	L1	F	blade size	blade screw	Torx	clamp screw	Torx
right hand									
5999788	KM40TSKGMER50C	KM40TS	28,0	20,50	50	MS1162	T25	MS2002	T25
5999862	KM50TSKGMER50C	KM50TS	38,0	25,50	50	MS1162	T25	MS2002	T25
6000410	KM50TSKGMER65C	KM50TS	47,0	25,50	65	MS1163	T30	—	—
6000425	KM63TSKGMER65C	KM63TS	47,0	32,52	65	MS1163	T30	—	—
5999946	KM63TSKGMER50C	KM63TS	48,0	32,50	50	MS1162	T25	MS2002	T25
6000434	KM63XMZKGMER65CY	KM63XMZ	47,0	32,50	65	MS1163	T30	—	—
5999950	KM63XMZKGMER50CY	KM63XMZ	48,0	32,50	50	MS1162	T25	MS2002	T25
6017697	KM80ATCKGMER65C	KM80ATC	57,0	40,50	65	MS1163	T30	—	—
6000016	KM80ATCKGMER50C	KM80ATC	58,0	40,50	50	MS1162	T25	MS2002	T25
6017693	KM80TSKGMER65C	KM80TS	57,0	40,50	65	MS1163	T30	—	—
6000012	KM80TSKGMER50C	KM80TS	58,0	40,50	50	MS1162	T25	MS2002	T25
left hand									
5999789	KM40TSKGMEL50C	KM40TS	28,0	20,50	50	MS1162	T25	MS2002	T25
5999863	KM50TSKGMEL50C	KM50TS	38,0	25,50	50	MS1162	T25	MS2002	T25
6000421	KM50TSKGMEL65C	KM50TS	47,0	25,50	65	MS1163	T30	—	—
6000430	KM63TSKGMEL65C	KM63TS	47,0	32,52	65	MS1163	T30	—	—
5999947	KM63TSKGMEL50C	KM63TS	48,0	32,50	50	MS1162	T25	MS2002	T25
6000436	KM63XMZKGMELF65CY	KM63XMZ	47,0	32,50	65	MS1163	T30	—	—
5999971	KM63XMZKGMELF50CY	KM63XMZ	48,0	32,50	50	MS1162	T25	MS2002	T25
6017698	KM80ATCKGMEL65C	KM80ATC	57,0	40,50	65	MS1163	T30	—	—
6000017	KM80ATCKGMEL50C	KM80ATC	58,0	40,50	50	MS1162	T25	MS2002	T25
6017694	KM80TSKGMEL65C	KM80TS	57,0	40,50	65	MS1163	T30	—	—
6000013	KM80TSKGMEL50C	KM80TS	58,0	40,50	50	MS1162	T25	MS2002	T25

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.).

- Through the pocket coolant capable.
- Interchangeable blades for versatility and depth of cut.



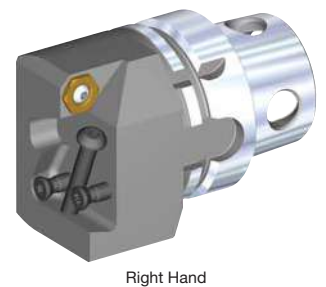
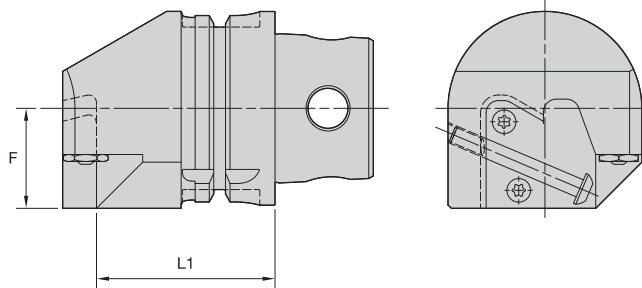
Grooving and Cut-Off

■ Modular Straight KM4X™ System with Coolant

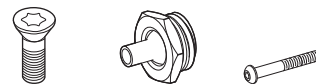


order number	catalogue number	CSMS system size	L1	F	blade size	blade screw	Torx	clamp screw	Torx
right hand									
5543560	KM4X63KGMSR65C	KM4X63	68,5	30,0	65	MS1163	T30	—	—
6000407	KM4X63KGMSR50C	KM4X63	73,5	31,0	50	MS1162	T25	MS2002	T25
left hand									
5543558	KM4X63KGMSL65C	KM4X63	68,5	30,0	65	MS1163	T30	—	—
6000408	KM4X63KGMSL50C	KM4X63	73,5	31,0	50	MS1162	T25	MS2002	T25

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.).

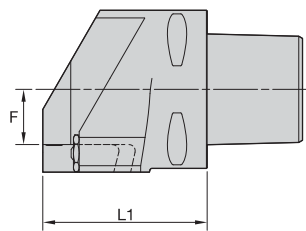
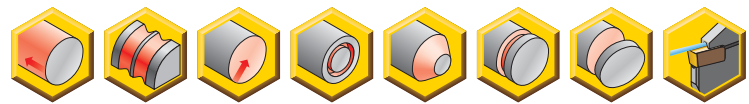


■ Modular End Mount KM4X™ System with Coolant



order number	catalogue number	CSMS system size	L1	F	cartridge size	blade screw	nozzle	clamp screw	kg	lbs
right hand										
5543555	KM4X63KGMER65C	KM4X63	57,0	32,5	65	MS1163	PMT04525	—	1,87	4.13
6000404	KM4X63KGMER50C	KM4X63	58,0	32,5	50	MS1162	PMT04525	MS2002	1,85	4.08
6000407	KM4X63KGMSR50C	KM4X63	73,5	31,0	50	MS1162	PMT04525	MS2002	1,86	4.11
left hand										
5543553	KM4X63KGME65C	KM4X63	57,0	32,5	65	MS1163	PMT04525	—	1,87	4.13
6000405	KM4X63KGME50C	KM4X63	58,0	32,5	50	MS1162	PMT04525	MS2002	1,85	4.08
6000408	KM4X63KGMSL50C	KM4X63	73,5	31,0	50	MS1162	PMT04525	MS2002	1,86	4.11

- Standard PSC Quick-Change platform.
- Through the pocket coolant capable.
- Interchangeable blades for versatility and depth of cut.



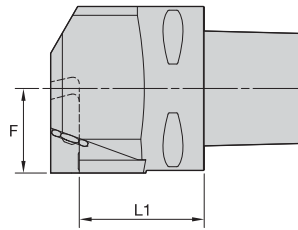
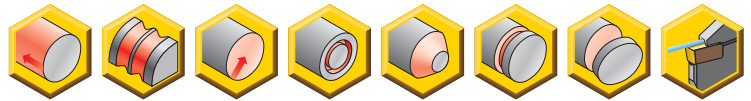
Right Hand

■ Modular Straight PSC System with Coolant



order number	catalogue number	CSMS system size	L1	F	blade size	blade screw	Torx	clamp screw	Torx
right hand									
6000028	PSC40KGMSR50C	PSC40	63,5	10,0	50	MS1162	T25	MS2002	T25
5405654	PSC50KGMSR65C	PSC50	49,0	25,5	65	MS1163	T30	—	—
6000152	PSC50KGMSR50C	PSC50	63,5	15,0	50	MS1162	T25	MS2002	T25
6000464	PSC63KGMSR65C	PSC63	60,5	21,0	65	MS1163	T30	—	—
6000211	PSC63KGMSR50C	PSC63	65,5	22,0	50	MS1162	T25	MS2002	T25
6000468	PSC80KGMSR65C	PSC80	68,5	29,0	65	MS1163	T30	—	—
6000216	PSC80KGMSR50C	PSC80	73,5	30,0	50	MS1162	T25	MS2002	T25
left hand									
6000029	PSC40KGMSL50C	PSC40	63,5	10,0	50	MS1162	T25	MS2002	T25
5405655	PSC50KGMSL65C	PSC50	49,0	25,5	65	MS1163	T30	—	—
6000153	PSC50KGMSL50C	PSC50	63,5	15,0	50	MS1162	T25	MS2002	T25
6000465	PSC63KGMSL65C	PSC63	60,5	21,0	65	MS1163	T30	—	—
6000213	PSC63KGMSL50C	PSC63	65,5	22,0	50	MS1162	T25	MS2002	T25
6000469	PSC80KGMSL65C	PSC80	68,5	29,0	65	MS1163	T30	—	—
6000217	PSC80KGMSL50C	PSC80	73,5	30,0	50	MS1162	T25	MS2002	T25

- Standard PSC Quick-Change platform.
- Through the pocket coolant capable.
- Interchangeable blades for versatility and depth of cut.



Right Hand

Grooving and Cut-Off

■ Modular End Mount PSC System with Coolant



order number	catalogue number	CSMS system size	L1	F	blade size	blade screw	Torx	clamp screw	Torx
right hand									
6000026	PSC40KGMER50C	PSC40	33,0	20,5	50	MS1162	T25	MS2002	T25
6000030	PSC50KGMER50C	PSC50	43,0	25,5	50	MS1162	T25	MS2002	T25
5405652	PSC50KGMER65C	PSC50	55,5	22,0	65	MS1163	T30	—	—
6000159	PSC63KGMER50C	PSC63	48,0	32,5	50	MS1162	T25	MS2002	T25
6000462	PSC63KGMER65C	PSC63	49,0	32,5	65	MS1163	T30	—	—
6000466	PSC80KGMER65C	PSC80	57,0	40,5	65	MS1163	T30	—	—
6000214	PSC80KGMER50C	PSC80	58,0	40,5	50	MS1162	T25	MS2002	T25
left hand									
6000027	PSC40KGMEL50C	PSC40	33,0	20,5	50	MS1162	T25	MS2002	T25
6000151	PSC50KGMEL50C	PSC50	43,0	25,5	50	MS1162	T25	MS2002	T25
5405653	PSC50KGMEL65C	PSC50	55,5	22,0	65	MS1163	T30	—	—
6000160	PSC63KGMEL50C	PSC63	48,0	32,5	50	MS1162	T25	MS2002	T25
6000463	PSC63KGMEL65C	PSC63	49,0	32,5	65	MS1163	T30	—	—
6000467	PSC80KGMEL65C	PSC80	57,0	40,5	65	MS1163	T30	—	—
6000215	PSC80KGMEL50C	PSC80	58,0	40,5	50	MS1162	T25	MS2002	T25

➤ Top Notch™

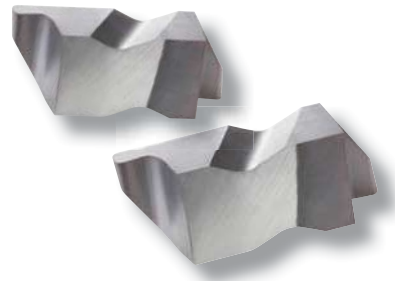
Grooving Tools and Beyond™ Inserts for
Your Shallow Groove and Turn Operations

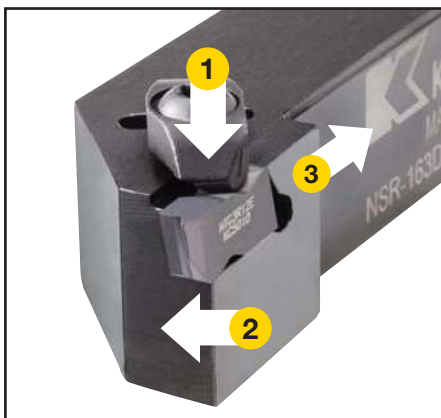
Primary Application

Top Notch Grooving Tools and Beyond Inserts are 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.





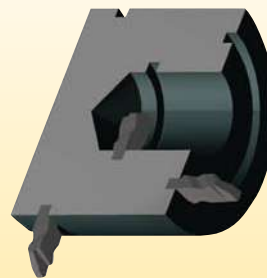
Our rigid clamping design prevents insert movement during high-feed rate applications. This benefit ensures excellent surface finish, improved productivity, and superior tool life and promotes perfect concentricity. The rugged bridge clamp generates locking forces in three directions to provide superior 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™

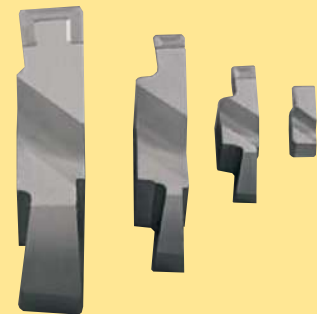


Grooving

For grooving depth $\leq 1.5x$ grooving width, review system capability chart and proceed to Step 2.

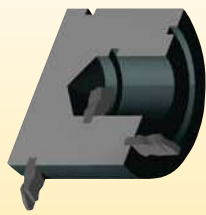
Top Notch Grooving for Internal, External, and Face Grooving Applications

system capabilities		minimum in (mm)	maximum in (mm)
O.D./I.D. grooving	width	0.31 (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.

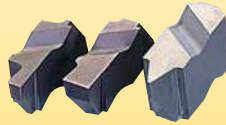
Step 3 • Select chipbreaker style and feed rate
Chipbreaker and Feed Rates • in/rev (mm/rev)


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)	—

_K chipbreaker inserts



flat-top inserts



positive rake inserts


Step 4 • Select grade and speed
Recommendations for Grade

Starting speed chart shown under "Application Guide"

machining condition	workpiece material					
	P	M	K	N	S	H
high-performance for optimal conditions (clean cuts, good machine condition, higher speed capability)	KCP10B 120-450	KCU10 120-260	KCK20B 150-550	KD1425 150-1500	KCU10 15-170	KB5625 45-230
general purpose (first choice for general machining)	KCP25B 110-365	KCU25 120-245	KCU10 60-245	KCU10 120-975	KCU10 15-135	KB5625 80-150
unfavourable conditions (roughing, poor machine condition, interrupted cuts, low speed, I.D. grooving)	KCU25 85-270	KCU25 90-210	KCU25 50-195	K313 40-610	KCU25 8-110	KB1630 45-120

Step 5 • Select insert and holder from catalogue page

NOTE: The insert size must match the gage insert size of your toolholder selection.

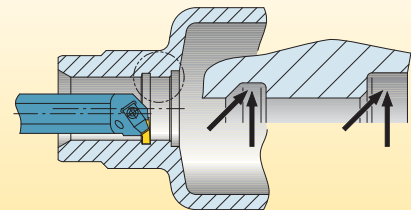
Example for Top Notch • Grooving

Material low-alloyed steel
 Groove depth 2mm (.079")
 Groove width 3mm (.118")
 Operation I.D. cut, limited speed capability,
 plunge groove and chamfer

Recommendation

Insert NG2M300RK
 Grade KC5025
 Insert width 3mm (.118")
 Insert size 2

 Toolholder A20QNTOL2 (metric)
 A12NEL2 (inch)
 Gage insert N.2R



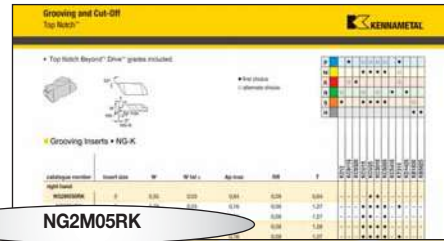
Speed: 120 m/min (400 SFM)
 Feed: 0,15 mm/rev (.006 in/rev)

Congratulations!

You have successfully maximised your productivity by selecting the best Top Notch insert geometry, grade, and cutting specifications for your application!

How Do Catalogue Numbers Work?

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



N	G		2	M	05	R		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 = Positive C = Groove and chamfer</p>		<p>M = Metric insert groove width C = Circlip groove insert width is nominal circlip size <input type="checkbox"/> = Blank indicates inch width insert</p>		<p>L = Left hand R = Right hand</p>	<p>Shown for groove and chamfer inserts in 0,01mm increments.</p>	<p>E = Hone only K = Standard chip control S = T Land and Hone ST = STD Tip (PcBN)</p>	<p>Groove size "J" or "L" for Poly-Vee inserts "I" indicates internal face grooving</p>													
	<p>B = Blank (for special forms) F = Face grooving G = Grooving P = Back R = Full radius U = Undercutting (or relieving) V = Poly-Vee</p>		<table border="1"> <thead> <tr> <th>insert number</th> <th>W1 mm</th> </tr> </thead> <tbody> <tr><td>1</td><td>2,54</td></tr> <tr><td>2</td><td>3,81</td></tr> <tr><td>3</td><td>4,95</td></tr> <tr><td>4</td><td>6,98</td></tr> <tr><td>5</td><td>9,65</td></tr> <tr><td>6</td><td>9,73</td></tr> </tbody> </table>	insert number	W1 mm	1	2,54	2	3,81	3	4,95	4	6,98	5	9,65	6	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 0,01mm.</p> <p>Metric example: 3,25mm width groove or radius equals "325" catalogue position number.</p> <p>Width Tolerance: ±0,025mm unless otherwise specified.</p>			
insert number	W1 mm																					
1	2,54																					
2	3,81																					
3	4,95																					
4	6,98																					
5	9,65																					
6	9,73																					

*Kennametal proprietary identification system.
 **Omit position for Top Notch NB-style blanks.

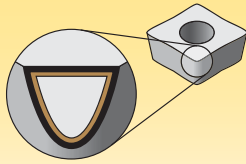
Top Notch Threading and Grooving Insert Dimensions

insert size	S mm	W1 mm
1	2,54	2,54
2	5,56	3,81
3	8,74	4,95
4	11,51	6,48
5	17,48	9,65
6	11,51	9,73
8	7,93	11,13

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.



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

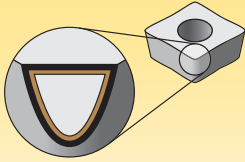
P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous
S	High-Temp Alloys
H	Hardened Materials

wear resistance ← → toughness

Grades

Coating		Grade Description		05	10	15	20	25	30	35	40	45
KCU10		<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 high-temp alloys with improved edge toughness, notch resistance, and higher cutting speed/feed capability.</p>	P									
			M									
KCU25		<p>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.</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									
KCP10B		<p>Composition: A specially engineered cobalt-enriched carbide grade with thick MTCVD TiCN-Al₂O₃-TiOCN coating for maximum wear resistance.</p> <p>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>	P									
			K									
KCP25B		<p>Composition: A tough cobalt-enriched carbide grade with a multilayer MTCVD TiCN-Al₂O₃-TiOCN 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 minimises microchipping and improves coating adhesion to substrate leading to long tool life and improved workpiece finishes.</p>	P									
			K									
KCK20B		<p>Composition: A specially toughened MTCVD TiCN-Al₂O₃-TiOCN coating over a wear-resistant substrate.</p> <p>Application: Specifically engineered to maximise coating adhesion and edge strength making this grade ideal in wet interrupted cutting of grey and ductile irons. It can be used in a wide range of applications from finishing to roughing to maximise productivity wherever strength and reliability are needed.</p>	P									
			K									





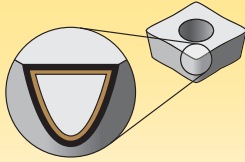
Coatings provide high-speed capability and are engineered for finishing to light roughing.

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

wear resistance ← → toughness

Grades

Coating	Grade Description		05	10	15	20	25	30	35	40	45	
K313	<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										
KC5010	<p>Composition: An advanced PVD AlTiN 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 high-temp alloys under stable conditions. It also performs well machining hardened and short chipping materials.</p>	P										
		M										
		K										
		N										
		S										
		H										
KC5025	<p>Composition: An advanced PVD-AlTiN-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										







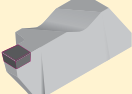














Coatings provide high-speed capability and are engineered for finishing to light roughing.

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

wear resistance ← → toughness

Grades

Coating	Grade Description		05	10	15	20	25	30	35	40	45	
KT315	<p>Composition: A multilayer 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										
		K										
KB1630	<p>Composition: An uncoated high content PcBN grade. PcBN tips are brazed onto a carbide insert.</p> <p>Application: Designed for roughing to finishing in interrupted cuts on hardened steels (>45 HRC). It can also be applied on grey cast iron, chilled irons, high chrome alloyed steels, high temp alloys and sintered powder metals. The tipped PcBN inserts are available in a wide range of insert styles, including Top Notch™ and Screw-On geometries.</p>	K										
		S										
		H										
KB5625	<p>Composition: A medium content PcBN with a PVD-TiN/AlTiN coating for added wear resistance.</p> <p>Application: Designed for roughing to finishing of hardened steels (>45 HRC). Use on bearing steels, hot and cold work steels, die steels, case hardened steels, carburised and nitrided irons, and some hard coatings.</p>	H										
KD1425	<p>Composition: A multimodal PCD grade with a range of grain sizes brazed onto a carbide substrate.</p> <p>Application: Engineered for extreme abrasion resistance, combined with good edge strength for demanding applications. An ideal choice for high-silicon aluminium alloys, bi-metallic (AL/GC) materials, MMC, carbon-fibre reinforced plastics, and other abrasive non-metallic materials.</p>	N										

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	C154	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	C160
NG-K 	<ul style="list-style-type: none"> • Chip control geometry. • General-purpose grooving. • O-ring grooving. • Circlip grooving. • Light turning. 	10° positive	C146	NP-K NPD-K 	<ul style="list-style-type: none"> • Turning. • Back turning positive. • Profiling with chip control. 	10° positive	C151
NG-ST 	<ul style="list-style-type: none"> • Hard turning. 	neutral	C163	NR 	<ul style="list-style-type: none"> • Full radius grooving. • Turning and profiling. 	neutral	C158
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	C152	NR-K 	<ul style="list-style-type: none"> • Chip control geometry. • Full radius grooving, turning, and profiling. 	10° positive	C150
NGD 	<ul style="list-style-type: none"> • Deep grooving. 	neutral	C157	NRD 	<ul style="list-style-type: none"> • Deep grooving. • Full radius end-form. 	neutral	C159
NGD-K 	<ul style="list-style-type: none"> • Chip control geometry. • Deep grooving. • Light turning. 	10° positive	C149	NRP 	<ul style="list-style-type: none"> • Full radius grooving. • Light-turning profiling. 	5° positive	C153
NGP 	<ul style="list-style-type: none"> • General-purpose grooving. • O-ring grooving. • Circlip grooving. 	5° positive	C152	NU 	<ul style="list-style-type: none"> • Undercutting. 	neutral	C161
NF 	<ul style="list-style-type: none"> • Face grooving. • Additional side clearance. 	neutral	C161	NV 	<ul style="list-style-type: none"> • Poly-Vee grooving. 	neutral	C162
NF-K 	<ul style="list-style-type: none"> • Face grooving with chip control. • Additional side clearance. 	10° positive	C159	NB/NBD 	<ul style="list-style-type: none"> • Blanks. • Blanks for deep grooving. • Available in uncoated grades only. 	—	C162–C163
NFD-K 	<ul style="list-style-type: none"> • Deep face grooving with chip control. • Additional side clearance. 	10° positive	C160				

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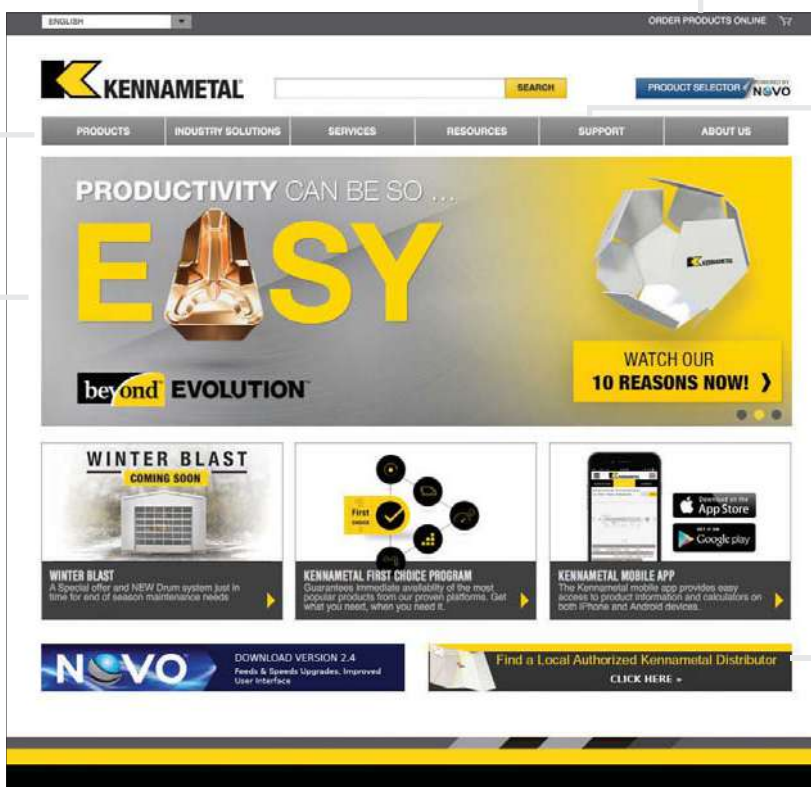
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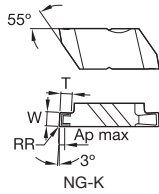
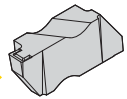


Grooving and Cut-Off

Top Notch™ Groove and Turn Inserts



- Top Notch Beyond Drive™ grades included.



- first choice
- alternate choice

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

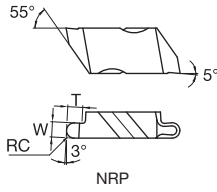
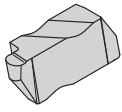
Grooving and Cut-Off

■ Groove and Turn • Chip Control

catalogue number	insert size	W	W tol ±	Ap max	RR	T	KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313	KC5010	KC5025	KT315	KB1630	KB6625	KD1425	
right hand																			
NG2M050RK	2	0,50	0,03	0,64	0,09	0,64	●	●	-	●	-	-	-	-	-	-	-	-	-
NG2031RK	2	0,79	0,03	0,76	0,09	1,27	●	●	●	●	-	-	●	●	●	-	-	-	-
NG2M080RK	2	0,80	0,03	0,76	0,09	1,27	●	●	●	●	-	-	-	-	-	-	-	-	-
NG2M100RK	2	1,00	0,03	0,76	0,09	1,28	●	●	●	●	-	-	●	●	●	-	-	-	-
NG2047RK	2	1,19	0,03	0,76	0,09	1,27	●	●	●	●	-	-	●	●	●	-	-	-	-
NG2M120RK	2	1,20	0,03	0,76	0,09	1,27	●	●	●	●	-	-	●	●	●	-	-	-	-
NG2M140RK	2	1,40	0,03	0,76	0,09	1,28	●	●	●	●	-	-	●	●	●	-	-	-	-
NG2M150RK	2	1,50	0,03	1,09	0,19	2,79	-	●	●	●	-	-	●	●	●	-	-	-	-
NG2062RK	2	1,56	0,03	1,09	0,19	2,79	●	●	●	●	-	-	●	●	●	-	-	-	-
NG2M170RK	2	1,70	0,03	1,09	0,19	2,79	●	●	●	●	-	-	●	●	●	-	-	-	-
NG2M175RK	2	1,75	0,03	1,09	0,19	2,81	-	●	●	●	-	-	-	-	-	-	-	-	-
NG2M195RK	2	1,95	0,03	1,09	0,19	2,79	●	●	●	●	-	-	●	●	●	-	-	-	-
NG2M200RK	2	2,00	0,03	1,09	0,19	2,79	●	●	●	●	-	-	●	●	●	-	-	-	-
NG2M220RK	2	2,20	0,03	1,09	0,19	2,79	-	●	●	●	-	-	●	●	●	-	-	-	-
NG2M225RK	2	2,25	0,03	1,09	0,19	2,81	●	●	●	●	-	-	●	●	●	-	-	-	-
NG2094RK	2	2,39	0,03	1,09	0,19	2,79	●	●	●	●	-	-	●	●	●	-	-	-	-
NG2M250RK	2	2,50	0,03	1,09	0,19	2,79	-	●	●	●	-	-	●	●	●	-	-	-	-
NG2M275RK	2	2,75	0,03	1,09	0,19	2,79	●	●	●	●	-	-	●	●	●	-	-	-	-
NG2M300RK	2	3,00	0,03	1,09	0,19	2,79	●	●	●	●	-	-	●	●	●	-	-	-	-
NG2125RK	2	3,18	0,03	1,09	0,19	2,79	●	●	●	●	-	-	●	●	●	-	-	-	-
NG2M320RK	2	3,20	0,03	1,09	0,19	2,79	-	-	-	-	-	-	-	-	-	-	-	-	-
NG2M325RK	2	3,25	0,03	1,09	0,19	2,79	-	●	●	●	-	-	●	●	●	-	-	-	-
NG3M100RK	3	1,00	0,03	0,76	0,20	1,91	-	●	●	●	-	-	●	●	●	-	-	-	-
NG3047RK	3	1,19	0,03	0,76	0,19	1,91	●	●	●	●	-	-	●	●	●	-	-	-	-
NG3M120RK	3	1,20	0,03	0,76	0,19	1,91	●	●	●	●	-	-	●	●	●	-	-	-	-
NG3M150RK	3	1,50	0,03	1,02	0,19	2,39	-	●	●	●	-	-	●	●	●	-	-	-	-
NG3062RK	3	1,58	0,03	1,02	0,19	2,39	●	●	●	●	-	-	●	●	●	-	-	-	-
NG3M175RK	3	1,75	0,03	1,02	0,19	2,39	-	●	●	●	-	-	●	●	●	-	-	-	-
NG3072RK	3	1,83	0,03	1,02	0,19	2,39	●	●	●	●	-	-	●	●	●	-	-	-	-
NG3078RK	3	1,98	0,03	1,02	0,19	2,39	●	●	●	●	-	-	●	●	●	-	-	-	-
NG3M200RK	3	2,00	0,03	1,02	0,19	2,39	-	●	●	●	-	-	●	●	●	-	-	-	-
NG3M220RK	3	2,20	0,03	1,02	0,19	2,39	-	●	●	●	-	-	●	●	●	-	-	-	-
NG3M225RK	3	2,24	0,03	1,02	0,19	2,39	●	●	●	●	-	-	●	●	●	-	-	-	-
NG3094RK	3	2,39	0,03	1,02	0,19	3,81	●	●	●	●	-	-	●	●	●	-	-	-	-
NG3M250RK	3	2,50	0,03	1,02	0,19	3,81	-	●	●	●	-	-	●	●	●	-	-	-	-

(continued)

- Full radius positive rake inserts.



- first choice
- alternate choice

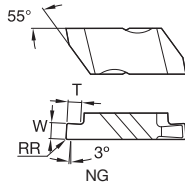
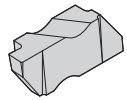
	P	M	K	N	S	H	KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425	
P	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
M	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
K	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
N	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
S	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
H	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

■ Groove and Turn • Full Radius • Positive

catalogue number	insert size	W	Ap max	RC	T	KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425	
right hand																		
NRP3031R	3	1,58	—	0,79	2,39	●	—	—	—	—	—	●	—	—	—	—	—	—
NRP3047R	3	2,39	—	1,19	3,81	●	—	—	—	—	—	●	—	—	—	—	—	—
NRP3062R	3	3,18	—	1,59	3,81	●	—	—	—	—	—	●	—	—	—	—	—	—
NRP3094R	3	4,78	—	2,39	3,81	●	—	—	—	—	—	●	—	—	—	—	—	—
left hand																		
NRP3031L	3	1,58	—	0,79	2,39	●	—	—	—	—	—	●	—	—	—	—	—	—
NRP3047L	3	2,39	—	1,19	3,81	●	—	—	—	—	—	●	—	—	—	—	—	—
NRP3062L	3	3,18	—	1,59	3,81	—	—	—	—	—	—	●	—	—	—	—	—	—
NRP3094L	3	4,78	—	2,39	3,81	●	—	—	—	—	—	●	—	—	—	—	—	—

NOTE: Right-hand insert shown; left-hand insert is mirror image.





● first choice
○ alternate choice

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

Grooving and Cut-Off

Groove and Turn • Flat Top

catalogue number	insert size	W	W tol ±	Ap max	RR	T	KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425	
right hand																			
NG2031R	2	0,79	0,03	—	0,09	1,27	●	●	—	—	●	●	●	●	—	—	—	—	—
NG2041R	2	1,04	0,03	—	0,09	1,27	●	●	—	—	●	●	●	●	—	—	—	—	—
NG2047R	2	1,19	0,03	—	0,09	1,27	●	●	—	—	●	—	—	—	—	—	—	—	—
NG2058R	2	1,47	0,03	—	0,19	1,27	—	●	—	—	—	—	—	●	—	—	—	—	—
NG2062R	2	1,58	0,03	—	0,19	2,79	●	●	—	—	●	●	●	●	—	—	—	—	—
NG2094R	2	2,39	0,03	—	0,19	2,79	●	●	—	—	●	●	●	●	—	—	—	—	—
NG2125R	2	3,18	0,03	—	0,19	2,79	●	●	—	—	—	—	●	—	—	—	—	—	—
NG3047R	3	1,19	0,03	—	0,19	1,91	●	●	—	—	●	●	●	●	—	—	—	—	—
NG3062R	3	1,58	0,03	—	0,19	2,39	●	●	—	—	●	●	●	●	—	—	—	—	—
NG3072R	3	1,83	0,03	—	0,19	2,39	●	—	—	—	●	—	●	—	—	—	—	—	—
NG3078R	3	1,98	0,03	—	0,19	2,39	●	—	—	—	●	—	●	—	—	—	—	—	—
NG3088R	3	2,24	0,03	—	0,19	2,39	●	●	—	—	●	—	●	—	—	—	—	—	—
NG3094R	3	2,39	0,03	—	0,19	3,81	●	●	—	—	●	●	●	●	—	—	—	—	—
NG3097R	3	2,46	0,03	—	0,32	3,81	●	●	—	—	●	—	●	—	—	—	—	—	—
NG3105R	3	2,67	0,03	—	0,19	3,81	●	●	—	—	●	—	●	●	—	—	—	—	—
NG3110R	3	2,79	0,03	—	0,32	3,81	—	●	—	—	—	—	—	●	—	—	—	—	—
NG3122R	3	3,10	0,03	—	0,19	3,81	—	●	—	—	—	—	—	—	—	—	—	—	—
NG3125R	3	3,18	0,03	—	0,19	3,81	●	●	—	—	●	●	●	●	—	—	—	—	—
NG3142R	3	3,61	0,03	—	0,32	3,81	—	●	—	—	—	—	●	—	—	—	—	—	—
NG3156R	3	3,96	0,03	—	0,19	3,81	●	●	—	—	●	—	●	●	—	—	—	—	—
NG3178R	3	4,52	0,03	—	0,19	3,81	—	—	—	—	—	—	—	●	—	—	—	—	—
NG3185R	3	4,70	0,03	—	0,57	3,81	—	●	—	—	—	—	—	—	—	—	—	—	—
NG3189R	3	4,80	0,03	—	0,57	3,81	—	●	—	—	—	—	—	—	—	—	—	—	—
NG4125R	4	3,18	0,03	—	0,19	3,81	●	●	—	—	●	●	—	—	—	—	—	—	—
NG4189R	4	4,80	0,03	—	0,57	6,35	●	●	—	—	●	●	—	—	—	—	—	—	—
NG4213R	4	5,41	0,03	—	0,19	6,35	—	●	—	—	—	—	—	—	—	—	—	—	—
NG4250R	4	6,35	0,03	—	0,57	6,35	●	●	—	—	●	—	●	●	—	—	—	—	—
NG5312R	5	7,93	0,03	—	0,83	9,52	—	●	—	—	—	—	—	—	—	—	—	—	—
NG6375R	6	9,53	0,03	—	0,83	6,35	—	●	—	—	—	—	—	—	—	—	—	—	—

(continued)

(Groove and Turn • Flat Top — continued)

● first choice
○ alternate choice

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

catalogue number	insert size	W	W tol ±	Ap max	RR	T	KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425	
left hand																			
NG1031L	1	0,79	0,08	—	0,19	1,27	—	●	—	—	—	—	—	—	—	—	—	—	—
NG1047L	1	1,19	0,08	—	0,19	1,91	—	●	—	—	—	—	—	●	—	—	—	—	—
NG1062L	1	1,58	0,08	—	0,19	1,91	—	●	—	—	—	—	—	●	—	—	—	—	—
NG1094L	1	2,39	0,08	—	0,19	1,91	—	●	—	—	—	—	—	●	—	—	—	—	—
NG2031L	2	0,79	0,03	—	0,09	1,27	●	●	—	●	●	●	—	—	—	—	—	—	—
NG2041L	2	1,04	0,03	—	0,09	1,27	—	●	—	—	●	—	●	●	—	—	—	—	—
NG2047L	2	1,19	0,03	—	0,09	1,27	●	●	—	—	—	—	●	—	—	—	—	—	—
NG2058L	2	1,47	0,03	—	0,19	1,27	—	●	—	—	—	—	—	—	—	—	—	—	—
NG2062L	2	1,58	0,03	—	0,19	2,79	●	●	—	—	●	●	●	●	—	—	—	—	—
NG2094L	2	2,39	0,03	—	0,19	2,79	●	●	—	—	—	—	●	●	—	—	—	—	—
NG2125L	2	3,18	0,03	—	0,19	2,79	●	●	—	—	—	—	●	—	—	—	—	—	—
NG3047L	3	1,19	0,03	—	0,19	1,91	●	●	—	—	●	●	—	—	—	—	—	—	—
NG3062L	3	1,57	0,03	—	0,19	2,38	●	●	—	—	●	●	●	●	—	—	—	—	—
NG3072L	3	1,83	0,03	—	0,19	2,39	●	—	—	—	—	—	●	—	—	—	—	—	—
NG3078L	3	1,98	0,03	—	0,19	2,39	●	—	—	—	—	—	—	—	—	—	—	—	—
NG3088L	3	2,24	0,03	—	0,19	2,39	●	●	—	—	—	—	●	—	—	—	—	—	—
NG3094L	3	2,39	0,03	—	0,19	3,81	●	●	—	—	●	●	●	●	—	—	—	—	—
NG3097L	3	2,46	0,03	—	0,32	3,81	●	●	—	—	—	—	—	—	—	—	—	—	—
NG3105L	3	2,67	0,03	—	0,19	3,81	●	●	—	—	—	—	●	—	—	—	—	—	—
NG3110L	3	2,79	0,03	—	0,32	3,81	—	●	—	—	—	—	—	●	—	—	—	—	—
NG3122L	3	3,10	0,03	—	0,19	3,81	—	●	—	—	—	—	—	—	—	—	—	—	—
NG3125L	3	3,18	0,03	—	0,19	3,81	●	●	—	—	●	●	●	●	—	—	—	—	—
NG3142L	3	3,61	0,03	—	0,32	3,81	●	●	—	—	—	—	—	—	—	—	—	—	—
NG3156L	3	3,96	0,03	—	0,19	3,81	—	●	—	—	—	—	—	●	—	—	—	—	—
NG3178L	3	4,52	—	—	0,19	3,81	—	●	—	—	—	—	—	—	—	—	—	—	—
NG3185L	3	4,70	0,03	—	0,57	3,81	—	—	—	—	—	—	—	●	—	—	—	—	—
NG3189L	3	4,80	0,03	—	0,57	3,81	●	●	—	—	●	—	●	●	—	—	—	—	—
NG4125L	4	3,18	0,03	—	0,19	3,81	●	●	—	—	—	●	—	—	—	—	—	—	—
NG4189L	4	4,80	0,03	—	0,57	6,35	●	●	—	—	●	—	●	—	—	—	—	—	—
NG4189LEST	4	4,80	0,03	—	0,57	6,35	—	—	—	—	—	—	—	—	—	●	—	—	—
NG4250L	4	6,35	0,03	—	0,57	6,35	●	●	—	—	●	—	●	—	—	—	—	—	—

NOTE: All KD and KB grades are single-ended tipped inserts.
Right-hand insert shown; left-hand insert is mirror image.



Grooving and Cut-Off

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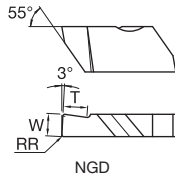
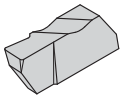
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○ alternate choice

	P	M	K	N	S	H	KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425	
P	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
M	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
K	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
N	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
S	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
H	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

Grooving and Cut-Off

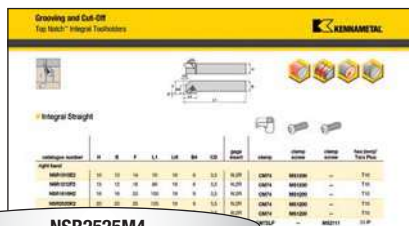
■ Groove and Turn • Deep Grooving • Flat Top

catalogue number	insert size	W	W tol ±	Ap max	RR	T	KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425
right hand																		
NGD3189R	3	4,80	0,03	—	0,57	6,35	●	-	-	-	-	●	-	-	-	-	-	-
NGD4250R	4	6,35	0,03	—	0,57	12,70	●	-	-	-	-	●	-	-	-	-	-	-
left hand																		
NGD3189L	3	4,80	0,03	—	0,57	6,35	●	-	-	-	-	●	●	-	-	-	-	-
NGD4250L	4	6,35	0,03	—	0,57	12,70	●	-	-	-	-	●	●	-	-	-	-	-

NOTE: Inserts have one cutting edge.
Right-hand insert shown; left-hand insert is mirror image.

How Do Catalogue Numbers Work?

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



NSR2525M4

N

Insert Holding Method



N = Top Notch*

S

Insert Mounting Location

R

Hand of Tool

Drop Head

2525

Shank Size

M

Tool Length

4

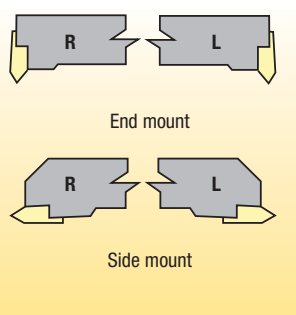
Insert Size

Qualified Surface and Length

Q = Qualified metric holder

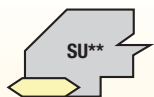
L1	ISO
32	A
40	B
50	C
60	D
70	E
80	F
90	G
100	H
110	J
125	K
140	L
150	M
160	N
170	P
180	Q
200	R
250	S
300	T
350	U
400	V
450	W
500	Y
Special Length	X

insert size	T mm
2	3,81
3	4,95
4	6,98
5	9,65
6	9,73
8	11,13



Metric:

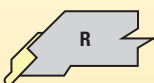
Shank height and width in millimetre and holder length according to ISO standard.



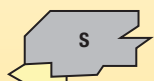
SU = Side mount utility



E = End



R = Undercut



S = Side mount, offset



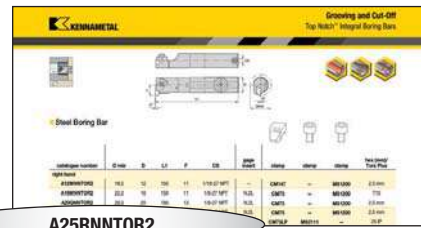
AS = Side mount, no offset

* Kennametal proprietary standard only.

** Side mount utility holder can only use NTU inserts.

How Do Catalogue Numbers Work?

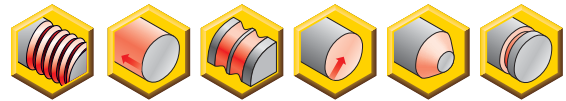
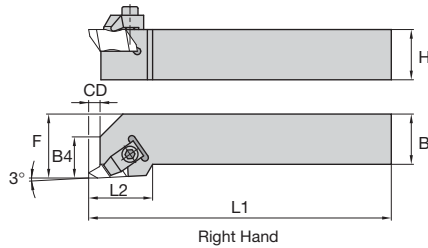
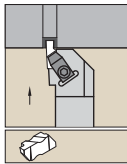
Each character in our catalogue number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.



A25RNNNTOR2

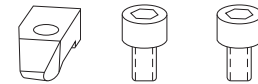
A	25	R	N	N	T	0	R	2																
Bar Type	Bar Diameter	Bar Length	Insert Holding Method	Insert Shape	Insert Location	Rake Angle	Hand of Bar	Insert Size																
 A = Steel with coolant	 Bar diameter in millimetres	 L = Length in millimetres	 N* = Top Notch	 E = End mount	 S = Straight mount	 R = Right hand L = Left hand	 R = Right hand L = Left hand	 T = Insert size in millimetres																
 H = Interchangeable head	metric bars: K = 125mm M = 150mm Q = 180mm R = 200mm S = 250mm T = 300mm U = 350mm		 S = Straight mount		 T = Insert size in millimetres																			
						<table border="1"> <thead> <tr> <th>insert size</th> <th>T mm</th> </tr> </thead> <tbody> <tr><td>1</td><td>3,54</td></tr> <tr><td>2</td><td>3,81</td></tr> <tr><td>3</td><td>5,35</td></tr> <tr><td>4</td><td>6,40</td></tr> <tr><td>5</td><td>9,65</td></tr> <tr><td>6</td><td>9,73</td></tr> <tr><td>8</td><td>11,13</td></tr> </tbody> </table>			insert size	T mm	1	3,54	2	3,81	3	5,35	4	6,40	5	9,65	6	9,73	8	11,13
insert size	T mm																							
1	3,54																							
2	3,81																							
3	5,35																							
4	6,40																							
5	9,65																							
6	9,73																							
8	11,13																							

*Kennametal standard only.



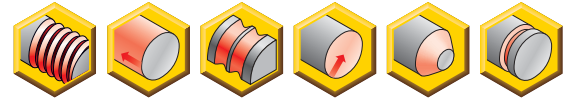
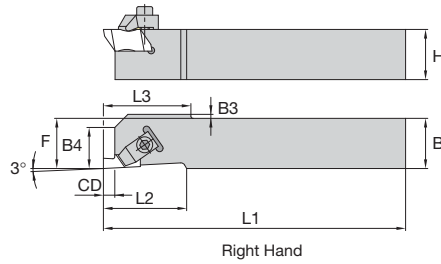
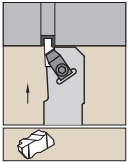
Grooving and Cut-Off

■ Integral Straight



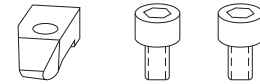
order number	catalogue number	H	B	F	L1	LH	B4	CD	gage insert	clamp	clamp screw	clamp screw	hex (mm)/ Torx Plus
right hand													
1098790	NSR1010E2	10	10	14	70	19	9	3,5	N.2R	CM74	MS1200	—	T10
1098791	NSR1212F2	12	12	16	80	19	9	3,5	N.2R	CM74	MS1200	—	T10
1098792	NSR1616H2	16	16	20	100	19	9	3,5	N.2R	CM74	MS1200	—	T10
1098793	NSR2020K2	20	20	25	125	19	9	3,5	N.2R	CM74	MS1200	—	T10
1098794	NSR2525M2	25	25	32	150	19	9	3,5	N.2R	CM74	MS1200	—	T10
1098795	NSR2020K3	20	20	25	125	32	13	5,3	N.3R	CM72LP	—	MS2111	25 IP
1098796	NSR2525M3	25	25	32	150	32	13	5,3	N.3R	CM72LP	—	MS2111	25 IP
1098797	NSR3225P3	32	25	32	170	32	13	5,3	N.3R	CM72LP	—	MS2111	25 IP
1098798	NSR3232P3	32	32	40	170	32	13	5,3	N.3R	CM72LP	—	MS2111	25 IP
1098799	NSR2525M4	25	25	32	150	35	14	7,5	N.4R	CM72LP	—	MS2111	25 IP
1098800	NSR3225P4	32	25	32	170	35	14	7,5	N.4R	CM72LP	—	MS2111	25 IP
1098801	NSR3232P4	32	32	40	170	35	14	7,5	N.4R	CM72LP	—	MS2111	25 IP
left hand													
1098861	NSL1010E2	10	10	14	70	19	9	3,5	N.2L	CM75	MS1200	—	T10
1098862	NSL1212F2	12	12	16	80	19	9	3,5	N.2L	CM75	MS1200	—	T10
1098863	NSL1616H2	16	16	20	100	19	9	3,5	N.2L	CM75	MS1200	—	T10
1098864	NSL2020K2	20	20	25	125	19	9	3,5	N.2L	CM75	MS1200	—	T10
1098865	NSL2525M2	25	25	32	150	19	9	3,5	N.2L	CM75	MS1200	—	T10
1098866	NSL2020K3	20	20	25	125	32	13	5,3	N.3L	CM73LP	—	MS2111	25 IP
1098867	NSL2525M3	25	25	32	150	32	13	5,3	N.3L	CM73LP	—	MS2111	25 IP
1098868	NSL3225P3	32	25	32	170	32	13	5,3	N.3L	CM73LP	—	MS2111	25 IP
1098869	NSL3232P3	32	32	40	170	32	13	5,3	N.3L	CM73LP	—	MS2111	25 IP
1098870	NSL2525M4	25	25	32	150	35	14	7,5	N.4L	CM73LP	—	MS2111	25 IP
1098871	NSL3225P4	32	25	32	170	35	14	7,5	N.4L	CM73LP	—	MS2111	25 IP
1098872	NSL3232P4	32	32	40	170	35	14	7,5	N.4L	CM73LP	—	MS2111	25 IP

NOTE: F dimension measured over sharp point of N-style threading insert.



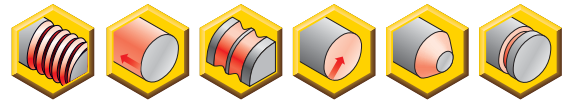
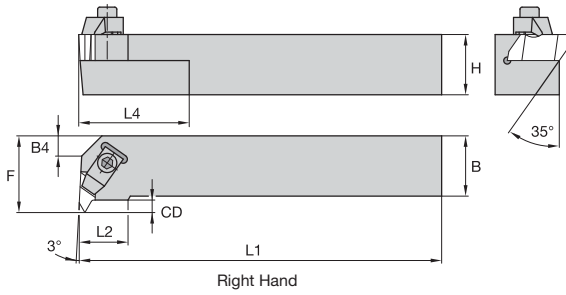
Grooving and Cut-Off

■ Integral Straight • No Offset

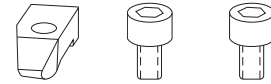


order number	catalogue number	H	B	F	L1	LH	B4	CD	B3	L3	gage insert	clamp	clamp screw	clamp screw	hex (mm)/ Torx Plus
right hand															
1098788	NASR1010M2Q	10	10	10	150	19	9	3,5	2,03	19	N.2R	CM182	MS1200	—	T10
1098789	NASR1212M2Q	12	12	12	150	19	9	3,5	—	—	N.2R	CM182	MS1200	—	T10
1098786	NASR1616K3Q	16	16	16	125	32	13	5,3	—	—	N.3R	CM184LP	—	MS2111	25 IP
left hand															
1098859	NASL1010M2Q	10	10	10	150	19	9	3,5	2,03	19	N.2L	CM183	MS1200	—	T10
1098860	NASL1212M2Q	12	12	12	150	19	9	6,9	—	—	N.2L	CM183	MS1200	—	T10
1098857	NASL1616K3Q	16	16	16	125	32	13	5,3	—	—	N.3L	CM185LP	—	MS2111	25 IP

NOTE: F dimension measured over sharp point of N-style threading insert.

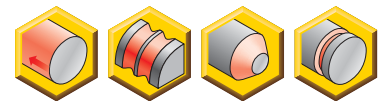
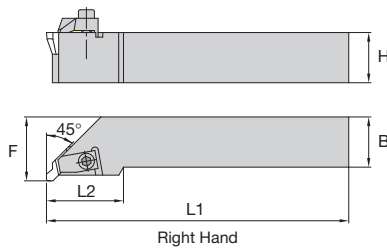
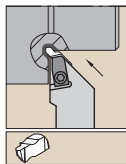


■ Integral End Mount

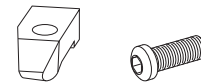


order number	catalogue number	H	B	F	L1	LH	CD	gage insert	clamp	clamp screw	clamp screw	Torx/ Torx Plus
right hand												
1098803	NER1616H2	16	16	20	100	15	3,5	N.2L	CM75	MS1200	—	T10
1098804	NER2020K2	20	20	25	125	15	3,5	N.2L	CM75	MS1200	—	T10
1098805	NER2525M2	25	25	32	150	15	3,5	N.2L	CM75	MS1200	—	T10
1098806	NER2525M3	25	25	32	150	22	5,3	N.3L	CM73LP	—	MS2111	25 IP
1098807	NER3225P3	32	25	32	170	22	3,8	N.3L	CM73LP	—	MS2111	25 IP
1098808	NER2525M4	25	25	35	150	24	6,4	N.4L	CM73LP	—	MS2111	25 IP
1098809	NER3225P4	32	25	35	170	24	6,4	N.4L	CM73LP	—	MS2111	25 IP
1098810	NER3232P4	32	32	40	170	24	6,4	N.4L	CM73LP	—	MS2111	25 IP
left hand												
1098874	NEL1616H2	16	16	20	100	15	3,5	N.2R	CM74	MS1200	—	T10
1098875	NEL2020K2	20	20	25	125	15	3,5	N.2R	CM74	MS1200	—	T10
1098876	NEL2525M2	25	25	32	150	15	3,5	N.2R	CM74	MS1200	—	T10
1098877	NEL2525M3	25	25	32	150	22	5,3	N.3R	CM72LP	—	MS2111	25 IP
1098878	NEL3225P3	32	25	32	170	22	3,8	N.3R	CM72LP	—	MS2111	25 IP
1098879	NEL2525M4	25	25	35	150	24	6,4	N.4R	CM72LP	—	MS2111	25 IP
1098880	NEL3225P4	32	25	35	170	24	6,4	N.4R	CM72LP	—	MS2111	25 IP
1098881	NEL3232P4	32	32	40	170	24	6,4	N.4R	CM72LP	—	MS2111	25 IP

NOTE: F dimension measured over sharp point of N-style threading insert.

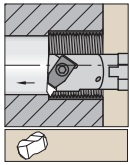


■ Integral 45° Undercut • Metric

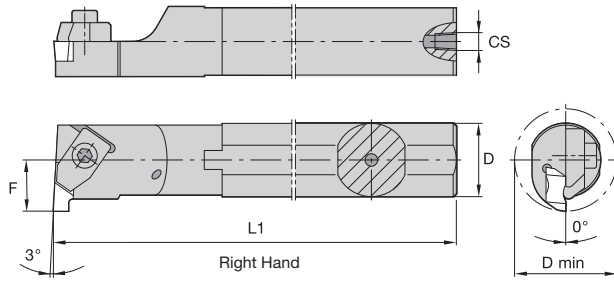


order number	catalogue number	H	B	F	L1	LH	gage insert	clamp	clamp screw	hex (mm)/ Torx Plus
right hand										
1098812	NRR2020K3	20	20	25	125	32	NU3125L	CM73LP	MS2111	25 IP
1098813	NRR2525M3	25	25	32	150	32	NU3125L	CM73LP	MS2111	25 IP
1098814	NRR3225P3	32	25	32	170	32	NU3125L	CM73LP	MS2111	25 IP
left hand										
1098883	NRL2020K3	20	20	25	125	32	NU3125R	CM72LP	MS2111	25 IP
1098884	NRL2525M3	25	25	32	150	32	NU3125R	CM72LP	MS2111	25 IP
1098885	NRL3225P3	32	25	32	170	32	NU3125R	CM72LP	MS2111	25 IP

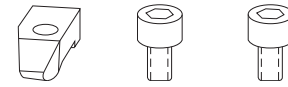
NOTE: NR-style toolholders are compatible with "NU" style inserts only.



Steel shank with through coolant.



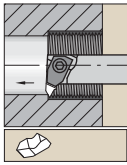
■ Steel Boring Bar • Metric



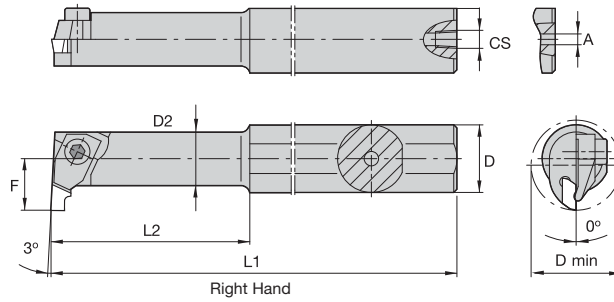
order number	catalogue number	D min	D	L1	F	CS	gage insert	clamp	clamp screw	clamp screw	hex (mm)/ Torx Plus
right hand											
1098945	A12MNNTOR2	18,5	12	150	11	1/16-27 NPT	—	CM147	—	MS1200	2.5 mm
1098947	A16MNNTOR2	22,0	16	150	11	1/8-27 NPT	N.2L	CM75	—	MS1200	T10
1098949	A20QNNTOR2	26,0	20	180	13	1/8-27 NPT	N.2L	CM75	—	MS1200	2.5 mm
1098951	A25RNNTOR2	34,0	25	200	17	1/4-18 NPT	N.2L	CM75	—	MS1200	2.5 mm
1098953	A25RNNTOR3	34,0	25	200	17	1/8 - 27 NPT	N.3L	CM73LP	MS2111	—	25 IP
1098955	A32SNNTOR3	44,0	32	250	22	1/4-18 NPT	N.3L	CM73LP	MS2111	—	25 IP
1098957	A40TNNTOR3	54,0	40	300	27	1/4-18 NPT	N.3L	CM73LP	MS2111	—	25 IP
1099001	A40TNNTOR4	54,0	40	300	27	1/4-18 NPT	N.4L	CM73LP	MS2111	—	25 IP
1099003	A50UNNTOR4	70,0	50	350	35	1/4-18 NPT	N.4L	CM73LP	MS2111	—	25 IP
left hand											
1098946	A12MNNTOL2	18,5	12	150	11	1/16-27 NPT	NG2R	CM146	—	MS1200	2.5 mm
1098948	A16MNNTOL2	22,0	16	150	11	1/8-27 NPT	N.2R	CM74	—	MS1200	T10
1098950	A20QNNTOL2	26,0	20	180	13	1/8-27 NPT	NG2R	CM74	—	MS1200	2.5 mm
1098952	A25RNNTOL2	34,0	25	200	17	1/4-18 NPT	N.2R	CM74	—	MS1200	2.5 mm
1098954	A25RNNTOL3	34,0	25	200	17	1/4-18 NPT	N.3R	CM72LP	MS2111	—	25 IP
1098956	A32SNNTOL3	44,0	32	250	22	1/4-18 NPT	N.3R	CM72LP	MS2111	—	25 IP
1098958	A40TNNTOL3	54,0	40	300	27	1/4-18 NPT	N.3R	CM72LP	MS2111	—	25 IP
1099002	A40TNNTOL4	54,0	40	300	27	1/4-18 NPT	N.4R	CM72LP	MS2111	—	25 IP

NOTE: Minimum bore capability varies with depth of groove. See page C172 for details.

Grooving and Cut-Off



Necked steel shank with through coolant.

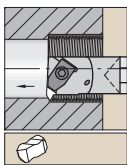


■ **Steel Boring Bar • Small ID • Metric**

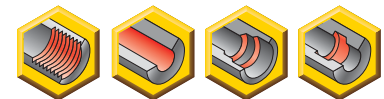
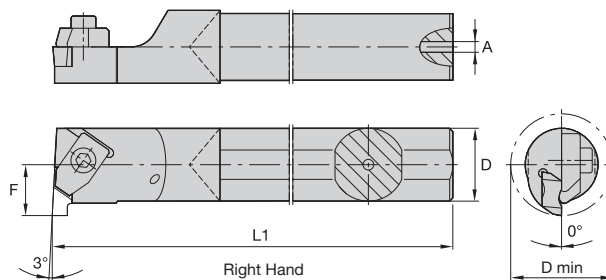


order number	catalogue number	D min	D	D2	L1	L2	F	A	CS	gage insert	clamp	clamp screw	hex (mm)
right hand													
1098944	A12MNNTOR1	11,5	12	10,0	150	31,30	7	4,0	1/16-27 NPT	N.1L	CM109	MS1034	1.5 mm
1098943	A10KNNTOR1	11,5	10	10,0	125	—	7	3,2	—	NG1L	CM109	MS1034	1.5 mm

NOTE: Minimum bore capability varies with depth of groove. See page C172 for details.



Carbide shank with through coolant.

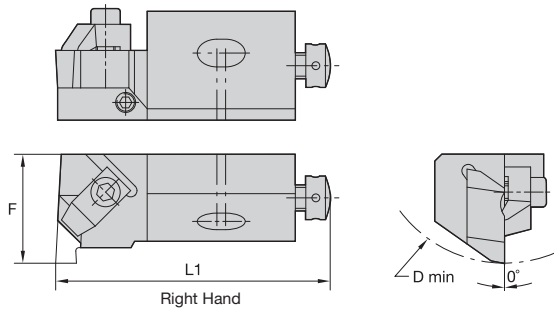
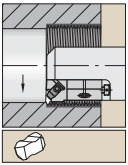


■ **Carbide Boring Bar**



order number	catalogue number	D min	D	L1	F	A	gage insert	clamp	clamp screw	Torx/ Torx Plus
right hand										
1152834	E16RNNTOR2	22,0	16	200	11	5,537	N.2L	CM75	MS1200	T10
1152836	E20SNNTOR2	26,0	20	250	13	7,137	N.2L	CM75	MS1200	T10
left hand										
1152835	E16RNNTOL2	22,0	16	200	11	5,537	N.2R	CM74	MS1200	T10

NOTE: Minimum bore capability varies with depth of groove. See page C172 for details.



Grooving and Cut-Off

Steel Boring Cartridge



order number	catalogue number	D min	F	L1	gage insert	clamp	clamp screw	hex (mm)	radial adjusting screw	hex (mm)	axial screw	hex (mm)	washer
right hand													
1098380	NER12CA2	50	20	55,7	N.2L	CM75	MS1025	2.5 mm	KUAM23	2.5 mm	KUAM31	2.5 mm	CSWM 060 050
left hand													
1098624	NEL12CA2	50	20	55,0	N.2R	CM74	MS1025	2.5 mm	KUAM23	2.5 mm	KUAM31	2.5 mm	CSWM 060 050
1098626	NEL25CA3	100	32	100,0	N.3R	CM72LP	MS412	4 mm	KUAM26	4 mm	KUAM33	4 mm	CSWM 100 080

NOTE: Minimum bore diameter (D min) capability varies with thread type and pitch. See page C172 for details.
F dimension measured over sharp point of Top Notch-style threading insert.

Machining Guidelines for Chip Control • Grooving

When the proper cutter diameter is not available, proper cutter positioning will provide positive results.

- Centre height of insert should be positioned at the centre of the workpiece or up to 0,13mm (.005") 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 0,08–0,3 mm/rev (.003–.012 IPR).

Groove Limits (Maximum Internal Groove Depth vs. Minimum Bore Diameter)

insert catalogue number	maximum internal groove depth mm	minimum bore diameter mm
NG-1094L	1,91	20,32
—	1,02	11,18
NG-2031R/L	1,27	18,54
NG-2041R/L	—	—
NG-2047R/L	—	—
NG-2058R/L	—	—
—	2,79	63,50
NG-2062R/L	2,59	44,45
NG-2094R/L	2,49	38,10
NG-2125R/L	2,03	25,40
—	1,40	18,54
NG-3047R/L	—	—
NG-3062R/L	2,39	44,45
NG-3072R/L	2,29	41,28
NG-3078R/L	1,91	34,93
NG-3088R/L	—	—
NG-3094R/L	—	—
NG-3097R/L	3,81	60,33
NG-3105R/L	—	—
NG-3110R/L	3,68	53,98
NG-3122R/L	—	—
NG-3125R/L	3,51	47,63
NG-3142R/L	—	—
NG-3156R/L	3,18	41,28
NG-3178R/L	—	—
NG-3185R/L	2,79	34,93
NG-3189R/L	—	—
NG-4125R/L	3,81	69,85
—	6,35	146,05
NG-4189R/L	6,22	127,00
NG-4213R/L	6,10	114,30
NG-4219R/L	5,54	82,55
NG-4250R/L	5,08	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.

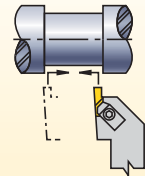
Machining Guidelines for Chip Control • Turning/Profiling

Maximum depth of cut for side cutting (turning/profiling) depends on the material being cut and the width of the tool.

- 0,79–1,6mm (.031–.062") wide insert can cut up to 0,6mm (.025" deep).
- 1,7–3,3mm (.067–.128") wide insert can cut up to 1mm (.040" deep).
- 3,5–4,8mm (.138–.189") wide insert can cut up to 2mm (.080" deep).
- 5–6,35mm (.197–.250") wide insert can cut up to 3mm (.120" deep).

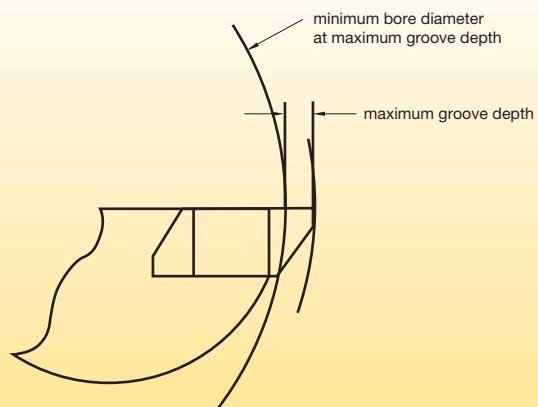
Finish Turning the Groove

1. Plunge both sides of groove width.
2. Plunge centre area to remove web of material remaining.
3. To avoid insert chipping and to achieve groove wall perpendicularity, follow the tool path outlined.
4. Use the lightest depth of cut that still allows good chipbreaking, tool life, and surface finish.



insert catalogue number	maximum internal groove depth mm	minimum bore diameter mm
—	9,53	731,82
NG-5250R/L	9,17	401,62
NG-5281R/L	8,74	274,62
NG-5312R/L	8,31	185,72
NG-5344R/L	7,47	122,22
NG-5375R/L	6,53	90,47
—	5,46	71,42
NG-6250R/L	6,35	146,05
NG-6281R/L	6,22	127,00
NG-6312R/L	6,10	114,30
NG-6344R/L	5,54	82,55
NG-6375R/L	5,08	63,50

Internal Groove Depth versus Bar Interference



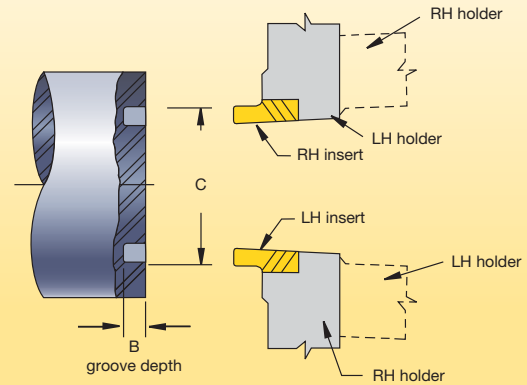
NOTE: Internal grooving depth limits are a function of bar clearance versus bore diameters.

■ Machining Guidelines for Face Grooving Operations • External

Standard NF/NDF Inserts

insert family	maximum groove depth "B"	minimum groove diameter "C"
	mm	mm
NF-3	1,52	23,90
NF-3	2,39	30,50
NF-3	3,18	36,10
NF-3	3,81	41,30
NFD-3	6,35	47,60
NF-4/6	1,52	23,90
NF-4/6	2,39	30,50
NF-4/6	3,18	36,10
NF-4/6	3,81	41,30
NF-4/6	4,78	47,60
NF-4/6	6,35	57,20
NFD-4	9,53	57,20
NFD-4	12,70	57,20

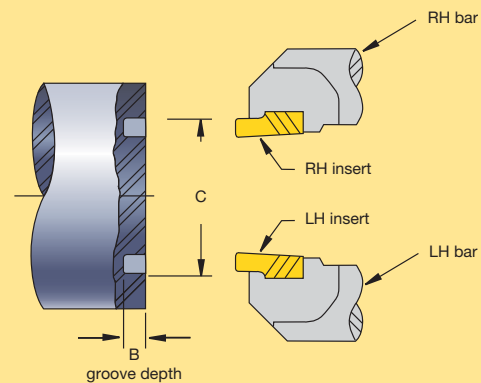
Toolholders



Standard NG/NGD Inserts

insert family	maximum groove depth "B"	minimum groove diameter "C"
	mm	mm
NG-2	1,27	54,0
NG-2	2,79	88,9
NG-3	2,39	101,6
NG-3	3,18	127,0
NG-3	3,81	139,7
NGD-3	6,35	174,6
NG-4	3,81	152,4
NG-4	6,35	209,6
NGD-4	9,53	222,3
NGD-4	12,70	222,3
NG-5	9,53	333,0

Boring Bars

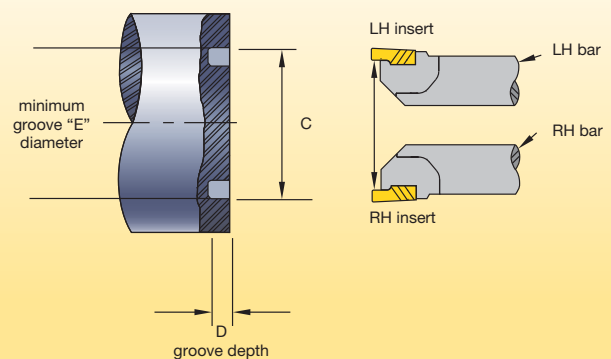


■ Machining Guidelines for Face Grooving Operations • Internal

insert family	maximum groove depth "D"	minimum groove diameter "E"
	mm	mm
NFD-3-KI	6,35	57,2

NOTE: For internal applications, use only NFD-KI inserts.

Boring Bars



■ 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 centre as possible.
- Dwell time in bottom of groove should be less than three revolutions.
- Recommended cutting speed and feeds are a starting point. Adjust, as necessary, for optimum tool life and chip control.

Definitions and Guidelines

1. Width of cut (W) = width of the insert.
2. Lead angle = 0° (neutral); 6° (RH or LH).

Reduce bur of cut-off faces:

- Use lead angle-type inserts (Figures 1 and 2). Lead angle on a cut-off insert reduces the bur that remains on the part but decreases tool life and increases tool side deflection and possibly cycle time.
- If 0° lead angle is mandatory, use the narrowest possible cut-off insert and blade. This will minimise the centre stub or cut-off bur length.

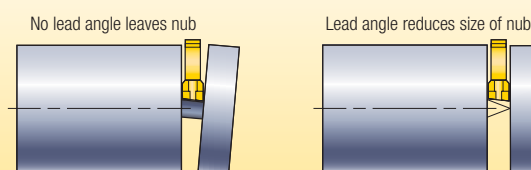
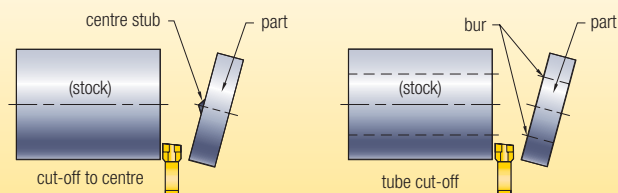


Figure 1

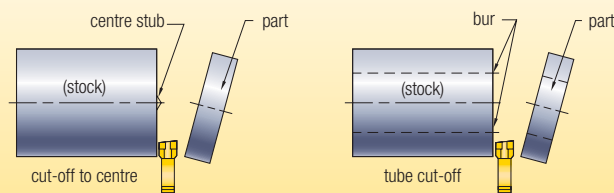
Insert selection **left-hand lead**



Left-hand lead insert leaves centre stub or bur on part and produces clean stock surface.

Figure 2

Insert selection **right-hand lead**



Reduces nub but decreases tool life and productivity

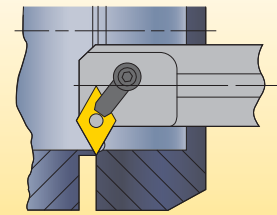
Right-hand lead insert leaves centre stub or bur on stock and produces clean part surface.

- Check total height and maintain on centre with part diameter.
- The cutting edge height should be within $\pm 0,1\text{mm}$ (.004") to the centre; recommended cutting position is 0,05mm (.002") above centre.

■ Tubing

- On tubing-type parts that require a chamfer on the I.D., align I.D. chamfer tool with cut-off surface. This will enable the chamfering operation to actually separate the part from the bar (see Figure 3). Note the part may drop onto the chamfering bar, which, in this case, will act like a catcher for the part.

Figure 3

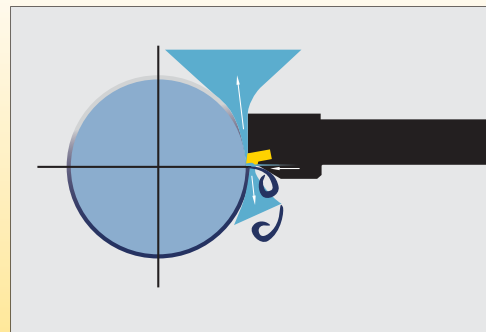


Internal chamfer line up

Improve surface finish of cut-off faces:

- Use insert with 0° lead angle.
- Increase coolant flow or improve application technique, as shown in Figure 4.
- 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 4

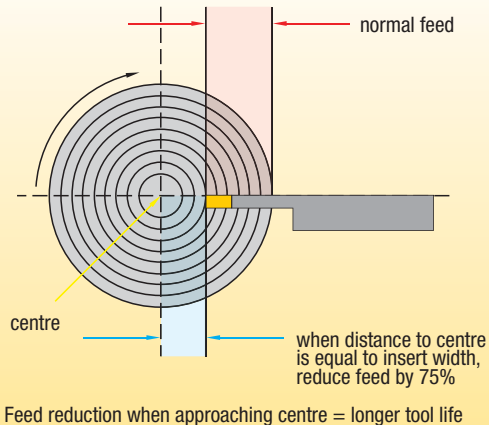


Preferred method for applying coolant

- 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.

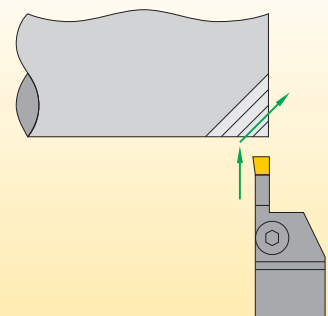
■ Programming Guidelines

Feed reduction in cut-off



Chamfering

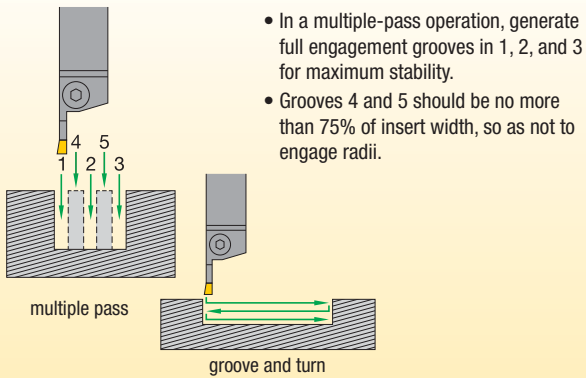
Chamfering with a grooving tool reduced machine index time and tool stations.



(continued)

■ Programming Guidelines (continued)

Pocketing



- In a multiple-pass operation, generate full engagement grooves in 1, 2, and 3 for maximum stability.
- Grooves 4 and 5 should be no more than 75% of insert width, so as not to engage radii.

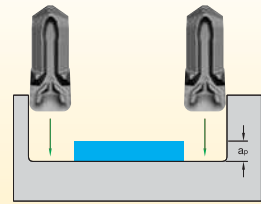
If pocket is deeper than wide = multiple pass

If pocket is wider than deep = groove and turn

Square Pocket

Steps 1 and 2

Plunge the radius and wall on each side to open up two grooves.



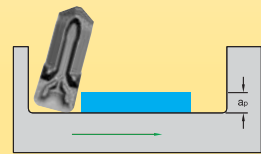
Step 3

Retract tool 0,1mm; this is necessary to create a flat bottom.



Step 4

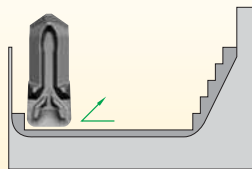
Side turn. This tool is designed to deflect, creating the necessary front clearance.



Profile Pocket

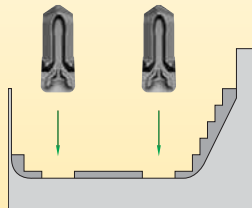
Step 1

Rough to have about the same amount of stock left on all surfaces for finish.



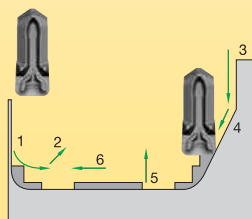
Step 2

Open up two grooves away from wall and radius.



Step 3

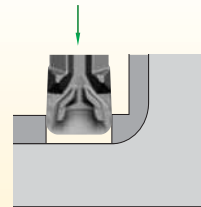
(1 and 2) Finish wall and radius.
(3 and 4) Finish wall, angle, and radius on opposite side of pocket.
(5) Retract tool 0,1mm (.004").
(6) Side turn to finish the floor of the pocket.



Generating a Radius

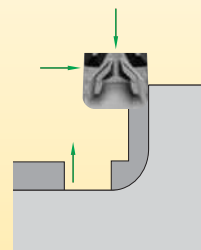
Step 1

Open up a groove away from the radius.



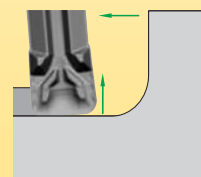
Step 2

Retract and move the material on the wall and generate the radius. By generating the groove in the prior step, only one surface is engaged at a time, reducing the risk of vibrations.



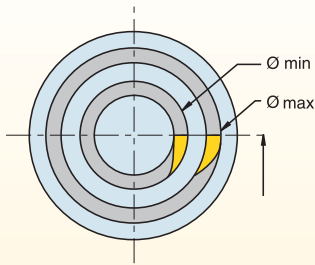
Step 3

Retract the tool 0,1mm (.004") and then side turn.



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

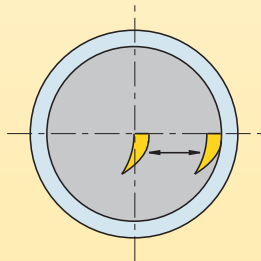
- The outside diameter of the first groove must be between the diameter minimum and diameter maximum capability of the face grooving tool (see illustration above). This creates clearance for the toolholder.

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 centre 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

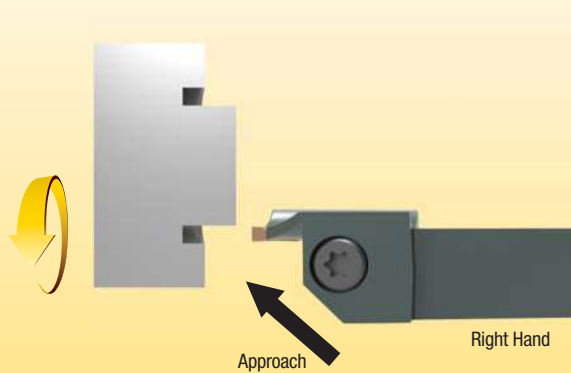
problem	remedy
bur	<ol style="list-style-type: none"> 1. Verify tool centre height. 2. Use sharp tools (index more often). 3. Use positive rake PVD coated insert. 4. Use correct grade for workpiece material. 5. Use correct geometry (e.g., positive rake for workhardening material). 6. Change tool path.
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 centre 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 centre 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).

Steps to proper face grooving tool selection

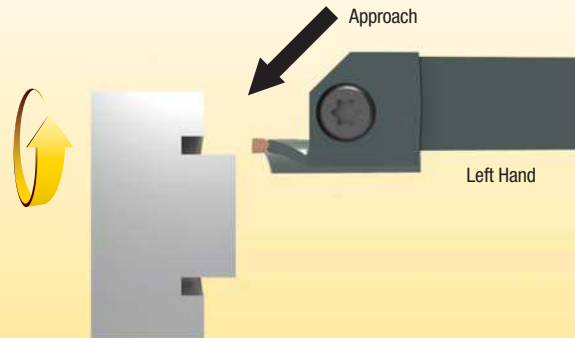
- Step 1: Select your spindle rotation
- Step 2: Select your angle of approach and toolholder orientation

Integral Tooling

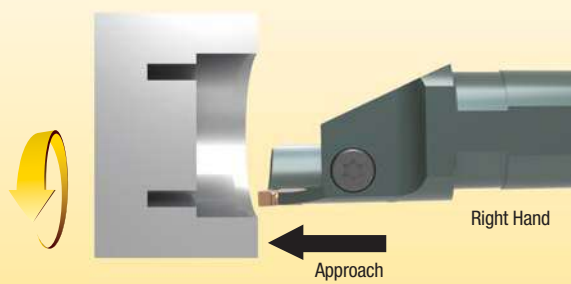
Anti-Clockwise Rotation
Square Shank



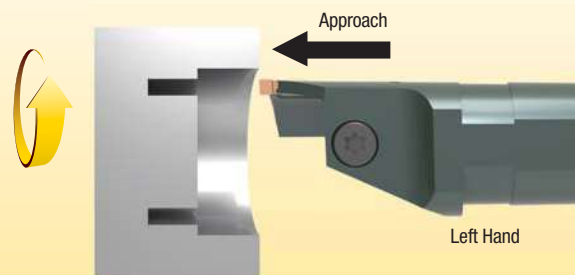
Clockwise Rotation
Square Shank



Boring Bar



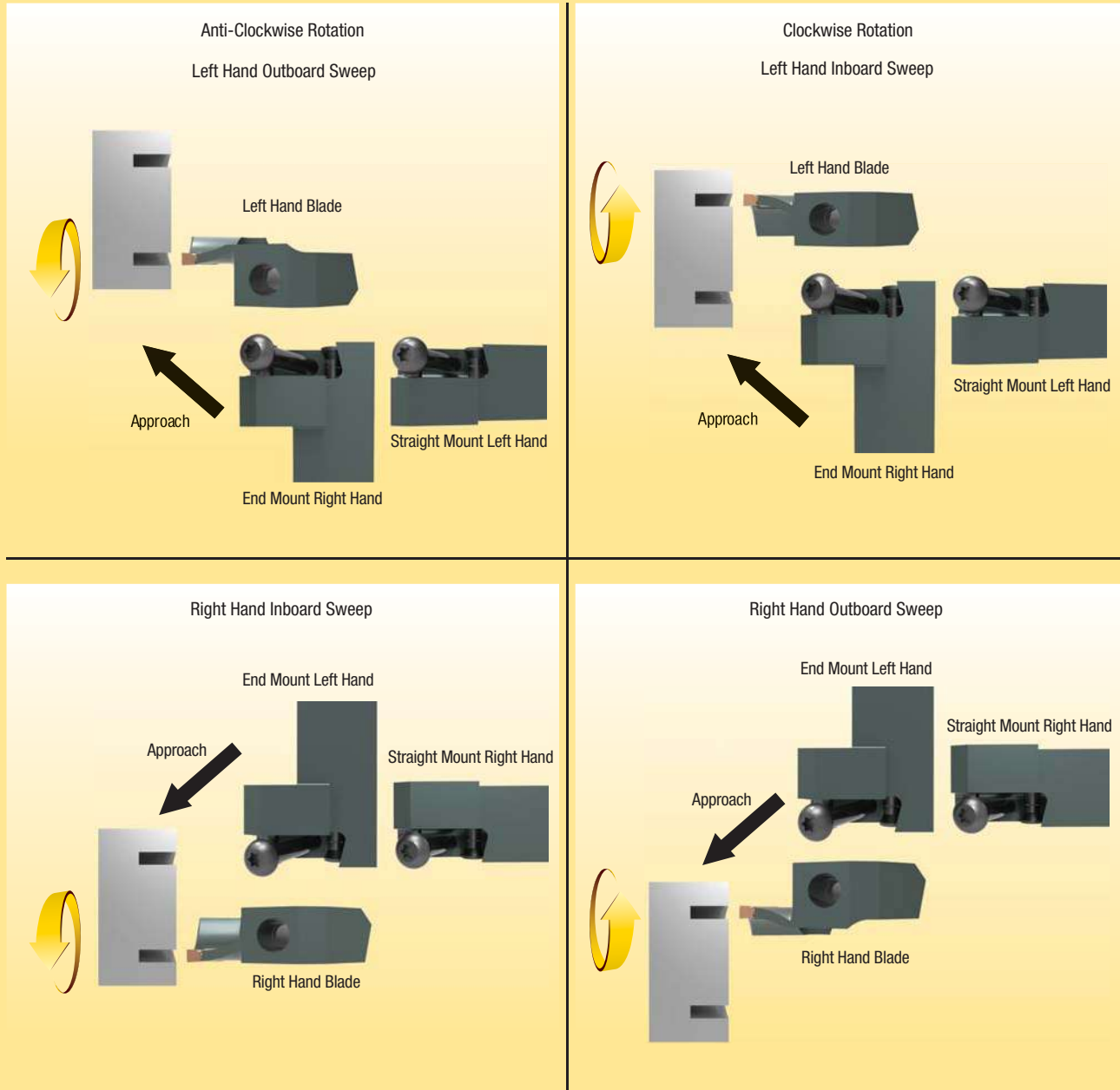
Boring Bar

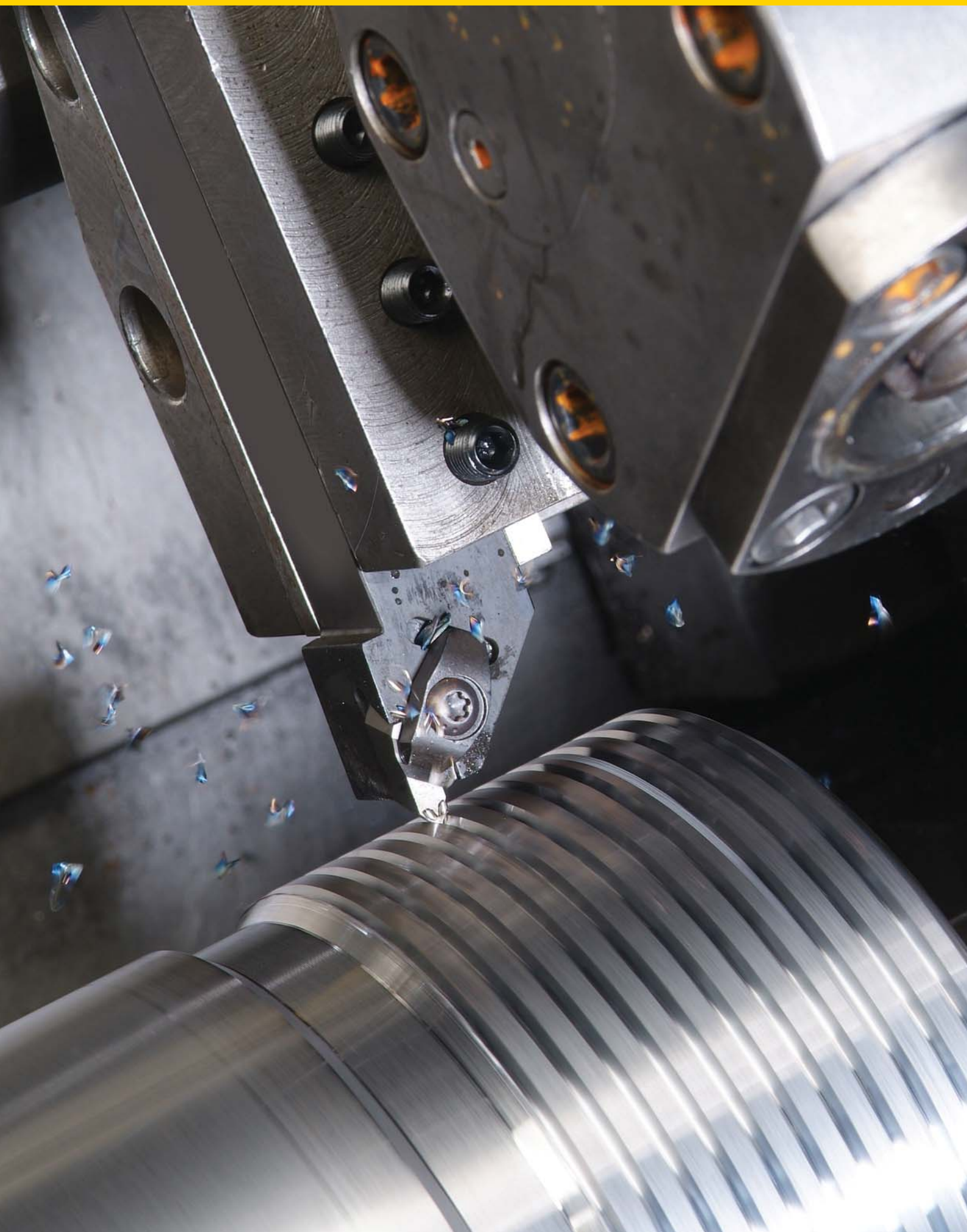


Steps to proper modular face grooving tool selection

- Step 1: Select your spindle rotation
- Step 2: Select your angle of approach and toolholder orientation
- Step 3: Identify combination of blade and shank tool

Modular Tooling

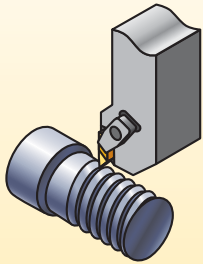




Threading

Threading Application Guide.....	D2-D3
Top Notch Threading	D4-D43
Laydown Threading.....	D44-D87
Threading Technical Information.....	D88-D110

**Top Notch
External
Threading**



Square Shank Toolholder Sizes:

- Metric — 10–32mm

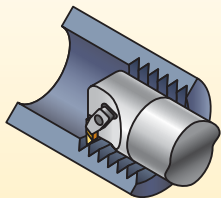
Cresting (Full Profile):

- UN TPI of 32–7
- ISO 1,5–3,0mm pitch

**60° Partial Profile — Flat Top
(NTF and NTK):**

- UN 44–4.5 TPI
- ISO 0,6–5,5mm pitch

**Top Notch
Internal
Threading**



Boring Bar Diameters:

- Metric — 10–50mm
- Minimum bore — 11,5mm
- Steel

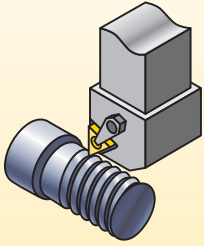
Cresting (Full Profile):

- UN 16–8 TPI
- ISO 1,5–3,0mm pitch

**60° Partial Profile — Flat Top
(NT-1L, NTF, and NTK):**

- UN 24–4.5 TPI
- ISO 1,0–5,5mm pitch

**LT Laydown
External
Threading**



Square Shank Toolholder Sizes:

- Metric — 8–40mm available

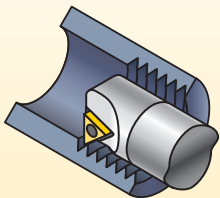
Cresting (Full Profile):

- UN 48–8 TPI
- ISO 0,5–5,0mm pitch

60° Partial Profile:

- UN 48–4 TPI
- ISO 0,5–6,0mm pitch

**LT Laydown
Internal
Threading**



Boring Bar Diameters:

- Metric — 12–50mm
- Minimum bore — 13mm
- Steel and carbide

**Cresting (Full Profile)
and Partial Profile:**

- UN 48–8 TPI
- ISO 0,5–5,0mm pitch

60° Partial Profile:

- UN 48–4 TPI
- ISO 0,5–6,0mm pitch

55° Partial Profile:

- UN 48–5 TPI
- ISO 0,5–5,0mm pitch

➤ Top Notch™ Thread Tooling

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.

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.
- Reduce 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.

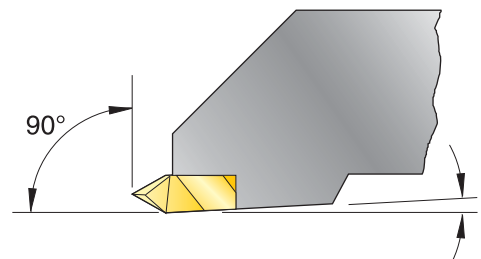


Top Notch inserts are available in KCU10™ and KCU25™ grades to withstand the demands placed on the cutting edge of the threading insert.

The versatility of the Top Notch™ steel enables you to use both threading and grooving inserts in the same toolholder.

Precision-Ground Thread Form

- Minimises built-up edge.
- Precisely cuts most common materials.
- Reduces cutting forces.
- Ensures accurate high-quality threads.



NOTE: Holders are designed to locate inserts inclined to 3° to provide back clearance down open side.

Superior Chip Control

- Eliminates long, troublesome coils.
- Excellent for internal threading operations.
- Available in partial profile inserts for 60° thread forms.

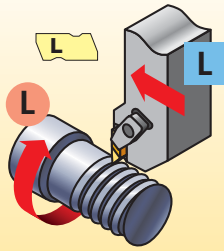
Step 1 • Select Threading Method and Hand of Tooling

Required Information:

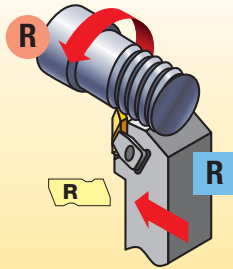
- External/internal operation.
- Spindle rotation/hand of thread.
- Feed direction.



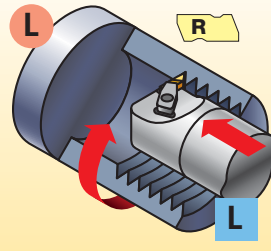
Feed direction toward the chuck • RECOMMENDED



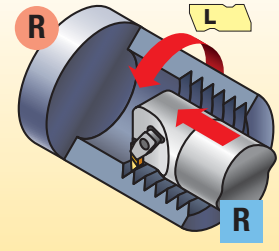
external left-hand thread



external right-hand thread

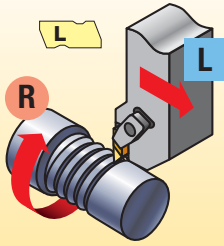


internal left-hand thread

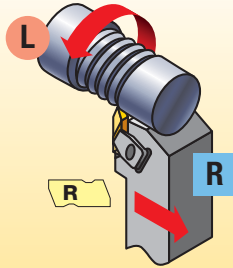


internal right-hand thread

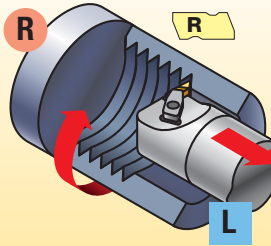
Feed direction away from the chuck



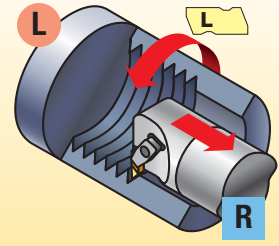
external right-hand thread



external left-hand thread



internal right-hand thread



internal left-hand thread

Step 2 • Select Holder from Catalogue Page

The insert size must match the gage insert size of your toolholder selection:

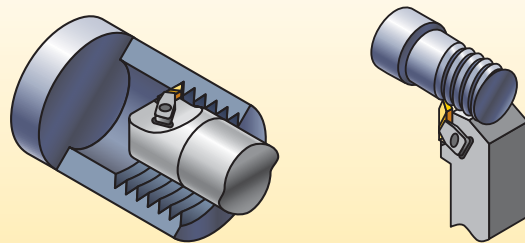
Required Information:

- External/internal operation.
- Minimum bore diameter (for internal operations).
- Hand of tool.
- Insert size (gage insert).

catalogue 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: Optimise your threading operation by using the proper infeed method and the recommended infeed values.

See the technical section on pages D88–D110 of this catalogue. For internal threading, minimum bore varies depending on thread type. See page D102 for details.

Step 3 • Choose Insert for Application

- See threading insert overview on page D11.
- 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.
- Note insert size for toolholder selection.

	insert size	catalogue number	KCU25/ KC5025	KCU10/ KC5010
	2	NT-2RK	•	•
	3	NT-3RK	•	•
	4	NT-4RK	•	•

Step 4 • Select Grade and Speed

Recommendations for Grade and Speed Selection — m/min

workpiece material	steel	stainless steel	cast iron	non-ferrous metals	high-temp alloys
insert style	chip control or neutral	chip control or positive	neutral	positive	positive
optimum cutting conditions	KCU10/KC5010 70–260	KCU10/KC5010 90–245	KCU10/KC5010 60–245	KC5410 90–550	KCU10/KC5010 30–150
first choice	KCU25/KC5025 50–230	KCU25/KC5025 75–230	KCU25/KC5025 50–180	KCU25/KC5025 60–455	KCU25/KC5025 20–120

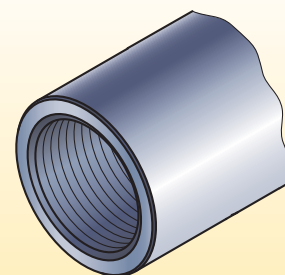
Examples:

- Chip Control:** NT-K or NT-CK (partial profile only)
Neutral: NT, NT-C, NTF, NTC, NJ, NJF, NDC-V, NA, NDC, NTB-A/B
Positive: NTP, NTK, NJP, NJK

Top Notch Threading Example:

application: 8 TPI Acme internal right-hand thread
material: alloy steel
workpiece diameter: 114,3mm
 good cutting conditions feed towards the chuck

Recommendation:
insert: NA3L8
grade: KCU10
insert size: 3
boring bar: A40NER3
gage insert: N.3L
speed: 150 m/min
infeed passes*: 12 passes



*Infeed recommendations provided in technical data section on pages D97–D101.

Recommended Starting Speeds [m/min]

Threading

Material Group		K68			KCU10/KC5010			KCU25/KC5025			KC5410		
P	0-1	-	-	-	135	200	260	105	165	230	-	-	-
	2	-	-	-	130	190	245	100	150	200	-	-	-
	3	-	-	-	105	155	200	75	125	170	-	-	-
	4	-	-	-	70	120	160	60	95	130	-	-	-
	5	-	-	-	105	155	200	75	130	170	-	-	-
	6	-	-	-	70	120	160	50	90	130	-	-	-
M	1	45	75	105	120	180	245	90	170	230	-	-	-
	2	35	65	100	90	165	210	75	140	200	-	-	-
	3	35	65	100	90	165	210	75	135	200	-	-	-
K	1	30	75	120	120	180	245	90	135	180	-	-	-
	2	25	60	100	90	150	210	70	120	170	-	-	-
	3	20	55	90	60	105	150	50	85	120	-	-	-
N	1-2	90	245	365	150	365	550	120	305	455	245	425	610
	3	45	75	105	90	135	180	60	105	150	90	150	210
	4	60	120	180	120	305	455	100	200	305	120	305	455
	5	45	90	150	90	165	245	70	135	195	120	210	305
	6	35	75	120	120	210	305	100	170	245	120	245	365
	S	1	8	25	45	30	70	105	20	40	60	-	-
2		8	24	40	30	65	100	20	35	45	-	-	-
3		8	24	40	30	65	100	20	35	45	-	-	-
4		9	60	105	55	105	150	45	85	120	-	-	-
H	1	-	-	-	30	45	60	-	-	-	-	-	-
	2	-	-	-	15	30	45	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-	-	-	-	-

NOTE: FIRST choice starting speeds are in **bold** type.

NOVO KNOWS CAD/CAM

With the addition of NOVO™ applications to your team, your CAD/CAM capabilities become much more accurate, streamlined, and productive.

Before NOVO: The programmer would be in their CAD/CAM software, programming a part. Using the tedious method of finding a tool in a catalogue, and then manually inputting the tooling information from the catalogue into the CAD/CAM software.

The concern is that assumptions are made, and only partial tooling information is entered.

With NOVO: The powerful digital intelligence of NOVO applications not only help the programmer find the right tool for the metalcutting job, but also automatically integrates all the tooling data into a complete CAD/CAM solution. The integration of all the tooling data increases the viability of the part being programmed, and is delivered quickly — saving you time.

NOVO applications can ensure you have the right tools on your machines, in the right sequence. Resulting in flawless execution that accelerates every job, and maximises every shift. kennametal.com/novo



How Do Catalogue Numbers Work?

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

NDC38RDR75

N

Type of Insert

N — Top Notch*



D

Insert

C

Additional Information

- B** — Buttress
- F** — Fine pitch
- S** — Stub Acme
- C** — Cresting
- P** — Positive rake
- K** — Fine pitch, positive

3

Insert Size

8RD

Industry Thread Identification

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

R

Hand of Insert

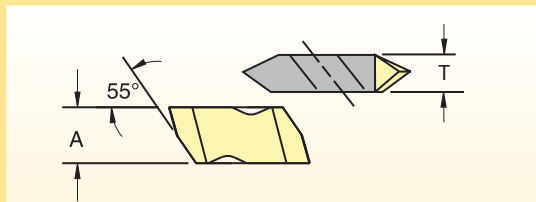
- R** — Right hand
- L** — Left hand

75

Definition of Insert

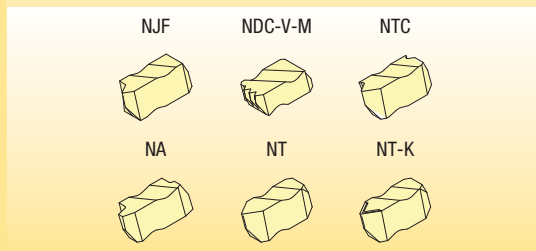
Additional Information

- A** — Acme
- D** — API or NPT
- J** — UNJ thread
- T** — 60° V thread
- W** — 55° V Whitworth



Top Notch insert dimensions

insert size	A mm	T mm
1	2,54	2,54
2	5,56	3,81
3	8,74	4,95
4	11,51	6,48
5	17,48	9,65
6	11,51	9,73
8	7,93	11,13

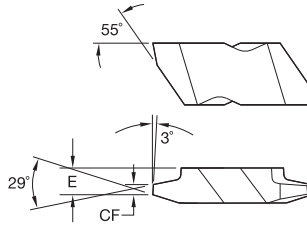
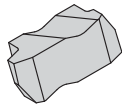
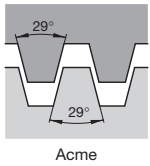


- Threads per inch or pitch (for metric)
- "A" or "B" type Buttress insert
- Taper per foot — API threads

- 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

*Kennametal proprietary standard only.

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.	D19, D24
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.	D21
	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.	D23
	NTU		Partial Profile 60° — fine pitch	—	—	N	Four-edged insert for 60° partial profile threading — requires NSU-style toolholder for size 4U insert.	D24
	NTC-M		Metric ISO	ISO R262, DIN 13	6g/6H	Y	Widely used metric 60° V-form for all industries.	D21
	NTC		American UN	ANSI B1.1:74	2A/2B	Y	Widely used inch-based 60° V-form for all industries.	D20
	NJ	NJP	UNJ	MIL-S-8879C	3A/3B	N	Controlled root radius on external threads for military and aerospace industries.	D17–D18
	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.	D17–D18
	NDC-V		NPT	ANSI/ACME B1.201:1983	Standard NPT	Y	National Pipe Thread standard forms for pipe fittings.	D16
	NDC-V-M		NPT — multi-tooth	ANSI/ACME B1.201:1983	Standard NPT	Y	High-productivity multi-tooth threading inserts for NPT threads.	D16
	NWC-E		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.	D25
	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.	D14
	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.	D14
	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.	D15
	NDC-RD-M		API Round — multi-tooth	API STD. 5B:1979	Standard API RD	Y	High productivity multitooth threading inserts for API round threads.	D15
	NA		Acme	ANSI B1.5:1988	3G	N	29° truncated thread form for motion applications in a wide variety of industries.	D12
	NAS		Stub Acme	ANSI B1.8:1988	2G	N	Shallow depth 29° truncated thread form for motion applications in a wide variety of industries.	D13
	NTB-A		American Buttress — 7° clearance 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° clearance flank is the leading flank.	D19
	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 flank.	D20



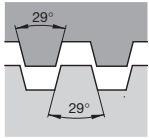
● first choice
○ alternate choice

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

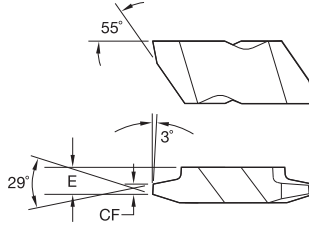
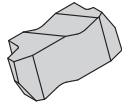
Threading

■ NA

catalogue number	insert size	RC	E	CF	TPI	K68	KCU10	KCU25	KC5010	KC5025	KC5410
right hand											
NA3R10	3	—	3,79	0,810	10	—	●	●	●	●	—
NA3R12	3	—	3,79	0,719	12	—	●	—	—	●	—
NA3R16	3	—	3,79	0,523	16	—	●	—	—	—	—
NA3R4	3	—	3,38	2,222	4	—	—	●	●	●	—
NA3R5	3	—	3,79	1,750	5	—	●	●	●	●	—
NA3R6	3	—	3,79	1,438	6	—	●	●	●	●	—
NA3R8	3	—	3,79	1,044	8	—	●	●	●	●	—
NA4R4	4	—	5,13	2,223	4	—	—	●	●	●	—
NA4R5	4	—	5,13	1,750	5	—	—	—	—	●	—
NA4R6	4	—	5,13	1,438	6	—	—	—	—	●	—
NA6R25	6	—	7,19	3,635	2.5	—	—	—	—	●	—
NA6R2	6	—	7,19	4,577	2	—	●	●	●	●	—
NA6R3	6	—	7,19	3,007	3	—	—	●	—	●	—
left hand											
NA3L8	3	—	3,79	1,044	8	—	●	●	●	●	—
NA3L10	3	—	3,79	0,810	10	—	—	●	—	●	—
NA3L12	3	—	3,79	0,719	12	—	—	—	●	●	—
NA3L4	3	—	3,38	2,222	4	●	●	●	●	●	—
NA3L5	3	—	3,79	1,750	5	—	—	●	●	●	—
NA3L6	3	—	3,79	1,438	6	—	—	●	●	●	—
NA4L5	4	—	5,13	1,750	5	—	—	—	—	●	—
NA4L6	4	—	5,13	1,438	6	—	—	—	—	●	—
NA4L8	4	—	5,13	1,044	8	—	—	●	—	—	—
NA4L4	4	—	5,13	2,223	4	—	●	—	—	●	—
NA6L3	6	—	7,19	3,007	3	—	—	●	—	●	—
NA6L25	6	—	7,19	3,635	2.5	—	—	●	—	—	—
NA6L2	6	—	7,19	4,577	2	—	—	●	●	●	—
NA3L16	3	—	3,79	0,523	16	—	●	—	—	—	—



Stub Acme



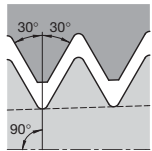
● first choice
○ alternate choice

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

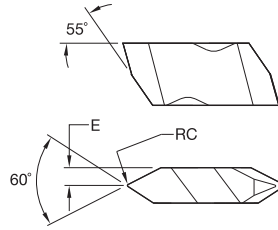
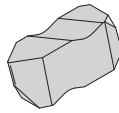
NAS

catalogue number	insert size	RC	E	CF	TPI	K68	KCU10	KCU25	KC5010	KC5025	KC5410
right hand											
NAS3R10	3	—	3,79	0,940	10	—	●	—	●	●	—
NAS3R12	3	—	3,79	0,828	12	—	—	●	—	●	—
NAS3R16	3	—	3,79	0,605	16	—	—	—	—	●	—
NAS3R4	3	—	3,79	2,550	4	—	—	●	—	●	—
NAS3R5	3	—	3,79	2,014	5	—	●	—	—	●	—
NAS3R6	3	—	3,79	1,656	6	—	●	—	●	●	—
NAS3R8	3	—	3,79	1,209	8	—	●	●	●	●	—
left hand											
NAS3L10	3	—	3,79	0,940	10	—	●	—	—	●	—
NAS3L12	3	—	3,79	0,828	12	—	—	—	—	●	—
NAS3L4	3	—	3,79	2,550	4	—	—	●	—	●	—
NAS3L5	3	—	3,79	2,014	5	—	●	—	—	●	—
NAS3L6	3	—	3,79	1,656	6	—	●	●	●	●	—
NAS3L8	3	—	3,79	1,209	8	—	●	●	●	●	—





API Rotary Shoulder Connections



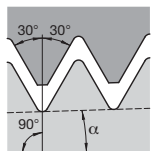
● first choice
○ alternate choice

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

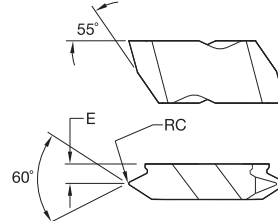
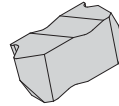
Threading

■ ND • Partial Profile

catalogue number	insert size	RC	E	TPI	K68	KCU10	KCU25	KC5010	KC5025	KC5410
right hand										
ND3040R	3	0,45	2,08	5	-	-	-	-	●	-
ND3038R	3	0,90	2,08	4	-	-	-	-	●	-
ND4050R	4	0,57	3,25	4	-	-	●	-	-	-
left hand										
ND3038L	3	0,90	2,08	4	-	-	-	-	●	-
ND3040L	3	0,45	2,08	5	-	-	●	-	-	-

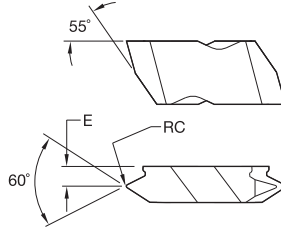
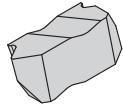
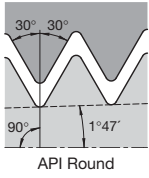


$\alpha = 1/2 \arctg (tpf/12)$
API Rotary Shoulder Connections



■ NDC • Cresting

catalogue number	insert size	RC	E	TPI	K68	KCU10	KCU25	KC5010	KC5025	KC5410
right hand										
NDC3040R3	3	0,45	3,73	5	-	-	-	-	●	-
NDC4040R3	4	0,45	3,73	5	-	-	-	-	●	-
NDC4050R2	4	0,57	4,65	4	-	-	-	-	●	-
NDC4050R3	4	0,57	4,65	4	-	-	-	-	●	-
NDC4038R2	4	0,90	4,65	4	-	-	-	-	●	-
left hand										
NDC3040L3	3	0,45	3,73	5	-	-	-	●	-	-
NDC4050L2	4	0,57	4,65	4	-	-	-	-	●	-
NDC4038L2	4	0,90	4,65	4	-	-	-	-	●	-

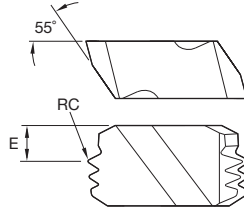
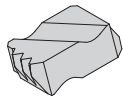
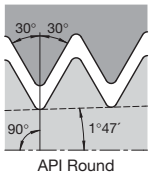


● first choice
○ alternate choice

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

■ NDC-RD

catalogue number	insert size	RC	E	TPI	K68	KCU10	KCU25	KC5010	KC5025	KC5410
right hand										
NDC310RDR75	3	0,36	3,18	10	-	-	-	-	●	-
NDC38RDR75	3	0,43	3,18	8	-	-	●	●	●	-
left hand										
NDC310RDL75	3	0,36	3,18	10	-	-	-	-	●	-
NDC38RDL75	3	0,43	3,18	8	-	-	●	●	●	-

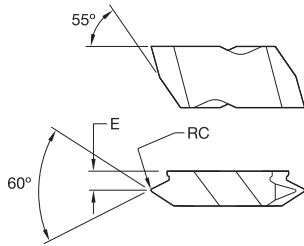
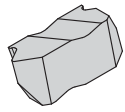


■ NDC-RD-M • Multitooth

catalogue number	insert size	RC	E	TPI	K68	KCU10	KCU25	KC5010	KC5025	KC5410
right hand										
NDC68RDR75M	6	0,41	2,62	8	-	●	-	-	-	-



Threading

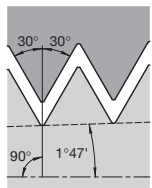


● first choice
○ alternate choice

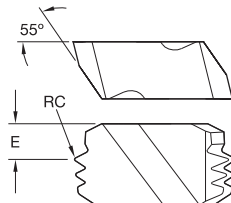
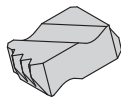
P	●	●	●	●	●	●
M	●	●	●	●	●	●
K	○	●	●	●	●	●
N	●	●	○	○	○	●
S	●	●	●	●	●	○
H	○	○	○	○	○	○

■ NDC-V

catalogue number	insert size	RC	E	TPI	K68	KCU10	KCU25	KC5010	KC5025	KC5410
right hand										
NDC327VR75	3	0,05	3,66	27	-	●	-	-	-	-
NDC314VR75	3	0,08	3,66	14	-	●	-	-	-	-
NDC3115VR75	3	0,10	3,66	11.5	-	●	-	●	-	-
NDC38VR75	3	0,13	2,54	8	-	-	-	●	-	-
left hand										
NDC3115VL75	3	0,10	3,66	11.5	-	●	-	●	-	-
NDC38VL75	3	0,13	2,54	8	-	-	-	●	-	-



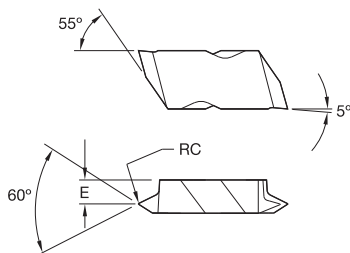
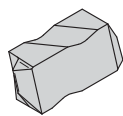
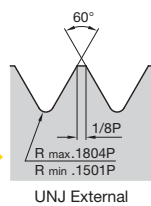
NPT



■ NDC-V-M • Multitooth

catalogue number	insert size	RC	E	TPI	K68	KCU10	KCU25	KC5010	KC5025	KC5410
right hand										
NDC8115VR75M	8	0,10	2,59	11.5	-	●	-	-	-	-
NDC88VR75M	8	0,13	2,41	8	-	●	-	●	-	-
left hand										
NDC88VL75M	8	0,13	2,41	8	-	-	-	●	-	-

Threading

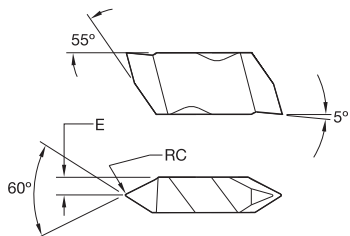
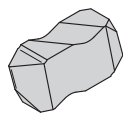
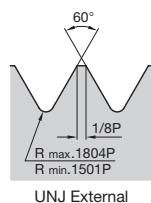


● first choice
○ alternate choice

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

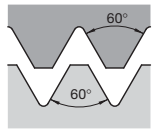
NJK

catalogue number	insert size	RC	E	external thread pitch mm	internal thread pitch mm	external TPI	internal TPI	K68	KCU10	KCU25	KC5010	KC5025	KC5410
right hand													
NJK3005R32	3	0,13	3,58	—	—	32	—	—	—	—	●	●	—
NJK3006R28	3	0,15	3,58	—	—	28	—	—	—	●	●	—	—
NJK3007R24	3	0,17	3,58	—	—	24	—	—	—	●	●	—	—
NJK3008R20	3	0,20	3,58	—	—	20	—	—	●	●	●	—	—
NJK3009R18	3	0,22	3,58	—	—	18	—	—	—	●	●	—	—
NJK3010R16	3	0,25	3,58	—	—	16	—	—	—	●	●	—	—
NJK3012R14	3	0,28	3,58	—	—	14	—	—	—	—	●	●	—
left hand													
NJK3005L32	3	0,13	3,58	—	—	32	—	—	—	—	—	●	—
NJK3006L28	3	0,15	3,58	—	—	28	—	—	—	—	—	●	—

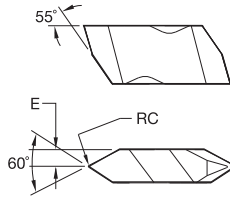
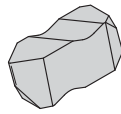


NJP

catalogue number	insert size	RC	E	external thread pitch mm	internal thread pitch mm	external TPI	internal TPI	K68	KCU10	KCU25	KC5010	KC5025	KC5410
right hand													
NJP3010R16	3	0,25	2,49	—	—	16	—	—	●	—	●	●	—
NJP3014R12	3	0,33	2,49	—	—	12	—	●	●	●	●	●	—
NJP3020R8	3	0,49	2,49	—	—	8	—	—	—	●	●	●	—
left hand													
NJP3010L16	3	0,25	2,49	—	—	16	—	—	—	—	—	●	—
NJP3014L12	3	0,33	2,49	—	—	12	—	—	—	—	●	—	—
NJP3020L8	3	0,49	2,49	—	—	8	—	—	—	—	—	●	—



Partial Profile 60°

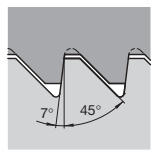


- first choice
- alternate choice

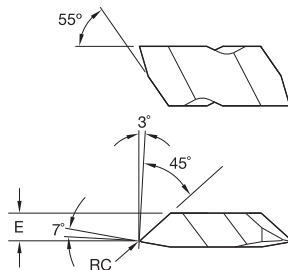
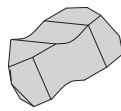
P	●	●	●	●	●	●	●	●	●	●
M	●	●	●	●	●	●	●	●	●	●
K	○	●	●	●	●	●	●	●	●	●
N	●	●	○	○	○	○	○	○	○	○
S	●	●	●	●	●	●	●	●	●	○
H	○	○	○	○	○	○	○	○	○	○

■ NT

catalogue number	insert size	RC	E	external thread pitch mm	internal thread pitch mm	external TPI	internal TPI	K68	KCU10	KCU25	KC5010	KC5025	KC5410
right hand													
NT2R	2	0,10	1,90	0,70-3,0	1,25-3,5	8-36	7-20	●	●	●	●	●	●
NT3R	3	0,17	2,49	1,25-4,0	2,0-5,0	6-20	5-12	●	●	●	●	●	●
NT4R	4	0,17	3,25	1,25-6,25	2,0-6,25	4-20	4-12	●	●	●	●	●	●
left hand													
NT2L	2	0,10	1,90	0,70-3,0	1,25-3,5	8-36	7-20	●	●	●	●	●	●
NT3L	3	0,17	2,49	1,25-4,0	2,0-5,0	6-20	5-12	●	●	●	●	●	●
NT4L	4	0,17	3,25	1,25-6,25	2,0-6,25	4-20	4-12	●	●	●	●	●	●



American Butress-Push

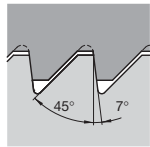


■ NTB-A

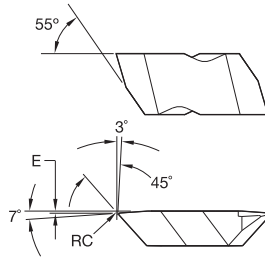
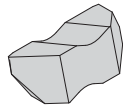
catalogue number	insert size	RC	E	TPI	K68	KCU10	KCU25	KC5010	KC5025	KC5410
right hand										
NTB2RA	2	0,08	3,20	16-20	●	-	-	-	-	-
NTB3RA	3	0,17	4,17	8-16	-	●	-	-	●	-
NTB4RA	4	0,25	5,23	4-6	-	●	-	-	-	-
left hand										
NTB3LA	3	0,17	4,17	8-16	●	-	-	●	●	-



Threading



American Buttress-Pull

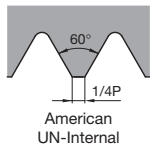


- first choice
- alternate choice

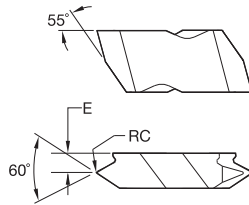
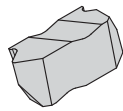
P	●	●	●	●	●	●	●	●	●	●
M	●	●	●	●	●	●	●	●	●	●
K	○	●	●	●	●	●	●	●	●	●
N	●	●	○	○	○	○	○	○	○	○
S	●	●	●	●	●	●	●	●	●	○
H	○	○	○	○	○	○	○	○	○	○

■ NTB-B

catalogue number	insert size	RC	E	TPI	K68	KCU10	KCU25	KC5010	KC5025	KC5410
right hand										
NTB2RB	2	0,08	0,25	16-20	-	-	-	●	-	-
NTB3R12B	3	0,16	2,49	12	-	-	-	●	-	-
NTB3RB	3	0,17	0,31	8-16	●	●	●	●	●	-
NTB4RB	4	0,25	0,41	4-6	-	●	-	●	●	-
left hand										
NTB2LB	2	0,08	0,25	16-20	-	●	-	●	-	-
NTB3L12B	3	0,16	2,49	12	-	-	-	●	-	-
NTB3LB	3	0,17	0,31	8-16	●	●	-	●	●	-
NTB4LB	4	0,25	0,41	4-6	-	-	-	●	●	-

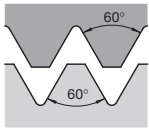


American UN-Internal

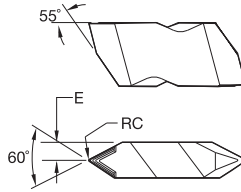
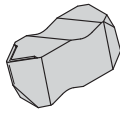


■ NTC-I

catalogue number	insert size	RC	E	external thread pitch mm	internal thread pitch mm	external TPI	internal TPI	K68	KCU10	KCU25	KC5010	KC5025	KC5410
right hand													
NTC3R12I	3	0,10	3,76	-	-	-	12	-	-	-	-	●	-
left hand													
NTC3L12I	3	0,10	3,76	-	-	-	12	-	-	-	-	●	-
NTC3L14I	3	0,09	3,76	-	-	-	14	-	-	-	-	●	-
NTC3L16I	3	0,08	3,76	-	-	-	16	-	-	-	-	●	-
NTC3L8I	3	0,18	2,72	-	-	-	8	-	-	-	-	●	-
NTC3L10I	3	0,13	2,72	-	-	-	10	-	-	-	-	●	-



Partial Profile 60°



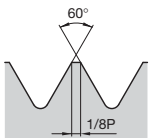
- first choice
- alternate choice

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

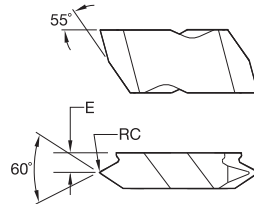
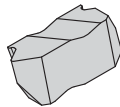


■ NT-CK

catalogue number	insert size	RC	E	external thread pitch mm	internal thread pitch mm	external TPI	internal TPI	K68	KCU10	KCU25	KC5010	KC5025	KC5410
right hand													
NT3RCK	3	0,34	2,46	2,5-4,0	4,0	6-11	6	-	●	●	●	●	-
NT4RCK	4	0,34	3,23	2,5-5,5	4,0-5,5	4,5-11	4,5-6	-	-	●	●	●	-
left hand													
NT3LCK	3	0,34	2,46	2,5-4,0	4,0	6-11	6	-	●	●	●	●	-
NT4LCK	4	0,34	3,23	2,5-5,5	4,0-5,5	4,5-11	4,5-6	-	-	●	-	●	-



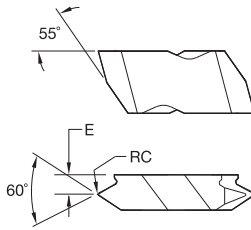
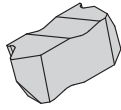
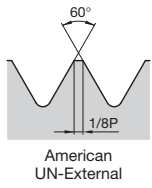
ISO Metric-External



■ NTC-M-E

catalogue number	insert size	RC	E	external thread pitch mm	internal thread pitch mm	external TPI	internal TPI	K68	KCU10	KCU25	KC5010	KC5025	KC5410
right hand													
NTC3MR150E	3	0,20	3,68	1,50	-	-	-	-	●	-	●	●	-
NTC3MR200E	3	0,27	3,68	2,00	-	-	-	-	-	-	●	-	-

Threading

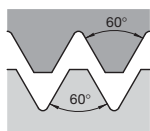


● first choice
○ alternate choice

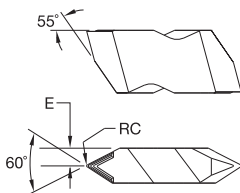
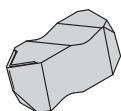
P	●	●	●	●	●
M	●	●	●	●	●
K	○	●	●	●	●
N	●	●	○	○	○
S	●	●	●	●	○
H	○	○	○	○	○

■ NTC-E

catalogue number	insert size	RC	E	external thread pitch mm	internal thread pitch mm	external TPI	internal TPI	K68	KCU10	KCU25	KC5010	KC5025	KC5410
right hand													
NTC3R32E	3	0,10	3,76	—	—	32	—	—	●	—	—	●	—
NTC3R28E	3	0,12	3,76	—	—	28	—	—	—	—	—	●	—
NTC3R24E	3	0,13	3,76	—	—	24	—	—	—	—	●	●	—
NTC3R20E	3	0,16	3,76	—	—	20	—	—	●	—	●	●	—
NTC3R18E	3	0,18	3,76	—	—	18	—	—	—	●	●	●	—
NTC3R16E	3	0,19	3,76	—	—	16	—	—	—	—	●	●	—
NTC3R14E	3	0,22	3,76	—	—	14	—	—	—	—	●	●	—
NTC3R13E	3	0,24	3,76	—	—	13	—	—	—	—	●	●	—
NTC3R12E	3	0,25	3,76	—	—	12	—	—	—	●	●	●	—
NTC3R11E	3	0,28	2,72	—	—	11	—	—	●	—	—	●	—
NTC3R10E	3	0,32	2,72	—	—	10	—	—	—	—	●	●	—
NTC3R9E	3	0,36	2,72	—	—	9	—	—	—	●	—	—	—
NTC3R8E	3	0,41	2,72	—	—	8	—	—	—	●	—	●	—
NTC3R7E	3	0,47	2,72	—	—	7	—	—	—	—	—	●	—
left hand													
NTC3L16E	3	0,19	3,76	—	—	16	—	—	●	—	—	—	—
NTC3L12E	3	0,25	3,76	—	—	12	—	—	—	●	—	—	—
NTC3L10E	3	0,32	2,72	—	—	10	—	—	—	●	—	—	—
NTC3L8E	3	0,41	2,72	—	—	8	—	—	—	—	●	—	—



Partial Profile 60°



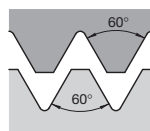
● first choice
○ alternate choice

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

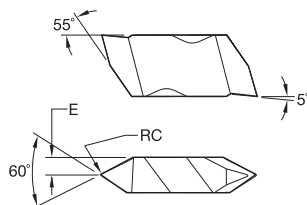
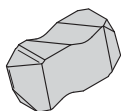
■ NT-K

Threading

catalogue number	insert size	RC	E	external thread pitch mm	internal thread pitch mm	external TPI	internal TPI	K68	KCU10	KCU25	KC5010	KC5025	KC5410
right hand													
NT2RK	2	0,10	1,90	0,70-3,0	1,25-3,5	8-36	7-20	-	●	●	●	●	-
NT3RK	3	0,17	2,49	1,25-4,0	2,0-5,0	6-20	5-12	-	●	●	●	●	-
NT4RK	4	0,16	3,24	1,25-6,25	2,0-6,25	4-20	4-12	-	●	●	●	●	-
left hand													
NT2LK	2	0,10	1,90	0,70-3,0	1,25-3,5	8-36	7-20	-	●	●	●	●	-
NT3LK	3	0,17	2,49	1,25-4,0	2,0-5,0	6-20	5-12	-	●	●	●	●	-
NT4LK	4	0,16	3,24	1,25-6,25	2,0-6,25	4-20	4-12	-	●	●	●	●	-

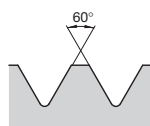


Partial Profile 60°

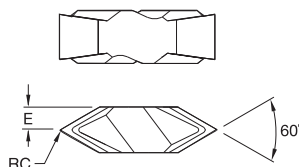
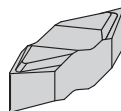


■ NTP

catalogue number	insert size	RC	E	external thread pitch mm	internal thread pitch mm	external TPI	internal TPI	K68	KCU10	KCU25	KC5010	KC5025	KC5410
right hand													
NTP2R	2	0,10	1,91	0,70-3,0	1,25-3,5	8-36	7-20	●	●	●	●	●	-
NTP3R	3	0,17	2,49	1,25-4,0	2,0-5,0	6-20	5-12	●	●	●	●	●	●
NTP4R	4	0,17	3,25	1,25-6,25	2,0-6,25	4-20	4-12	-	●	●	●	●	-
left hand													
NTP2L	2	0,10	1,91	0,70-3,0	1,25-3,5	8-36	7-20	●	●	●	●	●	-
NTP3L	3	0,17	2,49	1,25-4,0	2,0-5,0	6-20	5-12	●	●	●	●	●	-
NTP4L	4	0,17	3,25	1,25-6,25	2,0-6,25	4-20	4-12	-	-	-	●	●	-

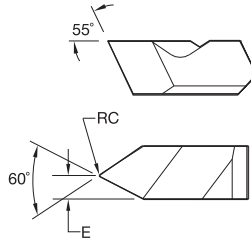
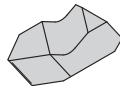
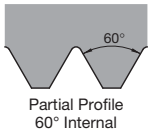


Partial Profile 60° External



■ NTU

catalogue number	insert size	RC	E	external thread pitch mm	internal thread pitch mm	external TPI	internal TPI	K68	KCU10	KCU25	KC5010	KC5025	KC5410
right hand													
NTU4R	4U	0,11	3,18	1,25-6,25	-	4-20	-	-	-	●	-	●	-

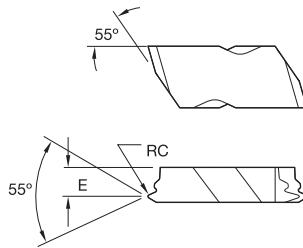
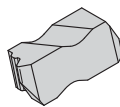
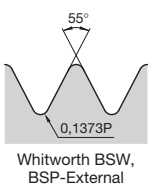


● first choice
○ alternate choice

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

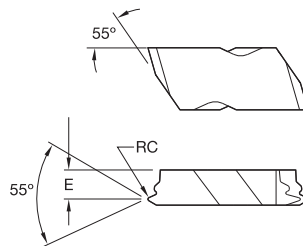
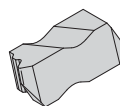
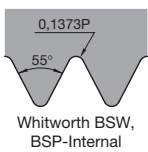
■ NT-1L

catalogue number	insert size	RC	E	external thread pitch mm	internal thread pitch mm	external TPI	internal TPI	K68	KCU10	KCU25	KC5010	KC5025	KC5410
left hand													
NT1L	1	0,08	1,09	—	1,0-2,0	—	12-24	●	●	●	●	●	—



■ NWC-E

catalogue number	insert size	RC	E	TPI	K68	KCU10	KCU25	KC5010	KC5025	KC5410
right hand										
NWC3R14E	3	0,24	3,43	14	—	—	●	●	—	—
NWC3R11E	3	0,30	3,43	11	—	—	●	●	—	—



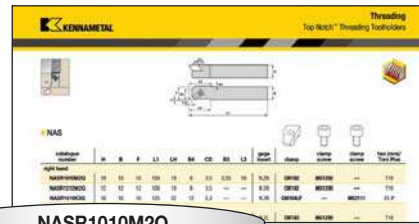
■ NWC-I

catalogue number	insert size	RC	E	TPI	K68	KCU10	KCU25	KC5010	KC5025	KC5410
left hand										
NWC3L11I	3	0,30	3,43	11	—	—	—	●	—	—



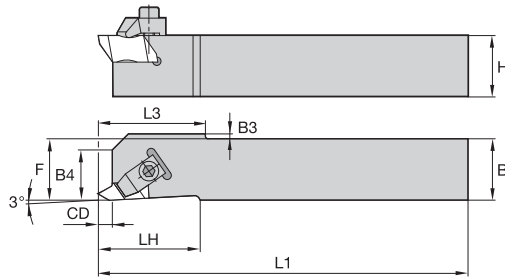
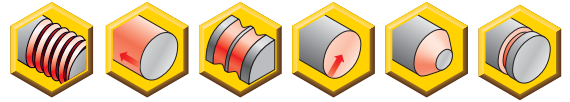
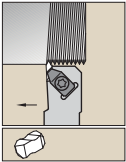
How Do Catalogue Numbers Work?

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

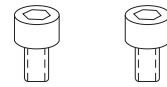


NASR1010M2Q

N	AS	R		1010	M	2	Q																																																														
Insert Holding Method	Insert Mounting Location	Hand of Tool	Drop Head	Shank Size	Tool Length	Insert Size	Qualified Holder																																																														
<p>N — Top Notch™</p>	<p>End mount</p> <p>Side mount, offset</p> <p>Side mount, no offset</p>			<p>Shank height and width in mm and holder</p>	<table border="1"> <thead> <tr> <th>L1</th> <th>ISO</th> </tr> </thead> <tbody> <tr><td>32</td><td>A</td></tr> <tr><td>40</td><td>B</td></tr> <tr><td>50</td><td>C</td></tr> <tr><td>60</td><td>D</td></tr> <tr><td>70</td><td>E</td></tr> <tr><td>80</td><td>F</td></tr> <tr><td>90</td><td>G</td></tr> <tr><td>100</td><td>H</td></tr> <tr><td>110</td><td>J</td></tr> <tr><td>125</td><td>K</td></tr> <tr><td>140</td><td>L</td></tr> <tr><td>150</td><td>M</td></tr> <tr><td>160</td><td>N</td></tr> <tr><td>170</td><td>P</td></tr> <tr><td>180</td><td>Q</td></tr> <tr><td>200</td><td>R</td></tr> <tr><td>250</td><td>S</td></tr> <tr><td>300</td><td>T</td></tr> <tr><td>350</td><td>U</td></tr> <tr><td>400</td><td>V</td></tr> <tr><td>450</td><td>W</td></tr> <tr><td>500</td><td>Y</td></tr> <tr><td>special length</td><td>X</td></tr> </tbody> </table>	L1	ISO	32	A	40	B	50	C	60	D	70	E	80	F	90	G	100	H	110	J	125	K	140	L	150	M	160	N	170	P	180	Q	200	R	250	S	300	T	350	U	400	V	450	W	500	Y	special length	X	<table border="1"> <thead> <tr> <th>insert size</th> <th>T</th> </tr> </thead> <tbody> <tr><td>2</td><td>3,81</td></tr> <tr><td>3</td><td>4,95</td></tr> <tr><td>4</td><td>6,98</td></tr> <tr><td>5</td><td>9,65</td></tr> <tr><td>6</td><td>9,73</td></tr> <tr><td>8</td><td>11,13</td></tr> </tbody> </table>	insert size	T	2	3,81	3	4,95	4	6,98	5	9,65	6	9,73	8	11,13	<p>Q — Qualified holder</p>
L1	ISO																																																																				
32	A																																																																				
40	B																																																																				
50	C																																																																				
60	D																																																																				
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special length	X																																																																				
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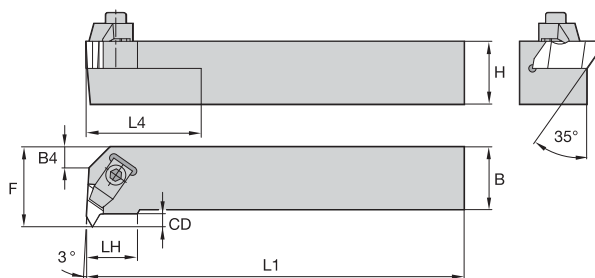
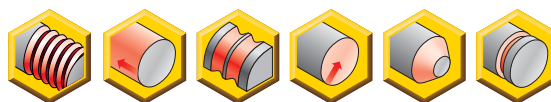
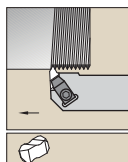


NAS



order number	catalogue number	H	B	F	L1	LH	B4	CD	B3	L3	gage insert	clamp screw	clamp screw	clamp	hex (mm)/ Torx Plus
right hand															
1098788	NASR1010M2Q	10	10	10	150	19	9	3,5	2,03	19	N.2R	CM182	MS1200	—	T10
1098789	NASR1212M2Q	12	12	12	150	19	9	3,5	—	—	N.2R	CM182	MS1200	—	T10
1098786	NASR1616K3Q	16	16	16	125	32	13	5,3	—	—	N.3R	CM184LP	—	MS2111	25 IP
left hand															
1098859	NASL1010M2Q	10	10	10	150	19	9	3,5	2,03	19	N.2L	CM183	MS1200	—	T10
1098860	NASL1212M2Q	12	12	12	150	19	9	6,9	—	—	N.2L	CM183	MS1200	—	T10
1098857	NASL1616K3Q	16	16	16	125	32	13	5,3	—	—	N.3L	CM185LP	—	MS2111	25 IP

NOTE: F dimension measured over sharp point of N-style threading insert.



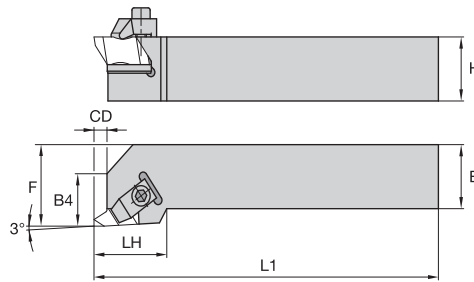
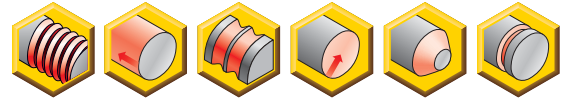
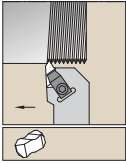
Threading

■ NE



order number	catalogue number	H	B	F	L1	LH	CD	L4	gage insert	clamp screw	clamp screw	clamp	hex (mm)/ Torx Plus
right hand													
1098803	NER1616H2	16	16	20	100	15	3,5	—	N.2L	CM75	MS1200	—	T10
1098804	NER2020K2	20	20	25	125	15	3,5	—	N.2L	CM75	MS1200	—	T10
1098805	NER2525M2	25	25	32	150	15	3,5	25,4	N.2L	CM75	MS1200	—	T10
1098806	NER2525M3	25	25	32	150	22	5,3	50,8	N.3L	CM73LP	—	MS2111	25 IP
1098808	NER2525M4	25	25	35	150	24	6,4	50,8	N.4L	CM73LP	—	MS2111	25 IP
1098807	NER3225P3	32	25	32	170	22	3,8	50,8	N.3L	CM73LP	—	MS2111	25 IP
1098809	NER3225P4	32	25	35	170	24	6,4	50,8	N.4L	CM73LP	—	MS2111	25 IP
1098810	NER3232P4	32	32	40	170	24	6,4	50,8	N.4L	CM73LP	—	MS2111	25 IP
left hand													
1098874	NEL1616H2	16	16	20	100	15	3,5	—	N.2R	CM74	MS1200	—	T10
1098875	NEL2020K2	20	20	25	125	15	3,5	—	N.2R	CM74	MS1200	—	T10
1098876	NEL2525M2	25	25	32	150	15	3,5	25,4	N.2R	CM74	MS1200	—	T10
1098877	NEL2525M3	25	25	32	150	22	5,3	50,8	N.3R	CM72LP	—	MS2111	25 IP
1098879	NEL2525M4	25	25	35	150	24	6,4	50,8	N.4R	CM72LP	—	MS2111	25 IP
1098878	NEL3225P3	32	25	32	170	22	3,8	50,8	N.3R	CM72LP	—	MS2111	25 IP
1098880	NEL3225P4	32	25	35	170	24	6,4	50,8	N.4R	CM72LP	—	MS2111	25 IP
1098881	NEL3232P4	32	32	40	170	24	6,4	50,8	N.4R	CM72LP	—	MS2111	25 IP

NOTE: F dimension measured over sharp point of Top Notch-style threading insert.

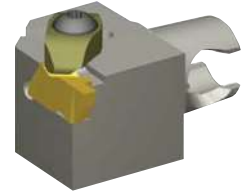
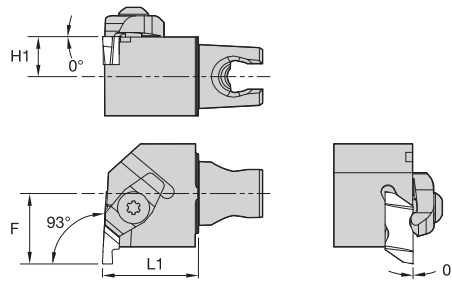


■ NS



order number	catalogue number	H	B	F	L1	LH	B4	CD	gage insert	clamp	clamp screw	clamp screw	hex (mm)/ Torx Plus
right hand													
1098790	NSR1010E2	10	10	14	70	19	9	3,5	N.2R	CM74	MS1200	—	T10
1098791	NSR1212F2	12	12	16	80	19	9	3,5	N.2R	CM74	MS1200	—	T10
1098792	NSR1616H2	16	16	20	100	19	9	3,5	N.2R	CM74	MS1200	—	T10
1098793	NSR2020K2	20	20	25	125	19	9	3,5	N.2R	CM74	MS1200	—	T10
1098795	NSR2020K3	20	20	25	125	32	13	5,3	N.3R	CM72LP	—	MS2111	25 IP
1098794	NSR2525M2	25	25	32	150	19	9	3,5	N.2R	CM74	MS1200	—	T10
1098796	NSR2525M3	25	25	32	150	32	13	5,3	N.3R	CM72LP	—	MS2111	25 IP
1098799	NSR2525M4	25	25	32	150	35	14	7,5	N.4R	CM72LP	—	MS2111	25 IP
1098797	NSR3225P3	32	25	32	170	32	13	5,3	N.3R	CM72LP	—	MS2111	25 IP
1098800	NSR3225P4	32	25	32	170	35	14	7,5	N.4R	CM72LP	—	MS2111	25 IP
1098798	NSR3232P3	32	32	40	170	32	13	5,3	N.3R	CM72LP	—	MS2111	25 IP
1098801	NSR3232P4	32	32	40	170	35	14	7,5	N.4R	CM72LP	—	MS2111	25 IP
left hand													
1098861	NSL1010E2	10	10	14	70	19	9	3,5	N.2L	CM75	MS1200	—	T10
1098862	NSL1212F2	12	12	16	80	19	9	3,5	N.2L	CM75	MS1200	—	T10
1098863	NSL1616H2	16	16	20	100	19	9	3,5	N.2L	CM75	MS1200	—	T10
1098864	NSL2020K2	20	20	25	125	19	9	3,5	N.2L	CM75	MS1200	—	T10
1098866	NSL2020K3	20	20	25	125	32	13	5,3	N.3L	CM73LP	—	MS2111	25 IP
1098865	NSL2525M2	25	25	32	150	19	9	3,5	N.2L	CM75	MS1200	—	T10
1098867	NSL2525M3	25	25	32	150	32	13	5,3	N.3L	CM73LP	—	MS2111	25 IP
1098870	NSL2525M4	25	25	32	150	35	14	7,5	N.4L	CM73LP	—	MS2111	25 IP
1098868	NSL3225P3	32	25	32	170	32	13	5,3	N.3L	CM73LP	—	MS2111	25 IP
1098871	NSL3225P4	32	25	32	170	35	14	7,5	N.4L	CM73LP	—	MS2111	25 IP
1098869	NSL3232P3	32	32	40	170	32	13	5,3	N.3L	CM73LP	—	MS2111	25 IP
1098872	NSL3232P4	32	32	40	170	35	14	7,5	N.4L	CM73LP	—	MS2111	25 IP

NOTE: F dimension measured over sharp point of Top Notch-style threading and grooving insert.

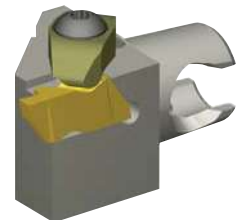
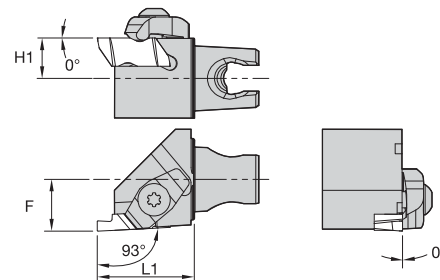


Threading

■ NE 93°



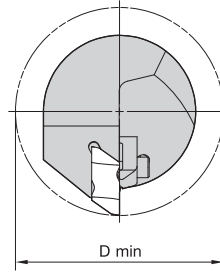
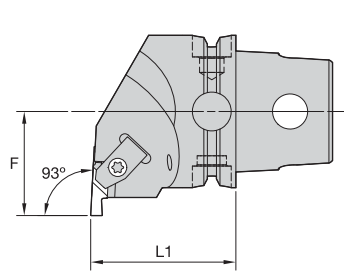
order number	catalogue number	L1	F	H1	gage insert	clamp	clamp screw	clamp screw
right hand								
2399462	KM25NER230	30	22	12,5	NG2L	CM75	—	MS1200
2399494	KM25NER330	30	22	12,5	NG3L	CM73LP	MS2111	—
2399496	KM25NER430	30	24	12,5	NG4L	CM73LP	MS2111	—
left hand								
2399495	KM25NEL330	30	22	12,5	NG3R	CM72LP	MS2111	—
2399497	KM25NEL430	30	24	12,5	NG4R	CM72LP	MS2111	—



■ NS 93°



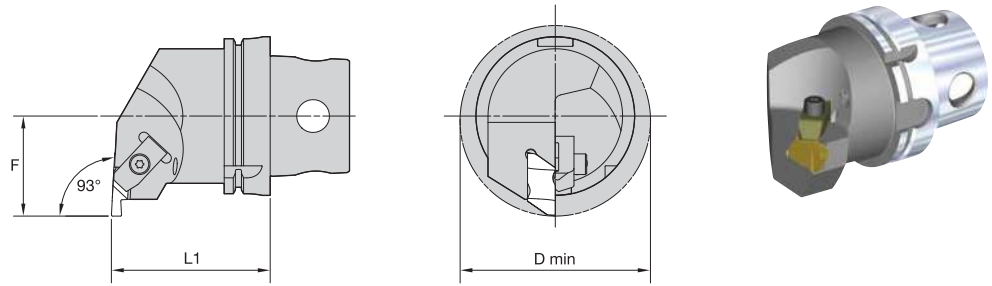
order number	catalogue number	L1	F	H1	gage insert	clamp	clamp screw	clamp screw
right hand								
2399498	KM25NSR230	30	16	12,5	NG2R	CM74	—	MS1200
2399500	KM25NSR330	30	16	12,5	NG3R	CM72LP	MS2111	—
left hand								
2399499	KM25NSL230	30	16	12,5	NG2L	CM75	—	MS1200
2399501	KM25NSL330	30	16	12,5	NG3L	CM73LP	MS2111	—
2399503	KM25NSL430	30	16	12,5	NG4L	CM213LP	MS2111	—



■ NE 93°



order number	catalogue 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	0,30	.66
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	.65
left hand												
3902132	KM40TSNEL2	40	1.575	27	1.063	54	2.126	NG2R	CM74	MS1488	0,30	.66
3902283	KM40TSNEL3	40	1.575	27	1.063	54	2.126	NG3R	CM-72	MS1489	0,30	.67
3902284	KM40TSNEL4	40	1.575	27	1.063	54	2.126	NG4R	CM-72	MS1489	0,30	.65

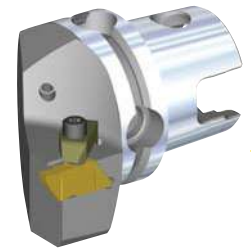
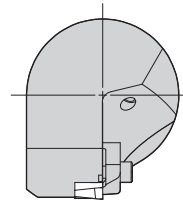
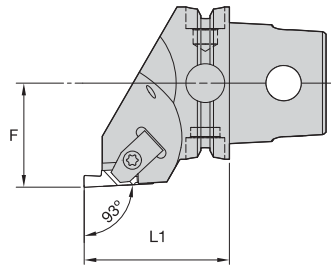


Threading

■ NE



order number	catalogue number	L1		F		D min		gage insert	clamp	clamp screw	kg	lbs
		mm	in	mm	in	mm	in					
right hand												
5337758	KM4X100NER3	100	3.937	63	2.480	120	4.724	NG3L	CM73	MS1489	4,45	9.80
5337759	KM4X100NER4	100	3.937	63	2.480	120	4.724	NG4L	CM73	MS1489	4,51	9.93
5337770	KM4X100NER5	100	3.937	63	2.480	120	4.724	NG5L	CM81	MS1490	4,65	10.25
5337771	KM4X100NER6	100	3.937	63	2.480	120	4.724	NG6L	CM121	MS1489	4,48	9.88
left hand												
5337754	KM4X100NEL3	100	3.937	63	2.480	120	4.724	NG3R	CM-72	MS1489	4,45	9.80
5337755	KM4X100NEL4	100	3.937	63	2.480	120	4.724	NG4R	CM-72	MS1489	4,51	9.93
5337756	KM4X100NEL5	100	3.937	63	2.480	120	4.724	NG5R	CM80	MS1490	4,65	10.25
5337757	KM4X100NEL6	100	3.937	63	2.480	120	4.724	NG6R	CM120	MS1489	4,48	9.88



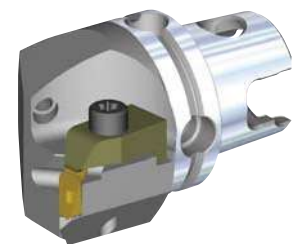
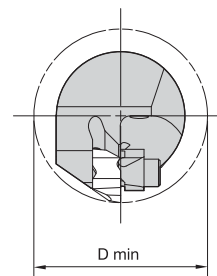
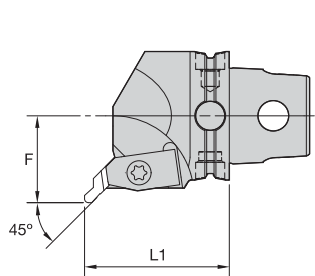
Threading



■ NS 93°



order number	catalogue 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	CM-72	MS1489	0,32	.71
3902295	KM40TSNSR4	47	1.850	27	1.063	NG4R	CM-72	MS1489	0,30	.66
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	0,30	.66



■ NR 45°



order number	catalogue number	L1		F		D min		gage insert	clamp	clamp 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	CM-72	MS1489	0,33	.74

How Do Catalogue Numbers Work?

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



A25RNNTOR2

A	25	R	N	N	T	O	R	2														
Bar Type	Bar Diameter	Bar Length	Insert Holding Method	Insert Shape	Insert Location	Rake Angle 0 = 0°	Hand of Tool	Insert Size														
Steel with coolant 	Bar in millimetres 		N — Top Notch* 		End mount Side mount 		Right hand Left hand 	 <table border="1"> <thead> <tr> <th>insert size</th> <th>T</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>3,81</td> </tr> <tr> <td>3</td> <td>4,95</td> </tr> <tr> <td>4</td> <td>6,98</td> </tr> <tr> <td>5</td> <td>9,65</td> </tr> <tr> <td>6</td> <td>9,73</td> </tr> <tr> <td>8</td> <td>11,13</td> </tr> </tbody> </table>	insert size	T	2	3,81	3	4,95	4	6,98	5	9,65	6	9,73	8	11,13
insert size	T																					
2	3,81																					
3	4,95																					
4	6,98																					
5	9,65																					
6	9,73																					
8	11,13																					
			*Proprietary standard only.																			
Bars K = 125,0mm M = 150,0mm Q = 180,0mm R = 200,0mm S = 250,0mm T = 300,0mm U = 350,0mm 																						

Beyond™ Top Notch™ Profiling



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

Higher Productivity and Profitability

- Lower cutting forces increase speeds and reduce cycle time.
- Extended tool life.

Reliability

- Predictable tool life/uniform wear.
- Resists chip flow damage.
- Consistent surface finish.

Versatility

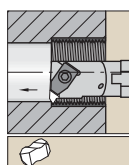
- Products can be applied across a wide range of applications.
- Use in low- to high-speed applications.
- Complete portfolio of products.
- For finish to rough turning of steel, cast iron, stainless steel, and high-temp alloys.



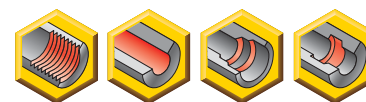
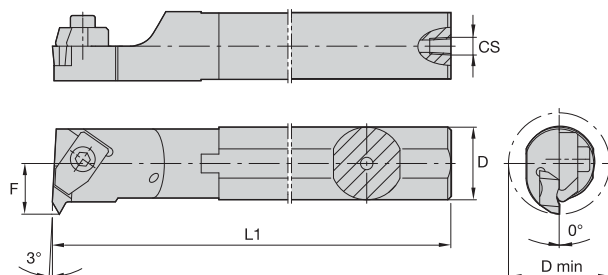
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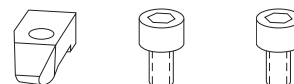
kennametal.com



Steel shank with through coolant.

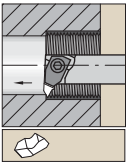


■ A-NNT

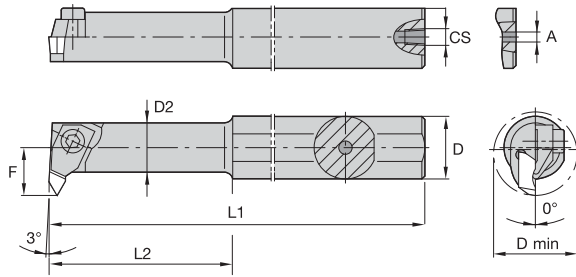


order number	catalogue number	D min	D	L1	F	CS	gage insert	clamp	clamp screw	clamp screw	hex (mm)/ Torx Plus
right hand											
1098945	A12MNNTOR2	18,5	12	150	11	1/16-27 NPT	—	CM147	—	MS1200	2.5 mm
1098947	A16MNNTOR2	22,0	16	150	11	1/8-27 NPT	N.2L	CM75	—	MS1200	T10
1098949	A20QNNTOR2	26,0	20	180	13	1/8-27 NPT	N.2L	CM75	—	MS1200	2.5 mm
1098951	A25RNNTOR2	34,0	25	200	17	1/4-18 NPT	N.2L	CM75	—	MS1200	2.5 mm
1098953	A25RNNTOR3	34,0	25	200	17	1/8 - 27 NPT	N.3L	CM73LP	MS2111	—	25 IP
1098955	A32SNNTOR3	44,0	32	250	22	1/4-18 NPT	N.3L	CM73LP	MS2111	—	25 IP
1098957	A40TNNTOR3	54,0	40	300	27	1/4-18 NPT	N.3L	CM73LP	MS2111	—	25 IP
1099001	A40TNNTOR4	54,0	40	300	27	1/4-18 NPT	N.4L	CM73LP	MS2111	—	25 IP
1099003	A50UNNTOR4	70,0	50	350	35	1/4-18 NPT	N.4L	CM73LP	MS2111	—	25 IP
left hand											
1098946	A12MNNTOL2	18,5	12	150	11	1/16-27 NPT	NG2R	CM146	—	MS1200	2.5 mm
1098948	A16MNNTOL2	22,0	16	150	11	1/8-27 NPT	N.2R	CM74	—	MS1200	T10
1098950	A20QNNTOL2	26,0	20	180	13	1/8-27 NPT	NG2R	CM74	—	MS1200	2.5 mm
1098952	A25RNNTOL2	34,0	25	200	17	1/4-18 NPT	N.2R	CM74	—	MS1200	2.5 mm
1098954	A25RNNTOL3	34,0	25	200	17	1/4-18 NPT	N.3R	CM72LP	MS2111	—	25 IP
1098956	A32SNNTOL3	44,0	32	250	22	1/4-18 NPT	N.3R	CM72LP	MS2111	—	25 IP
1098958	A40TNNTOL3	54,0	40	300	27	1/4-18 NPT	N.3R	CM72LP	MS2111	—	25 IP
1099002	A40TNNTOL4	54,0	40	300	27	1/4-18 NPT	N.4R	CM72LP	MS2111	—	25 IP

NOTE: Minimum bore diameter (D min) capability varies with thread type and pitch. See page D102 for details.
F dimension measured over sharp point of NG-style grooving insert.



Necked steel shank with through coolant.

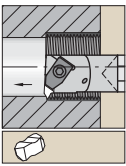


A-NNT -1

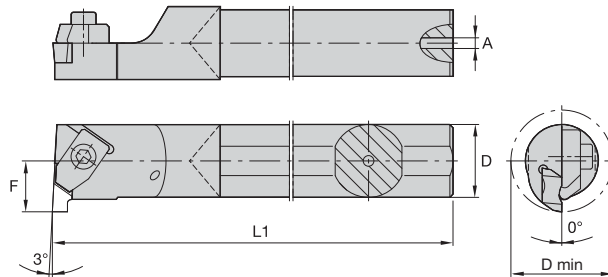


order number	catalogue number	D min	D	HDD	L1	L2	F	A	CS	gage insert	clamp	clamp screw	hex (mm)
right hand													
1098943	A10KNNTOR1	11,5	10	10,0	125	—	7	3,2	—	NG1L	CM109	MS1034	1.5 mm
1098944	A12MNNTOR1	11,5	12	10,0	150	31,30	7	4,0	1/16-27 NPT	N.1L	CM109	MS1034	1.5 mm

NOTE: F dimension measured over sharp point of Top Notch style threading insert.



Carbide shank with through coolant.

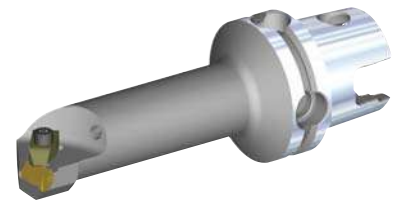
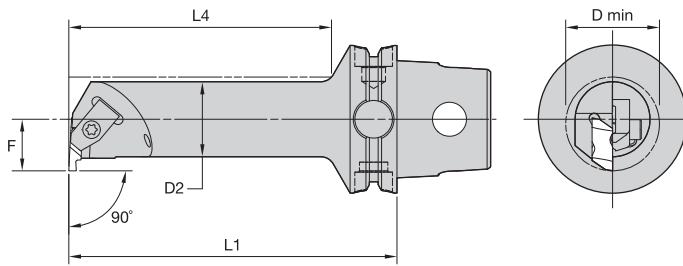


E-NNT



order number	catalogue number	D min	D	L1	F	A	gage insert	clamp	clamp screw	Torx/ Torx Plus
right hand										
1152834	E16RNNTOR2	22	16	200	11	5,5	N.2L	CM75	MS1200	T10
1152836	E20SNNTOR2	26	20	250	13	7,1	N.2L	CM75	MS1200	T10
left hand										
1152835	E16RNNTOL2	22	16	200	11	5,5	N.2R	CM74	MS1200	T10

NOTE: Minimum bore diameter (D min) capability varies with thread type and pitch. See page D102 for details.
F dimension measured over sharp point of Top Notch style threading insert.



Threading



■ NE 90° • Steel

order number	catalogue number	D2		D min		F		L4		L1		gage insert	kg	lbs
		mm	in	mm	in	mm	in	mm	in	mm	in			
right hand														
3955481	KM40TSS12ENER2	12	.472	19	.73	11	.433	42	1.655	70	2.756	NG2L	0,27	.58
3955483	KM40TSS16FNER2	16	.630	20	.79	11	.433	56	2.209	80	3.150	NG2L	0,28	.62
3955485	KM40TSS20GNER2	20	.787	25	.98	13	.512	70	2.757	90	3.543	NG2L	0,35	.76
3955487	KM40TSS25ENER2	25	.984	32	1.26	17	.669	55	2.169	70	2.756	NG2L	0,34	.75
3955491	KM40TSS25ENER3	25	.984	34	1.34	17	.669	55	2.169	70	2.756	NG3L	0,35	.77
3955489	KM40TSS25HNER2	25	.984	32	1.26	17	.669	75	2.954	100	3.937	NG2L	0,49	1.08
3955493	KM40TSS25HNER3	25	.984	34	1.34	17	.669	75	2.954	100	3.937	NG3L	0,49	1.09
3955497	KM40TSS32GNER3	32	1.260	40	1.57	22	.866	76	2.993	90	3.543	NG3L	0,55	1.21
3955495	KM40TSS32JNER3	32	1.260	40	1.57	22	.866	96	3.780	110	4.331	NG3L	0,67	1.48
left hand														
3955480	KM40TSS12ENEL2	12	.472	19	.73	11	.433	42	1.655	70	2.756	NG2R	0,27	.59
3955482	KM40TSS16FNEL2	16	.630	20	.79	11	.433	56	2.209	80	3.150	NG2R	0,28	.62
3955484	KM40TSS20GNEL2	20	.787	25	.98	13	.512	70	2.757	90	3.543	NG2R	0,35	.76
3955486	KM40TSS25ENEL2	25	.984	32	1.26	17	.669	55	2.169	70	2.756	NG2R	0,34	.75
3955490	KM40TSS25ENEL3	25	.984	34	1.34	17	.669	55	2.169	70	2.756	NG3R	0,35	.77
3955492	KM40TSS25HNEL3	25	.984	34	1.34	17	.669	75	2.954	100	3.937	NG3R	0,49	1.09
3955496	KM40TSS32GNEL3	32	1.260	40	1.57	22	.866	76	2.993	90	3.543	NG3R	0,55	1.21

(continued)

(NE 90° • Steel — continued)

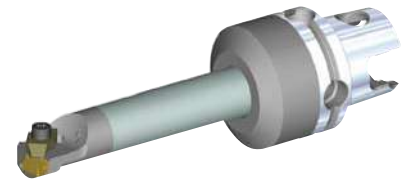
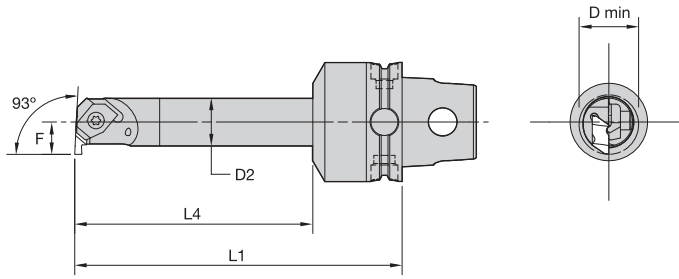
Spare Parts


catalogue number	clamp	clamp screw
right hand		
KM40TSS12ENER2	CM147	MS1488
KM40TSS16FNER2	CM147	MS1488
KM40TSS20GNER2	CM75	MS1488
KM40TSS25ENER2	CM75	MS1488
KM40TSS25ENER3	CM73	MS1489
KM40TSS25HNER2	CM75	MS1488
KM40TSS25HNER3	CM73	MS1489
KM40TSS32GNER3	CM73	MS1489
KM40TSS32JNER3	CM73	MS1489
left hand		
KM40TSS12ENEL2	CM146	MS1488
KM40TSS16FNEL2	CM146	MS1488
KM40TSS20GNEL2	CM74	MS1488
KM40TSS25ENEL2	CM74	MS1488
KM40TSS25ENEL3	CM-72	MS1489
KM40TSS25HNEL3	CM-72	MS1489
KM40TSS32GNEL3	CM-72	MS1489





Threading



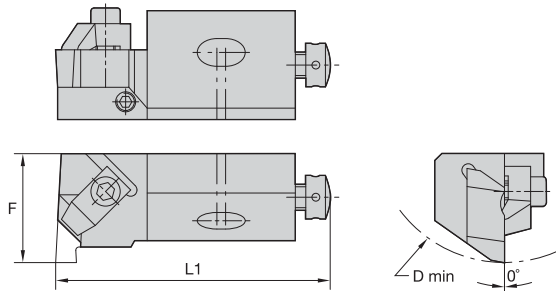
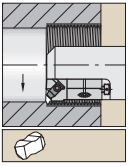
■ NE 90° • Carbide

order number	catalogue number	D2		D min		F		L4		L1		gage insert	kg	lbs
		mm	in	mm	in	mm	in	mm	in	mm	in			
right hand														
3951836	KM40TSE16JNER2	16	.630	20	.79	11	.433	80	3.15	110	4.331	NG2L	0,41	.90
left hand														
3951835	KM40TSE16JNEL2	16	.630	20	.79	11	.433	80	3.15	110	4.331	NG2R	0,41	.90

■ Spare Parts



catalogue number	clamp	clamp screw
right hand KM40TSE16JNER2	CM146	MS1488
left hand KM40TSE16JNEL2	CM147	MS1488

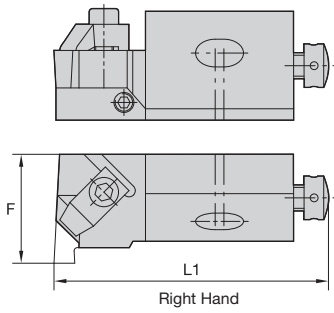
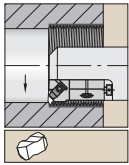


■ Steel Boring Cartridge



order number	catalogue number	D min	F	L1	gage insert	clamp	clamp screw	hex (mm)	radial adjusting screw	hex (mm)	axial screw	hex (mm)	washer
right hand													
1098380	NER12CA2	50	20	55,7	N.2L	CM75	MS1025	2.5 mm	KUAM23	2.5 mm	KUAM31	2.5 mm	CSWM 060 050
left hand													
1098624	NEL12CA2	50	20	55,0	N.2R	CM74	MS1025	2.5 mm	KUAM23	2.5 mm	KUAM31	2.5 mm	CSWM 060 050
1098626	NEL25CA3	100	32	100,0	N.3R	CM72LP	MS412	4 mm	KUAM26	4 mm	KUAM33	4 mm	CSWM 100 080

NOTE: Minimum bore diameter (D min) capability varies with thread type and pitch. See page D102 for details.
F dimension measured over sharp point of Top Notch-style threading insert.



Threading

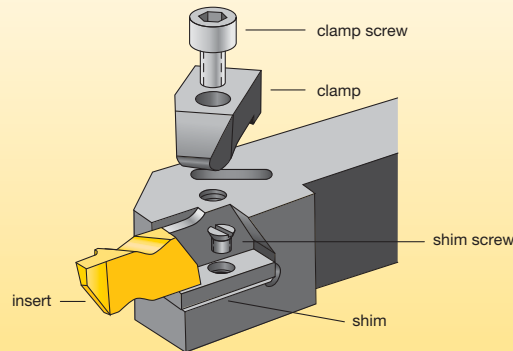
■ Steel Boring Cartridge



order number	catalogue number	D min	F	L1	gage insert	clamp	clamp screw	hex (mm)	radial adjusting screw	hex (mm)	axial screw	hex (mm)	washer
right hand													
1098380	NER12CA2	50	20	55,7	N.2L	CM75	MS1025	2.5 mm	KUAM23	2.5 mm	KUAM31	2.5 mm	CSWM 060 050
left hand													
1098624	NEL12CA2	50	20	55,0	N.2R	CM74	MS1025	2.5 mm	KUAM23	2.5 mm	KUAM31	2.5 mm	CSWM 060 050
1098626	NEL25CA3	100	32	100,0	N.3R	CM72LP	MS412	4 mm	KUAM26	4 mm	KUAM33	4 mm	CSWM 100 080

NOTE: Minimum bore diameter (D min) capability varies with thread type and pitch. See page D102 for details.
 F dimension measured over sharp point of Top Notch style threading insert.

Toolholders and Boring Bars



insert size and style	clamp	clamp screw	shim	shim screw
NG-1L	CM-109	S-304	-	-
NG-2R	CM-182	S-310	-	-
NG-2L	CM-183	S-310	-	-
NG-2R	CM-74	S-310	-	-
NG-2L	CM-75	S-310	-	-
NG-3R	CM-184	S-412	-	-
NG-3L	CM-185	S-412	-	-
NG-3R	CM-72	S-412	-	-
NG-3L	CM-73	S-412	-	-
NG-3R*	CM-78	S-412	-	-
NG-3L*	CM-70	S-412	-	-
NG-4R	CM-72	S-412	SM-420	SL-344
NG-4L	CM-73	S-412	SM-420	SL-344
NG-5R	CM-80	S-352	-	-
NG-5L	CM-81	S-352	-	-
NG-6R	CM-120	S-412	SM-416	S-111
NG-6L	CM-121	S-412	SM-416	S-111
NG-8R	CM-144	S-422	SM-419	S-112
NG-8L	CM-145	S-422	SM-419	S-112
NG-8R**	CM-144	S-422	SM-427	S-111
NG-8L**	CM-145	S-422	SM-427	S-111
Top Notch relief grooving				
NU-3125R	CM-72	S-412	-	-
NU-3125L	CM-73	S-412	-	-
NU-3125R**	CM-72	S-618	-	-
NU-3125L**	CM-73	S-618	-	-

*25mm diameter boring head.

**Boring head.

➤ LT • Laydown Triangle Threading

Primary Application

Laydown triangle (LT) 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. Variable shim angles enable proper cutting geometry for high-helix angle and reverse helix angle threading, maximising tool life and improving thread quality.

Features and Benefits

Precision-Ground Thread Form on LT and LT-CB

- Minimises 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 moulded LT-K thread form provides outstanding utility and value.
- Excellent chip control combined with the KU25T™ grade enables trouble-free threading on a variety of workpiece materials.



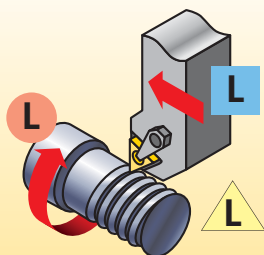
Step 1 • Select Threading Method and Hand of Tooling

Required Information:

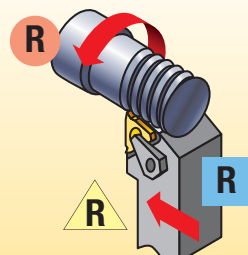
- External/internal operation.
- Spindle rotation/hand of thread.
- Feed direction.



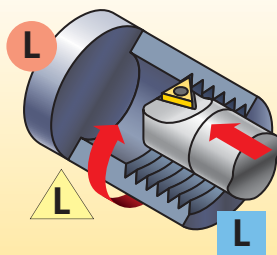
Feed direction toward the chuck • standard helix • RECOMMENDED



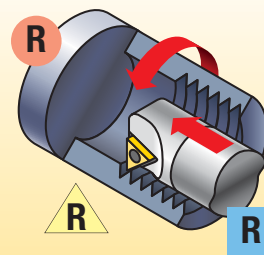
external left-hand thread



external right-hand thread

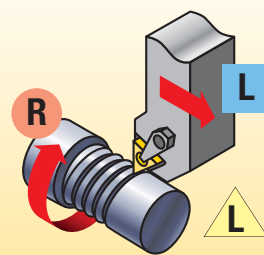


internal left-hand thread

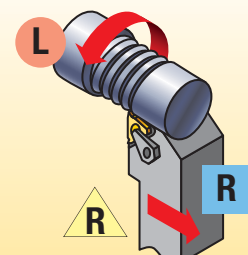


internal right-hand thread

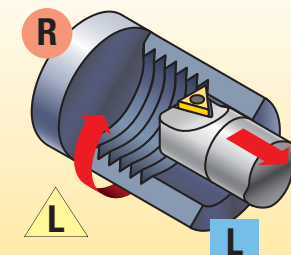
Feed direction away from the chuck • reverse helix*



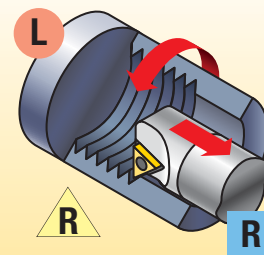
external right-hand thread



external left-hand thread



internal right-hand thread



internal left-hand thread

*Negative shim required

Step 2 • Select Holder from Catalogue Page

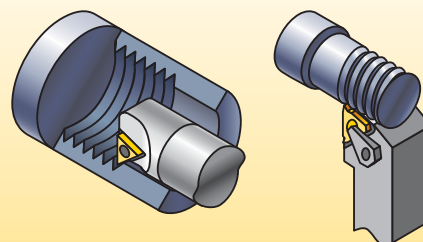
Required Information:

- External/internal operation.
- Minimum bore diameter (for internal operations).
- Hand of tool.
- Insert size (gage insert).

The insert size must match the gage insert size of your toolholder selection:

catalogue number	gage insert	minimum bore diameter	shim
S0812LSER2	2IRA60	16,5mm	SM-Y13
S2020LSER3	3IR...	36,8mm	SM-Y13

Select the appropriate holder for the insert size and hand:



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 optimised 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 D50.

	insert size	catalogue number	KCU25/KC5025
	11	2IRA60	•
	16	3IRAG60	•

Step 4 • Select Appropriate Shim

Required Information:

- Thread form (TPI or pitch).
- Pitch diameter.
- Helix method (hand of tool, feed direction, hand of thread).
- Number of starts.

Select the proper shim: SMYE... for external RH or internal LH
SMYI... for internal RH or external LH

RH thread/RH tooling

LH thread/LH tooling

insert size	toolholder		shim ordering code (inch)							
	external	internal	standard	SM-YE3	SM-YE3-1N	SM-YE3-1SN	SM-YE3-2N	SM-YE3-3N	SM-YE3-3N	
3 (3/8")	RH	LH	SM-YE3-3P	SM-YE3-2P	SM-YE3-1P	SM-YE3	SM-YE3-1N	SM-YE3-1SN	SM-YE3-2N	SM-YE3-3N
3 (3/8")	LH	RH	SM-YE4-3P	SM-YE4-2P	SM-YE4-1P	SM-YE4	SM-YE4-1N	SM-YE4-1SN	SM-YE4-2N	SM-YE4-3N
4 (1/2")	RH	LH	SM-YE4-3P	SM-YE4-2P	SM-YE4-1P	SM-YE4	SM-YE4-1N	SM-YE4-1SN	SM-YE4-2N	SM-YE4-3N
4 (1/2")	LH	RH	SM-YE4-3P	SM-YE4-2P	SM-YE4-1P	SM-YE4	SM-YE4-1N	SM-YE4-1SN	SM-YE4-2N	SM-YE4-3N

TPI	pitch (mm)	pitch diameter (inch)							
		0.72	0.75	0.78	0.81	0.84	0.87	0.90	0.93
72	0.35	-	-	-	0.17-0.31	0.32-0.84	>0.84	0.84-0.90	0.91-1.12
64	-	0.25	-	-	0.12-0.2	0.31-0.84	>0.84	0.84-0.91	0.91-1.12
-	0.40	-	-	-	0.14-0.35	0.36-0.96	>0.96	0.96-0.96	0.96-1.14
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
48	-	-	-	-	0.12-0.17	0.18-0.46	0.47-1.27	>1.27	1.27-0.47
44	-	-	-	-	0.13-0.19	0.2-0.51	0.52-1.38	>1.38	1.38-0.52
-	0.60	-	-	-	0.13-0.2	0.21-0.53	0.54-1.44	>1.44	1.44-0.54
40	-	-	-	-	0.11-0.13	0.14-0.21	0.22-0.56	0.57-1.52	>1.52
-	0.70	-	-	-	0.12-0.15	0.16-0.23	0.24-0.62	0.63-1.68	>1.68
36	-	-	-	-	0.12-0.15	0.16-0.23	0.24-0.62	0.63-1.69	>1.69
-	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	1.27-3.38	>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	1.42-3.9	>3.90	3.9-1.42	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	2.69-7.19	>7.19	7.19-2.69	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	-	0.54-0.61	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	-	0.78-0.86	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

If recommended shim is different from shim supplied with toolholder, order shim separately.
 NOTE: Optimise your threading operation by using the proper infeed angle and the recommended infeed values.
 See the Technical Section on pages D88–D110.
 Also see detailed shim selection information on pages D109–D110.

Step 5 • Select Grade and Speed

Recommendations for Grade and Speed Selection – m/min

	workpiece material	P	M	K	N	S
Kenna Perfect™	insert style	CB chipbreaker			CB chipbreaker	
	optimum cutting conditions	KC5010 70–260	KC5010 90–245	KC5010 60–245	KC5010 90–550	KC5010 30–150
	first choice	KC5025 50–230	KC5025 75–230	KC5025 50–180	KC5025 60–455	KC5025 20–120
Kenna Universal™	insert style	-K chipbreaker				
	selection	KU25T 45–210	KU25T 70–205	KU25T 45–160	KU25T 55–410	KU25T 20–110

NOTE: See threading insert overview on page D50.

Recommended Starting Speeds [m/min]

Threading

Material Group		KC5010			KC5025			KU25T		
P	0-1	135	200	260	105	165	230	95	150	210
	2	130	190	245	100	150	200	90	135	180
	3	105	155	200	75	125	170	70	115	155
	4	70	120	160	60	95	130	55	85	115
	5	105	155	200	75	130	170	70	115	155
	6	70	120	160	50	90	130	45	80	115
M	1	120	180	245	90	170	230	80	155	205
	2	90	165	210	75	140	200	70	125	180
	3	90	165	210	75	135	200	70	120	180
K	1	120	180	245	90	135	180	80	120	160
	2	90	150	210	70	120	170	65	110	155
	3	60	105	150	50	85	120	45	75	110
N	1-2	150	365	550	120	305	455	110	275	410
	3	90	135	180	60	105	150	55	95	135
	4	120	305	455	100	200	305	90	180	275
	5	90	165	245	70	135	195	65	120	175
	6	120	210	305	100	170	245	90	155	220
S	1	30	70	105	20	40	60	20	35	55
	2	30	65	100	20	35	45	20	30	40
	3	30	65	100	20	35	45	20	30	40
	4	55	105	150	45	85	120	40	75	110
H	1	30	45	60	-	-	-	-	-	-
	2	15	30	45	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-	-

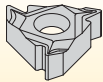
NOTE: FIRST choice starting speeds are in **bold** type.

How Do Catalogue Numbers Work?

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

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

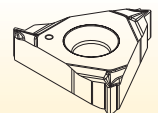
Thread Pitch

UN

Thread Profile

CB

Chip Control

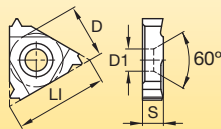


□ = Flat top

CB = Chipbreaker

K = Kenna Universal™ chipbreaker

insert size	LI (mm)	D (mm)	S (mm)	D1 (mm)
11	11,0	6,35	3,20	3,25
16	16,5	9,52	3,63	3,94
22	22,0	12,70	4,78	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.	D53–D54, D66–D67
 LT-ISOCB	 LT-ISOK	 LT-ISO	Metric ISO	ISO R262, DIN 13	6g/6H	Y	Widely used metric 60° V-form for all industries.	D57–D58, D70–D71
 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.	D62–D63, D74–D75
		 LT-UNJ	UNJ	MIL-S-8879C	3A/3B	Y	Controlled root radius on external threads for military and aerospace industries, 60° thread form.	D63, D75
 LT-NPTCB		 LT-NPT	NPT	USAS B2.1:1968	Standard NPT	Y	National Pipe Thread standard 60° thread form for pipe fittings.	D59, D72
 LT-NPTFCB		 LT-NPTF	NPTF	ANSI B1.20.3-1976	Class 2	Y	Dryseal-type NPT 60° thread form for pipe fittings.	D60, D72
	 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.	D52, D65–D66
		 LT-BSPT	BSPT	BS 21:1985	Standard BSPT	Y	55° form for pipe fittings.	D56, D69
 LT-WCB	 LT-WK	 LT-W	Whitworth, BSW, BSF, BSP	BS 84:1956, ISO 228/1:1985, DIN 259	Medium Class A	Y	Widely used 55° form for gas and water connections.	D64–D65, D76
		 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.	D55, D68
		 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.	D55, D69
		 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.	D56, D69
		 LT-ACME	Acme	ANSI B1.5:1988	3G	N	29° truncated thread form for motion applications in a wide variety of industries.	D54, D68
		 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.	D61, D73
		 LT-RD	Round	DIN 405	7h/7H	Y	Round thread form for tube fittings in the chemical and food industries.	D60, D73
		 LT-TR	Trapez	DIN 103	7e/7H	N	30° truncated metric thread form for motion applications.	D61, D73

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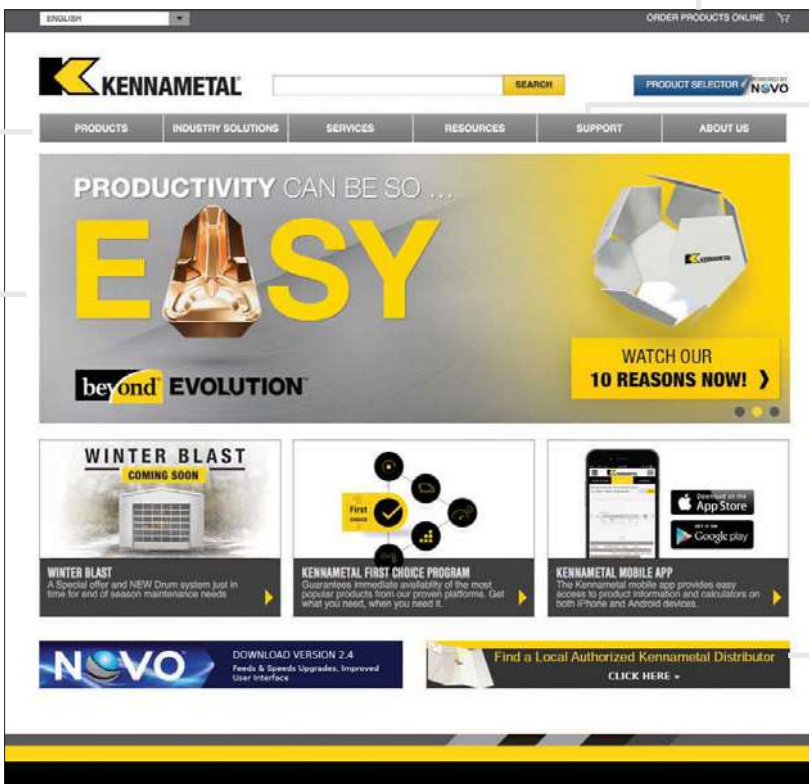
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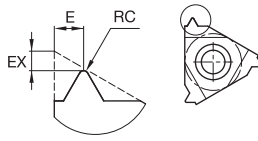
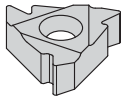
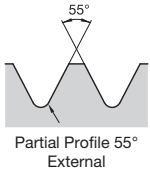
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Kennametal offers world-class products and services globally. Our distributors know us, and more importantly, they know you. They know better than anyone in the industry how to put the global power of Kennametal to work for you — in your industry, in your region, and for your business.



● first choice
○ alternate choice

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

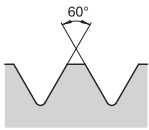
Threading

■ **LT-ER/L-55**

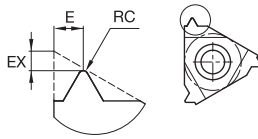
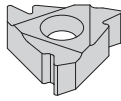
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right hand									
LT16ERA55	16	0,05	0,8	0,89	0,50-1,50	16-48	-	●	-
LT16ERAG55	16	0,08	1,2	1,70	0,50-3,00	8-48	●	●	-
16ERG55	16	0,20	1,2	1,70	1,75-3,00	8-14	-	●	-
LT22ERN55	22	0,43	1,7	2,49	3,50-5,00	5-7	-	●	-
left hand									
LT16ELAG55	16	0,08	1,2	1,70	0,50-3,00	8-48	-	●	-

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

● first choice
○ alternate choice

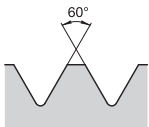


Partial Profile 60° External

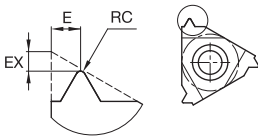
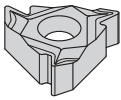


LT-ER/L-60

catalogue number	insert size	RC	EX	E	thread pitch mm	TPI	KC5010	KC5025	KU25T
right hand									
LT16ERA60	16	0,05	0,8	0,9	0,50-1,50	16-48	●	●	-
16ERAG60	16	0,08	1,2	1,7	0,50-3,0	8-48	-	●	-
LT16ERAG60	16	0,08	1,2	1,7	0,50-3,0	8-48	●	-	-
LT16ERG60	16	0,28	1,2	1,7	1,75-3,0	8-14	●	●	-
LT22ERN60	22	0,53	1,7	2,5	3,5-5,0	5-7	-	●	-
left hand									
LT16ELA60	16	0,05	0,8	0,9	0,50-1,50	16-48	-	●	-
LT16ELAG60	16	0,08	1,2	1,7	0,50-3,0	8-48	-	●	-
LT16ELG60	16	0,28	1,2	1,7	1,75-3,0	8-14	-	●	-
LT22ELN60	22	0,53	1,7	2,5	3,5-5,0	5-7	-	●	-



Partial Profile 60° External



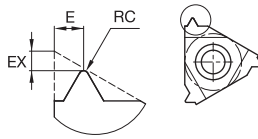
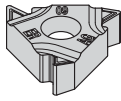
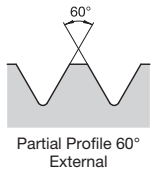
LT-ER-60CB

catalogue number	insert size	RC	EX	E	thread pitch mm	TPI	KC5010	KC5025	KU25T
right hand									
LT16ERAG60CB	16	0,08	0,9	1,5	0,50-3,0	8-48	●	●	-



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

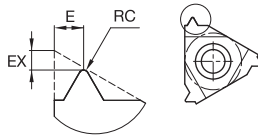
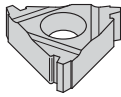
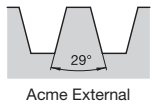
● first choice
○ alternate choice



Threading

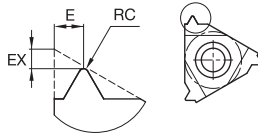
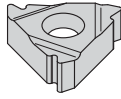
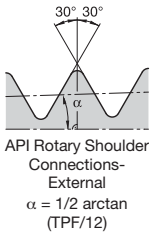
■ LT-ER-60K

catalogue number	insert size	RC	EX	E	thread pitch mm	TPI	KC5010	KC5025	KU25T
right hand									
LT16ERAG60K	16	0,08	1,2	1,7	0,50-3,0	8-48	-	-	●



■ LT-ER/L-ACME

catalogue number	insert size	RC	EX	E	thread pitch mm	TPI	KC5010	KC5025	KU25T
right hand									
LT16ER10ACME	16	-	1,3	1,40	-	10	-	●	-
LT16ER12ACME	16	-	1,1	1,19	-	12	-	●	-
LT16ER16ACME	16	-	1,0	1,09	-	16	-	●	-
LT16ER8ACME	16	-	1,4	1,50	-	8	-	●	-
LT22ER5ACME	22	-	2,0	2,29	-	5	-	●	-
LT22ER6ACME	22	-	1,8	2,11	-	6	-	●	-

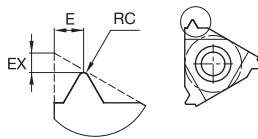
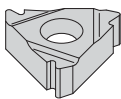
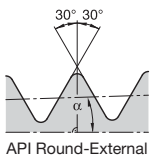


● first choice
 ○ alternate choice

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

LT-ER/L-API

catalogue number	insert size	RC	EX	E	thread pitch mm	TPI	KC5010	KC5025	KU25T
right hand									
LT22ER4API382	22	—	2,1	2,79	—	4	-	●	-
LT22ER4API502	22	—	2,0	2,90	—	4	●	●	-
LT22ER4API503	22	—	2,0	2,90	—	4	●	-	-
LT22ER5API403	22	—	1,8	2,60	—	5	●	-	-
LT27ER4API502	28	0,64	2,0	2,79	—	4	-	●	-
LT27ER4API382	28	0,97	2,0	2,79	—	4	-	●	-



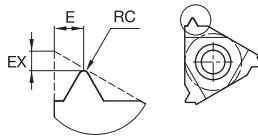
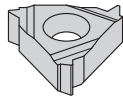
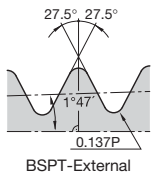
LT-ER/L-APIRD

catalogue number	insert size	RC	EX	E	thread pitch mm	TPI	KC5010	KC5025	KU25T
right hand									
LT16ER10APIRD	16	—	1,2	1,40	—	10	-	●	-
LT16ER8APIRD	16	—	1,3	1,50	—	8	-	●	-
left hand									
LT16EL8APIRD	16	—	1,3	1,50	—	8	-	●	-



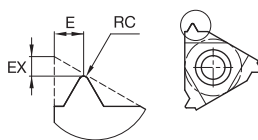
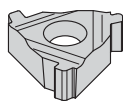
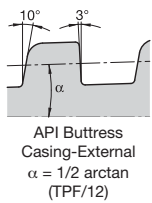
P	●	●	●
M	●	●	●
K	●	●	●
N	○	○	○
S	●	●	●
H	○	○	○

● first choice
○ alternate choice



LT-ER/L-BSPT

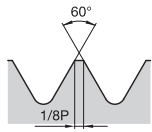
catalogue number	insert size	RC	EX	E	thread pitch mm	TPI	KC5010	KC5025	KU25T
right hand									
LT16ER11BSPT	16	—	1,1	1,50	—	11	—	●	—
LT16ER14BSPT	16	—	1,0	1,19	—	14	—	●	—



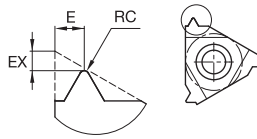
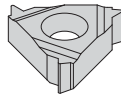
LT-ER/L-BUT

catalogue number	insert size	RC	EX	E	thread pitch mm	TPI	KC5010	KC5025	KU25T
right hand									
LT22ER5BUT75	22	—	3,1	1,91	—	5	—	●	—

Threading



ISO Metric-External



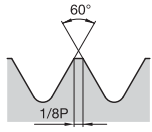
- first choice
- alternate choice

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

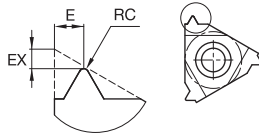
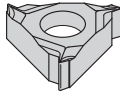
■ LT-ER/L-ISO

catalogue number	insert size	RC	EX	E	thread pitch mm	TPI	KC5010	KC5025	KU25T
right hand									
LT16ER05ISO	16	—	0,6	0,4	0,50	—	—	●	—
LT16ER075ISO	16	—	0,6	0,6	0,75	—	—	●	—
LT16ER10ISO	16	—	0,7	0,7	1,0	—	●	●	—
LT16ER125ISO	16	—	0,8	0,9	1,25	—	●	●	—
LT16ER15ISO	16	—	0,8	1,0	1,5	—	●	●	—
LT16ER175ISO	16	—	0,9	1,2	1,75	—	●	●	—
LT16ER20ISO	16	—	1,0	1,3	2,0	—	●	●	—
LT16ER25ISO	16	—	1,1	1,5	2,5	—	●	●	—
LT16ER30ISO	16	—	1,2	1,6	3,0	—	●	●	—
LT22ER35ISO	22	—	1,6	2,3	3,5	—	—	●	—
LT22ER40ISO	22	—	1,6	2,3	4,0	—	—	●	—
LT22ER45ISO	22	—	1,7	2,4	4,5	—	—	●	—
LT22ER50ISO	22	—	1,7	2,5	5,0	—	—	●	—
left hand									
LT16EL15ISO	16	—	0,8	1,0	1,5	—	●	●	—
LT16EL175ISO	16	—	0,9	1,2	1,75	—	—	●	—
LT16EL20ISO	16	—	1,0	1,3	2,0	—	—	●	—
LT16EL25ISO	16	—	1,1	1,5	2,5	—	—	●	—
LT16EL30ISO	16	—	1,2	1,6	3,0	—	—	●	—
LT16EL05ISO	16	—	0,6	0,4	0,50	—	—	●	—
LT16EL075ISO	16	—	0,6	0,6	0,75	—	—	●	—
LT16EL10ISO	16	—	0,7	0,7	1,0	—	—	●	—
LT16EL125ISO	16	—	0,8	0,9	1,25	—	—	●	—
LT22EL35ISO	22	—	1,6	2,3	3,5	—	—	●	—





ISO Metric-External



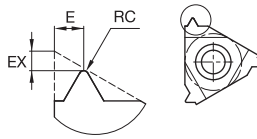
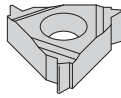
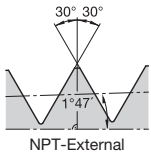
● first choice
○ alternate choice

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

Threading

■ **LT-ER-ISOCB**

catalogue number	insert size	RC	EX	E	thread pitch mm	TPI	KC5010	KC5025	KU25T
right hand									
LT16ER05ISOCB	16	—	1,2	0,5	0,50	—	●	●	—
LT16ER075ISOCB	16	—	1,2	0,6	0,75	—	●	●	—
LT16ER10ISOCB	16	—	0,7	0,8	1,0	—	●	●	—
LT16ER125ISOCB	16	—	0,7	0,8	1,25	—	●	●	—
LT16ER15ISOCB	16	—	0,7	0,8	1,5	—	●	●	—
LT16ER175ISOCB	16	—	1,2	1,5	1,75	—	●	●	—
LT16ER20ISOCB	16	—	1,2	1,5	2,0	—	●	●	—
LT16ER25ISOCB	16	—	1,2	1,5	2,5	—	—	●	—
LT16ER30ISOCB	16	—	1,3	1,5	3,0	—	●	●	—

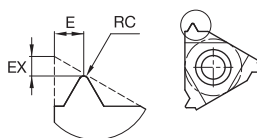
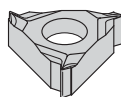
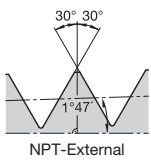


● first choice
○ alternate choice

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

LT-ER/L-NPT

catalogue number	insert size	RC	EX	E	thread pitch mm	TPI	KC5010	KC5025	KU25T
right hand									
LT16ER115NPT	16	—	1,1	1,5	—	11.5	●	●	—
LT16ER14NPT	16	—	0,9	1,2	—	14	●	●	—
LT16ER18NPT	16	—	0,8	1,0	—	18	●	●	—
LT16ER27NPT	16	—	0,7	0,8	—	27	—	●	—
LT16ER8NPT	16	—	1,3	1,8	—	8	—	●	—



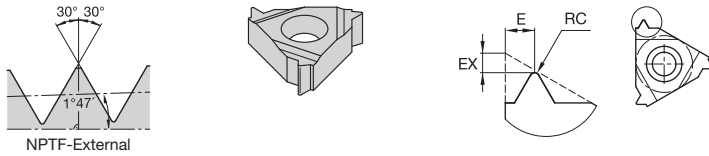
LT-ER-NPTCB

catalogue number	insert size	RC	EX	E	thread pitch mm	TPI	KC5010	KC5025	KU25T
right hand									
LT16ER14NPTCB	16	—	1,1	1,5	—	14	●	●	—



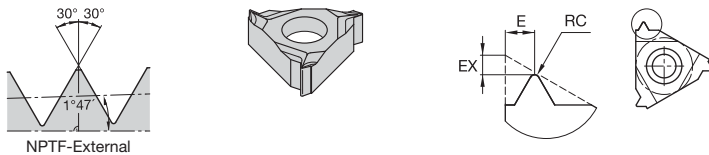
P	●	●	●
M	●	●	●
K	●	●	●
N	○	○	○
S	●	●	●
H	○	○	○

● first choice
○ alternate choice



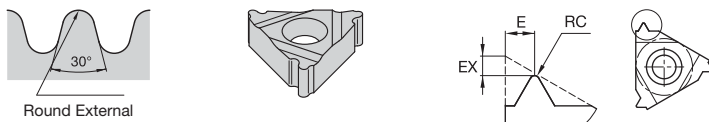
■ LT-ER/L-NPTF

catalogue number	insert size	RC	EX	E	thread pitch mm	TPI	KC5010	KC5025	KU25T
right hand									
LT16ER115NPTF	16	—	1,1	1,5	—	11.5	-	●	-
LT16ER14NPTF	16	—	0,9	1,2	—	14	-	●	-



■ LT-ER-NPTFCB

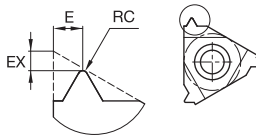
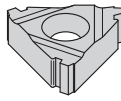
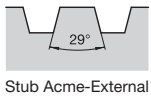
catalogue number	insert size	RC	EX	E	thread pitch mm	TPI	KC5010	KC5025	KU25T
right hand									
LT16ER115NPTFCB	16	—	1,1	1,5	—	11.5	-	●	-



■ LT-ER/L-RD

catalogue number	insert size	RC	EX	E	thread pitch mm	TPI	KC5010	KC5025	KU25T
right hand									
LT16ER8RD	16	0,76	1,4	1,30	—	8	-	●	-
LT22ER6RD	22	1,01	1,5	1,70	—	6	-	●	-

Threading

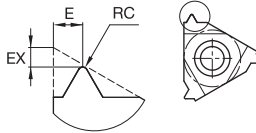
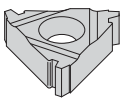
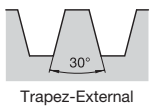


● first choice
○ alternate choice

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

LT-ER/L-STACME

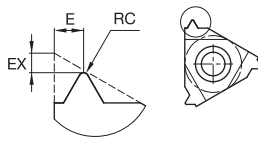
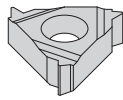
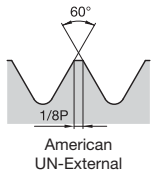
catalogue number	insert size	RC	EX	E	thread pitch mm	TPI	KC5010	KC5025	KU25T
right hand									
LT16ER10STACME	16	—	1,2	1,30	—	10	—	●	—
LT16ER12STACME	16	—	1,2	1,19	—	12	—	●	—
LT16ER16STACME	16	—	1,0	0,99	—	16	—	●	—
LT16ER6STACME	16	—	1,7	1,80	—	6	—	●	—
LT16ER8STACME	16	—	1,4	1,50	—	8	—	●	—
LT22ER5STACME	22	—	2,1	2,29	—	5	—	●	—



LT-ER/L-TR

catalogue number	insert size	RC	EX	E	thread pitch mm	TPI	KC5010	KC5025	KU25T
right hand									
LT16ER2TR	16	—	1,1	1,30	2,0	—	—	●	—
LT16ER3TR	16	—	1,3	1,50	3,0	—	—	●	—
LT22ER4TR	22	—	1,7	1,91	4,0	—	—	●	—
LT22ER5TR	22	—	2,1	2,50	5,0	—	—	●	—





● first choice
○ alternate choice

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

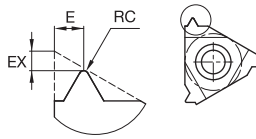
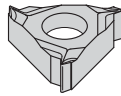
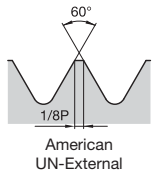
Threading

■ LT-ER/L-UN

catalogue number	insert size	RC	EX	E	thread pitch mm	TPI	KC5010	KC5025	KU25T
right hand									
LT16ER10UN	16	—	1,1	1,5	—	10	—	●	—
LT16ER12UN	16	—	1,1	1,4	—	12	●	●	—
LT16ER14UN	16	—	1,0	1,2	—	14	●	●	—
LT16ER16UN	16	—	0,9	1,1	—	16	●	●	—
LT16ER18UN	16	—	0,8	1,0	—	18	●	●	—
LT16ER20UN	16	—	0,8	0,9	—	20	●	●	—
LT16ER24UN	16	—	0,7	0,8	—	24	●	●	—
LT16ER28UN	16	—	0,6	0,7	—	28	●	●	—
LT16ER32UN	16	—	0,6	0,6	—	32	●	●	—
LT16ER36UN	16	—	0,6	0,6	—	36	—	●	—
LT16ER40UN	16	—	0,6	0,6	—	40	—	●	—
LT16ER48UN	16	—	0,6	0,6	—	48	—	●	—
LT16ER8UN	16	—	1,2	1,6	—	8	—	●	—
left hand									
LT16EL24UN	16	—	0,7	0,8	—	24	—	●	—
LT16EL28UN	16	—	0,6	0,7	—	28	—	●	—
LT16EL8UN	16	—	1,2	1,6	—	8	—	●	—
LT16EL12UN	16	—	1,1	1,4	—	12	—	●	—
LT16EL14UN	16	—	1,0	1,2	—	14	—	●	—
LT16EL16UN	16	—	0,9	1,1	—	16	—	●	—
LT16EL18UN	16	—	0,8	1,0	—	18	—	●	—
LT16EL20UN	16	—	0,8	0,9	—	20	—	●	—

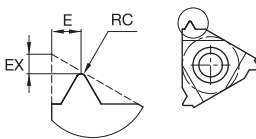
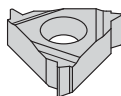
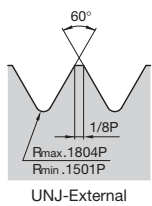
P	●	●	●
M	●	●	●
K	●	●	●
N	○	○	○
S	●	●	●
H	○	○	○

● first choice
○ alternate choice



LT-ER-UNCB

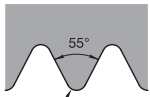
catalogue number	insert size	RC	EX	E	thread pitch mm	TPI	KC5010	KC5025	KU25T
right hand									
LT16ER10UNCB	16	—	1,2	1,5	—	10	—	●	—
LT16ER12UNCB	16	—	1,2	1,5	—	12	●	●	—
LT16ER14UNCB	16	—	1,2	1,5	—	14	●	●	—
LT16ER16UNCB	16	—	0,8	0,8	—	16	●	●	—
LT16ER18UNCB	16	—	0,7	0,8	—	18	●	●	—
LT16ER20UNCB	16	—	0,7	0,8	—	20	●	●	—
LT16ER24UNCB	16	—	0,7	0,8	—	24	●	●	—
LT16ER28UNCB	16	—	0,7	0,8	—	28	●	●	—
LT16ER32UNCB	16	—	1,2	0,5	—	32	●	●	—
LT16ER8UNCB	16	—	1,3	1,5	—	8	●	●	—



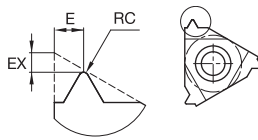
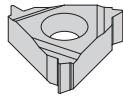
LT-ER/L-UNJ

catalogue number	insert size	RC	EX	E	thread pitch mm	TPI	KC5010	KC5025	KU25T
right hand									
LT16ER12UNJ	16	—	1,1	1,3	—	12	●	●	—
LT16ER14UNJ	16	—	1,0	1,2	—	14	●	●	—
LT16ER16UNJ	16	—	0,9	1,1	—	16	●	●	—
LT16ER18UNJ	16	—	0,8	1,0	—	18	●	●	—
LT16ER20UNJ	16	—	0,8	0,9	—	20	●	●	—
LT16ER24UNJ	16	—	0,7	0,8	—	24	—	●	—
LT16ER28UNJ	16	—	0,7	0,7	—	28	—	●	—
LT16ER32UNJ	16	—	0,6	0,7	—	32	—	●	—
left hand									
LT16EL16UNJ	16	—	0,9	1,1	—	16	—	●	—





Whitworth BSW,
BSF, BSP-Internal



● first choice
○ alternate choice

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

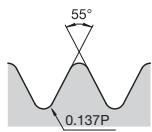
■ **LT-ER/L-W**

Threading

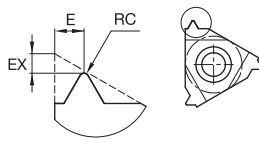
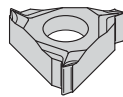
catalogue number	insert size	RC	EX	E	thread pitch mm	TPI	KC5010	KC5025	KU25T
right hand									
LT16ER10W	16	—	1,1	1,50	—	10	-	●	-
LT16ER11W	16	—	1,1	1,50	—	11	●	●	-
LT16ER12W	16	—	1,1	1,40	—	12	-	●	-
LT16ER14W	16	—	1,0	1,19	—	14	●	●	-
LT16ER16W	16	—	0,9	1,09	—	16	-	●	-
LT16ER18W	16	—	0,8	0,99	—	18	-	●	-
LT16ER19W	16	—	0,8	0,99	—	19	●	●	-
LT16ER20W	16	—	0,8	0,89	—	20	-	●	-
LT16ER24W	16	—	0,7	0,79	—	24	-	●	-
LT16ER28W	16	—	0,6	0,69	—	28	-	●	-
LT16ER8W	16	—	1,2	1,50	—	8	-	●	-
LT16ER9W	16	—	1,2	1,70	—	9	-	●	-
LT22ER6W	22	—	1,6	2,29	—	6	-	●	-
LT22ER7W	22	—	1,6	2,29	—	7	-	●	-
left hand									
LT16EL11W	16	—	1,1	1,50	—	11	-	●	-
LT16EL14W	16	—	1,0	1,19	—	14	-	●	-

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

● first choice
○ alternate choice

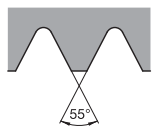


Whitworth BSW,
BSF, BSP-External

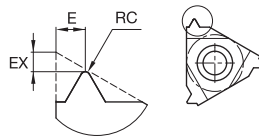
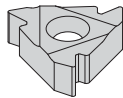


LT-ER-WCB

catalogue number	insert size	RC	EX	E	thread pitch mm	TPI	KC5010	KC5025	KU25T
right hand									
LT16ER11WCB	16	—	1,3	1,50	—	11	-	●	-
LT16ER14WCB	16	—	1,3	1,50	—	14	●	●	-



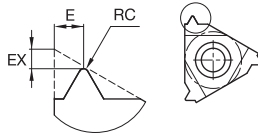
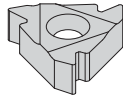
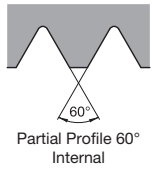
Partial Profile 55°
Internal



LT-NR/L-55

catalogue number	insert size	RC	EX	E	thread pitch mm	TPI	KC5010	KC5025	KU25T
right hand									
LT11NRA55	11	0,05	0,8	0,89	0,50-1,50	16-48	-	●	-
LT16NRA55	16	0,05	0,8	0,89	0,50-1,50	16-48	-	●	-
LT16NRAG55	16	0,07	1,2	1,70	0,50-3,00	8-48	-	●	-
LT16NRG55	16	0,21	1,2	1,70	1,75-3,00	8-14	-	●	-
LT22NRN55	22	0,43	1,7	2,49	3,50-5,00	5-7	-	●	-





● first choice
○ alternate choice

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

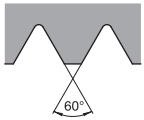
Threading

LT-NR/L-60

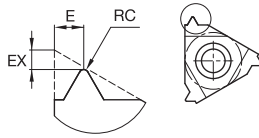
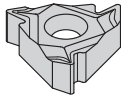
catalogue number	insert size	RC	EX	E	thread pitch mm	TPI	KC5010	KC5025	KU25T
right hand									
LT11NRA60	11	0,05	0,8	0,9	0,50-1,5	48-16	●	●	-
LT16NRA60	16	0,05	0,8	0,9	0,50-1,5	48-16	●	●	-
LT16NRAG60	16	0,05	1,2	1,7	0,50-3,0	48-8	●	●	-
LT16NRG60	16	0,15	1,2	1,7	1,75-3,0	14-8	●	●	-
LT22NRN60	22	0,31	1,7	2,5	3,5-5,0	7-5	-	●	-
left hand									
LT11NLA60	11	0,05	0,8	0,9	0,50-1,5	48-16	-	●	-
LT16NLA60	16	0,05	0,8	0,9	0,50-1,5	48-16	-	●	-
LT16NLAG60	16	0,05	1,2	1,7	0,50-3,0	48-8	-	●	-
LT16NLG60	16	0,15	1,2	1,7	1,75-3,0	14-8	-	●	-
LT22NLN60	22	0,31	1,7	2,5	3,5-5,0	7-5	-	●	-

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

● first choice
○ alternate choice

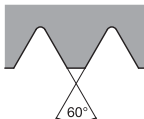


Partial Profile 60°
Internal

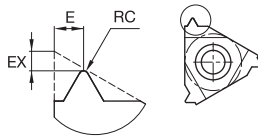
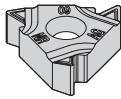


■ LT-NR-60CB

catalogue number	insert size	RC	EX	E	thread pitch mm	TPI	KC5010	KC5025	KU25T
right hand									
LT11NRA60CB	11	0,05	0,6	0,8	0,50-1,50	48-16	-	●	-
LT16NRAG60CB	16	0,05	0,9	1,5	0,50-3,0	48-8	-	●	-
LT16NRG60CB	16	0,16	1,0	1,5	1,75-3,0	14-8	-	●	-



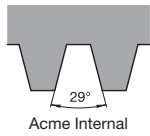
Partial Profile 60°
Internal



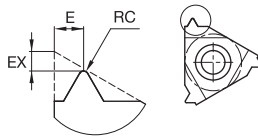
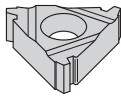
■ LT-NR-60K

catalogue number	insert size	RC	EX	E	thread pitch mm	TPI	KC5010	KC5025	KU25T
right hand									
LT16NRAG60K	16	0,04	1,2	1,7	0,50-3,0	48-8	-	-	●





Acme Internal



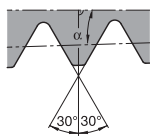
● first choice
○ alternate choice

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

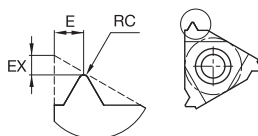
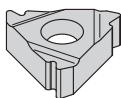
Threading

LT-NR/L-ACME

catalogue number	insert size	RC	EX	E	thread pitch mm	TPI	KC5010	KC5025	KU25T
right hand									
LT16NR10ACME	16	—	1,2	1,30	—	10	-	●	-
LT16NR12ACME	16	—	1,2	1,30	—	12	-	●	-
LT16NR8ACME	16	—	1,4	1,50	—	8	-	●	-
LT22NR5ACME	22	—	2,0	2,29	—	5	-	●	-
LT22NR6ACME	22	—	1,8	2,11	—	6	-	●	-



API Rotary Shoulder Connections-Internal
 $\alpha = 1/2 \arctan (TPF/12)$

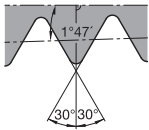


LT-NR/L-API

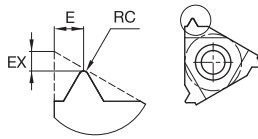
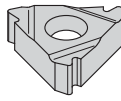
catalogue number	insert size	RC	EX	E	thread pitch mm	TPI	KC5010	KC5025	KU25T
right hand									
LT22NR4API382	22	—	2,1	2,79	—	4	-	●	-
LT22NR4API502	22	—	2,1	3,10	—	4	-	●	-
LT22NR5API403	22	—	1,8	2,60	—	5	-	●	-
LT27NR4API502	28	0,65	2,0	3,79	—	4	-	●	-
LT27NR4API382	28	0,99	2,0	2,79	—	4	-	●	-

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

● first choice
○ alternate choice

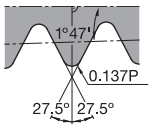


API Round-Internal

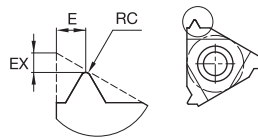
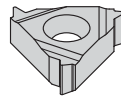


LT-NR/L-APIRD

catalogue number	insert size	RC	EX	E	thread pitch mm	TPI	KC5010	KC5025	KU25T
right hand									
LT16NR10APIRD	16	—	1,2	1,40	—	10	-	●	-
LT16NR8APIRD	16	—	1,3	1,50	—	8	-	●	-

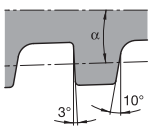


BSPT-Internal

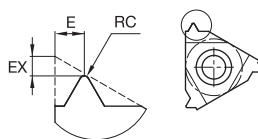
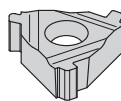


LT-NR/L-BSPT

catalogue number	insert size	RC	EX	E	thread pitch mm	TPI	KC5010	KC5025	KU25T
right hand									
LT11NR14BSPT	11	—	0,9	0,99	—	14	-	●	-
LT16NR11BSPT	16	—	1,1	1,50	—	11	-	●	-
LT16NR14BSPT	16	—	1,0	1,19	—	14	-	●	-



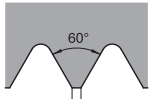
API Buttress Casing-Internal
 $\alpha = 1/2 \arctan (TPF/12)$



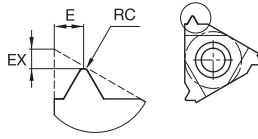
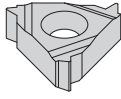
LT-NR/L-BUT

catalogue number	insert size	RC	EX	E	thread pitch mm	TPI	KC5010	KC5025	KU25T
right hand									
LT22NR5BUT1	22	—	2,8	1,91	—	5	-	●	-
LT22NR5BUT75	22	—	2,8	1,91	—	5	-	●	-





ISO Metric-Internal



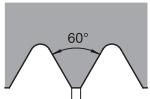
● first choice
○ alternate choice

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

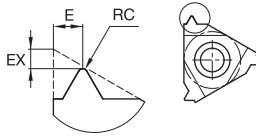
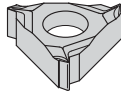
■ LT-NR/L-ISO

Threading

catalogue number	insert size	RC	EX	E	thread pitch mm	TPI	KC5010	KC5025	KU25T
right hand									
LT11NR05ISO	11	—	0,6	0,4	0,50	—	—	●	—
LT11NR075ISO	11	—	0,6	0,6	0,75	—	—	●	—
LT11NR10ISO	11	—	0,6	0,7	1,0	—	—	●	—
LT11NR125ISO	11	—	0,8	0,9	1,25	—	—	●	—
LT11NR15ISO	11	—	0,8	1,0	1,5	—	●	●	—
LT11NR175ISO	11	—	0,9	1,1	1,75	—	—	●	—
LT11NR20ISO	11	—	0,9	1,1	2,0	—	—	●	—
LT16NR05ISO	16	—	0,6	0,4	0,50	—	—	●	—
LT16NR075ISO	16	—	0,6	0,6	0,75	—	—	●	—
LT16NR10ISO	16	—	0,6	0,7	1,0	—	●	●	—
LT16NR125ISO	16	—	0,8	0,9	1,25	—	—	●	—
LT16NR15ISO	16	—	0,8	1,0	1,5	—	●	●	—
LT16NR175ISO	16	—	0,9	1,2	1,75	—	—	●	—
LT16NR20ISO	16	—	1,0	1,3	2,0	—	●	●	—
LT16NR25ISO	16	—	1,1	1,5	2,5	—	—	●	—
LT16NR30ISO	16	—	1,1	1,5	3,0	—	●	●	—
LT22NR35ISO	22	—	1,6	2,3	3,5	—	—	●	—
LT22NR40ISO	22	—	1,6	2,3	4,0	—	—	●	—
LT22NR45ISO	22	—	1,6	2,4	4,5	—	—	●	—
LT22NR50ISO	22	—	1,6	2,3	5,0	—	—	●	—
left hand									
LT11NL15ISO	11	—	0,8	1,0	1,5	—	—	●	—
LT11NL10ISO	11	—	0,6	0,7	1,0	—	—	●	—
LT16NL30ISO	16	—	1,1	1,5	3,0	—	—	●	—
LT16NL10ISO	16	—	0,6	0,7	1,0	—	—	●	—
LT16NL15ISO	16	—	0,8	1,0	1,5	—	—	●	—
LT16NL20ISO	16	—	1,0	1,3	2,0	—	—	●	—
LT16NL25ISO	16	—	1,1	1,5	2,5	—	—	●	—



ISO Metric-Internal



- first choice
- alternate choice

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

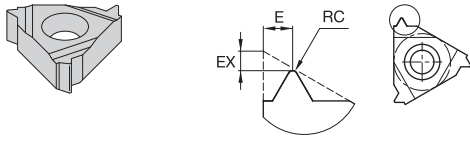
■ LT-NR-ISOCB

catalogue number	insert size	RC	EX	E	thread pitch mm	TPI	KC5010	KC5025	KU25T
right hand									
LT11NR075ISOCB	11	—	1,2	0,5	0,75	—	—	●	—
LT11NR10ISOCB	11	—	0,7	0,8	1,0	—	—	●	—
LT11NR125ISOCB	11	—	0,7	0,8	1,25	—	—	●	—
LT11NR15ISOCB	11	—	0,7	0,8	1,5	—	—	●	—
LT16NR10ISOCB	16	—	0,7	0,8	1,0	—	—	●	—
LT16NR15ISOCB	16	—	0,7	0,8	1,5	—	—	●	—
LT16NR20ISOCB	16	—	1,1	1,5	2,0	—	—	●	—
LT16NR25ISOCB	16	—	1,1	1,5	2,5	—	—	●	—



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

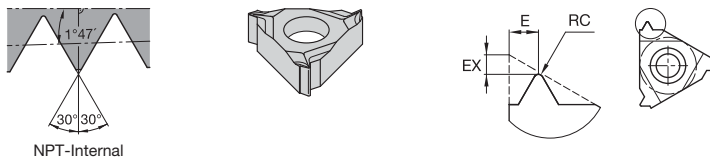
● first choice
○ alternate choice



Threading

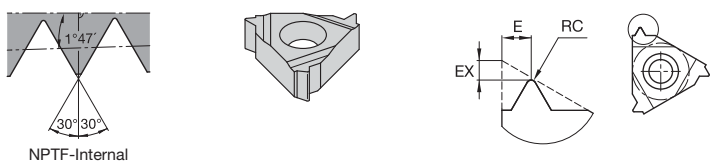
LT-NR/L-NPT

catalogue number	insert size	RC	EX	E	thread pitch mm	TPI	KC5010	KC5025	KU25T
right hand									
LT11NR14NPT	11	—	0,8	1,0	—	14	●	●	—
LT11NR18NPT	11	—	0,8	1,0	—	18	—	●	—
LT16NR115NPT	16	—	1,1	1,5	—	11.5	●	●	—
LT16NR14NPT	16	—	0,9	1,2	—	14	—	●	—
LT16NR8NPT	16	—	1,3	1,8	—	8	—	●	—



LT-NR-NPTCB

catalogue number	insert size	RC	EX	E	thread pitch mm	TPI	KC5010	KC5025	KU25T
right hand									
LT16NR115NPTCB	16	—	1,1	1,5	—	11.5	—	●	—
LT16NR14NPTCB	16	—	1,4	1,2	—	14	—	●	—

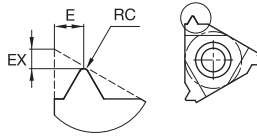
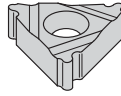
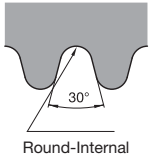


LT-NR/L-NPTF

catalogue number	insert size	RC	EX	E	thread pitch mm	TPI	KC5010	KC5025	KU25T
right hand									
LT11NR14NPTF	11	—	0,8	0,99	—	14	—	●	—
LT16NR14NPTF	16	—	0,9	1,19	—	14	—	●	—

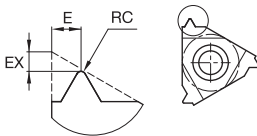
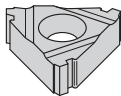
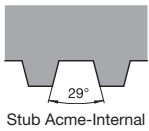
P	●	●	●
M	●	●	●
K	●	●	●
N	○	○	○
S	●	●	●
H	○	○	○

● first choice
○ alternate choice



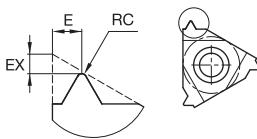
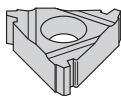
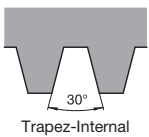
LT-NR/L-RD

catalogue number	insert size	RC	EX	E	thread pitch mm	TPI	KC5010	KC5025	KU25T
right hand									
LT16NR8RD	16	0,70	1,4	1,40	—	8	-	●	-
LT22NR6RD	22	0,93	1,5	1,70	—	6	-	●	-



LT-NR/L-STACME

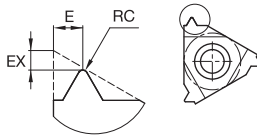
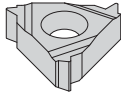
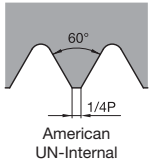
catalogue number	insert size	RC	EX	E	thread pitch mm	TPI	KC5010	KC5025	KU25T
right hand									
LT16NR10STACME	16	—	1,2	1,30	—	10	-	●	-
LT16NR12STACME	16	—	1,1	1,19	—	12	-	●	-
LT16NR14STACME	16	—	1,1	1,09	—	14	-	●	-
LT16NR16STACME	16	—	1,0	0,99	—	16	-	●	-
LT16NR6STACME	16	—	1,7	1,80	—	6	-	●	-
LT16NR8STACME	16	—	1,4	1,50	—	8	-	●	-



LT-NR/L-TR

catalogue number	insert size	RC	EX	E	thread pitch mm	TPI	KC5010	KC5025	KU25T
right hand									
LT16NR2TR	16	—	1,1	1,30	2,0	—	-	●	-
LT16NR3TR	16	—	1,3	1,50	3,0	—	-	●	-
LT22NR4TR	22	—	1,7	1,91	4,0	—	-	●	-
LT22NR5TR	22	—	2,1	2,50	5,0	—	-	●	-





● first choice
○ alternate choice

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

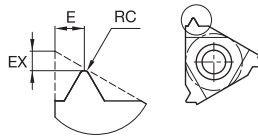
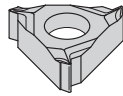
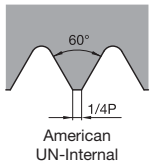
Threading

■ LT-NR/L-UN

catalogue number	insert size	RC	EX	E	thread pitch mm	TPI	KC5010	KC5025	KU25T
right hand									
LT11NR16UN	11	—	0,9	1,1	—	16	●	●	—
LT11NR18UN	11	—	0,8	1,0	—	18	—	●	—
LT11NR20UN	11	—	0,8	0,9	—	20	—	●	—
LT11NR24UN	11	—	0,7	0,8	—	24	—	●	—
LT11NR28UN	11	—	0,6	0,7	—	28	—	●	—
LT11NR32UN	11	—	0,6	0,6	—	32	—	●	—
LT11NR40UN	11	—	0,6	0,6	—	40	—	●	—
LT16NR10UN	16	—	1,1	1,5	—	10	—	●	—
LT16NR12UN	16	—	1,1	1,4	—	12	●	●	—
LT16NR14UN	16	—	0,9	1,2	—	14	—	●	—
LT16NR16UN	16	—	0,9	1,1	—	16	—	●	—
LT16NR18UN	16	—	0,8	1,0	—	18	—	●	—
LT16NR20UN	16	—	0,8	0,9	—	20	—	●	—
LT16NR24UN	16	—	0,7	0,8	—	24	—	●	—
LT16NR28UN	16	—	0,6	0,7	—	28	—	●	—
LT16NR32UN	16	—	0,6	0,6	—	32	—	●	—
LT16NR8UN	16	—	1,1	1,5	—	8	—	●	—
left hand									
LT11NL32UN	11	—	0,6	0,6	—	32	—	●	—
LT16NL10UN	16	—	1,1	1,5	—	10	—	●	—
LT16NL12UN	16	—	1,1	1,4	—	12	—	●	—
LT16NL16UN	16	—	0,9	1,1	—	16	—	●	—

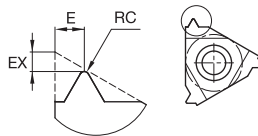
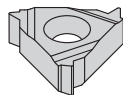
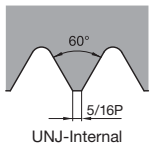
P	●	●	●
M	●	●	●
K	●	●	●
N	○	○	○
S	●	●	●
H	○	○	○

● first choice
○ alternate choice



LT-NR-UNCB

catalogue number	insert size	RC	EX	E	thread pitch mm	TPI	KC5010	KC5025	KU25T
right hand									
LT11NR16UNCB	11	—	0,7	0,8	—	16	-	●	-
LT11NR18UNCB	11	—	0,6	0,8	—	18	-	●	-
LT11NR20UNCB	11	—	0,6	0,8	—	20	-	●	-
LT11NR24UNCB	11	—	0,7	0,8	—	24	-	●	-
LT11NR32UNCB	11	—	1,2	0,5	—	32	-	●	-
LT16NR10UNCB	16	—	1,1	1,5	—	10	-	●	-
LT16NR12UNCB	16	—	1,1	1,5	—	12	-	●	-
LT16NR14UNCB	16	—	1,1	1,5	—	14	-	●	-
LT16NR16UNCB	16	—	0,7	0,8	—	16	-	●	-
LT16NR18UNCB	16	—	0,6	0,8	—	18	-	●	-
LT16NR20UNCB	16	—	0,7	0,6	—	20	-	●	-
LT16NR8UNCB	16	—	1,1	1,5	—	8	-	●	-



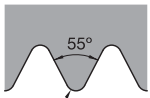
LT-NR/L-UNJ

catalogue number	insert size	RC	EX	E	thread pitch mm	TPI	KC5010	KC5025	KU25T
right hand									
LT11NR14UNJ	11	—	1,0	1,2	—	14	-	●	-
LT11NR16UNJ	11	—	0,9	1,1	—	16	-	●	-
LT11NR18UNJ	11	—	0,8	1,0	—	18	-	●	-
LT16NR12UNJ	16	—	1,1	1,3	—	12	-	●	-
LT16NR16UNJ	16	—	0,9	1,1	—	16	-	●	-

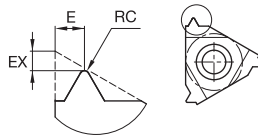
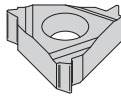


P	●	●	●
M	●	●	●
K	●	●	●
N	○	○	○
S	●	●	●
H	○	○	○

● first choice
○ alternate choice



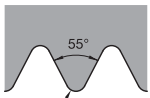
Whitworth BSW,
BSF, BSP-Internal



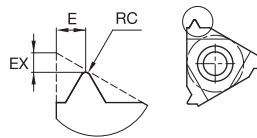
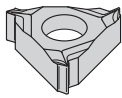
Threading

LT-NR/L-W

catalogue number	insert size	RC	EX	E	thread pitch mm	TPI	KC5010	KC5025	KU25T
right hand									
LT11NR14W	11	—	0,9	1,09	—	14	-	●	-
LT11NR19W	11	—	0,8	0,99	—	19	-	●	-
LT16NR10W	16	—	1,1	1,50	—	10	-	●	-
LT16NR11W	16	—	1,1	1,50	—	11	●	●	-
LT16NR12W	16	—	1,1	1,40	—	12	-	●	-
LT16NR14W	16	—	1,0	1,19	—	14	-	●	-
LT16NR16W	16	—	0,9	1,09	—	16	-	●	-
LT16NR19W	16	—	0,8	0,99	—	19	-	●	-
LT16NR20W	16	—	0,8	0,89	—	20	-	●	-
LT16NR8W	16	—	1,2	1,50	—	8	-	●	-
LT22NR7W	22	—	1,6	2,29	—	7	-	●	-
left hand									
LT16NL11W	16	—	1,1	1,50	—	11	-	●	-



Whitworth BSW,
BSF, BSP-Internal



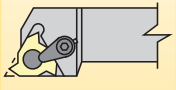
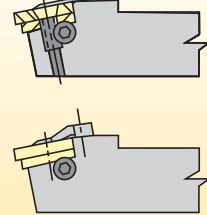


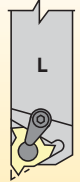
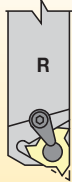
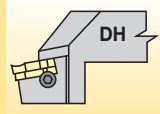
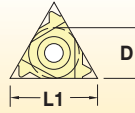
LT-NR-WCB

catalogue number	insert size	RC	EX	E	thread pitch mm	TPI	KC5010	KC5025	KU25T
right hand									
LT16NR11WCB	16	—	1,3	1,50	—	11	-	●	-
LT16NR14WCB	16	—	1,3	1,50	—	14	-	●	-

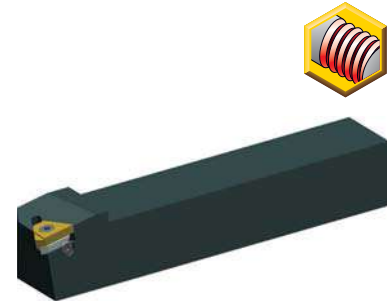
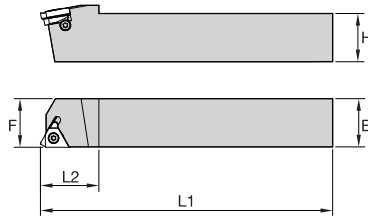
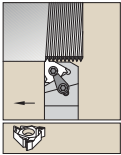
How Do Catalogue Numbers Work?

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



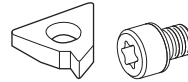
<p>L</p> <p>Insert Style</p>	<p>S</p> <p>Insert Holding Method</p>	<p>AS</p> <p>Tool Style</p>	<p>R</p> <p>Hand of Tool</p>	<p>Drop Head</p>	<p>2525M</p> <p>Shank Size</p>	<p>16</p> <p>Insert Size</p>	<p>Qualified Surface and Length</p>															
<p>L – Laydown triangle</p> 	<p>S – Insert screw or clamp only</p> 	<p>Straight shank</p>  <p>Offset shank</p> 	<p>Left hand</p>  <p>Right hand</p> 		<p>Metric: Shank height and width in mm and holder length according to ISO standard.</p>	<p>C – qualified back and end, 5" long</p> <p>D – qualified back and end, 6" long</p> <p>E – qualified back and end, 7" long</p> <p>T – qualified back and end, 3.25" long</p> <p>Q – qualified metric holder</p>																
					<p>Size equals number of 1/8" increments of IC.</p>  <table border="1"> <thead> <tr> <th>inch insert size</th> <th>metric insert size</th> <th>D mm</th> <th>L1 mm</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>11</td> <td>6,4</td> <td>11,0</td> </tr> <tr> <td>3</td> <td>16</td> <td>9,5</td> <td>16,5</td> </tr> <tr> <td>4</td> <td>22</td> <td>12,7</td> <td>22,0</td> </tr> </tbody> </table>	inch insert size	metric insert size	D mm	L1 mm	2	11	6,4	11,0	3	16	9,5	16,5	4	22	12,7	22,0	
inch insert size	metric insert size	D mm	L1 mm																			
2	11	6,4	11,0																			
3	16	9,5	16,5																			
4	22	12,7	22,0																			

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.** For Threading Shim Catalogue Numbering System, please see page D80.

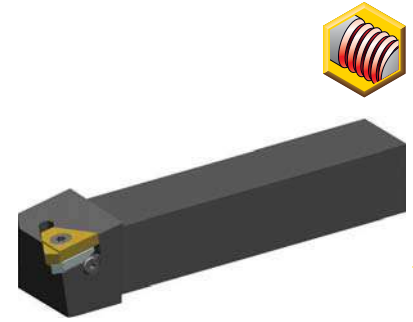
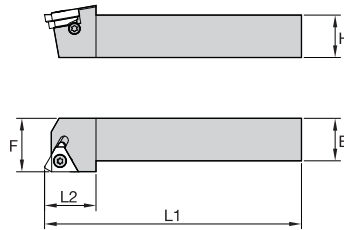
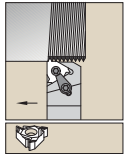


Threading

■ LSA

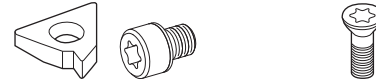


order number	catalogue number	H	B	F	L1	gage insert	shim	shim screw	Torx	Torx	insert screw	Torx
right hand												
1136965	LSASR1212N16	12	12	16	85	LT16ER	—	—	—	—	SSA3T	T10
1136984	LSASR1616H16	16	16	16	100	LT16ER	SMYE3	SSY3T	T10	T15	SSA3T	T10
1136992	LSASR2020K16	20	20	20	125	LT16ER	SMYE3	SSY3T	T10	T15	SSA3T	T10
1137000	LSASR2525M16	25	25	25	150	LT16ER	SMYE3	SSY3T	T10	T15	SSA3T	T10
1137007	LSASR2525M22	25	25	25	150	LT22ER	SMYE4	SSY4T	T20	T20	SSA4T	T20
1125454	LSASR3232P16	32	32	32	170	LT16ER	SMYE3	SSY3T	T10	T15	SSA3T	T10
1611931	LSASR3232P22	32	32	32	170	LT22ER	SMYE4	SSY4T	T20	T20	SSA4T	T20
left hand												
1136926	LSASL1212N16	12	12	16	85	LT16EL	—	—	—	—	SSA3T	T10
1136935	LSASL1616H16	16	16	16	100	LT16EL	SMYI3	SSY3T	T10	T15	SSA3T	T10
1136943	LSASL2020K16	20	20	20	125	LT16EL	SMYI3	SSY3T	T10	T15	SSA3T	T10
1136951	LSASL2525M16	25	25	25	150	LT16EL	SMYI3	SSY3T	T10	T15	SSA3T	T10
1136959	LSASL2525M22	25	25	25	150	LT22EL	SMYI4	SSY4T	T20	T20	SSA4T	T20

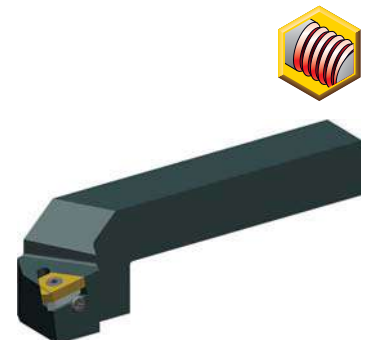
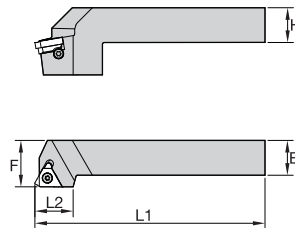
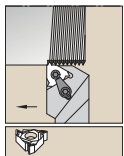


Threading

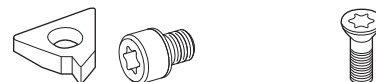
■ LSS



order number	catalogue number	H	B	F	L1	LH	gage insert	shim	shim screw	Torx	insert screw	Torx
right hand												
1137054	LSSR2020K16Q	20	20	25	125	25	LT16ER	SMYE3	SSY3T	T10	SSA3T	T10
1137063	LSSR2525M16Q	25	25	32	150	25	LT16ER	SMYE3	SSY3T	T10	SSA3T	T10
1137069	LSSR2525M22Q	25	25	32	150	30	LT22ER	SMYE4	SSY4T	T20	SSA4T	T20
1611933	LSSR3232P16Q	32	32	40	170	32	LT16ER	SMYE3	SSY3T	T10	SSA3T	T10
1611935	LSSR3232P22Q	32	32	40	170	30	LT22ER	SMYE4	SSY4T	T20	SSA4T	T20
left hand												
1192325	LSSL2020K16Q	20	20	25	125	25	LT16EL	SMYI3	SSY3T	T10	SSA3T	T10
1137022	LSSL2525M16Q	25	25	32	150	25	LT16EL	SMYI3	SSY3T	T10	SSA3T	T10
1137029	LSSL2525M22Q	25	25	32	150	30	LT22EL	SMYI4	SSY4T	T20	SSA4T	T20
1611934	LSSL3232P16Q	32	32	40	170	32	LT16EL	SMYI3	SSY3T	T10	SSA3T	T10



■ LSS-DH

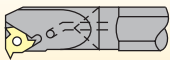
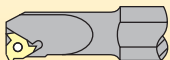

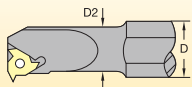
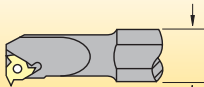
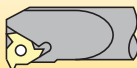
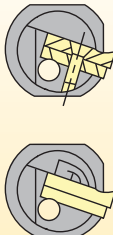

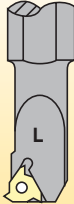
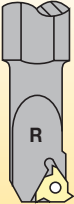
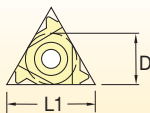


order number	catalogue number	H	B	F	L1	LH	gage insert	shim	shim screw	Torx	insert screw	Torx
right hand												
1174502	LSSRDH2020K16Q	20	20	25	125	38	LT16ER	SMYE3	SSY3T	T10	SSA3T	T10
1611938	LSSRDH2525M16	25	25	32	150	38	LT16ER	SMYE3	SSY3T	T10	SSA3T	T10
1137036	LSSRDH2525M22Q	25	25	32	150	38	LT22ER	SMYE4	SSY4T	T20	SSA4T	T20
left hand												
1611939	LSSLDH2525M16	25	25	32	150	38	LT16EL	SMYI3	SSY3T	T10	SSA3T	T10

How Do Catalogue Numbers Work?

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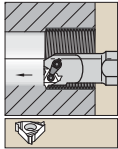


E	16		L	S	E	R	16																
Bar Type	Primary Necked Shank Bar Diameter	Secondary (mounting) Bar Diameter	Insert Style	Insert Holding Method	Bar Style	Hand of Tool	Insert Size																
<p>E — Carbide with coolant</p>  <p>S — Steel shank without coolant</p>  <p>H — Interchangeable head with coolant</p> 	<p>Metric diameter in mm.</p> 	<p>Metric diameter in mm.</p> 	<p>L — Laydown triangle</p> 	<p>S — Insert screw</p> 	<p>End cutting edge mount</p> 	<p>Left Hand</p>  <p>Right Hand</p> 	<p>Size equals number of 1/8" increments of IC.</p>  <table border="1"> <thead> <tr> <th>inch insert size</th> <th>metric insert size</th> <th>D mm</th> <th>L1 mm</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>11</td> <td>6,4</td> <td>11,0</td> </tr> <tr> <td>3</td> <td>16</td> <td>9,5</td> <td>16,5</td> </tr> <tr> <td>4</td> <td>22</td> <td>12,7</td> <td>22,0</td> </tr> </tbody> </table>	inch insert size	metric insert size	D mm	L1 mm	2	11	6,4	11,0	3	16	9,5	16,5	4	22	12,7	22,0
inch insert size	metric insert size	D mm	L1 mm																				
2	11	6,4	11,0																				
3	16	9,5	16,5																				
4	22	12,7	22,0																				

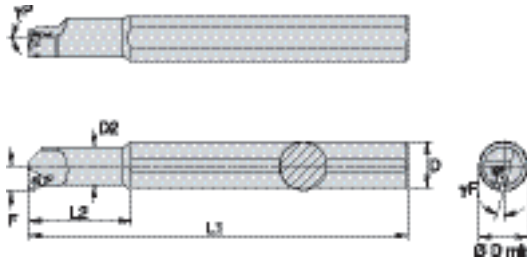
LT Threading Shim Catalogue Numbering System

SM	Y	E	3	2P
Shim	Shim for LT Standard Inserts	Insert Threading	Insert Size	Shim Angle
		<p>E = External</p> <p>I = Internal</p>	<p>D value in 1/8"</p>	<p>2P = 2° positive</p> <p>1P = 1° positive</p> <p>— = 0° neutral</p> <p>1N = 1° negative</p> <p>2N = 2° negative</p> <p>3N = 3° negative</p>

For shims and shim kits, see pages D109–D110.

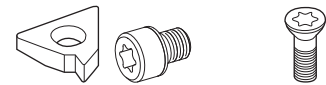


Steel shank with through coolant.

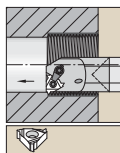


Threading

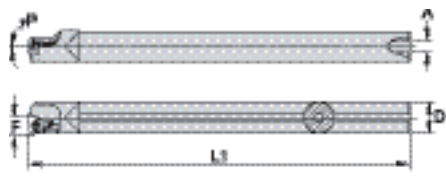
A-LSE



order number	catalogue number	D	D min	D2	F	L1	L2	γF°	γP°	gage insert	shim		insert screw		
											shim	screw	Torx	Torx	
right hand															
1131468	A1020LSER11	20	13	—	7,3	180	25	-15.0	-1.5	LT11NR	—	—	—	SSN2T	T8
1131481	A1320LSER11	20	16	—	8,9	180	32	-15.0	-1.5	LT11NR	—	—	—	SSN2T	T8
1612581	A1320LSER16	20	17	—	10,3	180	32	-15.0	-1.5	LT16NR	—	—	—	SSA3T	T10
1798921	A1616LSER16	16	20	16,0	11,3	150	32	-15.0	-1.5	LT16NR	—	—	—	SSA3T	T10
1131509	A1620LSER16	20	20	—	11,7	180	36	-15.0	-1.5	LT16NR	—	—	—	SSA3T	T10
1131524	A2020LSER16	20	24	20,0	13,4	180	40	-15.0	-1.5	LT16NR	SMYI3	SSY3T	T10	SSA3T	T10
1131547	A2525LSER16	25	29	—	16,1	200	45	-15.0	-1.5	LT16NR	SMYI3	SSY3T	T10	SSA3T	T10
1131566	A2525LSER22	25	32	—	17,2	200	45	-15.0	-1.5	LT22NR	SMYI4	SSY4T	T20	SSA4T	T20
1612584	A2020LSER22	20	27	20,0	15,6	180	50	-15.0	-1.5	LT22NR	—	—	—	SSA4T	T20
1131574	A2532LSER16	32	29	—	16,3	250	60	-15.0	-1.5	LT16NR	SMYI3	SSY3T	T10	SSA3T	T10
1131582	A2532LSER22	32	32	—	17,4	250	60	-15.0	-1.5	LT22NR	SMYI4	SSY4T	T20	SSA4T	T20
1612587	A3232LSER22	32	39	32,0	21,5	250	60	-15.0	-1.5	LT22NR	SMYI4	SSY4T	T20	SSA4T	T20
1798922	A4040LSER22	40	47	40,0	25,8	300	60	-15.0	-1.5	LT22NR	SMYI4	SSY4T	T20	SSA4T	T20
1798920	A1010LSER11	10	13	10,0	7,3	100	100	-15.0	-1.5	LT11NR	—	—	—	SSN2T	T8
left hand															
1612586	A2532LSEL16	32	29	—	16,3	250	—	-15.0	-1.5	LT16NL	SMYE3	SSY3T	T10	SSA3T	T10
1131458	A1020LSEL11	20	13	—	7,3	180	25	-15.0	-1.5	LT11NL	—	—	—	SSN2T	T8
1131476	A1320LSEL11	20	16	—	8,9	180	32	-15.0	-1.5	LT11NL	—	—	—	SSN2T	T8
1798980	A1616LSEL16	16	20	16,0	11,3	150	32	-15.0	-1.5	LT16NL	—	—	—	SSA3T	T10
1131499	A1620LSEL16	20	20	—	11,5	180	40	-15.0	-1.5	LT16NL	—	—	—	SSA3T	T10
1131516	A2020LSEL16	20	24	20,0	13,4	180	40	-15.0	-1.5	LT16NL	SMYE3	SSY3T	T10	SSA3T	T10
1131532	A2525LSEL16	25	29	—	16,1	200	45	-15.0	-1.5	LT16NL	SMYE3	SSY3T	T10	SSA3T	T10
1131540	A2525LSEL22	25	32	—	17,2	200	45	-15.0	-1.5	LT22NL	SMYE4	SSY4T	T20	SSA4T	T20
1612585	A2020LSEL22	20	27	20,0	15,6	180	50	-15.0	-1.5	LT22NL	—	—	—	SSA4T	T20
1612588	A3232LSEL22	32	39	32,0	21,5	250	60	-15.0	-1.5	LT22NL	SMYE4	SSY4T	T20	SSA4T	T20
1799093	A4040LSEL22	40	47	40,0	25,8	300	60	-15.0	-1.5	LT22NL	SMYE4	SSY4T	T20	SSA4T	T20
1798979	A1010LSEL11	10	13	10,0	7,3	100	100	-15.0	-1.5	LT11NL	—	—	—	SSN2T	T8

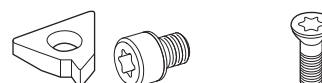


Carbide shank with through coolant.



Threading

E-LSE

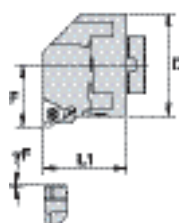


order number	catalogue number	D	D min	F	L1	A	γF°	γP°	gage insert	shim	shim screw	Torx	insert screw	Torx
right hand														
1152844	E16RLSER16	16	20	11,5	200,0	6	-15	-1.5	LT16NR	—	—	—	SN3TPKG	T10
1152846	E20SLSER16	20	24	13,4	250,0	7	-15	-1.5	LT16NR	SMYI3	SSY3T	T10	SSA3T	T10
1152848	E25TLSER16	25	29	15,8	300,0	8	-15	-1.5	LT16NR	SMYI3	SSY3T	T10	SSA3T	T10

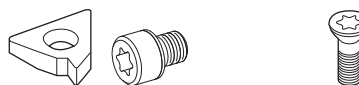
NOTE: Items listed without a shim are designed for a 1.5° inclination angle.



With through coolant.

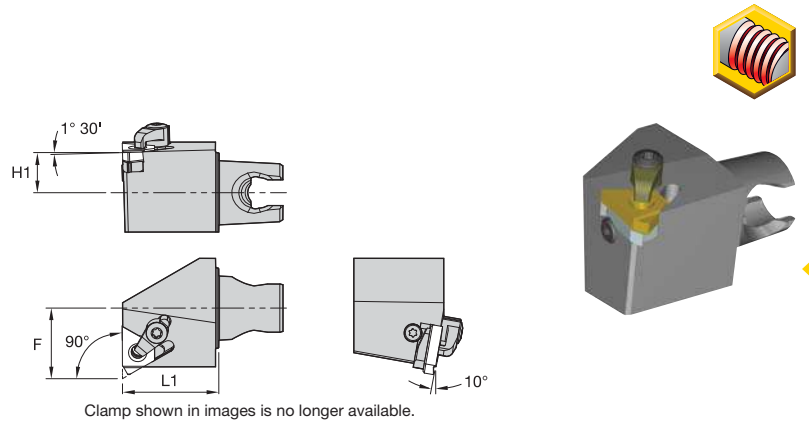


H-LSE



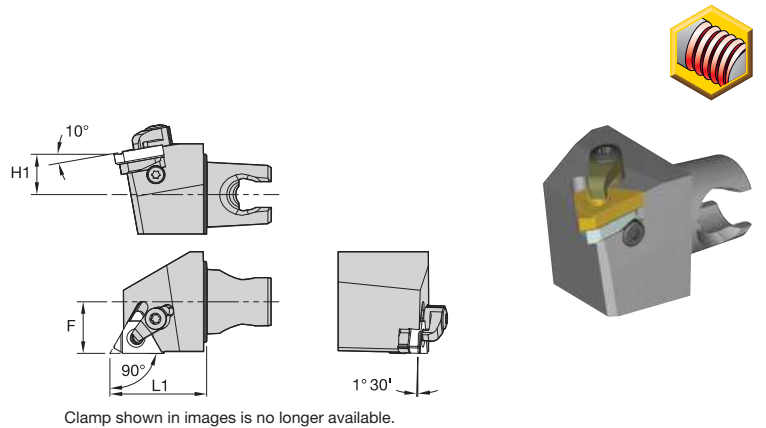
order number	catalogue number	D	D min	L1	F	γF°	γP°	gage insert	shim	shim screw	Torx	insert screw	Torx
right hand													
1095216	H16LSER3	25	30,5	41,3	16,4	-15,0	-1.5	LT16NR	SMYI3	SSY3T	T10	SSA3T	T10
1095218	H20LSER3	32	36,8	41,3	19,3	-15,0	-1.5	LT16NR	SMYI3	SSY3T	T10	SSA3T	T10
1095220	H24LSER3	38	44,7	41,3	22,5	-15,0	-1.5	LT16NR	SMYI3	SSY3T	T10	SSA3T	T10
1095224	H24LSER4	38	45,3	41,3	24,7	-15,0	-1.5	LT22NR	SMYI4	SSY4T	T20	SSA4T	T20
1803997	H40LSER22	40	47,0	41,3	25,9	-15,0	-1.5	LT22NR	SMYI4	SSY4T	T20	SSA4T	T20
1803995	H50LSER16	50	54,0	41,3	28,6	-15,0	-1.5	LT16NR	SMYI3	SSY3T	T10	SSA3T	T10
1803999	H50LSER22	50	56,0	41,3	30,5	-15,0	-1.5	LT22NR	SMYI4	SSY4T	T20	SSA4T	T20
3842905	H50LSER27	50	58,0	41,3	31,4	-15,0	-1.5	LT27NR	SMYI5	SSY5T	T25	SSA5T	T25
1095222	H32LSER3	51	61,0	41,3	32,4	-15,0	-1.5	LT16NR	SMYI3	SSY3T	T10	SSA3T	T10
1095226	H32LSER4	51	61,0	41,3	32,4	-15,0	-1.5	LT22NR	SMYI4	SSY4T	T20	SSA4T	T20
3842895	H32LSER5	51	61,0	41,3	32,5	-15,0	-1.5	LT27NR	SMYI5	SSY5T	T25	SSA5T	T25
3842897	H40LSER5	64	77,0	41,3	38,9	-15,0	-1.5	LT27NR	SMYI5	SSY5T	T25	SSA5T	T25

NOTE: For boring adaptors, see pages B386.



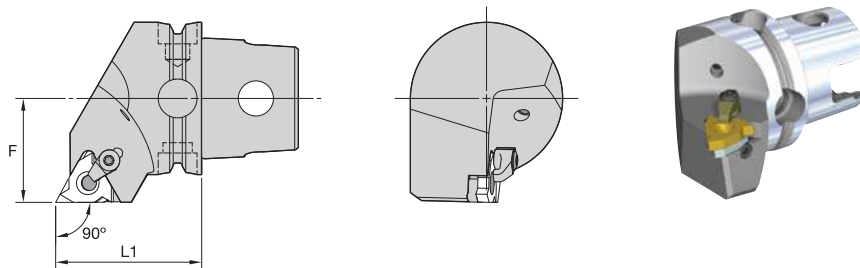
■ LSE • End Mount

order number	catalogue number	L1	F	H1	gage insert	insert screw	shim	shim screw
right hand								
2399506	KM25LSER1630	30	22	12,5	LT16EL	SSA3T	SMYI3	SSY3T
left hand								
2399507	KM25LSEL1630	30	22	12,5	LT16ER	SSA3T	SMYE3	SSY3T



■ LSS • Side Mount

order number	catalogue number	L1	F	H1	gage insert	insert screw	shim	shim screw
right hand								
2399504	KM25LSSR1630	30	16	12,5	LT16ER	SSA3T	SMYE3	SSY3T
3176219	KM25LSSR2230	30	16	12,5	LT22ER	SSA4T	SMYE4	SSY4T
left hand								
2399505	KM25LSSL1630	30	16	12,5	LT16EL	SSA3T	SMYI3	SSY3T
3176220	KM25LSSL2230	30	16	12,5	LT22EL	SSA4T	SMYI4	SSY4T

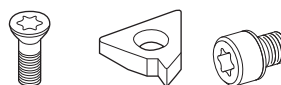


Clamp shown in images is no longer available.

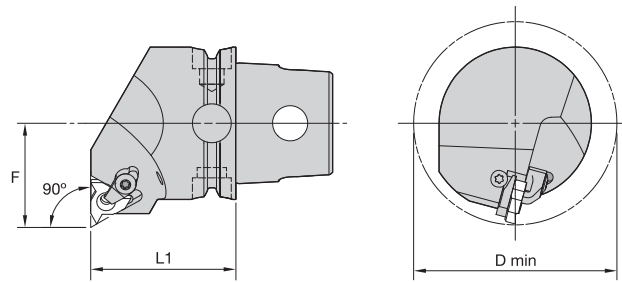
Threading



■ LSS 90°



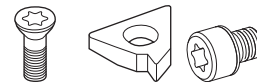
order number	catalogue number	L1		F		gage insert	insert screw	shim	shim screw	kg	lbs
		mm	in	mm	in						
right hand											
3950857	KM40TSLSSR16	40	1.575	27	1.063	LT16ER	SSA3T	SMYE3	SSY3T	0,31	.68
3950858	KM40TSLSSR22	40	1.575	27	1.063	LT22ER	SSA4T	SMYE4	SSY4T	0,30	.66
3959401	KM40TSLSSR27	45	1.772	27	1.063	LT27ER	SSA5T	SMYE5	SSY5T	0,37	.82
left hand											
3950855	KM40TSLSSL16	40	1.575	27	1.063	LT16EL	SSA3T	SMYI3	SSY3T	0,32	.70
3950856	KM40TSLSSL22	40	1.575	27	1.063	LT22EL	SSA4T	SMYI4	SSY4T	0,31	.68
3959400	KM40TSLSSL27	45	1.772	27	1.063	LT27EL	SSA5T	SMYI5	SSY5T	0,37	.82



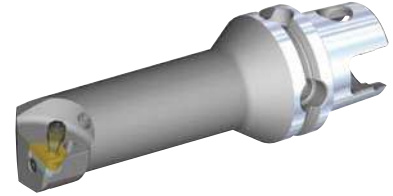
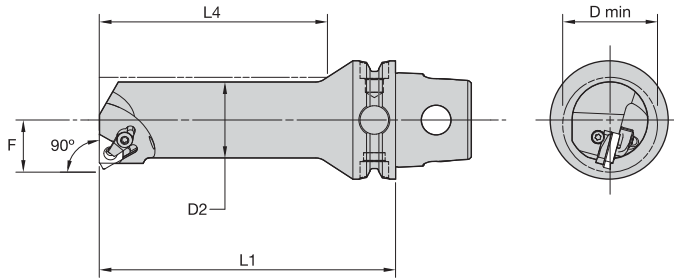
Clamp shown in images is no longer available.



■ LSE-N 90° • Internal Only



order number	catalogue number	L1		F		D min		gage insert	insert screw	shim	shim screw	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	0,35	.77
3950854	KM40TSLSER22N	40	1.575	27	1.063	54	2.126	LT22NR	SSA4T	SMYI4	SSY4T	0,35	.77
3959399	KM40TSLSER27N	45	1.772	27	1.063	54	2.126	LT27NR	SSA5T	SMYI5	SSY5T	0,39	.86
left hand													
3950831	KM40TSLSEL16N	40	1.575	27	1.063	54	2.126	LT16NL	SSA3T	SMYE3	SSY3T	0,35	.77



Clamp shown in images is no longer available.

Threading



■ LSE 90°

order number	catalogue 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
3955469	KM40TSS20GLSEL16	20	.79	25	.98	13	.512	70	2.76	90	3.543	LT16NL	0,34	.75
3955471	KM40TSS25HLSEL16	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

NOTE: Items listed without a shim are designed for a 1,5° inclination angle.

■ Spare Parts

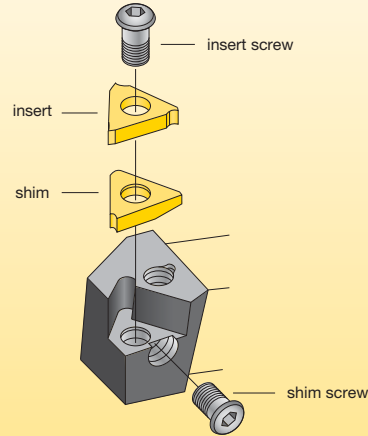












catalogue number	insert screw	shim	shim screw
right hand			
KM40TSS10DLSER11	SSN2T	—	—
KM40TSS12ELSER11	SSN2T	—	—
KM40TSS16FLSER16	SN3TPKG	—	—
KM40TSS20GLSER16	SSA3T	SMYI3	SSY3T
KM40TSS25HLSER16	SSA3T	SMYI3	SSY3T
KM40TSS32JLSER16	SSA3T	SMYI3	SSY3T
KM40TSS32JLSER22	SSA4T	SMYI4	SSY4T
left hand			
KM40TSS10DLSEL11	SSN2T	—	—
KM40TSS12ELSEL11	SSN2T	—	—
KM40TSS20GLSEL16	SSA3T	SMYE3	SSY3T
KM40TSS25HLSEL16	SSA3T	SMYE3	SSY3T
KM40TSS32JLSEL16	SSA3T	SMYE3	SSY3T
KM40TSS32JLSEL22	SSA4T	SMYE4	SSY4T

Laydown 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 D109–D110.



insert size and screw	insert screw	shim	shim screw and washer
3ER 	SS-A3T	SM-YIE3	SS-Y3T
3EL 	SS-A3T	SM-YI3	SS-Y3T
4ER 	SS-A4T	SM-YIE4	SS-Y4T
4EL 	SS-A4T	SM-YI4	SS-Y4T
Laydown Threading boring bars			
2IR 	SS-N2T	—	—
2IL 	SS-N2T	—	—
3IR 	SS-A3T	SM-YI3	SS-Y3T
3IL 	SS-A3T	SM-YIE3	SS-Y3T
4IR 	SS-A4T	SM-YI4	SS-Y4T
4IL 	SS-A4T	SM-YIE4	SS-Y4T

SM	—	Y	E	3	—	2N												
Shim		Y-shim for Laydown standard inserts	E – External I – Internal	IC – 16mm		Shim Angle												
				<table border="1"> <tr> <td>2P</td> <td>2° positive</td> </tr> <tr> <td>1P</td> <td>1° positive</td> </tr> <tr> <td>—</td> <td>0°</td> </tr> <tr> <td>1N</td> <td>1° negative</td> </tr> <tr> <td>2N</td> <td>2° negative</td> </tr> <tr> <td>3N</td> <td>3° negative</td> </tr> </table>		2P	2° positive	1P	1° positive	—	0°	1N	1° negative	2N	2° negative	3N	3° negative	
2P	2° positive																	
1P	1° positive																	
—	0°																	
1N	1° negative																	
2N	2° negative																	
3N	3° negative																	

resultant angle		3.5°	2.5°	1.5°	0.5°	-0.5°	-1.5°
insert size (IC)	toolholder	shim ordering code					
16mm	ex. RH/in. LH ex. LH/in. RH	SM-YE3-2P SM-YI3-2P	SM-YE3-1P SM-YI3-1P	SM-YE3 SM-YI3	SM-YE3-1N SM-YI3-1N	SM-YE3-2N SM-YI3-2N	SM-YE3-3N SM-YI3-3N
22mm	ex. RH/in. LH ex. LH/in. RH	SM-YE4-2P SM-YI4-2P	SM-YE4-1P SM-YI4-1P	SM-YE4 SM-YI4	SM-YE4-1N SM-YI4-1N	SM-YE4-2N SM-YI4-2N	SM-YE4-3N SM-YI4-3N

Slanted Shim Kit

Because you might occasionally need different shims than those supplied with our standard toolholders, we strongly recommend that shim kits be readily available in every tool shop.

insert size	shim size (D)	ordering code	contains slanted shims
3x	16mm	ABY3SET	SM-YE3-2P, 1P, 1N, 2N, 3N SM-YI3-2P, 1P, 1N, 2N, 3N
4x	22mm	ABY4	SM-YE4-2P, 1P, 1N, 2N, 3N SM-YI4-2P, 1P, 1N, 2N, 3N

The Helix Angle

Example:

d = 48,06mm (1.892")

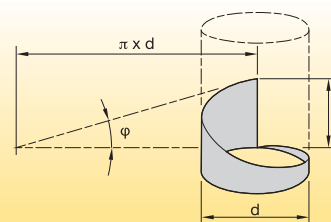
p = 3,175mm (.125")

ϕ = Helix angle

p = pitch

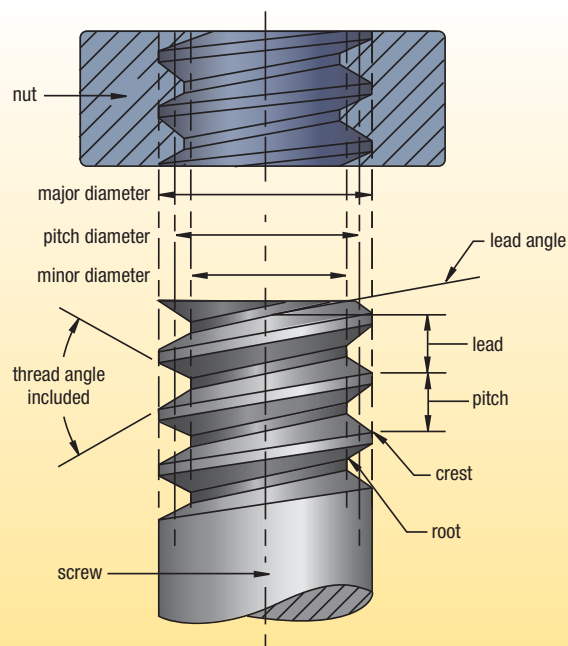
d = pitch diameter

$$\phi = \arctan \left(\frac{p * \text{starts}}{\pi * \phi} \right) = 1.13^\circ$$



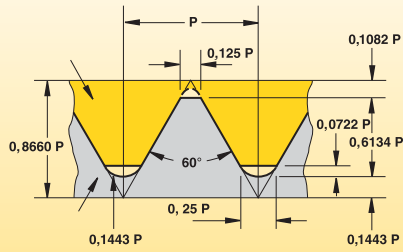
Screw Thread Definitions

- Major diameter** — The largest diameter of a straight screw thread. This applies to both internal and external threads.
- 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.
- Thread angle (included)** — The included angle between the individual flanks of the thread form.
- Minor diameter** — The smallest diameter of a straight screw thread. This applies to both internal and external threads.
- 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.
- 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.
- Pitch** — The distance from a point on a screw thread to a corresponding point on the next thread measured parallel to the thread axis.
- Crest** — The outer most surface of the thread form which joins the flanks.
- Root** — The inner most surface of the thread form which joins the flanks.



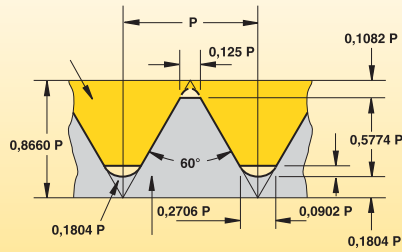
NOTE: Threads per inch (TPI) not shown:
The number of threads per inch measured axially.
The terms pitch and TPI are often used interchangeably. TPI = 1/pitch

ISO M (Metric) and UN (Unified National)



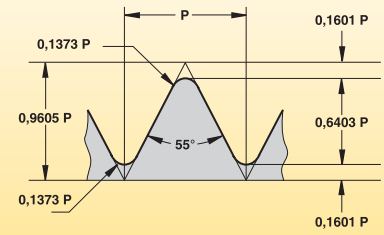
Use: All branches of mechanical industry.

UNJ (controlled root radius)



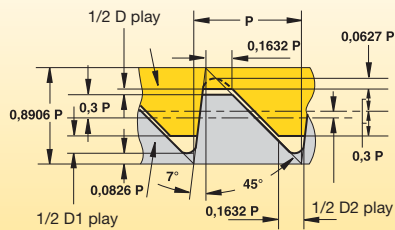
Use: Aircraft and space industry.

Whitworth (BSW)



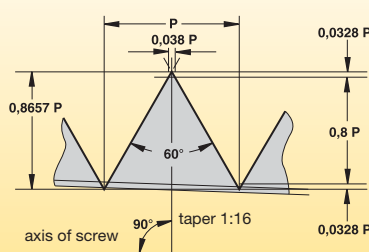
Use: Fittings and pipe couplings for gas, water, and sewer lines (replaced by ISO).

American Buttress



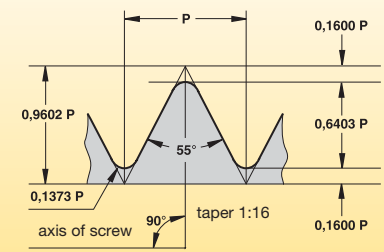
Use: Fittings and pipe couplings.

NPT (American National Pipe Thread)



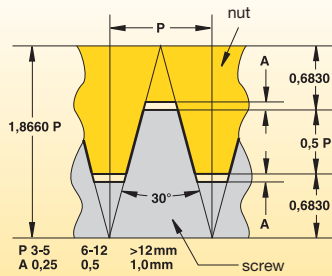
Use: Fittings and pipe couplings.

BSPT (British Standard Pipe Thread)



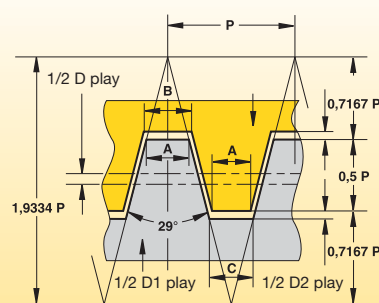
Use: Pipe thread for steam, gas, and water lines.

TR DIN 103



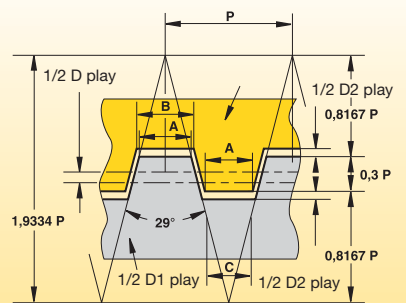
Use: Mechanical industry for motion transmission screws.

Acme



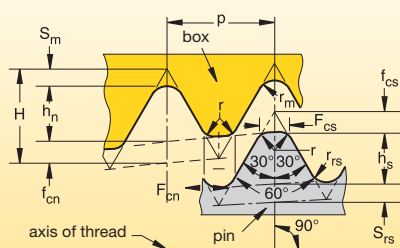
A = 0,0307 P
B = 0,3707 P - x D play
C = 0,3707 P - (D1 play - D2 play)
Use: Acme-General is used in mechanical industry for motion transmission screws.

Acme, truncated (Stub)



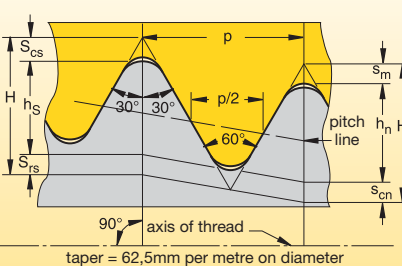
A = 0,4224 P
B = 0,4224 P - x D play
C = 0,4224 P - (D1 play - D2 play)
Use: Where normal Acme is too deep.

API Rotary Shoulder Connection



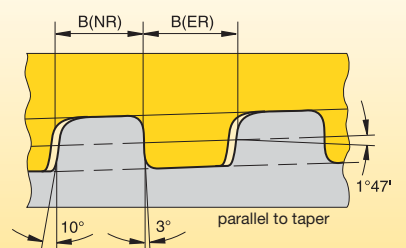
NOTE: Taper shown exaggerated.

API Casing and Tubing Round Thread Form



NOTE: Taper shown exaggerated.

API Buttress




**Suggested Grades and Speeds for Threading
Various Workpiece Materials**

workpiece group	workpiece material	recommended surface speed — m/mm				
		uncoated	PVD coated			
		K68	KC5010	KC5025	KC5410	KU25T
free-machining carbon steel	10L18, 10L45, 1213, 12L13, 12L14, 1140, 1141, 11L44, 1151, 10L50	—	91–198	45–198	—	91–137
plain carbon steel	10063, 1008, 1010, 1015, 1018, 1020, 1025, 1026, 1108, 1117	—	76–198	45–175	—	76–122
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	—	76–198	38–167	—	73–122
alloy steels/tool steels 330–450 HB (36–47 HRC)		—	61–160	—	—	61–106
martensitic/ferritic stainless/precipitation hardening	416, 420F, 440F, 405, 409, 429, 430, 434, 436, 442, PH	—	45–160	30–122	—	24–61
austenitic stainless steel	201, 202, 301, 302, 303, 304, 304, 305, 321, 347, 348, 310, 314, 316, 316L, 330	61–106	61–198	46–137	—	24–106
grey cast iron 135–270 HB	class 20, 30, 35, 45	61–91	61–237	46–122	—	30–110
grey cast iron 275–450 HB	class 50, 55, 60	45–76	45–175	15–76	—	30–110
alloy/ductile iron	A536, J434C, 60-40-18, 80-55-06, 100-70-03	45–76	45–198	30–160	—	30–110
free-machining aluminium alloys	2024-T4, 2014-T6, 6061-T6 2011-T3, 3003-H18, A2, Alcan, Alcoa 510, Duralumin	122–244	122–365	—	152–457	30–305
high-silicon aluminium alloys	A380, A390, A380-1, A390-1, A380-2	—	—	—	—	—
copper/zinc/brass		76–183	76–304	46–236	—	30–244
non-metallics	Graphite, Nylon, Plastics, Rubbers, Phenolics, Carbon	122–457	122–396	46–305	—	30–244
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	24–37	24–122	13–76	—	11–85
high-temperature alloys 260–450 HB (26–47 HRC)	Rene 95, Waspaloy A286, Incoloy 800, Haynes 188, Stellite F, Haynes 25	24–30	30–76	6–61	—	11–61
titanium alloys	Ti-6Al-4V, Ti-5Al-2.5Sn	34–55	34–99	—	—	11–76

NOTE: When workpiece hardness levels are at the top of a range, starting m/mm 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

problem	cause	possible solution
<p>thread with torn finish</p> 	<ul style="list-style-type: none"> • Burs. • Torn finish. • Steps. • Improper shim. • Improper infeed. 	<ul style="list-style-type: none"> • Use modified flank infeed. • Use full profile insert. • Increase coolant concentration. • Increases m/min. • Check machine "Z" travel axis. • Check insert form. • Check for correct shim in LT system. • Calculate flank clearance.
<p>chatter</p> 	<ul style="list-style-type: none"> • Poor rigidity. • Insert movement. • Improper infeed. • Off centreline. 	<ul style="list-style-type: none"> • Use modified flank infeed. • Minimise tool overhang. • Check for workpiece deflection. • Check insert and clamp. • Verify that tool cutting position is at workpiece centreline. • Adjust number of passes. Fewer passes reduce chatter.
<p>built-up edge</p> 	<ul style="list-style-type: none"> • Speed too low. • Insufficient coolant. • Chip load. 	<ul style="list-style-type: none"> • Increase m/min. • Increase coolant concentration and/or flow. • Adjust infeed angle. • Increase depth of cut per pass.
<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 modified flank infeed. • Use a more wear-resistant grade (e.g., KC5010™). • Reduce m/mm. • Increase coolant flow.
<p>chipping</p> 	<ul style="list-style-type: none"> • Improper infeed. • Chip load. • Wrong grade. • Incorrect speed. • Poor rigidity. 	<ul style="list-style-type: none"> • Use modified flank infeed. • Increase or decrease number of passes. • Eliminate spring passes. • Use tougher grade (e.g., KC5025™). • Increase m/mm if chipping on trailing edge. • Decrease m/mm if chipping on leading edge. • Minimise tool overhang. • Check for insert movement/check clamp. Torque screw or clamp to correct value. • Check for possible part deflection. • Calculate flank clearance. • Ensure correct shim.
<p>broken nose</p> 	<ul style="list-style-type: none"> • Heavy chip load. • Small nose radius. • Wrong grade. • Improper infeed. 	<ul style="list-style-type: none"> • Use modified flank infeed. • Decrease chip load. • Use large nose radius if possible. • Use tougher grade (e.g., KC5025).
<p>flank wear</p> 	<ul style="list-style-type: none"> • Improper shim. • Wrong grade. • Insufficient coolant. • Off centreline. • Insufficient flank clearance. • Improper infeed angle. 	<ul style="list-style-type: none"> • Ensure correct shim. • Use a more wear-resistant grade (e.g., KC5025). • Increase coolant flow. • Check the centreline height of the tool. (The smaller the diameter, the more critical the need for centreline accuracy.) • Calculate flank clearance and change shim to increase clearance on worn flank. • If wear is on trailing flank, increase infeed angle clearance.

(continued)

(Technical Information • Failure and Solution Guide — continued)

problem	possible solution																	
	increase m/min	reduce m/min	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 reseat	reduce tool overhang	reselect shim	apply chipbreaker style	reduce DOC	adjust centre height	begin cutting threads 12mm before workpiece	change infeed method
chatter	•			•							•	•				•		•
bur 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														•				•

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, controls 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.

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 0,127mm depth of cut and produce an acceptable finish. For some materials, a 0,025mm to 0,076mm (spring) pass may be used to improve surface finish, however, chip breaking action may be compromised.

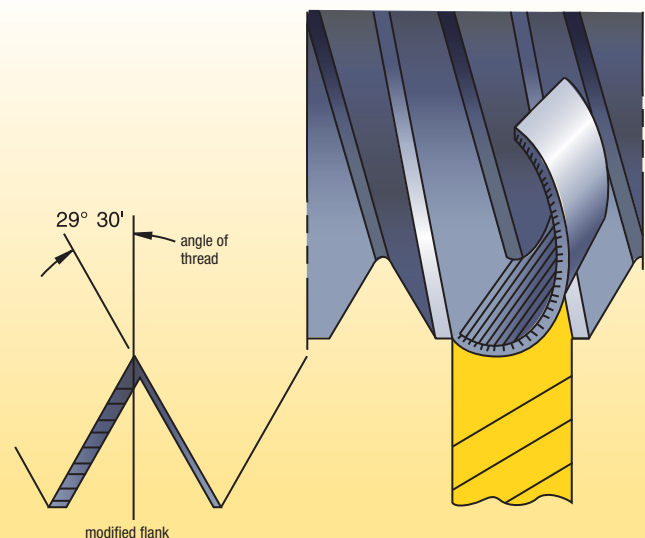


Machine Programming

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 0,127mm depth of cut on every pass. In most applications, use of CNC canned cycles produce only marginally successful results. Custom written programmes are better and are recommended.

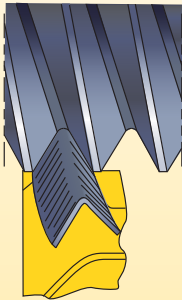
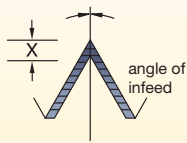
Infeed Angle

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°.



Radial

modified flank



Advantage —

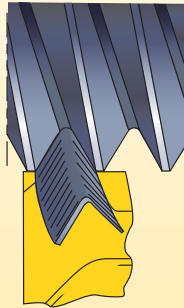
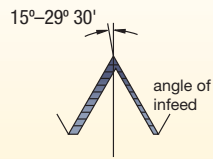
- Cutting on both sides of the thread form places all of the cutting edge in the cut and protects edge from chipping.
- Even wear on the insert.

Disadvantage —

- Tool develops a channel chip that may be difficult to handle.
- Tip chipping occurs when cutting high-tensile materials.
- Bur condition is increased.
- Entire cutting edge is engaged at finish of thread, causing increased tendency to chatter.

Modified flank

modified flank



Advantage —

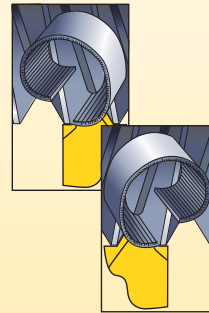
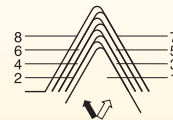
- Tool cuts both sides of thread form, so it is protected from chipping similar to 0° infeed. Channel-type chip develops, but uneven chip thickness helps remove the chip similar to flank infeed.
- This is the preferred method, especially when used with a chip control insert.
- Combined radial and/or 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 equalised and chip flow is much less of a problem.

Alternating flank

alternating flank



Advantage —

- Increased tool life because both edges are used equally.

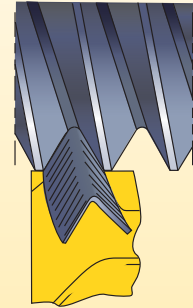
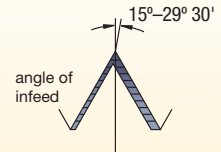
NOTE: Some machine tools may require special programming techniques to achieve this method of infeed.

Disadvantage —

- Difficult to cut on conventional machinery.

Reversed modified flank

modified flank



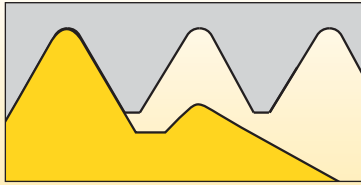
Advantage —

- 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.
- As chip flow is the reversed feed direction, it is an excellent choice for internal threading.

Disadvantage —

- Programming needs to be done line by line.

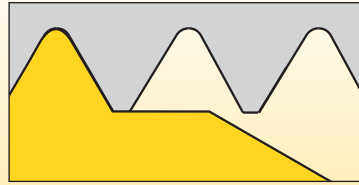
Partial Profile



Tooth profile with universal profile shape:

- Reduced inventory.
- For various pitches in a limited range.
- Major/minor diameters must be accurately pre-turned.

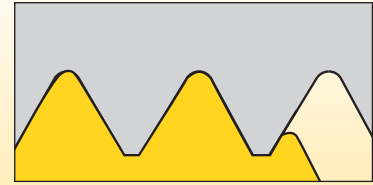
Full Profile



Tooth profile with full profile shape including tooth height:

- For bur-free, precise threads in the specified pitch.
- General application.
- Machining allowance for outside/core diameter around .004-.006".

Multi-Tooth Profile



Multi-tooth full profile generally with 2-3 teeth:

- Highly productive threading with fewer passes and longer tool life.
- Requires a rigid setup and long thread pass through.

Formulas

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

- m/min = metres per minute
- RPM = revolutions per minute
- D = part diameter
- π = 3.1416

Maximum Cutting Speeds

On older machines 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:

metric formula: maximum cutting speed (m/min) =

$$\text{part diameter (mm)} \times 3.14 \times (1/\text{pitch}) \times \frac{\text{max mm/min}}{1000\text{mm}}$$

Flank clearance

- γ = $\arctan(\sin(\beta/2) * \tan(\alpha))$
- γ = side (flank) clearance
- β = included angle of thread form
- α = radial inclination angle

Thread	Angle	External	Internal
UN & ISO	60	5.3	8
BSW	55	4.8	7.3
TR	30	2.6	4
ACME	29	2.6	3.9
AMBUT	7	.6	.9
AMBUT	45	4	6

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	1,25-1,5	1,75-2	2,5-3	3,5-4	4,5-6	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 .0,05mm infeed on last passes to avoid work hardening 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. For example, an 8-pitch external thread has a depth of 2mm (.0789").

$$\Delta a_{p_x} = \frac{a_p}{\sqrt{\text{nap}-1}} * \sqrt{\phi}$$

Formula for constant chip load infeed

- Δa_p = radial infeed
- x = actual pass (from 1 to the nap)
- nap = number of passes
- ϕ = 1st pass, 0.3
2nd pass, 1
3rd pass and up, x-1

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.

Using Flank Infeed

Lower bending stress and stabilised cutting edges produce more favourable chip shapes and larger cutting thicknesses.

Carbides with high hardness, good wear resistance, and temperature stability are advantageous.

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 0,05mm. The allowance at the diameter should not exceed 0,2mm.

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
T Ap (mm)	0,305	0,457	0,610	0,762	0,914	1,067	1,219	1,524	1,829	2,159	2,464	2,769	3,073
N Ap	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	0,096	0,145	0,167	0,187	0,224	0,221	0,252	0,278	0,302	0,328	0,361	0,405	0,435
2	0,080	0,119	0,138	0,154	0,185	0,182	0,208	0,230	0,249	0,271	0,298	0,335	0,359
3	0,073	0,109	0,126	0,141	0,169	0,167	0,191	0,210	0,228	0,248	0,273	0,306	0,329
4	0,056	0,084	0,097	0,108	0,130	0,128	0,146	0,161	0,175	0,190	0,209	0,235	0,252
5			0,082	0,091	0,110	0,108	0,123	0,136	0,148	0,160	0,176	0,198	0,213
6				0,080	0,097	0,095	0,109	0,120	0,130	0,141	0,155	0,175	0,187
7						0,086	0,098	0,108	0,118	0,128	0,141	0,158	0,169
8						0,079	0,090	0,100	0,108	0,118	0,129	0,145	0,156
9								0,093	0,101	0,109	0,120	0,135	0,145
10								0,087	0,095	0,103	0,113	0,127	0,136
11									0,089	0,097	0,107	0,120	0,129
12									0,085	0,092	0,102	0,114	0,122
13										0,088	0,097	0,109	0,117
14										0,085	0,093	0,105	0,112
15											0,090	0,101	0,108
16													0,104
T Ap (mm)	0,305	0,457	0,610	0,762	0,914	1,067	1,219	1,524	1,829	2,159	2,464	2,769	3,073

NOTE: Always allow 0,08–0,13mm extra stock for full profile inserts.

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
T Ap (mm)	0,279	0,406	0,533	0,686	0,813	0,940	1,092	1,346	1,626	1,905	2,159	2,438	2,718
N Ap	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	0,088	0,129	0,146	0,168	0,199	0,195	0,226	0,246	0,282	0,315	0,328	0,357	0,384
2	0,073	0,106	0,121	0,139	0,164	0,161	0,187	0,203	0,232	0,260	0,271	0,295	0,317
3	0,067	0,097	0,110	0,127	0,151	0,147	0,171	0,186	0,213	0,238	0,248	0,270	0,291
4	0,051	0,075	0,085	0,097	0,116	0,113	0,131	0,143	0,163	0,183	0,190	0,207	0,223
5			0,071	0,082	0,097	0,095	0,111	0,120	0,138	0,154	0,160	0,175	0,188
6				0,072	0,086	0,084	0,097	0,106	0,121	0,136	0,141	0,154	0,166
7						0,076	0,088	0,096	0,110	0,123	0,128	0,139	0,150
8						0,070	0,081	0,088	0,101	0,113	0,118	0,128	0,138
9								0,082	0,094	0,105	0,109	0,119	0,128
10								0,077	0,088	0,099	0,103	0,112	0,120
11									0,083	0,093	0,097	0,106	0,114
12									0,000	0,089	0,092	0,101	0,108
13										0,000	0,088	0,096	0,103
14											0,000	0,085	0,092
15												0,000	0,089
16													0,092
T Ap (mm)	0,279	0,406	0,533	0,686	0,813	0,940	1,092	1,346	1,626	1,905	2,159	2,438	2,718

NOTE: Always allow 0,08–0,13mm extra stock for full profile inserts.

UN Thread, External Thread Cutting

TPI	24	20	18	16	14	12	11	10	9	8	7	6	5
T Ap (mm)	0,660	0,787	0,864	0,965	0,914	1,067	1,219	1,524	1,829	2,159	2,464	2,769	3,073
N Ap	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	0,181	0,193	0,212	0,216	0,177	0,207	0,223	0,264	0,302	0,341	0,374	0,405	0,435
2	0,149	0,159	0,175	0,178	0,146	0,171	0,184	0,218	0,249	0,282	0,309	0,335	0,359
3	0,137	0,146	0,160	0,163	0,134	0,156	0,168	0,200	0,228	0,258	0,283	0,306	0,329
4	0,105	0,112	0,123	0,125	0,103	0,120	0,129	0,153	0,175	0,198	0,217	0,235	0,252
5	0,088	0,094	0,103	0,106	0,087	0,101	0,109	0,129	0,148	0,167	0,183	0,198	0,213
6		0,083	0,091	0,093	0,076	0,089	0,096	0,114	0,130	0,147	0,161	0,175	0,187
7				0,084	0,069	0,080	0,087	0,103	0,118	0,133	0,146	0,158	0,169
8					0,063	0,074	0,080	0,095	0,108	0,122	0,134	0,145	0,156
9					0,059	0,069	0,074	0,088	0,101	0,114	0,125	0,135	0,145
10							0,070	0,083	0,095	0,107	0,117	0,127	0,136
11								0,078	0,089	0,101	0,111	0,120	0,129
12									0,085	0,096	0,105	0,114	0,122
13										0,092	0,101	0,109	0,117
14											0,097	0,105	0,112
15												0,101	0,108
16													0,104
T Ap (mm)	0,660	0,787	0,864	0,965	0,914	1,067	1,219	1,524	1,829	2,159	2,464	2,769	3,073

NOTE: Always allow 0,08–0,13mm extra stock for full profile inserts.

UN Thread, Internal Thread Cutting

TPI	24	20	18	16	14	12	11	10	9	8	7	6	5
T Ap (mm)	0,584	0,686	0,762	0,864	0,991	1,143	1,245	1,372	1,524	1,727	1,956	2,286	2,743
N Ap	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	0,160	0,168	0,187	0,193	0,205	0,221	0,241	0,250	0,264	0,285	0,309	0,347	0,402
2	0,132	0,139	0,154	0,159	0,169	0,183	0,199	0,207	0,218	0,236	0,255	0,287	0,332
3	0,121	0,127	0,141	0,146	0,155	0,167	0,182	0,189	0,200	0,216	0,234	0,263	0,304
4	0,093	0,097	0,108	0,112	0,119	0,128	0,140	0,145	0,153	0,166	0,179	0,202	0,233
5	0,078	0,082	0,091	0,094	0,100	0,108	0,118	0,123	0,129	0,140	0,151	0,170	0,196
6		0,072	0,080	0,083	0,088	0,095	0,104	0,108	0,114	0,123	0,133	0,150	0,173
7				0,075	0,080	0,086	0,094	0,098	0,103	0,111	0,120	0,135	0,156
8					0,073	0,079	0,086	0,090	0,095	0,102	0,111	0,124	0,144
9						0,074	0,080	0,084	0,088	0,095	0,103	0,116	0,134
10								0,078	0,083	0,089	0,097	0,109	0,126
11									0,078	0,085	0,092	0,103	0,119
12										0,080	0,087	0,098	0,113
13											0,083	0,094	0,108
14												0,080	0,104
15													0,100
16													
T Ap (mm)	0,584	0,686	0,762	0,864	0,991	1,143	1,245	1,372	1,524	1,727	2,036	2,286	2,743

NOTE: Always allow 0,08–0,13mm extra stock for full profile inserts.

NPT Thread, External, and Internal Machining

TPI	27	18	14	11.5	8
T Ap (mm)	0,762	1,118	1,422	1,727	2,489
N Ap	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	0,187	0,231	0,260	0,285	0,378
2	0,154	0,191	0,214	0,236	0,312
3	0,141	0,175	0,196	0,216	0,286
4	0,108	0,134	0,151	0,166	0,219
5	0,091	0,113	0,127	0,140	0,185
6	0,080	0,100	0,112	0,123	0,163
7		0,090	0,101	0,111	0,147
8		0,083	0,093	0,102	0,135
9			0,087	0,095	0,126
10			0,081	0,089	0,118
11				0,085	0,112
12				0,080	0,107
13					0,102
14					0,098
15					
16					
T Ap (mm)	0,762	1,118	1,422	1,727	2,489

NOTE: Always allow 0,08–0,13mm extra stock for full profile inserts.

BSPT Thread, External, and Internal Machining

TPI	28	19	14	11
T Ap (mm)	0,584	0,864	1,168	1,448
N Ap	5	8	10	12
	values for flank infeed (X/Z)			
order of passes	X/Z	X/Z	X/Z	X/Z
1	0,160	0,179	0,213	0,239
2	0,132	0,148	0,176	0,197
3	0,121	0,135	0,161	0,181
4	0,093	0,104	0,124	0,139
5	0,078	0,087	0,104	0,117
6		0,077	0,092	0,103
7		0,070	0,083	0,093
8		0,064	0,076	0,086
9			0,071	0,080
10			0,067	0,075
11				0,071
12				0,067
13				
14				
15				
16				
T Ap (mm)	0,584	0,864	1,168	1,448

Trapezoid Thread to DIN 103, External, and Internal Machining

pitch	1,5	2	3	4	5
T Ap (mm)	1,016	1,245	1,753	2,261	2,743
N Ap	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	0,249	0,258	0,320	0,373	0,417
2	0,206	0,213	0,264	0,308	0,344
3	0,188	0,195	0,242	0,282	0,315
4	0,144	0,150	0,186	0,217	0,242
5	0,122	0,126	0,157	0,183	0,204
6	0,107	0,111	0,138	0,161	0,180
7		0,100	0,125	0,145	0,162
8		0,092	0,115	0,134	0,149
9			0,107	0,125	0,139
10			0,100	0,117	0,131
11				0,111	0,123
12				0,105	0,117
13					0,112
14					0,108
15					
16					
T Ap (mm)	1,016	1,245	1,753	2,261	2,743

NOTE: Always allow 0,08–0,13mm extra stock for full profile inserts.

Round Thread to DIN 405, External, and Internal Machining

pitch	10	8	6
T Ap (mm)	1,321	1,626	2,159
N Ap	8	10	12
	values for flank infeed (X/Z)		
order of passes	X/Z	X/Z	X/Z
1	0,273	0,297	0,357
2	0,226	0,245	0,294
3	0,207	0,224	0,270
4	0,159	0,172	0,207
5	0,134	0,145	0,174
6	0,118	0,128	0,154
7	0,107	0,116	0,139
8	0,098	0,106	0,128
9		0,099	0,119
10		0,093	0,112
11			0,106
12			0,100
13			
14			
15			
16			
T Ap (mm)	1,321	1,626	2,159

Whitworth, External, and Internal Thread Cutting

TPI	28	20	19	16	14	12	11	10	9	8	7	6	5
T Ap (mm)	0,584	0,813	0,813	0,864	1,016	1,346	1,473	1,626	1,803	2,032	2,311	2,718	3,251
N Ap	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	0,160	0,199	0,199	0,179	0,210	0,261	0,285	0,297	0,312	0,336	0,351	0,398	0,460
2	0,132	0,164	0,164	0,148	0,174	0,215	0,236	0,245	0,258	0,277	0,290	0,329	0,380
3	0,121	0,151	0,151	0,135	0,159	0,197	0,216	0,224	0,236	0,254	0,266	0,301	0,348
4	0,093	0,116	0,116	0,104	0,122	0,151	0,166	0,172	0,181	0,195	0,204	0,231	0,267
5	0,078	0,097	0,097	0,087	0,103	0,128	0,140	0,145	0,153	0,164	0,172	0,195	0,225
6		0,086	0,086	0,077	0,091	0,112	0,123	0,128	0,135	0,145	0,151	0,171	0,198
7				0,070	0,082	0,102	0,111	0,116	0,122	0,131	0,137	0,155	0,179
8				0,064	0,075	0,093	0,102	0,106	0,112	0,120	0,126	0,143	0,165
9						0,087	0,095	0,099	0,104	0,112	0,117	0,133	0,153
10								0,093	0,098	0,105	0,110	0,125	0,144
11									0,093	0,099	0,104	0,118	0,136
12										0,095	0,099	0,112	0,130
13											0,095	0,107	0,124
14												0,091	0,119
15													0,114
16													0,110
T Ap (mm)	0,584	0,813	0,813	0,864	1,016	1,346	1,473	1,626	1,803	2,032	2,311	2,718	3,251

NOTE: Always allow 0,08–0,13mm extra stock for full profile inserts.

Multi-Tooth 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	0,609	0,838	0,838	1,168	1,168	1,778	0,939	0,939	1,245	1,245	1,880	1,575	1,753	1,753	2,540
1	0,330	0,381	0,508	0,508	0,711	0,558	0,431	0,558	0,558	0,762	0,584	0,736	0,584	0,812	0,889
2	0,279	0,254	0,330	0,381	0,457	0,482	0,304	0,381	0,406	0,482	0,508	0,482	0,508	0,558	0,635
3	—	0,203	—	0,279	—	0,431	0,203	—	0,279	—	0,431	0,355	0,355	0,3815	0,558
4	—	—	—	—	—	0,304	—	—	—	—	0,355	—	0,304	—	0,457

Recommendations for Steel Workpieces (<300 BHN)

catalogue number	insert size	TPI profile	total depth — on radius		
			1st pass	2nd pass	3rd pass
NTC-8R/L8EM	8	8 UN	1,21	1,63	2,00
NTC-8R/L8IM	8	8 UN	1,19	1,55	1,88
NTC-8R/L10EM	8	10 UN	0,92	1,27	1,60
NTC-8R/L10IM	8	10 UN	0,90	1,22	1,52
NTC-8R/L12EM	8	12 UN	0,76	1,04	1,32
NTC-8R/L12IM	8	12 UN	0,76	0,93	1,20
NTC-8R/L14EM	8	14 UN	0,68	0,95	1,12
NTC-8R/L14IM	8	14 UN	0,60	0,78	1,04
NTC-8R/L16EM 8	8	16 UN	0,58	0,81	0,96
NTC-8R/L16IM	8	16 UN	0,50	0,68	0,93
NTC-8R/L18EM	8	18 UN	0,48	0,66	0,86
NTC-8R/L18IM	8	18 UN	0,48	0,60	0,83
NDC-68RDR/L-75M	8	8 round	1,47	1,65	1,85
NDC-61RDR/L-75M	8	10 round	1,11	1,29	1,45
NDC-88RDRD/L-75M	8	8 round	1,29	1,75	1,85
NDC-88VR/L-75M	8	8 NPT	1,01	1,72	2,45
NDC-8115VR/L-75M	8	11.5 NPT	0,96	1,37	1,70
NDN-814VR/L-75M	8	14 NPT	0,96	1,22	1,36

NOTE: Always allow 0,08–0,13mm extra stock for full profile inserts.

ACME, External

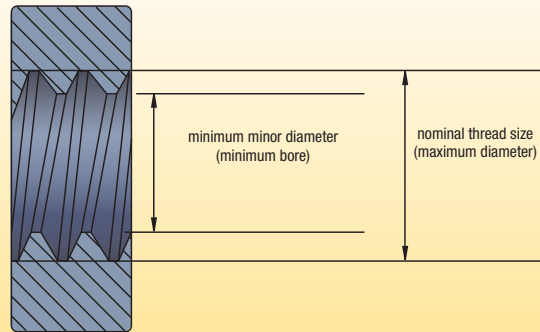
pitch, TPI	28	20	19	16	14	12	11	10	9	8	7	6	5
depth	.028	.032	.032	.034	.040	.053	.058	.064	.071	.080	.091	.107	0.128
number of passes	5	6	6	8	8	9	9	10	11	12	14	15	16
	values for flank infeed (X/Z)												
order of passes	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z
1	.039	.041	.050	.063	.074	.095	.112	.138	.180	.256	.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

NOTE: Always allow 0,08–0,13mm extra stock for full profile inserts.

ACME, Internal

pitch, TPI	28	20	19	16	14	12	11	10	9	8	7	6	5
depth	.028	.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	.256	.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

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.



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 and NT-4 60° V-threading inserts

TPI	nominal thread size	minimum thread diameter (mm)
6,00**	M76 x 6.00	69,50
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.

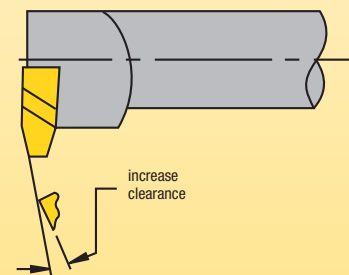
**NT-4-insert only.

Acme Threading Limits
internal threading limitations NA and NAS-2, -3, -4, and -6 Acme threading inserts

TPI	nominal thread size	minimum thread diameter (mm)	
	NT-1	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

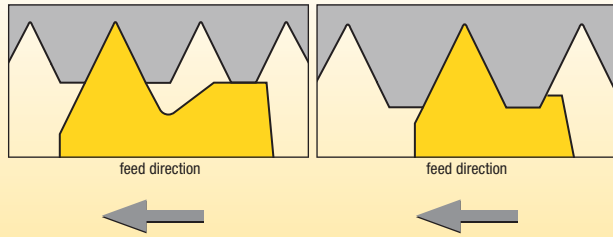
*Sixteen threads per inch and finer can be cut provided minor diameter is 36,5mm (1.438") or larger.

**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 multiple start threads. Modified standard inserts may be furnished for machining threads outside of the limits shown.

60° V-Thread Crest Turning Application Data



NTC crest turning insert for ($P \leq 2\text{mm}$) and finer.

NTC crest turning insert for ($P \geq 3\text{mm}$) and coarser.

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.

60° V-Thread Crest Turning Application Data

insert catalogue number	nose radius on insert (mm)	thread radius per MIL-S-8879A (mm)
NJ-3014R/L12	0,317/0,342	0,317/0,381
NJK-3008R/L20	0,190/0,215	0,190/0,228

“J” thread note for catalogue

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.

60° V-Thread Application Data

insert description	insert	D (mm)	E (mm)	recommended TPI*		recommended TP*	
				external	internal	external	internal
	NT-1	1,90	1,11	–	24–12	–	1,00–2,00
	NT-2	28,70	1,90	36–8	20–7	0,70–3,00	1,25–3,50
	NT-2-K	28,70	1,90	36–8	20–7	0,70–3,00	1,25–3,50
	NTF-2	15,75	1,01	44–14	24–12	0,60–1,75	1,00–2,00
	NTK-2	15,75	1,01	44–14	24–12	0,60–1,75	1,00–2,00
	NTP-2	28,70	1,90	36–8	20–7	0,70–3,0	1,25–3,50
	NT-3	37,59	2,46	20–6	12–5	1,25–4,00	2,00–5,00
	NT-3-K	37,59	2,46	20–6	12–5	1,25–4,00	2,00–5,00
	NT-3-C	37,59	2,46	11–6	6 (only)	2,50–4,00	4,00 (only)
	NT-3-CK	37,59	2,46	11–6	6 (only)	2,50–4,00	4,00 (only)
	NTF-3	21,08	1,37	44–10	24–9	0,60–2,50	1,00–2,50
	NTK-3	21,08	1,37	44–10	24–9	0,60–2,50	1,00–2,50
	NTP-3	37,59	2,46	20–6	12–5	1,25–4,00	2,00–5,00
	NT-4	49,78	3,22	20–4	12–4	1,25–6,25	2,00–6,25
	NT-4-K	49,78	3,22	20–4	12–4	1,25–6,25	2,00–6,25
	NT-4-C	49,78	3,22	11–4 1/2	6–4 1/2	2,50–5,50	4,00–5,50
	NT-4-CK	49,78	3,22	11–4 1/2	6–4 1/2	2,50–5,50	4,00–5,50
	NTF-4	21,08	1,37	44–10	24–9	0,60–2,50	1,00–2,50
	NTK-4	21,08	1,37	44–10	24–9	0,60–2,50	1,00–2,50
	NTP-4	49,78	3,22	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.

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/IR4API502	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.

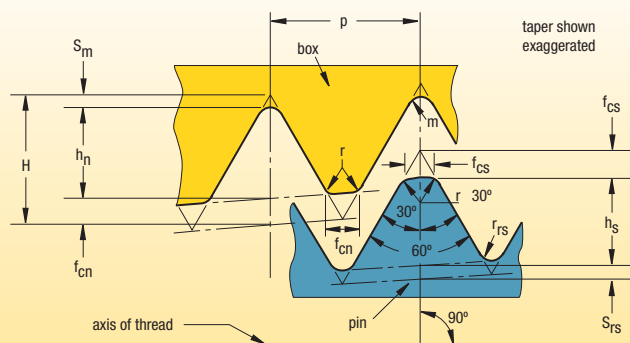
API Thread Forms

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	
V-.040	3	.172303	.117842	.020000	.034461	.040	—	.020	.015	.250
V-.050	3	.215379	.147303	.025000	.043076	.050	—	.025	.015	
V-.050	2	.216005	.147804	.025000	.043201	.050	—	.025	.015	.250

NOTE: All dimensions in inches.

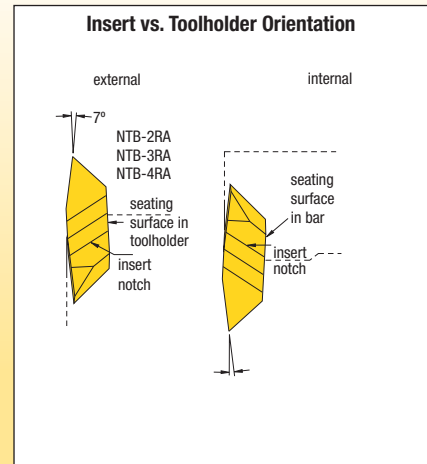
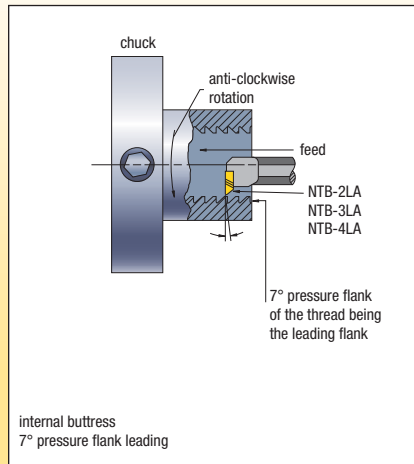
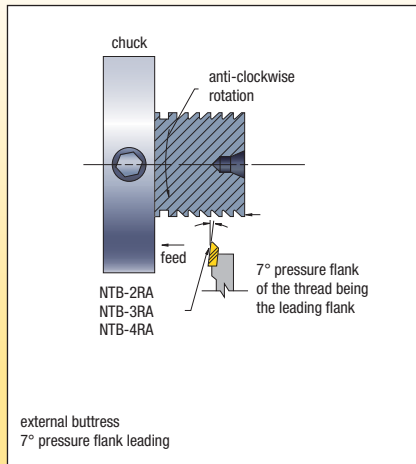
V-.040 and V-.050 Product Thread Form



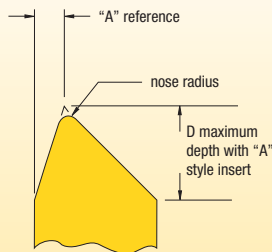
Casing and Tubing Round Thread (Height Dimensions)

thread element	10 TPI p = .1000	8 TPI p = .1250	
H	= .866p	.08660	.10825
$H_s = h_n$	= .626p - .007	.05560	.07125
$S_{rs} = S_m$	= .120p + .002	.01400	.01700
$S_{cs} = S_{cn}$	= .120p + .005	.01700	.02000

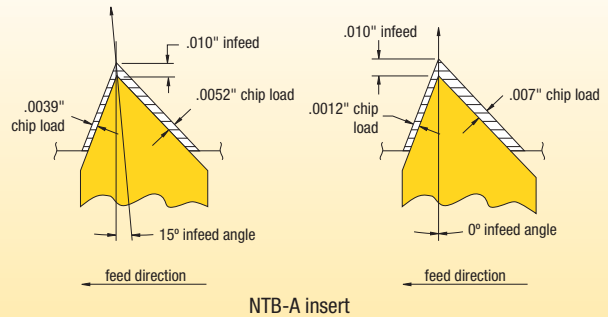
American Buttress (7° Pressure Flank Leading) NTB-A Inserts • Push Type



Reference Dimensions



Infeed Angle vs. Chip Load: 7° Pressure Flank Leading



insert	D (inch)	"A" ref. (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.

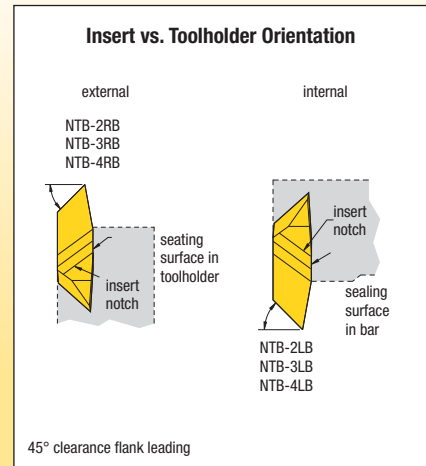
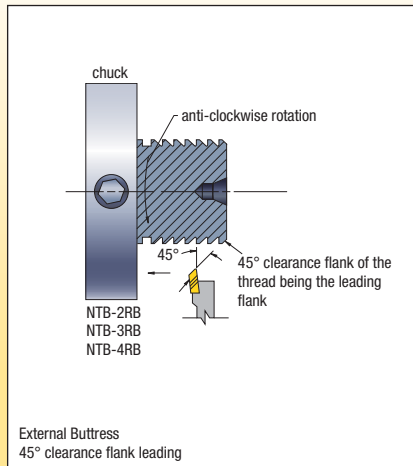
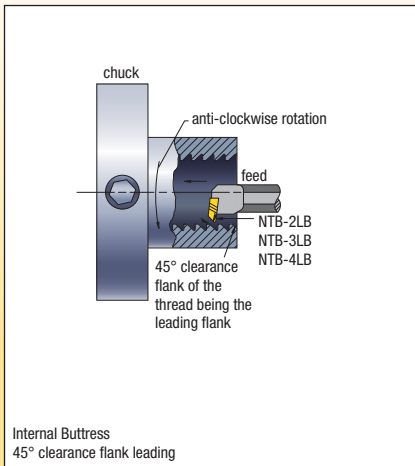
**Can cut 16 or 20 threads per inch provided minor diameter is 1.375" or larger.

Threads per Inch vs. Maximum Root Radius Chart (Inch)

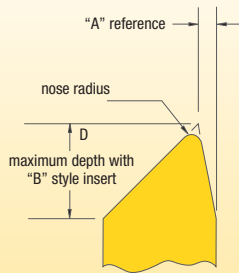
TPI	20	16	12	10	8	6	5	4	3	2-1/2	2	1-1/2	1-1/4	1
maximum root radius	.0036	.0045	.0059	.0071	.0089	.0119	.0143	.0179	.0238	.0268	.0375	.0476	.0572	.0714

NOTE: Special Buttress forms are available upon request.

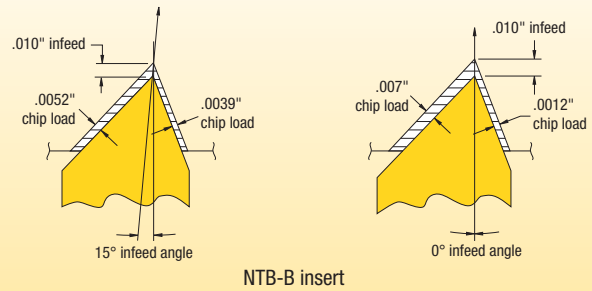
American Buttress (45° Clearance Flank Leading): NTB-B Inserts • PULL-type



Reference Dimensions



Infeed Angle vs. Chip Load: 45° Clearance Flank Leading



insert	D (inch)	"A" reference (inch)	nose radius (inch)	pitch based on maximum radius
NTB-3B	.171	.031	.005-.004	8-16 TPI

NOTE: For balanced chip load, a reverse 15° infeed angle is suggested.

Internal Threading Limitations

internal threading limitations NTB-2B Buttress threading inserts			internal threading limitations NTB-3 and NTB-4B Buttress threading inserts		
TPI	nominal thread size	minimum minor diameter (inch)	TPI	nominal thread size	minimum minor diameter (inch)
8	1-3/4	1.600	4*	2-7/8	2.575
10	1-5/8	1.505	5	2-3/4	2.510
12	1-1/2	1.400	6	2-3/8	2.175
16	1-1/4	1.175	8	2-1/8	1.975
20	1-1/16	1.002	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.

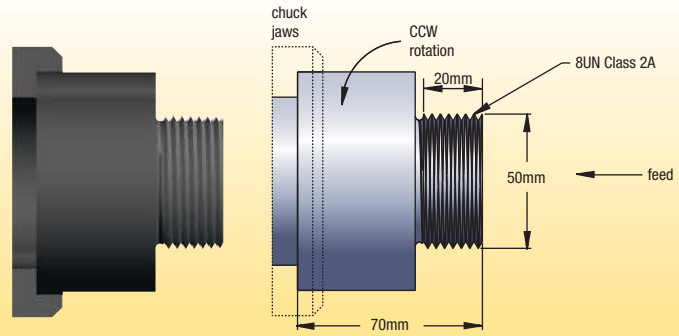
Required Information

From Part Drawing:

material: 316SS, 200 HB
 thread form: 8UN
 tolerance: class 2A
 operation: external threading
 pitch diameter: 50mm x 25mm deep

From Machine Setup Data:

tooling: 20mm x 20mm
 spindle rotation: anti-clockwise
 feed: toward chuck

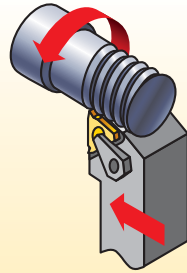


Steps for a Successful Threading Operation

Step 1 • Determine Threading Method

Need to Know:

- Operation (external).
- Spindle rotation (CCW).
Anti-clockwise rotation.
- Feed direction (toward chuck).
- Right-hand toolholder.
- Right-hand insert (ER).
- Standard helix method.



Step 2 • Select Insert



Need to Know:

- Thread form (ISO R262 1mm pitch).
- Hand of insert (right hand — ER).

Choose the High-Performance Solution

catalogue number	insert size	KCU25/ KC5025
3ER10ISO	3	•

High-Performance Selection

NOTE: Use insert with largest insert size available.

insert: 3ER10ISO
 grade: KCU25/KC5025
 speed: 150 m/min

Step 3 • Select the Grade and Speed

Need to Know:

- Workpiece material (316SS-200HB).
- Operation (external).

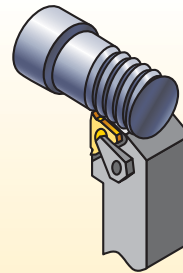
Options: Grade and Speed
 Selection Guidelines

threading operation	stainless steel
external	general purpose and high performance
	KC5025
	50–360 m/min

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 (16).



Options:

catalogue number	insert size	shim
AL203R	3	SM-YE3

First choice: LSASR-123 holder

Step 5 • Select Shim

Need to Know:

- Thread form — TPI or pitch (8 TPI).
- Pitch diameter (50mm).
- Helix method (standard).
See Laydown Threading (LT) shim selection chart.

Select SM-YE3 shim

NOTE: The SM-YE3 shim is supplied with the selected toolholder.

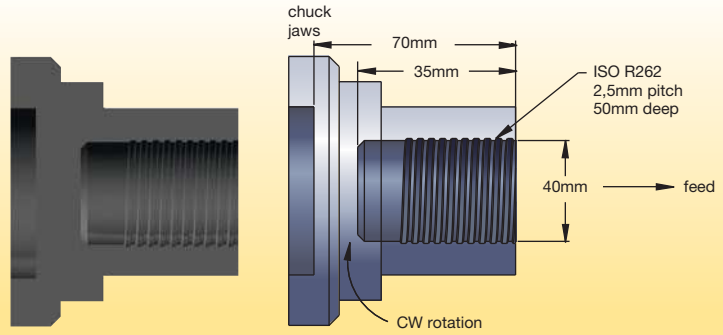
Required Information

From Part Drawing:

- material: 4140 steel
- thread form: ISO R262 2,5mm pitch
- tolerance: ISO Metric Class 6G/6H
- operation: internal threading
- pitch diameter: 40mm x 35mm deep

From Machine Setup Data:

- tooling: 20mm boring bar
- spindle rotation: clockwise
- feed: away from chuck

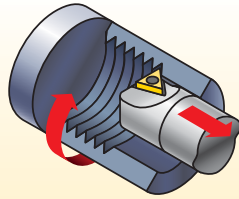


Steps for a Successful Threading Operation

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 (ISO Metric Class 6G/6H).
- Hand of insert (left hand — NL).

Choose the High-Performance Solution

catalogue number	insert size	KCU25/ KC5025
3IL25ISO	3	•

High-Performance Selection

NOTE: Use insert with largest possible insert size to go into the bore.

- insert: 3IL25ISO
- grade: KCU25/KC5025
- speed: 130 m/min

Step 3 • Select the Grade and Speed

Need to Know:

- Workpiece material (4010 steel).
- Operation (internal).

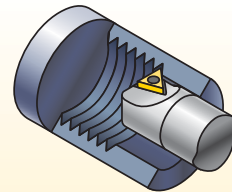
Options: Grade and Speed
Selection Guidelines

threading operation	steel
internal	general purpose and high performance
	KC5025
	40–200 m/min

Step 4 • Select Toolholder

Need to Know:

- External or internal operation (internal).
- Pitch diameter to determine minimum bore diameter for internal operations (40mm).
- Type of tooling — toolholder, boring bar (boring bar).
- Hand of tool (left hand).
- Insert size (16).



Options:

catalogue number	insert size	shim
AVR32D3R	3	SM-YE3

First choice: LSASR-123 holder

Step 5 • Select Shim

Need to Know:

- Thread form — TPI or pitch (2,5mm pitch).
- Pitch diameter (50mm).
- Helix method (standard). See Laydown Threading (LT) shim selection chart.

Select SM-YE3 shim

NOTE: For this application, the standard shim supplied should be replaced with the recommended shim, SM-YE3.

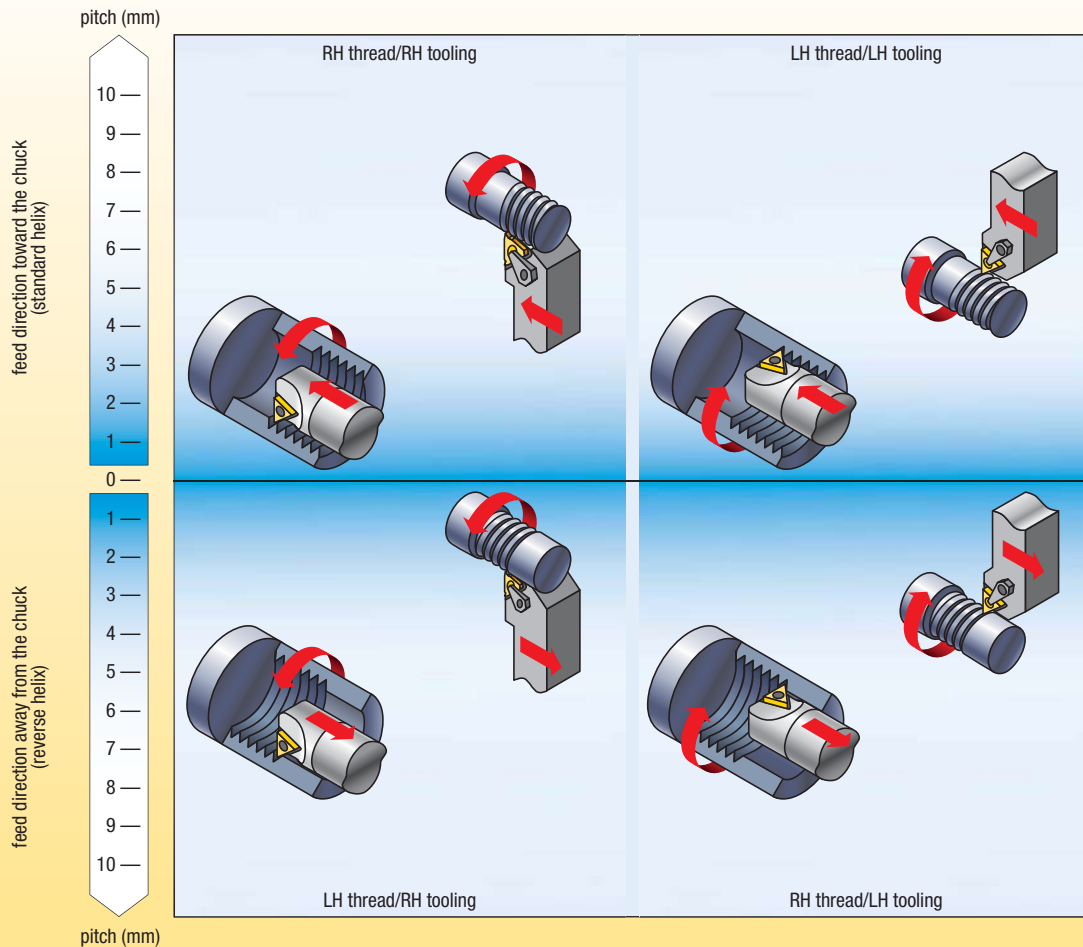
Laydown Threading Shim Selection Guidelines

It is essential to select the correct shim to ensure thread quality and maximum tool life. These parameters are needed:

- Pitch
- Pitch diameter
- Number of starts
- Feed direction

NOTE: When considering method of thread cutting, the part's shape and stability and the flow of chips are determining factors in your decision.

Laydown Selection Chart



NOTE: For multi-start threads, use the lead value instead of the pitch.

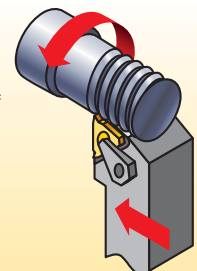
Diagram of Thread Lead Angles

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
 TPI = threads per inch
 S = number of starts
 single-start, lead = pitch
 multiple-start, 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.



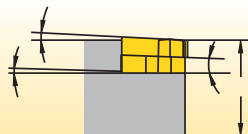
■ Laydown Threading Shim Selection Table • Metric

insert size	toolholder		shim ordering code (mm)							
	external	internal				standard				
3 (9,52)	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
3 (9,52)	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
4 (12,7)	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
4 (12,7)	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 (mm)							
72	—		—	—	—	3,1-8	8-21,4	>21,4	21,4-8	8-3,1
—	0,35		—	—	—	3,0-8	8-21,3	>21,3	21,3-8	3-8
64	—		—	—	—	3,4-9	9-24,1	>24,1	24,1-9	9-3,4
—	0,40		—	—	—	3,5-9,1	9,1-24,3	>24,3	24,3-9,1	9,1-3,5
56	—		—	—	—	3,9-10,3	10,3-27,6	>27,6	27,6-10,3	10,3-3,9
—	0,50		—	—	2,8-4,3	4,3-11,4	11,4-30,4	>30,4	30,4-11,4	11,4-4,3
48	—		—	—	3-4,6	4,6-12,1	12,1-32,2	>32,2	32,2-12,1	12,1-4,6
44	—		—	—	—	3,3-5	5-13,2	>13,2	13,2-35,1	35,1-13,2
—	0,60		—	2,6-3,4	3,4-5,2	5,2-13,7	13,7-36,5	>36,5	36,5-13,7	13,7-5,2
40	—		—	2,8-3,6	3,6-5,5	5,5-14,5	14,5-38,6	>38,6	38,6-14,5	14,5-5,5
—	0,70		—	3,0-4	4-6,1	6,1-16	16-42,6	>42,6	42,6-16	16-6,1
36	—		—	3,1-4	4-6,1	6,1-16,1	16,1-42,9	>42,9	42,9-16,1	16,1-6,1
—	0,75		2,8-3,2	3,3-4,3	4,3-6,5	6,5-17,1	17,1-45,6	>45,6	45,6-17,1	17,1-6,5
32	—		3-3,4	3,4-4,5	4,5-6,9	6,9-18,1	18,1-48,3	>48,3	48,3-18,1	18,1-6,9
—	0,80		3-3,5	3,5-4,6	4,6-6,9	6,9-18,2	18,2-48,6	>48,6	48,6-18,2	18,2-6,9
28	—		3,4-3,9	3,9-5,2	5,2-7,9	7,9-20,7	20,7-55,1	>55,1	55,1-20,7	20,7-7,9
27	—		3,6-4,1	4,1-5,4	5,4-8,2	8,2-21,4	21,4-57,2	>57,2	57,2-21,4	21,4-8,2
—	1,00		3,8-4,3	4,3-5,7	5,7-8,7	8,7-22,8	22,8-60,8	>60,8	60,8-22,8	22,8-8,7
24	—		4-4,6	4,6-6	6-9,2	9,2-24,1	24,1-64,3	>64,3	64,3-24,1	24,1-9,2
—	1,25		4,7-5,4	5,4-7,1	7,1-10,8	10,9-28,5	28,5-76	>76,0	76-28,5	28,5-10,8
20	—		4,8-5,5	5,5-7,2	7,2-11	11-28,9	29-77,2	>77,2	77,2-28,9	29-11
18	—		5,3-6,1	6,1-8	8-12,2	12,2-32,2	32,2-85,8	>85,8	85,8-32,2	32,2-12,2
—	1,50		5,7-6,5	6,5-8,5	8,5-13	13-34,2	34,2-91,2	>91,2	91,2-34,2	34,2-13
16	—		6-6,9	6,9-9	9-13,8	13,8-36,2	36,2-96,5	>96,5	96,5-36,2	36,2-13,8
—	1,75		6,6-7,96	7,6-10	10-15,2	15,2-39,9	39,9-106,4	>106,4	106,4-39,9	39,9-15,2
14	—		6,9-7,9	7,9-10,3	10,3-15,7	15,7-41,4	41,4-110,3	>110,3	110,3-41,4	41,4-15,7
13	—		7,4-8,5	8,5-11,1	11,1-17	17-44,5	44,5-118,8	>118,8	118,8-44,5	44,5-17
—	2,00		7,6-8,7	8,7-11,4	11,4-17,4	17,4-45,6	45,6-121,6	>121,6	121,6-45,6	45,6-17,4
12	—		8-9,2	9,2-12	12,1-18,4	18,4-48,2	48,3-128,7	>128,7	128,7-48,2	48,2-18,4
11,5	—		8,4-9,6	9,6-12,6	12,6-19,2	19,2-50,3	50,3-134,3	>134,3	134,3-50,3	50,3-19,2
11	—		8,8-10	10-13,1	13,1-20	20-52,6	52,6-140,4	>140,4	140,4-52,6	52,6-20
—	2,50		9,5-10,8	10,8-14,2	14,2-21,7	21,7-57	57-152	>152,0	152-57	57-21,7
10	—		9,6-11	11-14,5	14,5-22	22-57,9	57,9-154,4	>154,4	154,4-57,9	57,9-22
9	—		10,7-12,2	12,2-16,1	16,1-24,5	24,5-64,3	64,3-171,6	>171,6	171,6-64,3	64,3-24,5
—	3,00		11,4-13	13-17,1	17,1-26	26-68,4	68,4-182,4	>182,4	182,4-68,4	68,4-26
8	—		12-13,8	13,8-18,1	18,1-27,6	27,6-72,4	72,4-193	>193,0	193-72,4	72,4-27,6
—	3,50		13,3-15,2	15,2-19,9	19,9-30,4	30,4-79,8	79,8-212,8	>212,8	212,8-79,8	79,8-30,4
7	—		13,8-15,7	15,7-20,7	20,7-31,5	31,5-82,7	82,7-220,6	>220,6	220,6-82,7	82,7-31,5
—	4,00		15,2-17,3	17,3-22,8	22,8-34,7	34,7-91,2	91,2-243,2	>243,2	243,2-91,2	91,2-34,7
6	—		16-18,3	18,3-24,1	24,1-36,7	36,7-96,5	96,5-257,4	>257,4	257,4-96,5	96,5-36,7
—	5,00		19-21,7	21,7-28,5	28,5-43,4	43,4-114	114-304	>304,0	304-114	114-43,4
5	—		19,3-22	22-28,9	28,9-44,1	44,1-115,8	115,8-308,8	>308,8	308,8-115,8	115,8-44,1
4,5	—		21,4-24,5	24,5-32,1	32,1-49	49-128,7	128,7-343,1	>343,1	343,1-128,7	128,7-49
—	6,00		22,7-26	26-34,2	34,2-52,1	52,1-136,8	136,8-364,8	>364,8	364,8-136,8	136,8-52,1
4	—		24,1-27,5	27,5-36,2	36,2-55,1	55,1-144,8	144,8-386	>386	386-144,8	144,8-55,1
inclination angle			4.5	3.5	2.5	1.5	0.5	0.0	-0.5	-1.5
			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.

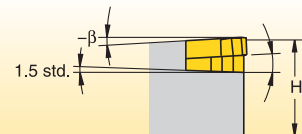
standard helix method:

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.



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- Define Machining Feature (face milling, slotting, blind hole, etc.)
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- Receive Ranked Results

SELECT

A method of selecting cutting tools from a tree structure via a hierarchy or parametric search:

- If you know which product you are looking for, a quick search can be performed by just the catalogue number or product description.
- Smart filters significantly reduce the amount of potential tooling solutions.
- After the tool is selected, NOVO also provides cutting and adaptive item options that fit with your solution.

NOVO applications can ensure you have the right tools on your machines, in the right sequence. Resulting in flawless execution that accelerates every job, and maximises every shift. kennametal.com/novo



Application Specific

Fix-Perfect	E2–E18
Top Notch Profiling	E20–E43
Railroad Machining	E44–E61
K-Lock Inserts	E62–E65

➤ **Fix-Perfect™**

Precision Ground Insert Programme Goes Above and Beyond!

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, Functions, and Benefits

Features

- Tangential design.
- Rigid clamping system.
- Up to eight cutting edges (protected by pocket seat).
- Positive geometry.
- Precision ground insert.

Functions

- Stable system.
- Very stable clamping system and quick and easy cutting edge switch.
- Use up to eight edges per insert.
- Very low cutting forces and excellent chip control.
- Better indexing accuracy.

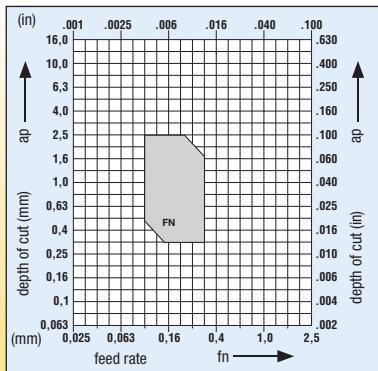
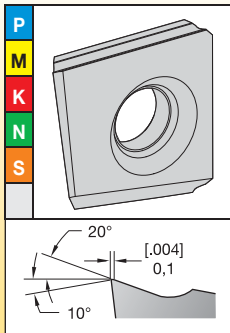


Benefits

- Process reliability and high productivity.
- Reduced machine downtime.
- Higher productivity.
- Low vibrations, smooth cut, silent cut, no workpiece deformation, and high surface quality.
- Process reliability.

Finishing

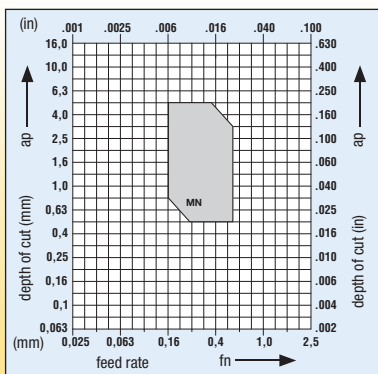
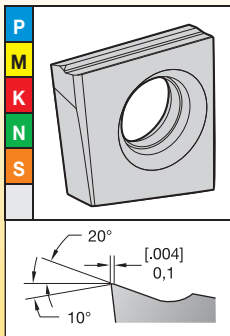
D2FIX-FN



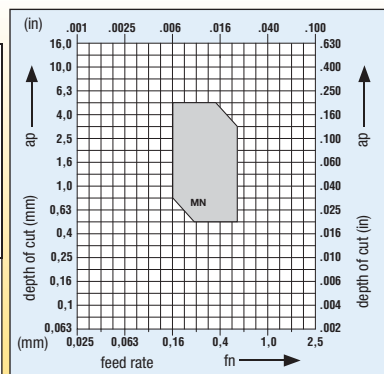
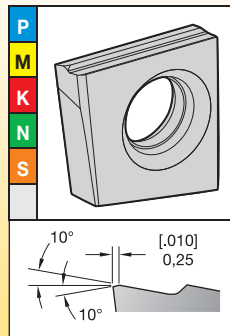
P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous Materials
S	High-Temp Alloys
H	Hardened Materials

Medium Machining

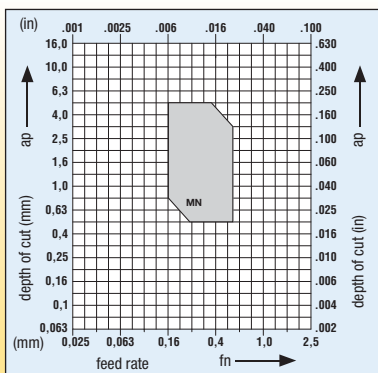
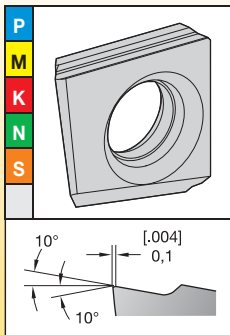
C2FIX-MN



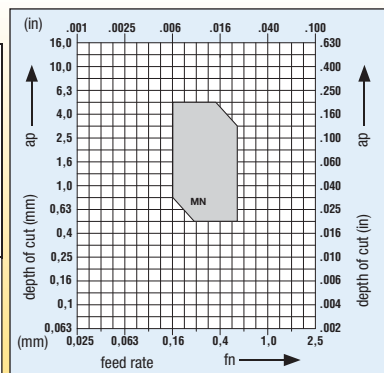
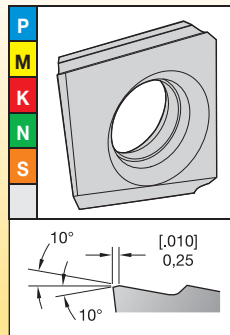
C2FIX18-MN



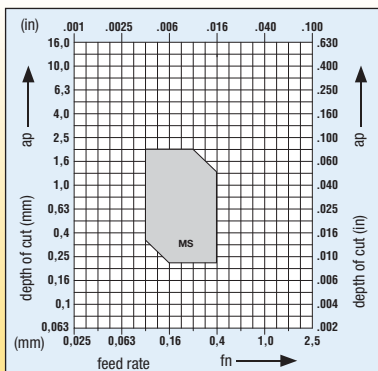
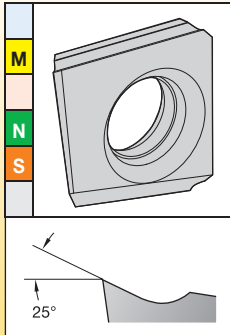
D2FIX15-MN



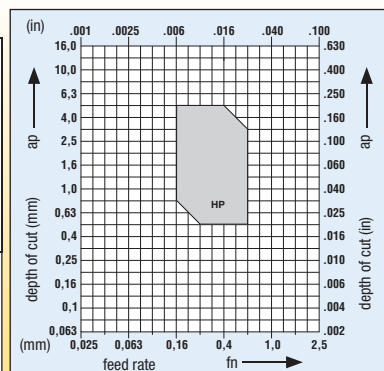
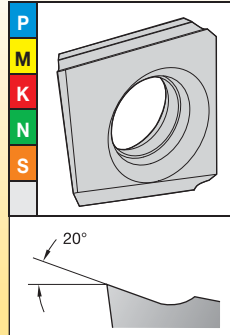
K2FIX-MN



D2FIX-MS

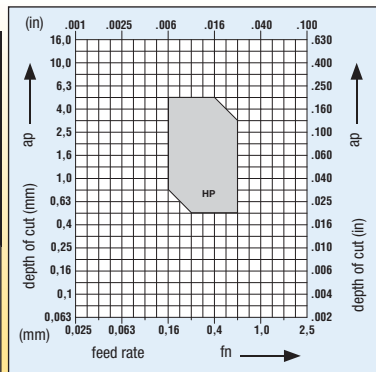
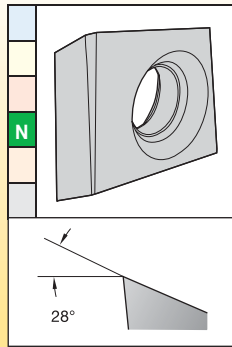


D2FIX-HP



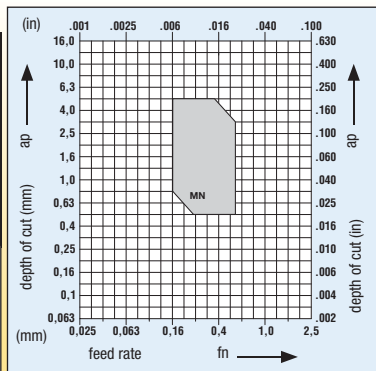
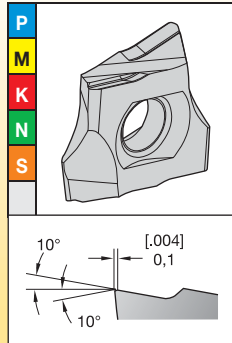
Medium Machining

E2FIX-HP

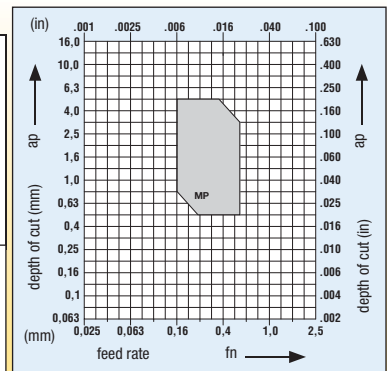
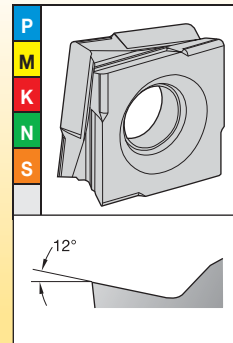


P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous Materials
S	High-Temp Alloys
H	Hardened Materials

D4FIX-MN

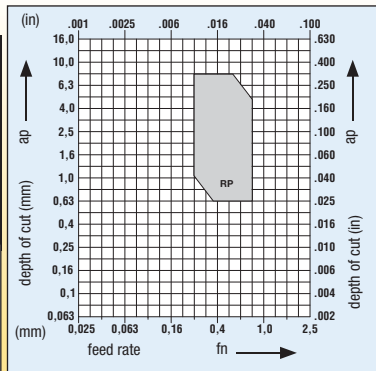
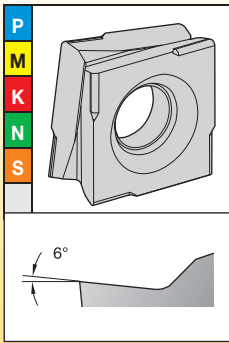


C8FIX-MP

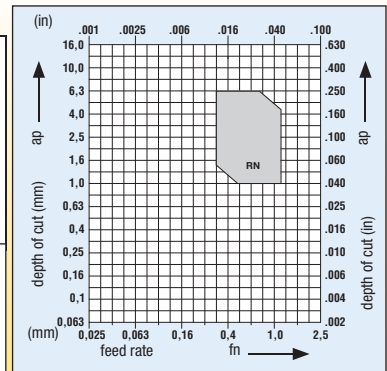
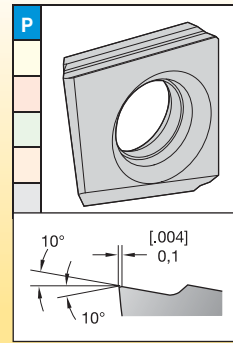


Roughing

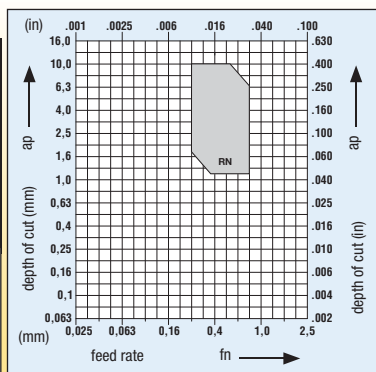
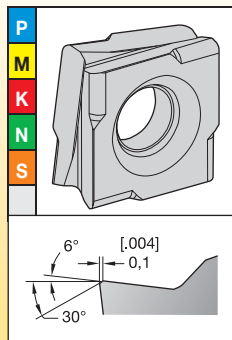
C8FIX-RP



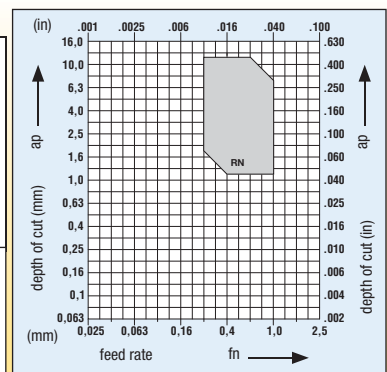
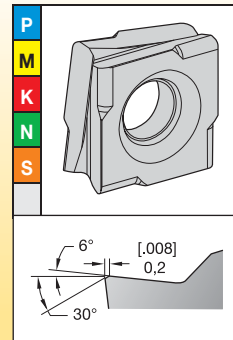
D2FIX-RN



C8FIX15-RN



C8FIX18-RN



Select the Insert Geometry

8-Edged Inserts

Roughing

Interrupted cut and/or heavy scale
USE: -RP OR -RN



-RP



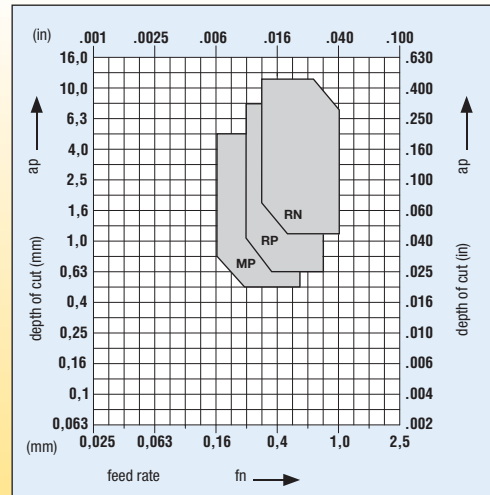
-RN

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



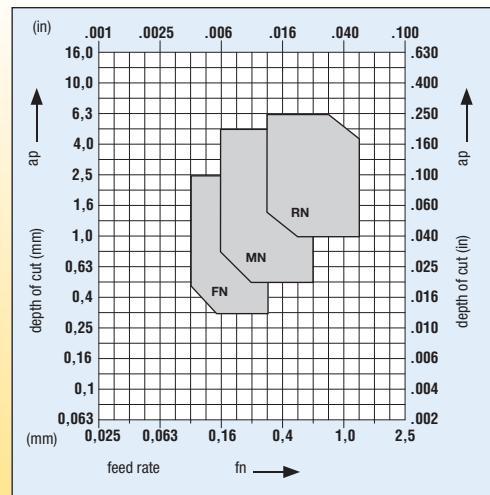
-MN

Finishing

Non-interrupted cut, not scale
USE: -FN



-FN



2-Edged Inserts, High Positive

Medium Turning

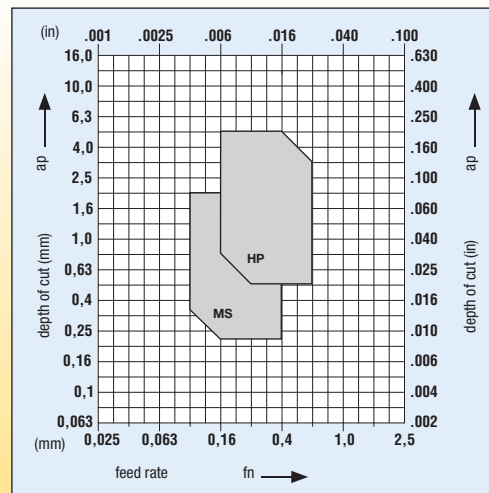
Slightly interrupted cut and/or slight scale
USE: -HP OR -MS



-HP



-MS



Select the grade

	P	M	K	N	S	H
heavily interrupted	KCP40/KCU25	KCU25/KCP40	KCP25/KCU25	KCU25	KCU25	–
lightly interrupted	KCP25/KCU25	KCU25/KCP40	KCP25/KCU25	KCU25	KCU25	–
varying depths of cut	KCP10/KCU10	KCU10/KCM15	KCP10/KCU10	KCU10	KCU10	KCU10
smooth	KCP10/KCU10	KCU10/KCM15	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)	105 (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	180

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
	KCM15											165	550
	KCU25											165	550
	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											140	450
	KCU10											165	550
	KCP25											165	550
	KCP10											185	600

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

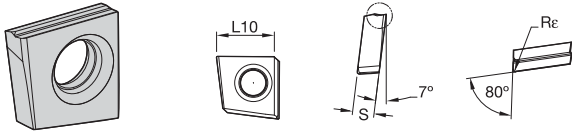
Hardened Steel speed — m/min (SFM) starting conditions

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



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

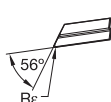
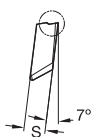
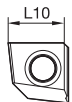
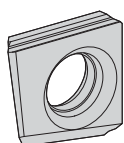
● first choice
○ alternate choice



Application Specific

► C2FIX-MN

catalogue number	L10	S	Re	KCP10	KCP25	KCP40	KCM15	KCU10	KCU25
right hand									
C2FIX110404RMN	10,70	4,00	0,40	-	-	-	-	●	-
C2FIX110405RMN	10,70	4,00	0,50	-	●	●	-	-	-
C2FIX150510RMN	14,50	5,00	1,00	-	●	-	-	-	-
C2FIX150512RMN	14,50	5,00	1,20	-	-	-	-	-	●
C2FIX150505RMN	14,70	5,00	0,50	-	●	-	-	-	-
left hand									
C2FIX110404LMN	10,70	4,00	0,40	-	-	-	-	-	●
C2FIX110405LMN	10,70	4,00	0,50	-	●	●	-	●	-
C2FIX110408LMN	10,70	4,00	0,80	-	●	-	-	-	-
C2FIX150510LMN	14,50	5,00	1,00	-	●	●	-	-	-
C2FIX150508LMN	14,60	5,00	0,80	-	●	-	-	●	●
C2FIX150504LMN	14,70	5,00	0,40	-	-	●	-	-	●
C2FIX150505LMN	14,70	5,00	0,50	-	●	●	-	●	-
C2FIX180610LMN	17,50	6,00	1,00	-	●	●	-	●	-

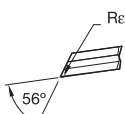
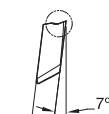
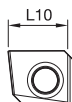
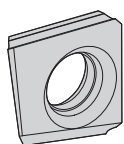


- first choice
- alternate choice

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

D2FIX-MN

catalogue number	L10	S	R _ε	KCP10	KCP25	KCP40	KCM15	KCU10	KCU25
right hand									
D2FIX110405RMN	10,50	4,00	0,50	-	●	●	-	-	-
D2FIX150508RMN	14,20	5,00	0,80	-	●	-	-	-	-
D2FIX150505RMN	14,50	5,00	0,50	●	●	●	-	-	-
D2FIX150504RMN	14,60	5,00	0,40	-	●	-	-	-	-
D2FIX150503RMN	14,70	5,00	0,30	-	●	-	-	-	-
left hand									
D2FIX110405LMN	10,50	4,00	0,50	-	●	●	-	-	-
D2FIX150508LMN	14,20	5,00	0,80	-	●	-	-	-	-
D2FIX150505LMN	14,50	5,00	0,50	-	●	-	-	-	-

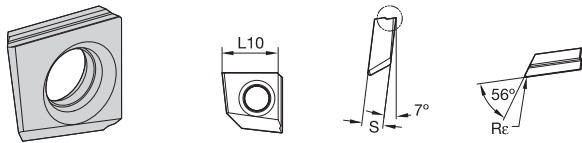


D2FIX-HP

catalogue number	L10	S	R _ε	KCP10	KCP25	KCP40	KCM15	KCU10	KCU25
right hand									
D2FIX110404RHP	10,00	4,00	0,40	-	-	-	-	-	●
D2FIX110403RHP	10,10	4,00	0,30	-	●	-	-	●	-
D2FIX150508RHP	13,60	5,00	0,80	-	-	-	-	●	●
D2FIX150504RHP	14,00	5,00	0,40	-	-	-	-	●	●
D2FIX150503RHP	14,10	5,00	0,30	-	●	-	-	●	-
left hand									
D2FIX110403LHP	10,10	4,00	0,30	-	-	-	-	●	-
D2FIX150508LHP	13,60	5,00	0,80	-	-	-	-	●	-
D2FIX150503LHP	14,10	5,00	0,30	-	-	-	-	●	-

Application Specific

beyond



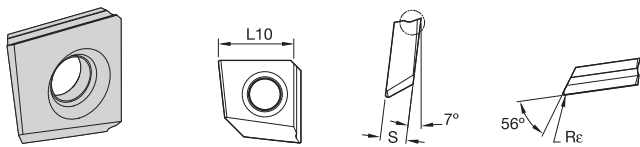
● first choice
○ alternate choice

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

■ D2FIX-MS

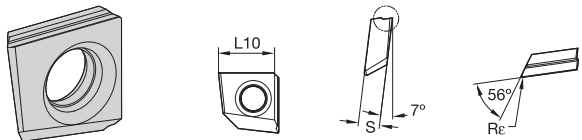
catalogue number	L10	S	Rε	KCP10	KCP25	KCP40	KCM15	KCU10	KCU25
right hand									
D2FIX150505RMS	13,90	5,00	0,50	-	-	-	-	●	-
D2FIX150503RMS	14,10	5,00	0,30	-	-	-	-	●	-
left hand									
D2FIX150505LMS	13,90	5,00	0,50	-	-	-	-	●	-
D2FIX150503LMS	14,10	5,00	0,30	-	-	-	-	●	-

Application Specific



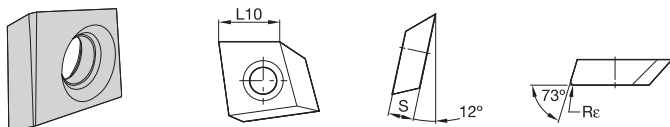
■ D2FIX-FN

catalogue number	L10	S	Rε	KCP10	KCP25	KCP40	KCM15	KCU10	KCU25
right hand									
D2FIX150505RFN	13,90	5,00	0,50	-	●	-	-	●	-



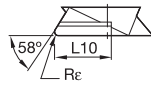
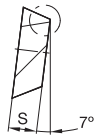
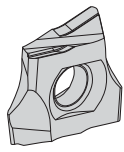
■ D2FIX-RN

catalogue number	L10	S	Rε	KCP10	KCP25	KCP40	KCM15	KCU10	KCU25
right hand									
D2FIX150505RRN	14,50	5,00	0,50	●	-	●	-	-	-
left hand									
D2FIX150505LRN	14,50	5,00	0,50	-	●	-	-	-	-



■ E2FIX-HP

catalogue number	L10	S	Rε	KCP10	KCP25	KCP40	KCM15	KCU10	KCU25
right hand									
E2FIX100505RHP	10,50	5,00	0,50	-	-	-	-	●	-
left hand									
E2FIX100505LHP	10,50	5,00	0,50	-	-	-	-	●	-

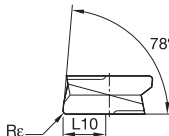
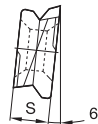
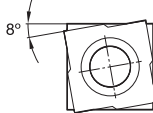
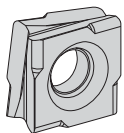


● first choice
○ alternate choice

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

D4FIX-MN

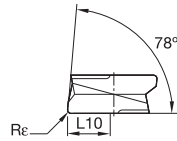
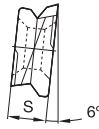
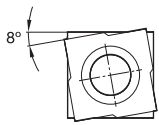
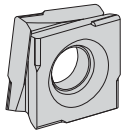
catalogue number	L10	S	Rε	KCP10	KCP25	KCP40	KCM15	KCU10	KCU25
right hand									
D4FIX140608RMN	6,70	5,90	0,80	●	●	-	-	●	●
D4FIX140605RMN	7,00	5,90	0,50	●	●	-	-	-	-
D4FIX140604RMN	7,10	5,90	0,40	-	-	●	-	-	●
D4FIX140603RMN	7,20	5,90	0,30	●	●	-	-	-	-
left hand									
D4FIX140608LMN	6,70	5,90	0,80	-	●	-	-	-	-



C8FIX-RN

catalogue number	L10	S	Rε	KCP10	KCP25	KCP40	KCM15	KCU10	KCU25
right hand									
C8FIX150612RRN	8,60	6,60	1,20	-	●	-	-	-	-
C8FIX150608RRN	8,90	6,60	0,80	●	●	●	-	-	●
C8FIX150605RRN	9,10	6,60	0,50	●	●	●	-	-	●
C8FIX180812RRN	10,60	7,90	1,20	-	●	●	-	-	●
C8FIX180808RRN	10,90	7,90	0,80	-	●	●	-	-	-
left hand									
C8FIX150612LRN	8,60	6,60	1,20	-	●	-	-	-	-
C8FIX150608LRN	8,90	6,60	0,80	-	●	-	-	-	●
C8FIX150605LRN	9,10	6,60	0,50	-	●	●	-	-	●
C8FIX180812LRN	10,60	7,90	1,20	-	●	-	-	-	-





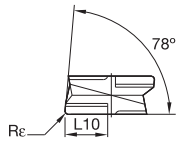
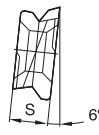
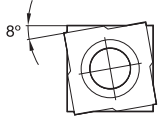
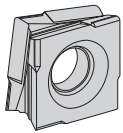
● first choice
○ alternate choice

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

■ C8FIX-RP

Application Specific

catalogue number	L10	S	Rε	KCP10	KCP25	KCP40	KCM15	KCU10	KCU25
right hand									
C8FIX120508RRP	6,90	5,50	0,80	●	●	-	-	-	-
C8FIX120505RRP	7,10	5,50	0,50	-	-	-	-	-	●
C8FIX120504RRP	7,20	5,50	0,40	●	●	-	-	-	-
C8FIX120503RRP	7,30	5,50	0,30	-	●	●	-	-	-
left hand									
C8FIX120508LRP	6,90	5,50	0,80	-	●	●	-	-	-
C8FIX150612LRP	7,80	6,60	1,20	-	-	-	-	-	-
C8FIX150608LRP	8,80	6,60	0,80	-	-	-	-	-	●

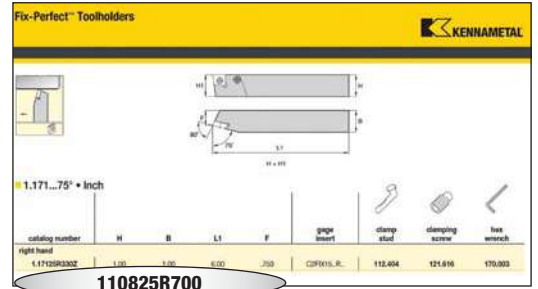


■ C8FIX-MP

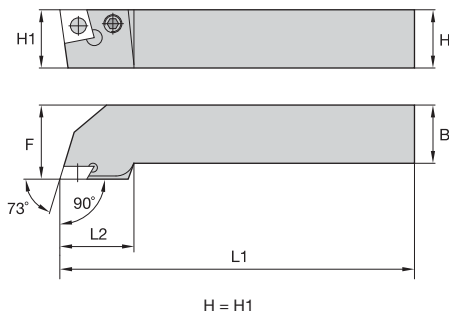
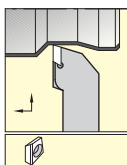
catalogue number	L10	S	Rε	KCP10	KCP25	KCP40	KCM15	KCU10	KCU25
right hand									
C8FIX120503RMP	7,30	5,50	0,30	-	●	-	-	●	●
C8FIX150603RMP	9,30	6,60	0,30	●	●	●	-	●	●
C8FIX180805RMP	11,10	7,90	0,50	-	●	-	-	-	-
left hand									
C8FIX120503LMP	7,30	5,50	0,30	●	●	-	-	●	-
C8FIX150603LMP	9,30	6,60	0,30	-	●	-	-	-	-

How Do Catalogue Numbers Work?

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



1	1	08	25	R	7	0	0																				
Turning Programme	Number of Cutters	Version	Shaft Dimensions	Direction of Working	Insert Size and Type	Insert Shape	Clamping Screw Support																				
<p>1 = Fix-Perfect</p>	<p>1 = Inserts with 2 cutting edges</p> <p>3 = Inserts with 4 cutting edges</p> <p>7 = Inserts with 8 cutting edges</p>	<p>08 = 90° or 93° setting, for machining aluminium</p> <p>16 = 92° setting angle</p> <p>20 = 92° setting angle</p> <p>22 = 92° setting angle</p> <p>30 = 75° setting angle</p> <p>71 = 75° setting angle</p> <p>72 = 45° setting angle</p> <p>77 = 90° setting angle</p> <p>80 = 90° or 93° setting angle</p>	<p>25 = 25 x 25mm</p>	<p>R = Right</p> <p>L = Left</p>	<table border="1"> <thead> <tr> <th></th> <th>L</th> <th>cutting edges</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>8mm 20mm 25mm</td> <td>4 4 4</td> </tr> <tr> <td>1</td> <td>10,5mm 12mm</td> <td>2 8</td> </tr> <tr> <td>3</td> <td>14,5mm 15mm</td> <td>2 8</td> </tr> <tr> <td>4</td> <td>17,5mm 18mm</td> <td>2 8</td> </tr> <tr> <td>5</td> <td>23,5mm 21mm</td> <td>2 8</td> </tr> <tr> <td>7</td> <td>10,5mm</td> <td>2 Alu</td> </tr> </tbody> </table>		L	cutting edges	0	8mm 20mm 25mm	4 4 4	1	10,5mm 12mm	2 8	3	14,5mm 15mm	2 8	4	17,5mm 18mm	2 8	5	23,5mm 21mm	2 8	7	10,5mm	2 Alu	<p>0 = Activated from main cutting edge</p> <p>1 = Minor cutting edge</p> <p>2 = Above</p> <p>5 = Main cutting edge with sharp-edged full cartridge</p> <p>6 = Minor cutting edge with sharp-edged full cartridge</p>
	L	cutting edges																									
0	8mm 20mm 25mm	4 4 4																									
1	10,5mm 12mm	2 8																									
3	14,5mm 15mm	2 8																									
4	17,5mm 18mm	2 8																									
5	23,5mm 21mm	2 8																									
7	10,5mm	2 Alu																									
<p>Toolholder</p> <p>10 = 10 x 10mm</p> <p>11 = 40 x 40mm</p> <p>16 = 16 x 16mm</p> <p>20 = 20 x 20mm</p> <p>21 = 50 x 50mm</p> <p>25 = 25 x 25mm</p> <p>32 = 32 x 25mm 32 x 32mm</p> <p>40 = 40 x 32mm</p>																											

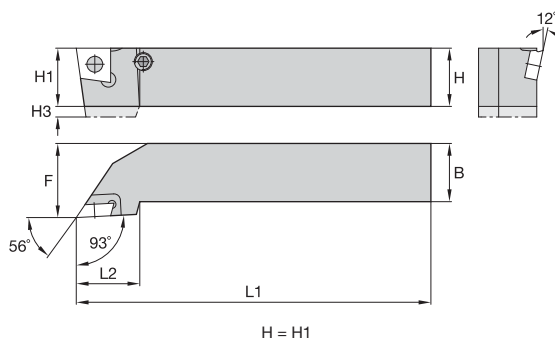
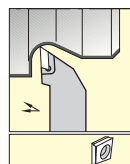


■ 1.108...90° • Metric

Application Specific



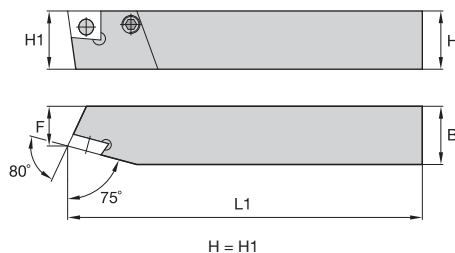
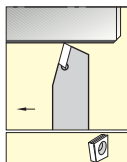
catalogue number	H	B	L1	F	gage insert	clamp stud	clamping screw	hex wrench
right hand								
1.10825R700	25	25	150,0	32,0	E2FIX10..R..	410.081	121.616	170.003



■ 1.108...93° • Metric



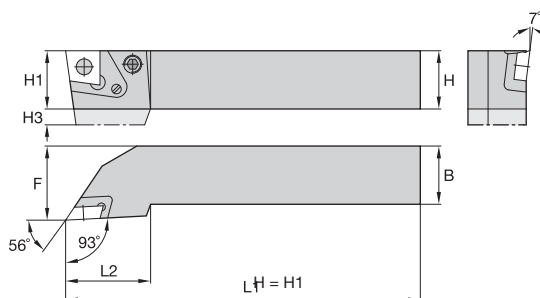
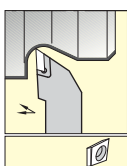
catalogue number	H	H3	B	L1	F	gage insert	clamp stud	clamping screw	hex wrench
right hand									
1.10820R310	20	5	20	125,0	25,0	D2FIX15..RHP/FN/MS	112.403	121.612	170.003
1.10825R310	25	—	25	150,0	32,0	D2FIX15..RHP/FN/MS	112.404	121.616	170.003
left hand									
1.10825L310	25	5	25	150,0	32,0	D2FIX15..LHP/FN/MS	112.404	121.616	170.003


1.171...75° • Metric

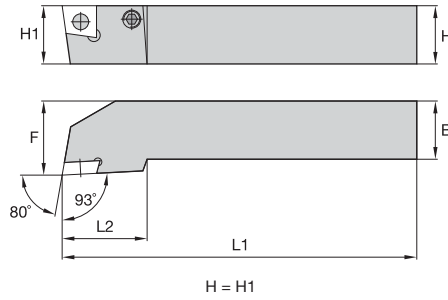
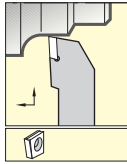
catalogue number	H	B	L1	F	gage insert	clamp stud	clamping screw	hex wrench	
left hand									
1.17125L330	25	25	150,0	17,0	C2FIX15..L..	112.404	121.616	170.003	



Application Specific


1.18 • Metric

catalogue number	H	H3	B	L1	F	gage insert	clamp stud	clamping screw	hex wrench	steel nest assembly
right hand										
1.18016R110	16	4	16	100,0	24,0	D2FIX11..R..	112.244	121.612	170.003	—
1.18020R110	20	—	20	125,0	25,0	D2FIX11..R..	112.244	121.612	170.003	—
1.18020R310	20	5	20	125,0	26,0	D2FIX15..R..	112.403	121.612	170.003	—
1.18025R110	25	—	25	150,0	32,0	D2FIX11..R..	112.244	121.612	170.003	—
1.18025R310	25	—	25	150,0	32,0	D2FIX15..R..	112.404	121.616	170.003	—
1.18025R315	25	7	25	150,0	32,0	D2FIX15..R..	112.505	121.616	170.003	132.151
1.18032R315	32	—	25	170,0	32,0	D2FIX15..R..	112.505	121.616	170.003	132.151
left hand										
1.18016L110	16	4	16	100,0	24,0	D2FIX11..L..	112.244	121.612	170.003	—
1.18020L110	20	—	20	125,0	25,0	D2FIX11..L..	112.244	121.612	170.003	—
1.18025L310	25	—	25	150,0	32,0	D2FIX15..L..	112.404	121.616	170.003	—
1.18025L315	25	7	25	150,0	32,0	D2FIX15..L..	112.505	121.616	170.003	132.156
1.18032L315	32	—	25	170,0	32,0	D2FIX15..L..	112.505	121.616	170.003	132.156

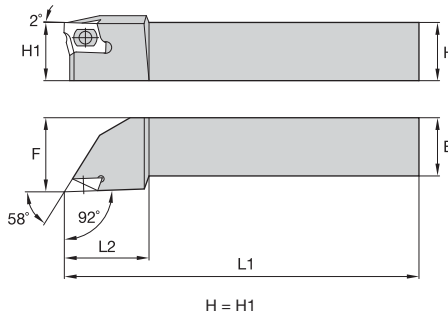
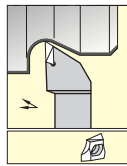


■ 1.180...93° • Metric

Application Specific



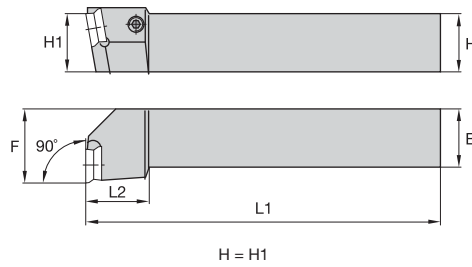
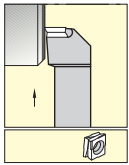
catalogue number	H	B	L1	F	gage insert	clamp stud	clamping screw	hex wrench
left hand								
1.18025L330	25	25	150,0	32,0	C2FIX15..L..	112.404	121.616	170.003



■ 1.380...92° • Metric



catalogue number	H	B	L1	F	gage insert	clamp stud	clamping screw	hex wrench
right hand								
1.38020R021	20	20	125,0	25,0	D4FIX..R..	114.111	121.812	170.004
1.38025R021	25	25	150,0	32,0	D4FIX..R..	114.114	121.816	170.004
left hand								
1.38025L021	25	25	150,0	32,0	D4FIX..L..	114.114	121.816	170.004

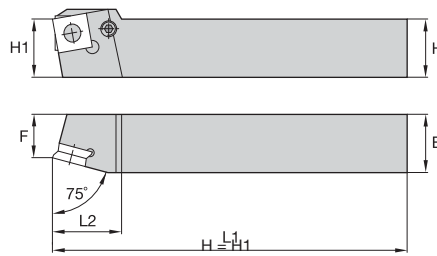
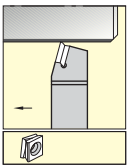


■ 1.777...90° • Metric



catalogue number	H	B	L1	F	gage insert	clamp stud	clamping screw	hex wrench
right hand								
1.77725R301	25	25	150,0	32,0	C8FIX15..L..	118.314	121.816	170.004

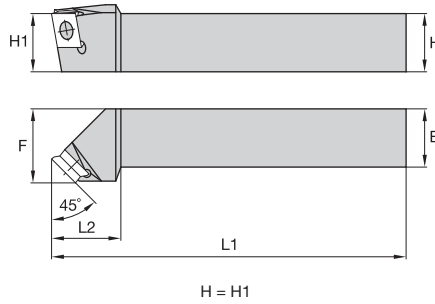
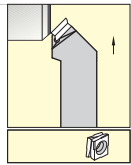
NOTE: Right-hand tool requires left-hand insert.



■ 1.771...75° • Metric



catalogue number	H	B	L1	F	gage insert	clamp stud	clamping screw	hex wrench
right hand								
1.77120R100	20	20	125,0	17,0	C8FIX12..R..	118.204	121.612	170.003
1.77125R300	25	25	150,0	21,0	C8FIX115..R..	410.084	121.816	170.004
1.77132R400	32	32	170,0	27,0	C8FIX18..R..	410.091	—	—
left hand								
1.77120L100	20	20	125,0	17,0	C8FIX12..L..	118.204	121.612	170.003

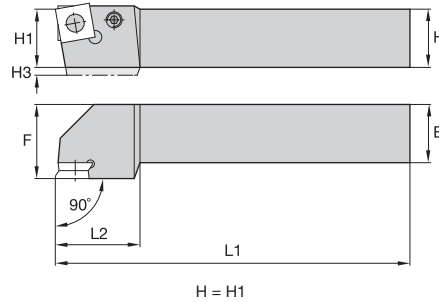
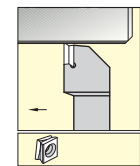


■ 1.772...45° • Metric

Application Specific

catalogue number	H	B	L1	F	gage insert	clamp stud	clamping screw	hex wrench	
right hand									
1.77225R301	25	25	150,0	32,0	C8FIX15..L..	118.314	121.816	170.004	

NOTE: C8FIX15..L.. is usable for plunging only.
For both plunging and turning, C4FIX15..L.. has to be used.



■ 1.780...90° • Metric

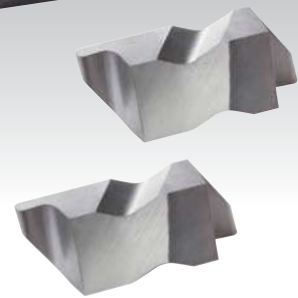
catalogue number	H	H3	B	L1	F	gage insert	clamp stud	clamping screw	hex wrench
right hand									
1.78012R103	12	—	12	80,0	14,0	C8FIX12..R..	—	—	170.003
1.78016R100	16	4	16	100,0	25,0	C8FIX12..R..	118.204	121.616	170.003
1.78020R100	20	—	20	125,0	25,0	C8FIX12..R..	118.204	121.616	170.003
1.78025R100	25	—	25	150,0	32,0	1.81201R...	118.204	121.616	170.003
1.78025R300	25	—	25	150,0	32,0	C8FIX15..R..	410.084	121.816	170.004
1.78032R400	32	—	32	170,0	40,0	C8FIX18..R..	410.091	121.825	170.004
left hand									
1.78025L100	25	—	25	150,0	32,0	1.81202L...	118.204	121.616	170.003
1.78025L300	25	—	25	150,0	32,0	C8FIX15..L..	410.084	121.816	170.004

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Top Notch[™]



Top Notch Grooving Tools and Beyond Inserts are 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.



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- 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.
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- Chip control inserts provide excellent chip evacuation in grooving, and offer better chip control in multidirectional turning.

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➤ Beyond™ Top Notch™ Profiling

The Top Notch system 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

Beyond™ Grades

Higher Productivity and Profitability

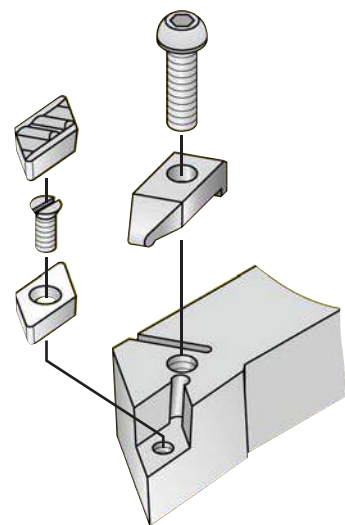
- Lower cutting forces increase speeds and reduce cycle time.
- Extended tool life.

Reliability

- Predictable tool life/uniform wear.
- Resists chip flow damage.
- Consistent surface finish.

Versatility

- Products can be applied across a wide range of applications.
- Use in low- to high-speed applications.
- Complete portfolio of products.
- For finish to rough turning of steel, cast iron, stainless steel, and high-temp alloys.



FP Geometry

- Higher metal removal rate.
- Versatility.
- Long tool life.
- Optimum chip control over wide range of cutting conditions and workpiece materials.
- Improved surface finish.
- Better indexability.
- Less adjustment during insert change.

UF Geometry

- Reduces cutting forces.
- Long tool life.
- Optimum chip control over wide range of cutting conditions.
- Chip control in finishing applications.

HP Geometry

- Reduces cutting forces.
- Long tool life.
- Interference is avoided to improve surface finish of the workpiece.
- Better indexability.
- Good control over job dimensions.
- Reduces workpiece material sticking.



Select the geometry –
based on feed rate and depth of cut

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

operation	insert style application	insert geometry	profile	feed rate — mm										
				0,04	0,063	0,01	0,16	0,25	0,4	0,63	1,0	1,6	2,5	5,0
				depth of cut — mm										
				0,1	0,16	0,25	0,4	0,63	1,0	1,6	2,5	4,0	6,3	10,0
fine finishing	DCGR-UF			0,1–0,3										
				0,1–1,3										
fine finishing	KCGR-UF			0,1–0,3										
				0,1–1,3										
finishing	DCGR			0,1–0,3										
				0,1–1,3										
	KCGR			0,1–0,4										
				0,3–2,0										
	DCGR-FP			0,063–0,25										
				0,16–1,6										
	DCGR-HP			0,1–0,4										
0,3–2,0														
KCGR-FP			0,063–0,25											
			0,16–1,6											
KCGR-HP			0,063–0,25											
			0,16–1,6											

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

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

operation	insert style application	insert geometry	profile	feed rate — mm										
				0,04	0,063	0,01	0,16	0,25	0,4	0,63	1,0	1,6	2,5	5,0
				0,1	0,16	0,25	0,4	0,63	1,0	1,6	2,5	4,0	6,3	10,0
				depth of cut — mm										
fine finishing	VBMR-UF			0,1–0,3										
				0,1–1,3										
fine finishing	VCMR-UF			0,1–0,3										
				0,1–1,3										
fine finishing	VGR-UF			0,1–0,3										
				0,1–1,3										
finishing	VBMR			0,1–0,4										
				0,3–2,0										
	VBMR-FP			0,063–0,25										
				0,16–1,6										
	VGR			0,1–0,4										
				0,3–2,0										
VCMR-FP			0,063–0,25											
			0,16–1,6											
VGR-FP			0,063–0,25											
			0,16–1,6											

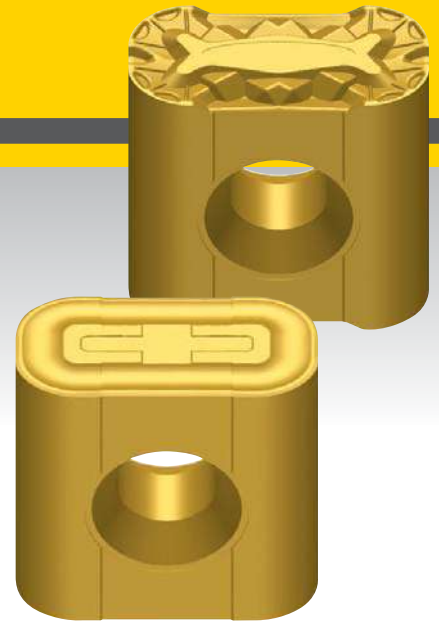
■ Select the geometry —
based on feed rate and depth of cut

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

operation	insert style application	insert geometry	profile	feed rate — mm										
				0,04	0,063	0,01	0,16	0,25	0,4	0,63	1,0	1,6	2,5	5,0
				0,1	0,16	0,25	0,4	0,63	1,0	1,6	2,5	4,0	6,3	10,0
				depth of cut — mm										
finishing	VPGR-HP			0,2–0,4										
				0,6–2,3										
finishing	KNGX-15			0,2–0,4										
				0,8–2,8										
finishing	KNGX-20			0,2–0,5										
				1,0–3,0										
finishing	KNGX-25			0,3–0,6										
				1,1–3,6										
finishing	KNGX-32			0,3–0,7										
				1,5–5,1										

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 technology for maximum metal removal and higher productivity. They 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.



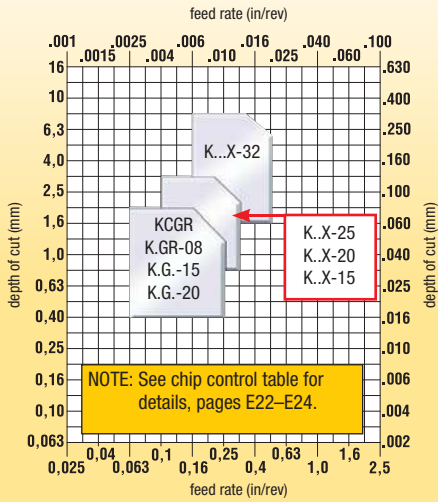
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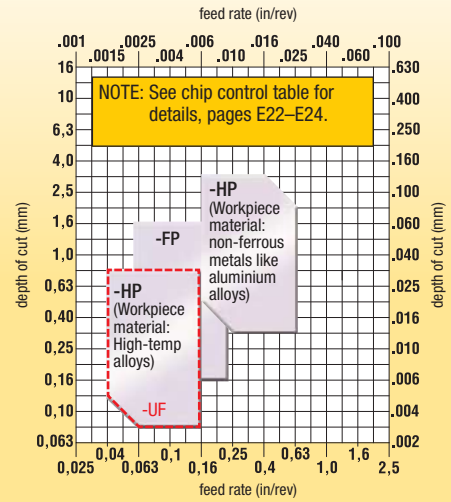
kennametal.com

Step 1 • Select the insert geometry

Negative Inserts



Positive Inserts



Chip Control Range
 -UF: feed 0,08–0,3 mm/rev; DOC 0,1–1,3mm
 -FP: feed 0,1–0,3 mm/rev; DOC 0,1–1,3mm
 -HP: feed 0,28–0,4 mm/rev; DOC 0,6–2,3mm

Step 2 • Select the grade

cutting condition	Symbol	Steel			Stainless Steel		
		Finishing	Medium Machining	Roughing	Finishing	Medium Machining	Roughing
heavily interrupted cut	⚙️	KCP25	KCM25	KCM25	KCM25	KCM25	KCM25
lightly interrupted cut	⚙️	KCP10	KCP25	KCP25	KC5010/KCU10	KC5025/KCU25	KC5025/KCU25
varying depth of cut, casting, or forging skin	⚙️	KT315	KCP25	KCP25	KT315	KCM25	KCM25
smooth cut, pre-turned surface	⚙️	KT315	KCP05/KCP10	KCP10	KT315	KC5010/KCU10	KCM25

cutting condition	Symbol	Cast Iron			Non-Ferrous		
		Finishing	Medium Machining	Roughing	Finishing	Medium Machining	Roughing
heavily interrupted cut	⚙️	KCP10	KCP10	KCP10	KC5010/KCU10	KC5010/KCU10	KC5010/313/KCU10
lightly interrupted cut	⚙️	KCP05	KCP05	KCP05	KC5410/KD1425	KC5010/KCU10	KC5010
varying depth of cut, casting, or forging skin	⚙️	KCK05	KCK05	KCK05	KD1425	KC5410	KC5410
smooth cut, pre-turned surface	⚙️	KC5010/KCU10	KC5010/KCU10	KC5010/KCU10	KD1425	KC5410	KC5410

cutting condition	Symbol	High-Temperature Alloys		
		Finishing	Medium Machining	Roughing
heavily interrupted cut	⚙️	KC5025/KUC25	K68	K68
lightly interrupted cut	⚙️	KC5010	KC5010	KCM25
varying depth of cut, casting, or forging skin	⚙️	KC5010	KC5010	KC5010
smooth cut, pre-turned surface	⚙️	KC5010/KCU10/K313	KC5010/KCU10	KC5010

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
	KCP05/KCP10									340	800
	KCP25									180	600
	KCM25									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
	KCM25									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
	KCK20									245	800
	KCP25									230	750

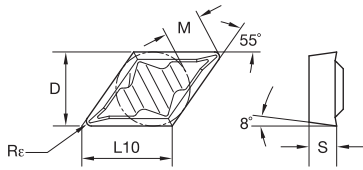
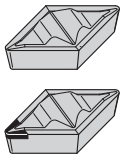
Non-Ferrous speed — m/min (SFM) starting conditions

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/K313									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)	120 (400)	m/min	SFM
S	KC5010/KCU10									60	200
	KC5025/KCU25									50	170
	KCM25									70	230
	K68/K313									30	100

Represents the recommended starting conditions. Optimise for your specific application.

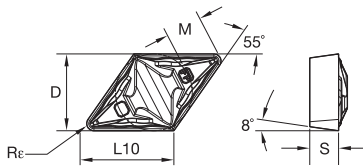
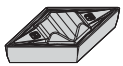


● first choice
○ alternate choice

■ DCGR • DPGR

Application Specific

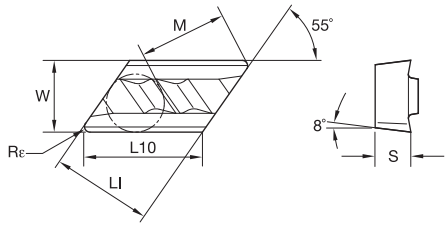
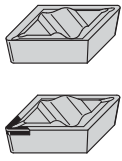
ISO catalogue number	D	L10	S	M	Rε
DCGR150404	12,70	15,50	4,76	6,94	0,4
DCGR150408	12,70	15,50	4,76	6,48	0,8
DCGR150412	12,70	15,50	4,76	6,01	1,2



■ DCGR-FP • DPGR-FP

ISO catalogue number	D	L10	S	M	Rε
DCGR150404FP	12,70	15,50	4,76	6,94	0,4
DCGR150408FP	12,70	15,50	4,76	6,48	0,8

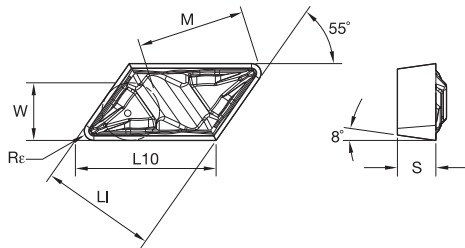
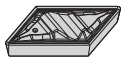
	P	M	K	N	S	H	K68	K313	KU10	KCP10	KCP25B	KCP25	KCK05	KCM15B	KCM25B	KCM25	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KD1425	
DCGR150404	●	●	●	○	○	○	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●	●	●	●
DCGR150408	●	●	●	○	○	○	●	-	-	-	-	-	-	-	-	-	●	●	●	●	●	●	●	●
DCGR150412	●	●	●	○	○	○	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●	●	●	●
DCGR150404FP	●	●	●	○	○	○	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●	●	●	●
DCGR150408FP	●	●	●	○	○	○	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●	●	●	●



● first choice
○ alternate choice

KCGR • NPGR

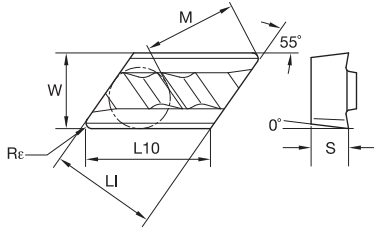
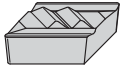
ISO catalogue number	LI	L10	W	S	M	Rε	K68	K313	KU10	KP10	KP25B	KP25	KGK05	KCM15B	KCM25B	KCM25	KGU10	KCU25	KC5010	KC5025	KC5410	KT315	KD1425	
right hand																								
KCGR110304R08	9,53	11,60	6,35	3,18	9,10	0,4	●	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●	●	●
KCGR110308R08	9,53	11,60	6,35	3,18	8,66	0,8	-	-	-	-	-	-	-	-	-	-	-	●	●	●	●	-	-	●
left hand																								
KCGR110308L08	9,53	11,60	6,35	3,18	8,66	0,8	-	-	-	-	-	-	-	●	-	-	-	●	●	●	●	-	-	●
KCGR110304L08	9,53	11,60	6,35	3,18	9,10	0,4	●	-	-	-	-	-	-	-	-	-	-	●	●	●	●	-	-	●



KCGR-FP • NPGR-FP

ISO catalogue number	LI	L10	W	S	M	Rε	K68	K313	KU10	KP10	KP25B	KP25	KGK05	KCM15B	KCM25B	KCM25	KGU10	KCU25	KC5010	KC5025	KC5410	KT315	KD1425	
right hand																								
KCGR110304R08FP	9,52	11,60	6,35	3,18	9,13	0,4	-	-	-	●	-	●	-	-	-	●	-	-	-	-	-	-	-	-
KCGR110308R08FP	9,52	11,63	6,35	3,18	8,73	0,8	-	-	-	●	-	-	-	-	-	-	●	-	-	-	-	-	-	-
left hand																								
KCGR110308L08FP	9,52	11,63	6,35	3,18	8,73	0,8	-	-	-	●	-	●	-	-	-	-	-	-	-	-	-	-	-	-
KCGR110304L08FP	9,52	11,60	6,35	3,18	9,13	0,4	-	-	-	●	-	●	-	-	-	●	-	●	-	-	-	-	-	-

Application Specific



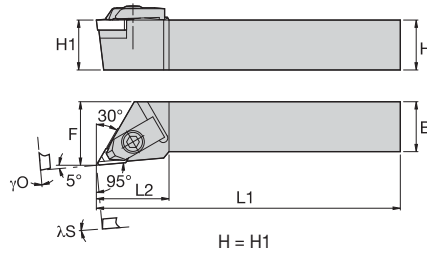
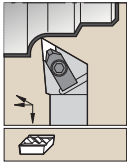
● first choice
○ alternate choice

■ KNGX • NPR/L

Application Specific

ISO catalogue number	LI	L10	W	S	M	Re	K68	K313	KU10	KCP10	KCP25B	KCP25	KCK05	KCM15B	KCM25B	KCM25	KCU10	KCU25	KC5010	KC5025	KC5410	KT315	KD1425
right hand																							
KNGX150404R20	12,68	15,44	9,47	4,76	13,46	0,4	-	-	-	-	-	-	-	-	-	-	-	●	●	-	-	-	-
KNGX150408R20	12,68	15,44	9,47	4,76	12,99	0,8	-	-	-	-	-	-	-	-	-	-	●	●	●	-	-	-	-
KNGX150401R15	12,70	15,44	9,53	4,76	13,76	0,1	●	-	-	-	-	-	-	-	-	-	●	-	-	-	-	-	-
KNGX150402R15	12,70	15,44	9,53	4,76	13,67	0,2	-	-	-	-	-	-	-	-	-	-	●	-	-	-	-	-	-
KNGX220404R25	18,62	22,73	9,53	4,76	19,91	0,4	-	-	-	-	-	-	-	-	-	-	●	-	-	-	-	-	-
KNGX220408R32	18,62	22,73	9,53	4,76	19,47	0,8	-	-	-	-	-	-	-	-	-	-	●	-	-	-	-	-	-
left hand																							
KNGX150408L20	12,68	15,44	9,47	4,76	12,99	0,8	●	-	-	-	-	-	-	-	-	-	-	●	●	-	-	-	-
KNGX150404L20	12,68	15,44	9,47	4,76	13,46	0,4	-	-	-	-	-	-	-	-	-	-	-	●	●	-	-	-	-
KNGX220408L20	18,62	22,73	9,53	4,76	19,47	0,8	-	-	-	-	-	-	-	-	-	-	●	-	-	-	-	-	-

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

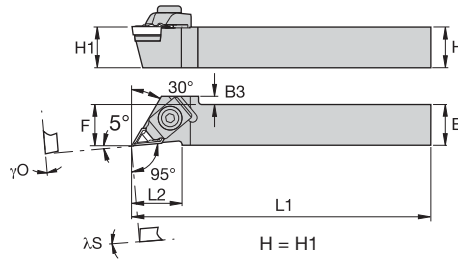
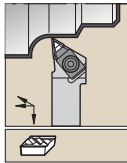


■ **NKLC 95°**

Application Specific



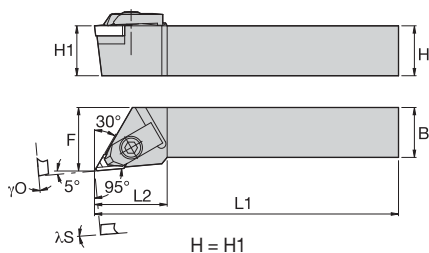
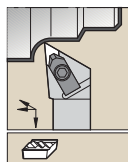
catalogue number	H	B	F	L1	λS°	γO°	gage insert	shim	shim screw	hex (mm)	clamp	clamp screw	hex (mm)
right hand													
NKLCR1616H11	16	16	20,0	100	0.0	0.0	KC..110305R	SM885	MS959	3 mm	CM68	MS524	3 mm
NKLCR2020K11	20	20	25,0	125	0.0	0.0	KC..110305R	SM885	MS959	3 mm	CM68	MS524	3 mm
NKLCR2525M11	25	25	32,0	150	0.0	0.0	KC..110305R	SM885	MS959	3 mm	CM68	MS524	3 mm
left hand													
NKLCL2020K11	20	20	25,0	125	0.0	0.0	KC..110305L	SM886	MS959	3 mm	CM68	MS524	3 mm
NKLCL2525M11	25	25	32,0	150	0.0	0.0	KC..110305L	SM886	MS959	3 mm	CM68	MS524	3 mm



■ **NKLC-F 95°**



catalogue number	H	B	F	L1	λS°	γO°	gage insert	shim	shim screw	hex (mm)	clamp	clamp screw	hex (mm)
right hand													
NKLCRF1212M11Q	12	12	12,0	150	0.0	0.0	KC..110305R	SM885	MS959	3 mm	CM180	MS524	3 mm

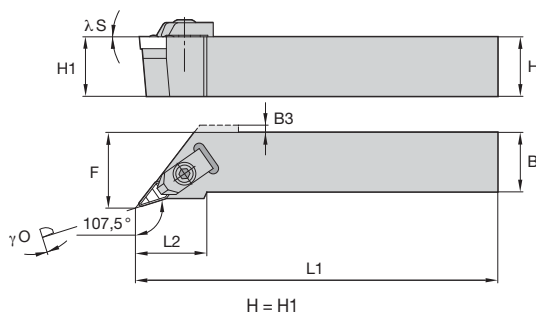
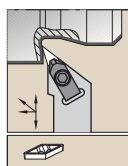


■ NKLN 95°

catalogue number	H	B	F	L1	λS°	γO°	gage insert	shim	shim screw	hex (mm)	clamp	clamp screw	hex (mm)
right hand													
NKLNR2020K15	20	20	25,0	125	-2.0	-5.0	KN..150410R	SM872	MS111	2 mm	CM66	MS625	4 mm
NKLNR2525M15	25	25	32,0	150	-2.0	-5.0	KN..150410R	SM872	MS111	2 mm	CM66	MS625	4 mm
left hand													
NKLNL2020K15	20	20	25,0	125	-2.0	-5.0	KN..150410L	SM871	MS111	2 mm	CM66	MS625	4 mm
NKLNL2525M15	25	25	32,0	150	-2.0	-5.0	KN..150410L	SM871	MS111	2 mm	CM66	MS625	4 mm

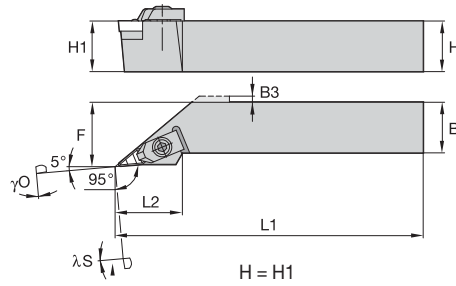
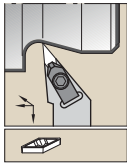


Application Specific



■ NVHB 107,5°

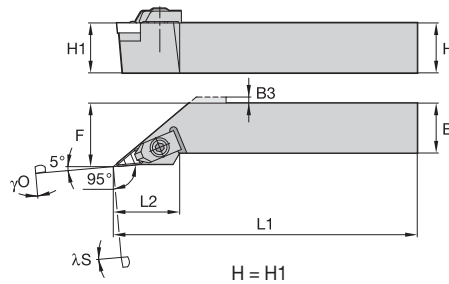
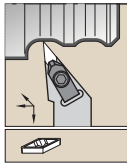
catalogue number	H	B	F	L1	LH	λS°	γO°	gage insert	shim	shim screw	hex (mm)	clamp	clamp screw	hex (mm)
right hand														
NVHBR2020K11	20	20	25,0	125	30,0	0.0	0.0	VB..110304	SM813	MS959	2.5 mm	CM158	MS518	2.5 mm
NVHBR2525M11	25	25	32,0	150	30,0	0.0	0.0	VB..110304	SM813	MS959	2.5 mm	CM158	MS518	2.5 mm
left hand														
NVHBL2020K11	20	20	25,0	125	30,0	0.0	0.0	VB..110304	SM813	MS959	2.5 mm	CM159	MS518	2.5 mm
NVHBL2525M11	25	25	32,0	150	30,0	0.0	0.0	VB..110304	SM813	MS959	2.5 mm	CM159	MS518	2.5 mm



■ NVLB 95°

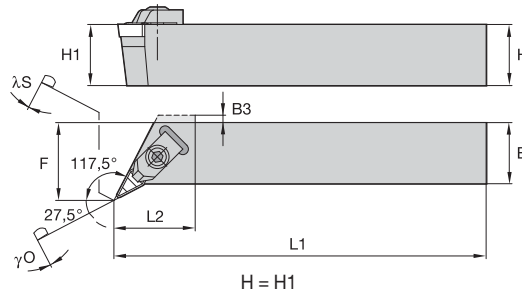
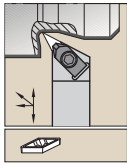
Application Specific

catalogue number	H	B	F	L1	LH	λS°	γO°	gage insert	shim	shim screw	hex (mm)	clamp	clamp screw	hex (mm)	
right hand															
NVLBR2020K11	20	20	25,0	125	30,0	0.0	0.0	VB..110304	SM813	MS959	2.5 mm	CM158	MS518	2.5 mm	
NVLBR2525M11	25	25	32,0	150	32,0	0.0	0.0	VB..110304	SM813	MS959	2.5 mm	CM158	MS518	2.5 mm	
left hand															
NVLBL2020K11	20	20	25,0	125	30,0	0.0	0.0	VB..110304	SM813	MS959	2.5 mm	CM159	MS518	2.5 mm	
NVLBL2525M11	25	25	32,0	150	32,0	0.0	0.0	VB..110304	SM813	MS959	2.5 mm	CM159	MS518	2.5 mm	



■ NVLC 95°

catalogue number	H	B	F	L1	LH	B3	λS°	γO°	gage insert	shim	shim screw	hex (mm)	clamp	clamp screw	hex (mm)
right hand															
NVLCR1616H16	16	16	20,0	100	37,0	5,0	0.0	0.0	VC..160408	SM812	MS959	4 mm	CM113	MS412	4 mm
NVLCR2020K16	20	20	25,0	125	37,0	—	0.0	0.0	VC..160408	SM812	MS959	4 mm	CM113	MS412	4 mm
NVLCR2525M16	25	25	32,0	150	37,0	—	0.0	0.0	VC..160408	SM812	MS959	4 mm	CM113	MS412	4 mm
NVLCR3225P16	32	25	32,0	170	37,0	—	0.0	0.0	VC..160408	SM812	MS959	4 mm	CM113	MS412	4 mm
left hand															
NVLCCL2020K16	20	20	25,0	125	37,0	—	0.0	0.0	VC..160408	SM812	MS959	4 mm	CM114	MS412	4 mm
NVLCCL2525M16	25	25	32,0	150	37,0	—	0.0	0.0	VC..160408	SM812	MS959	4 mm	CM114	MS412	4 mm
NVLCCL3225P16	32	25	32,0	170	37,0	—	0.0	0.0	VC..160408	SM812	MS959	4 mm	CM114	MS412	4 mm

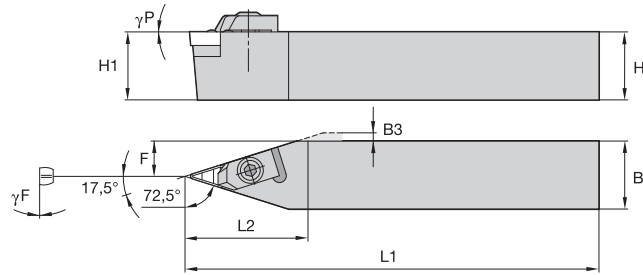
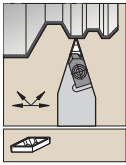


■ NVOC 117,5°



catalogue number	H	B	F	L1	LH	B3	λS°	γO°	gage insert	shim	shim screw	hex (mm)	clamp	clamp screw	hex (mm)
right hand															
NVOCR2020K16	20	20	32,0	125	29,0	3,0	0.0	0.0	VC..160408	SM812	MS959	4 mm	CM113	MS412	4 mm
NVOCR2525M16	25	25	32,0	150	29,0	3,0	0.0	0.0	VC..160408	SM812	MS959	4 mm	CM113	MS412	4 mm
left hand															
NVOCL2020K16	20	20	32,0	125	29,0	3,0	0.0	0.0	VC..160408	SM812	MS959	4 mm	CM114	MS412	4 mm
NVOCL2525M16	25	25	32,0	150	29,0	3,0	0.0	0.0	VC..160408	SM812	MS959	4 mm	CM114	MS412	4 mm

Application Specific

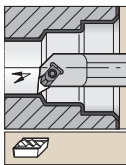


■ NVVC 72,5°

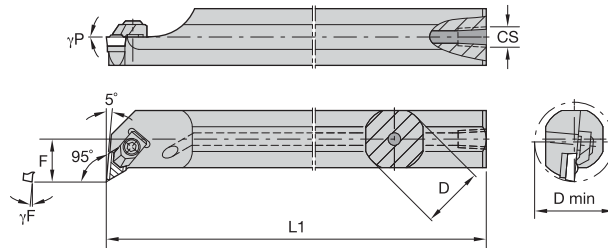
Application Specific



catalogue number	H	B	F	L1	LH	B3	γF°	γP°	gage insert	shim	shim screw	hex (mm)	clamp	clamp screw	hex (mm)
NVVCN2020K16	20	20	10,0	125	42,0	2,0	0.0	0.0	VC..160408	SM812	MS959	4 mm	CM113	MS412	4 mm
NVVCN2525M16	25	25	12,5	150	42,0	—	0.0	0.0	VC..160408	SM812	MS959	4 mm	CM113	MS412	4 mm



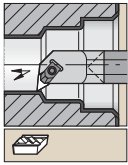
Steel shank with through coolant.



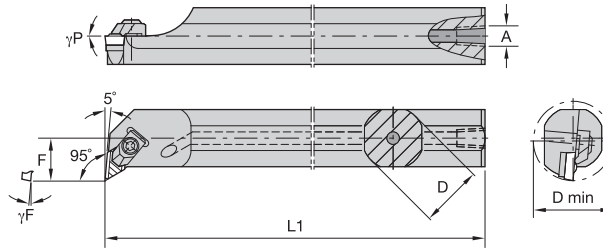
■ A-NKLC 95°



catalogue number	D	D min	F	L1	CS	γF°	γP°	gage insert	shim	shim screw	hex	clamp	clamp screw	hex	
right hand															
A12MNKLCR11	12	16,0	9,0	150	1/16-27 NPT	-5.0°	0.0°	KC..110305R	—	—	2.5 mm	CM106	MS518	2.5 mm	
A16MNKLCR11	16	20,0	11,0	150	1/8-27 NPT	-7.0°	0.0°	KC..110305L	SM886	MS959	2.5 mm	CM106	MS518	2.5 mm	
A20QNKLCR11	20	25,0	13,0	180	1/8-27 NPT	-5.0°	0.0°	KC..110305L	SM886	MS959	3 mm	CM68	MS524	3 mm	
A25RNKLCR11	25	32,0	16,0	200	1/4-18 NPT	-5.0°	0.0°	KC..110305L	SM886	MS959	3 mm	CM68	MS524	3 mm	
A32SNKLCR11	32	40,0	22,0	250	1/4-18 NPT	-5.0°	0.0°	KC..110305L	SM886	MS959	3 mm	CM68	MS524	3 mm	
left hand															
A12MNKLCL11	16	20,0	11,0	150	1/8-27 NPT	-7.0°	0.0°	KC..110305L	—	—	2.5 mm	CM106	MS518	2.5 mm	
A16MNKLCL11	16	20,0	11,0	150	1/8-27 NPT	-7.0°	0.0°	KC..110305R	SM885	MS959	2.5 mm	CM105	MS518	2.5 mm	
A20QNKLCL11	20	25,0	13,0	180	1/8-27 NPT	-5.0°	0.0°	KC..110305R	SM885	MS959	3 mm	CM68	MS524	3 mm	
A25RNKLCL11	25	32,0	16,0	200	1/4-18 NPT	-5.0°	0.0°	KC..110305R	SM885	MS959	3 mm	CM68	MS524	3 mm	



Carbide shank with through coolant.

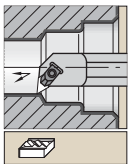


■ E-NKLC 95°

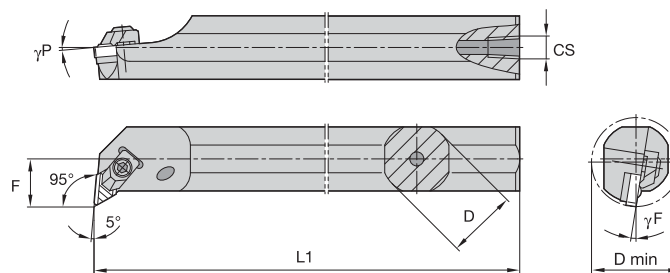
catalogue number	D	D min	F	L1	A	γF°	γP°	gage insert	shim	shim screw	hex	clamp	clamp screw	hex
right hand														
E12QNKLCR11	12	16,0	9,0	180	4,8	-5,0°	0,0°	KC..110308L	—	—	2.5 mm	CM106	MS518	2.5 mm
E16RNKLCR11	16	20,0	11,0	200	5,5	-5,0°	0,0°	KC..110308L	SM886	MS959	2.5 mm	CM106	MS518	2.5 mm
left hand														
E12QNKLC11	12	16,0	9,0	180	4,8	-5,0°	0,0°	KC..110308R	—	—	2.5 mm	CM105	MS518	2.5 mm



Application Specific

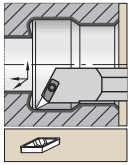


Steel shank with through coolant.

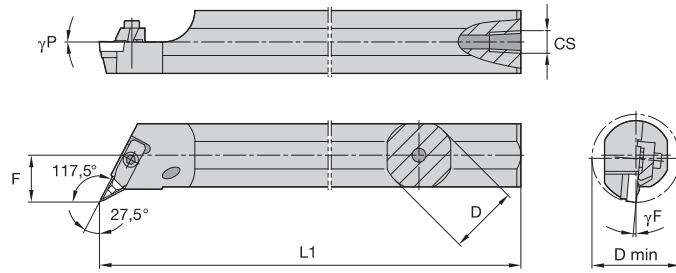


■ A-NKLN 95°

catalogue number	D	D min	F	L1	CS	γF°	γP°	gage insert	shim	shim screw	hex	clamp	clamp screw	hex
right hand														
A40TNKLN15	40	50,0	27,0	300	1/4-18 NPT	-5,0°	-5,0°	KN..150410L	SM871	MS111	4 mm	CM66	MS624	4 mm



Steel shank with through coolant.

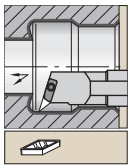


■ **A-NVOC 117,5°**

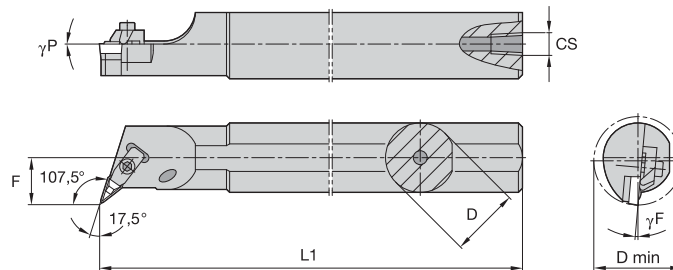
Application Specific



catalogue number	D	D min	F	L1	CS	γF°	γP°	gage insert	shim	shim screw	hex	clamp	clamp screw	hex	
right hand															
A32SNVOCR16	32	40,0	22,0	250	1/4-18 NPT	-2.0°	0.0°	VC..160408	SM812	MS959	4 mm	CM113	MS412	4 mm	
A50UNVOCR16	50	63,0	35,0	350	1/4-18 NPT	-2.0°	0.0°	VC..160408	SM812	MS959	4 mm	CM113	MS412	4 mm	
left hand															
A32SNVOCL16	32	40,0	22,0	250	1/4-18 NPT	-2.0°	0.0°	VC..160408	SM812	MS959	4 mm	CM114	MS412	4 mm	
A40TNVOCL16	40	50,0	27,0	300	1/4-18 NPT	-2.0°	0.0°	VC..160408	SM812	MS959	4 mm	CM114	MS412	4 mm	



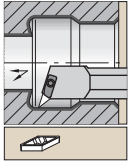
Steel shank with through coolant.



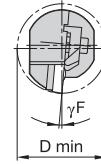
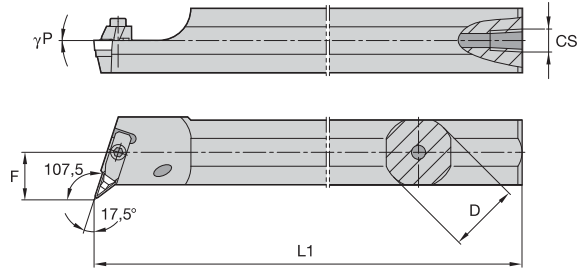
■ **A-NVQB 107,5°**



catalogue number	D	D min	F	L1	CS	γF°	γP°	gage insert	shim	shim screw	hex	clamp	clamp screw	hex	
right hand															
A25TNVQBR11	25	32,0	17,0	300	1/4-18 NPT	-5.0°	0.0°	VB..110304	SM813	MS959	2.5 mm	CM159	MS518	2.5 mm	



Steel shank with through coolant.



■ A-NVQC 107,5°

catalogue number	D	D min	F	L1	CS	γF°	γP°	gage insert	shim	shim screw	hex	clamp	clamp screw	hex
right hand														
A32SNVQCR16	32	40,0	22,0	250	1/4-18 NPT	-2,0°	0,0°	VC..160408	SM812	MS959	4 mm	CM113	MS412	4 mm



Application Specific

➤ Railroad

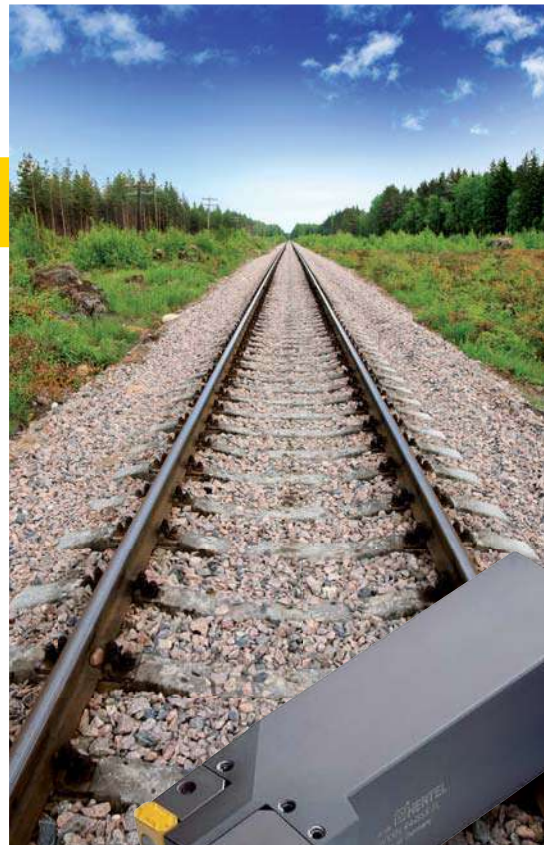
The intimate understanding Kennametal provides of the economics of the railroad value chain enables us to offer unparalleled custom solutions tailored to your needs. We deliver superior value because we listen closely to you, our customer, and innovate based on your feedback. Our goal is to help you be more competitive — both locally and on a global scale.

Best Practices in Productivity

As your trusted partner for optimised production, Kennametal offers customers a unique commitment to research and development excellence, leading to continued delivery of highly innovative ways to enhance your productivity. Certification to ISO 9001, QS 9000 TES, and VDA 6.4 guarantees 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 behaviour 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 analyse your existing production processes and help you identify new methods to improve your overall performance.



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 the Kennametal grade selection delivers higher wheel turning productivity.



Wheelset

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.



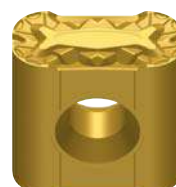
LNUX-RRF Full Radius



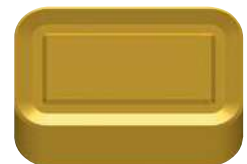
LNUX-RRP Full Radius



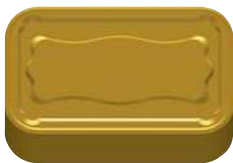
LNUX-RRH



LNUX-RRP



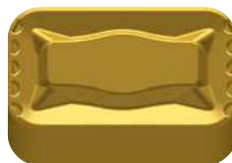
KRR6586-71



KRR6586-75



LNUX-RRSM



KRR6586-65



KRR6586-52



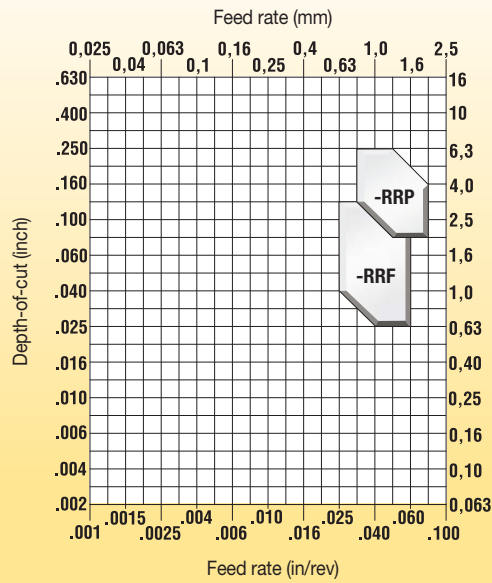
KRR6586-50

■ LNUX

Full-Radius Design

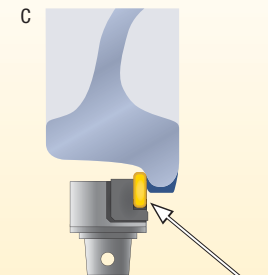
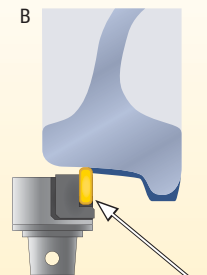
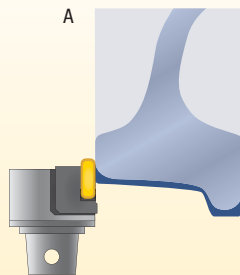
Our well-performed chipbreaking geometry RRF and RRP

- One insert can be applied in profiling and facing.
- Chip control even at smaller DOC will be improved!



■ Application Recommendation

- A: At the beginning of the process, the DOC is higher because most of the bigger bur needs to be removed.
- B: The DOC is smaller, but sometimes it has “hot spots” or brake spots.
- C: Most critical area in regards to chip control because the thickness of the chip is quite thin and very difficult to manage.

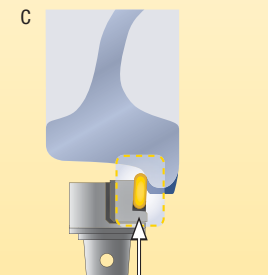
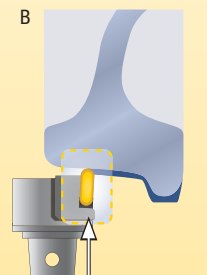
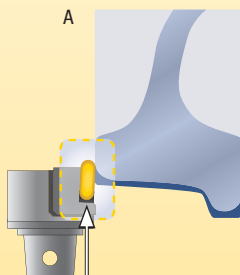


Approach angle -3° in feed direction

Problem with chip control!

A, B, & C: One insert can be applied in profiling and facing.

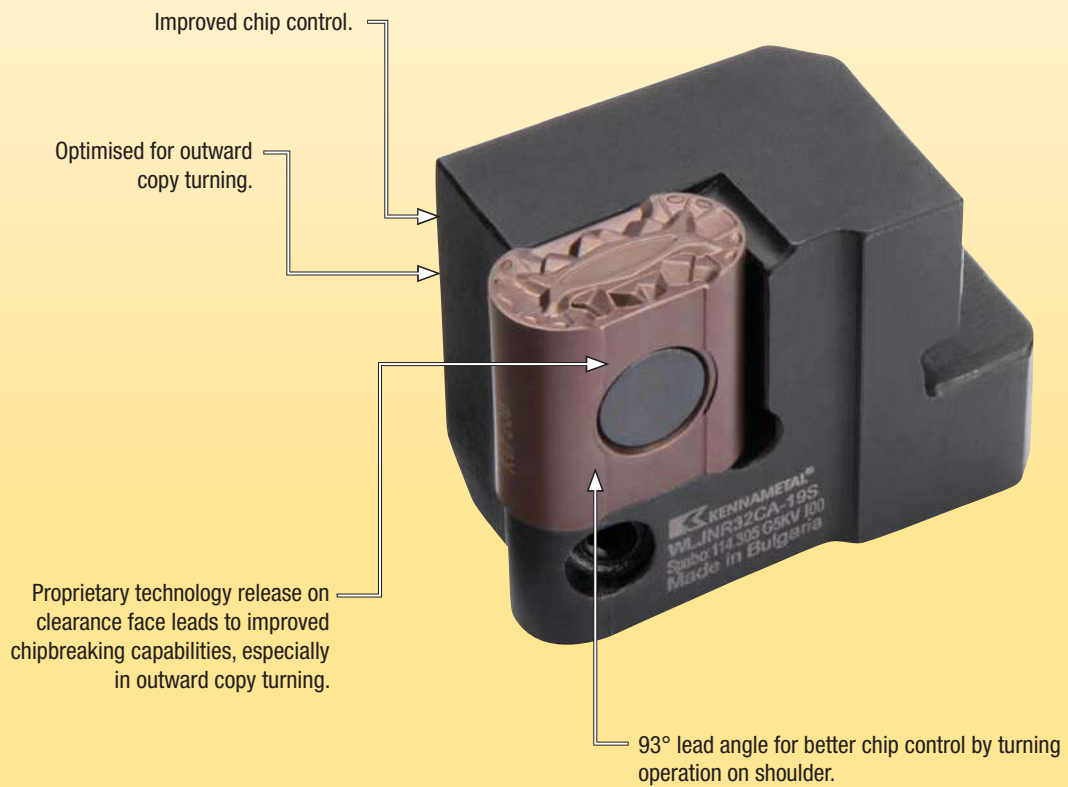
A & C: Chip control, even at a smaller DOC, will be improved.



Modified cartridge with approach angle of 93° (difference of 6°)

Improved chip control capabilities

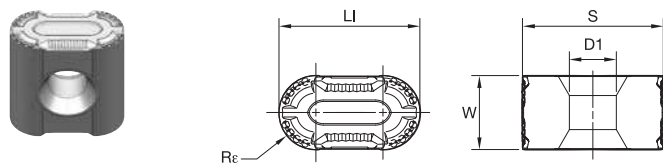
■ **Features and Benefits**



- The well performed RRF and RRP chipbreaker geometry with a full-radius design offers better chip control even at smaller DOC.

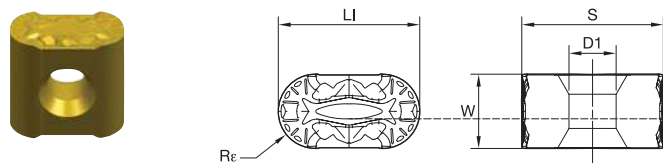
- first choice
- alternate choice

P	●	●
M	○	○
K	○	○
N	○	○
S	○	○
H	○	○



■ LNUX-RRF Full-Radius

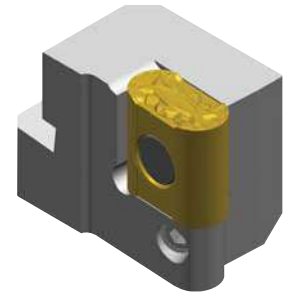
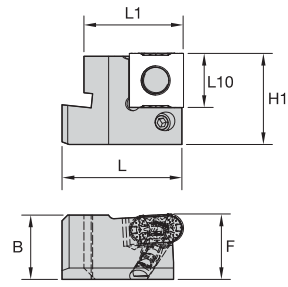
ISO catalogue number	W	LI	S	Re	D1	KCP10B	KCP25B
LNUX191950RRF	10,00	19,05	19,05	5,00	6,35	●	●



■ LNUX-RRP Full-Radius

ISO catalogue number	W	LI	S	Re	D1	KCP10B	KCP25B
LNUX191950RRP	10,00	19,05	19,05	5,00	6,35	●	●
LNUX301960RRP	12,00	30,00	19,05	6,00	6,35	●	●

Application Specific



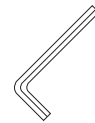
■ Cartridge WLJN

order number	catalogue number	H1	B	F	L10	L1	L	gage insert
6049016	WLJNL32CA19S	1.260	.890	.906	.750	1.38	1.681	LNUX191950RRP
6049018	WLJNL32CA30S	1.260	.890	.925	1.181	1.38	1.772	LNUX301960RRP
6049015	WLJNR32CA19S	1.260	.890	.906	.750	1.38	1.681	LNUX191950RRP
6049017	WLJNR32CA30S	1.260	.890	.925	1.181	1.38	1.772	LNUX301960RRP



Application Specific

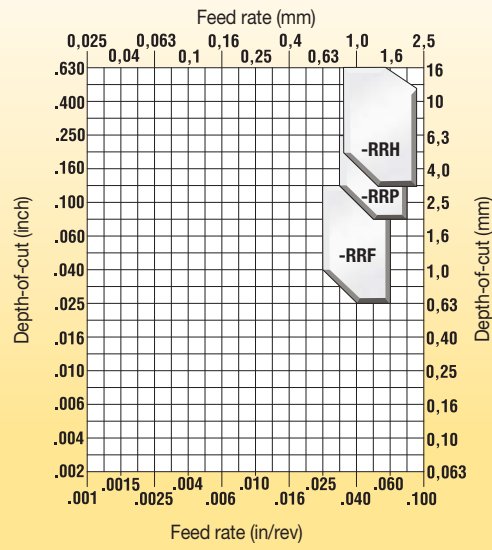
■ Spare Parts



catalogue number	clamp stud	clamp screw	hex wrench
WLJNL32CA19S	114.305	121.616	170.003
WLJNL32CA30S	114.305	121.616	170.003
WLJNR32CA19S	114.305	121.616	170.003
WLJNR32CA30S	114.305	121.616	170.003

■ New Chipbreaking Geometry

For Rail Wheel Machining — RRF



-RRH

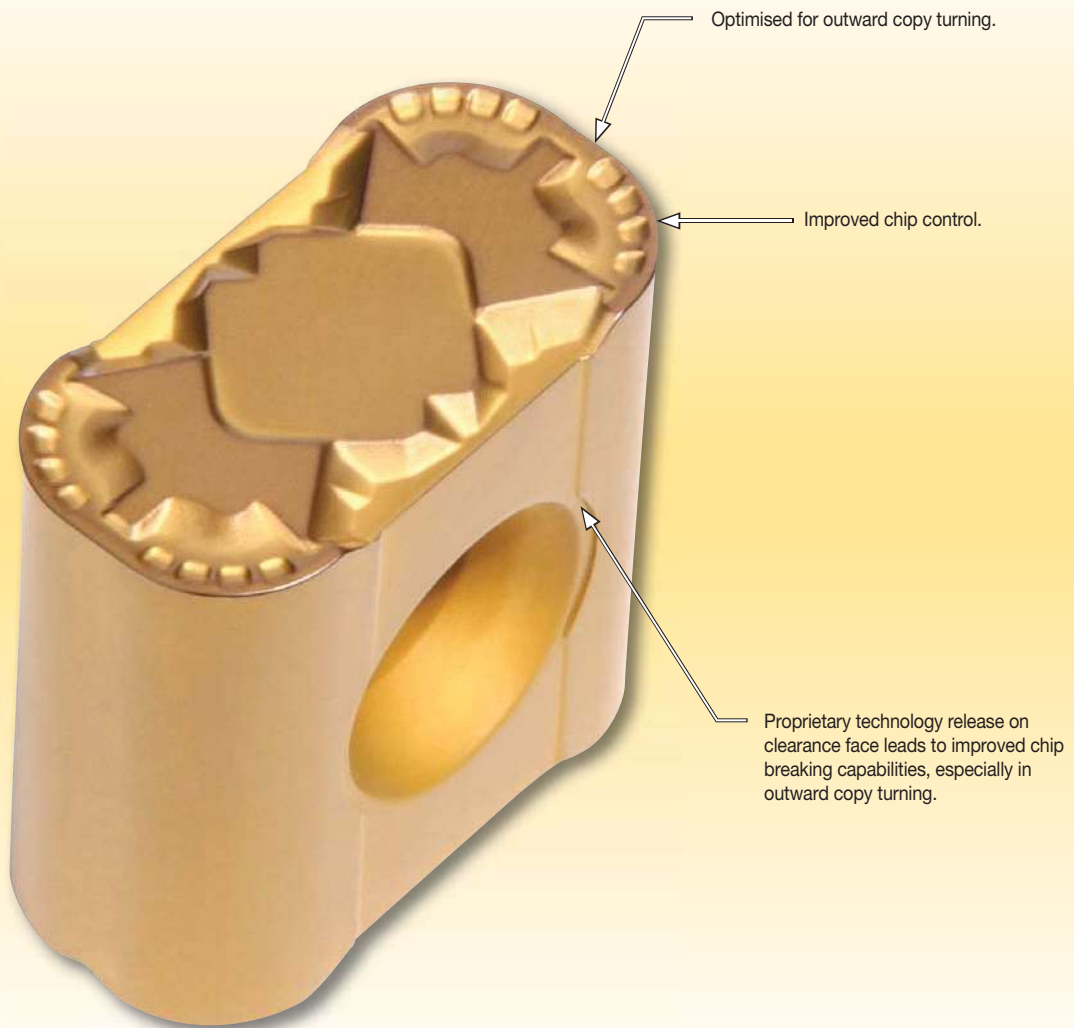


-RRP



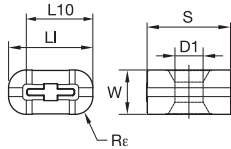
-RRF

■ Small DOC Re-Profiling



Kennametal stocks a complete line of standard inserts for wheel and axle machining. Inserts are available in various styles, sizes, and grades.

- **Wheel boring** — moulded chipbreaker inserts in round, square, octagon, and regrindable inserts.
- **Axle turning** — triangle- and diamond-shaped inserts with chipbreakers.
- **Wheel turning** — rectangular and square styles, with or without moulded chipbreakers.
- **Wheel truing** — round buttons with centre hole for locking.



- first choice
- alternate choice

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

■ LNUX-RRF

ISO catalogue number	W	LI	L10	S	Rε	D1	KCP10B	KCP10	KCP25B	KCP25
LNUX191940RRF	10,00	19,00	19,00	19,05	4,00	6,35	-	●	-	●
LNUX301940RRF	12,00	30,00	30,00	19,05	4,00	6,35	-	●	-	●

NOTE: Also available in KC9105™.

■ LNUX-RRH

ISO catalogue number	W	LI	L10	S	Rε	D1	KCP10B	KCP10	KCP25B	KCP25
LNUX191940RRH	10,00	19,00	19,00	19,05	4,00	6,35	-	●	-	●
LNUX301940RRH	12,00	30,00	30,00	19,05	4,00	6,35	-	●	-	●

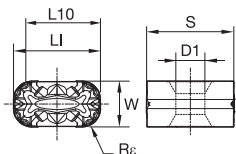
NOTE: Also available in KC9105.

Application Specific

Kennametal stocks a complete line of standard inserts for wheel and axle machining. Inserts are available in various styles, sizes, and grades.

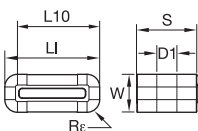
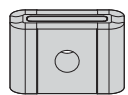
- **Wheel boring** — moulded chipbreaker inserts in round, square, octagon, and regrindable inserts.
- **Axle turning** — triangle- and diamond-shaped inserts with chipbreakers.
- **Wheel turning** — rectangular and square styles, with or without moulded chipbreakers.
- **Wheel truing** — round buttons with centre hole for locking.

Application Specific



■ LNUX-RRP

ISO catalogue number	W	LI	L10	S	Re	D1
LNUX191940RRP	10,00	19,00	19,00	19,05	4,00	6,35
LNUX301940RRP	12,00	30,00	30,00	19,05	4,00	6,35



■ LNUX-RRSM

ISO catalogue number	W	LI	L10	S	Re	D1
LNUX191940RRSM	10,00	19,00	19,00	19,05	4,00	6,35
LNUX301940RRSM	12,00	30,00	30,00	19,05	4,00	6,35

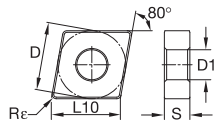
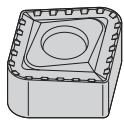
NOTE: Also available in KC9105™.

- first choice
- alternate choice

P	M	K	N	S	H	KCP10B	KCP10	KCP25B	KCP25
●	●	○	○	○	○	-	●	-	●
-	-	-	-	-	-	●	-	-	-

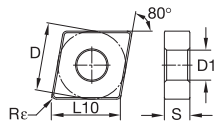
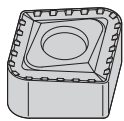
Kennametal stocks a complete line of standard inserts for wheel and axle machining. Inserts are available in various styles, sizes, and grades.

- **Wheel boring** — moulded chipbreaker inserts in round, square, octagon, and regrindable inserts.
- **Axle turning** — triangle- and diamond-shaped inserts with chipbreakers.
- **Wheel turning** — rectangular and square styles, with or without moulded chipbreakers.
- **Wheel truing** — round buttons with centre hole for locking.



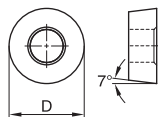
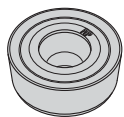
■ CNMM-RRP

ISO catalogue number	L10	S	Rε	D1
CNMM190740RRP	19,34	7,94	4,00	7,93



■ LNUX-WT5

ISO catalogue number	L10	S	Rε	D1
LNUX191940S-WT5	19,05	19,05	4,00	6,35
SNMX190640S-WT5	19,05	6,35	4,00	6,35



■ RCMX

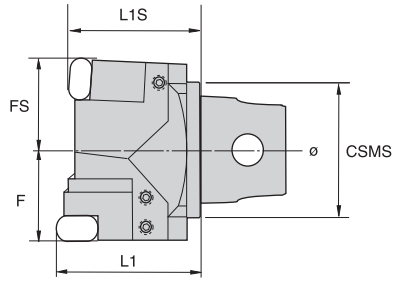
ISO catalogue number	L10	S	Rε	D1
RCMX2507M076	—	7,94	—	7,40

- first choice
- alternate choice

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

●	○	○	○	○
○	○	○	○	○
○	○	○	○	○
○	○	○	○	○

Application Specific



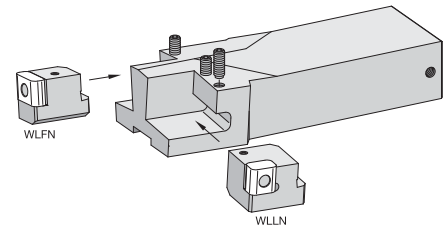
■ TK

order number	catalogue number	CSMS system size	F	FS	L1	L1S
1781755	TK01338D	KM63	42,50	42,50	66,00	60,00
1781756	TK01339D	KM63	42,50	42,50	66,00	60,00

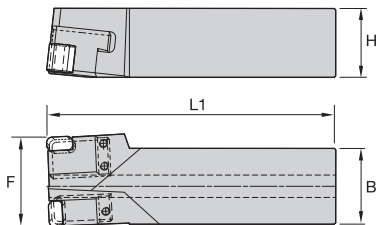
Application Specific

Assembly Instructions

basic/KM shank	cartridge WLLN..	cartridge WLFN..
right	right	left
left	left	right

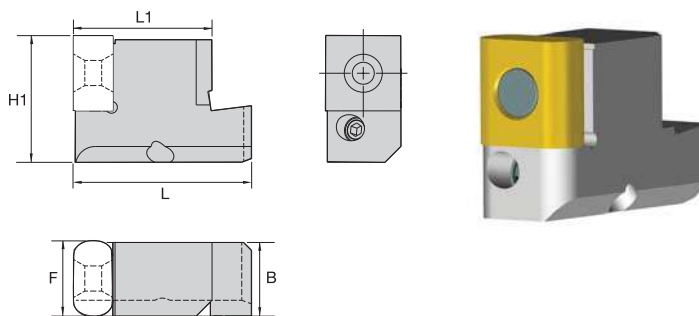


Assembly of complete tool



■ Basic Shank WXXN

order number	catalogue number	H		B		F assembly		L1 assy		clamp screw
		mm	in	mm	in	mm	in	mm	in	
1251261	WXXNL4455X-FL	50,00	1.969	55,00	2.165	65,00	2.559	210,00	8.268	PT00163
1251262	WXXNR4455X-FL	50,00	1.969	55,00	2.165	65,00	2.559	210,00	8.268	PT00163



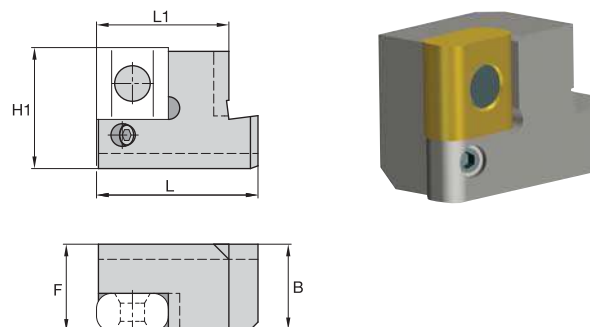
■ Cartridge WLFN

order number	catalogue number	H1	B	F	L1	L	insert 1
2435188	WLFNL32CA19S	32,00	18,60	19,00	35,00	42,70	LNUX191940...
2435187	WLFNR32CA19S	32,00	18,60	19,00	35,00	42,70	LNUX191940...

■ Spare Parts



catalogue number	clamp stud	clamp screw	hex wrench
WLFNL32CA19S	114.305	121.616	170.003
WLFNR32CA19S	114.305	121.616	170.003



■ Cartridge WLLN

order number	catalogue number	H1	B	F	L1	L	insert 1
2435184	WLLNL32CA19S	32,00	22,60	23,00	35,00	42,70	LNUX191940...
2435186	WLLNL32CA30S	32,00	22,60	23,00	35,00	42,70	LNUX301940...
2435183	WLLNR32CA19S	32,00	22,60	23,00	35,00	42,70	LNUX191940...
2435185	WLLNR32CA30S	32,00	22,60	23,00	35,00	42,70	LNUX301940...

■ Spare Parts



catalogue number	clamp stud	clamp screw	hex wrench
WLLNL32CA19S	114.305	121.616	170.003
WLLNL32CA30S	114.305	121.616	170.003
WLLNR32CA19S	114.305	121.616	170.003
WLLNR32CA30S	114.305	121.616	170.003

➤ Wheel and Wheelset Truing with **Beyond™** RU and UP Geometries

Kennametal tooling incorporates the latest technology for maximum metal removal and higher productivity. Standard off-the-shelf inserts and fewer pieces of hardware reduce inventory and operating costs. These tools are for reconditioning mounted wheel sets, wheel boring, wheel truing, axle turning, and journal burnishing.




Features and Benefits

Advantages of Kennametal Wheel Lathe Tools

- Heavy-duty steel locking unit.
- No top clamp to wear out or interfere with chip flow.
- Hardened-steel locking unit prevents insert movement.
- Quick removal of the steel locking unit.
- Fast trouble-free insert indexing.
- Withstand severe roughing cuts on work-hardened wheels.

Achieve superior results while lowering production time and maintenance costs in 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 flange side.

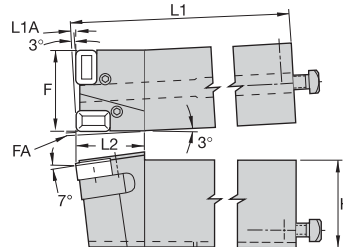
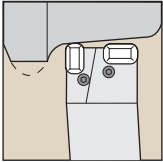


RU-Roughing Universal



UP-Universal Positive

- Fully automatic, heavy-duty wheel lathe with integrated measuring device to determine wheel set profile wear.
- Portal-type machine bed enables roll-through operation.
- Suitable for machining wheel sets for locomotives, transit, passenger, and freight cars.



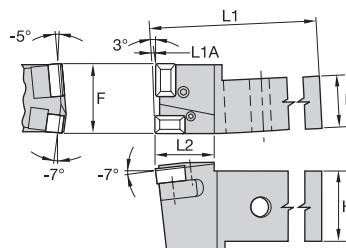
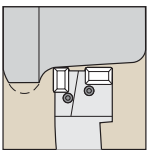
Application Specific

■ Tread Profile Truing

order number	catalogue number	H	F	L1	L2	FA	L1A	insert 1
1015754	HUWTCL	80,00	76,20	275,00	63,50	3,00	3,00	KRR6586__
1015723	HUWTCR	80,00	76,20	275,00	63,50	3,00	3,00	KRR6586__

NOTE: Requires two inserts.

- Maximum productivity at minimum operating costs.
- Fast insert indexing while tool is mounted in the tool block.
- Individual steel locking units make it easy to index and lock each insert.
- Gage location on tool, over insert, is held to +/- 0,08mm.
- No top clamp to wear out or interfere with chip flow.
- Replaceable steel locking unit protects toolholder from damage.
- Improved inserts with chip control.



■ Wheel Tread Contouring

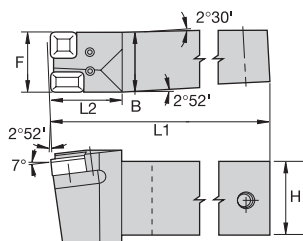
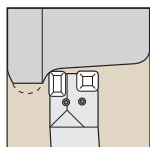
order number	catalogue number	H	B	F	L1	L2	L1A	insert 1
1015688	FUWTCL	76,20	57,15	76,20	254,00	66,55	3,05	KRR6586__
1015687	FUWTCR	76,20	57,15	76,20	254,00	66,55	3,05	KRR6586__

NOTE: Requires two inserts.

- Maximum productivity at minimum operating costs.
- Fast insert indexing tool mounted in tool block.
- Individual steel locking units make it easy to index and lock each insert.
- Minimum parts for lower inventory.
- No top clamp 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.



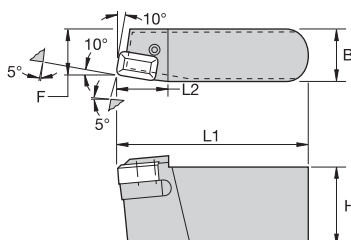
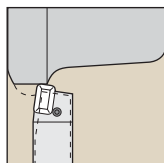
Application Specific



■ Wheel Tread Contouring

order number	catalogue number	H	B	F	L1	L2	insert 1
1015659	SUWTCL	76,20	57,15	57,15	254,00	66,55	KRR6586_
1015658	SUWTCR	76,20	57,15	57,15	254,00	66,55	KRR6586_

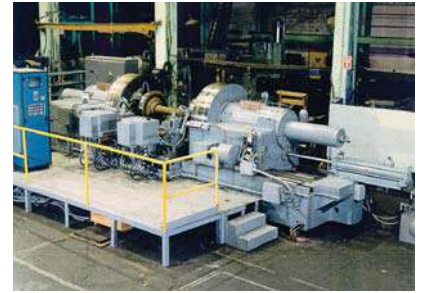
NOTE: Requires two inserts.



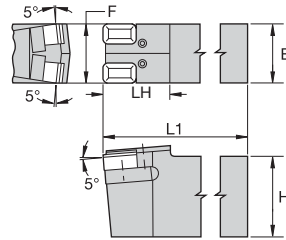
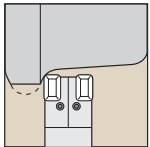
■ Wheel Flange Topping

order number	catalogue number	H	B	F	L1	L2	insert 1
1015690	NUFRL	63,50	41,28	36,53	152,40	39,62	KRR6586_
1015689	NUFRR	63,50	41,28	36,53	152,40	39,62	KRR6586_

- Maximum productivity at minimum operating costs.
- Fast insert indexing tool mounted in tool block.
- Individual steel locking units make it easy to index and lock each insert.
- Gage location on tool, over insert, is held to +/- 0,08mm.
- No top clamp 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-Niles Wheel Turning Lathe



■ Wheel Tread Contouring

order number	catalogue number	H	B	F	L1	LH	insert 1	steel locking unit	lock screw
1015684	NUWTC	76,20	57,15	57,15	412,75	95,25	KRR6586_	SU3	S1006PKG

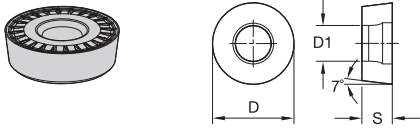
NOTE: Requires two inserts.



Application Specific

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

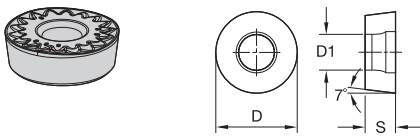
● first choice
○ alternate choice



■ RCMH-UPG

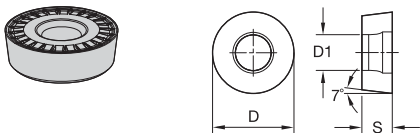
ISO catalogue number	D	D1	S	KCK15B	KCK20	KCP10	KCP10B	KCP25	KCP25B	KCPK05	KCU10
RCMH2507M0TUPG	25	7,55	7,94	-	-	-	●	-	●	-	-
RCMH3209M0TUPG	32	10,35	9,52	-	-	●	-	-	●	-	-

Application Specific



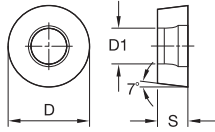
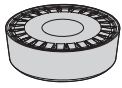
■ RCMH-RU

ISO catalogue number	D	D1	S	KCK15B	KCK20	KCP10	KCP10B	KCP25	KCP25B	KCPK05	KCU10
RCMH2507M0RU	25	7,55	7,94	-	-	-	-	●	-	-	-
RCMH3209M0RU	32	10,35	9,53	-	-	-	-	●	-	-	-



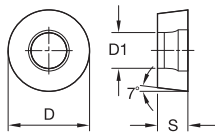
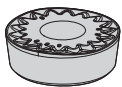
■ RCMT-UPG

ISO catalogue number	D	D1	S	KCK15B	KCK20	KCP10	KCP10B	KCP25	KCP25B	KCPK05	KCU10
RCMT1606M0UPG	16	5,50	6,35	●	-	-	●	-	●	●	-
RCMT2006M0UPG	20	6,50	6,35	●	-	-	-	-	●	●	-



■ RCMX-UPG

ISO catalogue number	D	D1	S
RCMX2507M0TUPG	25	7,19	7,94
RCMX3209M0TUPG	32	9,78	9,52



■ RCMX-RU

ISO catalogue number	D	D1	S
RCMX2507M0RU	25	7,19	7,94
RCMX3209M0RU	32	9,78	9,53

● first choice
○ alternate choice

P	M	K	N	S	H	KCK15B	KCK20	KCP10	KCP10B	KCP25	KCP25B	KCPK05	KCU10
○	○	●	○	○	○	-	-	-	●	-	●	-	-
○	○	○	○	○	○	-	-	-	-	-	-	-	-
○	○	○	○	○	○	-	-	-	-	-	-	-	-
○	○	○	○	○	○	-	-	-	-	-	-	-	-
○	○	○	○	○	○	-	-	-	-	-	-	-	-
○	○	○	○	○	○	-	-	-	-	-	-	-	-



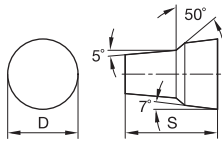
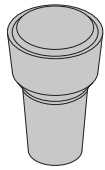
Application Specific

➤ K-Lock™ Inserts

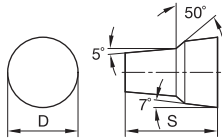


Features and Benefits

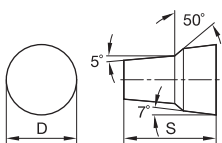
- K-Lock inserts are ideal for deep grooving and profiling.
- A unique insert clamping system enables unimpeded chip flow.
- Available in moulded and ground peripheries.


RCGK-FS

ISO catalogue number	D	S	K68	KCU10	KCU25	KC5010	KC5025	KC5410
RCGK040300FS	4,76	6,38	-	•	-	-	-	-
RCGK060400FS	6,35	9,09	-	-	-	•	-	-
RCGK090700FS	9,53	13,23	-	-	-	•	•	-
RCGK120800FS	12,70	16,61	-	•	-	-	-	-


RCGK-HP

ISO catalogue number	D	S	K68	KCU10	KCU25	KC5010	KC5025	KC5410
RCGK040300HP	4,76	6,38	-	•	-	•	-	-
RCGK060400HP	6,35	9,09	-	•	-	•	-	-
RCGK090700HP	9,53	13,23	-	-	-	•	•	-
RCGK120800HP	12,70	16,61	-	•	-	-	-	•


RCMK

ISO catalogue number	D	S	K68	KCU10	KCU25	KC5010	KC5025	KC5410
RCMK040300	4,76	6,38	-	-	-	•	-	-
RCMK060400	6,35	9,09	-	•	-	•	-	-
RCMK090700	9,53	13,23	-	-	-	•	-	-
RCMK120800	12,70	16,61	-	-	-	•	-	-

• first choice
 ○ alternate choice

P	•	○	○	○	○	○	○	○
M	•	•	•	•	•	•	•	•
K	○	○	○	○	○	○	○	○
N	•	○	○	○	○	○	○	○
S	•	•	•	•	•	•	•	•
H	•	•	•	•	•	•	•	•

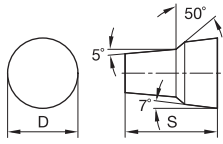


Application Specific

- Medium geometry with positive rake face for chip control in difficult materials.

- first choice
- alternate choice

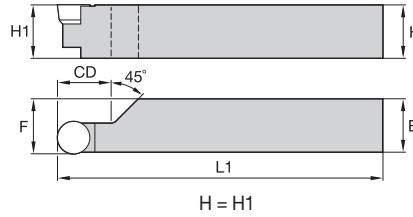
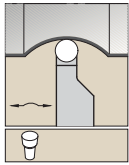
P							
M	●	●	●	●	●		
K							
N						●	
S	●	●	●	●	●	●	●
H							



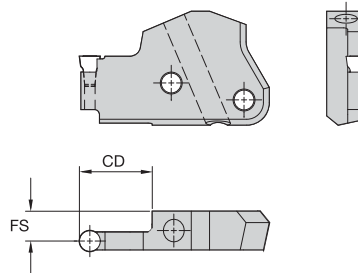
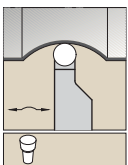
RCMK-MP

Application Specific

ISO catalogue number	D	L10	Re	K68	KCU10	KCU25	KC5010	KC5025	KC5410	KCS10
RCMK060400MP	6,35	—	—	—	—	—	—	—	—	●
RCMK090700MP	9,53	—	—	—	—	—	—	—	—	●
RCMK120800MP	12,70	—	—	—	—	—	—	—	—	●


TRAO

catalogue number	H1	B	F	L1	CD	gage insert
right hand						
TRAOR2525M04	25	25	25,4	150	20	RC..040300
TRAOR2525M06	25	25	25,5	150	20	RC..060400
TRAOR3225P06	32	25	25,5	170	20	RC..060400
left hand						
TRAOL2525M06	25	25	25,5	150	20	RC..060400


Modular Blades

TRM

catalogue number	CD	FS	cartridge size	gage insert
right hand				
TRM50R0432M	32	9,62	50	RCMK152
TRM50R0620M	19	8,98	50	RCMK23
TRM50R0632M	32	8,98	50	RCMK-23
TRM50R0640M	38	8,98	50	RCGK23
TRM50R0720M	19	8,42	50	RCMK-2.55
TRM50R0920M	19	7,64	50	RC_K35
TRM50R0932M	32	7,65	50	RCMK-35
TRM50R0940M	38	7,64	50	RC_K35
TRM50R0950M	50	7,65	50	RCMK-35
left hand				
TRM50L0432M	32	9,62	50	RCMK152
TRM50L0620M	19	8,98	50	RCMK23
TRM50L0632M	32	8,98	50	RCMK-23
TRM50L0640M	38	8,98	50	RCGK23
TRM50L0920M	19	7,64	50	RC_K35
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1162246	RCMT06G20M K313	B224	1181989CNGA120408T02020 KY3500	B292	1184088LNEU1245R08 KC725M	U19	1191431B105A06700 K10	G33
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1162249	RCMT1204M0 K313	B224	1181991CNGA120416T02020 KY3500	B292	1184090LNEU1245R32 KC725M	U19	1191433B105A07000 K10	G33
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1162251	RCMT2006M0 K313	B224	1181993CNGA160616T02020 KY3500	B292	1184092LNEU1255R08 KC725M	U19	1191435B105A07500 K10	G33
1162254	TCGT110204HP K313	B243	1181994CNGA190612T02020 KY3500	B292	1184093LNEU1255R16 KC725M	U19	1191436B105A07800 K10	G33
1162255	TCGT16T304HP K313	B243	1181995CNGA190616T02020 KY3500	B292	1184094LNEU1255R32 KC725M	U19	1191437B105A08000 K10	G33
1162256	TCGT16T308HP K313	B243	1181996SNGA120408T02020 KY3500	B293	1184097LNEU1245R04 KC725M	U19	1191438B105A08400 K10	G33
1162272	CPMT06G204LF K68	B190	1181997SNGA120412T02020 KY3500	B293	1184098LNEU1250R04 KC725M	U19	1191439B105A08500 K10	G33
1162274	CPMT09T308LF K68	B190	1181998SNGA120416T02020 KY3500	B293	1184099LNEU1255R04 KC725M	U19	1191440B105A08700 K10	G33
1162288	VBGT110302LF K68	B264	1181999SNGA150612T02020 KY3500	B293	1184100LNEU1260R04 KC725M	U19	1191441B105A08800 K10	G33
1162289	VBGT160404HP K68	B264	1182000SNGA150616T02020 KY3500	B293	1184103LNEU1245R04 KC725M	U20	1191442B105A09000 K10	G33
1162296	RCGT08Q3M0HP K68	B222	1182002DNGA150408T02020 KY3500	B293	1184105LNEU1255R04 KC725M	U20	1191443B105A09500 K10	G33
1162297	RCMT06G20M K68	B224	1182003DNGA150412T02020 KY3500	B293	1184106LNEU1260R04 KC725M	U20	1191444B105A09700 K10	G33
1162586	SPUN120308 K68	B169	1182004DNGA150416T02020 KY3500	B293	1185937DFT370R4WD40M	J46	1191445B105A09800 K10	G33
1162732	TPUN110304 K68	B171	1182005DNGA150612T02020 KY3500	B293	1185955DFT410R4WD40M	J46	1191446B105A10000 K10	G33
1162733	TPUN110308 K68	B171	1182006VNGA160408T02020 KY3500	B294	1186677SNGX150716T02020 KY3500	B297	1191448B105A10200 K10	G33
1162734	TPUN160304 K68	B171	1182008TNGA160416T02020 KY3500	B294	1188639PSKNR12CA-12	B120	1191449B105A10300 K10	G33
1162735	TPUN160308 K68	B171	1182363NT1L K68	D25	1188641PTFNR12CA-16	B142	1191450B105A10500 K10	G33
1162737	TPUN220408 K68	B171	1182370NTB3RB K68	D20	11909771.78025R300	E18	1191451B105A10700 K10	G33
1162738	TPUN220412 K68	B171	1182373NTB3LB K68	D20	11910463.3705R320	U14	1191452B105A11000 K10	G33
1163009	CPGH09T304 K313	B188	1182375NTB2RA K68	D19	11910473.37052R820	U14	1191453B105A11800 K10	G33
1163010	CPGH09T308 K313	B188	1182379NTB3LA K68	D19	11910483.37061R320	U14	1191454B105A12000 K10	G33
1163033	TD6P K68	B253	1182853SPGN120308 K313	B169	11910493.37061R820	U14	1191455B105A12500 K10	G33
1163051	CPGT06G202K K68	B188	1182856SPGN190412 K313	B169	11910503.37071R320	U14	1191456B105A12700 K10	G33
1163052	CPGT06G204K K68	B188	1182877SNGN090308T02020 KY3500	B297	11910513.37071R820	U14	1191457B105A12800 K10	G33
1163054	CPGH09T302 K68	B188	1182878SNGN120408T02020 KY3500	B297	11910523.37091R320	U14	1191458B105A13000 K10	G33
1163055	CPGH09T304 K68	B188	1182879SNGN120412T02020 KY3500	B297	11910533.37091R820	U14	1191459B105A13800 K10	G33
1163056	CPGH09T308 K68	B188	1182880SNGN120416T02020 KY3500	B297	11910543.37100R720	I23	1191460B105A14000 K10	G33
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1163286VCGR160404 K313	E34	1182929SPGN190408 K68	B169	11910623.37141R832	U14	1191468B105A18000 K10	G34
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1163323KNGX150408L20 K68	E30	1183236TNGN220416T02020 KY3500	B298	11911313.76063R320	J72-73	1191619B411A16000 KF1	G101
1163325VCGR160402 K68	E34	1183237TPGN160308T02020 KY3500	B299	11911323.76073R404M	J72-73	1191620B50Z06000 K10	G152
1163326VCGR160404 K68	E34	1183238TPGN160312T02020 KY3500	B299	11911333.76084R048V	J72-73	1191628B50Z04000 K10	G152
1163327VCGR160408 K68	E34	1183239TPGN220408T02020 KY3500	B299	11911343.76102R058V	J72-73	1191629B50Z06000 K10	G152
1163328VCGR160412 K68	E34	1183254TPGN110304 K68	B171	11911353.77000R024V	J74	1191630B50Z10000 K10	G152
1163336KCGR110304R08 K68	E29	1183255TPGN110308 K68	B171	11911363.77000R025V	J74	1191631B50Z12000 K10	G152
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1163532RCMK060400 K313	E63	1183260TPGN160316 K68	B171	11911393.77000R029V	J74	1191970DV50BRK32040M	K86
1163533RCMK090700 K313	E63	1183262TPGN160302 K68	B171	11911403.77000R038V	J74	1191971DV50BRK50040M	K86
1163535RCMK040300 K313	E63	1183264TPGN220404 K68	B171	11911413.77000R039V	J74	1192045F2AA1800ADL45 K600	P119
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1176134B105A08200 K10	G33	1183436CNGN120412T02020 KY3500	B295	1191366551.125	B136	1192325LSSL2020K16Q	D79
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1198578	B411A04650 KF1	G100	1199469	B105A17000 K10	G34	1244376	4.96164-205	U13	1244775	PSKNR2525M16	B64
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1198582	B411A04900 KF1	G100	1199480	B105A18500 K10	G34	1244385	4.96255-206	U13	1244777	PCKNL3225P16	B64
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1198602	B411A06500 KF1	G100	1199811	F2AA0600ADL45 K600	P119	1244452	PSSNL12CA12	B121	1244791	PTGNL1616H16	B135
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1198630	B411A09000 KF1	G100	1201661	B105A04900 K10	G32	1244630	PCBNL2020K12	B64	1244803	PCLNL3225P19	B65
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1245372	1.77120R100	E17	1245997	KSEM175R5WN20M	H59	1246187	CBTF330R2WD20N3M	J98	1261367	CSSSL2525M12-MX7	B365
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1245392	1.78012R103	E18	1246005	KSEM185R5WN25M	H59	1246205	CBTF280R2WD20N3M	J98	1261379	CSPP10CA09	B377
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1274800	ISSN443 K9	B105-107	1300343	5.34270R058100	J77	1328642	A06MSWLCR2	B271	1520076	3.90016CEGDD KMF	U9
1274805	ISSN543 K9	B105	1300344	5.34280R032080	J77	1328644	A08RSWLCR2	B271	1522062	KRBB16SCLDRS406A	K75, K98
1274807	ISSN643 K9	B105	1310704	DPGT070204LF KC5010	B214	1328646	A10SSWLCR3	B271	1522063	KRBB16SFCFR06085A	K75, K98
1279732	KRCSTFPR113F	K85	1310705	DPGT11T302LF KC5010	B214	1331458	CENLR2525M13MF7	B361	1522064	KRBB16SFCFR0611A	K75, K98
1279733	KRDCKR63M	K86-88	1310707	DPGT11T301LF KC5010	B214	1331597	CRSNL3225P12MN7	B362	1522068	KRBB16SFCFR06135A	K75, K98
1279734	KRDCKR80M	K86-88	1310718	CCGT060202LF KC5010	B175	1339367	MSN910CA09	B117	1522069	KRBB16SFCFR0616A	K75, K99
1279736	KRDE070019M	K85, K104	1310719	DPGT11T304HP KC5010	B214	1500650	KRCSFCFR062L	K82	1522070	KRBB16SFCFR0619A	K75, K99
1279739	KRDE083019M	K85, K104-105	1310720	DPGT11T304LF KC5010	B214	1501221	CENLR2525M13MN7	B361	1522071	KRBB16SFCFR0622A	K75, K99
1279740	KRDE096019M	K85, K105	1310721	CCGT060201LF KC5010	B175	1501222	CENLR2525M13MN7	B361	1522848	TPGT090204LF KC5010	B254
1279741	KRDE101023M	K85, K106	1310723	DPGT11T308HP KC5010	B214	1501356	TPGT16T302HP KC5010	K82	1522850	TPGT16T302HP KC5010	B254
1279742	KRDE120023M	K85, K106-107	1310724	CCGT060204HP KC5010	B175	1501357	KRCSFCFR063L	K82	1522905	CPGT060202HP KC5010	B188
1279743	KRDE139026M	K85, K107	1310725	DPGT11T308LF KC5010	B214	1501652	50A05R90SP12CFP	S76	1522907	CPGT060204HP KC5010	B188
1279745	KRDE156026M	K85, K108	1310726	CCGT060204LF KC5010	B175	1501653	63A08R90SP12CFP	S76	1522942	TGCT110204HP KC5010	B243
1279746	KRDE175026M	K85, K109	1310728	CCGT060208LF KC5010	B175	1501655	80A10R90SP12CFP	S76	1522943	TGCT16T302HP KC5010	B243
1279748	KRDE193026M	K85, K110	1310730	CCGT09T302HP KC5010	B175	1501660	100B14R90SP12CFP	S76	1522945	TGCT16T304HP KC5010	B243
1279772	KR32KR32038050M	K88	1310733	CCGT09T302LF KC5010	B175	1501666	50A06R70SP12CFP	S72	1522946	TGCT110204LF KC5010	B243
1279775	KR32KR32047050M	K88	1310735	CCGT09T301LF KC5010	B175	1501667	63B08R70SP12CFP	S72	1522947	TGCT16T302LF KC5010	B243
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1279798	KR80KR80095100M	K88	1310793	TPGT110202HP KC5010	B254	1503015	100B08R90SP12C2WFP	S76	1527051	SCMT12040811 KT315	B230
1279856	KSEM165R7WN20M	H61	1310800	TPGT16T304HP KC5010	B254	1503018	125B10R70SP12C2WFP	S76	1527992	DCMT11T30811 KT315	B206
1279857	KSEM170R7WN20M	H61	1310802	TPGT16T308HP KC5010	B254	1503021	160C12R90SP12C3WFP	S76	1527995	TCMT16T30811 KT315	B243
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1279859	KSEM180R7WN20M	H61	1310805	TPGT16T308LF KC5010	B254	1503027	50A04R70SP12CFP	S72	1535836	SDET120412PDERGB KC725M	T105, T112, U51
1279863	KSEM185R7WN25M	H61	1310838	CPGT060202LF KC5010	B189	1503029	63B05R70SP12CFP	S72	1536224	SDET1204PDERGB KC520M	T105, T112, U51
1279864	KSEM190R7WN25M	H61	1310839	CPGT060201LF KC5010	B189	1503034	100B08R70SP12C2WFP	S72	1539005	DV40BK80060M	K86
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1712586SPHX1205ZCERGP	S73	1724340LT16ER14UNC	D63	1725478LT16NR175ISO	D70	1743805LT22ER5BUT75	D56
1712601	.....LT16ER16UNC	D63	1724352	.....LT16EL125ISO	D57	1725511	.....LT16NR20ISO	D70	1743810	.....LT11NL32UNC	D74
1712602	.....LT16ER16UNC	D63	1724354	.....LT16ER12UNC	D63	1725512	.....LT16NR25ISO	D70	1743824	.....LT16NL16UNC	D74
1712603	.....LT16ER18UNC	D63	1724356	.....LT16ER19UNC	D64	1725513	.....LT16NR30ISO	D70	1743826	.....LT16NL12UNC	D74
1712604	.....LT16ER18UNC	D63	1724358	.....LT16EL15ISO	D57	1725515	.....LT22NR35ISO	D70	1743827	.....LT16NL10UNC	D74
1712605	.....LT16ER20UNC	D63	1724360	.....LT16ER14UNC	D64	1725516	.....LT22NR40ISO	D70	1743829	.....LT11NLA60	D66
1712606	.....LT16ER20UNC	D63	1724372	.....LT16EL175ISO	D57	1725519	.....LT22NR45ISO	D70	1743830	.....LT16NLA60	D66
1712607	.....LT16ER24UNC	D63	1724373	.....LT16ER11UNC	D64	1725520	.....LT22NR50ISO	D70	1743831	.....LT16NLAGE60	D66
1712608	.....LT16ER24UNC	D63	1724377	.....LT16EL20ISO	D57	1725704	.....LT16NR8UNC	D74	1743832	.....LT16NL660	D66
1712609	.....LT16ER28UNC	D63	1724392	.....LT16NR11UNC	D76	1730321	.....DFR020204LD	J84	1743833	.....LT22NLN60	D66
1712610	.....LT16ER28UNC	D63	1724394	.....LT16EL25ISO	D57	1732924	.....MS1944	C39-40	1743847	.....LT16NL11UNC	D76
1712611	.....LT16ER32UNC	D63	1724398	.....LT16ER18NPT	D59			C112-114	1743899	.....LT11NR32UNC	D74
1712612	.....LT16ER32UNC	D63	1724400	.....LT16EL30ISO	D57	1743686	.....LT16EL8APIRD	D55	1743900	.....LT11NR28UNC	D74
1712614	.....LT16ER11WCB	D65	1724401	.....LT16ER14NPT	D59	1743696	.....LT16EL16UNC	D63	1743901	.....LT11NR24UNC	D74
1712615	.....LT16ER14WCB	D65	1724402	.....LT16ER115NPT	D59	1743701	.....LT16ELA60	D53	1743902	.....LT11NR20UNC	D74
1712616	.....LT16ER14WCB	D65	1724403	.....LT11NR14NPT	D72	1743702	.....LT16ELAGE60	D53	1743903	.....LT11NR18UNC	D74
1712617	.....LT16ER14NPTCB	D59	1724405	.....LT16NR115NPT	D72	1743703	.....LT16ELG60	D53	1743904	.....LT11NR16UNC	D74
1712618	.....LT16ER14NPTCB	D59	1724406	.....LT16ERAG60	D53	1743704	.....LT22ELN60	D53	1743908	.....LT16NR32UNC	D74
1712620	.....LT16ER15NPTCB	D60	1724408	.....LT22EL35ISO	D57	1743705	.....LT16ELAGE55	D52	1743909	.....LT16NR28UNC	D74
1712661	.....LT16NR8UNC	D75	1724411	.....LT16ERAG60	D53	1743715	.....LT16EL14UNC	D64	1743910	.....LT16NR24UNC	D74
1712663	.....LT16NR10UNC	D75	1724412	.....LT16ERAG60	D53	1743717	.....LT16EL11UNC	D64	1743921	.....LT16NR20UNC	D74
1712664	.....LT16NR12UNC	D75	1724414	.....LT11NRAG60	D66	1743734	.....LT16ER32UNC	D63	1743922	.....LT16NR18UNC	D74
1712665	.....LT16NR14UNC	D75	1724415	.....LT16NRAG60	D66	1743735	.....LT16ER28UNC	D63	1743923	.....LT16NR16UNC	D74
1712666	.....LT16NR16UNC	D75	1724418	.....LT16NRAG60	D66	1743736	.....LT16ER24UNC	D63	1743924	.....LT16NR14UNC	D74
1712667	.....LT16NR18UNC	D75	1724420	.....LT16NRAG60	D66	1743737	.....LT16ER20UNC	D63	1743925	.....LT16NR12UNC	D74
1712668	.....LT16NR20UNC	D75	1724422	.....LT16ERAG55	D52	1743738	.....LT16ER18UNC	D63	1743926	.....LT16NR10UNC	D74
1712669	.....LT16NR11WCB	D76	1724426	.....LT16ERAG55	D52	1743739	.....LT16ER16UNC	D63	1743927	.....LT11NRAG60	D66
1712670	.....LT16NR14WCB	D76	1724437	.....LT11NL10ISO	D70	1743740	.....LT16ER14UNC	D63	1743928	.....LT16NRAG60	D66
1712671	.....LT16NR115NPTCB	D72	1724439	.....LT11NL15ISO	D70	1743741	.....LT16ER12UNC	D63	1743929	.....LT16NRAG60	D66
1712672	.....LT16NR14NPTCB	D72	1724494	.....LT16NL10ISO	D70	1743744	.....LT16ERAG60	D53	1743930	.....LT16NRG60	D66
1712711	.....SPHX1205ZCERGP	S74	1724495	.....LT16ER10ISO	D57	1743745	.....16ERAG60	D53	1743931	.....LT22NRN60	D66
1712714	.....SPHX1205ZCERGP	S77	1724499	.....LT16NL20ISO	D70	1743746	.....LT16ERAG55	D53	1743932	.....LT11NRAG55	D65
1712730	.....NG2M150LK	C147	1724524	.....LT16ER05ISO	D57	1743747	.....LT22ERN60	D53	1743933	.....LT16NRAG55	D65
1712734	.....NG2M150RK	C146	1724525	.....LT16NL25ISO	D70	1743748	.....LT16ERAG55	D52	1743934	.....LT16NRAG55	D65
1712949	.....SPHX1205ZCERGP	S77	1724526	.....LT16NL30ISO	D70	1743749	.....LT16ERAG55	D52	1743935	.....LT16NRAG55	D65
1712981	.....SPHX1205ZCERGP	S78	1724527	.....LT16ER075ISO	D57	1743750	.....16ERAG55	D52	1743936	.....LT22NRN55	D65
1713203	.....DFT090508MD	J87	1724562	.....LT16ER48UNC	D62	1743751	.....LT22ERN55	D56	1743937	.....LT16NR19UNC	D76
1713307	.....RCGT0803MOHP	B222	1724563	.....LT16ER40UNC	D62	1743752	.....LT16ER28UNC	D64	1743938	.....LT11NR14UNC	D76
1713308	.....RCGT10T3MOHP	B222	1724564	.....LT16ER36UNC	D62	1743753	.....LT16ER24UNC	D64	1743939	.....LT16NR20UNC	D76
1713310	.....RCGT0803MOHP	B222	1724565	.....LT16ER32UNC	D62	1743754	.....LT16ER20UNC	D64	1743940	.....LT16NR19UNC	D76
1713351	.....RCGT10T3MOHP	B222	1724566	.....LT16ER28UNC	D62	1743755	.....LT16ER19UNC	D64	1743942	.....LT16NR16UNC	D76
1713352	.....RCGT1204MOHP	B222	1724734	.....LT16ER24UNC	D62	1743756	.....LT16ER18UNC	D64	1743943	.....LT16NR14UNC	D76
1713356	.....CPGT09T308LF	B189	1724735	.....LT16ER20UNC	D62	1743757	.....LT16ER16UNC	D64	1743944	.....LT16NR12UNC	D76
1713359	.....VBGT110301LF	B264	1724736	.....LT16ER18UNC	D62	1743758	.....LT16ER14UNC	D64	1743945	.....LT16NR11UNC	D76
1713402	.....840.142.200	K118-120	1724737	.....LT16ER16UNC	D62	1743759	.....LT16ER12UNC	D64	1743946	.....LT16NR10UNC	D76
1713440	.....DFT070408MD	J87	1724738	.....LT16ER14UNC	D62	1743760	.....LT16ER11UNC	D64	1743948	.....LT16NR8UNC	D76
1713512	.....DFT06T308MD	J87	1724834	.....LT16ER12UNC	D62	1743761	.....LT16ER10UNC	D64	1743949	.....LT22NR7UNC	D76
1713513	.....DFT05T308MD	J87	1724835	.....LT16ER10UNC	D62	1743762	.....LT16ER9UNC	D64	1743962	.....LT11NR14BSPT	D69
1713515	.....DFT030304MD	J87	1724836	.....LT16ER8UNC	D62	1743763	.....LT16ER8UNC	D64	1743963	.....LT16NR14BSPT	D69
1713517	.....DFT030204MD	J87	1724878	.....NG3047RK	C146	1743764	.....LT22ER7UNC	D56	1743964	.....LT16NR11BSPT	D69
1715530	.....841.142.250	K118-120	1725015	.....LT16EL28UNC	D62	1743765	.....LT22ER6UNC	D64	1743966	.....LT11NR18NPT	D72
1721296	.....SPHX1205ZCERGP	S77	1725017	.....LT16EL24UNC	D62	1743767	.....LT16ER14BSPT	D56	1743967	.....LT11NR14NPT	D72
1723607	.....NG3094RK	C146	1725018	.....LT16EL20UNC	D62	1743768	.....LT16ER11BSPT	D56	1743970	.....LT16NR14NPT	D72
1723608	.....SPGT09T308LF	B238	1725053	.....LT16EL18UNC	D62	1743769	.....LT16ER27NPT	D59	1743971	.....LT16NR115NPT	D72
1723693	.....LT16ER15ISO	D57	1725054	.....LT16EL16UNC	D62	1743770	.....LT16ER18NPT	D59	1743972	.....LT16NR8NPT	D72
1723694	.....LT16ER125ISO	D57	1725055	.....LT16EL14UNC	D62	1743771	.....LT16ER14NPT	D59	1743973	.....LT11NR14NPT	D72
1723695	.....LT16ER175ISO	D57	1725056	.....LT16EL12UNC	D62	1743772	.....LT16ER115NPT	D59	1743974	.....LT16NR14NPT	D72
1723696	.....LT16ER20ISO	D57	1725058	.....LT16EL8UNC	D62	1743773	.....LT16ER8NPT	D59	1743978	.....LT16NR12ACME	D68
1723697	.....LT16ER25ISO	D57	1725060	.....LT11NR40UNC	D74	1743774	.....LT16ER14NPT	D60	1743979	.....LT16NR10ACME	D68
1723698	.....LT16ER30ISO	D57	1725108	.....LT16ER10ISO	D57	1743775	.....LT16ER115NPT	D60	1743980	.....LT16NR8ACME	D68
1723726	.....LT16EL15ISO	D57	1725109	.....LT16ER125ISO	D57	1743776	.....LT16ER16ACME	D54	1743981	.....LT22NRAG60	D68
1724012	.....LT11NR15ISO	D70	1725110	.....LT16ER15ISO	D57	1743778	.....LT16ER10ACME	D54	1743982	.....LT16NR5ACME	D68
1724013	.....LT16NR10ISO	D70	1725221	.....LT16ER175ISO	D57	1743779	.....LT16ER10ACME	D54	1743983	.....LT16NR16STACME	D73
1724014	.....LT16NR15ISO	D70	1725222	.....LT16ER20ISO	D57	1743780	.....LT16ER8ACME	D54	1743984	.....LT16NR14STACME	D73
1724031	.....LT16NR20ISO	D70	1725223	.....LT16ER25ISO	D57	1743781	.....LT22ER6ACME	D54	1743985	.....LT16NR12STACME	D73
1724040	.....LT16NR30ISO	D70	1725224	.....LT16ER30ISO	D57	1743782	.....LT22ER5ACME	D54	1743986	.....LT16NR10STACME	D73
1724291	.....LT16ER32UNC	D62	1725225	.....LT22ER35ISO	D57	1743783	.....LT16ER16STACME	D61	1743987	.....LT16NR8STACME	D73
1724292LT16ER28UNC	D62	1725461LT22ER40ISO	D57	1743785LT16ER12STACME	D61	1743988LT16NR6STACME	D73
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1743993	LT22NR4TR KC5025	D73	1762451	160C10RP90BG15C10WHPM	S146	1785477	CCGT060208HP KC5010	B175	1795802	NA3L4 KC5025	D12
1743994	LT22NR5TR KC5025	D73	1763116	HSK63ASVS4B139M	K80	1785478	CPGT060208HP KC5010	B188	1795809	364.016	H58-59, H61, H63, H98
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1743998	LT16NR10APIRD KC5025	D69	1763376	KM63SVS4B110M	K80	1785481	TCGT110208HP KC5010	B243	1795816	170.290	H65
1743999	LT16NR8APIRD KC5025	D69	1763378	KM50SVS5B125M	K80	1785482	TPGT110208HP KC5010	B254	1795860	170.291	H65
1744000	LT22NR4AP382 KC5025	D68	1763379	KM63SVS5B110M	K80	1785501	NG2M300LK KC5025	C148	1796047	NT2L KC5010	D19
1744002	LT22NR5AP403 KC5025	D68	1763382	KM80SVS6B150M	K80	1785713	VBGT160404HP KC5010	B264	1796048	NT2L KC5025	D19
1744003	LT22NR4AP1502 KC5025	D68	1764146	NG4250LK KC5010	C148	1785714	VBGT160408HP KC5010	B264	1796049	NT2R KC5010	D19
1744005	LT22NR5BUT75 KC5025	D69	1764148	NG4250LK KC5025	C148	1785715	CNGP120401 KC5410	B46	1796050	NT2R KC5025	D19
1744006	LT22NR5BUT11 KC5025	D69	1764575	NTP3L KC5010	D24	1785716	CNGP120402 KC5410	B46	1796051	NT3R KC5010	D19
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1744665	NG30934R KC5010	C154	1765641	NTC3R8E KC5010	D22	1785718	CNGP120408 KC5410	B46	1796083	NT3L KC5010	D19
1746442	CTFPR12CA16	B378	1765732	NTC3R8E KC5025	D22	1785719	CNGP120412 KC5410	B46	1796084	NT3L KC5025	D19
1747635	DCGT070202HP KC5010	B206	1765733	NTC3R12E KC5010	D22	1785733	DNGP150404 KC5410	B74	1796085	NT4L KC5010	D19
1748698	NG3062RK KC5010	C146	1765734	NTC3R12E KC5025	D22	1785734	DNGP150408 KC5410	B74	1796086	NT4L KC5025	D19
1749102	KSEM321R3WD50M	H60	1770917	NT3LCK KC5010	D21	1785735	DNGP150604 KC5410	B74	1796087	NT4R KC5010	D19
1749103	KSEM330R3WD50M	H60	1771602	NG3125RK KT315	C147	1785740	TNGP160404 KC5410	B122	1796088	NT4R KC5025	D19
1749106	KSEM340R3WD50M	H60	1772152	SCLCRF0808M06Q	B181	1785741	TNGP160408 KC5410	B122	1796090	NT2R KC5010	D24
1749109	KSEM350R3WD50M	H60	1772157	SDJCRF0808M07Q	B211	1785746	VNGP160401 KC5410	B143	1796091	NTP2R KC5025	D24
1749110	KSEM360R3WD50M	H60	1772159	SDACR1212M11Q	B209	1785747	VNGP160402 KC5410	B143	1796103	NTP2L KC5010	D24
1749131	KSEM361R3WD50M	H60	1772160	SDACL1212M11Q	B209	1785748	CPGT060202HP KC5410	B188	1796104	NTP2L KC5025	D24
1749132	KSEM370R3WD50M	H60	1772173	SDPCN1212M11Q	B212	1785749	CPGT060204HP KC5410	B188	1796105	NTP3R KC5010	D24
1749133	KSEM380R3WD50M	H60	1772197	STJCRF1212M11Q	B248	1785750	CPGT060208HP KC5410	B188	1796106	NTP3R KC5025	D24
1749207	CV50RMHTS13M394	J79	1772198	STJCLF1212M11Q	B248	1785752	CPGT09T308HP KC5410	B188	1796107	NTP3R KC5010	D24
1749208	CV50RMHTS32M394	J79	1772222	D25MTTB400	B386	1785753	DCGT070208HP KC5410	B206	1796109	NTP4R KC5010	D24
1749210	CV50RMHTS40M413	J79	1772223	D32MTTB447	B386	1785756	TPGT110208HP KC5410	B254	1796110	NTP4R KC5025	D24
1749263	CV50BHTS13M295	J79	1772224	D40MTTB530	B386	1787513	WNGX080712T02020 KY3500	B298	1796112	NTP4L KC5010	D24
1749264	CV50BHTS16M295	J79	1772230	D50MTTB700	B386	1791528	410.084	E17-18, S79, S82	1796113	NTP4L KC5025	D24
1749266	CV50BHTS22M295	J79	1772253	H32SCLCR09	B183	1792258	KSEM125R1WN16M	H58	1796115	NT2RK KC5010	D24
1749273	CV50RMHTS50M413	J79	1772255	H25SDUCR11	B213	1792259	KSEM136R1WN16M	H58	1796116	NT2LK KC5010	D24
1749281	BT50BHTS22075M	J80	1772256	H25SDUCL11	B213	1792260	KSEM146R1WN20M	H58	1796117	NT3RK KC5010	D24
1749285	BT50BHTS32080M	J80	1772257	H32SDUCR11	B213	1792262	KSEM130R3WN16M	H59	1796118	NT3LK KC5010	D24
1749286	BT50BHTS40080M	J80	1772258	H32SDUCL11	B213	1792293	KSEM135R3WN16M	H59	1796119	NT4RK KC5010	D24
1749287	BT50BHTS50080M	J80	1772747	KSEM125R5WN16M	H59	1792294	KSEM136R3WN16M	H59	1796120	NT4LK KC5010	D24
1749428	CV50BHTS27M295	J79	1772748	KSEM140R5WN16M	H59	1792295	KSEM140R3WN16M	H59	1796121	NT3RCK KC5010	D21
1749429	CV50BHTS32M295	J79	1772749	KSEM150R5WN20M	H59	1792296	KSEM145R3WN20M	H59	1796122	NT3RCK KC5025	D21
1749430	CV50BHTS40M314	J79	1773924	360.637	D26	1792297	KSEM146R3WN20M	H59	1796133	NT3LCK KC5025	D21
1749461	CV50BHTS50M314	J79	1774499	KSEM125R3WN16M	H59	1792298	KSEM150R3WN20M	H59	1796134	NT4RCK KC5010	D21
1749491	CV50RMHTS13M394	J79	1775033	NG3125RK KC5025	C147	1792299	KSEM155R3WN20M	H59	1796135	NT4RCK KC5025	D21
1749492	CV50RMHTS16M394	J79	1775035	NG3125LK KC5025	C148	1792301	KSEM130R5WN16M	H59	1796137	NT4LCK KC5025	D21
1749493	CV50RMHTS22M394	J79	1775036	NG3047RK KC5025	C146	1792302	KSEM136R5WN16M	H59	1796138	NTF2R KC5010	D23
1749607	KSEM130R3WD50M	H60	1775037	NG3062RK KC5025	C146	1792323	KSEM135R5WN16M	H59	1796139	NTF2L KC5010	D23
1749610	KSEM400R3WD50M	H60	1775478	CM72LP	C166, C168-169, C171, D29-30, D36, D41-42	1792325	KSEM145R5WN20M	H59	1796140	NTF3R KC5010	D23
1749648	DFR020204GD KC7140	J84	1775479	CM73LP	C166, C168-169, D29-30, D36	1792326	KSEM146R5WN20M	H59	1796141	NTF3L KC5010	D23
1749718	420.060	S68, S143-147	1777658	100B08RP90SP15C2WFP	S82	1792328	KSEM155R5WN20M	H59	1796153	NTF4R KC5025	D23
1750433	B411A07700 KF1	G100	1777661	100B09RP70SP15C2WFP	S79	1792632	NR3047RK KC5010	C150	1796156	NTK2R KC5010	D23
1752626	420.200	S10, S14, S17, S21, S25, S32, S34, S48, S53, S68, S72, S76, S79, S82, S102-103, S132, S143-144, S146, T17, T50, T72	1777860	CNMG120408MP KC5025	B51	1792683	NR3047RK KC5025	C150	1796157	NTK2L KC5010	D23
1752628	420.100	S72, S76, S102-103, S143-144, S146	1779401	193.337	S145-146	1792684	NR3062RK KC5010	C150	1796158	NTK3R KC5010	D23
1752629	420.120	S68, S76, S79, S82, S102-103, S143-144, S146-147	1781755	TK013380	E54	1792685	NR3062RK KC5025	C150	1796159	NTK3R KC5025	D23
1752630	420.160	S32, S34, S68, S72, S76, S79, S82, S143-144, S146	1781756	TK013390	E54	1793315	NG3110R KC5025	C154	1796160	NTK3L KC5010	D23
1753934	B411A08700 KF1	G100	1782505	VCGR160402 KC5410	E34	1794406	NG3M225RK KC5025	C146	1796161	NTK3L KC5025	D23
1754251	DFR165R2WD32M	J10	1782709	50A03R060S63PBG15S3WWSM	S147	1794630	BGHX15L5PCFRGG K110M	S148	1796176	NJP3020R8 KC5010	D18
1757331	63A04RP90BG15C1WPM	S144	1782711	80A05R090S63PBG15S5WWSM	S147	1794631	BGHX15L5PCFRGG KC510M	S148	1796177	NJP3020R8 KC5025	D18
1758493	50A03RP90BG15C2WPM	S144	1782830	VPGP443K KC5410	B144	1794653	BGHX15L5PCFRGG K110M	S148	1796179	NJP3020L8 KC5010	D18
1758495	80A05RP90BG15C1WPM	S144	1782831	TPGT090204LF KC5410	B254	1794655	BGHX15L5PCTRRG KC510M	S148	1796180	NJP3014R12 KC5010	D18
1758496	100B06RP90BG15C2WPM	S144	1782896	RCMT120400 KC5010	B224	1794656	BGHX15L5PCFRGG1W K110M	S149	1796181	NJP3014L12 KC5010	D18
1758497	125B08RP90BG15C2WPM	S144	1782902	CNMG120404FW KT315	B49	1794657	BGHX15L5PCFRGG1W KC510M	S149	1796182	NJP3010R16 KC5010	D18
1758498	160C10RP90BG15C2WPM	S144	1783133	CNMG120408FW KT315	B49	1794659	BGHX15L5PCTRRG1W K110M	S149	1796194	NJP3012R14 KC5010	D17
1758499	200C12RP90BG15C3WPM	S144	1783134	CNMG120412FW KT315	B49	1794660	BGHX15L5PCTRRG1W KC510M	S149	1796195	NJP3012R14 KC5025	D17
1758500	250C16RP90BG15C4WPM	S144	1783135	CNMG110404FW KT315	B78	1795217	80A05RP90SP15C1WFP	S82	1796198	NJP3010R16 KC5010	D17
1758572	80A06RP90BG15C2WPM	S144	1783136	CNMG110408FW KT315	B78	1795286	160C10RP90SP15C2WFP	S82	1796199	NJP3010R16 KC5025	D17
1758573	100B08RP90BG15C2WPM	S144	1783137	CNMG150404FW KT315	B78	1795288	200C12RP90SP15C2WFP	S82	1796200	NJP3010L16 KC5010	D17
1758574	125B10RP90BG15C2WPM	S144	1783138	CNMG150408FW KT315	B78	1795485	BGHX15L5PCFRGGT KD1410	S148	1796202	NJP3009R18 KC5010	D17
1758580	50A03R049A32PBG15S3WHPM	S145	1783141	WNMG060404FW KT315	B156	1795486	BGHX15L5PCFRGGT KD1415	S148	1796203	NJP3009R18 KC5025	D17
1758592	63A04RP90BG15C4WHPM	S146	1783142	WNMG060408FW KT315	B156	1795785	NT2RK KC5025	D24	1796331	NJP3008R20 KC5010	D17
1758593	80A05RP90BG15C5WHPM	S146	1783143	WNMG080404FW KT315	B156	1795786	NT2LK KC5025	D24	1796332	NJP3008R20 KC5025	D17
1762261	B411A05600 KF1	G100	1783144	WNMG080408FW KT315	B156	1795787	NT3RK KC5025	D24	1796393	NJP3008L20 KC5010	D17
1762299	NG3062LK KC5010	C148	1783152	CNMG120404FW KC5010	B49	1795788	NT3LK KC5025	D24	1796395	NJP3007R24 KC5010	D17
1762369	100B06RP90BG15C6WHPM	S146	1783233	CNMG120408FW KC5010	B49	1795789	NT4RK KC5025	D24	1796396	NJP3007R24 KC5025	D17
1762370	125B08RP90BG15C8WHPM	S146	1783234	CNMG120412FW KC5010	B49	1795790	NT4LK KC5025	D24	1796397	NJP3007L24 KC5010	D17
			1783237	CNMG150404FW KC5010	B78	1795791	NTP2R KC5025	D23	1796399	NJP3006R28 KC5010	D17
			1783273	WNMG060408FW KC5010	B156	17					

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1796430	NJK3008R20 KC5025	D18	1797211	KSEM145R10WN20M	H61	1799557	NDC4050R3 KC5025	D14	1805825	F3BA0800BWM40C160 K600	P124
1796443	NJK3007R24 KC5010	D18	1797212	KSEM146R10WN20M	H61	1799560	NDC38DR75 KC5010	D15	1805929	F3AA0400AWS45 K600	P121
1796446	NJK3007R24 KC5025	D18	1797233	KSEM150R10WN20M	H61	1799561	NDC38DR75 KC5025	D15	1805930	F3AA0500AWS45 K600	P121
1796449	NJK3006R28 KC5010	D18	1797234	KSEM155R10WN20M	H61	1799562	NDC38RD75 KC5010	D15	1805931	F3AA0600AWS45 K600	P121
1796452	NJK3006L28 KC5025	D18	1797235	SCFPR10CA09	B199	1799563	NDC38RD75 KC5025	D15	1805932	F3AA0800AWM45 K600	P121
1796473	NJK3005R32 KC5010	D18	1798199	160C10RP70SP15C2WFP	S79	1799565	NDC310RD75 KC5025	D15	1805983	F3AA1000AWL45 K600	P121
1796474	NJK3005R32 KC5025	D18	1798200	200C12RP70SP15C2WFP	S79	1799567	NDC310RD75 KC5025	D15	1805984	F3AA1200AWL45 K600	P121
1796476	NJK3005L32 KC5025	D18	1798604	80A06RP90SP15C1WFP	S82	1799576	NTB3RA KC5025	D19	1805985	F3AA1400AWL45 K600	P121
1796497	NA3R12 KC5025	D12	1798605	125B10RP90SP15C2WFP	S82	1799577	NTB3LA KC5010	D19	1805986	F3AA1600AWL45 K600	P121
1796499	NA3L12 KC5010	D12	1798920	A101QLSER11	D81	1799578	NTB3LA KC5025	D19	1805987	F3AA1800AWL45 K600	P121
1796500	NA3L12 KC5025	D12	1798921	A1616LSER16	D81	1799583	NTB2RB KC5010	D20	1805988	F3AA2000AWX45 K600	P121
1796501	NA3R10 KC5010	D12	1798922	A4040LSER22	D81	1799585	NTB2LB KC5010	D20	1806435	DFR030204GD KCT140	J84
1796502	NA3R10 KC5025	D12	1798962	DFR170R3WD32M	J11	1799587	NTB3RB KC5010	D20	1806437	DFR040304GD KCT140	J84
1796504	NA3L10 KC5025	D12	1798979	A101QLSEL11	D81	1799588	NTB3RB KC5025	D20	1807047	F3BA0800BWM40 K600	P123
1796505	NA3R8 KC5010	D12	1798980	A1616LSEL16	D81	1799589	NTB3LB KC5010	D20	1807048	F3BA1000BWM40 K600	P123
1796506	NA3R8 KC5025	D12	1799053	DFR180R3WD32M	J11	1799591	NTB3LB KC5025	D20	1807049	F3BA1200BWL40 K600	P123
1796507	NA3L8 KC5010	D12	1799055	DFR200R3WD32M	J11	1799603	NTB4RB KC5010	D20	1807050	F3BA1600BWL40 K600	P123
1796508	NA3L8 KC5025	D12	1799056	DFR210R3WD25M	J11	1799604	NTB4LB KC5025	D20	1807051	F3BA2000BWM40 K600	P123
1796509	NA3R6 KC5010	D12	1799059	DFR220R3WD25M	J11	1799605	NTB4LB KC5010	D20	1807052	F3BA2500BWM40 K600	P123
1796510	NA3R6 KC5025	D12	1799093	A4040LSEL22	D20	1799606	NTB4LB KC5025	D20	1807220	CCGT09T304LF KC5410	B175
1796511	NA3L6 KC5010	D12	1799238	NT1L KC5010	D81	1799693	DFR190R2WD32M	J10	1807346	F3BA1000BWM40C220 K600	P124
1796512	NA3L6 KC5025	D12	1799239	NT1L KC5025	D25	1799695	DFR220R3WD32M	J11	1807347	F3BA1200BWL40C260 K600	P124
1796514	NA3R5 KC5010	D12	1799241	NTC3R7E KC5025	D22	1800067	BGHX15L5PCERGGT1W KD1415	S149	1807348	F3BA1600BWL40C320 K600	P124
1796515	NA3R5 KC5025	D12	1799363	NTC3L8E KC5010	D20	1801017	NGM3400LK KC5025	C148	1807349	F3BA2000BWM40C380 K600	P124
1796516	NA3L5 KC5010	D12	1799366	NTC3L8I KC5025	D20	1801125	3.41020R900STF CS5	I16	1807350	F3BA2500BWM40C450 K600	P124
1796517	NA3L5 KC5025	D12	1799369	NTC3R10E KC5010	D22	1801126	3.41220R900STF CS5	I16	1808487	NG2031RK KC5010	C146
1796518	NA3R4 KC5010	D12	1799370	NTC3R10E KC5025	D22	1801129	3.41220R900STF KMF	I16	1808488	NG4189RK KC5010	C147
1796519	NA3L4 KC5010	D12	1799384	NTC3L10I KC5025	D20	1801779	NR3031R KC5010	C158	1808491	NR3047LK KC5025	C150
1796520	NA3R16 KC5025	D13	1799386	NTC3R11E KC5025	D22	1801793	NG3047R KC5010	C154	1808583	NGD3125RK KC5025	C149
1796524	NA3R12 KC5025	D13	1799389	NTC3R12I KC5025	D22	1802547	CCMT09T304MMW KT315	B178	1809057	HSK100AHT50085M	J81
1796525	NA3L12 KC5025	D13	1799390	NTC3L12I KC5025	D20	1802549	CCMT09T308MMW KT315	B178	1809059	HSK100AHT50090M	J81
1796526	NA3R10 KC5010	D13	1799391	NTC3R13E KC5010	D22	1802551	WNG608040RLF KC5010	B154	1810334	DFR170R2WD32M	J10
1796527	NA3R10 KC5025	D13	1799392	NTC3R13E KC5025	D22	1802564	CCMT09T304MMW KC5010	B178	1810335	DFR175R2WD32M	J10
1796529	NA3L10 KC5025	D13	1799393	NTC3R14E KC5010	D22	1802566	CCMT09T308MMW KC5010	B178	1810336	DFR180R2WD32M	J10
1796530	NA3R8 KC5010	D13	1799394	NTC3R14E KC5025	D22	1802567	CPMT09T308MMW KC5010	B191	1810337	DFR185R2WD32M	J10
1796531	NA3R8 KC5025	D13	1799398	NTC3L14I KC5025	D20	1802568	CCMT120404MMW KC5010	B178	1810338	DFR195R2WD32M	J10
1796532	NA3L8 KC5010	D13	1799399	NTC3R16E KC5010	D22	1802569	CCMT120408MMW KC5010	B178	1810339	DFR200R2WD32M	J10
1796543	NA3L8 KC5025	D13	1799400	NTC3R16E KC5025	D22	1802594	80A07RP70SP15C1WFP	S79	1810340	DFR205R2WD32M	J10
1796544	NA3R6 KC5010	D13	1799404	NTC3L16I KC5025	D20	1802595	125B12RP70SP15C2WFP	S79	1810341	DFR210R2WD32M	J10
1796545	NA3R6 KC5025	D13	1799405	NTC3R18E KC5010	D22	1802596	160C16RP70SP15C4WFP	S79	1810342	DFR220R2WD32M	J10
1796546	NA3L6 KC5010	D13	1799406	NTC3R18E KC5025	D22	1802810	SPHX15T6PCERGP KOK15	S83	1810363	DFR230R2WD32M	J10
1796547	NA3L6 KC5025	D13	1799409	NTC3R20E KC5010	D22	1802813	CCMT060202FW KT315	B176	1810364	DFR240R2WD32M	J10
1796549	NA3R5 KC5025	D13	1799410	NTC3R20E KC5025	D22	1802843	CPMT060202FW KT315	B189	1810365	DFR165R3WD32M	J11
1796551	NA3L5 KC5025	D13	1799413	NTC3R24E KC5010	D22	1802844	CCMT060204FW KT315	B176	1810366	DFR175R3WD32M	J11
1796552	NJ3020R8 KC5010	D17	1799414	NTC3R24E KC5025	D22	1802845	CPMT060204FW KT315	B189	1810367	DFR185R3WD32M	J11
1796553	NJ3020R8 KC5025	D17	1799416	NTC3R28E KC5025	D22	1802846	CCMT060208FW KT315	B176	1810368	DFR190R3WD32M	J11
1796555	NJ3020L8 KC5025	D17	1799418	NTC3R32E KC5025	D22	1802886	SPHX15T6PCERGP4S KOK15	S83	1810369	DFR195R3WD32M	J11
1796556	NJ3014R12 KC5010	D17	1799439	NA4R6 KC5025	D12	1802893	SPHX15T6PCFRGN1W KOK15	S84	1810370	DFR205R3WD32M	J11
1796557	NJ3014R12 KC5025	D17	1799441	NA4L6 KC5025	D12	1802971	CPMT060208FW KT315	B189	1810371	DFR210R3WD32M	J11
1796558	NJ3014L12 KC5010	D17	1799443	NA4R5 KC5025	D12	1802983	CCMT09T304FW KT315	B176	1810372	DFR230R3WD32M	J11
1796559	NJ3014L12 KC5025	D17	1799445	NA4L5 KC5025	D12	1802984	CPMT09T304FW KT315	B189	1810373	DFR240R3WD32M	J11
1796561	NJ3010R16 KC5025	D17	1799446	NA4R4 KC5010	D12	1802986	CCMT09T308FW KT315	B176	1816891	LT11NR14UNJ KC5025	D75
1796583	NJ3010L16 KC5025	D17	1799447	NA4R4 KC5025	D12	1802991	CPMT09T308FW KT315	B189	1816983	LT11NR16UNJ KC5025	D75
1796705	470.232	S10, S14, S17, S21, S25, S32, S34, S48, S53, S68, S72, S76, S79, S82, S102-103, S143-144, S146, T50, T72	1799449	NA4L4 KC5025	D12	1802992	CCMT060202FW KC5010	B176	1817533	LT22ER4AP1503 KC5010	D55
1796707	470.233	S17, S21, S25, S32, S34, S48, S53, S68, S72, S76, S79, S82, S102-103, S143-144, S146, T17, T50, T72	1799450	NA6R2 KC5010	D12	1803013	CPMT060202FW KC5010	B189	1817570	NF3125LK KC5025	C159
1796708	470.234	S21, S25, S34, S68, S72, S76, S79, S82, S102, S144, S146	1799451	NA6R2 KC5025	D12	1803014	CCMT060204FW KC5010	B176	1817571	NF3125RK KC5025	C159
1796709	470.235	S21, S25, S34, S68, S144	1799452	NA6L2 KC5010	D12	1803022	CCMT09T308FW KC5010	B176	1817572	CNMG120404FP KC5010	B49
1796710	470.236	S21, S25	1799453	NA6L2 KC5025	D12	1803023	CPMT09T308FW KC5010	B189	1817578	NFD3125LK KC5025	C160
1797157	KSEM125R7WN16M	H61	1799463	NA6L2 KC5025	D12	1803024	NTC3MR150E KC5010	D21	1817614	CNMG120408FP KC5010	B49
1797158	KSEM130R7WN16M	H61	1799465	NA6R25 KC5025	D12	1803285	NTC3MR150E KC5025	D21	1817616	DNMG110404FP KC5010	B77
1797159	KSEM135R7WN16M	H61	1799469	NA6R3 KC5025	D12	1803292	NTC3MR200E KC5010	D21	1817617	DNMG110408FP KC5010	B77
1797160	KSEM136R7WN16M	H61	1799471	NA6L3 KC5025	D12	1803924	NG2062L KC5025	C155	1817618	NG3189RK KC5025	C147
1797161	KSEM140R7WN16M	H61	1799475	NA6R25 KC5025	D12	1803995	H50LSER16	D82	1817619	NG31100LK KC5025	C148
1797162	KSEM145R7WN20M	H61	1799483	NDC38VR75 KC5010	D16	1803997	H40LSER22	D82	1817620	NG3M100RK KC5025	C146
1797183	40A02RP90BG15CFPM	S144	1799484	NDC38VL75 KC5010	D16	1803999	H50LSER22	D82	1817623	NG3M120LK KC5025	C148
1797203	KSEM146R7WN20M	H61	1799485	NDC3115VR75 KC5010	D16	1804265	SPHX12052CEELGP KC520M	S73	1817626	NG3M120RK KC5025	C146
1797204	KSEM150R7WN20M	H61	1799486	NDC3115VL75 KC5010	D16	1804638	NG2062L KC5010	C155	1817627	NG3M150LK KC5025	C148
1797205	KSEM155R7WN20M	H61	1799490	NDC88VR75M KC5010	D16	1804784	DFT05T308HP KMF	J87	1817629	NG3M150RK KC5025	C146
1797206	KSEM125R10WN16M	H61	1799491	NDC88VL75M KC5010	D16	1804785	DFT06T308HP KMF	J87	1817630	NG3M175LK KC5025	C148
1797207	KSEM130R10WN16M	H61	1799497	NTU4R KC5025	D24	1804790	DFT070408HP KMF	J87	1817631	NG3M175RK KC5025	C146
1797208	KSEM135R10WN16M	H61	1799500	NWC3R11E KC5010	D25	1804791	DFT090508HP KMF	J87	1817632	NG3M200LK KC5025	C148
1797209	KSEM136R10WN16M	H61	1799501	NWC3R11E KC5025	D25	1804829	DFT05T308HP KC7140	J87	1817635	NG3M200RK KC5025	C146
			1799502	NWC3L11I KC5025	D25	1804830	DFT06T308HP KC7140	J87	1817		

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1817662	NFD4189LK KC5025	C160	1818352	NP3012RK KC5010	C151	1818856	NR4125RK KC5010	C150	1832313	CNMG190612MP KC5010	B51
1817667	420.080	S143-144	1818353	NGD3189RK KC5025	C149	1818857	NR4125RK KC5025	C150	1832315	CNMG190616MP KC5010	B51
1817675	NG3M250LK KC5025	C148	1818354	NGD4125LK KC5010	C149	1818858	NRD3031R KC5010	C159	1832316	DNMG110408MP KC5010	B79
1817676	NG3M250RK KC5025	C146	1818355	NGD4125LK KC5025	C149	1818859	NRD3031R KC5025	C159	1832318	DNMG150404MP KC5010	B79
1817678	NG3M275LK KC5025	C148	1818356	NGD4125RK KC5010	C149	1818860	NRD3031R KC5010	C159	1832319	DNMG150408MP KC5010	B79
1817679	NG3M275RK KC5010	C147	1818357	NGD4125RK KC5025	C149	1818861	NRD3031R KC5025	C159	1832321	DNMG150612MP KC5010	B79
1817680	NG3M275RK KC5025	C147	1818359	NGD4189LK KC5010	C149	1818862	NRD3062L KC5010	C159	1832322	DNMG150604MP KC5010	B79
1817681	NG3M300LK KC5010	C148	1818360	NGD4189LK KC5025	C149	1818863	NRD3062L KC5025	C159	1832323	DNMG150608MP KC5010	B79
1817682	NG3M300LK KC5025	C148	1818361	NGD4189RK KC5010	C149	1818864	NRD3062R KC5010	C159	1832324	DNMG150612MP KC5010	B79
1817699	NG1047L KC5025	C155	1818362	NGD4189RK KC5025	C149	1818865	NRD3062R KC5025	C159	1832325	SNMG120408MP KC5010	B98
1817700	NG1062L KC5025	C155	1818366	NG2M300RK KC5010	C146	1818866	NRD4062L KC5025	C159	1832327	SNMG120412MP KC5010	B98
1817702	NG1094L KC5025	C155	1818368	NG2M325RK KC5025	C146	1818874	NU3094L KC5025	C161	1832330	SNMG150612MP KC5010	B98
1817703	NG3M300RK KC5010	C147	1818369	NG3047LK KC5010	C148	1818875	NU3094R KC5025	C161	1832353	SNMG190616MP KC5010	B98
1817704	NG3M300RK KC5025	C147	1818370	NG3047LK KC5025	C148	1818876	NU3125L KC5025	C161	1832354	SNMG160404MP KC5010	B125
1817705	NG3M320LK KC5025	C148	1818371	NG3062LK KC5025	C148	1818878	NU3156L KC5025	C161	1832355	SNMG160408MP KC5010	B125
1817706	NG3M320RK KC5025	C147	1818372	NG3072LK KC5010	C148	1818891	NG3156LK KC5010	C148	1832356	SNMG160412MP KC5010	B125
1817707	NG3M325LK KC5025	C148	1818374	NGD4250LK KC5025	C149	1818892	NG3156LK KC5025	C148	1832357	SNMG220408MP KC5010	B125
1817708	NG3M325RK KC5025	C147	1818375	NGD4250RK KC5010	C149	1818913	NG3156RK KC5010	C147	1832358	SNMG220412MP KC5010	B125
1817709	NG3M350LK KC5025	C148	1818376	NGD4250RK KC5025	C149	1818914	NG3156RK KC5025	C147	1832359	SNMG220416MP KC5010	B125
1817710	NG3M350RK KC5025	C147	1818425	NR2031L KC5025	C158	1818916	NG3178R KC5025	C154	1832360	SNMG160404MP KC5010	B146
1817713	NG2031LK KC5010	C147	1818426	NR2031R KC5025	C158	1818917	NG3185L KC5025	C155	1832361	SNMG160408MP KC5010	B146
1817718	NG2031LK KC5025	C147	1818434	NP2002RK KC5010	C151	1818919	NG3189LK KC5010	C148	1832373	SNMG160412MP KC5010	B146
1817719	NG2031RK KC5025	C146	1818435	NP2002RK KC5025	C151	1818920	NG3189LK KC5025	C148	1832374	SNMG160404MP KC5010	B157
1817720	NG2041L KC5025	C155	1818437	NP3002RK KC5010	C151	1818921	NG3189RK KC5010	C147	1832376	SNMG060408MP KC5010	B157
1817721	NG2041R KC5025	C154	1818439	NP3012RK KC5025	C151	1819108	SPHX15T6ZCTRGP4SK KY3500	S80	1832378	SNMG080408MP KC5010	B157
1817722	NG2047LK KC5010	C147	1818440	NP2002RK KC5010	C151	1819110	SPHX15T6ZCFRGN1W KCK15	S81	1832379	SNMG160412MP KC5010	B157
1817740	NG3M400RK KC5010	C147	1818444	NRD4125L KC5025	C159	1819168	SPHX15T6PCTRGP KY3500	S83	1833500	SPHX1205PCFRGN1T1WB KB1340	S78, S84
1817741	NG3M400RK KC5025	C147	1818455	NG2M170LK KC5010	C147	1819171	SPHX15T6PCFRGN1WK KY3500	S84			S84
1817965	NG3M425RK KC5025	C147	1818456	NG2M170LK KC5025	C147	1819206	CNMG120404FP KT315	B49	1833501	SPHX1205ZCERGN1T1WB KB1340	S74
1817970	NG4125RK KC5010	C148	1818457	NG2M170RK KC5010	C146	1819207	CNMG120408FP KT315	B49	1833766	B411A06100 KF1	G100
1817972	NG4189LK KC5010	C148	1818458	NR3031LK KC5010	C150	1819211	DNMG110408FP KT315	B77	1834274	R67FBH506	K136
1817975	NG2047LK KC5025	C146	1818459	NR3031LK KC5025	C150	1819335	DNMG150404FP KT315	B77	1834295	SNMG120412FP KT315	B98
1817977	NG2047RK KC5010	C147	1818460	NR3031RK KC5010	C150	1819336	DNMG150408FP KT315	B77	1834819	170.294	H58, H65
1817979	NG2047RK KC5025	C148	1818461	NG2M170RK KC5025	C146	1819340	DNMG150612FP KT315	B77	1836470	170.295	H65
1817993	NG4189LK KC5025	C148	1818462	NR3031RK KC5025	C150	1819354	SNMG160404FP KT315	B124	1836471	170.296	H65
1817994	NG4189RK KC5025	C147	1818473	NR3047LK KC5010	C150	1819355	SNMG160408FP KT315	B124	1840501	KCGX110304R15 KC5410	E31
1818000	NG4250RK KC5010	C147	1818474	NG2M175LK KC5025	C147	1819357	SNMG160404FP KT315	B145	1841355	VCGR160416 KC5010	E34
1818001	NG4250RK KC5025	C146	1818476	NG2M195LK KC5010	C147	1819358	SNMG160408FP KT315	B145	1841781	MS1336	V66, V74, V78, V78
1818003	NG2058R KC5025	C154	1818478	NR3062LK KC5010	C150	1819440	DNMG150404FP KC5010	B77	1841782	MS2038	S41, S60, S62, T33, T50, T72, T102, V49, V56
1818005	NG2062LK KC5010	C147	1818479	NG2M195RK KC5010	C146	1819441	DNMG150408FP KC5010	B77			
1818006	NG2062LK KC5025	C147	1818480	NR3031RK KC5025	C146	1819451	SPHX1205PCTRGP KTKP20	S77	1841856	MS1556	T98, U32-34, V147
1818007	NG2062RK KC5010	C146	1818481	NR3062LK KC5025	C150	1819494	DNMG150604FP KC5010	B77			
1818008	NG2062RK KC5025	C146	1818482	NG2M200LK KC5010	C147	1819495	DNMG150608FP KC5010	B77	1843976	RCMT1204M0 KC5010	B224
1818009	NG2094LK KC5010	C147	1818483	NG2M200LK KC5025	C146	1819500	SNMG160404FP KC5010	B124	1845216	TCMT110204LF KC5010	B244
1818010	NG2094LK KC5025	C147	1818484	NG2M200RK KC5010	C146	1819501	SNMG160408FP KC5010	B124	1845218	TCMT110204RF KC5010	B177
1818011	NG2094RK KC5010	C146	1818485	NG2M200RK KC5025	C146	1819502	SNMG160412FP KC5010	B124	1845219	TCMT110204LF KC5010	B255
1818037	NG2094RK KC5025	C146	1818487	NG2M220RK KC5025	C146	1819513	SNMG160404FP KC5010	B145	1845227	CCMT09T304LF KC5010	B177
1818039	NG2125LK KC5010	C148	1818489	NG2M225LK KC5025	C147	1819515	SNMG060404FP KC5010	B156	1845230	SCMT09T304LF KC5010	B230
1818041	NG2125LK KC5025	C148	1818491	NG2M225RK KC5025	C146	1819516	SNMG060408FP KC5010	B156	1847935	CNMG120412T01020FW KY3500	B293
1818042	NG2125RK KC5010	C146	1818492	NG2M250LK KC5025	C147	1819517	SNMG080404FP KC5010	B156	1848593	SPGX060304RHP KC7140	J89
1818050	NG4M400RK KC5010	C147	1818493	NG2M250RK KC5025	C146	1819518	SNMG080408FP KC5010	B156	1848597	SPGX070304RHP KC7140	J89
1818051	NG4M400RK KC5025	C148	1818494	NG2M275LK KC5010	C147	1819519	SNMG080412FP KC5010	B156	1848601	SPGX09T308RHP KC7140	J89
1818052	NG4M450LK KC5025	C147	1818497	NG2M275RK KC5025	C146	1819846	SPHX1205PCFRGN1WB KCK15	S78	1848605	SPPX120408RHP KC7140	J89
1818054	NG4M500LK KC5010	C148	1818498	NG2M300LK KC5010	C148	1819848	SPHX1205PCFRGN1WB K725M	S78	1848655	ICSN443 K9	B58-60
1818073	NG2125RK KC5025	C147	1818503	NG3072LK KC5025	C148	1819849	SPHX1205PCFRGN1WB KC520M	S78	1849051	DCGR150404 KC5010	E28
1818075	NG2M080LK KC5025	C146	1818504	NG3072RK KC5010	C146	1819850	SPHX1205PCFRGN1WB KTKP20	S78	1849052	DCGR150408 KC5010	E28
1818077	NG2M080RK KC5025	C146	1818505	NG3072RK KC5025	C146	1819852	SPHX1205PCFRGN1WB KY3500	S78	1849053	DCGR150412 KC5010	E28
1818078	NG2M100LK KC5010	C147	1818507	NG3078LK KC5025	C148	1819853	SPHX1205ZCFRGN1WB KTKP20	S73	1849054	KCGX110301R15 KC5010	E31
1818079	NG2M100LK KC5025	C147	1818508	NG3078LK KC5025	C148	1819858	SPHX1205ZCFRGN1WB KCK15	S74	1849055	KCGX110301L15 KC5010	E31
1818080	NG2M100RK KC5010	C146	1818509	NG3078RK KC5025	C146	1819861	SPHX1205ZCFRGN1WB KC520M	S74	1849056	KCGX110302R15 KC5010	E31
1818081	NG2M100RK KC5025	C146	1818714	SPHX15T6ZCERGP KCK15	S80	1819864	SPHX1205ZCFRGN1WB KY3500	S74	1849058	KCGX110304R15 KC5010	E31
1818082	NG2M120LK KC5010	C147	1818721	SPHX15T6ZCTRGP KY3500	S80	1824861	TCMT16T308LF KC5010	B244	1849059	KCGX110304L15 KC5010	E31
1818093	NG2M120LK KC5025	C147	1818755	SPHX15T6ZCERGP4S KCK15	S80	1824882	TCMT16T304LF KC5010	B244	1849060	KCGX110308R15 KC5010	E31
1818094	NG2M120RK KC5010	C146	1818766	NG3094LK KC5010	C148	1829218	SNMG160404FP KT315	B125	1849243	KCGX110308L15 KC5010	E31
1818095	NG2M120RK KC5025	C146	1818768	NG3094LK KC5025	C148	1829219	SNMG160408FP KT315	B125	1849249	KNGX150404R20 KC5010	E30
1818097	NG2M140LK KC5025	C147	1818769	NG3094RK KC5025	C146	1829220	SNMG160404FP KC5010	B125	1849250	KNGX150404L20 KC5010	E30
1818098	NG2M140RK KC5010	C146	1818824	NG3105R KC5025	C154	1831439	841.142.200	K118-120	1849251	KNGX150408R20 KC5010	E30
1818099	NG2M140RK KC5025	C146	1818825	NG3110L KC5025	C155	1831441	841.142.320	K118-119	1849252	KNGX150408L20 KC5010	E30
1818110	NGD3062LK KC5010	C149	1818827	NR3078LK KC5010	C150	1831442	841.142.420	K118-119	1849274	KCGR110304R08 KC5010	E29
1818111	NGD3062LK KC5025	C149	1818828	NR3078LK KC5025	C150	1831590	KM63XMKZRS060Y	K87	1849275	KCGR110304L08 KC5010	E29
1818112	NGD3062RK KC5010	C149	1818829	NR3078RK KC5010	C150	1831749	NG3062L KC5010	C155	1849279	VBMR110304 KC5010	E32
1818113	NGD3062RK KC5025	C149	1818831	NR3094L KC5010	C158	1831750	NG4250R KC5010	C154	1849281	VCGR160402 KC5010	E34
1818114	NGD3094LK KC5010	C149	1818833	NR3094L KC5025	C158	1832293	CNMG090308MP KC5010	B51	1849301	VCGR160404 KC5010	E34
1818115	NGD3094LK KC5025	C149	1818834	NR3094R KC5010	C158	1832294	CNMG120404MP KC5010	B51	1849302	VCGR160408 KC5010	E34
1818116	NGD3094RK KC5010	C149	1818835	NR3094R KC5025	C158	1832295	CNMG120408MP KC5010	B51	1849323	VCGR160412 KC5010	E34
1818117	NGD3094RK KC5025	C149	1818836	NR4062LK KC5010	C150	1832296	CNMG120412MP KC5010	B51	1849846	KCGR110304L08 KT315	E29
1818118	NGD3125LK KC5025	C149	1818838	NR4062RK KC5010	C150	1832297	CNMG120416MP KC5010	B51	1849866	KCGR110308R08 KT315	E29
1818119	NGD3125LK KC5025	C149	1818840	NR4094LK KC5010	C150	1832298	CNMG160608MP KC5010	B51	1849869	KCGX110302R15 KT315	E31

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1849903	KCGR110308L08 KC5025	E29	1865870	RCMK040300 KC5010	E63	1866959	CCGT09T302HP KC5025	B175	1869976	DCMT11T308LF KT315	B207
1849906	VBMR110304 KC5025	E32	1865871	RCMK060400 KC5010	E63	1866960	CCGT09T304HP KC5025	B175	1869980	SCMT09T304LF KT315	B230
1849908	VCGR160402 KC5025	E34	1865953	RCMK090700 KC5010	E63	1866961	CCGT09T308HP KC5025	B175	1869996	TCMT110204LF KT315	B244
1849909	VCGR160404 KC5025	E34	1865954	RCMK120800 KC5010	E63	1866994	CCGT120404HP KC5025	B175	1869998	TCMT110208LF KT315	B244
1849910	VCGR160408 KC5025	E34	1865955	RCMK040300HP KC5010	E63	1866996	CPGT060202HP KC5025	B188	1870000	TCMT16T304LF KT315	B244
1849983	KCGX110301R15 KC5025	E31	1865956	RCMK060400HP KC5010	E63	1866997	CCGT060204HP KC5025	B188	1870002	TCMT16T308LF KT315	B244
1849998	KCGX110304R15 KC5025	E31	1865959	RCGV060400 KC5010	B166	1867001	CPGT09T302HP KC5025	B188	1870021	CNGG120401LF KC5010	B46
1850011	KCGX110304L15 KC5025	E31	1865960	RCGV090700 KC5010	B166	1867002	CPGT09T304HP KC5025	B188	1870022	CNGG120402LF KC5010	B46
1850012	KCGX110308R15 KC5025	E31	1865961	RCGV120700 KC5010	B166	1867004	DCGT070202HP KC5025	B206	1870036	VBMT110302LF KT315	B265
1850067	KCGR110304R08 KC5025	E29	1865962	RPGV090700 KC5010	B167	1867006	DCGT070204HP KC5025	B206	1870037	VBMT110304LF KT315	B265
1850070	KCGR110304L08 KC5025	E29	1865999	RCMT0602M0 KC5010	B224	1867007	DCGT070208HP KC5025	B206	1870039	VBMT160402LF KT315	B265
1851263	CNGA120408T01020FW KY3500	B293	1866000	RCMT0803M0 KC5010	B224	1867009	RCGT110304HP KC5025	B206	1870043	CNGG120404LF KC5010	B46
1851264	CNGA120416T01020FW KY3500	B293	1866001	RCMT10T3M0 KC5010	B224	1867010	DCGT11T304HP KC5025	B206	1870044	CNGG120408LF KC5010	B46
1851265	WNGA080408T01020FW KY3500	B294	1866014	RCMT1605M0 KC5010	B224	1867011	DCGT11T308HP KC5025	B206	1870069	CNGG120412LF KC5010	B46
1851268	CNGX120708T01020FW KY3500	B295	1866015	RCMT2006M0 KC5010	B224	1867028	RCGT10T3M0HP KC5025	B222	1870072	CNGG150402LF KC5010	B74
1851269	CNGX120712T01020FW KY3500	B295	1866017	RCMT060200 KC5010	B224	1867029	RCGT1204M0HP KC5025	B222	1870113	CNGG150404LF KC5010	B74
1851270	CNGX120716T01020FW KY3500	B295	1866019	RCMT09T300 KC5010	B224	1867031	TCGT110204HP KC5025	B243	1870114	CNGG150408LF KC5010	B74
1851304	SCGN090408EFW KY3500	B299	1866310	CNMX120712T02020 KY3500	B295	1867034	DCGT11T302HP KC5025	B243	1870323	VBMT160408LF KT315	B265
1852181	CS412	B168, B370	1866311	CNMX120716T02020 KY3500	B295	1867035	TCGT16T308HP KC5025	B243	1870324	CPMT050204LF KT315	B190
1854201	CPMT050204LF KC5010	B190	1866356	SNMX120712T02020 KY3500	B298	1867036	TCGT110202HP KC5025	B254	1870326	CPMT060204LF KT315	B190
1854340	HTSR0408025M	J67	1866357	SNMX120716T02020 KY3500	B298	1867037	TPGT11T302HP KC5025	B254	1870328	CPMT09T302LF KT315	B190
1854342	HTSR0408028M	J67	1866358	SNMX150716T02020 KY3500	B298	1867042	TPGT16T304HP KC5025	B254	1870329	CPMT09T304LF KT315	B190
1854378	B514S08000 KC7030	J68	1866564	CCGT0602X0LF KC5025	B175	1867046	VBGT160404HP KC5025	B264	1870333	CPMT09T308LF KT315	B190
1854379	B514S10000 KC7030	J68	1866565	CCGT060201LF KC5025	B175	1867049	VBGT160408HP KC5025	B264	1870335	CPMT070204LF KT315	B215
1855439	NG3M200RK KT315	C146	1866566	CCGT060202LF KC5025	B175	1867050	VBGT110304HP KC5025	B264	1870337	DPMT11T304LF KT315	B215
1855476	NG2031RK KT315	C146	1866567	CCGT060204LF KC5025	B175	1867051	VBGT110302HP KC5025	B264	1870339	SPMT09T304LF KT315	B238
1855479	NG2047RK KT315	C146	1866569	CCGT09T308LF KC5025	B175	1867060	VBGT110304HP KC5010	B264	1870342	TPMT090204LF KT315	B255
1855504	NG2062RK KT315	C146	1866570	CCGT09T301LF KC5025	B175	1867061	VBGT110302HP KC5010	B264	1870365	TPMT110208LF KT315	B255
1855506	NG2094RK KT315	C146	1866571	CCGT09T302LF KC5025	B175	1867212	SSP025016M	B58-60, B66, B85, B89-90, B105-107, B132, B137, B149-150, B152, B161, B163	1870366	TPMT16T304LF KT315	B255
1855508	NG2125RK KT315	C146	1866572	CCGT09T308LF KC5025	B175	1867278	KMSP451P	B58-60, B66, B85, B89-90, B105-107, B132, B161, B163	1870367	TPMT16T308LF KT315	B255
1855556	NG2M200RK KT315	C146	1866593	CCGT09T308LF KC5025	B175	1867314	KMSP551P	B58-60, B66, B105	1870619	CPMT160402LF KC5010	B122
1855576	NG3062RK KT315	C146	1866616	CCGT09T308LF K313	B175	1867321	KLM46L51P	B58-60, B85, B105-107, B132	1870983	CPMT060202LF KC5010	B190
1855577	NG3094LK KT315	C146	1866617	CPGT060201LF KC5025	B189	1867333	KLM46L51P	B58-60, B105, B107, B161	1870984	CPMT09T302LF KC5010	B177
1855578	NG3094RK KT315	C146	1866618	CPGT060202LF KC5025	B189	1867338	KLM58L51P	B58-60, B105	1870986	CPMT09T308LF KC5010	B177
1855910	SPHX1205ZCSRGP KCK15	S73	1866619	CPGT060204LF KC5025	B189	1867620	CNGP120408 KC5010	B46	1870987	CPMT120404LF KC5010	B177
1857709	420.102	S72	1866620	CPGT060208LF KC5025	B189	1868190	CPGH09T301 KC5010	B188	1870988	CPMT09T308LF KC5010	B177
1859604	VBMT160404LF KT315	B265	1866621	CPGT09T302LF KC5025	B189	1868254	CPGH09T301 KT315	B188	1870989	CPMT060202LF KC5010	B190
1860701	190.458	J67	1866622	CPGT09T304LF KC5025	B189	1868255	CPGH09T302 KC5010	B188	1870998	DPMT11T302LF KC5010	B215
1860827	NG3088L KC5010	C155	1866623	CPGT09T308LF KC5025	B189	1868419	CNGP120401 KC5010	B46	1870999	DPMT11T304LF KC5010	B215
1861004	FAS1003026D KC7015	H33	1866625	CPGT060201LF KC5410	B189	1868420	CNGP120402 KC5010	B46	1871000	DPMT11T308LF KC5010	B215
1861493	H32PCLNR12	B69	1866638	TPGT090204LF KC5025	B254	1868421	CNGP120404 KC5010	B46	1871002	SCMT09T308LF KC5010	B230
1861496	H32PDUNR15	B91	1866640	TPGT110202LF KC5025	B254	1868443	CNGP120412 KC5010	B46	1871013	CPMT060204LF KC5010	B190
1861500	H40PCLNR12	B69	1866641	TPGT110204LF KC5025	B254	1868444	CNGP120416 KC5010	B46	1871014	CPMT060208LF KC5010	B190
1861501	H40PCLNR12	B69	1866644	DCGT070204LF KC5025	B206	1868451	CNGP120416 KC5010	B46	1871015	CPMT09T302LF KC5010	B190
1861517	H50PCLNR12	B69	1866646	DCGT070201LF KC5025	B206	1868452	DNGP150402 KC5010	B74	1871016	CPMT09T304LF KC5010	B190
1861518	H50PCLNR12	B69	1866647	DCGT11T301LF KC5025	B206	1868455	DNGP150404 KC5010	B74	1871017	CPMT09T308LF KC5010	B190
1861519	H50PDUNR15	B91	1866648	DCGT11T3X0LF KC5025	B206	1868456	DNGP150608 KC5010	B74	1871019	DCMT11T312LF KC5010	B207
1861520	H50PDUNR15	B91	1866650	DCGT070201LF KC5010	B206	1868457	SNGP120404 KC5010	B96	1871020	DCMT150404LF KC5010	B207
1863407	552.210	B369, B374	1866651	DCGT11T301LF KC5010	B206	1868462	CNGP120402 KC5010	B46	1871021	DCMT150408LF KC5010	B207
1864501	VCMR160404 KC5010	E33	1866652	DCGT150408LF KC5010	B206	1868463	CNGP120404 KC5010	B46	1871022	DPMT070202LF KC5010	B215
1864502	VCMR160408 KC5010	E33	1866653	TPGT16T304LF KC5025	B254	1868464	CNGP120416 KC5010	B46	1871033	DPMT070204LF KC5010	B215
1864543	VCMR160404 KC5025	E33	1866655	TPGT110208LF KC5010	B254	1868465	VNGP160402 KC5010	B143	1871035	VBMT110308LF KC5010	B265
1864544	VCMR160408 KC5025	E33	1866656	TPGT110204LF KC5010	B254	1868466	VNGP220404 KC5010	B143	1871036	VBMT160402LF KC5010	B265
1864562	VCMR160404 KT315	E33	1866665	DPGT070204LF KC5025	B214	1868467	VNGP220408 KC5010	B143	1871038	WPMT040204LF KC5010	B272
1864583	VCMR160408 KT315	E33	1866666	DPGT11T302LF KC5025	B214	1868982	CCMT060202LF KC5010	B177	1871039	WPMT06T304LF KC5010	B272
1864815	SNHX1102PZTNGP KC725M	U15	1866668	DPGT11T304LF KC5025	B214	1868989	CPGH09T304 KC5025	B188	1871040	WPMT06T308LF KC5010	B272
1864816	SNHX11T3PZTNGP KC725M	U15	1866674	TPGT16T308LF KC5410	B254	1868990	CPGH09T308 KC5010	B188	1871041	WCMT040204LF KC5010	B270
1864817	SNHX1203PZTNGP KC725M	U15	1866675	VBGT1103X0LF KC5025	B264	1868993	CPGH09T308 KC5025	B188	1871042	WCMT06T308LF KC5010	B270
1864825	SNHX12L5PZTNGP KC725M	U15	1866676	VBGT110301LF KC5025	B264	1868996	CCMT060208LF KT315	B177	1871083	SCMT120404LF KC5010	B230
1864829	SNHX11T3PZFNGE KC510M	U14	1866677	VBGT110302LF KC5025	B264	1868997	CCMT09T304LF KT315	B177	1871084	SCMT120408LF KC5010	B230
1864830	SNHX1203PZFNGE KC510M	U14	1866678	VBGT110304LF KC5025	B264	1868998	CCMT09T308LF KT315	B177	1871085	SCMT120412LF KC5010	B230
1864831	SNHX12L5PZFNGE KC510M	U14	1866679	VBGT1604X0LF KC5025	B264	1868999	CCMT09T304LF KT315	B177	1871086	SPMT09T304LF KC5010	B238
1865174	SPGR090308K KC5010	B169	1866681	VBGT160401LF KC5025	B264	1869821	CCMT060204LF KC5010	B177	1871087	SPMT09T308LF KC5010	B238
1865210	TPGR110304K KC5010	B171	1866682	VBGT160402LF KC5025	B264	1869894	CPGH09T304 KC5010	B188	1871088	TCMT110202LF KC5010	B244
1865214	TPGR160304K KC5010	B171	1866683	VBGT160404LF KC5025	B264	1869896	CPGH09T304 KC5025	B188	1871089	TCMT16T302LF KC5010	B244
1865218	TPGR160308K KC5010	B171	1866685	VBGT110302LF KC5010	B264	1869899	CPGH09T304 KC5010	B188	1871091	TCMT16T302LF KC5010	B244
1865436	SPGN090304 KC5010	B169	1866686	VBGT110304LF KC5010	B264	1869901	CPGH09T308 KC5010	B188	1871104	TCMT16T312LF KC5010	B244
1865452	SPGN090308 KC5010	B169	1866675	VBGT160401LF KC5010	B264	1869903	CPGH09T308 KC5025	B188	1871105	TCMT16T312LF KC5010	B244
1865483	SPGN120304 KC5010	B169	1866754	VBGT160402LF KC5010	B264	1869932	CCMT060208LF KT315	B177	1871106	TPMT090202LF KC50	

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1871170DCMT11T302UF KC5010B208	1881199KCLUX110302R15 KC5010E32	1881447TPUN110304T00520 KY1615B321	1913482B966A06800 KC7315G133
1871171DCMT11T304UF KC5010B208	1881200KCLUX110305R15 KC5010E32	1881448TPUN110308T00520 KY1615B321	1913483B966A07000 KC7315G133
1871172DCMT11T308UF KC5010B208	1881201KCLUX110302L15 KC5010E32	1881449TPUN160304T00520 KY1615B321	1913484B966A07400 KC7315G133
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1931554	TTP15	S46-48, U40-49	1949634	A4SML1616K0314	C113	1952780	A4R0500M05P00GMP KC5010	C96	1991229	B966A12600 KC7315	G134
1931573	MS2077	U40-49, V70-72, V139	1949635	A4SMR2020K0314	C112	1952847	A4C0305N00CF02 KC5025	C102	1992230	B977A07700 KC7315	G140
1931575	MS2078	S41, T102, U38-39	1949636	A4SML2020K0314	C113	1952848	A4C0305R00CF02 KC5025	C103	1992232	B966A10400 KC7315	G133
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1937536	TDHB07T1202 KC5025	B249	1949658	A25RA4EMR0310M	C119	1962705	B977F05600 KC7315	G143	1995582	F4AJ1000AWMS0L150 KC633M	P145
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1996159	F6AV1600ADL45	KC637M	2018164	12748500200		2046287	B977F14200	KC7315	2049489	B977A12200	KC7315
1996160	F8AV2000ADL45	KC637M	2018166	12748500400		2047379	KSEM1270HPM	KC7315	2049505	B977F05550	KC7315
1996161	F6AV0600AWM45	KC637M	2018285	12148006000		2047380	KSEM1280HPM	KC7315	2050081	MS2111	
1996162	F6AV0800AWM45	KC637M	2018296	MS2260		2047382	KSEM1310HPM	KC7315			C166-169, D27-30, D36
1996183	F6AV1000AWL45	KC637M	2018679	12148068700		2047393	KSEM1320HPM	KC7315	2050230	B978A09800	KC7315
1996184	F6AV1200AWL45	KC637M	2029553	12148044900		2047395	KSEM1370HPM	KC7315	2057426	MTFNL12CA16	
1996185	F6AV1600AWX45	KC637M				2047396	KSEM1380HPM	KC7315	2071739	MSSSL12CA12	
1996186	F8AV2000AWX45	KC637M	2032259	12748600900		2047397	KSEM1389HPM	KC7315	2071758	MSSSL10CA09	
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1996188	F8AV2500ADL45	KC637M	2033774	63A03RPP09B15CM		2047399	KSEM1420HPM	KC7315	2074429	MTFNR16CA16	
1996211	F4AL0300AWL30L040	KC637M	2033852	360.660		2047400	KSEM1429HPM	KC7315	2074430	MSKNR16CA12	
1996212	F4AL0300AWM30L040	KC637M	2033863	360.661		2047401	KSEM1440HPM	KC7315	2074432	MSRNR16CA12	
1996213	F4AL0400AWL30L050	KC637M	2033865	360.663		2047403	KSEM1468HPM	KC7315	2074433	MCFNR16CA12	
1996214	F4AL0400AWM30L050	KC637M	2033866	360.664		2047404	KSEM1480HPM	KC7315	2074904	MTSLNR12CA12	
1996215	F4AL0500AWL30L060	KC637M	2033867	360.665		2047405	KSEM1508HPM	KC7315	2077947	MCLNL12CA12	
1996216	F4AL0500AWM30L060	KC637M	2033868	360.666		2047406	KSEM1530HPM	KC7315	2078231	MSRNR12CA12	
1996217	F4AL0600AWL30L080	KC637M	2033869	360.667		2047408	KSEM1550HPM	KC7315	2078236	MTFNR12CA16	
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1996219	F4AL0800AWL30L120	KC637M	2033871	360.669		2047410	KSEM1580HPM	KC7315	2114011	MSKNR10CA09	
1996220	F4AL0800AWX30L120	KC637M	2033872	360.670		2047411	KSEM1609HPM	KC7315	2114013	MSKNR12CA12	
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1996222	F4AL1000AWX30L150	KC637M	2035319	DFR190R4WD32M		2047413	KSEM1627HPM	KC7315	2114034	CTPFL10CA11	
1996223	F2AL0200AWM20	KC637M	2035688	OPPT07L6AFSNHB	KC725M	2047414	KSEM1667HPM	KC7315	2114041	MTGNR12CA16	
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1996230	F2AL1200AWX20	KC637M	2036604	KSEM3200HPM	KC7315	2047421	KSEM1905HPM	KC7315	2202451	KRBB10SCFPR06135C	
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1996246	F2AT0500AWL20R005	KC637M	2036608	KSEM1600HPM	KC7315	2047425	KSEM2024HPM	KC7315	2203577	B977A12600	KC7315
1996247	F2AT0600AWL20R010	KC637M	2036609	KSEM2600HPM	KC7315	2047426	KSEM2064HPM	KC7315	2203579	B977A07100	KC7315
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1996276	F2AT0200AWM20R003	KC637M	2036704	KSEM2700HPM	KC7315	2047429	KSEM2223HPM	KC7315	2204113	B977F21000	KC7315
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1996279	F2AT0500AWL20R010	KC637M	2036882	KSEM1800HPM	KC7315	2047432	KSEM2350HPM	KC7315	2204393	CBTF150R2WD20N2M	
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1996282	F2AT1000AWL20R020	KC637M	2036905	KSEM3000HPM	KC7315	2047435	KSEM2461HPM	KC7315	2204396	CBTF200R2WD20N2M	
1996283	F2AT1200AWX20R030	KC637M	2036906								

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2204403	CBTF350R2WD32N3M	J98	2227162	SPHX15T6PCSRGP KCPK30	S83	2244891	CNMG150402MS KC5010	B79	2245742	SPHX070306R20 KC7215	J99
2204404	CBTF380R2WD32N3M	J98	2227164	SPHX15T6ZCERGP KCPK30	S80	2244892	CNMG150412MS KC5010	B79	2245833	SPHX070308R20 KC7215	J99
2204405	CBTF180R2WD20N2M	J98	2227165	SPHX15T6ZCSRGP KCPK30	S80	2244893	CNMG150604MS KC5010	B79	2245834	SPHX070312R20 KC7215	J99
2204406	CBTF230R2WD20N2M	J98	2227264	B977F08200 KC7315	G144	2244894	CNMG150608MS KC5010	B79	2245836	SPHX090312R20 KC7215	J99
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2204408	CBTF240R2WD20N3M	J98	2227374	OFK07L6AFENGB KC520M	S55	2244897	CNMG120412MS KC5010	B99	2245839	SPHX120410R20 KC7215	J99
2204409	CBTF270R2WD20N3M	J98	2227380	OFK07L6AFSNHB KC520M	S55	2244901	CNMG160402MS KC5010	B126	2245840	SPHX120416R20 KC7215	J99
2209877	B976F05100 KC7315	G143	2227984	B976A12800 KC7315	G141	2244902	CNMG160404MS KC5010	B126	2245841	SPHX120420R20 KC7215	J99
2210084	LINEQ1245R04 KCPK30	U20	2228362	B977A05900 KC7315	G139	2244903	CNMG160408MS KC5010	B126	2245843	SPHX150512R20 KC7215	J99
2210086	LINEU1245R04 KCPK30	U19	2229054	B977A19200 KC7315	G142	2244904	CNMG220404MS KC5010	B126	2245844	SPHX150516R20 KC7215	J99
2210095	SDET1204PDSRGP KCPK30	T105, T112, U51	2229055	B966A10800 KC7315	G133	2244905	CNMG220408MS KC5010	B126	2245845	SPHX150520R20 KC7215	J99
2210766	OFPT07L6AFSNHB KCPK30	S55	2229138	B977A13300 KC7315	G141	2244910	CNMG160401MS KC5010	B146	2245846	SPHX06202R21 KC7215	J100
2210767	OFPT07L6AFENGB KCPK30	S55	2229285	THW3M	U27-35, U40-49	2244911	CNMG160402MS KC5010	B146	2245847	SPHX06206R21 KC7215	J100
2210826	40A02RP90BG15CM	S143	2229362	B256A16000 KC7315	G63	2244912	CNMG160408MS KC5010	B146	2245848	SPHX06208R21 KC7215	J100
2210827	50A03RP90BG15CM	S143	2229364	B256A13500 KC7315	G63	2244913	CNMG220404MS KC5010	B146	2245849	SPHX070306R21 KC7215	J100
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2210829	100B04RP90BG15CM	S143	2229366	B256A14000 KC7315	G63	2244916	CNMG080402MS KC5010	B158	2245853	SPHX090310R21 KC7215	J100
2210830	125B05RP90BG15CM	S143	2229393	B256A08800 KC7315	G63	2244917	CNMG080404MS KC5010	B158	2245854	SPHX090312R21 KC7215	J100
2210831	160C06RP90BG15CM	S143	2229412	OFK07L6AFSNHB KCPK30	S55	2244918	CNMG080408MS KC5010	B158	2245855	SPHX090316R21 KC7215	J100
2212773	OFK07L6AFSNHB KC522M	S55	2229543	OFK07L6AFENGB KC522M	S55	2244919	CNMG120412MS KC5025	B52	2245856	SPHX120408R21 KC7215	J100
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2213700	B966A04300 KC7315	G132	2229549	CNMG120404FS KC5025	B46	2244922	CNMG160612MS KC5025	B52	2245859	SPHX120420R21 KC7215	J100
2213701	B966A04400 KC7315	G132	2229550	CNMG120408FS KC5010	B46	2244923	CNMG190608MS KC5025	B52	2245860	SPHX070310R20 KC7215	J99
2213726	B977F05300 KC7315	G143	2229551	CNMG120408FS KC5025	B46	2244924	CNMG190612MS KC5025	B52	2245861	SPHX120412R20 KC7215	J100
2213842	193.409	S53, V153	2229552	DNGG150402FS KC5010	B74	2244929	CNMG150604MS KC5025	B79	2245862	SPHX120412R21 KC7215	J99
2213947	WNMG060408RP KC5010	B159	2229644	DNGG150404FS KC5010	B74	2244930	CNMG150608MS KC5025	B79	2245972	HNEN090508MSN KY3500	S92, S98
2213962	COMT120412MF KC5025	B177	2229645	DNGG150404FS KC5025	B74	2244931	CNMG150612MS KC5025	B79	2246044	A4G0605M06U08GMP KC5025	C95
2214237	B978A15200 KC7315	G148	2229646	DNGG150408FS KC5010	B74	2244932	CNMG160408MS KC5025	B99	2246045	A4G0605M06U08GMP KC5010	C95
2214926	B966A11300 KC7315	G133	2229648	CNMG120402MS KC5010	B52	2244936	CNMG190612MS KC5025	B126	2246047	TPM01000M06P08GMP KC5025	C95
2215328	B976F05200 KC7315	G143	2229649	CNMG120402MS KC5025	B52	2244937	CNMG160402MS KC5025	B126	2246074	A4G0605M06U08GMP KC5025	C95
2217005	B966A07700 KC7315	G133	2229651	CNMG120401MS KC5010	B52	2244938	CNMG160404MS KC5025	B126	2246074	TPM110204LF KC5025	B255
2217646	NTB3L12B KC5010	D20	2229652	CNMG120401MS KC5025	B52	2244939	CNMG160408MS KC5025	B126	2246494	SECT1404AEFNLC K0410M	S42
2217647	NTB3R12B KC5010	D20	2229654	CNMG120404MS K313	B52	2244940	CNMG220404MS KC5025	B126	2248306	B966A14300 KC7315	G134
2217898	B976A13300 KC7315	G141	2229654	CNMG120404MS KC5010	B52	2244941	CNMG220408MS KC5025	B126	2248735	420.104	S68
2218437	SNHX1103T KCPK30	U14	2229655	CNMG120404MS KC5025	B52	2244943	CNMG270608MS KC5025	B126	2248993	50HC030M	G85
2218492	B977A09200 KC7315	G140	2229656	CNMG120408MS K313	B52	2244947	CNMG160402MS KC5025	B146	2248994	50HC050M	G85
2219248	B977F06200 KC7315	G144	2229657	CNMG120408MS KC5010	B52	2244948	CNMG160408MS KC5025	B146	2248995	75HC030M	G85
2220306	LINEQ1245R04 KCK15	U20	2229659	CNMG120408MS KC5025	B52	2244950	CNMG220408MS KC5025	B146	2248996	75HC040M	G85
2220307	LINEQ1250R04 KCK15	U20	2229660	CNMG120408MS KC5025	B79	2244953	CNMG080404MS KC5025	B158	2248997	75HC050M	G85
2220308	LINEQ1255R04 KCK15	U20	2229661	DNMG150404MS KC5010	B79	2244954	CNMG080408MS KC5025	B158	2249180	B978A090700 KC7315	G147
2220309	LINEQ1260R04 KCK15	U20	2229662	CNMG150404MS KC5025	B79	2244955	CNMG120412MS K313	B52	2250771	CNMG120401FS KC5010	B46
2220334	SPGN090308 KCK15	B169	2229663	CNMG150408MS K313	B79	2244958	CNMG160612MS K313	B52	2250772	CNMG120402FS KC5010	B46
2220598	F3AH0050AWS30 K0635M	P164	2229694	CNMG150408MS KC5010	B79	2244959	CNMG150604MS K313	B79	2250775	DNGG110402FS KC5010	B74
2220599	F3AH0060AWS30 K0635M	P164	2229695	CNMG150408MS KC5025	B79	2244966	CNMG150608MS K313	B79	2250784	TNMG160404FS KC5010	B122
2220600	F3AH0080AWS30 K0635M	P164	2229696	CNMG160404MS KC5010	B146	2244971	CNMG220408MS K313	B126	2250789	VNMG160402FS KC5010	B143
2220601	F3AH0100AWS30 K0635M	P164	2229697	CNMG160404MS KC5025	B146	2244981	CNMG270616MS K313	B126	2250790	VNMG160404FS KC5010	B143
2220602	F3AH0120AWS30 K0635M	P164	2230052	B978F12000 KC7315	G149	2244983	CNMG160402MS K313	B146	2250791	VNMG160408FS KC5010	B143
2220633	F3AH0150AWS30 K0635M	P164	2230406	B977A14200 KC7315	G141	2244984	CNMG160408MS K313	B146	2250809	TNMG160402FS KC5025	B122
2220651	F3AH0200AWS30 K0635M	P164	2230539	B977A06700 KC7315	G139	2244989	CNMG080404MS K313	B158	2250810	VNMG160404FS KC5025	B122
2220652	F3AH0250AWS30 K0635M	P164	2231579	B966A07200 KC7315	G133	2244990	CNMG080408MS K313	B158	2250816	VNMG160404FS KC5025	B143
2220653	F3AH0300AWS30 K0635M	P164	2231776	B976A06600 KC7315	G139	2245036	CNMG220432RP KC5010	B128	2250817	VNMG160408FS KC5025	B143
2220714	MDHX1004ZDERGD KC520M	S69	2231777	B976A08300 KC7315	G140	2245067	TNMG270612RP KC5010	B128	2250824	B966A05200 KC7315	G132
2220855	B966A06100 KC7315	G132	2231778	B976A09600 KC7315	G140	2245045	CNMG120408RP KC5025	B53	2251337	B977F09100 KC7315	G144
2220856	B966A06600 KC7315	G133	2231830	B966A12300 KC7315	G134	2245046	CNMG120412RP KC5025	B53	2251340	B977F10100 KC7315	G144
2220857	B966A14800 KC7315	G134	2233364	B977A16600 KC7315	G142	2245048	CNMG160616MS KC5025	B53	2251521	SSP025018M	B66, B105-106
2221944	OFPT07L6AFENGB KCK15	S55	2234423	OFK07L6AFENGB KCPK30	S55	2245049	CNMG160612RP KC5025	B53	2251639	B977A13800 KC7315	G141
2221945	OFPT07L6AFSNHB KCK15	S55	2234816	A4C0405N0CF02 KC5025	C102	2245050	CNMG160616RP KC5025	B53	2251799	B966F05300 KC7315	G135
2222651	B976A08600 KC7315	G140	2234819	A4C0305R10CF02 KC5025	C103	2245051	CNMG190612RP KC5025	B53	2251802	B966F08200 KC7315	G135
2224587	B976A05600 KC7315	G139	2234821	A4C0405R10CF02 KC5025	C103	2245053	CNMG150408RP KC5025	B81	2252989	KSEM1250PCM KC7135	H56
2224588	B976A09100 KC7315	G140	2234823	A4R0305M03U00GMIN KC5025	C97	2245056	CNMG150608RP KC5025	B81	2252992	KSEM1750PCM KC7135	H56
2226032	VNMG160404MS K313	B146	2234824	A4R0305M03U00GMIN KC5010	C97	2245059	CNMG120408RP KC5025	B101	2253024	KSEM2600PCM KC7135	H56, H87
2226630	B976A14100 KC7315	G141	2234825	A4R0300M03P00GMP KC5025	C96	2245060	CNMG120412RP KC5025	B101	2255896	B978A08800 KC7315	G147
2226662	B977A12900 KC7315	G141	2234826	A4R0300M03P00GMP KC5010	C96	2245063	CNMG190612RP KC5025	B101	2256128	NGP2062R KC5010	C152
2227124	3.90016SNGD KCPK30	U9	2235124	B978A19840 KC7315	G148	2245064	CNMG190616RP KC5025	B101	2256252	B966A09900 KC7315	G133
2227125	3.90016SNGD KCPK30	U9	2235210	A4R0300M03P00GMP K313	C96	2245065	CNMG160408RP KC5025	B128	2256916	B966A04700 KC7315	G132
2227126	3.90022SNGD KCPK30	U9	2236065	B977A08400 KC7315	G140	2245066	CNMG160412RP KC5025	B128	2256918	B977A10800 KC7315	G141
2227127	3.90022SNGD KCPK30	U9	2236620	DCMT11T308FW K315	B207	2245077	CNMG220408RP KC5025	B128	2257597	TNMG220408RP KC7315	G63
2227128	3.90030SNGD KCPK30	U9	2239685	DCMT11T304FW KC5010	B207	2245074	CNMG160408RP KC5025	B147	2257646	B256A09500 KC7315	G63
2227129	3.90030SNGD KCPK30	U9	2240351	B977A10300 KC7315	G140	2245076	CNMG080408RP KC5025	B159	2258040	KTIPO80R55S10M	H31

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2262960W14U27-28, U30, U32-34	2264958B966F09100 KC7315G135	2273104DCLNR3232P16KC06B60	2383587SPCT10T312PPERLD2 KC725MT100, U36
2262961W16U29, U31, U35	2264970B978A06300 KC7315G146	2273095DCRNR3225P12KC04B60	2383588SPCT10T312PPERLD2 KC725MT100, U36
2262962W18U40-42, U44, U46, U48	2264971B978A06400 KC7315G146	2273097DCRNR3232P19KC06B60	2383589SPCT10T316ENLD2 KC725MT100, U36
2262963W20U43, U45, U47, U49	2264972B978A06700 KC7315G146	2273099DCLNL4040S19KC06B60	2383590SPCT10T320ENLD2 KC725MT100, U36
2262964CP1416U27-35	2264973B966F05100 KC7315G135	2273101DCSNR2020K12KC04B60	2383591SDCT120404PDFRLE KC410MT103, T110, U50, U51
2262965CP1820U40-49	2264976B976F06300 KC7315G144	2273102DCSNR2525M12KC04B60	2383592SDCT120404PDFRLE KC410MT103, T110, U50, U51
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2263090A4SML3225P0626C113	2264978B976F07100 KC7315G144	2273105DDJNR2020K11KC04B85	2383594SDCT120404PDFRLE KC410MT103, T110, U50, U51
2263091A4SMR3225P0826C112	2264981B977F04100 KC7315G143	2273106DDJNR2525M11KC04B85	2383595SDCT120412PDFRLE KC410MT103, T110, U50, U51
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2263198A40TA4EML0616MC119	2264990B966F06700 KC7315G135	2273139DSDNR3232P19KC06B105	2383600SDCT120424FNLE KC410MT103, T110, U50, U51
2263299MS1490C37-40, C44-45, C112-113, D32	2264996B976F05600 KC7315G143	2273156DSSNR3225P12KC04B107	2383601SDCT120424FNLE KC410MT103, T110, U50, U51
2263361A4G0605M06U04GMM KC5010C96	2265002B966F06300 KC7315G135	2273318B966A03100 KC7315G132	2383602SDCT120424FNLE KC410MT103, T110, U50, U51
2263362A4G0605M06U04GMM KC5025C96	2265003B966F07300 KC7315G135	2273321B966A09200 KC7315G133	2383603SDCT120424FNLE KC410MT103, T110, U50, U51
2263373A4G0605M06U08GMM KT315C96	2265006B966F05600 KC7315G135	2273388EDPT180548PDERGD KC725MT74	2383604SDCT120424FNLE KC410MT103, T110, U50, U51
2263374A4G0605M06U08GMM KC5010C96	2265008B977F06400 KC7315G144	2273392DTFNR2020K16KC04B132	2383605SDCT120424FNLE KC410MT103, T110, U50, U51
2263375A4G0605M06U08GMM KC5025C96	2265022B966F07100 KC7315G135	2273440DTGNR2020K16KC04B132	2383606SDCT120424FNLE KC410MT103, T110, U50, U51
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2384522	STN1627UNI KC635M	W44	2390275	SPET10T3PPERGB2 KCPK30	T100, U37	2393422	STN1118UNE KC635M	W44	2404433	B978A1700 KC7315	G147
2384524	STN1632UNI KC635M	W44	2390276	SPET10T3PPERGB2 KC520M	T100, U37	2393667	STN1624UNE KC635M	W44	2404438	B966A06300 KC7315	G133
2385356	B976A05100 KC7315	G139	2390277	SPET10T3PPSRGB2 KC725M	T100, U37	2393668	STN1620UNE KC635M	W44	2404444	STN10075ISOI KC635M	W45
2385527	F2AL0050AWS30L050 KC637M	P166	2390278	SPET10T3PPSRGB2 KCK15	T100, U37	2393670	STN1616UNE KC635M	W44	2404445	STN10100ISOI KC635M	W45
2385528	F2AL0060AWS30L060 KC637M	P166	2390279	SPET10T3PPSRGB2 KCPK30	T100, U37	2393671	STN1614UNE KC635M	W44	2404446	STN10125ISOI KC635M	W45
2385529	F2AL0080AWS30L080 KC637M	P166	2390280	SPET10T3PPSRGB2 KC520M	T100, U37	2396971	B977A04900 KC7315	G139	2404447	STN10150ISOI KC635M	W45
2385530	F2AL0100AWS30L100 KC637M	P166	2390281	SDET1204PDELGB2 KC520M	T104, T111, U52	2397289	B976A17100 KC7315	G142	2404449	STN11100ISOI KC635M	W45
2385531	F2AL0120AWS30L120 KC637M	P166	2390282	SDET1204PDELGB2 KCK15	T104, T111, U52	2397687	B976A04900 KC7315	G139	2404451	STN11150ISOI KC635M	W45
2385532	F2AL0150AWS30L150 KC637M	P166	2390283	SDET1204PDELGB2 KCPK30	T104, T111, U52	2397688	B976A07900 KC7315	G140	2404454	STN16100ISOI KC635M	W45
2385533	F2AL0160AWS30L160 KC637M	P166	2390284	SDET1204PDELGB2 KC725M	T104, T111, U52	2397765	KLM68L25IP	B59-60, B105	2404456	STN16150ISOI KC635M	W45
2385534	F2AL0180AWS30L180 KC637M	P166	2390285	SDET1204PDERGB2 KC520M	T104, T111, U52	2397767	KMSP625IP	B59-60, B105	2404457	STN16175ISOI KC635M	W45
2385535	F2AL0200AWS30L200 KC637M	P166	2390286	SDET1204PDERGB2 KCK15	T104, T111, U52	2398751	A4M50R0314B036048	C127	2404458	STN16200ISOI KC635M	W45
2385536	F2AL0250AWS30L250 KC637M	P166	2390287	SDET1204PDERGB2 KCPK30	T104, T111, U52	2398752	A4M50R0314B042058	C127	2404472	MDHX1004ZDERGD4W K110M	S69
2385537	F2AL0300AWS30L300 KC637M	P166	2390288	SDET1204PDERGB2 KC725M	T104, T111, U52	2398753	A4M50R0314B052074	C127	2404707	ADG0305M30U02B KC5025	C98
2385538	F2AL0400AWS30L400 KC637M	P166	2390289	SDET1204PDSRGB2 KC520M	T104, T111, U52	2398754	A4M50R0314B068100	C127	2404708	A4G0405M04U04B KC5025	C98
2385539	F2AL0600AWS30L600 KC637M	P166	2390290	SDET1204PDSRGB2 KCK15	T104, T111, U52	2398755	A4M50R0314B090160	C127	2404943	MDHX1004ZDERGD K110M	S69
2385540	F2AH0030AWS30L040 KC637M	P162-163	2390291	SDET1204PDSRGB2 KCPK30	T104, T111, U52	2398756	A4M50R0314B130300	C127	2404944	MDHX1004ZDERGD KTPK20	S69
2385541	F2AH0050AWS30L070 KC637M	P162-163	2390292	SDET1204PDSRGB2 KC520M	T104, T111, U52	2398757	A4M50R0314B290999	C127	2404945	F3AA1000AWL45R050 K600	P122
2385542	F2AH0100AWS30L150 KC637M	P162-163	2390293	SDET1204PDSRGB2 KC725M	T104, T111, U52	2398758	A4M50L0314B036048	C128	2404946	F3AA1200AWL45R050 K600	P122
2385543	F2AH0150AWS30L230 KC637M	P162-163	2390294	SDET120412PDELGB2 KC520M	T104, T111, U52	2398759	A4M50L0314B042058	C128	2404947	F3AA1600AWX45R050 K600	P122
2385544	F2AH0160AWS30L240 KC637M	P162-163	2390295	SDET120412PDELGB2 KCK15	T104, T111, U52	2398760	A4M50L0314B052074	C128	2404948	F3AA2000AWX45R050 K600	P122
2385545	F2AH0180AWS30L270 KC637M	P162-163	2390296	SDET120412PDELGB2 KCPK30	T104, T111, U52	2398761	A4M50L0314B068100	C128	2404949	F3AA2500AWX45R050 K600	P122
2385546	F2AH0200AWS30L300 KC637M	P162-163	2390297	SDET120412PDERGB2 KC520M	T104, T111, U52	2398762	A4M50R0314B090160	C128	2404950	F3AA1000AWL45R100 K600	P122
2385547	F2AH0250AWS30L370 KC637M	P162-163	2390298	SDET120412PDERGB2 KCK15	T104, T111, U52	2398763	A4M50R0314B130300	C128	2404951	F3AA1200AWL45R100 K600	P122
2385548	F2AH0300AWS30L450 KC637M	P162-163	2390299	SDET120412PDERGB2 KCPK30	T104, T111, U52	2398764	A4M50L0314B290999	C128	2404952	F3AA1600AWX45R100 K600	P122
2385549	F2AH0400AWS30L600 KC637M	P162-163	2390300	SDET120412PDERGB2 KC725M	T104, T111, U52	2398765	A4M50R0414B048072	C127	2404953	F3AA1600AWX45R100 K600	P122
2385550	F2AH0030AWS30L040 KC637M	P162-163	2390301	SDET120412PDERGB2 KCK15	T104, T111, U52	2398766	A4M50R0414B064100	C127	2405161	KTIPO80R3SCF12M	H32
2385551	F2AH0050AWS30L070 KC637M	P162-163	2390302	SDET120412PDERGB2 KCPK30	T104, T111, U52	2398767	A4M50R0414B064100	C127	2405162	KTIPO85R3SCF12M	H32
2385552	F2AH0100AWS30L150 KC637M	P162-163	2390303	SDET120412PDERGB2 KC520M	T104, T111, U52	2398768	A4M50R0414B092150	C127	2405203	KTIPO90R3SCF12M	H32
2385553	F2AH0150AWS30L230 KC637M	P162-163	2390304	SDET120412PDERGB2 KCK15	T104, T111, U52	2398769	A4M50R0414B132300	C127	2405204	KTIPO95R3SCF12M	H32
2385554	F2AH0160AWS30L240 KC637M	P162-163	2390305	SDET120412PDERGB2 KCPK30	T104, T111, U52	2398770	A4M50R0414B290999	C127	2405205	KTIPI00R3SCF16M	H32
2385555	F2AH0180AWS30L270 KC637M	P162-163	2390306	SDET120412PDERGB2 KC520M	T104, T111, U52	2398771	A4M50L0414B048072	C128	2405206	KTIPI05R3SCF16M	H32
2385556	F2AH0200AWS30L300 KC637M	P162-163	2390307	SDET120412PDERGB2 KCK15	T104, T111, U52	2398772	A4M50L0414B064100	C128	2405207	KTIPI10R3SCF16M	H32
2385557	F2AH0250AWS30L370 KC637M	P162-163	2390308	SDET120412PDERGB2 KCPK30	T104, T111, U52	2398773	A4M50L0414B092150	C128	2405208	KTIPI15R3SCF16M	H32
2385558	F2AH0300AWS30L450 KC637M	P162-163	2390309	SDET120412PDERGB2 KC520M	T104, T111, U52	2398774	A4M50L0414B132300	C128	2405209	KTIPI20R3SCF16M	H32
2385559	F2AH0400AWS30L600 KC637M	P162-163	2390310	SDET120412PDERGB2 KCK15	T104, T111, U52	2398775	A4M50L0414B290999	C128	2405210	KTIPI25R3SCF16M	H32
2385560	F2AH0030AWS30L040 KC637M	P162-163	2390311	SDET120412PDERGB2 KCPK30	T104, T111, U52	2398776	A4M50R0519B058094	C127	2405211	KTIPI30R3SCF16M	H32
2385561	F2AH0050AWS30L070 KC637M	P162-163	2390312	SDET120412PDERGB2 KC520M	T104, T111, U52	2398777	A4M50R0519B080136	C127	2405212	KTIPI35R3SCF16M	H32
2385562	F2AH0100AWS30L150 KC637M	P162-163	2390313	SDET120412PDERGB2 KCK15	T104, T111, U52	2398778	A4M50R0519B120300	C127	2405213	KTIPI40R3SCF16M	H32
2385563	F2AH0150AWS30L230 KC637M	P162-163	2390314	SDET120412PDERGB2 KCPK30	T104, T111, U52	2398779	A4M50R0519B250999	C127	2405214	KTIPI45R3SCF16M	H32
2385564	F2AH0160AWS30L240 KC637M	P162-163	2390315	SDET120412PDERGB2 KC520M	T104, T111, U52	2398780	A4M50L0519B058094	C128	2405215	KTIPI50R3SCF20M	H32
2385565	F2AH0180AWS30L270 KC637M	P162-163	2390316	SDET120412PDERGB2 KCK15	T104, T111, U52	2398781	A4M50L0519B080136	C128	2405216	KTIPI60R3SCF20M	H32
2385566	F2AH0200AWS30L300 KC637M	P162-163	2390317	SDET120412PDERGB2 KCPK30	T104, T111, U52	2398782	A4M50L0519B120300	C128	2405217	KTIPI65R3SCF20M	H32
2385567	F2AH0250AWS30L370 KC637M	P162-163	2390318	SDET120412PDERGB2 KC520M	T104, T111, U52	2398783	A4M50R0519B250999	C128	2405218	KTIPI70R3SCF20M	H32
2385568	F2AH0300AWS30L450 KC637M	P162-163	2390319	SDET120412PDERGB2 KCK15	T104, T111, U52	2398784	A4M50R0519B250999	C128	2405219	KTIPI75R3SCF20M	H32
2385569	F2AH0400AWS30L600 KC637M	P162-163	2390320	SDET120412PDERGB2 KCPK30	T104, T111, U52	2398785	A4M50R0519B250999	C128	2405220	KTIPI80R3SCF20M	H32
2385570	F2AH0030AWS30L040 KC637M	P162-163	2390321	SDET120412PDERGB2 KC520M	T104, T111, U52	2398786	A4M50R0519B250999	C128	2405221	KTIPI85R3SCF20M	H32
2385571	F2AH0050AWS30L070 KC637M	P162-163	2390322	SDET120412PDERGB2 KCK15	T104, T111, U52	2398787	A4M50R0519B250999	C128	2405222	KTIPI90R3SCF20M	H32
2385572	F2AH0100AWS30L150 KC637M	P162-163	2390323	SDET120412PDERGB2 KCPK30	T104, T111, U52	2398788	A4M50R0519B250999	C128	2405223	KTIPI95R3SCF20M	H32
2385573	F2AH0150AWS30L230 KC637M	P162-163	2390324	SDET120412PDERGB2 KC520M	T104, T111, U52	2398789	A4M50R0519B250999	C128	2405224	KTIPI00R5SS10M	H31
2385574	F2AH0160AWS30L240 KC637M	P162-163	2390325	SDET120412PDERGB2 KCK15	T104, T111, U52	2398790	A4M50R0519B250999	C128	2405225	KTIPI05R5SS10M	H31
2385575	F2AH0180AWS30L270 KC637M	P162-163	2390326	SDET120412PDERGB2 KCPK30	T104, T111, U52	2398791	A4M50R0519B250999	C128	2405226	KTIPI10R5SS12M	H31
2385576	F2AH0200AWS30L300 KC637M	P162-163	2390327	SDET120412PDERGB2 KC520M	T104, T111, U52	2398792	A4M50R0519B250999	C128	2405227	KTIPI15R5SS12M	H31
2385577	F2AH0250AWS30L370 KC637M	P162-163	2390328	SDET120412PDERGB2 KCK15	T104, T111, U52	2398793	A4M50R0519B250999	C128	2405228	KTIPI20R5SS14M	H31
2385578	F2AH0300AWS30L450 KC637M	P162-163	2390329	SDET120412PDERGB2 KCPK30	T104, T111, U52	2398794	A4M50R0519B250999	C128	2405229	KTIPI25R5SS14M	H31
2385579	F2AH0400AWS30L600 KC637M	P162-163	2390330	SDET120412PDERGB2 KC520M	T104, T111, U52	2398795	A4M50R0519B250999	C128	2405230	KTIPI30R5SS14M	H31
2385580	F2AH0030AWS30L040 KC637M	P162-163	2390331	SDET120412PDERGB2 KCK15	T104, T111, U52	2398796	A4M50R0519B250999	C128	2405231	KTIPI35R5SS14M	H31
2385581	F2AH0050AWS30L070 KC637M	P162-163	2390332	SDET120412PDERGB2 KCPK30	T104, T111, U52	2398797	A4M50R0519B250999	C128	2405232	KTIPI40R5SS16M	H31
2385582	F2AH0100AWS30L150 KC637M	P162-163	2390333	SDET120412PDERGB2 KC520M	T104, T111, U52	2398798	A4M50R0519B250999	C128	2405233	KTIPI45R5SS16M	H31
2385583	F2AH0150AWS30L230 KC637M	P162-163	2390334	SDET120412PDERGB2 KCK15	T104, T111, U52	2398799	A4M50R0519B250999	C128	2405234	KTIPI50R5SS16M	H31
2385584	F2AH0160AWS30L240 KC637M	P162-163	2390335	SDET120412PDERGB2 KCPK30	T104, T111, U52	2398800	A4M50R0519B250999	C128	2405235	KTIPI55R5SS16M	H31
2385585	F2AH0180AWS30L270 KC637M	P162-163	2390336	SDET120412PDERGB2 KC520M	T104, T111, U52	2398801	A4M50R0519B250999	C128	2405236	KTIPI60R5SS16M	H31
2385586	F2AH0200AWS30L300 KC637M	P162-163	2390337	SDET120412PDERGB2 KCK15	T104, T111, U52	2398802	A4M50R0519B2				

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2405387	SDPT1204PDRGB2 KC725M	T105, T112, U52	2425324	B977A06300 KC7315	G139	2429571	STN1614NPTF KC635M	W46	2435325	DNMG150608P KC5010	B81
2405388	SDPT1204PDRGB2 KCK15	T105, T112, U52	2425325	B977A06600 KC7315	G139	2429572	STN16115NPTF KC635M	W46	2436719	B978A11300 KC7315	G147
2405389	SDPT1204PDRGB2 KCPK30	T105, T112, U52	2425326	B977A07300 KC7315	G140	2429575	STN1614NPS KC635M	W46	2436798	B978A16200 KC7315	G148
2405616	KSEM3200PCM KC7135	H56, H87	2425328	B977A07900 KC7315	G140	2429576	STN16115NPS KC635M	W46	2438407	NG3125R KC5010	C154
2405618	KSEM4000PCM KC7135	H56, H87	2425330	B977A07600 KC7315	G140	2429582	STN1119BSW KC635M	W46	2438408	NG3125R KC5025	C154
2406113	F3AA2000AWX45R100 K600	P122	2425331	B977A08600 KC7315	G140	2429587	STN1614BSW KC635M	W46	2438663	BGHX15L5PCERGGTM KD1410	S148
2406114	F3AA2500AWX45R100 K600	P122	2425332	B977A09100 KC7315	G140	2429588	STN1612BSW KC635M	W46	2438664	BGHX15L5SPCTRHT KD1410	S148
2406115	F3AA1000AWL45R200 K600	P122	2425344	B977A09600 KC7315	G140	2429589	STN1611BSW KC635M	W46	2438665	BGHX15L504ERGET KD1415	S149
2406116	F3AA1200AWL45R200 K600	P122	2425380	B977A12400 KC7315	G141	2429593	STN2711BSW KC635M	W46	2439073	TRAIR2525M04	E65
2406117	F3AA1600AWX45R200 K600	P122	2425381	B977A11400 KC7315	G141	2429600	514.111	B138	2439075	TRAIR2525M06	E65
2406118	F3AA2000AWX45R200 K600	P122	2425455	B977A10400 KC7315	G140	2429601	514.112	B142, B165	2439076	TRAIL2525M06	E65
2406119	F3AA2500AWX45R200 K600	P122	2425456	B977A11300 KC7315	G141	2429602	514.118	B87-88, B111, B113, B135, B138, B163	2439077	TRAIL2525P06	E65
2406120	F3AA1000AWL45R400 K600	P122	2425457	B977A10900 KC7315	G141	2429633	514.122	B68, B73, B114, B120-121	2439399	DVJNR2020K16KC04	B149
2406121	F3AA1200AWL45R400 K600	P122	2425659	CCMT060202LF KC5025	B177	2429634	514.123	B64-66, B68-69, B73, B111-113, B135, B138, B163, B165	2439400	DVJNL2020K16KC04	B149
2406122	F3AA1600AWX45R400 K600	P122	2425660	CCMT060204LF KC5025	B177	2429635	514.124	B114	2439402	DVJNL2525M16KC04	B149
2406123	F3AA2000AWX45R400 K600	P122	2425773	CCMT091304LF KC5025	B177	2429636	514.125	B64-65, B68, B111-113	2439443	DVJNR3225P16KC04	B149
2406124	F3AA2500AWX45R400 K600	P122	2425775	CCMT120404LF KC5025	B177	2429637	514.128	B87-88, B91	2439449	DVONR2020K16KC04	B150
2407294	B977A10100 KC7315	G140	2425779	CPMT050204LF KC5025	B190	2429638	514.133	B64-66, B111-113	2439450	DVONL2020K16KC04	B150
2407297	B977A07700 KC7315	G147	2425780	CPMT060202LF KC5025	B190	2429639	514.138	B111	2439451	DVONR2525M16KC04	B150
2408209	B977A09400 KC7315	G140	2425781	CPMT060204LF KC5025	B190	2429642	F3AA1000AWL45R300 K600	P122	2439452	DVONL2525M16KC04	B150
2408266	B966A03400 KC7315	G132	2425782	CPMT060208LF KC5025	B190	2429643	F3AA1200AWL45R300 K600	P122	2439453	DVONR3225P16KC04	B150
2408308	B977A09300 KC7315	G140	2425784	CPMT091304LF KC5025	B190	2429673	F3AA1200AWL45R300 K600	P122	2439454	DVONR3225P16KC04	B150
2414136	A4ENN2020K0305	C118	2425785	CPMT091308LF KC5025	B190	2429674	F3AA1600AWX45R300 K600	P122	2439455	DVNN2020K16KC04	B150
2414137	A4ENN2525M0305	C118	2425786	DCMT070202LF KC5025	B207	2429675	F3AA2000AWX45R300 K600	P122	2439456	DVNN2525M16KC04	B150
2416198	B977A16400 KC7315	G142	2425788	DCMT150404LF KC5025	B207	2429676	F3AA2500AWX45R300 K600	P122	2439470	DWLN2020K06KC04	B161
2416279	B977A04100 KC7315	G138	2425789	DCMT150408LF KC5025	B207	2429851	CNMG120408CT KC5010	B48	2439471	DWLN2020K08KC04	B161
2417183	50A05RS90ED18D	T72	2425790	DPMT070202LF KC5025	B215	2429979	DNMG150404CT KC5010	B76	2439472	DWLN2020K08KC04	B161
2417184	80A07RS90ED18D	T72	2425791	DPMT070204LF KC5025	B215	2429985	DNMG150408CT KC5010	B76	2439476	DWLN2020K06KC04	B161
2417185	50A04RS90ED18D	T72	2425793	DPMT111304LF KC5025	B215	2430006	DNMG150612CT KC5010	B76	2440526	KTIP08RS85M10	H31
2417186	63A05RS90ED18D	T72	2425794	DPMT111308LF KC5025	B215	2430467	F2AA1000AWL45R050 K600	P120	2440527	KTIP160R85S18M	H31
2417187	80A06RS90ED18D	T72	2425795	SCMT091304LF KC5025	B230	2430468	F2AA1200AWL45R050 K600	P120	2441866	A25RDTFNR16KC04	B137
2417188	100A07RS90ED18D	T72	2425796	SCMT091308LF KC5025	B230	2430469	F2AA1600AWX45R050 K600	P120	2441867	A25RDCNLR12KC04	B66
2417189	125B08RS90ED18D	T72	2425798	SCMT120408LF KC5025	B230	2430470	F2AA2000AWX45R050 K600	P120	2441869	A25RDTFNL16KC04	B137
2417190	160C10RS90ED18D	T72	2425800	SPMT091304LF KC5025	B238	2430471	F2AA2500AWX45R050 K600	P120	2441870	A32SDTFNR16KC04	B137
2417191	40A03R050325ED18	B70	2425801	SPMT091308LF KC5025	B238	2430472	F2AA1000AWL45R100 K600	P120	2441916	A32SDVUNR16KC04	B152
2417296	DCLNR1616H09K03	B59	2425802	TCMT110202LF KC5025	B244	2430503	F2AA1200AWL45R100 K600	P120	2441917	F2AA1200AWL45R100 K600	B152
2419790	B977A12300 KC7315	G141	2425803	TCMT110204LF KC5025	B244	2430504	F2AA1600AWX45R100 K600	P120	2441918	A40TDVUNR16KC04	B152
2421384	SSV5T K9	D82, D84-85	2425804	TCMT110208LF KC5025	B244	2430505	F2AA2000AWX45R100 K600	P120	2441919	A40TDVUNR16KC04	B152
2421386	SSA5T	D82, D84-85	2425805	TCMT16T302LF KC5025	B244	2430506	F2AA2500AWX45R100 K600	P120	2441919	A40TDVUNR16KC04	B152
2424997	B967A12500 KC7315	G134	2425806	TCMT16T304LF KC5025	B244	2430507	F2AA1000AWL45R200 K600	P120	2441921	A25RDWLN08KC04	B163
2425000	B967A09000 KC7315	G133	2425807	TCMT16T308LF KC5025	B244	2430508	F2AA1200AWL45R200 K600	P120	2441922	A25RDWLN06KC04	B163
2425052	B967A10800 KC7315	G133	2425807	TCMT16T308LF KC5025	B244	2430509	F2AA1600AWX45R200 K600	P120	2441923	A25RDWLN08KC04	B163
2425073	B967A08500 KC7315	G133	2425809	TCMT220408LF KC5025	B244	2430509	F2AA1600AWX45R200 K600	P120	2441924	A25RDWLN08KC04	B163
2425113	B966A04100 KC7315	G132	2425811	TPMT090204LF KC5025	B255	2430510	F2AA2000AWX45R200 K600	P120	2441925	A32SDWLN08KC04	B163
2425114	B966A04900 KC7315	G132	2425813	TPMT110208LF KC5025	B255	2430511	F2AA2500AWX45R200 K600	P120	2441926	A32SDWLN08KC04	B163
2425115	B966A05400 KC7315	G132	2425814	TPMT16T304LF KC5025	B255	2430512	F2AA1000AWL45R400 K600	P120	2441927	A40TDWLN08KC04	B163
2425117	B966A03600 KC7315	G132	2425815	TPMT16T308LF KC5025	B255	2430513	F2AA1200AWL45R400 K600	P120	2441930	A25RDCNLR12KC04	B66
2425118	B966A07100 KC7315	G133	2425817	TPMT220408LF KC5025	B255	2430514	F2AA1600AWX45R400 K600	P120	2441931	A32SDCLNR12KC04	B66
2425119	B966A07300 KC7315	G133	2425818	VBMT110308LF KC5025	B265	2430515	F2AA2000AWX45R400 K600	P120	2441932	A40TDCLNR12KC04	B66
2425120	B966A07600 KC7315	G133	2425819	VBMT160402LF KC5025	B265	2430516	F2AA2500AWX45R400 K600	P120	2441933	A40TDCLNR12KC04	B66
2425143	B966A08700 KC7315	G133	2425820	WPMTS3T104LF KC5025	B272	2430517	F2AA1000AWL45R300 K600	P120	2441934	A40TDCLNR12KC04	B66
2425145	B966A08900 KC7315	G133	2425821	WPMT040204LF KC5025	B272	2430518	F2AA1200AWL45R300 K600	P120	2441938	A40TDCLNR16KC06	B66
2425146	B966A09100 KC7315	G133	2425825	WCMT06T308LF KC5025	B270	2430519	F2AA1600AWX45R300 K600	P120	2441939	A25RDDUNR11KC04	B90
2425149	B966A09700 KC7315	G133	2425826	CNMG120404RP KC5010	B53	2430520	F2AA2000AWX45R300 K600	P120	2441940	A25RDDUNL11KC04	B90
2425151	B966A10900 KC7315	G133	2425828	CNMG120404RP KC5025	B53	2430521	F2AA2500AWX45R300 K600	P120	2441941	A40TDWLN08KC04	B90
2425173	B966A11100 KC7315	G133	2425841	DNGG150412FS KC5010	B74	2433330	F1AA0200AWS30 K600	P118	2441942	A32SDUNR11KC04	B90
2425176	B966A11900 KC7315	G134	2425843	DCMT070204LF KC5025	B207	2433331	F1AA0300AWS30 K600	P118	2441943	A32SDUNR15KC06	B90
2425203	B966A12400 KC7315	G134	2425844	DCMT11T302LF KC5025	B207	2433332	F1AA0400AWS30 K600	P118	2441946	A32SDUNR15KC06	B90
2425205	B966A12800 KC7315	G134	2425845	DCMT11T304LF KC5025	B207	2433343	F1AA0500AWS30 K600	P118	2441947	A40TDUNR15KC06	B90
2425206	B966A12900 KC7315	G134	2425846	DCMT11T308LF KC5025	B207	2433344	F1AA0600AWS30 K600	P118	2441948	A40TDUNR15KC06	B90
2425233	B966A14200 KC7315	G134	2425847	VBMT160404LF KC5025	B265	2433345	F1AA0800AWM30 K600	P118	2441949	A40TDUNR15KC06	B90
2425285	B977A03000 KC7315	G138	2425848	VBMT160408LF KC5025	B265	2433346	F1AA1000AWM30 K600	P118	2441950	A50DDUNL15KC06	B90
2425288	B977A03100 KC7315	G138	2425863	DNMG110408MS KC5010	B79	2433347	F1AA1200AWM30 K600	P118	2441951	A25RDDQNR11KC04	B89
2425290	B977A03200 KC7315	G138	2425864	DNMG110408MS KC5025	B79	2435131	B967A08000 KC7315	G133	2441952	A25RDDQNR11KC04	B89
2425292	B977A03400 KC7315	G138	2425869	WNMG060408MS KC5010	B158	2435183	WLLNR32CA19S	E55	2441953	A32SDQNR15KC06	B89
2425303	B977A03500 KC7315	G138	2425870	WNMG060408MS KC5025	B158	2435184	WLLNL32CA19S	E55	2441954	A32SDQNL15KC06	B89
2425304	B977A03600 KC7315	G138	2425871	WNMG060408MS K313	B158	2435185	WLLNR32CA30S	E55	2441955	A40TDQNL15KC06	B89
2425305	B977A03700 KC7315	G138	2426878	SDET1204PDSLGB2 KCPK30	T104, T111, U52	2435186	WLLNL32CA30S	E55	2441956	A40TDQNL15KC06	B89
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2443437	125H08NK90SD12N18K	U42	2447535	A16RPTFNR11	B138	2458917	SDETT120416SNGB2 KC520M	T104, T111, U52	2499730	KSEM1350HPGM KC7315	H42
2443438	125H08RK90SD12N18K	U40	2447536	A20SPTFNR11	B138				2499731	KSEM1360HPGM KC7315	H42
2443439	125H08LK90SD12N18K	U41	2447537	A25TPTFNR16	B138	2458918	SDETT120420SNGB2 KCPK30	T104, T111, U52	2499732	KSEM1370HPGM KC7315	H42
2443440	125H08NK90SD12N20K	U43	2447538	A25TPTFNL16	B138				2499733	KSEM1380HPGM KC7315	H42
2443443	125Y08NK90SP10N14K	U34	2447539	A32UPTFNR16	B138				2499735	KSEM1400HPGM KC7315	H42
2443444	125Y08RK90SP10N14K	U32	2449473	KSEM2600HPGM KC7315	H43	2458919	SDETT120420SNGB2 KC725M	T104, T111, U52	2499736	KSEM1410HPGM KC7315	H42
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2443446	125Y08NK90SP10N16K	U35	2449476	KSEM4000HPGM KC7315	H43				2499739	KSEM1440HPGM KC7315	H42
2443449	125Y08NK90SD12N18K	U48	2449518	KSEM2300HPGM KC7315	H42	2458920	SDETT120420SNGB2 KCK15	T104, T111, U52	2499740	KSEM1450HPGM KC7315	H42
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2443453	125Y08RK90SD12N20K	U45	2450343	B707A06000FBG KC7315	G114				2499746	KSEM1530HPGM KC7315	H42
2443454	125Y08LK90SD12N20K	U47	2450344	B707A08000FBG KC7315	G114				2499748	KSEM1550HPGM KC7315	H42
2443455	160H10NK90SP10N14K	U30	2450345	B707A13000FBG KC7315	G115	2458922	SDETT120424SNGB2 KCPK30	T104, T111, U52	2499749	KSEM1650HPGM KC7315	H42
2443456	160H10RK90SD12N18K	U27	2450346	B707A20000FBG KC7315	G115				2499750	KSEM1570HPGM KC7315	H42
2443457	160H10LK90SP10N14K	U28	2450909	KSEM2000HPGM KC7315	H42				2499751	KSEM1580HPGM KC7315	H42
2443458	160H10NK90SP10N16K	U31	2451576	EDCT180508PDERGD KC725M	T74	2458933	SDETT120424SNGB2 KC725M	T104, T111, U52	2499753	KSEM1600HPGM KC7315	H42
2443461	160H10NK90SD12N18K	U42	2451578	EDCT180512PDRFLDJ KC410M	T73				2499755	KSEM1620HPGM KC7315	H42
2443462	160H10RK90SD12N18K	U40	2451579	EDCT180512PDRGD KC725M	T74				2499757	KSEM1650HPGM KC7315	H42
2443463	160H10LK90SD12N18K	U41	2451580	EDCT180524PDRFLDJ KC410M	T73	2458934	SDETT120424SNGB2 KCK15	T104, T111, U52	2499759	KSEM1700HPGM KC7315	H42
2443464	160H10NK90SD12N20K	U43	2451581	EDCT180540PDRFLDJ KC410M	T73				2499763	KSEM1800HPGM KC7315	H42
2443467	160Y10NK90SP10N14K	U34	2451582	EDCT180540PDRDLJ KC522M	T74				2499765	KSEM1850HPGM KC7315	H42
2443468	160Y10RK90SP10N14K	U32	2451684	EDCT180548PDRFLDJ KC410M	T73	2458936	SDETT120432SNGB2 KCPK30	T104, T111, U52	2499767	KSEM1900HPGM KC7315	H42
2443469	160Y10LK90SP10N14K	U33	2451686	EDCT180508PDRFLDJ KC410M	T73				2499771	KSEM1950HPGM KC7315	H42
2443470	160Y10NK90SP10N16K	U35	2452135	OFKTO7L6AFENBG KC725M	S55				2499775	KSEM2100HPGM KC7315	H42
2443473	160Y10NK90SD12N18K	U48	2452136	OFKTO7L6AFSNHB KC725M	S55	2458937	SDETT120432SNGB2 KC725M	T104, T111, U52	2499777	KSEM2150HPGM KC7315	H43
2443475	160Y10LK90SD12N18K	U46	2453684	OFPT06L5AFENBG KC725M	S51				2499779	KSEM2200HPGM KC7315	H43
2443476	160Y10NK90SD12N20K	U49	2453686	OFPT06L5AFSNHB KC725M	S51				2499782	KSEM2250HPGM KC7315	H43
2443479	200J14NK90SP10N14K	U30	2453687	OFKTO6L5AFENBG KC725M	S50	2458938	SDETT120432SNGB2 KCK15	T104, T111, U52	2499784	KSEM2350HPGM KC7315	H43
2443484	200J14LK90SP10N16K	U29	2453688	OFKTO6L5AFSNHB KC725M	S50				2499786	KSEM2400HPGM KC7315	H43
2443485	200J14NK90SD12N18K	U42	2455054	B976A06100 KC7315	G139				2499787	KSEM2450HPGM KC7315	H43
2443488	200J14NK90SD12N20K	U43	2455056	B976A07300 KC7315	G140	2458939	SDETT120432SNGB2 KC520M	T104, T111, U52	2499789	KSEM2500HPGM KC7315	H43
2443491	200Y14NK90SP10N14K	U34	2455057	B976A07700 KC7315	G140				2499791	KSEM2550HPGM KC7315	H43
2443493	200Y14LK90SP10N14K	U33	2455430	A4R0500M05P00T01025 KY3500	B300, C100				2499795	KSEM2700HPGM KC7315	H43
2443494	200Y14NK90SP10N16K	U35	2455801	OFPT06L5AFENBG KCK15	S51	2460124	EDPT180512PDRSGD KC725M	T75	2499796	KSEM2750HPGM KC7315	H43
2443500	200Y14NK90SD12N20K	U49	2455802	OFPT06L5AFSNHB KCK15	S51	2460125	EDPT180512PDRSGD KCPK30	T75	2499798	KSEM2800HPGM KC7315	H43
2443502	200Y14LK90SD12N20K	U47	2455814	OFKTO6L5AFENBG KCK15	S50	2460185	EDPT180512PDRSGD KCK15	T75	2499800	KSEM2900HPGM KC7315	H43
2443503	250J18NK90SP10N16K	U31	2455816	OFPT06L5AFENBG KCPK30	S51	2460273	881.252.200	K133, K135	2499802	KSEM2950HPGM KC7315	H43
2443505	250J18LK90SP10N16K	U29	2455818	OFPT06L5AFSNHB KCPK30	S51				2499803	KSEM2950HPGM KC7315	H43
2443506	250J16NK90SD12N18K	U42	2455819	OFKTO6L5AFENBG KCPK30	S50	2465831	63A09F84SN12B	S102	2499807	KSEM3050HPGM KC7315	H43
2443512	250Y18NK90SP10N16K	U35	2455820	OFKTO6L5AFSNHB KCPK30	S50	2465832	125B18F84SN12B	S102	2499810	KSEM3100HPGM KC7315	H43
2443515	250Y16NK90SD12N18K	U48	2455821	OFPT06L5AFENBG KC520M	S51	2465988	KSEM2050HPGM KC7315	H42	2499811	KSEM3150HPGM KC7315	H43
2443518	250Y16NK90SD12N20K	U49	2455822	OFPT06L5AFSNHB KC520M	S51	2466093	160C24F84SN12B	S102	2499813	KSEM3200HPGM KC7315	H43
2443521	315K20NK90SP10N16K	U31	2455854	OFKTO6L5AFENBG KC520M	S50	2466094	200C30F84SN12B	S102	2499814	KSEM3250HPGM KC7315	H43
2443524	315K18NK90SD12N18K	U42	2456097	RCGT0803MOMS KC5010	B223	2466098	KSEM3500HPGM KC7315	H43	2499818	KSEM3350HPGM KC7315	H43
2443526	315K18LK90SD12N18K	U41	2456099	RCGT1204MOMS KC5010	B223	2466477	KSEM3800HPGM KC7315	H43	2499820	KSEM3400HPGM KC7315	H43
2443527	315K18NK90SD12N20K	U43	2456320	DSDNN4040S25KCO9	B105	2466478	KSEM3800HPGM KC7315	H43	2499822	KSEM3450HPGM KC7315	H43
2443530	315Y20NK90SP10N16K	U35	2456321	DSRNR4040S25KCO9	B106	2466598	KSEM3700HPGM KC7315	H43	2499824	KSEM3550HPGM KC7315	H43
2443533	315Y18NK90SD12N20K	U49	2456322	DSRNL4040S25KCO9	B106	2478640	25A03R044B25SED14	T48	2499826	KSEM3600HPGM KC7315	H43
2443536	315Y18NK90SD12N18K	U48	2456906	DFR125R4WD20M	J12	2478642	32A04R050B32SED14	T48	2499828	KSEM3650HPGM KC7315	H43
2443937	80A12RF84SN12B	S102	2456907	DFR127R4WD20M	J12	2478686	50A06R9S0ED14D	T50	2499831	KSEM3750HPGM KC7315	H43
2443938	100B15RF84SN12B	S102	2456908	DFR130R4WD20M	J12	2478689	63A07R9S0ED14D	T50	2499834	KSEM3800HPGM KC7315	H43
2444419	RCGK060400FS KC5010	E63	2456909	DFR135R4WD20M	J12	2478690	80A09R9S0ED14D	T50	2499835	KSEM3900HPGM KC7315	H43
2444420	RCGK090700FS KC5010	E63	2456910	DFR140R4WD20M	J12	2479504	40A02R80A32SKE25	T79	2499836	KSEM3950HPGM KC7315	H43
2444424	RCGK090700FS KC5025	E63	2456911	DFR145R4WD20M	J12	2487433	KSEM1750HPGM KC7315	H42	2499837	OFKTO7L6AFFNLJ KC410M	S54
2445703	F2AA0600AWM45R050 K600	P120	2456912	DFR150R4WD20M	J12	2488036	EDCT180520PDRFLDJ KC410M	T73	2499843	KSEM1508HPGM KC7315	H42
2445704	F2AA0600AWM45R100 K600	P120	2457733	DFR155R4WD20M	J12	2488096	193.433	S46-48	2499844	KSEM1548HPGM KC7315	H42
2445705	F2AA0800AWM45R050 K600	P120	2457734	DFR160R4WD20M	J12	2490989	B976A11300 KC7315	G141	2499845	KSEM1588HPGM KC7315	H42
2445706	F2AA0800AWM45R100 K600	P120	2457735	DFR165R4WD32M	J12	2494500	KSEM2650HPGM KC7315	H43	2499846	KSEM1609HPGM KC7315	H42
2445707	F3AA0600AWM45R050 K600	P122	2457736	DFR170R4WD32M	J12	2494501	KSEM3300HPGM KC7315	H43	2499847	KSEM1627HPGM KC7315	H42
2445708	F3AA0600AWM45R100 K600	P122	2457737	DFR175R4WD32M	J12	2496015	KSEM2133HPGM KC7315	H43	2499848	KSEM1667HPGM KC7315	H42
2445709	F3AA0800AWM45R050 K600	P122	2457738	DFR180R4WD32M	J12	2498749	DFR175R3WD25M	J11	2499849	KSEM1707HPGM KC7315	H42
2445710	F3AA0800AWM45R100 K600	P122	2457739	DFR185R4WD32M	J12	2498750	DFR180R3WD25M	J11	2499850	KSEM1746HPGM KC7315	H42
2446615	RPGV120700 KC5010	B167	2457741	DFR195R4WD32M	J12	2498751	DFR185R3WD25M	J11	2499851	KSEM1786HPGM KC7315	H42
2446618	RPGV060400 KC5010	B167	2457742	DFR195R4WD32M	J12	2498752	DFR190R3WD25M	J11	2499852	KSEM1826HPGM KC7315	H42
2447150	A25TPCLR12	B68	2457743	DFR205R4WD32M	J12	2499003	DFR195R3WD25M	J11	2499853	KSEM1865HPGM KC7315	H42
2447151	A25TPCLR12	B68	2457744	DFR210R4WD32M	J12	2499004	DFR200R3WD25M	J11	2499854	KSEM1905HPGM KC7315	H42
2447152	A32UPCLR12	B68	2457746	DFR230R4WD32M	J12	2499005	DFR205R3WD25M	J11	2499855	KSEM1927HPGM KC7315	H42
2447377	EDCT180508PDERDL KC522M	T74	2457747	DFR240R4WD32M	J12	2499006	DFR230R3WD25M	J11	2499856	KSEM1945HPGM KC7315	H42
2447380	EDCT180548PDERDL KC522M	T74	2458790	OFKTO6L5AFENBG KC522M	S50	2499007	DFR240R3WD25M	J11	2499857	KSEM1984HPGM KC7315	H42
2447473	A32UPCLR12	B68	2458791	OFKTO6L5AFSNHB KC522M							

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2499866	KSEM2461HPGM KC7315	H43	2542523	A4M50R0314A290999	C125	2598816	NGP3125R KC5010	C152	2619033	B707A05560FBG KC7315	G114
2499867	KSEM2540HPGM KC7315	H43	2542524	A4M50L0314A036048	C126	2598817	NGP3125L KC5010	C152	2620169	B978A04600 KC7315	G146
2499868	KSEM2567HPGM KC7315	H43	2542527	A4M50L0314A068100	C126	2598823	NGD3189L KC5010	C157	2622232	20A02P039B20SED14	T48
2499869	KSEM2619HPGM KC7315	H43	2542528	A4M50L0314A090160	C126	2598824	NG3062R KC5010	C154	2623070	B707A16000FBG KC7315	G115
2499870	KSEM2659HPGM KC7315	H43	2542529	A4M50L0314A130300	C126	2599495	NG4189R KC5010	C154	2623553	B256A05100 KC7315	G63
2499871	KSEM2778HPGM KC7315	H43	2542530	A4M50L0314A290999	C126	2599496	NR3031L KC5010	C158	2623860	KSEM2000PCM KC7135	H56, H87
2499872	KSEM2818HPGM KC7315	H43	2542531	A4M50R0414A048072	C125	2599497	NG4189L KC5010	C155	2623933	40A05R050B32SED14	T48
2499873	KSEM2858HPGM KC7315	H43	2542532	A4M50R0414A064100	C125	2599498	NG4250L KC5010	C155	2623934	40A05RS90ED14D	T50
2499874	KSEM2937HPGM KC7315	H43	2542533	A4M50R0414A092150	C125	2599501	NGP4250R KC5010	C152	2623935	100A10RS90ED14D	T50
2499875	KSEM2977HPGM KC7315	H43	2542534	A4M50R0414A132300	C125	2599504	NGD4250L KC5010	C157	2623936	125B12RS90ED14D	T50
2499876	KSEM3016HPGM KC7315	H43	2542535	A4M50R0414A290999	C125	2599505	NR4125R KC5010	C158	2623937	25A02R044B25SED14	T48
2499877	KSEM3056HPGM KC7315	H43	2542537	A4M50L0414A064100	C126	2599506	NR3047R KC5010	C158	2623938	32A03R050B32SED14	T48
2499878	KSEM3096HPGM KC7315	H43	2542538	A4M50L0414A092150	C126	2599507	NR3047L KC5010	C158	2623939	40A05R050B32SED14	T48
2499879	KSEM3175HPGM KC7315	H43	2542539	A4M50L0414A132300	C126	2599508	NR3062R KC5010	C158	2623940	40A04RS90ED14D	T50
2499880	KSEM3254HPGM KC7315	H43	2542540	A4M50L0414A290999	C126	2599509	NR3062L KC5010	C158	2623941	50A05RS90ED14D	T50
2499881	KSEM3294HPGM KC7315	H43	2542541	A4M50R0519A058094	C125	2599510	NRP3031R KC5010	C153	2623942	40A05RS90ED14D	T50
2499882	KSEM3334HPGM KC7315	H43	2542542	A4M50R0519A080136	C125	2599511	NRP3031L KC5010	C153	2623963	80A07RS90ED14D	T50
2499883	KSEM3373HPGM KC7315	H43	2542543	A4M50R0519A120300	C125	2599512	NRP3047R KC5010	C153	2623964	100A08RS90ED14D	T50
2499884	KSEM3413HPGM KC7315	H43	2542544	A4M50R0519A250999	C125	2599513	NR3047L KC5010	C153	2623965	160C11RS90ED14D	T50
2499885	KSEM3493HPGM KC7315	H43	2542545	A4M50L0519A058094	C126	2599514	NRP3062R KC5010	C153	2625682	B256A07000 KC7315	G63
2499886	KSEM3572HPGM KC7315	H43	2542546	A4M50L0519A080136	C126	2599515	NR3062L KC5010	C153	2625713	F3BA0600ADL40E180 K600	P125
2499887	KSEM3612HPGM KC7315	H43	2542547	A4M50L0519A120300	C126	2599516	NRP3094R KC5010	C153	2625714	F3BA0800ADL40E240 K600	P125
2499888	KSEM3651HPGM KC7315	H43	2542548	A4M50L0519A250999	C126	2599518	NRP3094L KC5010	C153	2625715	F3BA1000ADL40E300 K600	P125
2499889	KSEM3731HPGM KC7315	H43	2542822	KSEM2500PCM KC7135	H56, H87	2599519	NG3047R KC5025	C154	2625716	F3BA1200ADL40E360 K600	P125
2499890	KSEM3810HPGM KC7315	H43	2542849	KSEM3000PCM KC7135	H56, H87	2599521	NR3062R KC5025	C154	2625717	F3BA1600ADL40E480 K600	P125
2499891	KSEM3846HPGM KC7315	H43	2542938	B977F04650 KC7315	G143	2599522	NG3062L KC5025	C155	2625718	F3BA2000ADL40E600 K600	P125
2499960	B977F03800 KC7315	G143	2544200	SPCT1073PERL2D KC520M	T100	2599523	NG3094R KC5025	C154	2625743	B256A08000 KC7315	G63
2500741	50A03R80A32SK25	T79				2599524	NG3094L KC5025	C155	2627240	B967A12000 KC7315	G134
2500876	LT16ERAG60K KU25T	D54	2544251	B977F03500 KC7315	G143	2599525	NG3125L KC5025	C155	2627513	F4AW0400AWL38W040 KC633M	P22
2500931	LT16NRAG60K KU25T	D67	2544413	SDCT1204PDERL2D KC520M	T104	2599526	NG3156R KC5025	C154	2627514	F4AW0500AWL38W040 KC633M	P22
2503543	A4ENM2020K0611	C118				2599527	NG3156L KC5025	C155	2627515	F4AW0600AWL38W040 KC633M	P22
2503544	A4ENM2525M0611	C118				2599528	NG3189R KC5025	C154	2627516	F4AW0800AWL38W040 KC633M	P22
2503545	A4ENM3232P0611	C118	2545095	OFK707L6AFENLB KOPK30	S54	2599529	NR3062R KC5025	C155	2627517	F4AW1000AWL38W040 KC633M	P22
2503550	A4SML2020K0317	C113	2545097	OFK707L6AFSNLB KOPK30	S54	2599530	NR3031R KC5025	C158	2627518	F4AW0400AWL38W060 KC633M	P22
2503551	A4SMR2020K0317	C112	2546816	BGHX15L5PSCRLT KD1410	S148	2599531	NR3031L KC5025	C158	2627519	F4AW0500AWL38W060 KC633M	P22
2503552	A4SML2020K0417	C113	2548776	KTIP080R8SS10M	H31	2599534	NR3062R KC5025	C158	2627520	F4AW0600AWL38W060 KC633M	P22
2503553	A4SMR2020K0417	C112	2548777	KTIP090R8SS10M	H31	2599535	NR3062L KC5025	C158	2627521	F4AW0800AWL38W060 KC633M	P22
2503554	A4SML2020K0620	C113	2548778	KTIP095R8SS10M	H31	2599536	NRD4062R KC5010	C159	2627522	F4AW1000AWL38W060 KC633M	P22
2503555	A4SMR2020K0620	C112	2548779	KTIP100R8SS12M	H31	2599537	NRD4062L KC5010	C159	2628928	B707A11570FBG KC7315	G115
2503556	A4SML2016K0317	C113	2548780	KTIP105R8SS12M	H31	2599538	NRD4094R KC5010	C159	2629032	B707A04900FBG KC7315	G114
2503557	A4SMR2016K0317	C112	2548781	KTIP110R8SS12M	H31	2599539	NRD4094L KC5010	C159	2629368	B707A12000FBG KC7315	G115
2503559	A4SMR2016K0417	C112	2548782	KTIP115R8SS12M	H31	2599540	NRD4125L KC5010	C159	2633016	B707A18000FBG KC7315	G115
2504223	KSEM1970HPGM KC7315	H42	2548913	KTIP120R8SS14M	H31	2599550	NR4125L KC5010	C158	2633730	KTIP080R3BF08M	I11
2506705	B977A15200 KC7315	G141	2548914	KTIP125R8SS14M	H31	2599571	NG2031R KC5010	C154	2633731	KTIP090R5BF10M	I13
2507899	KSEM2560HPM KC7315	H40	2548915	KTIP130R8SS14M	H31	2599572	NG2031L KC5010	C155	2633732	KTIP106R3BF17M	I11
2509326	EDPT180508PDSRGD KC725M	T75	2548916	KTIP135R8SS14M	H31	2599743	NG2041R KC5010	C154	2634374	3.7700R224V	J75
2509327	EDPT180508PDSRGD KCPK30	T75	2548917	KTIP140R8SS16M	H31	2599744	NG2041L KC5010	C155	2634375	3.7700R227V	J75
2509328	EDPT180508PDSRGD KCK15	T75	2548918	KTIP145R8SS16M	H31	2599745	NG2047R KC5010	C154	2634376	3.7700R229V	J75
2509387	EDPT180516PDSRGD KC725M	T75	2548919	KTIP150R8SS16M	H31	2599746	NG2047L KC5010	C155	2634377	3.7700R231V	J75
2509388	EDPT180516PDSRGD KCPK30	T75	2548920	KTIP080R8SCF12M	H32	2599748	NG2094R KC5010	C154	2634378	3.7700R239V	J75
2509408	EDPT180532PDSRGD KC725M	T75	2548921	KTIP085R8SCF12M	H32	2599749	NG2094L KC5010	C155	2634379	3.7700R248V	J75
2509410	EDPT180532PDSRGD KCPK30	T75	2548922	KTIP090R8SCF12M	H32	2599750	NG2125R KC5010	C154	2634380	3.7700R251V	J75
2510390	125B09RS90ED14D	T50	2548923	KTIP095R8SCF12M	H32	2599751	NG2125L KC5010	C155	2634381	3.7700R253V	J75
2526351	KEGT25L531PEERLJD KC410M	T82	2548924	KTIP100R8SCF16M	H32	2599752	NGP2031R KC5010	C152	2634382	3.7700R274V	J75
2526385	KEGT25L508PEERLJD KC410M	T82	2548925	KTIP105R8SCF16M	H32	2599757	NR2031R KC5010	C158	2634413	3.7700R276V	J75
2526387	KEGT25L564PEERLJD KC410M	T82	2548926	KTIP110R8SCF16M	H32	2599758	NR2031L KC5010	C158	2634414	3.7700R278V	J75
2526391	KMSP825IP	B105-106	2548927	KTIP115R8SCF16M	H32	2599759	NR2062R KC5010	C158	2634415	3.7700R280V	J75
2526442	KLM81025IP	B105-106	2548928	KTIP120R8SCF16M	H32	2599760	NR2062L KC5010	C158	2634416	3.7700R282V	J75
2526757	KEGT25L516PEERLJD KC410M	T82	2548929	KTIP125R8SCF16M	H32	2599761	NG2031R KC5025	C154	2634417	3.7700R284V	J75
2539334	CM184LP	C167, D27	2548930	KTIP130R8SCF16M	H32	2599765	NG2062R KC5025	C154	2634418	3.7700R286V	J75
2539335	CM185LP	C167, D27	2548931	KTIP135R8SCF16M	H32	2599887	B976A04100 KC7315	G138	2634419	3.7700R288V	J75
2541018	KSEM1800PCM KC7135	H56, H87	2548932	KTIP140R8SCF16M	H32	2603030	KSEM2430HPGM KC7315	H43	2634568	B707A07500FBG KC7315	G114
2541019	KSEM1850PCM KC7135	H56	2548933	KTIP145R8SCF16M	H32	2604354	RNMG120400RN KC5010	B94	2635436	B977A15300 KC7315	G141
2541020	KSEM2300PCM KC7135	H56, H87	2548934	KTIP150R8SCF20M	H32	2605709	B977F03000 KC7315	G143	2636514	B707A12800FBG KC7315	G115
2541133	B707A07000FBG KC7315	G114	2548935	KTIP160R8SCF20M	H32	2607377	B707A10000FBG KC7315	G115	2636741	S2160	V82
2541200	KRDEA046AM	K75	2549023	NG3047L KC5010	C155	2613785	25A02R050A32SED18-170	T71	2636814	MS1235CG	T80
2541202	KRDEA012AM	K75	2549978	OFF707L6AFENGB KC520M	S55	2613786	32A03R050A32SED18-200	T71	2637756	MS2060	S34
2541213	KRDE025010M	K76	2579622	B976A06900 KC7315	G139	2613787	40A04R050A32SED18-200	T71	2637805	F7IP	T29, T38
2541214	KRDE033010M	K76	2582207	CTFPR20CA22	B378	2613788	32A02R050A32SED18-200	T71	2639052	B707A1800FBG KC7315	G115
2541215	KRDE043010M	K76	2582790	B707A17000FBG KC7315	G115	2613789	40A03R050A32SED18-200	T71	2639144	B707A15250FBG KC7315	G115
2541216	KRDE065012M	K76	2594849	B707A21000FBG KC7315	G115	2613790	3.41020R904 KC7315	I16	2639491	KSEM3900PCM KC7135	H56, H87
2541217	KRCW032A	K76	2598759	NG3072R KC5010	C154	2613791	3.41020R901 KC7315	I15	2641904	B966A16500 KC7315	G134
2541511	KSEM1300PCM KC7135	H56, H87	2598760	NG3072L KC							

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2646077	KSEM1550PCM	K7135	2646387	B343S14000HPG	KC7315	2651014	B343S08200HPG	KC7315	2657425	F2AL0200AWM30E100	KC637M
2646078	KSEM1560PCM	K7135	2646389	B343S14200HPG	KC7315	2651015	B343S08300HPG	KC7315	2657426	F2AL0200AWM30E160	KC637M
2646080	KSEM1580PCM	K7135	2646390	B343S14280HPG	KC7315	2651016	B343S08334HPG	KC7315	2657427	F2AL0200AWM30E200	KC637M
2646081	KSEM1600PCM	K7135	2646391	B343S15000HPG	KC7315	2651017	B343S08400HPG	KC7315	2657432	F2AL0400AWM30E060	KC637M
2646082	KSEM1620PCM	K7135	2646392	B343S15500HPG	KC7315	2651018	B343S08433HPG	KC7315	2657435	F2AL0400AWM30E160	KC637M
2646083	KSEM1650PCM	K7135	2646393	B343S15870HPG	KC7315	2651019	B343S08500HPG	KC7315	2657439	F2AT1000AWL20R010	KC637M
2646084	KSEM1700PCM	K7135	2646394	B343S16000HPG	KC7315	2651020	B343S08600HPG	KC7315	2657440	F2AT1200AWX20R005	KC637M
2646085	KSEM1900PCM	K7135	2646395	B343S16500HPG	KC7315	2651021	B343S08700HPG	KC7315	2657441	F2AT1200AWX20R010	KC637M
2646086	KSEM1950PCM	K7135	2646396	B343S16670HPG	KC7315	2651022	B343S08733HPG	KC7315	2657603	B707A1700FBG	KC7315
2646087	KSEM2050PCM	K7135	2646397	B343S17000HPG	KC7315	2651023	B343S08800HPG	KC7315	2658030	B707A08800FBG	KC7315
2646088	KSEM2100PCM	K7135	2646399	B343S17500HPG	KC7315	2651025	B343S09000HPG	KC7315	2658054	B256A08400	KC7315
2646089	KSEM2150PCM	K7135	2646400	B343S17700HPG	KC7315	2651026	B343S09100HPG	KC7315	2658075	B967A0700	KC7315
2646090	KSEM2200PCM	K7135	2646401	B343S18000HPG	KC7315	2651028	B343S09347HPG	KC7315	2658213	B977A06528	KC7315
2646091	KSEM2250PCM	K7135	2646402	B343S10100HPG	KC7315	2651029	B343S09400HPG	KC7315	2658214	B977A09746	KC7315
2646092	KSEM2350PCM	K7135	2646423	B343S10200HPG	KC7315	2651030	B343S09500HPG	KC7315	2658215	B977A06909	KC7315
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2646259	B343S06600HPG	KC7315	2649366	B976A06350	KC7315	2651176	HF14FBHS1440	K126	2658242	B977A19446	KC7315
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2646261	B343S06746HPG	KC7315	2649368	B976A07145	KC7315	2651178	HF19FBHS1840	K126	2658394	B978A04763	KC7315
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2659241	A4R0800M08P00T01025 KY3500	B300, C100	2888087	KTIP085R4BF09MI12	2957738	SNXF120412SNGP KC514MS104	2983279	EDCT140408PDFRDLJ KC410MT51, T60
2659244	A4R250106P00T0425 KY3500	B300, C100	2888088	KTIP090R4BF10MI12	2957739	SNXF12042ZNSNGP KC514MS104	2983331	EDCT140408PDERGD KC725MT52, T61
2659833	KEGT25L520PEERLDJ KC410MT82	2888089	KTIP095R4BF10MI12	2961763	551.013B356	2983890	EDCT140404PDERGD KC725MT52, T61
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2877376	KDMB16R140A16HNCV114	2889054	KTIP120R4BF13MI12	2974425	A4SMR2020K0217C112	2984418	EDCT140412PDFRDLJ KC410MT51, T60
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2877386	KDMT16R140A16HNCV130	2889063	KTIP085R5BF09MI13	2979216	A4C0255N00CF02 KC5025C102	2984427	EDCT140412PDFRDLJ KC410MT51, T60
2877387	KDMT16R175A16HNCV130	2889064	KTIP095R5BF10MI13	2979217	A4C0255R06CF02 KC5025C103	2984428	EDCT140412PDFRDLJ KC410MT51, T60
2877388	KDMT20R140A20HNCV130	2889065	KTIP100R5BF11MI13	2979223	A20R4AEMR0207MC119	2984429	EDCT140412PDFRDLJ KC410MT51, T60
2877389	KDMT20R190A20HNCV130	2889066	KTIP105R5BF11MI13	2979224	A25RA4EMR0210MC119	2984430	EDCT140412PDFRDLJ KC410MT51, T60
2877454	EDPT180508PDERHD KC725MT75	2889067	KTIP110R5BF12MI13	2979225	A25RA4EMR0210MC119	2984431	EDCT140412PDFRDLJ KC410MT51, T60
2877455	EDPT180508PDERHD KCPK30T75	2889068	KTIP115R5BF12MI13	2979226	A25RA4EMR0210MC119	2984432	EDCT140412PDFRDLJ KC410MT51, T60
2877456	EDPT180512PDERHD KC725MT75	2889069	KTIP120R5BF13MI13	2980526	EDPT140412PDSRGD KCPK30T54, T63	2984433	EDCT140412PDFRDLJ KC410MT51, T60
2877457	EDPT180512PDERHD KCPK30T75	2889070	KTIP125R5BF13MI13	2980527	EDPT140412PDSRGD KC520MT54, T63	2984434	EDCT140412PDFRDLJ KC410MT51, T60
2877458	EDPT180516PDERHD KC725MT75	2889071	KTIP130R5BF14MI13	2980530	EDPT140408PDSRGD KC520MT54, T63	2984435	EDCT140412PDFRDLJ KC410MT51, T60
2877459	EDPT180516PDERHD KCPK30T75	2889072	KTIP135R5BF14MI13	2980531	EDPT140408PDSRGD KCPK30T54, T63	2984436	EDCT140412PDFRDLJ KC410MT51, T60
2877460	EDPT180532PDERHD KC725MT75	2889073	KTIP140R5BF15MI13	2980568	EDPT140412PDSRGD KC725MT54, T63	2984437	EDCT140412PDFRDLJ KC410MT51, T60
2877461	EDPT180532PDERHD KCPK30T75	2889074	KTIP145R5BF15MI13	2981644	EDPT140408PDSRGD KC725MT54, T63	2984438	EDCT140412PDFRDLJ KC410MT51, T60
2878139	52A02RS90KE25T80	2889075	KTIP150R5BF16MI13	2982018	OFK07L6AFSNLB KC725MS54	2984439	EDCT140412PDFRDLJ KC410MT51, T60
2878591	B976A03300 KC7315G138	2889076	KTIP160R5BF17MI13	2982019	OFK07L6AFENLB KC725MS54	2984440	EDCT140412PDFRDLJ KC410MT51, T60
2878592	B976A03000 KC7315G138	2889261	SDCT120432ENLD2 KC522MT104, T111, U51	2982020	OFK06L5AFSNLB KC725MS50	2984441	EDCT140412PDFRDLJ KC410MT51, T60
2880434	40A02R110S63SKE25T81	2890223	B976A03700 KC7315G138	2982021	OFK06L5AFENLB KC725MS50	2984442	EDCT140412PDFRDLJ KC410MT51, T60
2880439	50A03R140S63SKE25T81	2890773	S32SCLN1R12MX7B372	2982022	OFK06L5AFENLB KC725MS50	2984443	EDCT140412PDFRDLJ KC410MT51, T60
2880630	KSCM63R08CAH63A090S131	2891696	CSDNN2525M12MX7B363	2982023	OFK06L5AFENLB KC725MS50	2984444	EDCT140412PDFRDLJ KC410MT51, T60
2881212	193.450J75	2891706	CKNR2525M12MX7B356	2982024	OFK06L5AFENLB KC725MS50	2984445	EDCT140412PDFRDLJ KC410MT51, T60
2881283	193.451J75	2891727	CKNL2525M12MX7B356	2982025	OFK07L6AFENLB KC522MS54	2984446	EDCT140412PDFRDLJ KC410MT51, T60
2881349	KSCM80R10CAB27S132	2896948	B707A19000FBG KC7315G115	2982026	OFK06L5AFSNLB KC522MS50	2984447	EDCT140412PDFRDLJ KC410MT51, T60
2881352	KSCM100R12CAB32S132	2907289	FBSUCR09CA06FK112	2982027	OFK06L5AFSNLB KC520MS50	2984448	EDCT140412PDFRDLJ KC410MT51, T60
2881505	KSCM125R16CAB40S132	2907291	FBSTFCR09CA11FK113	2982028	OFK06L5AFSNLB KCPK30S50	2984449	EDCT140412PDFRDLJ KC410MT51, T60
2881509	KSCM160R18CAB40S132	2940518	B978A08200 KC7315G147	2982029	EDPT140416PDSRGD KC725MT54, T63	2984450	EDCT140412PDFRDLJ KC410MT51, T60
2881510	KSCM200R24CAB60S132	2951623	BGHX15L5PSCRLET KD1415S148	2982084	OFK06L5AFENLB KC522MS50	2984451	EDCT140412PDFRDLJ KC410MT51, T60
2881511	KSCM250R30CAB60S132	2951631	3.37092R320I14	2982086	OFK06L5AFENLB KCK15S50	2984452	EDCT140412PDFRDLJ KC410MT51, T60
2882164	B976A16200 KC7315G142	2951632	3.37092R820I14	2982087	OFK06L5AFENLB KCPK30S50	2984453	EDCT140412PDFRDLJ KC410MT51, T60
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3017668	KTIP180R3SCF25M	H32	3031718	TM25N100ISO KC610M	W14	3043944	KSEM3500PCM KC7135	H56, H87	3093561	HNGJ0905ANENLD KC522M	S18, S22
3017669	KTIP190R3SCF25M	H32	3031719	TM25N150ISO KC610M	W14	3047641	T320MF140X150R6HX KC7542	M4	3093719	HNGJ0905ANSNGD KCPK30	S18, S23
3017670	KTIP200R3SCF25M	H32	3031720	TM25N200ISO KC610M	W14	3048803	KSEM3300PCM KC7135	H56, H87	3094010	843.006.000	K120-122, K136
3017671	KTIP170R5SS18M	H31	3031721	TM25N250ISO KC610M	W14	3050716	DFR020204MD KC7140	J84	3094035	880.252.200	K133, K135
3017672	KTIP180R5SS20M	H31	3031722	TM25N300ISO KC610M	W14	3051244	EDPT140420PDERHD KC522M	T53, T62	3095646	63A04RS90RC20C	V82
3017673	KTIP190R5SS20M	H31	3031733	TM25N200UN KC610M	W14	3051245	EDPT140420PDERHD KC725M	T53, T62	3095647	80A05RS90RC20C	V82
3017674	KTIP200R5SS25M	H31	3031734	TM25N180UN KC610M	W14	3051246	EDPT140420PDERHD KCPK30	T53, T62	3095649	100B06RS90RC20C	V82
3017675	KTIP170R5SCF20M	H32	3031735	TM25N16UN KC610M	W14	3051247	EDPT140431PDERHD KC522M	T53, T62	3095650	125B06RS90RC20C	V82
3017676	KTIP180R5SCF25M	H32	3031736	TM25N14UN KC610M	W14	3051248	EDPT140431PDERHD KC725M	T53, T62	3095651	160C07RS90RC20C	V82
3017677	KTIP190R5SCF25M	H32	3031737	TM25N12UN KC610M	W14	3051249	EDPT140431PDERHD KCPK30	T53, T62	3095652	200C08RS90RC20C	V82
3017678	KTIP200R5SCF25M	H32	3031738	TM25N10UN KC610M	W14	3051250	EDPT140440PDERHD KC522M	T53, T62	3095653	160C09RS90RC20C	V82
3020201	B707A10600FBG KC7315	G115	3031739	TM25N9UN KC610M	W14	3051251	EDPT140440PDERHD KC725M	T53, T62	3097294	KSEM1660HPGM KC7315	H42
3021212	MS1242CG	T80, V72, V78, V82, V139	3031740	TM25N8UN KC610M	W14	3051252	EDPT140440PDERHD KCPK30	T53, T62	3097295	KSEM1860HPGM KC7315	H42
3022625	A4M50L0214M	C124	3031742	TM25EN14W KC610M	W15	3051549	EDPT140424PDERHD KC522M	T53, T62	3098071	B70A04200FBG KC7315	G114
3023165	EDPT180548PDERHD KC725M	T75	3031743	TM25EN12W KC610M	W15	3101525	EDPT140440PDERHD KC522M	T53, T62	3101753	KIPR032R12CF03	V153
3023166	EDPT180548PDERHD KCPK30	T75	3031744	TM25EN11W KC610M	W15	3051251	EDPT140440PDERHD KC725M	T53, T62	3101754	KIPR032R12CF04	V154
3023574	KSEM2210HPGM KC7315	H43	3031745	TM25EN115NPT KC610M	W15	3051252	EDPT140440PDERHD KCPK30	T53, T62	3101755	KIPR040R12CF04	V154
3024272	B707A10200FBG KC7315	G115	3031746	TM25EN115NPT KC610M	W15	3051549	EDPT140424PDERHD KC522M	T53, T62	3102669	B97A08020 KC7315	G140
3024745	B966A13100 KC7315	G134	3031747	TM25EN14BSPT KC610M	W15	3051550	EDPT140424PDERHD KC725M	T53, T62	3106097	SDPT120412PDSNHPZ KCPK30	V141
3026450	12MHC030M	G85	3031748	TM25EN11BSPT KC610M	W15	3051551	EDPT140424PDERHD KCPK30	T53, T62	3106098	SDPT120412PDSNHPZ KC725M	V141
3026451	12MHC040M	G85	3031749	TM25N100UN KC635M	W14	3051552	EDPT140404PDERHD KC522M	T53, T62	3106099	SDPT120412PDSNHPZ KC725M	V141
3026452	12MHC050M	G85	3031750	TM25N150ISO KC635M	W14	3051623	A4M50L2B14M	C124	3110522	B976A03200 KC7315	G138
3026453	12MHC060M	G85	3031751	TM25N200ISO KC635M	W14	3051624	A4M50R0214M	C124	3110544	B976A03600 KC7315	G138
3026454	12MHC070M	G85	3031752	TM25N250ISO KC635M	W14	3051629	A4M50L0212A060084	C126	3110545	B976A07200 KC7315	G140
3026455	12MHC080M	G85	3031753	TM25N300ISO KC635M	W14	3051632	A4M50L0212A250999	C126	3111542	32M2R050M16SSD12PL	V137
3026456	12MHC090M	G85	3031754	TM25N200UN KC635M	W14	3051663	A4M50L0212B036046	C128	3114313	KTIP170R8S18M	H31
3026457	12MHC100M	G85	3031755	TM25N16UN KC635M	W14	3051664	A4M50L0212B042054	C128	3114314	KTIP180R8S20M	H31
3026458	20MHC030M	G85	3031756	TM25N14UN KC635M	W14	3051665	A4M50L0212B050064	C128	3114315	KTIP190R8S20M	H31
3026459	20MHC040M	G85	3031757	TM25N12UN KC635M	W14	3051666	A4M50L0212B060084	C128	3114316	KTIP200R8S25M	H31
3026460	20MHC050M	G85	3031758	TM25N10UN KC635M	W14	3051667	A4M50L0212B080124	C128	3114317	KTIP180R8S25M	H32
3026461	20MHC060M	G85	3031759	TM25N10UN KC635M	W14	3051668	A4M50L0212A050064	C128	3114318	KTIP190R8S25M	H32
3026462	20MHC070M	G85	3031760	TM25N9UN KC635M	W14	3051670	A4M50R0212A036046	C125	3114319	KTIP190R8S25M	H32
3026463	20MHC080M	G85	3031761	TM25N8UN KC635M	W14	3051671	A4M50R0212A042054	C125	3114320	KTIP200R8S25M	H32
3026464	20MHC090M	G85	3031763	TM25EN14W KC635M	W15	3051672	A4M50R0212A050064	C125	3114636	RIQ09E1312 KC6305	K55
3026465	20MHC100M	G85	3031765	TM25EN11W KC635M	W15	3051673	A4M50R0212A060084	C125	3115582	KSOM63R050F07	S53
3026651	20MHC060M	G85	3031766	TM25EN14NPT KC635M	W15	3051674	A4M50R0212A080124	C125	3115583	KSOM63R050F07	S53
3026652	20MHC070M	G85	3031767	TM25EN115NPT KC635M	W15	3051675	A4M50R0212A120254	C125	3115584	KSOM63R050F07	S53
3026653	20MHC080M	G85	3031770	TM25BLANK	W15	3051676	A4M50R0212A250999	C125	3115585	KSOM63R050F07	S53
3026654	20MHC090M	G85	3031908	T320NCO3750-16R3BX KC7542	M4	3051677	A4M50R0212B036046	C127	3115586	KSOM63R050F07	S53
3026655	20MHC100M	G85	3031910	T320NCO4375-14R3BX KC7542	M4	3051678	A4M50R0212B042054	C127	3115587	KSOM63R050F07	S53
3026656	20MHC110M	G85	3031911	T320NCO5000-13R3BX KC7542	M4	3051679	A4M50R0212B050064	C127	3115588	KSOM63R050F07	S53
3026657	20MHC120M	G85	3031914	T320M060X100R6HX KC7542	M4	3051680	A4M50R0212B060084	C127	3115589	KSOM63R050F07	S53
3026658	20MHC130M	G85	3031915	T320M080X125R6HX KC7542	M4	3051681	A4M50R0212B080124	C127	3115590	KSOM63R050F07	S53
3026659	20MHC140M	G85	3031916	T320M100X150R6HX KC7542	M4	3051682	A4M50R0212B120254	C127	3115591	KSOM63R050F07	S53
3026660	20MHC150M	G85	3031917	T320M120X175R6HX KC7542	M4	3051683	A4M50R0212B250999	C127	3115592	KSOM63R050F07	S53
3026661	20MHC160M	G85	3032732	EDPT140412PDERHD KC520M	T53, T62	3051863	EDPT140404PDERHD KC725M	T53, T62	3115593	KSOM63R050F07	S53
3026662	25MHC030M	G85	3033394	RCGT2006MOELF KC725M	V83	3051864	EDPT140404PDERHD KCK15	T53, T62	3115594	KSOM63R050F07	S53
3026663	25MHC040M	G85	3033723	EDPT140412PDERHD KC522M	T53, T62	3051865	EDPT140404PDERHD KCPK30	T53, T62	3115595	KSOM63R050F07	S53
3026664	25MHC050M	G85	3033724	EDPT140412PDERHD KC725M	T53, T62	3051866	EDPT140404PDERHD KC520M	T53, T62	3115596	KSOM63R050F07	S53
3026665	25MHC060M	G85	3033725	EDPT140412PDERHD KCK15	T53, T62	3053564	SDET120412PDENGZ KCPK30	V141	3115597	KSOM63R050F07	S53
3026666	25MHC070M	G85	3033726	EDPT140412PDERHD KCPK30	T53, T62	3053565	SDET120412PDSNGZ KCPK30	V141	3115598	KSOM63R050F07	S53
3026667	25MHC080M	G85	3033727	EDPT140412PDERHD KC520M	T53, T62	3055223	B707A13500FBG KC7315	G115	3115599	KSOM63R050F07	S53
3026668	25MHC090M	G85	3033728	EDPT140408PDERHD KC522M	T53, T62	3055230	50A04RS90SD12PL	V139	3115600	KSOM63R050F07	S53
3026669	25MHC100M	G85	3033729	EDPT140408PDERHD KC725M	T53, T62	3057117	B978A03700 KC7315	G146	3115601	KSOM63R050F07	S53
3026670	25MHC120M	G85	3033730	EDPT140408PDERHD KCK15	T53, T62	3057121	B978A07400 KC7315	G147	3115602	KSOM63R050F07	S53
3026671	25MHC140M	G85	3033731	EDPT140408PDERHD KCPK30	T53, T62	3057122	B978A09300 KC7315	G147	3115603	KSOM63R050F07	S53
3026672	25MHC160M	G85	3033732	EDPT140416PDERHD KC520M	T53, T62	3058199	KSEM2500HPGM KC7315	H43	3115604	KSOM63R050F07	S53
3026673	32MHC060M	G85	3033735	EDPT140416PDERHD KC522M	T53, T62	3058984	B707A04400FBG KC7315	G114	3115605	KSOM63R050F07	S53
3026674	32MHC070M	G85	3033953	EDPT140416PDERHD KCK15	T53, T62	3061071	B978F14000 KC7315	G149	3115606	KSOM63R050F07	S53
3026675	32MHC080M	G85	3033954	EDPT140416PDERHD KCPK30	T53, T62	3063843	50A05RS90SD12PL	V139	3115607	KSOM63R050F07	S53
3026676	32MHC090M	G85	3033966	B707A06800FBG KC7315	G114	3064110	40M3R050M16SSD12PL	V137	3115608	KSOM63R050F07	S53
3026677	32MHC100M	G85	3039409	KSEM3400PCM KC7135	H56, H87	3064549	KSEM2470HPGM KC7315	H43	3115609	KSOM63R050F07	S53
3026678	32MHC120M	G85	3039410	KSEM3600PCM KC7135	H56, H87	3066053	A4G0605M06U04B KCK20	C98	3115610	KSOM63R050F07	S53
3026679	32MHC140M	G85	3040265	B978F13000 KC7315	G149	3066133	SDET120412PDENGZ KC725M	V141	3115611	KSOM63R050F07	S53
3026680	32MHC160M	G85	3041312	B707A06100FBG KC7315	G114	3066281	SDET120412PDSNGZ KC725M	V141	3115612	KSOM63R050F07	S53
3026681	32MHC180M	G85				3066375	SDET120412PDSNGZ KC522M	V141	3115613	KSOM63R050F07	S53
3026682	32MHC200M	G85				3077140	SF150FBH01660	K125	3115614	KSOM63R050F07	S53
3026683	32MHC220M	G85							3115615	KSOM63R050F07	S53
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3026685	32MHC260M	G85							3115617	KSOM63R050F07	S53
3026686	32MHC280M	G85							3115618	KSOM63R050F07	S53
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3127186	NAS3L4 KC5025	D13	3325172	KSHR160C16RS45HN09	S21	3345680	32A04R040M16SED14	T47	3381130	KSEM1667HPLM KC7320	H50
3127866	B978F07400 KC7315	G149	3326218	RCGT2006MOSGF KC522M	V83	3345681	40A05R040M16SED14	T47	3381131	KSEM1700HPLM KC7320	H50
3133459	MS1294CG	V64, V72	3330195	MCFN20CA12	B70	3346236	MCFN20CA12	B70	3381132	KSEM1707HPLM KC7320	H50
3135660	B256A12500 KC7315	G63	3330196	MCLN120CA12	B72	3346237	MCKN12CA12	B71	3381133	KSEM1746HPLM KC7320	H50
3136510	EDPT180540PDERHD KC725M	T75	3330197	MCLNR20CA12	B72	3346238	MCKNR12CA12	B71	3381134	KSEM1750HPLM KC7320	H50
3138954	SNXF120412AMSN KY3500	S105	3330199	MDJNR20CA15	B92	3346240	MDJNL12CA11	B92	3381135	KSEM1757HPLM KC7320	H50
3138955	SNXF12042NAMSN KY3500	S105	3330200	MDQNL20CA15	B93	3346241	MDJNR12CA11	B92	3381136	KSEM1780HPLM KC7320	H50
3139149	843.009.000	K120-122, K136	3330201	MDQNR20CA15	B93	3346242	MSKNL12CA12	B115	3381137	KSEM1786HPLM KC7320	H50
3176219	KM25LSSR2230	D83	3330202	MSKNL20CA15	B115	3346273	MSYNL12CA12	B119	3381138	KSEM1790HPLM KC7320	H50
3176220	KM25LSSL2230	D83	3330203	MSRNL20CA15	B116	3346274	MSYNR12CA12	B119	3381139	KSEM1800HPLM KC7320	H50
3176596	TRM50R0640M	E65	3330206	MSSNR20CA15	B117	3346275	MTGNL12CA16	B140	3381140	KSEM1826HPLM KC7320	H50
3176598	TRM50L0640M	E65	3330207	MTFNL20CA22	B139	3348765	32A03R050A32SED14	T49	3381142	KSEM1850HPLM KC7320	H50
3176599	TRM50L0432M	E65	3330208	MTFNR20CA22	B139	3348766	32A04R050A32SED14	T49	3381143	KSEM1860HPLM KC7320	H50
3176600	TRM50R0432M	E65	3330209	MTGNL20CA22	B140	3348767	40A04R050A32SED14	T49	3381144	KSEM1865HPLM KC7320	H50
3176601	TRM50R0920M	E65	3330222	MCKNR16CA12	B72	3348768	40A05R050A32SED14	T49	3381145	KSEM1890HPLM KC7320	H50
3176602	TRM50L0920M	E65	3330273	MCLN16CA12	B72	3349309	HNEN0905ANSN KD200	S92, S98	3381146	KSEM1900HPLM KC7320	H50
3176604	TRM50R0940M	E65	3330274	MDJNL16CA15	B92	3349685	25A02R044A25SED18	T71	3381147	KSEM1905HPLM KC7320	H50
3176605	TRM50R0620M	E65	3330275	MDJNR16CA15	B92	3349686	32A03R050A32SED18	T71	3381148	KSEM1927HPLM KC7320	H50
3176606	TRM50L0620M	E65	3330276	MDQNL16CA15	B93	3349688	40A04R050A32SED18	T71	3381149	KSEM1923HPLM KC7320	H50
3176688	MS2173	B199, B202, B204-205	3330277	MDQNR16CA15	B93	3349689	32A03R050A25SED18	T69	3381150	KSEM1925HPLM KC7320	H50
3176689	MS2175	B199-205, B229, B260-262	3330279	MSRNL16CA12	B116	3349691	32A02R040M16SED18	T69	3381151	KSEM1927HPLM KC7320	H50
3180571	B977A14100 KC7315	G141	3330283	MSYNR16CA12	B119	3349692	32A03R040M16SED18	T69	3381152	KSEM1935HPLM KC7320	H50
3273589	EDCT140402PDFRLDJ KC410M	T51, T60	3330285	MTGN16CA16	B140	3349773	40A03R050A32SED18	T69	3381153	KSEM1936HPLM KC7320	H50
3273590	EDCT140440PDFRLDJ KC410M	T51, T60	3330527	100G10NP90SP10N16K	U26	3349774	40A04R040M16SED18	T69	3381154	KSEM1945HPLM KC7320	H50
3287987	CSWM 035 040	B199, B202, B204-205	3330528	100G10RP90SP10	U25	3351707	KHDA0600AGANA KC639M	P136	3381155	KSEM1950HPLM KC7320	H50
3287988	CSWM 040 050	B199-205, B229, B260-262	3330530	125H12NP90SP10N16K	U26	3351708	KHDA0800AGANA KC639M	P136	3381156	KSEM1984HPLM KC7320	H50
3287989	CSWM 060 050	B70-73, B92, B115-121, B139-142, B183, B199, B202, B220-221, B229, B235-237, B240-242, B260-263, B375-378, C171, D41-42	3330531	125H11RP90SP10	U25	3351709	KHDA1000AGANA KC639M	P136	3381157	KSEM2000HPLM KC7320	H50
3287990	CSWM 080 050	B70-73, B92-93, B115-117, B119, B139-141, B183, B235, B378	3330952	HNGJ0905ANENLD KCK15	S18, S22	3351710	KHDA1200AGANA KC639M	P136	3381158	KSEM2010HPLM KC7320	H50
3287991	CSWM 100 080	B72, B115, B119, C171, D41-42	3330973	160H12NP90SP10N16K	U26	3351711	KHDA1600AGANA KC639M	P136	3381159	KSEM2024HPLM KC7320	H50
3292774	EDCT180508PDERLDJ KC422M	T73	3330974	160H11RP90SP10	U25	3351712	KHDA2000AGANA KC639M	P136	3381160	KSEM2035HPLM KC7320	H50
3292775	EDCT180524PDERLDJ KC422M	T73	3330975	160H11LP90SP10	U25	3352074	881.252.720	K133	3381161	KSEM2050HPLM KC7320	H50
3300212	B707A05800FBG KC7315	G114	3330976	200J14NP90SP10N16K	U26	3352369	KMDA0600AGANA KC639M	P137	3381162	KSEM2064HPLM KC7320	H50
3322050	B707A10500FBG KC7315	G115	3330977	200J13RP90SP10	U25	3352370	KMDA0800AGANA KC639M	P137	3381163	KSEM2100HPLM KC7320	H50
3322370	CFM0402R45RHP KC040	H34	3330978	200J13LP90SP10	U25	3352371	KMDA1000AGANA KC639M	P137	3381164	KSEM2115HPLM KC7320	H50
3324493	KTIP170R3BF17M	I11	3330983	160H14NP90SD12N20K	U39	3352372	KMDA1200AGANA KC639M	P137	3381165	KSEM2133HPLM KC7320	H50
3324494	KTIP170R3BF18M	I11	3330984	160H12RP90SD12	U38	3352373	KMDA1600AGANA KC639M	P137	3381166	KSEM2143HPLM KC7320	H51
3324495	KTIP180R3BF18M	I11	3330985	160H12LP90SD12	U38	3352494	KMDA2000AGANA KC639M	P137	3381167	KSEM2150HPLM KC7320	H50
3324496	KTIP170R4BF18M	I12	3330986	200J18NP90SD12N20K	U39	3353405	KSEM2973HPGM KC7315	H43	3381168	KSEM2150HPLM KC7320	H50
3324497	KTIP180R4BF18M	I12	3330987	200J14RP90SD12	U38	3362163	881.252.550	K133-134	3381169	KSEM2150HPLM KC7320	H50
3324498	KTIP170R5BF18M	I13	3330988	200J14LP90SD12	U38	3364974	B978F0500 KC7315	G149	3381170	KSEM2150HPLM KC7320	H51
3324499	KTIP180R5BF18M	I13	3330989	250J22NP90SD12N20K	U39	3367371	B531A03200SPF KDF400	G105	3381171	KSEM2183HPLM KC7320	H50
3324721	A4G0305M0302UB KCK20	C98	3330990	250J16RP90SD12	U38	3367372	B531A05100SPF KDF400	G105	3381172	KSEM2200HPLM KC7320	H50
3324722	A4G0405M04004B KCK20	C98	3330991	250J16LP90SD12	U38	3367373	B531A06500SPF KDF400	G105	3381173	KSEM2200HPLM KC7320	H51
3324723	A4G0505M05004B KCK20	C98	3331106	L20SSCLP09	B198	3367382	B532A03200SPF KDF400	G105	3381174	KSEM2237HPLM KC7320	H50
3324724	A4G0805M08008B KCK20	C98	3331107	L10MSCLP06	B198	3367383	B532A05100SPF KDF400	G105	3381175	KSEM2237HPLM KC7320	H50
3324725	A4G1005M10008B KCK20	C98	3331108	L16RSCLP09	B198	3367384	B532A06500SPF KDF400	G105	3381176	KSEM2244HPLM KC7320	H51
3324726	EDCT140424PDERLDJ KC422M	T52, T61	3331109	L20SSCLP09	B198	3367385	B531A06000SPF KDF400	G105	3381177	KSEM2250HPLM KC7320	H50
3324829	KSHR40D03R05B25SHN09	S20	3331110	L12QSCPL06	B198	3379064	EDPT180564PDERHD KC725M	T75	3381178	KSEM2277HPLM KC7320	H50
3324830	KSHR40D04R05B25SHN09	S20	3331111	L16RSCLP09	B198	3379065	EDPT180564PDERHD KC725M	T75	3381179	KSEM2277HPLM KC7320	H50
3324831	KSHR50A04RS45HN09	S21	3331112	L12QSCPL06	B198	3380488	KSEM1250HPLM KC7320	H50	3381180	KSEM2300HPLM KC7320	H51
3324832	KSHR50A05RS45HN09	S21	3331113	L16RSCLP09	B198	3380489	KSEM1270HPLM KC7320	H50	3381181	KSEM2300HPLM KC7320	H51
3324993	EDCT140404PDERLDJ KC422M	T52, T61	3331114	L16RSCLP09	B198	3380490	KSEM1280HPLM KC7320	H50	3381182	KSEM2300HPLM KC7320	H51
3324994	EDCT140408PDERLDJ KC422M	T52, T61	3331115	L108KSTP06	B198	3380491	KSEM1280HPLM KC7320	H50	3381183	KSEM2300HPLM KC7320	H51
3325163	KSHR63A06RS45HN09	S21	3331116	L12QSDUP07	B219	3380492	KSEM1293HPLM KC7320	H50	3381184	KSEM2342HPLM KC7320	H51
3325164	KSHR63A07RS45HN09	S21	3331117	L20SSDUPR1	B219	3381103	KSEM1300HPLM KC7320	H50	3381185	KSEM2342HPLM KC7320	H51
3325165	KSHR80A06RS45HN09	S21	3331123	L12QSTFRP1	B259	3381104	KSEM1350HPLM KC7320	H50	3381186	KSEM2381HPLM KC7320	H50
3325166	KSHR80A08RS45HN09	S21	3331128	L08KSTP09	B259	3381105	KSEM1360HPLM KC7320	H50	3381187	KSEM2381HPLM KC7320	H50
3325167	KSHR100B08RS45HN09	S21	3331131	L08KSTP09	B259	3381106	KSEM1380HPLM KC7320	H50	3381188	KSEM2381HPLM KC7320	H50
3325168	KSHR100B11RS45HN09	S21	3331132	CSRPR10CA09	B376	3381107	KSEM1389HPLM KC7320	H50	3381189	KSEM2381HPLM KC7320	H50
3325169	KSHR125B11RS45HN09	S21	3331143	CSSPL10CA09	B377	3381108	KSEM1400HPLM KC7320	H50	3381190	KSEM2381HPLM KC7320	H50
3325170	KSHR125B14RS45HN09	S21	3331145	MCFN10CA09	B70	3381109	KSEM1410HPLM KC7320	H50	3381191	KSEM2381HPLM KC7320	H50
			3331146	MCFN10CA09	B70	3381110	KSEM1415HPLM KC7320	H50	3381192	KSEM2400HPLM KC7320	H51
			3331149	MSTNR10CA09	B118	3381111	KSEM1420HPLM KC7320	H50	3381193	KSEM2400HPLM KC7320	H51
			3331150	MSYNL10CA09	B119	3381112	KSEM1429HPLM KC7320	H50	3381194	KSEM2400HPLM KC7320	H51
			3331173	HNGJ0905ANSNGD KCK15	S18, S23	3381113	KSEM1450HPLM KC7320	H50	3381195	KSEM2400HPLM KC7320	H51
			3331174	HNGJ0905ANENLD KCK15	S18, S23	3381114	KSEM1460HPLM KC7320	H50	3381196	KSEM2400HPLM KC7320	H51
			3331175	HNGJ0905ANENLD KC725M	S18, S22	3381115	KSEM1468HPLM KC7320	H50	3381197	KSEM2400HPLM KC7320	H51
			3331176	HNGJ0905ANSNGD KC725M	S18, S23	3381116	KSEM1480HPLM KC7320	H50	3381198	KSEM2400HPLM KC7320	H51
			3331178	HNGJ0905ANENLD KC725M	S18, S22	3381117	KSEM1500HPLM KC7320	H50	3381199	KSEM2400HPLM KC7320	H51
			3331277	63A06RF84SN12B	S102	3381118	KSEM1508HPLM KC7320	H50	3381200	KSEM2400HPLM KC7320	H51
			3331279	80A08RF84SN12B	S102	3381119	KSEM1548HPLM KC7320	H50	3381201	KSEM2400HPLM KC7320	H51
			3332362	MCLN125CA19	B72	3381120	KSEM1550HPLM KC7320	H50	3381202	KSEM2400HPLM KC7320	H51
			3332803	MCLNR25CA12	B72	3381121	KSEM1560HPLM KC7320	H5			

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3381628	KSEM2567HPLM KC7320	H51	3398461	B978F04700 KC7315	G149	3505149	B707A15500FBG KC7315	G115	3524542	UDDE6000B5ARA KC643M	P31
3381630	KSEM2600HPLM KC7320	H51	3398487	B978F07000 KC7315	G149	3505150	B707A16500FBG KC7315	G115	3524543	UDDE6000B5ARB KC643M	P31
3381631	KSEM4000HPLM KC7320	H51	3398489	B978F07500 KC7315	G149	3505151	B707A17500FBG KC7315	G115	3524544	UDDE6000B5ARB KC643M	P31
3381632	KSEM2581HPLM KC7320	H51	3399619	KSEM3700PCM KC7135	H56, H87	3505152	B707A18500FBG KC7315	G115	3524545	UDDE6000B5ARD KC643M	P31
3381633	KSEM2619HPLM KC7320	H51	3400552	MS2197	V137-139	3505952	B966A20000 KC7315	G134	3524546	UDDE8000B5ARA KC643M	P31
3381634	KSEM1311HPLM KC7320	H50	3400611	MS2191C00	T58-59, V72, V137-138, V140	3519355	B707A10800FBG KC7315	G115	3524547	UDDE8000B5ARB KC643M	P31
3381635	KSEM2650HPLM KC7320	H51	3400612	MS2191C06	T58-59, V137-138, V140	3521303	KSEM2330HPGM KC7315	H43	3524548	UDDE8000B5ARC KC643M	P31
3381636	KSEM2659HPLM KC7320	H51	3400613	MS2191C08	T58-59, V137-138, V140	3524411	UCDE0400A5ARA KC643M	P30	3524549	UDDE8000B5ARD KC643M	P31
3381637	KSEM2779HPLM KC7320	H51	3400616	MS2191C12	T58-59, V137-140	3524412	UCDE0500A5ASA KC643M	P30	3524550	UDDE1000B5ARA KC643M	P31
3381638	KSEM2670HPLM KC7320	H51	3400617	MS2191C14	T58-59, V137-138, V140	3524433	UCDE0500A5ARA KC643M	P30	3524551	UDDE1000B5ARB KC643M	P31
3381639	KSEM2817HPLM KC7320	H51	3400618	MS2191C16	T58-59, V137-138, V140	3524434	UCDE0600A5ARA KC643M	P30	3524552	UDDE1000B5ARC KC643M	P31
3381640	KSEM2700HPLM KC7320	H51	3400619	MS2191C18	T58-59, V137-138, V140	3524435	UCDE0600A5ARA KC643M	P30	3524553	UDDE1000B5ARD KC643M	P31
3381641	KSEM3254HPLM KC7320	H51	3400620	MS2191C20	T57-59, V137-140	3524436	UCDE0700A5ASA KC643M	P30	3524554	UDDE1200B5ARA KC643M	P31
3381642	KSEM2750HPLM KC7320	H51	3400879	12748500500	S95	3524437	UCDE0700A5ARA KC643M	P30	3524555	UDDE1200B5ARB KC643M	P31
3381643	KSEM3335HPLM KC7320	H51	3402143	32M2R040A25SSD12PL	V138	3524438	UCDE0800A5ASA KC643M	P30	3524556	UDDE1200B5ARC KC643M	P31
3381644	KSEM2800HPLM KC7320	H51	3402144	40M3R040A32SSD12PL	V138	3524439	UCDE0800A5ARA KC643M	P30	3524557	UDDE1200B5ARD KC643M	P31
3382970	B707A12100FBG KC7315	G115	3403362	CNMG120404UP KC5010	B54	3524440	UCDE0900A5ARA KC643M	P30	3524558	UDDE1200B5ARA KC643M	P31
3383028	CNGA120408S01020MT KB1345	B290	3403423	CNMG120408UP KC5010	B54	3524441	UCDE0900A5ARA KC643M	P30	3524559	UDDE1600B5ARB KC643M	P31
3383030	CNGA120408S02020MT KB1345	B290	3403424	CNMG120412UP KC5010	B54	3524442	UCDE1000A5ARA KC643M	P30	3524560	UDDE1600B5ARC KC643M	P31
3383031	DNGA150408S01020MT KB1345	B290	3403430	CNMG150408UP KC5010	B82	3524443	UCDE1000A5ARA KC643M	P30	3524561	UDDE1600B5ARD KC643M	P32
3383294	COGW09T308EC KB1345	B290	3403433	CNMG150608UP KC5010	B82	3524444	UCDE1200A5ARA KC643M	P30	3524562	UDDE1600B5ARE KC643M	P32
3383296	TPGW110204EC KB1345	B291	3403434	CNMG160408UP KC5010	B147	3524445	UCDE1200A5ARA KC643M	P30	3524563	UDDE2000B5ARA KC643M	P32
3383298	DCGW11T304S01015MT KB1345	B291	3403445	CNMG160408UP KC5010	B147	3524446	UCDE1400A5ARA KC643M	P30	3524564	UDDE2000B5ARB KC643M	P32
3383314	DCGW11T308S01015MT KB1345	B291	3403448	CNMG080408UP KC5010	B160	3524447	UCDE1400A5ARA KC643M	P30	3524565	UDDE2000B5ARC KC643M	P32
3383760	B707A09800FBG KC7315	G115	3403449	CNMG080412UP KC5010	B160	3524448	UCDE1600A5ARA KC643M	P30	3524566	UDDE2000B5ARD KC643M	P32
3387725	RCGT2006MOSGF KC725M	V83	3450355	MS1234CG	S21, V64	3524449	UCDE1600A5ARA KC643M	P30	3524567	UDDE2500B5ARB KC643M	P32
3387928	NR2M050L KC5010	C158	3450356	MS2189C	S10, S14, S17, S21, S25, S48, S53, S60, S62, T17, V139	3524450	UCDE1800A5ARA KC643M	P30	3524568	UDDE2500B5ARA KC643M	P32
3387928	NR3M150L KC5010	C158	3480435	B977A03250 KC7315	G138	3524451	UCDE1800A5ARA KC643M	P30	3524569	UDDE2500B5ARB KC643M	P32
3387935	NR2M050R KC5010	C158	3482532	CCMT09T308FP KCJ10	B176	3524452	UCDE1800A5ARA KC643M	P30	3524570	UDDE2500B5ARC KC643M	P32
3387936	NR2M075R KC5010	C158	3482959	T331NC2500-20R3BX KC7542	M22	3524453	UCDE2000A5ARA KC643M	P30	3524571	UDDE2500B5ARD KC643M	P32
3387937	NR2M100R KC5010	C158	3482960	T331NF2500-28R3BX KC7542	M22	3524454	UCDE2000A5ARA KC643M	P30	3524572	UDDE2500B5ARE KC643M	P32
3388407	NR2M100L KC5025	C158	3482961	T331NC3125-18R3BX KC7542	M22	3524455	UCDE2500A5ARA KC643M	P30	3524573	UDDE2500B5ARB KC643M	P32
3388409	NR2M150L KC5025	C158	3482962	T331NC3750-16R3BX KC7542	M22	3524456	UCDE2500A5ARA KC643M	P30	3524574	UDDE2500B5ARC KC643M	P32
3388411	NR3M100L KC5025	C158	3483053	T331NC4375-14R3BX KC7542	M22	3524457	UCDE2500A5ARA KC643M	P30	3524575	UDDE2500B5ARD KC643M	P32
3388453	NR3M150L KC5025	C158	3483054	T331NC5000-13R3BX KC7542	M22	3524458	UCDE2500A5ARA KC643M	P30	3524576	UDDE2500B5ARE KC643M	P32
3388455	NR3M200L KC5025	C158	3483057	T331M060X100R6HX KC7542	M23	3524459	UCDE2500A5ARA KC643M	P30	3526417	KSEM1935HPGM KC7315	H42
3388460	NR2M050R KC5025	C158	3483058	T331M080X125R6HX KC7542	M23	3524460	UCDE2500A5ARA KC643M	P30	3528124	B976A03180 KC7315	G138
3388462	NR2M100R KC5025	C158	3483059	T331M100X150R6HX KC7542	M23	3524461	UCDE2500A5ARA KC643M	P30	3528125	B976A03500 KC7315	G138
3388463	NR2M125R KC5025	C158	3483061	T331M120X175R6HX KC7542	M23	3524462	UCDE2500A5ARA KC643M	P30	3528126	B976A04620 KC7315	G139
3388464	NR2M150R KC5025	C158	3483062	T331M120X150R6HX KC7542	M23	3524463	UCDE2500A5ARA KC643M	P30	3528127	B976A05250 KC7315	G139
3388465	NR2M175R KC5025	C158	3483073	T331M140X200R6HX KC7542	M23	3524464	UCDE2500A5ARA KC643M	P30	3528128	B976A06530 KC7315	G139
3388466	NR3M100R KC5025	C158	3483074	T331M140X150R6HX KC7542	M23	3524465	UCDE2500A5ARA KC643M	P30	3528129	B976A06750 KC7315	G139
3388468	NR3M150R KC5025	C158	3483075	T331M160X200R6HX KC7542	M23	3524466	UCDE2500A5ARA KC643M	P30	3528131	B976A08430 KC7315	G140
3388470	NR3M200R KC5025	C158	3491692	B978A13100 KC7315	G148	3524467	UCDE2500A5ARA KC643M	P30	3528132	B976A09750 KC7315	G140
3397222	NGD2M200L KC5010	C149	3492007	MCCM16001	S62, V60, V82, V139	3524477	UCDE2500A5ARA KC643M	P30	3528129	B976A06750 KC7315	G139
3397223	NGD2M250L KC5010	C149	3492010	MCC080001	V82	3524478	UCDE2500A5ARA KC643M	P30	3528131	B976A08430 KC7315	G140
3397226	NGD3M300L KC5010	C149	3496233	B977F05558 KC7315	G143	3524479	UCDE2500A5ARA KC643M	P30	3528132	B976A09750 KC7315	G140
3397243	NGD2M150RK KC5010	C149	3503895	EDCT180564PDERLDJ KC422M	T73	3524480	UCDE2500A5ARA KC643M	P30	3528172	XNGJ0905ANSNGD3W KCK15	S22
3397244	NGD2M200RK KC5010	C149	3503901	MS2187C	S62, T17, V60, V78, V82, V139	3524481	UCDE2500A5ARA KC643M	P30	3547033	XNGJ0905ANSNGD3W KC725M	S22
3397246	NGD3M200RK KC5010	C149	3503902	MS2195C	V56, V60, V72, V78	3524482	UCDE2500A5ARA KC643M	P30	3547035	XNGJ0905ANSNGD3W KCPK30	S22
3397247	NGD3M250RK KC5010	C149	3505052	B707A03175FBG KC7315	G114	3524483	UCDE2500A5ARA KC643M	P31	3553429	KGMSR2525M65	C129
3397248	NGD3M300RK KC5010	C149	3505133	B707A03970FBG KC7315	G114	3524484	UCDE2500A5ARA KC643M	P31	3553430	KGMSL2525M65	C129
3397250	NGD3M400RK KC5010	C149	3505134	B707A04763FBG KC7315	G114	3524485	UCDE2500A5ARA KC643M	P31	3553431	KGMSR3232P65	C129
3397259	NGD2M150LK KC5025	C149	3505135	B707A06350FBG KC7315	G114	3524486	UDDE6000A5ARA KC643M	P31	3553432	KGMSR3232P65	C129
3397273	NGD2M200LK KC5025	C149	3505136	B707A07145FBG KC7315	G114	3524487	UDDE6000A5ARB KC643M	P31	3553453	KGMR2525M65	C130
3397274	NGD2M250LK KC5025	C149	3505137	B707A07938FBG KC7315	G114	3524488	UDDE6000A5ARB KC643M	P31	3553454	KGML2525M65	C130
3397275	NGD3M200LK KC5025	C149	3505138	B707A08334FBG KC7315	G114	3524489	UDDE6000A5ARC KC643M	P31	3553455	KGML3232P65	C130
3397276	NGD3M250LK KC5025	C149	3505139	B707A09129FBG KC7315	G115	3524490	UDDE6000A5ARC KC643M	P31	3553456	KGML3232P65	C130
3397277	NGD3M300LK KC5025	C149	3505140	B707A09525FBG KC7315	G115	3524491	UDDE6000A5ARC KC643M	P31	3553503	B976A07600 KC7315	G140
3397279	NGD3M350LK KC5025	C149	3505141	B707A10320FBG KC7315	G115	3524492	UDDE6000A5ARB KC643M	P31	3554366	CV40BRK32157	K86
3397280	NGD3M400LK KC5025	C149	3505142	B707A11111FBG KC7315	G115	3524493	UDDE6000A5ARB KC643M	P31	3554367	CV40BRK50236	K86
3397286	NGD2M150RK KC5025	C149	3505143	B707A11509FBG KC7315	G115	3524494	UDDE6000A5ARC KC643M	P31	3554368	CV50BRK32157	K86
3397287	NGD2M200RK KC5025	C149	3505144	B707A11908FBG KC7315	G115	3524495	UDDE6000A5ARC KC643M	P31	3554369	CV50BRK50157	K86
3397288	NGD2M250RK KC5025	C149	3505145	B707A14288FBG KC7315	G115	3524496	UDDE6000A5ARC KC643M	P31	3554370	CV50BRK63236	K86
3397289	NGD3M200RK KC5025	C149	3505146	B707A15875FBG KC7315	G115	3524497	UDDE6000A5ARC KC643M	P31	3554371	CV50BRK80275	K86
3397290	NGD3M250RK KC5025	C149	3505147	B707A17463FBG KC7315	G115	3524498	UDDE6000A5ARC KC643M	P31	3554372	BT40BRK32030M	K86
3397291	NGD3M300RK KC5025	C149				3524499	UDDE6000A5ARC KC643M	P31	3554373	BT40BRK50050M	K86
3397293	NGD3M400RK KC5025	C149				3524500	UDDE6000A5ARC KC643M	P31	3554374	BT50BRK32040M	K86
3397299	NG2M050LK KC5010	C147				3524501	UDDE6000A5ARC KC643M	P31	3554375	BT50BRK50040M	K86
3397370	NG2M050RK KC										

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3556399	MB40RBHT09K	K121	3585227	B532A05200SPF KDF400	G105	3587212	880.252.250	K133, K135	3637414	ABDE0800A3ARC K600	P112
3556400	MB50RBHT09K	K121	3585228	B532A06375SPF KDF400	G105	3587695	880.252.320	K133-134	3637415	ABDE1000A3ARA K600	P112
3556401	MB66RBHT12K	K121	3585229	B532A06400SPF KDF400	G105	3587698	881.252.420	K133-134	3637416	ABDE1000A3ARB K600	P112
3556402	MB66RBHT12LK	K121	3585230	B532A07938SPF KDF400	G105	3587699	880.252.420	K133-134	3637417	ABDE1000A3ARC K600	P112
3556403	MB87RBHT12K	K121	3585233	B532A09563SPF KDF400	G105	3587703	881.252.940	K133	3637418	ABDE1200A3ARA K600	P112
3556404	MB87RBHT16LK	K121	3585235	B532A12725SPF KDF400	G105	3587704	841.342.200	K118-120	3637419	ABDE1200A3ARB K600	P112
3556405	MB115RBHT16LK	K121	3586088	KSEM125SEFM	H64	3587705	848.200.005	K121	3637420	ABDE1200A3ARC K600	P112
3557114	A4M65R0620M	C124	3586089	KSEM130SEFM	H64	3587706	848.200.407	K120-122	3637421	ABDE1600A3ARA K600	P112
3557115	A4M65L0620M	C124	3586090	KSEM135SEFM	H64	3587707	848.250.005	K121	3637422	ABDE1600A3ARB K600	P112
3557116	A4M65R0626M	C124	3586091	KSEM140SEFM	H64	3587708	848.250.409	K120-122	3637423	ABDE1600A3ARC K600	P112
3557117	A4M65L0626M	C124	3586092	KSEM145SEFM	H64	3587709	848.320.005	K121	3637424	ABDE1600A3ARD K600	P112
3557119	A4M65L0820M	C124	3586183	KSEM150SEFM	H64	3587710	848.320.413	K120-122	3637425	ABDE2000A3ARA K600	P113
3557120	A4M65R0826M	C124	3586184	KSEM155SEFM	H64	3587711	841.342.420	K118-119	3637426	ABDE2000A3ARB K600	P113
3557121	A4M65L0826M	C124	3586185	KSEM160SEFM	H64	3587712	848.420.005	K121	3637427	ABDE2000A3ARC K600	P113
3557123	A4M65L1020M	C124	3586186	KSEM165SEFM	H64	3587713	848.420.614	K120-122	3637428	ABDE2000A3ARD K600	P113
3557124	A4M65R1026M	C124	3586187	KSEM170SEFM	H64	3587714	841.142.550	K118-119	3637429	ABDE3000A3AS K600	P111
3557125	A4M65L1026M	C124	3586188	KSEM175SEFM	H64	3587715	848.550.620	K120-122	3637430	ABDE4000A3AS K600	P111
3557131	A4M65R0624A070-112	C125	3586189	KSEM180SEFM	H64	3587716	848.550.005	K121	3637431	ABDE5000A3AS K600	P111
3557132	A4M65L0624A070-112	C126	3586190	KSEM185SEFM	H64	3587717	843.012.000	K120-122	3637432	ABDE6000A3AS K600	P111
3557163	A4M65R0624A100-212	C125	3586191	KSEM190SEFM	H64	3587718	844.012.000	K120-122	3637463	ABDE0800A3AS K600	P111
3557164	A4M65L0624A100-212	C126	3586192	KSEM195SEFM	H64	3587719	848.012.000	K120-122	3637464	ABDF0300A3AS K600	P111
3557165	A4M65R0624A200-999	C125	3586193	KSEM200SEFM	H64	3587720	846.012.000	K120-122	3637465	ABDE1200A3AS K600	P111
3557166	A4M65L0624A200-999	C126	3586194	KSEM205SEFM	H64	3587721	847.012.000	K120-122	3637466	ABDE1400A3AS K600	P111
3557167	A4M65R0824A090-200	C125	3586195	KSEM210SEFM	H64	3587722	841.142.720	K118-119	3637467	ABDE1000A3AS K600	P111
3557169	A4M65R0824A184-999	C125	3586196	KSEM215SEFM	H64	3587723	848.720.000	K120-122	3637468	ABDE1800A3AS K600	P111
3557173	A4M65R1024A200-999	C125	3586197	KSEM220SEFM	H64	3587724	848.720.005	K121	3637469	ABDE2000A3AS K600	P111
3557174	A4M65L1024A200-999	C126	3586198	KSEM225SEFM	H64	3587725	844.016.000	K120-122	3637552	ABDF0150A2AS K600	P110
3557175	A4M65R0624B070-112	C127	3586199	KSEM230SEFM	H64	3587726	845.016.000	K120-122	3637553	ABDF0200A2AS K600	P110
3557176	A4M65L0624B070-112	C128	3586200	KSEM235SEFM	H64	3587727	846.016.000	K120-122	3637554	ABDF0250A2AS K600	P110
3557177	A4M65R0624B100-212	C127	3586201	KSEM240SEFM	H64	3587728	847.016.000	K120-122	3637555	ABDF0300A2AS K600	P110
3557178	A4M65L0624B100-212	C128	3586202	KSEM245SEFM	H64	3587729	841.142.940	K118-119	3637556	ABDF0400A2AS K600	P110
3557179	A4M65R0624B200-999	C127	3586203	KSEM250SEFM	H64	3587730	848.940.640	K120, K122	3637557	ABDF0500A2AS K600	P110
3557180	A4M65L0624B200-999	C128	3586204	KSEM255SEFM	H64	3587732	KSHR200C16RS45HN09	S21	3637558	ABDF0600A2AS K600	P110
3557181	A4M65R0824B090-200	C127	3586205	KSEM260SEFM	H64	3587753	KSHR250C20RS45HN09	S21	3637559	ABDF0800A2AS K600	P110
3557182	A4M65L0824B090-200	C128	3586206	KSEM265SEFM	H64	3587754	KSHR315C24RS45HN09	S21	3637560	ABDF1000A2AS K600	P110
3557193	A4M65R0824B184-999	C127	3586207	KSEM270SEFM	H64	3588387	KSEM1604HPGM KC7315	H42	3637561	ABDF1200A2AS K600	P110
3557194	A4M65L0824B184-999	C128	3586208	KSEM275SEFM	H64	3592190	B978A05600 KC7315	G146	3637562	ABDF1400A2AS K600	P110
3557195	A4M65R1024B100-220	C127	3586209	KSEM280SEFM	H64	3593089	B978A04500 KC7315	G146	3637563	ABDF1600A2AS K600	P110
3557197	A4M65R1024B200-999	C127	3586210	KSEM285SEFM	H64	3593675	MS2206	U3	3637564	ABDF1800A2AS K600	P110
3557198	A4M65L1024B200-999	C128	3586211	KSEM290SEFM	H64	3593676	MS2207	U3	3637565	ABDF2000A2AS K600	P110
3557310	12147629800	K111-113	3586212	KSEM295SEFM	H64	3593681	MS2208	U3	3637636	D40MTTB560K440	B387
3559794	B967A14500 KC7315	G134	3586213	KSEM300SEFM	H64	3593911	MS2205	T29-33, T38-41	3637637	D50MTTB737KM40	B387
3560480	SDCT120464ENLDC2 KC725M	T104, T111, U51	3586214	KSEM305SEFM	H64	3594435	B977F04550 KC7315	G143	3637638	D60MTTB1000KM40	B387
3560482	SDET120464SNGB2 KCPK30	T104, T111, U52	3586215	KSEM310SEFM	H64	3594438	B977F03600 KC7315	G143	3638550	MDJNR3232P15	B86
3563231	B707A12700FBG KC7315	G115	3586216	KSEM315SEFM	H64	3595785	MCLNR3232P12	B62	3638551	MDJNL3232P15	B86
3575847	193.531	S25	3586217	KSEM320SEFM	H64	3595786	MCLNL3232P12	B62	3638615	B256A05000 KC7315	G63
3577119	KTMS21S25SD06H	U3	3586519	KM32RBHT24	K118	3595787	MCLNR3232P16	B62	3638616	B256A05500 KC7315	G63
3577121	KTMS25S25SD06H	U3	3586520	KM32RBHT30	K118	3595789	MCLNL3232P16	B62	3638617	B256A05800 KC7315	G63
3577133	KTMS32S32SD08H	U3	3586521	KM40RBHT40	K118	3597588	MCLNL3232P16	B62	3638618	B256A06000 KC7315	G63
3577135	KTMS40S32SD12H	U3	3586522	KM50RBHT50	K118	3597589	MS2219	V38-40	3638619	B256A06500 KC7315	G63
3577137	KTMS50S32SD12H	U3	3586543	KM50RBHT66	K118	3598160	B256A10200 KC7315	G63	3638620	B256A06800 KC7315	G63
3579858	KSEM2070HPGM KC7315	H42	3586544	KM50RBHT87	K118	3598188	B967A06500 KC7315	G133	3638621	B256A07800 KC7315	G63
3583765	SDMT060304EGG KC735M	U4	3586545	KM63UTRBHT7	K118	3609446	KSEM3235HPGM KC7315	H43	3638622	B256A08500 KC7315	G63
3583766	SDMT060304EGG KC730M	U4	3586546	KM63UTRBHT115	K118	3612090	H40SCLCR12	B183	3638623	B256A09000 KC7315	G63
3583768	SDMT080308EGG KC505M	U4	3586547	HSK63RBHT30	K118	3612136	H40SDUCR11	B213	3638624	B256A10000 KC7315	G63
3583769	SDMT080308EGG KC735M	U4	3586548	HSK63RBHT40	K118	3612137	H50SDUCR11	B213	3638625	B256A11800 KC7315	G63
3583770	SDMT080308EGG KC730M	U4	3586549	HSK63RBHT50	K118	3612139	H50SDUCL11	B213	3638626	B256A12000 KC7315	G63
3583784	SDMT120408EGG KC505M	U4	3586550	HSK63RBHT66	K118	3612156	H32MCLNR12	B68	3638627	B256A13000 KC7315	G63
3583785	SDMT120408EGG KC735M	U4	3586551	HSK63RBHT87	K118	3612178	H50MCLNR12	B68	3638628	B256A15000 KC7315	G63
3583786	SDMT120408EGG KC730M	U4	3586563	HSK63RBHT87	K118	3612192	H50MDUNL19	B91	3639212	NG3062LEST KB1425	C163
3585206	B531A03300SPF KDF400	G105	3586564	SF075RBHT24	K119	3612215	H40MVUNR16	B153	3639213	NG3062REST KB1425	C163
3585207	B531A03600SPF KDF400	G105	3586565	SF100RBHT30	K119	3612219	H50MVUNR16	B153	3639214	NG3094REST KB1425	C163
3585208	B531A04000SPF KDF400	G105	3586566	SF125RBHT40	K119	3612259	MWLNLR3232P08	B162	3639215	NG3094REST KB1425	C163
3585209	B531A04366SPF KDF400	G105	3586567	SF100RBHT50	K119	3612260	MWLNLR3232P08	B162	3639217	NG3125REST KB1425	C163
3585210	B531A04851SPF KDF400	G105	3586569	SF125RBHT66	K119	3612649	MWLNLR3232P16	B151	3639219	NG3125REST KB1425	C163
3585211	B531A04864SPF KDF400	G105	3586570	SF150RBHT87	K119	3612650	MWJNL3232P16	B151	3639221	NGP3088R KB1425	C152
3585212	B531A05200SPF KDF400	G105	3586571	SF200RBHT115	K119	3613695	MS2072CG	S21, V72, V139	3639223	NGP3125R KB1425	C152
3585213	B531A06375SPF KDF400	G105	3586572	KM32FBHS24	K133	3613696	MS2038CG	S21, V64, V72, V78, V139	3639344	NG3062LEST KB1630	C163
3585214	B531A06400SPF KDF400	G105	3586573	KM32FBHS31	K133	3615883	B976A09400 KC7315	G140	3639345	NG3062REST KB1630	C163
3585215	B531A07938SPF KDF400	G105	3586574	KM40FBHS40	K133	3616778	KSEM3220HPGM KC7315	H43	3639346	NG3094LEST KB1630	C163
3585217	B531A09563SPF KDF400	G105	3586575	KM50FBHS51	K133	3617131	RIQ06E1306 KC6305	K55	3639347	SCMT09308MP KB1630	C163
3585218	B531A09633SPF KDF400	G105	3586576	KM50FBHS67	K133	3617415	KIPR025RP09CF03	V154	3639348	NG3125LEST KB1630	C163
3585219	B531A11125SPF KDF400	G105	3586577	KM50FBHS87	K133	3617416	KIPR020RP06CF03	V154	3639349	NG3125REST KB1	



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3640677	B291A03000YPL KC7315	G94	3640789	B292A12500YPL KC7315	G96	3642195EDPT10T312PDSRGD KCPK30	T36, T44	3656068TNMS160404FST KD1400	B348
3640678	B291A04000YPL KC7315	G94	3640790	B292A13000YPL KC7315	G96	3642196	.....EDPT10T316PDSRGD KC725M	T36, T44	3656069	.....TNMS160408FST KD1400	B348
3640679	B291A04500YPL KC7315	G94	3640791	B292A13500YPL KC7315	G96	3642198EDPT10T316PDSRGD KCPK30	T36, T44	3656070VNGA160404FST KD1400	B350
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3640681	B291A05100YPL KC7315	G94	3640793	B292A14500YPL KC7315	G96	3642248CRDPN2525M09V	B168, B370	3656449CNGA120404FST KD1425	B344
3640682	B291A05500YPL KC7315	G94	3640794	B292A15000YPL KC7315	G96	3642251	.....CRDPN3232P09V	B168, B370	3656450	.....CNGA120408FST KD1425	B344
3640703	B291A06000YPL KC7315	G94	3640795	B292A15500YPL KC7315	G96	3642252	.....CRDPN3232P15V	B168, B370	3656452	.....CNMS120408FST KD1425	B345
3640704	B291A06350YPL KC7315	G95	3640796	B292A16000YPL KC7315	G96	3642276	.....CRGPR2525M06V	B168, B370	3656463	.....DNMA150404FST KD1425	B347
3640705	B291A06500YPL KC7315	G95	3640797	B292A16500YPL KC7315	G96	3642277	.....CRGPR2525M06V	B168, B370	3656464	.....DNMA150408FST KD1425	B347
3640706	B291A06800YPL KC7315	G95	3640798	B292A17000YPL KC7315	G96	3642280	.....CRGPR3232P09V	B168, B370	3656466	.....DNMS150408FST KD1425	B347
3640707	B291A07000YPL KC7315	G95	3640799	B292A17500YPL KC7315	G96	3642281CRGPR3232P09V	B168, B370	3656467TNMS160404FST KD1425	B348
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3640709	B291A08000YPL KC7315	G95	3640801	B292A18500YPL KC7315	G96	3643847KCGR110308L08 KD1425	E29	3656470TNMS160408FST KD1425	B350
3640710	B291A08334YPL KC7315	G95	3640802	B292A19000YPL KC7315	G96	3643849	.....KCGX110301R15 KD1425	E31	3656471	.....VNGA160404FST KD1425	B350
3640711	B291A08500YPL KC7315	G95	3640803	B292A19500YPL KC7315	G96	3643850KCGX110302R15 KD1425	E31	3656472VNGA160408FST KD1425	B350
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3640717	B291A10500YPL KC7315	G95	3641712EDPT10T308PDERHD KC522M	T36, T43	3643856VCGN160408 KD1425	B351, E34	3659966CCGW09T304FST KD1400	B344
3640718	B291A11000YPL KC7315	G95	3641734	.....EDPT10T308PDERHD KC725M	T36, T43	3643858	.....VCGR160404 KD1425	B351, E34	3659967	.....CCGW09T308FST KD1400	B344
3640719	B291A11500YPL KC7315	G95	3641735	.....EDPT10T308PDERHD KCK15	T36, T43	3643859	.....VCGR160408 KD1425	B351, E34	3659968	.....CPGW060202FST KD1400	B346
3640720	B291A12000YPL KC7315	G96	3641736	.....EDPT10T308PDERHD KCPK30	T36, T43	3643860	.....VCGR160412 KD1425	B351, E34	3659969	.....CPGW060202FST KD1400	B346
3640721	B291A12500YPL KC7315	G96	3641740	.....EDPT10T304PDERHD KC522M	T36, T43	3643862	.....DCGR150408 KD1425	E28	3659970	.....CPGW060208FST KD1400	B346
3640722	B291A12700YPL KC7315	G96	3641741	.....EDPT10T304PDERHD KC725M	T36, T43	3644073	.....DT7P	T30-33, T39-41	3659971	.....CPGW09T304FST KD1400	B346
3640723	B291A13000YPL KC7315	G96	3641742	.....EDPT10T304PDERHD KCK15	T36, T43	3644452	.....KSHR40D03R50A25SHN09	S20	3659972	.....CPGW09T308FST KD1400	B346
3640724	B291A14000YPL KC7315	G96	3641783	.....EDPT10T304PDERHD KCPK30	T36, T43	3645083	.....KSHR40D04R50A25SHN09	S20	3659975	.....CPGW060204FWST KD1400	B346
3640725	B291A14500YPL KC7315	G96	3642028	.....EDPT10T312PDERHD KC522M	T36, T43	3645083	.....SNMG250924RM KC5010	B100	3659976	.....CPGW09T308FWST KD1400	B346
3640726	B291A15000YPL KC7315	G96	3642029	.....EDPT10T312PDERHD KC725M	T36, T43	3647201	.....KSHR40A04R54SHN09	S21	3659977	.....DCGW070204FST KD1400	B346
3640727	B291A16000YPL KC7315	G96	3642031	.....EDPT10T312PDERHD KCPK30	T36, T43	3648330	.....CPGN120304F KD1425	B345	3659978	.....DCGW070204FST KD1400	B346
3640728	B291A17000YPL KC7315	G96	3642093	.....EDPT10T316PDERHD KC522M	T36, T43	3648331	.....CPGN120308F KD1425	B345	3659979	.....DCGW11T304FST KD1400	B346
3640729	B291A18000YPL KC7315	G96	3642094	.....EDPT10T316PDERHD KC725M	T36, T43	3648332	.....TPGN110304F KD1425	B349	3659980	.....DPGW070202FST KD1400	B348
3640730	B292A03000YPL KC7315	G94	3642096	.....EDPT10T316PDERHD KCPK30	T36, T43	3648428	.....DFT06T308D36MD KC7140	H89	3659981	.....DPGW070204FST KD1400	B348
3640731	B292A03175YPL KC7315	G94	3642097	.....EDPT10T320PDERHD KC725M	T36, T43	3648430	.....DFT05T308D32MD KC7140	H89	3659982	.....DPGW11T304FST KD1400	B348
3640732	B292A03500YPL KC7315	G94	3642098	.....EDPT10T320PDERHD KCPK30	T36, T43	3648474	.....DFT070408D45MD KC7140	H89	3659985	.....TPGW110204FST KD1400	B349
3640733	B292A04000YPL KC7315	G94	3642102	.....EDPT10T324PDERHD KC725M	T36, T43	3648478	.....DFT090508D56MD KC7140	H89	3659986	.....TPGW110204FST KD1400	B349
3640734	B292A04200YPL KC7315	G94	3642133	.....EDPT10T324PDERHD KCPK30	T36, T43	3648585	.....TPGN160308F KD1425	B349	3659987	.....CPGW110208FST KD1400	B349
3640735	B292A04300YPL KC7315	G94	3642134	.....D80MTTB1120KM63	B387	3648588	.....TPGN220408F KD1425	B349	3659990	.....TPGW16T308FST KD1400	B349
3640736	B292A04500YPL KC7315	G94	3642135	.....D100MTTB1330KM63	B387	3649187	.....EDCT10T308PDERLDJ KC410M	T35, T42	3659991	.....VBGW110304FST KD1400	B350
3640737	B292A04800YPL KC7315	G94	3642136	.....EDPT10T331PDERHD KC522M	T36, T43	3649188	.....EDCT10T308PDERLDJ KC422M	T35, T43	3659992	.....VNGA160404FST KD1400	B350
3640738	B292A05000YPL KC7315	G94	3642137	.....EDPT10T331PDERHD KC725M	T36, T43	3649189	.....EDCT10T308PDERLD KC520M	T35, T43	3659993	.....CCGW09T304FST KD1425	B344
3640739	B292A05200YPL KC7315	G94	3642138	.....EDPT10T331PDERHD KCPK30	T36, T43	3649190	.....EDCT10T308PDERLD KC522M	T35, T43	3659994	.....CCGW09T308FST KD1425	B344
3640740	B292A05400YPL KC7315	G94	3642141	.....EDPT10T304PDSRGD KC725M	T36, T44	3649191	.....EDCT10T308PDERLD KC725M	T35, T43	3659995	.....CCGW060202FST KD1425	B346
3640741	B292A05500YPL KC7315	G94	3642142	.....EDPT10T304PDSRGD KCK15	T36, T44	3649192	.....EDCT10T308PDERLD KCPK30	T35, T43	3659996	.....CCGW09T304FST KD1425	B344
3640742	B292A05558YPL KC7315	G94	3642143	.....EDPT10T304PDSRGD KCK15	T36, T44	3649213	.....EDCT10T308PDERLD KCK15	T35, T43	3659998	.....CCGW09T308FST KD1425	B344
3640743	B292A06000YPL KC7315	G94	3642144	.....EDPT10T304PDSRGD KC725M	T36, T44	3650831	.....SCMT120408MP KCK20	B231	3659999	.....CCGW09T308FST KD1425	B344
3640744	B292A06000YPL KC7315	G94	3642145	.....EDPT10T304PDSRGD KC725M	T36, T44	3650903	.....SCMT120408MP KCP25	B231	3660000	.....CPGW060202FST KD1425	B346
3640745	B292A06350YPL KC7315	G95	3642146	.....EDPT10T304PDSRGD KCK15	T36, T44	3654372	.....SPET10T304PPERGB2 KC725M	T100, U37	3660001	.....CPGW060208FST KD1425	B346
3640746	B292A06500YPL KC7315	G95	3642147	.....EDPT10T304PDSRGD KCK15	T36, T44	3654503	.....SPET10T304PPERGB2 KCPK30	T100, U37	3660002	.....CPGW09T304FST KD1425	B346
3640747	B292A06500YPL KC7315	G95	3642148	.....EDPT10T304PDSRGD KCK15	T36, T44	3654504	.....SPET10T304PPERGB2 KCK15	T100, U37	3660003	.....CPGW09T308FST KD1425	B346
3640748	B292A06500YPL KC7315	G95	3642149	.....EDPT10T304PDSRGD KCK15	T36, T44	3654505	.....SPET10T304PPERGB2 KC725M	T100, U37	3660004	.....CPGW060204FWST KD1425	B346
3640749	B292A06500YPL KC7315	G95	3642150	.....EDPT10T304PDSRGD KCK15	T36, T44	3654506	.....SPET10T304PPERGB2 KCPK30	T100, U37	3660005	.....CPGW09T308FWST KD1425	B346
3640750	B292A06528YPL KC7315	G95	3642151	.....EDPT10T304PDSRGD KCK15	T36, T44	3654507	.....SPET10T304PPERGB2 KCK15	T100, U37	3660006	.....CPGW060204FWST KD1425	B346
3640751	B292A06746YPL KC7315	G95	3642152	.....EDPT10T304PDSRGD KCK15	T36, T44	3655880	.....CNGA120404FST KD1400	B344	3660007	.....CPGW09T308FST KD1425	B346
3640752	B292A06800YPL KC7315	G95	3642153	.....EDPT10T304PDSRGD KCK15	T36, T44	3655881	.....CNGA120408FST KD1400	B344	3660008	.....TPGW11T304FST KD1425	B348
3640753	B292A06800YPL KC7315	G95	3642154	.....EDPT10T304PDSRGD KCK15	T36, T44	3655882	.....CNGM120404FST KD1400	B345	3660009	.....DCGW070204FST KD1425	B346
3640754	B292A06800YPL KC7315	G95	3642155EDPT10T304PDSRGD KCK15	T36, T44	3656063CNMS120408FST KD1400	B345	3660010DCGW11T304FST KD1425	B346
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3640759	B292A06800YPL KC7315	G95	3642160EDPT10T304PDSRGD KCK15	T36, T44	3656068DNMS150408FST KD1400	B347	3660015DPGW16T308FST KD1425	B349
3640760	B292A06800YPL KC7315	G95	3642161EDPT10T304PDSRGD KCK15	T36, T44	3656069DNMS150408FST KD1400	B347	3660016TPGW110204FST KD1425	B349
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3667060	SIF80HC25100M	K47	3682655	EDCT10T312PDERLD KC725M	T35, T43	3743035	M1H40J3R80B32S90ED14C12	T57	3744936	VBMT160408MP KCM25	B265
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3668023	SIF100HC25100M	K47	3682778	EDCT10T316PDERLDJ KC422M	T35, T43	3743039	M1H63T3R50A27S90ED14C6	T58	3744943	CCMT120412MP KCP10	B177
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3668058	B292A07200VPL KC7315	G95	3682780	EDCT10T316PDERLD KC522M	T35, T43	3743041	M1H63T4R65A27S90ED14C12	T58	3744946	DCMT11T304MP KCP10	B208
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3668625	RMS05500H7HF K605	K9	3682781	EDCT10T316PDERLD KC725M	T35, T43	3744538	12A01R020A16ED10	T31	3744949	SCMT09T308MP KCP10	B231
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3668629	RMS08000H7HF K605	K9	3683704	B707A03700FBG KC7315	G114	3744542	25A03R032A25ED10	T31	3744956	CCMT120408MP KCK20	B177
3668630	RMS09000H7HF K605	K9	3683843	KSEMP3975HPGM KC7315	H43	3744613	25A04R032A25ED10	T31	3744957	CCMT120412MP KCK20	B177
3668631	RMS10000H7HF K605	K9	3684779	EDCT10T302PDFRLDJ KC410M	T35, T42	3744614	32A04R040A32ED10	T31	3744958	CCMT09T308MP KCK20	B190
3668632	RMS11000H7HF K605	K9				3744615	32A05R040A32ED10	T31	3744962	SCMT09T304MP KCK20	B231
3668683	RMS12000H7HF K605	K9	3684824	EDCT10T331PDFRLDJ KC410M	T35, T42	3744616	16A02R025A16ED10-170	T32	3744965	TCMT16T308MP KCK20	B239
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3668885	RMS14000H7HF K605	K9	3684828	EDCT10T331PDERLD KC725M	T35	3744618	18A02R028A16ED10-170	T32	3744975	CCMT060204MP KCU10	B177
3668886	RMS05000H7SF K605	K8	3684829	EDCT10T331PDERLD KCPK30	T35, T43	3744619	20A02R028A20ED10-170	T32	3744979	CCMT09T308MP KCU10	B177
3668887	RMS05500H7SF K605	K8				3744620	20A02R032A20ED10R31-170	T32	3744977	CCMT09T308MP KCU10	B177
3668888	RMS06000H7SF K605	K8	3690478	KSEMP1400HPGM KC7315	H87	3744621	20A03R032A20ED10-170	T32	3744978	CCMT120408MP KCU10	B177
3668889	RMS06500H7SF K605	K8	3690479	KSEMP1500HPGM KC7315	H87	3744622	20A03R032A20ED10R31-170	T32	3744979	CPMT060208MP KCU10	B190
3668890	RMS07000H7SF K605	K8	3690480	KSEMP1600HPGM KC7315	H87	3744623	22A03R032A20ED10-170	T32	3744980	CCMT09T308MP KCU10	B190
3668891	RMS08000H7SF K605	K8	3690481	KSEMP1700HPGM KC7315	H87	3744624	25A03R040A25ED10-200	T32	3744981	DCMT11T304MP KCU10	B208
3668892	RMS09000H7SF K605	K8	3690482	KSEMP1800HPGM KC7315	H87	3744625	25A04R040A25ED10R31-200	T32	3744982	DCMT11T312MP KCU10	B208
3668893	RMS10000H7SF K605	K8	3690713	KSEMP1900HPGM KC7315	H87	3744626	25A04R040A25ED10-200	T32	3744983	DCMT11T308MP KCU10	B216
3668894	RMS11000H7SF K605	K8	3690714	KSEMP2100HPGM KC7315	H87	3744627	25A04R040A25ED10R31-200	T32	3744984	SCMT09T304MP KCU10	B231
3668895	RMS12000H7SF K605	K8	3690715	KSEMP2200HPGM KC7315	H87	3744628	28A04R040A25ED10-200	T32	3744985	SCMT120404MP KCU10	B231
3668896	RMS13000H7SF K605	K8	3690716	KSEMP2300HPGM KC7315	H87	3744629	32A04R040A32ED10-200	T32	3744986	SCMT120408MP KCU10	B231
3668897	RMS14000H7SF K605	K8	3690717	KSEMP2400HPGM KC7315	H87	3744630	32A04R048A32ED10R31-200	T32	3744987	SPMT09T308MP KCU10	B239
3668908	RMS05000H7HF K6C6305	K9	3690718	KSEMP2500HPGM KC7315	H87	3744631	32A05R048A32ED10-200	T32	3744988	SPMT120408MP KCU10	B239
3668909	RMS05500H7HF K6C6305	K9	3690719	KSEMP2600HPGM KC7315	H87	3744632	32A05R048A32ED10R31-200	T32	3744989	TCMT16T304MP KCU10	B245
3668910	RMS06000H7HF K6C6305	K9	3690720	KSEMP2700HPGM KC7315	H87	3744633	16A02R025B16ED10	T30	3744990	TCMT16T304MP KCU10	B245
3668911	RMS06500H7HF K6C6305	K9	3690721	KSEMP2800HPGM KC7315	H87	3744634	20A02R028B20ED10	T30	3745674	40A04RS90ED10D	T33
3668912	RMS07000H7HF K6C6305	K9	3690722	KSEMP2900HPGM KC7315	H87	3744635	20A03R028B20ED10	T30	3745675	40A06RS90ED10D	T33
3668913	RMS08000H7HF K6C6305	K9	3690723	KSEMP3000HPGM KC7315	H87	3744636	25A03R032B25ED10	T30	3745676	50A05RS90ED10D	T33
3668914	RMS09000H7HF K6C6305	K9	3690724	KSEMP3100HPGM KC7315	H87	3744637	25A04R032B25ED10	T30	3745677	50A08RS90ED10D	T33
3668915	RMS10000H7HF K6C6305	K9	3690725	KSEMP3200HPGM KC7315	H87	3744638	32A04R040B32ED10	T30	3745678	63A06RS90ED10D	T33
3668916	RMS11000H7HF K6C6305	K9	3690726	KSEMP3300HPGM KC7315	H87	3744639	32A05R040B32ED10	T30	3745679	63A09RS90ED10D	T33
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3668921	RMS05500H7SF K6C6305	K8	3732890	M1HR150E14W125Z3L200C6	T65	3744878	SPMT09T308MP KCM15	B239	3745708	16A02R025M08ED10	T29
3668922	RMS06000H7SF K6C6305	K8	3732891	M1HR150E14W125Z3L250C9	T65	3744880	TCMT16T308MP KCM15	B245	3745709	20A02R028M10ED10	T29
3668923	RMS06500H7SF K6C6305	K8	3732892	M1HR150E14W125Z3L300C12	T65	3744884	CCMT060204MP KCP25	B177	3745710	20A03R028M10ED10	T29
3668924	RMS07000H7SF K6C6305	K8	3732933	M1HR200E14S075Z3L200C6	T65	3744886	CCMT09T304MP KCP25	B177	3745711	25A03R032M12ED10	T29
3668925	RMS08000H7SF K6C6305	K8	3732934	M1HR200E14S075Z3L250C9	T65	3744887	CCMT09T308MP KCP25	B177	3745712	25A04R032M12ED10	T29
3668926	RMS09000H7SF K6C6305	K8	3732935	M1HR200E14W150Z3L300C12	T65	3744888	CCMT09T312MP KCP25	B177	3745723	32A04R040M16ED10	T29
3668927	RMS10000H7SF K6C6305	K8	3732937	M1HR250E14S100Z3L250C9	T65	3744890	CCMT120408MP KCP25	B177	3745724	32A05R040M16ED10	T29
3668928	RMS11000H7SF K6C6305	K8	3732938	M1HR250E14S100Z3L250C12	T65	3744891	CCMT120412MP KCP25	B177	3745725	40A06R040M16ED10	T29
3668929	RMS12000H7SF K6C6305	K8	3732939	M1HR250E14S100Z3L300C12	T65	3744893	CCMT09T308MP KCP25	B190	3745726	42A06R040M16ED10	T29
3668930	RMS13000H7SF K6C6305	K8	3733337	CNGA120412S01020MT KB5630	B290, B310	3744895	DCMT11T304MP KCP25	B208	3746074	DNMG110404MN KCP05	B78
3668931	RMS14000H7SF K6C6305	K8	3733417	DNGA150404S01025MT KB5630	B290, B314	3744896	DCMT11T312MP KCP25	B208	3746075	DNMG110408MN KCP05	B78
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3669084	DFT090508D63MD KC7140	H89	3738491	DV50BSIF10066M	K45	3744907	TCMT16T312MP KCP25	B245	3746090	DNMG150408MW KCP05	B80
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3747141	CNGA120408S01025MT KB5630	B290, B310	3749200	DNMG150608MW KCP10	B80	3749383	CPMT09T304LF KCP10	B190	3751475	CNMG120408FN KCP05	B49
3747142	CNGA120412S01025MT KB5630	B290, B310	3749253	SNMG120412MW KCP10	B100	3749384	CPMT09T308LF KCP10	B190	3751477	DNMG110404FN KCP05	B77
3747223	CNGA120404S01025FWMT KB5630	B289, B310	3749254	TNMG160408MW KCP10	B127	3749386	DCMT070204LF KCP10	B207	3751478	DNMG110408FN KCP05	B77
3747224	CNGA120408S01025FWMT KB5630	B289, B310	3749255	TNMG160412MW KCP10	B127	3749387	DCMT150404LF KCP10	B207	3751479	DNMG110412FN KCP05	B77
3747225	DNGA150408S01025MT KB5630	B290, B310	3749256	VNMG060408MW KCP10	B158	3749388	DCMT11T3212LF KCP10	B207	3751480	DNMG150404FN KCP05	B77
3747226	VNGA160404S01025MT KB5630	B292, B323	3749258	VNMG080408MW KCP10	B158	3749389	DCMT150404LF KCP10	B207	3751481	DNMG150408FN KCP05	B77
3747227	VNGA160408S01025MT KB5630	B292, B323	3749259	CNMG120404RP KCP10	B53	3749390	DCMT150408LF KCP10	B207	3751482	CNMG150412FN KCP05	B77
3747228	RNGN090300S02015C KB5630	B317	3749260	CNMG120416RP KCP10	B53	3749391	DPMT070204LF KCP10	B215	3751483	DNMG150604FN KCP05	B77
3747231	CGW060202S01015C KB5630	B290, B308	3749261	CNMG120416RP KCP10	B53	3749392	DPMT11T304LF KCP10	B215	3751484	DNMG150608FN KCP05	B77
3747232	CGW060204S01015C KB5630	B290, B308	3749262	CNMG160608RP KCP10	B53	3749393	DPMT11T304LF KCP10	B215	3751485	DNMG150612FN KCP05	B77
3747233	CGW09T304S01015MT KB5630	B291, B308	3749263	CNMG160612RP KCP10	B53	3749394	SCMT09T304LF KCP10	B230	3751486	SNMG120404FN KCP05	B97
3747234	CGW09T308S01015MT KB5630	B291, B308	3749264	CNMG160616RP KCP10	B53	3749395	SCMT09T308LF KCP10	B230	3751488	TNMG160404FN KCP05	B124
3747237	CPGW09T304S01015MT KB5630	B311	3749266	CNMG190616RP KCP10	B53	3749396	SCMT120404LF KCP10	B230	3751490	TNMG160412FN KCP05	B124
3747238	CPGW09T308S01015MT KB5630	B311	3749267	DNMG110408RP KCP10	B81	3749399	SPMT09T304LF KCP10	B238	3751492	VNMG160404FN KCP05	B145
3747239	DCGW070202S01015C KB5630	B291, B312	3749269	DNMG150408RP KCP10	B81	3749401	TCMT110204LF KCP10	B244	3751493	VNMG160408FN KCP05	B145
3747240	DCGW070204S01015C KB5630	B291, B312	3749271	DNMG150608RP KCP10	B81	3749402	TCMT110208LF KCP10	B244	3751494	VNMG080408FN KCP05	B155
3747241	DCGW11T304S01015MT KB5630	B291, B312	3749272	DNMG150612RP KCP10	B81	3749403	TCMT16T304LF KCP10	B244	3751495	VNMG080408FN KCP05	B155
3747242	DCGW11T308S01015MT KB5630	B291, B312	3749273	DNMG150616RP KCP10	B81	3749404	TCMT16T308LF KCP10	B244	3751498	CCMT09T308LF KCP05	B177
3747244	TPGW110208S01015C KB5630	B291, B321	3749274	RCMT1204MORP KCP10	B226	3749408	TPMT110204LF KCP10	B255	3751499	DCMT11T304LF KCP05	B207
3747245	VBGW160404S01015MT KB5630	B292, B322	3749277	SNMG120408RP KCP10	B101	3749410	TPMT16T304LF KCP10	B255	3751500	CNMG120408MN KCP05	B50
3747246	VBGW160408S01015MT KB5630	B292, B322	3749278	SNMG120412RP KCP10	B101	3749412	VBMT110304LF KCP10	B265	3751501	CNMG120412MN KCP05	B50
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3747374	MS1233	T58	3749283	SNMG190616RP KCP10	B101	3749414	VBMT160404LF KCP10	B265	3751506	VNMG080408MN KCP05	B157
3747375	MS1198	S110, T58	3749284	TNMG160408RP KCP10	B128	3749415	VBMT160408LF KCP10	B265	3751507	CNMG120408MN KCP05	B52
3748345	CNMG120408CT KCP05	B48	3749285	TNMG160412RP KCP10	B128	3749416	WPMT040204LF KCP10	B272	3751508	VNMG080412MW KCP05	B158
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3748363	DNMG150612CT KCP05	B76	3749288	TNMG220412RP KCP10	B128	3749444	CCMT09T312MF KCP10	B177	3751511	CNMG120408RP KCP05	B53
3748366	CNMG120404FF KCP05	B48	3749289	TNMG220416RP KCP10	B128	3749447	CPMT09T308MF KCP10	B190	3751512	CNMG110304LF KCP05	B56
3748367	CNMG120408FF KCP05	B48	3749290	TNMG270612RP KCP10	B128	3749448	DCMT11T304MF KCP10	B208	3751519	CNMG190612 KCP25	B47
3748368	DNMG110408FF KCP05	B76	3749291	VNMG160408RP KCP10	B147	3749450	DCMT11T308MF KCP10	B208	3751520	CNMG190616 KCP25	B47
3748374	TNMG160408FF KCP05	B124	3749292	VNMG160412RP KCP10	B147	3749451	DCMT11T312MF KCP10	B208	3751521	CNMG250924 KCP25	B47
3748375	VNMG160404FF KCP05	B145	3749293	VNMG060408RP KCP10	B159	3749453	SCMT09T308MF KCP10	B231	3751522	RNMG190600 KCP25	B94
3748376	VNMG160408FF KCP05	B145	3749294	VNMG060412RP KCP10	B159	3749454	SCMT120408MF KCP10	B231	3751546	SNMG250924 KCP25	B96
3748377	CNMG120404FW KCP05	B49	3749295	VNMG080408RP KCP10	B159	3749455	SCMT120412MF KCP10	B231	3751547	TNMG30024 KCP25	B123
3748378	CNMG120408FW KCP05	B49	3749296	VNMG080412RP KCP10	B159	3749456	SPMT09T308MF KCP10	B239	3751548	RCMT0602M0 KCP25	B224
3748379	CNMG120412FW KCP05	B49	3749297	VNMG080416RP KCP10	B159	3749459	TCMT16T308MF KCP10	B245	3751549	RCMT0803M0 KCP25	B224
3748381	DNMG110408FW KCP05	B78	3749298	CCMT060204UF KCP10	B178	3749460	TCMT16T312MF KCP10	B245	3751550	RCMT103M0 KCP25	B224
3748383	DNMG150408FW KCP05	B78	3749299	CCMT09T302UF KCP10	B178	3749462	TPMT16T308MF KCP10	B255	3751551	RCMT1605M0 KCP25	B224
3748384	DNMG150604FW KCP05	B78	3749300	CCMT09T304UF KCP10	B178	3749463	CNMG090304MN KCP10	B50	3751552	RCMT2006M0 KCP25	B224
3748385	DNMG150608FW KCP05	B78	3749307	DCMT11T308UF KCP10	B208	3749464	CNMG090308MN KCP10	B50	3751553	RCMT0602M0 KCP25	B224
3748386	SNMG120408FW KCP05	B98	3749309	DPMT11T304UF KCP10	B216	3749465	CNMG120404MN KCP10	B50	3751554	RCMT09T300 KCP25	B224
3748388	TNMG160404FW KCP05	B125	3749310	DPMT11T308UF KCP10	B216	3749466	CNMG120416MN KCP10	B50	3751555	CNMG120408CT KCP25	B48
3748389	TNMG160408FW KCP05	B125	3749311	SCMT09T308UF KCP10	B231	3749467	CNMG160608MN KCP10	B50	3751556	CNMG120412CT KCP25	B48
3748390	TNMG160412FW KCP05	B125	3749318	TPMT16T308UF KCP10	B256	3749474	DNMG110408MN KCP10	B78	3751557	DNMG150404CT KCP25	B76
3748391	VNMG060404FW KCP05	B156	3749336	CNMG120416CT KCP10	B48	3749475	DNMG110408MN KCP10	B78	3751558	DNMG150408CT KCP25	B76
3748392	VNMG060408FW KCP05	B156	3749337	DNMG110408CT KCP10	B76	3749477	DNMG110412MN KCP10	B78	3751559	DCMT11T304FW KCP25	B207
3748393	VNMG060408FW KCP05	B156	3749338	DNMG150404CT KCP10	B76	3749478	DNMG150404MN KCP10	B78	3751560	DNMG150612CT KCP25	B76
3748394	VNMG080404FW KCP05	B156	3749339	DNMG150408CT KCP10	B76	3749479	DNMG150604MN KCP10	B78	3751561	CCMT060204FW KCP25	B176
3748395	VNMG080404FW KCP05	B156	3749341	DNMG150604CT KCP10	B76	3749480	DNMG150612MN KCP10	B78	3751562	CCMT060208LF KCP25	B176
3748396	VNMG080412FW KCP05	B156	3749342	DNMG150608CT KCP10	B76	3749481	DNMG150616MN KCP10	B78	3751563	CCMT09T304FW KCP25	B176
3748397	CCMT060208LF KCP05	B177	3749344	DNMG150612CT KCP10	B76	3749483	SNMG090308MN KCP10	B98	3751564	CPMT09T308FW KCP25	B189
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3748422	VBMT110304LF KCP05	B265	3749348	CNMG120408FF KCP10	B48	3749486	SNMG120408MN KCP10	B98	3751567	CPMT09T304FW KCP25	B189
			3749349	DNMG110408FF KCP10	B76	3749487	SNMG120412MN KCP10	B98	3751568	CPMT09T308FW KCP25	B189
			3749350	DNMG150404FF KCP10	B76	3749490	SNMG190612MN KCP10	B98	3751569	DCMT11T304FW KCP25	B207
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			3749355	TNMG160404FF KCP10	B124	3749494	TNMG220408MN KCP10	B125	3751575	CCMT060208LF KCP25	B177
			3749357	VNMG160404FF KCP10	B145	3749496	VNMG160404MN KCP10	B145	3751576	CCMT120408LF KCP25	B177
			3749358	VNMG160408FF KCP10	B145	3749497	VNMG160408MN KCP10	B145	3751577	CPMT060204LF KCP25	B190
			3749359	CNMG120404FW KCP10	B49	3749498	VNMG160412MN KCP10	B145	3751578	CPMT060208LF KCP25	B190
			3749360	CNMG120408FW KCP10	B49	3749499	VNMG060404MN KCP10	B157	3751579	CPMT09T304LF KCP25	B190
			3749361	CNMG120412FW KCP10	B49	3749500	VNMG060408MN KCP10	B157	3751580	CPMT09T308LF KCP25	B190
			3749362	DNMG110404FW KCP10	B78	3749501	VNMG060412MN KCP10	B157	3751581	DCMT070204LF KCP25	B207
			3749363	DNMG110408FW KCP10	B78	3749502	VNMG080412MN KCP10	B157	3751582	DCMT11T308LF KCP25	B207
			3749364	DNMG150404FW KCP10	B78	3749503	CNMP120408 KCP10	B57	3751583	DCMT11T312LF KCP25	B207
			3749367	DNMG150608FW KCP10	B78	3749507	TNMP160408K KCP10	B130	3751585	DCMT150408LF KCP25	B207
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3751600	TCMT16T312LF KCP25	B244	3751741	SNMM120412RM KCP25	B103	3751957	DNMG150408UN KCK05	B82	3752095	TCMT16T304LF KCK05	B244
3751601	TCMT220408LF KCP25	B244	3751743	SNMM150612RM KCP25	B103	3751958	DNMG150412FN KCK05	B77	3752099	TPMT090204LF KCK05	B255
3751602	TPMT090204LF KCP25	B255	3751744	SNMM150616RM KCP25	B103	3751959	DNMG150604FN KCK05	B77	3752102	TPMT16T304LF KCK05	B255
3751603	TPMT110204LF KCP25	B255	3751745	SNMM190612RM KCP25	B103	3751967	DNMG150608FN KCK05	B77	3752103	TPMT16T308LF KCK05	B255
3751604	TPMT110208LF KCP25	B255	3751746	SNMM190616RM KCP25	B103	3751961	DNMG150612FN KCK05	B77	3752106	VBMT110304LF KCK05	B265
3751605	TPMT16T304LF KCP25	B255	3751747	SNMM190624RM KCP25	B103	3751963	SNMG090308FN KCK05	B97	3752107	VBMT110308LF KCK05	B265
3751606	TPMT16T308LF KCP25	B255	3751748	TNMM160408RM KCP25	B129	3751964	SNMG120404FN KCK05	B97	3752109	VBMT160408LF KCK05	B265
3751607	VBMT110304LF KCP25	B265	3751749	TNMM160412RM KCP25	B129	3751970	TNMG160404FN KCK05	B124	3752110	VBMT160412LF KCK05	B265
3751608	VBMT110308LF KCP25	B265	3751751	TNMM220412RM KCP25	B129	3751971	TNMG160408FN KCK05	B124	3752113	WPMT06T308LF KCK05	B272
3751609	VBMT160404LF KCP25	B265	3751753	TNMM270612RM KCP25	B129	3751972	SNMG160412FN KCK05	B124	3752114	CNMG120412RP KCK05	B53
3751610	VBMT160408LF KCP25	B265	3751754	TNMM270616RM KCP25	B129	3751974	VNMG160404FN KCK05	B145	3752115	CNMG160612RP KCK05	B53
3751611	WPMT06T304LF KCP25	B272	3751755	CNMG120408RN KCP25	B53	3751975	VNMG160408FN KCK05	B145	3752117	DNMG150408RP KCK05	B81
3751615	CCMT09T308MW KCP25	B178	3751756	CNMG120416RN KCP25	B53	3751976	VNMG060404FN KCK05	B155	3752119	CNMG150612RP KCK05	B81
3751616	CCMT120404MW KCP25	B178	3751757	CNMG120408RP KCP25	B53	3751978	VNMG080404FN KCK05	B155	3752121	SNMG120412RP KCK05	B101
3751617	CCMT120408MW KCP25	B178	3751759	CNMM120412RP KCP25	B56	3751979	VNMG080408FN KCK05	B155	3752122	TNMG160408RP KCK05	B128
3751618	CNMG120412MW KCP25	B52	3751760	CNMM120416RP KCP25	B56	3751980	CCMT060204LF KCK05	B177	3752124	VBMT160408LF KCK05	B159
3751620	CPMT09T308MW KCP25	B191	3751762	CNMM160612RP KCP25	B56	3751981	CCMT09T304LF KCK05	B177	3752125	VNMG080412RP KCK05	B159
3751622	DCMT11T308MW KCP25	B208	3751763	CNMM160616RP KCP25	B56	3751982	CCMT09T308LF KCK05	B177	3752127	CNMA120404 KCK15	B47
3751633	DNMG150408MW KCP25	B80	3751764	CNMM190612RP KCP25	B56	3751985	DCMT11T308LF KCK15	B207	3752128	CNMA120408 KCK15	B47
3751635	DNMG150608MW KCP25	B80	3751765	CNMM190616RP KCP25	B56	3751986	CCMT060208LF KCK15	B177	3752129	CNMA120412 KCK15	B47
3751636	DNMG150612MW KCP25	B80	3751766	CNMM190624RP KCP25	B56	3751987	CCMT120408LF KCK15	B177	3752130	CNMA120416 KCK15	B47
3751637	SNMG120408MW KCP25	B100	3751767	DNMM150608RP KCP25	B83	3751988	CPMT060204LF KCK15	B190	3752131	CNMA160608 KCK15	B47
3751639	TNMG160408MW KCP25	B127	3751768	DNMM150612RP KCP25	B83	3751989	CPMT060208LF KCK15	B190	3752132	CNMA160612 KCK15	B47
3751640	TNMG160412MW KCP25	B127	3751769	DNMM150616RP KCP25	B83	3751991	CPMT09T308LF KCK15	B190	3752143	CNMA160616 KCK15	B47
3751641	VNMG060408MW KCP25	B158	3751770	SNMM120408RP KCP25	B103	3751992	DCMT11T308LF KCK15	B207	3752144	CNMA190612 KCK15	B47
3751643	VNMG080408MW KCP25	B158	3751771	SNMM120412RP KCP25	B103	3752013	SCMT09T308LF KCK15	B230	3752145	DNMA150408 KCK15	B75
3751644	CNMG120404RP KCP25	B53	3751772	SNMM150612RP KCP25	B103	3752014	SCMT120408LF KCK15	B230	3752146	DNMA150412 KCK15	B75
3751645	CNMG120412RP KCP25	B53	3751773	SNMM190612RP KCP25	B103	3752015	SPMT09T308LF KCK15	B238	3752147	DNMA150608 KCK15	B75
3751646	CNMG120416RP KCP25	B53	3751775	SNMM190624RP KCP25	B103	3752016	TCMT110204LF KCK15	B244	3752152	SNMA120412 KCK15	B96
3751647	CNMG160608RP KCP25	B53	3751777	TNMM220412RP KCP25	B130	3752017	TCMT110208LF KCK15	B244	3752157	TNMA160408 KCK15	B123
3751648	CNMG160612RP KCP25	B53	3751805	DNMM190600 KCP40	B94	3752018	TCMT16T304LF KCK15	B244	3752158	TNMA160412 KCK15	B123
3751649	CNMG160616RP KCP25	B53	3751808	SNMG190616 KCP40	B96	3752019	TCMT16T308LF KCK15	B244	3752159	TNMA160416 KCK15	B123
3751650	CNMG190612RP KCP25	B53	3751809	SNMG250924 KCP40	B96	3752020	TCMT16T312LF KCK15	B244	3752163	TCMT16T312LF KCK15	B123
3751652	CNMM250924RP KCP25	B56	3751810	TNMG330924 KCP40	B123	3752021	TPMT090204LF KCK15	B255	3752164	VNMA160408 KCK15	B144
3751655	DNMG150408RP KCP25	B81	3751811	CNMG120408MN KCP40	B50	3752024	TPMT16T304LF KCK15	B255	3752165	VNMA060408 KCK15	B155
3751656	DNMG150412RP KCP25	B81	3751812	CNMG120412MN KCP40	B50	3752025	TPMT16T308LF KCK15	B255	3752167	TPMT16T308LF KCK15	B155
3751657	DNMG150608RP KCP25	B81	3751814	DNMM150408MN KCP40	B78	3752026	VBMT160404LF KCK15	B265	3752168	VNMA080412 KCK15	B155
3751658	DNMG150612RP KCP25	B81	3751816	DNMG150608MN KCP40	B78	3752027	VBMT160408LF KCK15	B265	3752170	CCMT060204LF KCK15	B177
3751659	DNMG150616RP KCP25	B81	3751818	SNMG120408MN KCP40	B98	3752028	CCMT060204MF KCK15	B177	3752171	CCMT09T304LF KCK15	B177
3751661	RCGT1204MORP KCP25	B223	3751819	SNMG120412MN KCP40	B98	3752029	CCMT09T304MF KCK15	B177	3752172	CCMT09T308LF KCK15	B177
3751673	RCMT1204MORP KCP25	B226	3751823	TNMG160412MN KCP40	B125	3752030	CCMT09T312MF KCK15	B177	3752173	DCMT11T304LF KCK15	B207
3751674	RCMT1606MORP KCP25	B226	3751824	TNMG220408MN KCP40	B125	3752031	CCMT120412MF KCK15	B177	3752174	CCMT09T308LF KCK15	B177
3751675	RCMT2006MORP KCP25	B226	3751826	VNMG080408MN KCP40	B157	3752032	CPMT060208MF KCK15	B190	3752175	CCMT120408MF KCK15	B177
3751677	RCMX2507MORP KCP25	B226	3751828	CNMG120408RP KCP40	B53	3752033	CPMT09T308MF KCK15	B190	3752176	CNMG120408RP KCK15	B53
3751679	SNMG120408RP KCP25	B101	3751829	CNMG120412RP KCP40	B53	3752035	DCMT11T304MF KCK15	B208	3752177	CNMG120404UN KCK15	B54
3751680	SNMG120412RP KCP25	B101	3751830	CNMG160612RP KCP40	B53	3752036	DCMT11T308MF KCK15	B208	3752178	CNMG120408UN KCK15	B54
3751681	SNMG150612RP KCP25	B101	3751833	CNMM120408RP KCP40	B56	3752037	DCMT11T312MF KCK15	B208	3752179	CNMG120412UN KCK15	B54
3751682	SNMG150616RP KCP25	B101	3751837	CNMM160612RP KCP40	B56	3752039	SCMT09T308MF KCK15	B231	3752181	CNMG160608UN KCK15	B54
3751685	SNMM250724RP KCP25	B103	3751847	SNMG120412RP KCP40	B101	3752040	SCMT120408MF KCK15	B231	3752182	CNMG160612UN KCK15	B54
3751686	SNMM250924RP KCP25	B103	3751848	SNMG150612RP KCP40	B101	3752041	SCMT120412MF KCK15	B231	3752183	CNMG160616UN KCK15	B54
3751687	TNMG160408RP KCP25	B128	3751850	SNMG190616RP KCP40	B101	3752042	SPMT09T308MF KCK15	B239	3752184	CNMG160608UN KCK15	B54
3751688	TNMG160412RP KCP25	B128	3751854	SNMM190612RP KCP40	B103	3752043	SPMT120408MF KCK15	B239	3752185	CNMG190612UN KCK15	B54
3751689	TNMG220408RP KCP25	B128	3751855	SNMM190616RP KCP40	B103	3752044	TCMT110208MF KCK15	B245	3752186	CNMG190616UN KCK15	B54
3751692	TNMG270612RP KCP25	B128	3751856	SNMM250724RP KCP40	B103	3752045	TCMT16T308LF KCK15	B245	3752187	DNMG110408UN KCK15	B82
3751694	TNMG330924RP KCP25	B128	3751858	TNMG220412RP KCP40	B128	3752047	TPMT110208MF KCK15	B255	3752188	DNMG110412UN KCK15	B82
3751695	VNMG160408RP KCP25	B147	3751859	TNMG330924RP KCP40	B128	3752048	TPMT16T308MF KCK15	B255	3752189	DNMG150408UN KCK15	B82
3751696	VNMG160412RP KCP25	B147	3751862	CNMG120408RP KCK05	B53	3752049	TPMT16T312MF KCK15	B255	3752192	DNMG150608UN KCK15	B82
3751697	VNMG060408RP KCP25	B159	3751873	CNMG120404UN KCK05	B54	3752050	CNMG120412RP KCK15	B53	3752193	DNMG150612UN KCK15	B82
3751698	VNMG060412RP KCP25	B159	3751874	CNMG120408UN KCK05	B54	3752052	CNMG160612RP KCK15	B53	3752196	SNMG120408UN KCK15	B102
3751699	VNMG080408RP KCP25	B159	3751875	CNMG120412UN KCK05	B54	3752053	CNMG190612RP KCK15	B53	3752200	SNMG150616UN KCK15	B102
3751700	VNMG080412RP KCP25	B159	3751882	CNMG190616UN KCK05	B54	3752057	DNMG150612RP KCK15	B81	3752201	SNMG190612UN KCK15	B102
3751701	VNMG080416RP KCP25	B159	3751896	CNMA120408 KCK05	B47	3752058	RCMT1204MORP KCK15	B226	3752203	TNMG160408UN KCK15	B128
3751702	CCMT060204UF KCP25	B178	3751898	CNMA120412 KCK05	B47	3752059	RCMT1606MORP KCK15	B226	3752207	TNMG120412UN KCK15	B128
3751703	CCMT09T304UF KCP25	B178	3751899	CNMA120416 KCK05	B47	3752061	SNMG120412RP KCK15	B101	3752209	VNMG160404UN KCK15	B147
3751705	CPMT060204UF KCP25	B191	3751906	CNMA190612 KCK05	B47	3752066	TNMG220416RP KCK15	B128	3752210	VNMG160408UN KCK15	B147
3751706	CPMT09T304UF KCP25	B191	3751908	TNMG160408UN KCK05	B128	3752067	VNMG160408RP KCK15	B147	3752211	VNMG060408UN KCK15	B160
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3751712	TCMT110204UF KCP25	B245	3751912	DNMA150412 KCK05	B75	3752072	CCMT060208LF KCK05	B177	3753009	B291A05600YLP KCP7315	G94
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3751715	CNMM120408RM KCP25	B55	3751931	TNMA220408 KCK05	B123	3752075	CPMT060208LF KCK05	B190	3753203	CPMT060408FF KCP10	B76
3751716	CNMM120412RM KCP25	B55	3751934	VNMA160408 KCK05	B144	3752076	CPMT09T304LF KCK05	B190	3753206	VNMG060404FF KCP10	B155
3751718	CNMM160612RM KCP25	B55	3751938	VNMA080408 KCK05	B155	3752077	CPMT09T308LF KCK05	B190	3753207	VNMG060408FF KCP10	B155
3751719	CNMM160616RM KCP25	B55	3751944	CNMG090308FN KCK05	B49	3752079	DCMT11T308LF KCK05	B207	3753208	VNMG060408FF KCP10	B155
3751721	CNMM190612RM KCP25	B55	375194								

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3753215	DNMG110404FN KCP10	B77	3753372	TNMG220408RP KCP10	B130	3753506	CNMG160612RN KCP25	B53	3753714	TNMG110304FN KCP25	B124
3753216	DNMG110408FN KCP10	B77	3753373	VNMG220408RN KCP10	B147	3753507	CNMG160616RN KCP25	B53	3753715	TNMG110308FN KCP25	B124
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3753222	DNMG150608FN KCP10	B77	3753380	VNMG080412RN KCP10	B159	3753511	CNMG190624RN KCP25	B53	3753719	TNMG220404FN KCP25	B124
3753223	DNMG150612FN KCP10	B77	3753381	VNMG080416RN KCP10	B159	3753512	DNMG150408RN KCP25	B81	3753720	TNMG220408FN KCP25	B124
3753225	SNMG090308FN KCP10	B97	3753386	EDPT10T308PDRGD KC520M	T36,	3753513	DNMG150412RN KCP25	B81	3753721	TNMG220412FN KCP25	B124
3753227	SNMG120408FN KCP10	B97			T44	3753514	DNMG150416RN KCP25	B81	3753722	VNMG160404FN KCP25	B145
3753228	SNMG120412FN KCP10	B97	3753387	EDPT10T312PDRGD KC520M	T36,	3753515	DNMG150608RN KCP25	B81	3753723	VNMG160408FN KCP25	B145
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3753239	VNMG160408FN KCP10	B145	3753415	CPMT09T308MF KCP25	B190	3753523	RNMG190608RN KCP25	B94	3753730	CCMT120404LF KCP25	B177
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3753241	VNMG060408FN KCP10	B155	3753417	EDCT10T308PDERLD KC510M	T35,	3753526	SNMG120408RN KCP25	B101	3753733	CCMT09T308MF KCP25	B177
3753242	VNMG080404FN KCP10	B155			T43	3753527	SNMG120412RN KCP25	B101	3753734	CCMT120408MF KCP25	B177
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3753244	CCMT060204LF KCP10	B177	3753419	DCMT11T308MF KCP25	B208	3753529	SNMG150608RN KCP25	B101	3753737	RCMT10T3M0 KCP30	B224
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3753251	CCMT120408MF KCP10	B177	3753426	SPMT120408MF KCP25	B239	3753546	TNMG160408RN KCP25	B127	3753750	SCMT09T304LF KCP30	B230
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3753328	CNMG160612RM KCP10	B55	3753459	SNMG150612MN KCP25	B98	3753612	CNMG190616RN KCP30	B53	3753782	DNMG150604MN KCP30	B78
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3753348	CNMG120408RN KCP10	B53	3753476	VNMG080416MN KCP25	B157	3753662	VNMG220408RN KCP30	B147	3753801	CNMG190612RP KCP30	B53
3753349	CNMG120416RN KCP10	B53	3753477	CNMP120404K KCP25	B57	3753663	VNMG220412RN KCP30	B147	3753802	CNMG190616RP KCP30	B53
3753351	CNMG120408RP KCP10	B53	3753478	CNMP120408K KCP25	B57	3753664	VNMG080408RN KCP30	B159	3753804	DNMG150412RP KCP30	B81
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3753361	TNMG270616RN KCP10	B127	3753491	VNMP160404K KCP25	B148	3753706	DNMG150408FN KCP25	B77	3753822	VNMG080412RP KCP30	B159
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3753829	WNMG080408MN KCP25	B157	3754861	DNMM150612RM KCP40	B82	3755673	DCMT11T308MF KCM15	B208	3757960	DNMG150608RN KCP05	B81
3753830	CNMG120408MW KCP25	B52	3754863	SNMM190612RM KCP40	B103	3755677	SCMT120408MF KCM15	B231	3757961	DNMG150612RN KCP05	B81
3753831	WNMG080412MW KCP25	B158	3754864	SNMM250924RM KCP40	B103	3755682	TPMT16T308MF KCM15	B255	3758013	WNMG080412RN KCP05	B159
3753832	CNMM190612RH KCP25	B55	3755331	WNMG080404FF KCP10	B155	3755684	CNMG120404MP KCM15	B51	3758033	DNMG110408RP KCM15	B81
3753834	CNMM190624RH KCP25	B55	3755332	CNMM250924RH KCP10	B55	3755685	CNMG120408MP KCM15	B51	3758035	DNMG150408RP KCM15	B81
3753836	SNMM190616RH KCP25	B102	3755363	LNMX191940RRH KCP10	E51	3755686	CNMG120412MP KCM15	B51	3758036	DNMG150408RP KCM15	B81
3753837	SNMM190624RH KCP25	B102	3755366	RCMT2006MORH KCP10	B225	3755689	CNMG160612MP KCM15	B51	3758043	TNMG160408RP KCM15	B128
3753867	CCMT09T308MW KCK20	B178	3755367	RCMX2507MORH KCP10	B225	3755691	CNMG190612MP KCM15	B79	3758046	TNMG270612RP KCM15	B128
3753871	CPMT09T308MW KCK20	B191	3755369	SNMM250724RH KCP10	B102	3755693	CNMG110408MP KCM15	B79	3758048	WNMG160408RP KCM15	B147
3753875	CNMG120412RP KCK20	B53	3755370	SNMM250924RH KCP10	B102	3755694	DNMG110412MP KCM15	B79	3758050	WNMG060408RP KCM15	B159
3753877	CNMG160608RP KCK20	B53	3755371	CNMM250924RM KCP10	B55	3755699	DNMG150608MP KCM15	B79	3758051	WNMG080408RP KCM15	B159
3753878	CNMG160612RP KCK20	B53	3755372	SNMM250724RM KCP10	B103	3755700	SNMG150612MP KCM15	B79	3758053	WNMG080412RP KCM15	B159
3753879	CNMG160616RP KCK20	B53	3755475	RCMT1605MO KCK20	B224	3755701	SNMG120408MP KCM15	B98	3758055	CNMG120408RP KCM15	B54
3753884	DNMG150408RP KCK20	B81	3755479	RCMT120400 KCK20	B224	3755702	SNMG120412MP KCM15	B98	3758056	CNMG120412UP KCM15	B54
3753887	CNMG150608RP KCK20	B81	3755481	CCMT120408LF KCK20	B177	3755704	SNMG150612MP KCM15	B98	3758064	DNMG150408RP KCM15	B82
3753888	DNMG150612RP KCK20	B81	3755482	CPMT060204LF KCK20	B190	3755705	SNMG190612MP KCM15	B98	3758065	DNMG150408RP KCM15	B82
3753891	SNMG120408RP KCK20	B101	3755484	CPMT09T304LF KCK20	B190	3755706	TNMG160404MP KCM15	B125	3758068	DNMG150608UP KCM15	B82
3753892	SNMG120412RP KCK20	B101	3755485	CPMT09T308LF KCK20	B190	3755707	TNMG160408MP KCM15	B125	3758073	CNMG150612UP KCM15	B102
3753897	SNMG190616RP KCK20	B101	3755486	DCMT070204LF KCK20	B207	3755711	WNMG160404MP KCM15	B146	3758076	TNMG160408UP KCM15	B129
3753898	TNMG160408RP KCK20	B128	3755487	DCMT11T308LF KCK20	B207	3755712	WNMG160408MP KCM15	B146	3758080	WNMG160404UP KCM15	B147
3753899	TNMG160412RP KCK20	B128	3755490	DCMT150408LF KCK20	B207	3755714	WNMG060404MP KCM15	B157	3758081	CNMG160408UP KCM15	B147
3753904	TNMG220432RP KCK20	B128	3755491	DPMT070204LF KCK20	B215	3755715	WNMG060408MP KCM15	B157	3758082	WNMG60412UP KCM15	B147
3753909	WNMG160412RP KCK20	B147	3755492	DPMT11T304LF KCK20	B215	3755716	WNMG080408MP KCM15	B157	3758084	WNMG080408UP KCM15	B160
3753912	WNMG080408RP KCK20	B159	3755503	DPMT11T308LF KCK20	B215	3755717	WNMG080412MP KCM15	B157	3758086	RCMT120400 KCM25	B224
3753923	WNMG080412RP KCK20	B159	3755504	SCMT09T304LF KCK20	B230	3755753	LNMX191940RRH KCP25	E51	3758087	CCMT060204LF KCM25	B177
3753926	CCMT060208FW KCK20	B176	3755505	SCMT09T308LF KCK20	B230	3755754	LNMX301940RRH KCP25	E51	3758088	CCMT09T304LF KCM25	B177
3753929	CCMT09T308FW KCK20	B176	3755507	SCMT120408LF KCK20	B230	3755755	RCMT160408MP KCP25	B225	3758089	CCMT09T308LF KCM25	B177
3753931	CPMT060204FW KCK20	B189	3755508	SCMT120412LF KCK20	B230	3755756	RCMX2507MORH KCP25	B225	3758091	CNMG120412LF KCM25	B177
3753932	CPMT060208FW KCK20	B189	3755509	SPMT09T304LF KCK20	B238	3755757	RCMX3209MORH KCP25	B225	3758092	DCMT11T304LF KCM25	B107
3753934	CPMT09T308FW KCK20	B189	3755510	SPMT09T308LF KCK20	B238	3755758	SNMM250724RH KCP25	B102	3758093	CCMT09T308MF KCM25	B177
3753935	DCMT11T304FW KCK20	B207	3755511	TCMT110204LF KCK20	B244	3755760	SNMM250924RH KCP25	B102	3758094	CCMT120408MF KCM25	B177
3753981	CNMG120408RN KCP40	B53	3755512	TCMT110208LF KCK20	B244	3755761	CNMM250924RM KCP25	B55	3758095	CNMG120408RP KCM25	B53
3753982	CNMG120412RN KCP40	B53	3755513	TCMT16T304LF KCK20	B244	3755762	RCMT2006MORH KCP25	B225	3758096	CNMM120408RP KCM25	B56
3753993	CNMG120416RN KCP40	B53	3755514	TCMT16T308LF KCK20	B244	3755763	SNMM250724RM KCP25	B103	3758099	CNMM160616RP KCM25	B56
3753994	CNMG160612RN KCP40	B53	3755515	TCMT16T312LF KCK20	B244	3755764	SNMM250924RM KCP25	B103	3758106	SNMM120412RP KCM25	B103
3753996	CNMG190608RN KCP40	B53	3755517	TPMT110204LF KCK20	B255	3755835	B292A08200PPL K7315	G95	3758108	SNMM150616RP KCM25	B103
3753997	CNMG190612RN KCP40	B53	3755520	TPMT16T308LF KCK20	B255	3755855	WNMA060412 KCK20	B155	3758110	SNMM190616RP KCM25	B103
3753998	CNMG190616RN KCP40	B53	3755522	TPMT220408LF KCK20	B255	3755856	CNMG120404UN KCK20	B54	3758111	SNMM190624RP KCM25	B103
3753999	DNMG150408RN KCP40	B81	3755526	VBMT160408LF KCK20	B265	3755857	CNMG120408UN KCK20	B54	3758133	CNMA120404 KCK20	B47
3754004	SNMG120412RN KCP40	B101	3755527	VBMT160412LF KCK20	B265	3755858	CNMG120412UN KCK20	B54	3758134	CNMA120408 KCK20	B47
3754005	SNMG120416RN KCP40	B101	3755528	WPMT040204MF KCK20	B272	3755859	CNMG120416UN KCK20	B54	3758135	CNMA120412 KCK20	B47
3754006	SNMG150612RN KCP40	B101	3755531	CCMT060204MF KCK20	B177	3755859	CNMG160608UN KCK20	B54	3758136	CNMA120416 KCK20	B47
3754008	SNMG190612RN KCP40	B101	3755532	CCMT09T304MF KCK20	B177	3755891	CNMG160612UN KCK20	B54	3758137	CNMA160608 KCK20	B47
3754010	TNMG220408RN KCP40	B127	3755533	CCMT09T312MF KCK20	B177	3755892	CNMG160616UN KCK20	B54	3758138	CNMA160612 KCK20	B47
3754012	TNMG270612RN KCP40	B127	3755534	CCMT120412MF KCK20	B177	3755893	CNMG190608UN KCK20	B54	3758141	CNMA190612 KCK20	B47
3754014	WNMG220408RN KCP40	B147	3755535	CPMT060208MF KCK20	B190	3755894	CNMG190612UN KCK20	B54	3758142	CNMA190616 KCK20	B47
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3754059	RCMT1204MO KCP30	B224	3755538	DCMT11T304MF KCK20	B208	3755896	DNMG110408UN KCK20	B82	3758144	DNMA150412 KCK20	B75
3754060	CCMT060204LF KCP30	B177	3755539	DCMT11T308MF KCK20	B208	3755897	DNMG110412UN KCK20	B82	3758145	DNMA150608 KCK20	B75
3754061	CCMT09T304LF KCP30	B177	3755540	DCMT11T312MF KCK20	B208	3755898	DNMG150408UN KCK20	B82	3758146	DNMA150612 KCK20	B75
3754062	CCMT09T308LF KCP30	B177	3755542	SCMT09T308MF KCK20	B231	3756000	DNMG150416UN KCK20	B82	3758149	SNMA120408 KCK20	B96
3754343	CCMT120404LF KCP30	B177	3755543	SCMT120408MF KCK20	B231	3756001	DNMG150608UN KCK20	B82	3758150	SNMA120412 KCK20	B96
3754344	DCMT11T304LF KCP30	B177	3755544	SCMT120412MF KCK20	B231	3756002	DNMG150612UN KCK20	B82	3758152	SNMA120412 KCK20	B96
3754345	CCMT09T308MF KCP30	B207	3755545	SPMT09T308MF KCK20	B239	3756003	DNMG150616UN KCK20	B82	3758154	SNMA190612 KCK20	B96
3754346	CCMT120408MF KCP30	B177	3755546	SPMT120408MF KCK20	B239	3756004	RNMG120400UN KCK20	B94	3758155	SNMA190616 KCK20	B96
3754347	CNMG120408MN KCP30	B50	3755547	TCMT110208MF KCK20	B245	3756005	SNMG120408UN KCK20	B102	3758156	TNMA160408 KCK20	B123
3754349	DNMG150408MN KCP30	B78	3755548	TCMT16T308MF KCK20	B245	3756006	SNMG120412UN KCK20	B102	3758157	TNMA160412 KCK20	B123
3754351	TNMG160408MN KCP30	B125	3755549	TCMT16T312MF KCK20	B245	3756007	SNMG120416UN KCK20	B102	3758158	TNMA160416 KCK20	B123
3754352	WNMG080408MN KCP30	B157	3755550	TPMT110208MF KCK20	B245	3756008	SNMG150612UN KCK20	B102	3758162	WNMA160408 KCK20	B144
3754363	CNMG120408RN KCP30	B53	3755551	TPMT16T308MF KCK20	B255	3756009	SNMG150616UN KCK20	B102	3758163	WNMA080408 KCK20	B155
3754365	CNMG120408RP KCP30	B53	3755552	TPMT16T312MF KCK20	B255	3756010	SNMG190612UN KCK20	B102	3758164	WNMA080412 KCK20	B155
3754367	CNMM120412RP KCP30	B56	3755565	CCMT060204LF KCM15	B177	3756011	SNMG190616UN KCK20	B102	3758165	WNMA080416 KCK20	B155
3754374	CNMM190616RH KCP30	B55	3755570	DCMT11T304LF KCM15	B207	3756012	TNMG160408UN KCK20	B128	3758166	RCMT1204MO KCK20	B224
3754375	CNMM190624RH KCP30	B55	3755593	CNMG120408RP KCM15	B53	3756013	TNMG160412UN KCK20	B128	3758167	CCMT060204LF KCK20	B177
3754376	SNMM190612RH KCP30	B102	3755632	CNMM250924RH KCP25	B55	3756014	TNMG160416UN KCK20	B128	3758168	CCMT09T304LF KCK20	B177
3754377	SNMM190616RH KCP30	B102	3755635	CPMT060204LF KCM15	B190	3756015	TNMG220408UN KCK20	B128	3758169	CCMT09T308LF KCK20	B177
3754378	SNMM190624RH KCP30	B102	3755637	CPMT09T304LF KCM15	B190	3756016	TNMG220412UN KCK20	B128	3758170	CCMT120404LF KCK20	B177
3754379	CNMM120408RN KCP30	B55	3755638	CPMT09T308LF KCM15	B190	3756017	TNMG220416UN KCK20	B128	3758172	DCMT11T304LF KCK20	B207
3754383	CNMM160616RM KCP30	B55	3755639	DCMT070204LF KCM15	B207	3756018	WNMG160404UN KCK20	B147	3758173	CCMT09T308MF KCK20	B177
3754385	CNMM190616RM KCP30	B55	3755640	DCMT11T308LF KCM15	B207	3756019	WNMG160408UN KCK20	B147	3758174	CCMT120408MF KCK20	B177
3754386	CNMM190624RM KCP30	B55	3755648	SCMT120408LF KCM15	B230	3756022	WNMG080404UN KCK20	B160	3758175	CNMG120408RP KCK20	B53
3754388	DNMM150608RM KCP30	B82	3755649	TCMT110204LF KCM15	B244	3756023	WNMG080408UN KCK20	B160	3758783	CNMG120404FP KCM15	B49
3754396	TNMM160408RN KCP30	B129	3755650	TCMT110208LF KCM15	B244	375624	WNMG080412UN KCK20	B160	3758784	CNMG120408FP KCM15	B49
3754398	TNMM220412RM KCP30	B129	3755651	TCMT16T304LF KCM15	B244	375625	WNMG080416UN KCK20	B160	3758785	CNMG120412FP KCM15	B49
3754399	TNMM270612RM KCP30	B129	3755655	TPMT110204LF KCM15	B255	3757726	B966A13400 K7315	G134	3758786	DNMG110404FP KCM15	B77
3754815	CNMM190612RH KCP40	B55	3755657	TPMT16T304LF KCM15	B255	3757916	CCMW09T308 KCK20	B178	3758787	DNMG110408FP KCM15	B77
3754818	CNMM250924RH KCP40	B55	3755659	VBMT160404LF KCM15	B265	3757917	CCMW120412 KCK20	B178	3758788	DNMG150404FP KCM15	B77
3754819	SNMM190616RH KCP40	B102	3755661								

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3758797TNMG160404FP KCM15B124	3760342CNMG120404MP KCM25B51	3761002CNMG120404RP KCM25B53	3766028EDCT10T324PDERLD KC522MT35, T43
3758798TNMG160408FP KCM15B124	3760343CNMG120408MP KCM25B51	3761003CNMG120412RP KCM25B53	3766029EDCT10T324PDERLD KC725MT35, T43
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3760290CPMT060204LF KCM25B190	3760439CNMG190612RP KCM35B53	3763726HNPJ0905ANSNGD KC520MS19, S23	3769060CPMT09T308FP KCP10B189
3760291CPMT060208LF KCM25B190	3760440CNMG190616RP KCM35B53	3763727HNPJ0905ANSNGD KC725MS19, S23	3769061DCMT11T304FP KCP10B207
3760292CPMT09T304LF KCM25B190	3760441DNMG150408RP KCM35B81	3763728HNPJ0905ANSNGD KCPK30S19, S23	3769063DCMT11T302FP KCP10B207
3760293CPMT09T308LF KCM25B190	3760442DNMG150412RP KCM35B81	3763729HNPJ090543ANSNHD KCK15S19, S24	3769064DCMT11T304FP KCP10B207
3760294DCMT070204LF KCM25B207	3760445SNMG120408RP KCM35B101	3764792CNMA120408S02020 KB1340B289	3769065DCMT11T308FP KCP10B207
3760295DCMT11T308LF KCM25B207	3760447SNMG150612RP KCM35B101	3764823B292A06600VPL KC7315G95	3769066DPMT070204FP KCP10B214
3760296DPMT070204LF KCM25B215	3760448SNMG190612RP KCM35B101	3764833CNMA120412S02020 KB1340B289	3769068DPMT11T308FP KCP10B214
3760298DPMT11T308LF KCM25B215	3760450TNMG160412MP KCM35B128	3764836CNMN120408S02020 KB1340B284	3769069SCMT09T308FP KCP10B230
3760299SCMT09T304LF KCM25B230	3760451TNMG270612RP KCM35B128	3764837CNMN120412S02020 KB1340B284	3769071TCMT110202FP KCP10B244
3760300SCMT09T308LF KCM25B230	3760453VNMG080408RP KCM35B159	3764838DNMA110408S02020 KB1340B289	3769072TCMT110204FP KCP10B244
3760302SCMT120408LF KCM25B230	3760454VNMG080412RP KCM35B159	3764839DNMA110412S02020 KB1340B289	3769076TCMT16T308FP KCP10B244
3760305TCMT16T304LF KCM25B244	3760455CNMG120408UP KCM35B54	3764840RNMM120408S02020 KB1340B285	3769082VBMT160404FP KCP10B265
3760306TCMT16T308LF KCM25B244	3760457CNMG160608UP KCM35B54	3764841RNMM120300S02020 KB1340B285	3769083VBM160402FP KCP10B265
3760307TCMT16T312LF KCM25B244	3760458CNMG160612UP KCM35B54	3764842RNMM120400S02020 KB13				

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3769118	SCMT09T308FP KCM15	B230	3769345	CCMT120404FP KCU10	B176	3769446	TCMT090204FP KCU25	B244	3781278	A4G0300M03P02GUP KCU10	C93
3769121	CPMT050204FP KCP25	B189	3769346	CCMT120408FP KCU10	B176	3769447	TCMT090208FP KCU25	B244	3781279	A4G0300M03P04GUP KCU10	C93
3769122	TCMT110208FP KCM15	B244	3769347	CPMT050202FP KCU10	B189	3769448	TCMT110204FP KCU25	B244	3781280	A4G0400M04P02GUP KCU10	C93
3769124	CPMT060202FP KCP25	B189	3769348	CPMT050204FP KCU10	B189	3769449	TCMT110204FP KCU25	B244	3781281	A4G0400M04P04GUP KCU10	C93
3769128	CPMT060204FP KCP25	B189	3769349	CPMT060202FP KCU10	B189	3769450	TCMT110208FP KCU25	B244	3781282	A4G0400M04P08GUP KCU10	C93
3769130	VBMT110304FP KCM15	B265	3769350	CPMT060204FP KCU10	B189	3769451	TCMT110304FP KCU25	B244	3781283	A4G0500M05P04GUP KCU10	C93
3769131	VBMT110308FP KCM15	B265	3769352	CPMT09T302FP KCU10	B189	3769452	TCMT110308FP KCU25	B244	3781284	A4G0500M05P08GUP KCU10	C93
3769132	CPMT060208FP KCP25	B189	3769353	CPMT09T304FP KCU10	B189	3769454	TCMT16T304FP KCU25	B244	3781285	A4G0600M06P04GUP KCU10	C93
3769133	VBMT1160404FP KCM15	B265	3769354	CPMT09T308FP KCU10	B189	3769455	TCMT16T308FP KCU25	B244	3781286	A4G0600M06P08GUP KCU10	C93
3769134	VBMT160408FP KCM15	B265	3769355	DCMT070202FP KCU10	B207	3769456	TCMT16T312FP KCU25	B244	3781287	A4G0800M08P08GUP KCU10	C93
3769139	DCMT070204FP KCP25	B207	3769356	DCMT070204FP KCU10	B207	3769457	TCMT220408FP KCU25	B244	3781288	A4G0800M08P12GUP KCU10	C93
3769140	DCMT070208FP KCP25	B207	3769357	DCMT070208FP KCU10	B207	3769458	TPMT16T304FP KCU25	B254	3781289	A4G1000M10P08GUP KCU10	C93
3769141	DCMT11T302FP KCP25	B207	3769358	DCMT11T302FP KCU10	B207	3769460	TPMT110204FP KCU25	B254	3781290	A4G1000M10P12GUP KCU10	C93
3769142	DCMT11T304FP KCP25	B207	3769359	DCMT11T304FP KCU10	B207	3769461	TPMT110304FP KCU25	B254	3781678	MS1499	B386
3769143	DCMT11T308FP KCP25	B207	3769360	DCMT11T308FP KCU10	B207	3769462	TPMT110304FP KCU25	B254	3781679	MS1130	B386
3769146	DCMT150408FP KCP25	B207	3769363	DCMT150408FP KCU10	B207	3769463	TPMT16T308FP KCU25	B254	3782458	B978A03000 KC7315	G146
3769147	DPMT070204FP KCP25	B214	3769364	DPMT070202FP KCU10	B214	3769464	VBMT110304FP KCU25	B265	3784063	193.523	H102-103
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3769150	SCMT09T304FP KCP25	B230	3769366	DPMT070208FP KCU10	B214	3769466	VBMT160402FP KCU25	B265	3784065	193.525	H102-103
3769151	SCMT09T308FP KCP25	B230	3769368	DPMT11T304FP KCU10	B214	3769467	VBMT160404FP KCU25	B265	3784066	193.526	H102-103
3769152	SCMT120404FP KCP25	B230	3769369	DPMT11T308FP KCU10	B214	3769468	VBMT160408FP KCU25	B265	3784326	170.350	H98
3769154	SCMT120412FP KCP25	B230	3769370	SCMT09T304FP KCU10	B230	3769469	WCMT040204FP KCU25	B270	3784327	170.353	H98
3769155	SPMT09T304FP KCP25	B238	3769371	SCMT09T308FP KCU10	B230	3773118	M1H2J02R36B20ED10C6	T39	3784328	170.355	H98-99
3769157	TCMT110204FP KCP25	B244	3769372	SCMT120404FP KCU10	B230	3773119	M1H25J02R46B25ED10C8	T39	3784329	170.356	H98-99
3769158	TCMT110208FP KCP25	B244	3769373	SCMT120408FP KCU10	B230	3773120	M1H32J02R54B32ED10C10	T39	3784330	170.345	H98
3769159	TCMT16T304FP KCP25	B244	3769374	SCMT120412FP KCU10	B230	3773121	M1H32J03R54B32ED10C15	T39	3784331	170.346	H98
3769160	TCMT16T308FP KCP25	B244	3769375	SPMT09T304FP KCU10	B238	3773122	M1H25J02R36A20ED10C6	T40	3784332	170.347	H98-99
3769161	TCMT220408FP KCP25	B244	3769376	SPMT09T308FP KCU10	B238	3773233	B967A05000 KC7315	G132	3784473	170.348	H99
3769162	TPMT090208FP KCP25	B254	3769377	TCMT090204FP KCU10	B244	3773803	M1H25J02R46A25ED10C8	T40	3784474	FBSFCR09CA06F	K111
3769163	TPMT110204FP KCP25	B254	3769378	TCMT090208FP KCU10	B244	3773805	M1H32J03R54A32ED10C15	T40	3784475	FBSFCR09CA06F	K111
3769165	TPMT16T304FP KCP25	B254	3769380	TCMT110204FP KCU10	B244	3773806	M1H2J02R28A20ED10C4	T40	3784476	FBSCLCR09CA06F	K111
3769166	TPMT16T308FP KCP25	B254	3769381	TCMT110208FP KCU10	B244	3773807	M1H25J02R28A25ED10C4	T40	3784477	FBSCLCR09CA06F	K111
3769168	VBMT110302FP KCP25	B265	3769382	TCMT110304FP KCU10	B244	3773808	M1H32J02R28A25ED10C4	T40	3784478	RPX120700MP KCS10	B167
3769169	VBMT110304FP KCP25	B265	3769383	TCMT110308FP KCU10	B244	3773809	M1H32J03R28A32ED10C6	T40	3784462	RPX090700MP KCS10	B167
3769170	VBMT110308FP KCP25	B265	3769384	TCMT110312FP KCU10	B244	3773810	M1H2J02R28M10ED10C4	T38	3787483	RPX120700MP KCS10	B167
3769171	VBMT160402FP KCP25	B265	3769386	TCMT16T304FP KCU10	B244	3773811	M1H25J02R32M12ED10C4	T38	3787484	RCGX060400MP KCS10	B166
3769172	VBMT160404FP KCP25	B265	3769387	TCMT16T308FP KCU10	B244	3773813	M1H32J03R40M16ED10C6	T38	3787486	RCGX120700MP KCS10	B166
3769173	VBMT160408FP KCP25	B265	3769388	TCMT16T312FP KCU10	B244	3773814	M1H40T03R50A16ED10C20	T41	3787488	RPMT120700MP KCS10	B229
3769174	VBMT160412FP KCP25	B265	3769389	TCMT220408FP KCU10	B244	3773815	M1H40T05R50A16ED10C20	T41	3787492	RCMT0803M0MP KCS10	B224
3769175	WCMT06T308FP KCP25	B270	3769390	TPMT090204FP KCU10	B254	3773816	M1H50T03R60A22ED10C15	T41	3787503	RCMT10T3M0MP KCS10	B224
3769176	WPMT040204FP KCP25	B272	3769391	TPMT090208FP KCU10	B254	3773817	M1H50T05R60A22ED10C25	T41	3787504	RCMT120400MP KCS10	B224
3769178	WPMTS3T104FP KCP25	B272	3769392	TPMT110202FP KCU10	B254	3774249	HNPJ0905ANSNHDKC522M...S19,S24		3787505	RCMT1606M0MP KCS10	B224
3769203	CCMT060202FP KCM25	B176	3769393	TPMT110204FP KCU10	B254	3774250	HNPJ0905ANSNHDKC522M...S19,S24		3787507	RCMK060400MP KCS10	E64
3769204	CCMT060204FP KCM25	B176	3769394	TPMT110208FP KCU10	B254	3774251	HNPJ0905ANSNHDKC522M...S19,S24		3787508	RCMK090700MP KCS10	E64
3769205	CCMT060208FP KCM25	B176	3769395	TPMT110304FP KCU10	B254	3774691	A4G0405M04U04GUP KCU25	C92	3787509	RCMK120800MP KCS10	E64
3769206	CCMT09T302FP KCM25	B176	3769396	TPMT110308FP KCU10	B254	3774692	A4G0405M04U08GUP KCU25	C92	3787512	RCG1120400MP KCS10	B222
3769207	CCMT09T304FP KCM25	B176	3769397	TPMT16T304FP KCU10	B254	3774724	A4G050M05U08GUP KCU25	C92	3790401	KTP120R5S25M	H31
3769208	CCMT09T308FP KCM25	B176	3769401	VBMT110302FP KCU10	B265	3774724	A4G0805M08U12GUP KCU25	C92	3790402	KTP220R3S25M	H31
3769210	CCMT120408FP KCM25	B176	3769402	VBMT110304FP KCU10	B265	3774906	SPX15T508RHP KC7140	J89	3790443	KTP230R3S25M	H31
3769223	CPMT060202FP KCM25	B189	3769403	VBMT110308FP KCU10	B265	3774919	EDPT10T31PDSRGE KC522M...T36,T44		3790444	KTP230R5S25M	H31
3769224	CPMT060204FP KCM25	B189	3769404	VBMT160402FP KCU10	B265	3774920	EDPT10T31PDSRGE KC725M...T36,T44		3790445	KTP250R3S25M	H31
3769226	CPMT09T302FP KCM25	B189	3769405	VBMT160404FP KCU10	B265	3774921	EDPT10T31PDSRGE KCPK30...T36,T44		3790446	KTP210R3S25M	H32
3769227	CPMT09T304FP KCM25	B189	3769406	VBMT160408FP KCU10	B265	3775003	EDPT10T31PDSRGE KC522M...T36,T44		3790447	KTP230R5S25M	H32
3769228	CPMT09T308FP KCM25	B189	3769407	WCMT040204FP KCU10	B270	3775004	EDPT10T31PDSRGE KC725M...T36,T44		3790448	KTP230R3S25M	H32
3769229	DCMT070202FP KCM25	B207	3769408	WCMT06T308FP KCU10	B270	3775005	EDPT10T31PDSRGE KCPK30...T36,T44		3790449	KTP240R3S25M	H32
3769230	DCMT070204FP KCM25	B207	3769409	WPMT040204FP KCU10	B272	3775016	EDPT10T308PDSRGE KC522M...T36,T44		3790450	KTP210R5S25M	H32
3769231	DCMT070208FP KCM25	B207	3769410	WPMT06T304FP KCU10	B272	3775017	EDPT10T308PDSRGE KC725M...T36,T44		3790451	KTP210R5S25M	H31
3769232	DCMT11T302FP KCM25	B207	3769411	WPMT06T308FP KCU10	B272	3775018	EDPT10T308PDSRGE KCPK30...T36,T44		3790452	KTP220R5S25M	H31
3769233	DCMT11T304FP KCM25	B207	3769412	WPMTS3T104FP KCU10	B272	3775022	EDPT10T31PDSRGE KC522M...T36,T44		3790453	KTP230R5S25M	H31
3769234	DCMT11T308FP KCM25	B207	3769413	CCMT060202FP KCU25	B176	3775063	EDPT10T31PDSRGE KC725M...T36,T44		3790454	KTP240R5S25M	H31
3769235	DCMT150404FP KCM25	B207	3769414	CCMT060204FP KCU25	B176	3775064	EDPT10T31PDSRGE KCPK30...T36,T44		3790455	KTP250R5S25M	H31
3769236	DCMT150408FP KCM25	B207	3769415	CCMT060208FP KCU25	B176	3776430	B291A12900VPL KC7315	G96	3790456	KTP210R5S25M	H32
3769240	SCMT09T304FP KCM25	B230	3769416	CCMT09T302FP KCU25	B176	3779249	EDPT10T304PDSRGE KC522M...T36,T44		3790457	KTP220R5S25M	H32
3769243	SCMT120408FP KCM25	B230	3769417	CCMT09T304FP KCU25	B176	3779250	EDPT10T304PDSRGE KC725M...T36,T44		3790458	KTP230R5S25M	H32
3769248	TCMT110204FP KCM25	B244	3769418	CCMT09T308FP KCU25	B176	3779251	EDPT10T304PDSRGE KCPK30...T36,T44		3790459	KTP240R5S25M	H32
3769251	TCMT16T308FP KCM25	B244	3769419	CCMT120404FP KCU25	B176	3780360	MS-2071	T14-17, V77-78	3790460	KTP250R5S25M	H32
3769253	TCMT220408FP KCM25	B244	3769421	CPMT050202FP KCU25	B189	3781192	A4G0200M02P02GUP KCU10	C93	3790461	KTP210R5S25M	H31
3769257	TPMT16T304FP KCM25	B254	3769422	CPMT050204FP KCU25	B189	3781252	A4G0200M02P02GUP KCU25	C93	3790462	KTP230R5S25M	H31
3769260	VBMT110304FP KCM25	B265	3769423	CPMT060202FP KCU25	B189	3781253	A4G0300M03P02GUP KCU25	C93	3790463	KTP240R5S25M	H31
3769262	VBMT160402FP KCM25	B265	3769424	CPMT060204FP KCU25	B189	3781254	A4G0300M03P04GUP KCU25	C93	3790464	KTP240R8S25M	H31
3769283	VBMT160404FP KCM25	B265	3769427	CPMT09T304FP KCU25	B189	3781255	A4G0400M04P02GUP KCU25	C93	3790465	KTP250R5S25M	H31
3769284	VBMT160408FP KCM25	B265	3769428	CPMT09T308FP KCU25	B189	3781256	A4G0400M04P04GUP KCU25	C93	3790466	KTP210R8S25M	H32
3769285	WPMT040204FP KCM25	B272	3769430	DCMT070204FP KCU25	B207	3781257	A4G0400M04P08GUP KCU25	C93	3790467	KTP220R8S25M	H32
3769290	CCMT060202FP KCU10	B176	3769433	DCMT11T302FP KCU25	B207	3781258	A4G0500M05P04GUP KCU25	C93	3790468	KTP230R8S25M	H32
3769291	CCMT060204FP KCU10	B176	3769432	DCMT11T304FP KCU25	B207	3781259	A4G0500M05P08GUP KCU25	C93	3790469	KTP240R8S25M	H32
3769292	CCMT060208FP KCU10	B176	3769433	DCMT11T308FP KCU25	B207	3781260	A4G0500M06P04GUP KCU25	C93	3790		



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3791270	A4G0505M05U08GUP	KCU10.....C92	3794427	KSEMP3750FDS63A1MH80, H92, H98	3855178	EDPT140416PDSRGE	KCPK30.....T53, T62	3860366	RHM21000KST175H7F	KT325.....K31
3791271	A4G0605M06U04GUP	KCU10.....C92	3794428	WD32FDS32216M	.....H103	3855180	EDPT140431PDSRGE	KC725M.....T53, T62	3860367	RHM22000KST175H7F	KT325.....K31
3791272	A4G0605M06U08GUP	KCU10.....C92	3794429	WD32FDS32391M	.....H103	3855181	EDPT140431PDSRGE	KCPK30.....T53, T62	3860368	RHM22200KST175H7F	KT325.....K31
3791273	A4G0605M06U12GUP	KCU10.....C92	3794430	WD32FDS36244M	.....H103	3855209	EDPT140404PDSRGE	KC522M.....T53, T62	3860369	RHM22500KST200H7F	KT325.....K31
3791275	A4G0805M08U08GUP	KCU10.....C92	3794431	WD32FDS36361M	.....H103	3855210	EDPT140404PDSRGE	KC725M.....T53, T62	3860370	RHM23000KST200H7F	KT325.....K31
3791276	A4G0805M08U12GUP	KCU10.....C92	3794432	WD32FDS45439M	.....H103	3855211	EDPT140404PDSRGE	KCPK30.....T53, T62	3860371	RHM23810KST200H7F	KT325.....K31
3791277	A4G1005M10U08GUP	KCU10.....C92	3794443	WD50FDS40217MH103	3855220	EDPT140404PDSRGE	KC522M.....T53, T62	3860372	RHM24000KST200H7F	KT325.....K31
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3791281	A4G0305M03U04GUP	KCU25.....C92	3794446	WD50FDS45304MH103	3855238	EDPT140408PDSRGE	KCPK30.....T53, T62	3860385	RHM26000KST200H7F	KT325.....K31
3791282	A4G0505M05U04GUP	KCU25.....C92	3794447	WD50FDS45451M	.....H103	3855240	EDPT140412PDSRGE	KC522M.....T53, T62	3860386	RHM26900KST200H7F	KT325.....K31
3791283	A4G0605M06U08GUP	KCU25.....C92	3794448	WD50FDS45459M	.....H103	3855242	EDPT140412PDSRGE	KCPK30.....T53, T62	3860387	RHM27000KST200H7F	KT325.....K31
3791284	A4G0605M06U08GUP	KCU25.....C92	3794449	WD50FDS50338M	.....H103	3855383	B291A04300YPL	KC7315.....G94	3860388	RHM27500KST200H7F	KT325.....K31
3791285	A4G0605M06U12GUP	KCU25.....C92	3794450	WD50FDS50613M	.....H103	3855561	CNMG120408MP	KCP10.....B51	3860389	RHM28000KST250H7F	KT325.....K32
3791286	A4G0805M08U08GUP	KCU25.....C92	3794451	WD50FDS56383M	.....H103	3855796	CM234R ASSY	.....B58-60, B66, B85, B89-90, B105-107, B132, B137, B152, B161, B163	3860390	RHM29000KST250H7F	KT325.....K32
3791287	A4G1005M10U08GUP	KCU25.....C92	3794452	WD50FDS56699M	.....H103				3860391	RHM29000KST250H7F	KT325.....K32
3791288	A4G1005M10U12GUP	KCU25.....C92	3794453	WD50FDS56693MH103				3860392	RHM30000KST250H7F	KT325.....K32
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3791290	A4G0305M03U02GUP	KCP10.....C92	3794455	WD50FDS63639MH103				3860395	RHM31750KST250H7F	KT325.....K32
3791291	A4G0305M03U04GUP	KCP10.....C92	3794916	KSEMP3175FDS32A1M	.....H80, H91, H98				3860396	RHM32000KST250H7F	KT325.....K32
3791292	A4G0405M04U04GUP	KCP10.....C92	3794917	KSEMP3334FDS32A1M	.....H80, H91, H98				3860397	RHM32500KST300H7F	KT325.....K32
3791293	A4G0405M04U08GUP	KCP10.....C92	3794918	KSEMP3493FDS32A1M	.....H80, H91, H98				3860398	RHM33000KST300H7F	KT325.....K32
3791294	A4G0505M05U04GUP	KCP10.....C92	3794919	KSEMP3651FDS36A1M	.....H80, H92, H98				3860400	RHM33500KST300H7F	KT325.....K32
3791295	A4G0505M05U08GUP	KCP10.....C92	3794920	KSEMP3810FDS36A1M	.....H80, H92, H98				3860401	RHM35000KST300H7F	KT325.....K32
3791296	A4G0605M06U04GUP	KCP10.....C92	3794921	KSEMP3970FDS36A1M	.....H80, H92, H98				3860402	RHM35000KST300H7F	KT325.....K32
3791297	A4G0605M06U08GUP	KCP10.....C92	3794922	KSEMP4128FDS40A1M	.....H80, H92, H98				3860403	RHM36000KST350H7F	KT325.....K32
3791298	A4G0605M06U12GUP	KCP10.....C92	3794933	KSEMP4445FDS40A1M	.....H80, H92, H98				3860404	RHM36510KST300H7F	KT325.....K32
3791299	A4G0805M08U08GUP	KCP10.....C92	3794934	KSEMP4763FDS45A1M	.....H81, H92, H98				3860405	RHM37000KST300H7F	KT325.....K32
3791300	A4G0805M08U12GUP	KCP10.....C92	3794935	KSEMP5080FDS50A1M	.....H81, H92, H98				3860406	RHM37500KST350H7F	KT325.....K32
3791301	A4G1005M10U08GUP	KCP10.....C92	3794936	KSEMP5398FDS50A1M	.....H81, H92, H98				3860408	RHM38100KST350H7F	KT325.....K32
3791303	A4G0205M02U02GUP	KCP25.....C92	3794937	KSEMP5715FDS56A1M	.....H81, H92, H98				3860409	RHM39000KST350H7F	KT325.....K32
3791304	A4G0305M03U02GUP	KCP25.....C92	3794938	KSEMP6033FDS56A1M	.....H81, H92, H98				3860410	RHM39690KST350H7F	KT325.....K32
3791305	A4G0305M03U04GUP	KCP25.....C92	3794939	KSEMP6350FDS63A1M	.....H81, H92, H99				3860411	RHM40000KST350H7F	KT325.....K32
3791306	A4G0405M04U04GUP	KCP25.....C92	3794940	KSEMP6668FDS63A1M	.....H81, H92, H99				3860412	RHM41000KST350H7F	KT325.....K32
3791307	A4G0405M04U08GUP	KCP25.....C92	3794941	KSEMP6985FDS63A1M	.....H81, H92, H99				3860413	RHM41280KST350H7F	KT325.....K32
3791308	A4G0505M05U04GUP	KCP25.....C92	3795256	RMB14000H7F	KT6215.....K18				3860414	RHM42000KST350H7F	KT325.....K32
3791309	A4G0505M05U08GUP	KCP25.....C92	3795257	RMB15000H7F	KT6215.....K18				3860416	RHM42000KST350H7F	KT325.....K29
3791310	A4G0605M06U04GUP	KCP25.....C92	3795258	RMB16000H7F	KT6215.....K18				3860476	RHM22000KST175H7F	KT325.....K29
3791311	A4G0605M06U08GUP	KCP25.....C92	3795260	RMB18000H7F	KT6215.....K18				3860477	RHM20640KST175H7F	KT325.....K29
3791312	A4G0605M06U12GUP	KCP25.....C92	3795261	RMB19000H7F	KT6215.....K18				3860478	RHM21000KST175H7F	KT325.....K29
3791313	A4G0805M08U08GUP	KCP25.....C92	3795262	RMB20000H7F	KT6215.....K18				3860480	RHM23810KST200H7F	KT325.....K29
3791314	A4G0805M08U12GUP	KCP25.....C92	3795311	B97818000	KC7315.....G149				3860481	RHM22500KST200H7F	KT325.....K29
3791316	A4G1005M10U12GUP	KCP25.....C92	3795333	RMB14000H7F	KT6215.....K17				3860482	RHM23000KST200H7F	KT325.....K29
3791545	B976A11600	KC7315.....G141	3795334	RMB15000H7F	KT6215.....K17				3860513	RHM23810KST200H7F	KT325.....K29
3793949	KSEMP3320FDS32A1M	.....H80, H91, H98	3795335	RMB16000H7F	KT6215.....K17				3860514	RHM24000KST200H7F	KT325.....K29
3793950	KSEMP3392FDS36A1M	.....H80, H92, H98	3795336	RMB17000H7F	KT6215.....K17				3860515	RHM25000KST200H7F	KT325.....K29
3794291	KSEMP3200FDS32A1M	.....H80, H91, H98	3795337	RMB18000H7F	KT6215.....K17				3860516	RHM25400KST200H7F	KT325.....K29
3794292	KSEMP3400FDS32A1M	.....H80, H91, H98	3795338	RMB19000H7F	KT6215.....K17				3860517	RHM26000KST200H7F	KT325.....K29
3794393	KSEMP3500FDS32A1M	.....H80, H91, H98	3795339	RMB20000H7F	KT6215.....K17				3860518	RHM26900KST200H7F	KT325.....K29
3794394	KSEMP3800FDS36A1M	.....H80, H92, H98	3831286	CNMG150612MP	KCP10.....B79				3860519	RHM27000KST200H7F	KT325.....K29
3794395	KSEMP3700FDS36A1M	.....H80, H92, H98	3830321	B976A08020	KC7315.....G140				3860520	RHM27500KST250H7F	KT325.....K30
3794396	KSEMP3800FDS36A1M	.....H80, H92, H98	3831819	M1H63T5R75A27S90ED14C20	.....T59				3860521	RHM28000KST250H7F	KT325.....K30
3794397	KSEMP3900FDS36A1M	.....H80, H92, H98	3838225	WNMG080412MP	KCP10.....B157				3860522	RHM28500KST200H7F	KT325.....K30
3794398	KSEMP4000FDS40A1M	.....H80, H92, H98	3842812	B291A13800YPL	KC7315.....G96				3860523	RHM29000KST250H7F	KT325.....K30
3794399	KSEMP4100FDS40A1M	.....H80, H92, H98	3842895	H32LSER5	.....D82				3860524	RHM30000KST250H7F	KT325.....K30
3794400	KSEMP4200FDS40A1M	.....H80, H92, H98	3842897	H40LSER5	.....D82				3860525	RHM3100KST175H7F	KT325.....K30
3794401	KSEMP4300FDS40A1M	.....H80, H92, H98	3842905	H50LSER27	.....D82				3860526	RHM31000KST250H7F	KT325.....K30
3794402	KSEMP4400FDS40A1M	.....H80, H92, H98	3848433	B967A15500	KC7315.....G134				3860527	RHM31750KST250H7F	KT325.....K30
3794403	KSEMP4500FDS45A1M	.....H81, H92, H98	3849319	XNGJ0905ANFNLDJW	KC410M.....S22				3860528	RHM32000KST250H7F	KT325.....K30
3794404	KSEMP4600FDS45A1M	.....H81, H92, H98	3849320	HNGJ0905ANFNLDJW	KC410M.....S18, S22				3860529	RHM32500KST300H7F	KT325.....K30
3794405	KSEMP4700FDS45A1M	.....H81, H92, H98	3852200	RPET1204M0ELE	KCPK30.....V73				3860530	RHM33000KST300H7F	KT325.....K30
3794406	KSEMP4800FDS45A1M	.....H81, H92, H98	3852233	RPET1204M0SGE	KCPK30.....V74				3860531	RHM33400KST300H7F	KT325.....K30
3794407	KSEMP4900FDS45A1M	.....H81, H92, H98	3852235	RPET1204M0ELE	KCPK30.....V73				3860532	RHM34000KST300H7F	KT325.....K30
3794408	KSEMP5100FDS50A1M	.....H81, H92, H98	3852284	RPPT1605M0SH	KCPK30.....V80				3860533	RHM34930KST300H7F	KT325.....K30
3794409	KSEMP5200FDS50A1M	.....H81, H92, H98	3852285	RPPT1605M0SH	KCPK30.....V80				3860534	RHM35000KST300H7F	KT325.....K30
3794410	KSEMP5300FDS50A1M	.....H81, H92, H98	3852395	RPPT1204M0SGP	KC725M.....V74				3860535	RHM36000KST300H7F	KT325.....K30
3794411	KSEMP5400FDS50A1M	.....H81, H92, H98	3852396	RPPT1204M0SGP	KCPK30.....V74				3860536	RHM36510KST300H7F	KT325.....K30
3794412	KSEMP5500FDS50A1M	.....H81, H92, H98	3854146	RIR04EDS06	KD1415.....K53				3860537	RHM37000KST300H7F	KT325.....K30
3794413	KSEMP5600FDS56A1M	.....H81, H92, H98	3854265	A4SMR2020K0208	.....C114				3860538	RHM37500KST350H7F	KT325.....K30
3794414	KSEMP5700FDS56A1M	.....H81, H92, H98	3854266	A4SML2020K0208	.....C114				3860539	RHM38000KST350H7F	KT325.....K30
3794415	KSEMP5800FDS56A1MH81, H92, H98	3854267	A4SMR2020K0308C114				3860540	RHM38100KST350H7F	KT325.....K30
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3860631	RHM23000KST200H7SF	KT6215	K29	3861201	SS20KST200RR5M	K39	3867816	B272Z07000HPS	KN25	G77	3868826	T630M040X070R6HX-D1	KM6515	M24	
3860632	RHM23810KST200H7SF	KT6215	K29	3861202	SS25KST250RR5M	K39	3867817	B272Z07145HPS	KN25	G77	3868827	T630M050X080R6HX-D1	KM6515	M24	
3860643	RHM24000KST200H7SF	KT6215	K29	3861203	SS32KST300RR5M	K39	3867818	B272Z07500HPS	KN25	G77	3868828	T630M060X100R6HX-D1	KM6515	M24	
3860644	RHM25000KST200H7SF	KT6215	K29	3861204	SS32KST350RR5M	K39	3867819	B272Z08000HPS	KN25	G77	3868829	T630M080X125R6HX-D1	KM6515	M24	
3860645	RHM25400KST200H7SF	KT6215	K29	3861272	B977F03100	KC7315	G143	3867820	B272Z08500HPS	KN25	G77	3868830	T630M100X150R6HX-D1	KM6515	M24
3860647	RHM26900KST200H7SF	KT6215	K29	3861630	KST175200RK	K39	3867821	B272Z09000HPS	KN25	G77	3868831	T630M120X150R6HX-D1	KM6515	M24	
3860648	RHM27000KST200H7SF	KT6215	K29	3861631	KST250250RK	K39	3867822	B272Z09500HPS	KN25	G77	3868832	T630M140X200R6HX-D6	KM6515	M24	
3860649	RHM27500KST200H7SF	KT6215	K30	3861632	KST300350RK	K39	3867823	B272Z09525HPS	KN25	G77	3868833	T630M160X200R6HX-D6	KM6515	M24	
3860650	RHM28000KST200H7SF	KT6215	K30	3861774	DINGA150416T02020	KYK10	B293	3867824	B272Z09550HPS	KN25	G77	3868834	T630M180X250R6HX-D6	KM6515	M24
3860651	RHM28580KST200H7SF	KT6215	K30	3861775	RNGN120400T02020	KYK10	B296	3867825	B272Z10000HPS	KN25	G77	3868856	T630M080X100R6HX-D4	KM6515	M24
3860652	RHM29000KST200H7SF	KT6215	K30	3861781	TPGN160312T02020	KYK10	B299	3867826	B274Z03000HPS	KN25	G79	3868857	T630M100X100R6HX-D4	KM6515	M24
3860653	RHM30000KST200H7SF	KT6215	K30	3862224	KST175200AS	K38	3867827	B274Z03175HPS	KN25	G79	3868858	T630M120X125R6HX-D4	KM6515	M24	
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3860656	RHM31750KST200H7SF	KT6215	K30	3862226	KST300350AS	K38	3867831	B274Z04000HPS	KN25	G79	3868862	T630M140X150R6HX-D4	KM6515	M24	
3860658	RHM32500KST200H7SF	KT6215	K30	3864351	B292A06200YPL	KC7315	G94	3867832	B274Z04500HPS	KN25	G79	3868863	T630M160X150R6HX-D4	KM6515	M24
3860659	RHM33000KST200H7SF	KT6215	K30	3865920	A4SBR2020K2S12016020	C115	3867833	B273Z03000HPS	KN25	G78	3868864	T630M180X150R6HX-D4	KM6515	M24	
3860660	RHM33340KST200H7SF	KT6215	K30	3865921	A4SBR2020K2S12020025	C115	3867834	B273Z03175HPS	KN25	G78	3868923	T630M050X080R6HX-D1	KP6525	M24	
3860662	RHM34930KST200H7SF	KT6215	K30	3865922	A4SBR2020K4S14035036	C115	3867835	B273Z03500HPS	KN25	G78	3868924	T630M100X125R6HX-D1	KP6525	M24	
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3860665	RHM36510KST200H7SF	KT6215	K30	3865926	A4SBR2020K4S14035048	C115	3867838	B273Z05000HPS	KN25	G78	3868927	T630M120X125R6HX-D1	KP6525	M24	
3860667	RHM37500KST200H7SF	KT6215	K30	3865927	A4SBR2525M5S19028038	C115	3867839	B273Z05500HPS	KN25	G78	3868928	T630M140X200R6HX-D6	KP6525	M24	
3860668	RHM38000KST200H7SF	KT6215	K30	3865928	A4SBR2525M5S19038038	C115	3867840	B273Z06000HPS	KN25	G78	3868929	T630M160X200R6HX-D6	KP6525	M24	
3860669	RHM38100KST200H7SF	KT6215	K30	3865929	A4SBL2020K2S12016020	C115	3867841	B273Z06350HPS	KN25	G78	3868930	T630M180X250R6HX-D6	KP6525	M24	
3860670	RHM39000KST200H7SF	KT6215	K30	3865931	A4SBL2020K2S12025036	C115	3867842	B273Z06500HPS	KN25	G78	3868933	T630M240X300R6HX-D6	KP6525	M28	
3860671	RHM39690KST200H7SF	KT6215	K30	3865932	A4SBL2020K3S14020025	C115	3867843	B273Z06746HPS	KN25	G78	3868942	T630M080X100R6HX-D4	KP6525	M24	
3860672	RHM40000KST200H7SF	KT6215	K30	3865934	A4SBL2020K4S14025035	C115	3867844	B273Z07000HPS	KN25	G78	3868943	T630M100X150R6HX-D4	KP6525	M24	
3860673	RHM41000KST200H7SF	KT6215	K30	3865937	A4SBL2525M5S19038058	C115	3867845	B273Z08000HPS	KN25	G78	3868944	T630M120X150R6HX-D4	KP6525	M24	
3860674	RHM41280KST200H7SF	KT6215	K30	3867457	A4M50R2S12B016020	C127	3867846	B273Z08500HPS	KN25	G78	3868946	T630M120X150R6HX-D4	KP6525	M24	
3860675	RHM42000KST200H7SF	KT6215	K30	3867458	A4M50R2S12B020025	C127	3867847	B273Z08500HPS	KN25	G78	3868948	T630M140X150R6HX-D4	KP6525	M24	
3860685	RHM20000KST175H7HF	KT6215	K31	3867459	A4M50R2S12B025036	C127	3867849	B273Z09525HPS	KN25	G78	3868949	T630M160X150R6HX-D4	KP6525	M24	
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3860860	RHM22500KST200H7HF	KT6215	K31	3867466	A4M50L2S12B016020	C128	3867876	B274Z06350HPS	KN25	G79	3868979	T631M100X150R6HX-D1	KP6525	M25	
3860861	RHM23000KST200H7HF	KT6215	K31	3867467	A4M50L2S12B020025	C128	3867877	B274Z06500HPS	KN25	G79	3868980	T631M120X175R6HX-D6	KP6525	M25	
3860862	RHM23810KST200H7HF	KT6215	K31	3867468	A4M50L2S12B025036	C128	3867878	B274Z06746HPS	KN25	G79	3868981	T631M140X200R6HX-D6	KP6525	M25	
3860863	RHM24000KST200H7HF	KT6215	K31	3867469	A4M50L3S14B020025	C128	3867879	B274Z07000HPS	KN25	G79	3868982	T631M160X250R6HX-D6	KP6525	M25	
3860864	RHM25000KST200H7HF	KT6215	K31	3867470	A4M50L3S14B025036	C128	3867880	B274Z08000HPS	KN25	G80	3868983	T631M180X250R6HX-D6	KP6525	M25	
3860865	RHM25400KST200H7HF	KT6215	K31	3867472	A4M50L4S14B035048	C128	3867881	B274Z08500HPS	KN25	G80	3869003	T631M080X100R6HX-D1	KP6525	M25	
3860867	RHM26900KST200H7HF	KT6215	K31	3867484	A4M50L5S17B028038	C128	3867882	B274Z08733HPS	KN25	G80	3869004	T631M100X100R6HX-D4	KP6525	M25	
3860868	RHM27000KST200H7HF	KT6215	K31	3867715	B271Z03000HPS	KN25	G74	3867883	B274Z09000HPS	KN25	G80	3869005	T631M120X125R6HX-D4	KP6525	M25
3860869	RHM27500KST200H7HF	KT6215	K31	3867716	B271Z03175HPS	KN25	G74	3867884	B274Z09525HPS	KN25	G80	3869006	T631M120X150R6HX-D4	KP6525	M25
3860870	RHM28000KST200H7HF	KT6215	K32	3867717	B271Z03200HPS	KN25	G74	3867885	B274Z10000HPS	KN25	G80	3869007	T631M140X150R6HX-D4	KP6525	M25
3860872	RHM29000KST200H7HF	KT6215	K32	3867718	B271Z03500HPS	KN25	G74	3868079	T620M030X050R6HX-D1	KM6515	M6	3869008	T631M140X150R6HX-D4	KP6525	M25
3860873	RHM30000KST200H7HF	KT6215	K32	3867719	B271Z03970HPS	KN25	G74	3868080	T620M040X070R6HX-D1	KM6515	M6	3869009	T631M160X150R6HX-D4	KP6525	M25
3860874	RHM30160KST200H7HF	KT6215	K32	3867720	B271Z04000HPS	KN25	G74	3868081	T620M050X080R6HX-D1	KM6515	M6	3869010	T631M180X150R6HX-D4	KP6525	M25
3860875	RHM31000KST200H7HF	KT6215	K32	3867721	B271Z04500HPS	KN25	G74	3868082	T620M060X100R6HX-D1	KM6515	M6	3869011	T631M200X150R6HX-D4	KP6525	M25
3860876	RHM31750KST200H7HF	KT6215	K32	3867722	B271Z04763HPS	KN25	G74	3868083	T620M080X125R6HX-D1	KM6515	M6	3871002	A46205M2S020GMN	KCU10	C99
3860877	RHM32000KST200H7HF	KT6215	K32	3867753	B271Z05000HPS	KN25	G74	3868084	T620M100X150R6HX-D1	KM6515	M6	3871033	A16RA4SAL2S12M017021	C120	C120
3860878	RHM32500KST200H7HF	KT6215	K32	3867754	B271Z05500HPS	KN25	G74	3868085	T620M120X175R6HX-D6	KM6515	M6	3871034	A20RA4SAL2S12M021026	C120	C120
3860879	RHM33000KST200H7HF	KT6215	K32	3867755	B271Z06000HPS	KN25	G74	3868096	T620M140X200R6HX-D6	KM6515	M6	3871035	A25RA4SAL2S12M026036	C120	C120
3860880	RHM33340KST200H7HF	KT6215	K32	3867756	B271Z06200HPS	KN25	G74	3868097	T620M160X200R6HX-D6	KM6515	M6	3871037	A25RA4SAL3S14M026036	C120	C120
3860881	RHM34000KST200H7HF	KT6215	K32	3867757	B271Z06350HPS	KN25	G74	3868099	T620M200X250R6HX-D6	KM6515	M6	3871038	A16RA4SAR2S12M017021	C120	C120
3860882	RHM34930KST200H7HF	KT6215	K32	3867758	B271Z06500HPS	KN25	G75	3868110	T620M080X100R6HX-D4	KM6515	M6	3871039	A20RA4SAR2S12M021026	C120	C120
3860883	RHM35000KST200H7HF	KT6215	K32	3867759	B271Z06746HPS	KN25	G75	3868111	T620M100X100R6HX-D4	KM6515	M6	3871040	A25RA4SAR2S12M026036	C120	C120
3860885	RHM36510KST200H7HF	KT6215	K32	3867760	B271Z07000HPS	KN25	G75	3868114	T620M120X150R6HX-D4	KM6515	M6	3871041	A20RA4SAR3S14M021026	C120	C120
3860886	RHM3														

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3871105	A4G0500M5SP04GUP	KCU25.....C98	3884463	KSEM3200HPCCLM	KC7410...H49, H87	3885857	B707A14000FBL	KCMS15.....G115	3894829	B707A07500FBS	KN15.....G114
3871107	A4G0205M2SU02GUP	KCU25.....C99	3884464	KSEM1270HPCCLM	KC7410.....H48	3885858	B707A14288FBL	KCMS15.....G115	3894830	B707A07938FBS	KN15.....G114
3871108	A4G0305M3SU02GUP	KCU25.....C99	3884465	KSEM1293HPCCLM	KC7410.....H48	3885859	B707A14500FBL	KCMS15.....G115	3894831	B707A08000FBS	KN15.....G114
3871109	A4G0305M3SU04GUP	KCU25.....C99	3884466	KSEM1310HPCCLM	KC7410.....H48	3885860	B707A15000FBL	KCMS15.....G115	3894832	B707A08500FBS	KN15.....G114
3871110	A4G0405M4SU04GUP	KCU25.....C99	3884467	KSEM1389HPCCLM	KC7410.....H48	3885861	B707A15250FBL	KCMS15.....G115	3894833	B707A08800FBS	KN15.....G115
3871112	A4G0505M5SU04GUP	KCU25.....C99	3884468	KSEM1429HPCCLM	KC7410.....H48	3885862	B707A15500FBL	KCMS15.....G115	3894834	B707A09000FBS	KN15.....G115
3871114	A4G0505M5SU08GUP	KCU25.....C99	3884469	KSEM1468HPCCLM	KC7410.....H48	3885863	B707A15875FBL	KCMS15.....G115	3894835	B707A09500FBS	KN15.....G115
3871115	A4R0200M2SP00GMP	KCU25.....C99	3884470	KSEM1548HPCCLM	KC7410.....H48	3885864	B707A16000FBL	KCMS15.....G115	3894836	B707A09525FBS	KN15.....G115
3871116	A4R0300M3SP00GMP	KCU25.....C99	3884471	KSEM1588HPCCLM	KC7410.....H48	3885865	B707A16500FBL	KCMS15.....G115	3894837	B707A10000FBS	KN15.....G115
3871118	A4R0500M5SP00GMP	KCU25.....C99	3884472	KSEM1609HPCCLM	KC7410.....H48	3885866	B707A17000FBL	KCMS15.....G115	3894838	B707A10320FBS	KN15.....G115
3872075	WD50FDS40183M	.....H102	3884473	KSEM1627HPCCLM	KC7410.....H48	3885867	B707A17500FBL	KCMS15.....G115	3894839	B707A10500FBS	KN15.....G115
3872079	WD50FDS45206M	.....H102	3884474	KSEM1667HPCCLM	KC7410.....H48	3885868	B707A18000FBL	KCMS15.....G115	3894840	B707A10000FBS	KN15.....G115
3872564	B292A14200VPL	KC7315.....G96	3884475	KSEM1707HPCCLM	KC7410.....H48	3885869	B707A19000FBL	KCMS15.....G115	3894841	B707A1111FBS	KN15.....G115
3873005	B292A07600VPL	KC7315.....G95	3884476	KSEM1746HPCCLM	KC7410.....H48	3885870	B707A19500FBL	KCMS15.....G115	3894842	B707A11509FBS	KN15.....G115
3873028	B976A11800	KC7315.....G141	3884477	KSEM1826HPCCLM	KC7410.....H48	3885871	B707A20000FBL	KCMS15.....G115	3894843	B707A11570FBS	KN15.....G115
3873438	50A05RS90SD12PLHF	.....V139	3884478	KSEM1905HPCCLM	KC7410.....H48	3885872	B707A21000FBL	KCMS15.....G115	3894844	B707A11700FBS	KN15.....G115
3873464	52A05RS90SD12PLHF	.....V139	3884479	KSEM1927HPCCLM	KC7410.....H48	3885873	B292A13900VPL	KC7315.....G96	3894845	B707A11800FBS	KN15.....G115
3873467	63A06RS90SD12PLHF	.....V139	3884480	KSEM1945HPCCLM	KC7410.....H48	3885874	B967A07500	KC7315.....G133	3894846	B707A12000FBS	KN15.....G115
3873469	66A06RS90SD12PLHF	.....V139	3884481	KSEM1984HPCCLM	KC7410.....H48	3885875	B272216000HPS	KN25.....G77	3894847	B707A12100FBS	KN15.....G115
3873520	80A07RS90SD12PLHF	.....V139	3884482	KSEM2024HPCCLM	KC7410.....H48	3885876	RPE1605MOSGE	KCPK30.....V79	3894848	B707A12500FBS	KN15.....G115
3873931	UDDE1400A5ASA	KC643M.....P31	3884483	KSEM2064HPCCLM	KC7410.....H48	3885877	RPE1605MOLE	KCPK30.....V79	3894849	B707A12800FBS	KN15.....G115
3873932	UDDE1400A5ARA	KC643M.....P31	3884484	KSEM2143HPCCLM	KC7410.....H48	3885878	B271210200HPS	KN25.....G75	3894850	B707A13000FBS	KN15.....G115
3874034	UDDE1400A5ARC	KC643M.....P31	3884485	KSEM2223HPCCLM	KC7410.....H48	3885879	B271210500HPS	KN25.....G75	3894851	B707A13500FBS	KN15.....G115
3874035	UDDE1400A5ARD	KC643M.....P31	3884486	KSEM2244HPCCLM	KC7410.....H48	3885880	B271213500HPS	KN25.....G75	3894852	B707A14000FBS	KN15.....G115
3874037	UDDE1400B5ARB	KC643M.....P31	3884487	KSEM2342HPCCLM	KC7410.....H48	3885881	B271210720HPS	KN25.....G75	3894853	B707A14288FBS	KN15.....G115
3876021	B967A08700	KC7315.....G133	3884488	KSEM2381HPCCLM	KC7410.....H48	3885882	B271211000HPS	KN25.....G75	3894854	B707A14500FBS	KN15.....G115
3876314	CNGN120716T02020	KYK10.....B295	3884489	KSEM2461HPCCLM	KC7410.....H48	3885883	B271211500HPS	KN25.....G75	3894855	B707A15000FBS	KN15.....G115
3876315	CNGA120408T02020	KYK10.....B292	3884490	KSEM2540HPCCLM	KC7410.....H48	3885884	B271212000HPS	KN25.....G75	3894856	B707A15250FBS	KN15.....G115
3876316	CNGA120412T02020	KYK10.....B292	3884491	KSEM2567HPCCLM	KC7410.....H48	3885885	B271212500HPS	KN25.....G75	3894857	B707A15500FBS	KN15.....G115
3876317	CNGA120412T02020	KYK10.....B292	3884492	KSEM2619HPCCLM	KC7410.....H48	3885886	B271212700HPS	KN25.....G75	3894858	B707A15875FBS	KN15.....G115
3876318	CNGA120412T02020	KYK10.....B293	3884493	KSEM2659HPCCLM	KC7410.....H48	3885887	B271213000HPS	KN25.....G75	3894859	B707A16000FBS	KN15.....G115
3876319	CNGA120416T02020	KYK10.....B292	3884494	KSEM2778HPCCLM	KC7410.....H48	3885888	B272210200HPS	KN25.....G77	3894860	B707A16500FBS	KN15.....G115
3876328	SNGX120712T02020	KYK10.....B297	3884495	KSEM2818HPCCLM	KC7410.....H49	3885889	B272210500HPS	KN25.....G77	3894861	B707A17000FBS	KN15.....G115
3876329	SNGX120716T02020	KYK10.....B297	3884496	KSEM2858HPCCLM	KC7410.....H49	3885890	B272210720HPS	KN25.....G77	3894862	B707A17500FBS	KN15.....G115
3876331	TNGA160408T02020	KYK10.....B294	3884497	KSEM2937HPCCLM	KC7410.....H49	3885891	B272212000HPS	KN25.....G77	3894863	B707A18000FBS	KN15.....G115
3876333	WNGX080712T02020	KYK10.....B298	3884498	KSEM2977HPCCLM	KC7410.....H49	3885892	B272212500HPS	KN25.....G77	3894864	B707A19000FBS	KN15.....G115
3876334	SNGA120408T02020	KYK10.....B293	3884499	KSEM3016HPCCLM	KC7410.....H49	3885893	B272212500HPS	KN25.....G77	3894865	B707A19050FBS	KN15.....G115
3876843	CNGF120408	KB1340.....B286	3884500	KSEM3175HPCCLM	KC7410.....H49	3885894	B272212000HPS	KN25.....G77	3894866	B707A20000FBS	KN15.....G115
3877207	CFM0402R3ORHP	KCU40.....H34	3884540	B291A06200VPL	KC7315.....G94	3885895	B272213000HPS	KN25.....G77	3894867	B707A21000FBS	KN15.....G115
3877688	B272211000HPS	KN25.....G77	3884541	B291A11800VPL	KC7315.....G95	3885896	B273210500HPS	KN25.....G78	3894868	B707A21000FBS	KN15.....G115
3877827	B967A11500	KC7315.....G134	3884593	B291A15800VPL	KC7315.....G96	3885897	B273210000HPS	KN25.....G78	3894869	B272212500HPS	KN25.....G77
3878037	B292A09800VPL	KC7315.....G95	3884594	B291A19800VPL	KC7315.....G96	3885898	B273211500HPS	KN25.....G78	3894903	WNMG060408FP	KCP10.....B96
3878347	HSK63A3SIFR0063M	.....K46	3884596	B291A05200VPL	KC7315.....G94	3885899	B273212000HPS	KN25.....G78	3901561	B292A04700VPL	KC7315.....G94
3883100	RIQ06E1312	KC6305.....K55	3884923	RCMT1204MOMP	KCS10.....B224	3885900	B273212500HPS	KN25.....G78	3902132	KM40TSNEL2	.....D31
3884395	KSEM1250HPCCLM	KC7410.....H48	3885689	B707A03000FBL	KCMS15.....G114	3885901	B273215000HPS	KN25.....G78	3902167	B292A07900VPL	KC7315.....G95
3884396	KSEM1300HPCCLM	KC7410.....H48, H87	3885690	B707A03175FBL	KCMS15.....G114	3885902	B273215000HPS	KN25.....G78	3902171	B291A17900VPL	KC7315.....G96
3884397	KSEM1350HPCCLM	KC7410.....H48	3885691	B707A03500FBL	KCMS15.....G114	3885903	B274210200HPS	KN25.....G80	3902283	KM40TSNEL3	.....D31
3884398	KSEM1400HPCCLM	KC7410.....H48, H87	3885692	B707A04000FBL	KCMS15.....G114	3885904	B274211000HPS	KN25.....G80	3902284	KM40TSNEL4	.....D33
3884399	KSEM1450HPCCLM	KC7410.....H48	3885693	B707A04400FBL	KCMS15.....G114	3885905	B274212000HPS	KN25.....G80	3902285	KM40TSNER2	.....D31
3884400	KSEM1500HPCCLM	KC7410.....H48, H87	3885824	B707A04500FBL	KCMS15.....G114	3885906	B274212500HPS	KN25.....G80	3902286	KM40TSNER3	.....D31
3884401	KSEM1550HPCCLM	KC7410.....H48	3885825	B707A04500FBL	KCMS15.....G114	3885907	B274214500HPS	KN25.....G80	3902287	KM40TSNER4	.....D31
3884402	KSEM1600HPCCLM	KC7410.....H48, H87	3885826	B707A05000FBL	KCMS15.....G114	3885908	B274213000HPS	KN25.....G80	3902288	KM40TSNRL3045M	.....D33
3884433	KSEM1650HPCCLM	KC7410.....H48	3885827	B707A05560FBL	KCMS15.....G114	3885909	B271214290HPS	KN25.....G75	3902289	KM40TSNRL2	.....D33
3884434	KSEM1700HPCCLM	KC7410.....H48, H87	3885828	B707A05900FBL	KCMS15.....G114	3885910	B271215500HPS	KN25.....G75	3902290	KM40TSNRL3	.....D33
3884435	KSEM1750HPCCLM	KC7410.....H48	3885829	B707A06000FBL	KCMS15.....G114	3885911	B271215870HPS	KN25.....G75	3902291	KM40TSNRL4	.....D33
3884436	KSEM1800HPCCLM	KC7410.....H48, H87	3885830	B707A06350FBL	KCMS15.....G114	3885912	B271216000HPS	KN25.....G75	3902292	KM40TSNRL5	.....D33
3884437	KSEM1850HPCCLM	KC7410.....H48	3885831	B707A06500FBL	KCMS15.....G114	3885913	B272213500HPS	KN25.....G77	3902293	KM40TSNRL2	.....D33
3884438	KSEM1900HPCCLM	KC7410.....H48, H87	3885832	B707A06800FBL	KCMS15.....G114	3885914	B272214000HPS	KN25.....G77	3902294	KM40TSNRL3	.....D33
3884439	KSEM1950HPCCLM	KC7410.....H48	3885833	B707A07000FBL	KCMS15.....G114	3885915	B272214500HPS	KN25.....G77	3902295	KM40TSNRL4	.....D33
3884440	KSEM2000HPCCLM	KC7410.....H48, H87	3885834	B707A07500FBL	KCMS15.....G114	3885916	B272215000HPS	KN25.....G77	3902973	B291A04400VPL	KC7315.....G94
3884441	KSEM2050HPCCLM	KC7410.....H48	3885835	B707A07938FBL	KCMS15.....G114	3885917	B272215500HPS	KN25.....G77	3903498	B978A03300	KC7315.....G146
3884442	KSEM2100HPCCLM	KC7410.....H48, H87	3885836	B707A08000FBL	KCMS15.....G114	3885918	B272215870HPS	KN25.....G77	3903995	B291A08600VPL	KC7315.....G95
3884443	KSEM2150HPCCLM	KC7410.....H48	3885837	B707A08500FBL	KCMS15.....G114	3885919	B272215870HPS	KN25.....G77	3904143	B291A03454VPL	KC7315.....G94
3884444	KSEM2200HPCCLM	KC7410.....H48, H87	3885838	B707A08800FBL	KCMS15.....G115	3885920	B273213100HPS	KN25.....G78	3904144	B291A03970VPL	KC7315.....G94
3884445	KSEM2250HPCCLM	KC7410.....H48	3885839	B707A09000FBL	KCMS15.....G115	3885921	B273214000HPS	KN25.....G78	3904146	B291A04851VPL	KC7315.....G94
3884446	KSEM2300HPCCLM	KC7410.....H48, H87	3885840	B707A09500FBL	KCMS15.....G115	3885922	B273214290HPS	KN25.....G78	3904147	B291A04915VPL	KC7315.....G94
3884447	KSEM2350HPCCLM	KC7410.....H48	3885841	B707A09525FBL	KCMS15.....G115	3885923	B273214500HPS	KN25.....G78	3904148	B291A05410VPL	KC7315.....G94
3884448	KSEM2400HPCCLM	KC7410.....H48, H87	3885842	B707A10000FBL	KCMS15.....G115	3885924	B273214500HPS	KN25.....G78	3904149	B291A06747VPL	KC7315.....G95
3884449	KSEM2450HPCCLM	KC7410.....H48	3885843	B707A10320FBL	KCMS15.....G115	3885925	B707A03000FBS	KN15.....G114	3904150	B291A07144VPL	KC7315.....G95
3884450	KSEM2500HPCCLM	KC7410.....H48, H87	3885844	B707A10500FBL	KCMS15.....G115	3885926	B707A03175FBS	KN15.....G114	3904151	B291A07938VPL	KC7315.....G95
3884451	KSEM2550HPCCLM	KC7410.....H48	3885845	B707A11000FBL	KCMS15.....G115	3885927	B707A03500FBS	KN15.....G114	3904152	B291A08733VPL	KC7315.....G95
3884452	KSEM2600HPCCLM	KC7410.....H48, H87	3885846	B707A11111FBL	KCMS15.....G115	3885928	B707A04000FBS	KN15.....G114	3904153	B291A08900VPL	KC7315.....G95

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3904165	B291A19050YPL KC7315	G96	3959614	EDCT180516PDERLDJ KC422M	T73	3994693	193.537	H102-103	4028508	T621MF100X125R6HX-D4 KP6525	M7
3904168	B292A03970YPL KC7315	G94	3959615	EDCT180532PDERLDJ KC422M	T73	3994709	B291A04900YPL KC7315	G94	4028509	T621MF120X125R6HX-D4 KP6525	M7
3904169	B292A04763YPL KC7315	G94	3960806	CNGX120416S020 KB1340	B287	3994711	B291A09800YPL KC7315	G95	4028510	T621MF120X150R6HX-D4 KP6525	M7
3904170	B292A04851YPL KC7315	G94	3960807	CNGX120412S01015 KB1340	B287	3998775	KSEM1735HPGM KC7315	H42	4028511	T621MF140X125R6HX-D4 KP6525	M7
3904171	B292A04915YPL KC7315	G94	3960808	CNGX120412S01015W KB1340	B287	3999270	TRM50R0720M	E65	4028512	T621MF140X150R6HX-D4 KP6525	M7
3904172	B292A08600YPL KC7315	G95	3960812	SNGX120416S020 KB1340	B287	3999273	TRM50L0932M	E65	4028513	T621MF160X150R6HX-D4 KP6525	M7
3904173	B292A08900YPL KC7315	G95	3964172	KDMB06MOERGN KC505M	V118	3999274	TRM50R0932M	E65	4028514	T621MF180X150R6HX-D4 KP6525	M7
3904174	B292A09130YPL KC7315	G95	3964191	KDMB06R150A06HN	V114	3999275	TRM50L0632M	E65	4028861	B271Z02383KMS KN25	G74
3904175	B292A09700YPL KC7315	G95	3964192	KDMB06R200A06HN	V114	3999276	TRM50R0632M	E65	4028862	B271Z02400KMS KN25	G74
3904176	B292A11509YPL KC7315	G95	3964213	KDMB08MOERGN KC505M	V118	3999277	TRM50L0950M	E65	4028873	B271Z02439KMS KN25	G74
3904177	B292A11908YPL KC7315	G95	3964214	KDMB10MOERGN KC505M	V118	3999278	TRM50R0950M	E65	4028874	B271Z02489KMS KN25	G74
3904178	B292A12700YPL KC7315	G96	3964215	KDMB12MOERGN KC505M	V118	4000408	KSEMP2800FDS28A1M	H80, H91, H98	4028875	B271Z02579KMS KN25	G74
3904179	B292A14288YPL KC7315	G96	3964216	KDMB16MOERGN KC505M	V118	4000409	WD32FDS28128M	H102	4028876	B271Z02578KMS KN25	G74
3904180	B292A15875YPL KC7315	G96	3964217	KDMB20MOERGN KC505M	V118	4000411	WD32FDS28345M	H103	4028877	B271Z02600KMS KN25	G74
3904182	B292A17463YPL KC7315	G96	3964218	KDMB25MOERGN KC505M	V118	4003224	KSEM2565HPGM KC7315	H43	4028880	B271Z02799KMS KN25	G74
3906105	R82154	K74	3964219	KDMB32MOERGN KC505M	V118	4003518	RIQ06R0200 KD1415	K54	4028881	B271Z02800KMS KN25	G74
3949799	B291A10200YPL KC7315	G95	3964220	KDMB06MOERGP KC515M	V118	4003520	B966A17000 KC7315	G134	4028882	B271Z02820KMS KN25	G74
3949899	A4R100SM10U00GMN KCP25	C97	3964221	KDMB08MOERGP KC515M	V118	4003521	B966A17500 KC7315	G134	4028883	B271Z02900KMS KN25	G74
3950219	WD32FDS32146M	H102	3964222	KDMB10MOERGP KC515M	V118	4003522	B966A18000 KC7315	G134	4028884	B271Z02947KMS KN25	G74
3950220	WD32FDS36166M	H102	3964223	KDMB12MOERGP KC515M	V118	4004710	CM215R ASSY	B149-150	4028885	B271Z02947KMS KN25	G74
3950221	WD50FDS50228M	H102	3964224	KDMB16MOERGP KC515M	V118			B152	4028886	B272Z02383KMS KN25	G76
3950222	WD50FDS56259M	H102	3964225	KDMB20MOERGP KC515M	V118	4004750	63A09RF84SN12B1W	S103	4028887	B272Z02400KMS KN25	G76
3950333	WD50FDS63289M	H102	3964226	KDMB25MOERGP KC515M	V118	4004751	80A12RF84SN12B2W	S103	4028888	B272Z02439KMS KN25	G76
3950653	100A08RS90SD12PL-HF	V139	3964227	KDMB32MOERGP KC515M	V118	4004752	100B15RF84SN12B3W	S103	4028889	B272Z02489KMS KN25	G76
3950688	B291A05900YPL KC7315	G94	3964228	KDMB06MOERGP KC505M	V118	4004793	125B18RF84SN12B3W	S103	4028890	B272Z02500KMS KN25	G76
3950831	KM40TSLSEL16N	D85	3964229	KDMB08MOERGP KC505M	V118	4004794	160C24RF84SN12B3W	S103	4028896	B272Z02800KMS KN25	G76
3950832	KM40TSLSER16N	D85	3964230	KDMB10MOERGP KC505M	V118	4005063	66A06RS90RP12	V72	4028900	B272Z02947KMS KN25	G76
3950854	KM40TSLSER22N	D85	3964231	KDMB12MOERGP KC505M	V118	4005704	LNUX191940RRP KCP10	E52	4028901	B273Z02383KMS KN25	G78
3950855	KM40TSLSSL16	D84	3964232	KDMB16MOERGP KC505M	V118	4005706	LNUX191940RRP KCP25	E52	4028903	B273Z02439KMS KN25	G78
3950856	KM40TSLSSL22	D84	3964233	KDMB20MOERGP KC505M	V118	4006482	B976F03000 KC7315	G143	4028910	B273Z02779KMS KN25	G78
3950857	KM40TSLSSR16	D84	3964234	KDMB25MOERGP KC505M	V118	4006503	B976A19840 KC7315	G142	4028911	B273Z02800KMS KN25	G78
3950858	KM40TSLSSR22	D84	3964235	KDMB32MOERGP KC505M	V118	4006504	B977A19840 KC7315	G142	4028912	B273Z02820KMS KN25	G78
3951835	KM40TSS16JNEL2 KWH	D40	3964236	KDMB06MOERLD K115M	V118	4006830	KTP270R8SS32M	H31	4028913	B273Z02870KMS KN25	G78
3951836	KM40TSS16JNER2 KWH	D40	3964237	KDMB08MOERLD K115M	V118	4008096	TNMG160405FP KCP10	B124	4028915	B273Z02947KMS KN25	G78
3954092	SNMG190616RN KCPK05	B101	3964238	KDMB10MOERLD K115M	V118	4011180	EDCT180550PDRFLDJ KC410M	T73	4028916	B273Z02947KMS KN25	G79
3954298	G50MTTB1026KM40	B387	3964239	KDMB12MOERLD K115M	V118	4011227	B532A06700SPF KDF400	G105	4028917	B274Z02400KMS KN25	G79
3954300	G80MTTB1564KM63	B387	3964240	KDMB16MOERLD K115M	V118	4024763	80A06RS90RP12	V72	4028918	B274Z02439KMS KN25	G79
3955463	KM40TSS10DLSEL11	D86	3964241	KDMB20MOERLD K115M	V118	4025498	63A07RS90RP12	V72	4028920	B274Z02500KMS KN25	G79
3955464	KM40TSS10DLSER11	D86	3964242	KDMB25MOERLD K115M	V118	4025911	B978A04800 KC7315	G146	4028922	B274Z02600KMS KN25	G79
3955465	KM40TSS12ELSEL11	D86	3964243	KDMB32MOERLD K115M	V118	4026180	T631M050X080R6HX-D1 KM6515	M25	4028923	B274Z02642KMS KN25	G79
3955466	KM40TSS12ELSER11	D86	3964244	KDMB12MOERHC KC530M	V118	4026181	T631M060X100R6HX-D1 KM6515	M25	4028925	B274Z02799KMS KN25	G79
3955468	KM40TSS16FLSER11	D86	3964245	KDMB16MOERHC KC530M	V118	4026182	T631M080X125R6HX-D1 KM6515	M25	4028926	B274Z02800KMS KN25	G79
3955469	KM40TSS20GLSER16	D86	3964246	KDMB20MOERHC KC530M	V118	4026223	T631M100X150R6HX-D1 KM6515	M25	4028928	B274Z02870KMS KN25	G79
3955470	KM40TSS20GLSER16	D86	3964247	KDMB25MOERHC KC530M	V118	4026224	T631M120X175R6HX-D6 KM6515	M25	4028929	B274Z02900KMS KN25	G79
3955471	KM40TSS25HLSER16	D86	3964248	KDMB32MOERHC KC530M	V118	4026225	T631M140X200R6HX-D6 KM6515	M25	4028930	B274Z02947KMS KN25	G79
3955472	KM40TSS25HLSER16	D86	3964255	KDMT10R120A10HNC	V130	4026226	T631M160X200R6HX-D6 KM6515	M25	4029315	HNP130720ANSNGD KCP725M	S26
3955473	KM40TSS32JLSER16	D86	3964256	KDMT10R150A10HNC	V130	4026227	T631M180X250R6HX-D6 KM6515	M25	4029316	HNP130720ANSNGD KCPK30	S26
3955474	KM40TSS32JLSER16	D86	3964257	KDMB06R90A08HN	V115	4026231	T631MF080X100R6HX-D4 KM6515	M25	4032304	UEBE0200A3A KC643M	P195
3955475	KM40TSS32JLSER22	D86	3964258	KDMB08R100A10HN	V115	4026232	T631MF100X100R6HX-D4 KM6515	M25	4032305	UEBE0300A3A KC643M	P195
3955476	KM40TSS32JLSER22	D86	3964259	KDMB08R150A10HN	V115	4026233	T631MF120X125R6HX-D4 KM6515	M25	4032306	UEBE0400A3A KC643M	P195
3955480	KM40TSS12ENEL2	D38-39	3964260	KDMB10R100A12HNC	V115	4026234	T631MF120X150R6HX-D4 KM6515	M25	4032307	UEBE0500A3A KC643M	P195
3955481	KM40TSS12ENER2	D38-39	3964261	KDMB12R150A12HNC	V115	4026235	T631MF120X150R6HX-D4 KM6515	M25	4032308	UEBE0600A3A KC643M	P195
3955482	KM40TSS16JNEL2	D38-39	3964262	KDMB12R120A16HNC	V115	4026236	T631MF140X125R6HX-D4 KM6515	M25	4032309	UEBE0800A3A KC643M	P195
3955483	KM40TSS16JNER2	D38-39	3964263	KDMB12R150A16HNC	V115	4026237	T631MF140X150R6HX-D4 KM6515	M25	4032310	UEBE1000A3A KC643M	P195
3955484	KM40TSS20GNEL2	D38-39	3964264	KDMB16R140A20HNC	V115	4026238	T631MF160X150R6HX-D4 KM6515	M25	4032311	UEBE1200A3A KC643M	P195
3955485	KM40TSS20GNER2	D38-39	3964265	KDMB16R175A20HNC	V115	4026239	T631MF160X150R6HX-D4 KM6515	M25	4032783	UEDE0200B3AS KC643M	P192
3955486	KM40TSS25ENEL2	D38-39	3965707	KDMT0806ERGN KC515M	V132	4027389	100B09RS90RP12	V72	4032784	UEDE0300A3AS KC643M	P192
3955487	KM40TSS25ENER2	D38-39	3965708	KDMT1008ERGN KC515M	V132	4027886	T621M050X080R6HX-D1 KM6515	M7	4032785	UEDE0400A3AS KC643M	P192
3955489	KM40TSS25JNER2	D38-39	3965709	KDMT0605ERGC KC515M	V132	4027887	T621M060X100R6HX-D1 KM6515	M7	4032786	UEDE0500A3AS KC643M	P192
3955490	KM40TSS25ENEL3	D38-39	3965710	KDMT0810ERGC KC515M	V132	4027888	T621M080X125R6HX-D1 KM6515	M7	4032787	UEDE0600A3AS KC643M	P192
3955491	KM40TSS25ENER3	D38-39	3965711	KDMT1010ERGC KC515M	V132	4027889	T621M100X150R6HX-D1 KM6515	M7	4032788	UEDE0800A3AS KC643M	P192
3955492	KM40TSS25HNEL3	D38-39	3965712	KDMT1010ERHC KC505M	V133	4027890	T621M120X175R6HX-D6 KM6515	M7	4032789	UEDE1000B3AS KC643M	P192
3955493	KM40TSS25HNER3	D38-39	3965913	KDMT1210ERHC KC505M	V133	4027916	T621M140X200R6HX-D6 KM6515	M7	4032790	UEDE1200A3AS KC643M	P192
3955495	KM40TSS32JNER3	D38-39	3965914	KDMT1610ERHC KC505M	V133	4027917	T621M160X200R6HX-D6 KM6515	M7	4032791	UEDE0200B3AS KC643M	P192
3955496	KM40TSS32GNEL3	D38-39	3965915	KDMT2010ERHC KC505M	V133	4027918	T621M180X250R6HX-D6 KM6515	M7	4032792	UEDE0300B3AS KC643M	P192
3955497	KM40TSS32GNER3	D38-39	3965916	KDMT1008SRHF KC515M	V133	4027919	T621MF080X100R6HX-D4 KM6515	M7	4032793	UEDE0400B3AS KC643M	P192
3955980	B967A07200 KC7315	G134	3965917	KDMT1210SRHF KC515M	V133	4027920	T621MF100X100R6HX-D4 KM6515	M7	4032794	UEDE0500B3AS KC643M	P192
3956013	B967A06000 KC7315	G132	3965918	KDMT1615SRHF KC515M	V133	4027921	T621MF120X125R6HX-D4 KM6515	M7	4032795	UEDE0600B3AS KC643M	P192
3956014	B967A07000 KC7315	G133	3965919	KDMT2020SRHF KC515M	V133	4027922	T621MF120X150R6HX-D4 KM6515	M7	4032796	UEDE0800B3AS KC643M	P192
3956017	B967A07400 KC7315	G133	396								



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4033713	B707A12700FBS KN15	G115	4034881	W0EJ090512SRHD KC725M	V41	4042842	SPPX09T310HP KC25	J89	4045188	WNMG080412RP KC10	B159
4033714	B707A12700FBL KCMS15	G115	4034882	W0EJ090512SRGD KC522M	V41	4042887	SPGX070308FP KCPK10	J90	4045189	WNMG080412UP KC10	B160
4033829	NA4L8 KC25	D12	4034925	W0EJ090512SRGD KC725M	V41	4042888	SPGX070308MD KCPK10	J89	4045193	CCGT09T301FL KC10	B175
4033830	NA4R4 KC25	D12	4034927	W0EJ090512SRGD KCPK30	V41	4042889	SPGX070308HP KCPK10	J89	4045194	CCGT09T304HP KC10	B175
4033833	NA6L2 KC25	D12	4035459	T640M040X070R6HX-D1 KP6525	M63	4042890	SPPX09T310FP KCPK10	J90	4045195	CCGT09T304FL KC10	B175
4033834	NA6L25 KC25	D12	4035460	T640M050X080R6HX-D1 KP6525	M63	4042891	SPPX09T310MD KCPK10	J89	4045196	CCGT09T308HP KC10	B175
4033835	NA6L3 KC25	D12	4035461	T640M060X100R6HX-D1 KP6525	M63	4042892	SPGX070308HP KCPK10	J89	4045197	CCGT09T308FL KC10	B175
4033836	NA6R2 KC25	D12	4035462	T640M080X125R6HX-D1 KP6525	M63	4042903	SPPX120412FP KCPK10	J90	4045198	CCGT120402HP KC10	B175
4033838	NA6R3 KC25	D12	4035463	T640M100X150R6HX-D1 KP6525	M63	4042904	SPPX120412MD KCPK10	J89	4045199	CCGT120404HP KC10	B175
4033841	ND4050R KC25	D14	4035464	T640M120X175R6HX-D6 KP6525	M63	4042905	SPPX120412HP KCPK10	J89	4045200	CCGT09T304HP KC10	B175
4033845	NDC38RDL75 KC25	D15	4035465	T640M140X200R6HX-D6 KP6525	M63	4042906	SPPX15T512FP KCPK10	J90	4045202	CCMT060204FW KC10	B176
4033846	NDC38RDR75 KC25	D15	4035466	T640M160X200R6HX-D6 KP6525	M63	4042907	SPPX15T512MD KCPK10	J89	4045204	CCMT09T304FW KC10	B176
4033852	NG1031L KC25	C155	4035467	T640M180X250R6HX-D6 KP6525	M63	4042908	SPPX09T310HP KCPK10	J89	4045205	CCGT09T304MM KC10	B178
4033853	NG1047L KC25	C155	4035468	T640M200X250R6HX-D6 KP6525	M63	4042913	SPPX120412FP KC25	J90	4045206	CCMT09T308FW KC10	B176
4033854	NG1062L KC25	C155	4035469	T640M220X250R6HX-D6 KP6525	M63	4042914	SPPX15T512FP KC25	J89	4045207	CCMT09T308MM KC10	B178
4033855	NG1094L KC25	C155	4035525	T641M050X080R6HX-D1 KP6525	M64	4042915	SPPX15T512HP KC25	J90	4045210	CPGH09T301 KC10	B188
4033856	NG65312R KC25	C154	4035526	T641M060X100R6HX-D1 KP6525	M64	4042933	SPGX070308FP KC10	J90	4045211	CPGH09T302 KC10	B188
4033858	NG6375R KC25	C154	4035527	T641M080X125R6HX-D1 KP6525	M64	4042934	SPGX070308MD KC10	J89	4045212	CPGH09T304 KC10	B188
4033859	NT1L KC25	D25	4035528	T641M100X150R6HX-D1 KP6525	M64	4042935	SPPX120412HP KC10	J89	4045213	CPGH09T308 KC10	B188
4033863	NTB3RB KC25	D20	4035529	T641M120X175R6HX-D6 KP6525	M64	4042936	SPPX09T310FP KC10	J90	4045214	CPGT060202HP KC10	B188
4033872	NTC3R12E KC25	D22	4035530	T641M140X200R6HX-D6 KP6525	M64	4042937	SPPX09T310MD KC10	J89	4045215	CPGT060202FL KC10	B189
4033877	NTC3R18E KC25	D22	4035531	T641M160X200R6HX-D6 KP6525	M64	4042938	SPPX09T310HP KC10	J89	4045216	CPGT060201LF KC10	B189
4033882	NTU4R KC25	D24	4035532	T641M180X250R6HX-D6 KP6525	M64	4042939	SPPX120412FP KC10	J90	4045217	CPGT060204HP KC10	B188
4033883	NU3094L KC25	C161	4035533	T641M200X250R6HX-D6 KP6525	M64	4042940	SPPX120412MD KC10	J89	4045218	CPGT060204FL KC10	B189
4033886	NU3125R KC25	C161	4035585	RCMX3209MORU KCP25	E61	4042941	SPPX120412HP KC10	J89	4045220	CPGT060208FL KC10	B189
4033887	NV3RJ KC25	C162	4035586	RCMX3209MORU KCK20	E61	4042942	SPPX15T512FP KC10	J90	4045221	CPGT09T302HP KC10	B188
4033888	NV4LL KC25	C162	4035593	RCMX2507MORU KCK20	E61	4042943	SPPX15T512MD KC10	J89	4045222	CPGT09T302FL KC10	B189
4033889	NV4RL KC25	C162	4035595	RCMH2507MORU KCP25	E60	4042944	SPPX15T512HP KC10	J89	4045223	CPGT09T304HP KC10	B188
4033892	NWC3R14E KC25	D25	4035698	LNLU19194ORRF KCP10	E51	4043046	32E03R045M16RP12	V70	4045224	CPGT09T304FL KC10	B189
4034717	A4G0200M02P02GMP KC10	C95	4036621	RPGN09030DE KYSP30	V155	4043047	40E04R045M16RP12	V70	4045225	CPGT09T308HP KC10	B188
4034718	A4G0205M02U02GMN KC10	C96	4036916	LNLU19194ORRF KCP25	E51	4043048	32A03R040B32RP12	V70	4045226	CPGT09T308FL KC10	B189
4034720	A4G0250M2B02GMP KC10	C95	4038003	LNLU2410ANSRHD KCPK30	S117	4043049	32A03R040A32RP12L190	V71	4045228	CPMT060204FW KC10	B189
4034721	A4G0300M03P02GMP KC10	C95	4038004	LNLU2410ANSRHD KCK15	S117	4043050	40A04RS90RP12	V72	4045229	CPMT060208FW KC10	B189
4034722	A4G0300M03P04GMP KC10	C95	4038005	LNLU2410ANSRHD KC725M	S117	4043051	50A04RS90RP12	V72	4045231	CPMT09T304MM KC10	B191
4034773	A4G0305M03U02GMN KC10	C96	4039608	SM-906 KC720	S116, S120, S122	4043052	50A05RS90RP12	V72	4045232	CPMT09T308FW KC10	B189
4034774	A4G0305M03U02GMP KC10	C95	4039774	MS2236	V114-115	4043063	63A05RS90RP12	V72	4045237	DCGT070202HP KC10	B206
4034775	A4G0305M03U04GMN KC10	C96	4040133	SPGX070308MD KC25	J89	4043064	80A06RS90RP12	V72	4045238	DCGT070201LF KC10	B206
4034776	A4G0305M03U04GMP KC10	C95	4040135	SPGX070308HP KC25	J89	4043065	100B07RS90RP12	V72	4045239	DCGT070204HP KC10	B206
4034777	A4G0400M04P02GMP KC10	C95	4040138	SPPX09T310MD KC25	J89	4044264	B532A07200SPF KDF400	G105	4045240	DCGT070208HP KC10	B206
4034778	A4G0400M04P04GMP KC10	C95	4040139	SPPX120412MD KC25	J89	4044821	TCGT110201LF KC10	B243	4045241	DCGT11T302HP KC10	B206
4034779	A4G0400M04P08GMP KC10	C96	4040141	SPPX120412HP KC25	J89	4044822	TCGT110204FL KC10	B243	4045242	DCGT11T301FL KC10	B206
4034780	A4G0405M04U04GMN KC10	C95	4040142	SPPX15T512MD KC25	J89	4044822	TCGT110204FL KC10	B243	4045245	DCGT150404 KC10	E28
4034781	A4G0405M04U04GMP KC10	C95	4040758	RPET1204M0EJLE KC422M	V73	4045101	VNMG160402LF KC10	B143	4045246	DCGR150408 KC10	E28
4034782	A4G0405M04U08GMN KC10	C96	4040905	KCI3M	V153-154	4045102	VNMG160404LF KC10	B143	4045248	KCGR11030408 KC10	E29
4034784	A4G0500M05P04GMP KC10	C95	4040931	MEGA45D125B06LN24	S116	4045104	CCGT060202HP KC10	B175	4045249	KCGR110304R8 KC10	E29
4034785	A4G0500M05P08GMP KC10	C95	4040932	MEGA45D160C07LN24	S116	4045135	CCGT060202LF KC10	B175	4045250	KCGR110308L8 KC10	E29
4034786	A4G0505M05U04GMN KC10	C96	4040954	MEGA45D250C1LN24	S116	4045136	CCGT060201LF KC10	B175	4045251	KCGR110308R8 KC10	E29
4034787	A4G0505M05U04GMP KC10	C95	4040955	MEGA45D315C13LN24	S116	4045137	CCGT060204HP KC10	B175	4045263	DCMT11T304HP KC10	B206
4034788	A4G0505M05U08GMN KC10	C96	4042332	KSHRH50A04RS15HN09	S17	4045138	CCGT060204LF KC10	B175	4045264	DCGT11T308HP KC10	B206
4034790	A4G0600M06P04GMP KC10	C95	4042533	KSHRH63A05RS15HN09	S17	4045140	CCGT060208FL KC10	B175	4045265	DCGT150408FL KC10	B206
4034791	A4G0600M06P08GMP KC10	C95	4042534	KSHRH80A06RS15HN09	S17	4045141	CCGT09T302HP KC10	B175	4045266	DCMT11T304FW KC10	B207
4034792	A4G0605M06U04GMN KC10	C96	4042535	KSHRH125B09RS15HN09	S17	4045142	CCGT09T302LF KC10	B175	4045267	DCMT11T304MM KC10	B208
4034794	A4G0605M06U08GMN KC10	C96	4042538	KSHRH100B08RS15HN09	S17	4045143	VNMG160408FL KC10	B143	4045268	DCMT11T308FW KC10	B207
4034799	A4G0800M08P12GMP KC10	C95	4042539	B976Z02400 KC7315	G138	4045144	VNMG220408FL KC10	B143	4045269	DCMT11T308FL KC10	B207
4034800	A4G0805M08U08GMN KC10	C96	4042540	B976Z02439 KC7315	G138	4045145	VNMG160401 KC10	B143	4045270	DCMT11T308MM KC10	B208
4034802	A4G09412B050GMN KC10	C97	4042541	B976Z02489 KC7315	G138	4045146	VNMG160402 KC10	B143	4045272	DPGT070202LF KC10	B214
4034805	A4G1005M10U08GMP KC10	C95	4042542	B976Z02500 KC7315	G138	4045147	VNMG220404 KC10	B143	4045274	DPGT070204HP KC10	B214
4034806	A4G12503P05GMN KC10	C97	4042543	B976Z02578 KC7315	G138	4045148	VNMG220408 KC10	B143	4045275	DPGT070204FL KC10	B214
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4034810	A4G250106P11GMN KC10	C97	4042547	B976Z02779 KC7315	G138	4045153	VNMG160408FF KC10	B145	4045281	DPGT11T308HP KC10	B214
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4034812	A4G37510P2GMN KC10	C97	4042549	B976Z02820 KC7315	G138	4045166	VNMG160408P KC10	B146	4045283	DPMT070208FW KC10	B215
4034813	A4R0200M02P00GMP KC10	C96	4042550	B976Z02870 KC7315	G138	4045167	VNMG160408PP KC10	B147	4045284	RCGT10T30MHP KC10	B222
4034815	A4R0300M03P00GMP KC10	C96	4042551	B976Z02900 KC7315	G138	4045168	VNMG160408UP KC10	B147	4045285	RCGT1204MHP KC10	B222
4034816	A4R0305M03U00GMN KC10	C97	4042552	B976Z02947 KC7315	G138	4045169	VNMG160412MP KC10	B146	4045286	RCMT0602M0 KC10	B224
4034817	A4R0400M04P00GMP KC10	C96	4042581	40E03R045M16RP16	V77	4045170	VNMG160408P KC10	B146	4045288	RCMT10T3M0 KC10	B224
4034818	A4R0405M04U00GMN KC10	C97	4042582	40E02R040A32RP16L200	V77	4045172	VNMG080404LF KC10	B154	4045289	RCMT10T30M0 KC10	B224
4034819	A4R0500M05P00GMP KC10	C96	4042693	52A04RS90RP16	V78	4045174	VNMG060404FW KC10	B156	4045290	RCMT1605M0 KC10	B224
4034820	A4R0505M05U00GMN KC10	C97	4042694	63A04RS90RP16	V78	4045175	VNMG060404MP KC10	B157	4045291	RCMT2006M0 KC10	B224
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4047831	SPPX09T308MD	KC7140	4050481	DNMGM150408MS	KCU25	B79	4050686	CNMG120408MP	KCU10	B51	4051214	C8FX150608RRN	KCP10	E11
4047832	SPPX120408MD	KC7140	4050482	DNMGM150408RP	KCU25	B81	4050688	CNMG120408RP	KCU10	B52	4051216	C8FX150603RMP	KCP10	E12
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4047850	D2FX150508RHP	KCU25	4050487	DNMGM150608MS	KCU25	B79	4050692	CNMG120412MP	KCU10	B51	4051519	B25A403200YPC	KCK10	G58
4047864	C2FX110404RHP	KCU25	4050488	DNMGM150608RP	KCU25	B81	4050695	CNMG120412RP	KCU10	B53	4051521	B25A403300YPC	KCK10	G58
4047865	C2FX110404LHM	KCU25	4050489	DNMGM150612MS	KCU25	B79	4050696	CNMG120412UP	KCU10	B54	4051522	B25A403454YPC	KCK10	G58
4047867	C2FX150504LHM	KCU25	4050490	DNMGM150612RP	KCU25	B81	4050699	CNMG120416RP	KCU10	B53	4051797	B25A093000YPC	KCK10	G59
4047868	C2FX150508LHM	KCU25	4050491	DNMGM150616RP	KCU25	B81	4050700	CNMG160608MP	KCU10	B51	4051798	B25A094000YPC	KCK10	G59
4047870	D4FX140604RHM	KCU25	4050513	CNMG160612MP	KCU25	B51	4050701	CNMG160608RP	KCU10	B53	4051799	B25A095000YPC	KCK10	G60
4047871	D4FX140608RHM	KCU25	4050514	CNMG160612MP	KCU25	B51	4050702	CNMG160612MP	KCU10	B51	4051800	B25A09525YPC	KCK10	G60
4050057	CNMG120408RP	KCU25	4050515	DNMGM150608MP	KCU25	B79	4050704	CNMG160612RP	KCU10	B53	4051801	B25A096000YPC	KCK10	G60
4050058	RCGT0803M0HP	KCU25	4050516	DNMGM150612MP	KCU25	B79	4050705	CNMG160612UP	KCU10	B54	4051802	B25A097000YPC	KCK10	G60
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4050062	CNMG120412FP	KCU10	4050519	SNMGM150612RP	KCU25	B101	4050712	CNMG190612RP	KCU10	B53	4051830	C8FX120508RRP	KCP10	E12
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4052028	B254A08600YPC KCK10	G59	4052146	B255A03970YPC KCK10	G58	4052851	B256A11000YPC KCK10	G60	4053270	B256A07300YPC KCK10	G59
4052029	B254A08700YPC KCK10	G59	4052147	B255A04000YPC KCK10	G58	4052852	B256A11200YPC KCK10	G60	4053271	B256A07500YPC KCK10	G59
4052031	B254A08800YPC KCK10	G59	4052148	B255A04039YPC KCK10	G58	4052863	B256A11300YPC KCK10	G60	4053272	B256A07600YPC KCK10	G59
4052032	B254A08839YPC KCK10	G59	4052149	B255A04100YPC KCK10	G58	4052864	B256A11500YPC KCK10	G60	4053273	B256A07800YPC KCK10	G59
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4052036	B254A09100YPC KCK10	G59	4052151	B255A04217YPC KCK10	G58	4052866	B256A11800YPC KCK10	G60	4053275	B256A08200YPC KCK10	G59
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4052040	B254A09500YPC KCK10	G60	4052155	B255A04500YPC KCK10	G58	4052869	B256A12300YPC KCK10	G60	4053278	B256A08600YPC KCK10	G59
4052041	B254A09525YPC KCK10	G60	4052156	B255A04572YPC KCK10	G58	4052870	B256A12400YPC KCK10	G60	4053279	B256A08700YPC KCK10	G59
4052042	B254A09800YPC KCK10	G60	4052157	B255A04600YPC KCK10	G58	4052871	B256A12400YPC KCK10	G60	4053280	B256A08800YPC KCK10	G59
4052043	B254A09921YPC KCK10	G60	4052158	B255A04700YPC KCK10	G58	4052872</					

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4053290	B256A09800YPC KCK10	G60	4054407	C8FX150605RRN KCP25	E11	4056175	SS20KST135AR3M	K38	4059064	T631M300X350R6HX-XL KP6525	M31
4053291	B256A10000YPC KCK10	G60	4054408	C8FX150608RRN KCP25	E11	4056176	SS20KST155AR3M	K38	4059065	T631M330X350R6HX-XL KP6525	M31
4053312	CDHBS4TOX0 KCU10	B184	4054409	C8FX150603LMP KCP25	E12	4056177	SS16KST115AR5M	K38	4059067	T631M360X400R6HX-XL KP6525	M31
4053323	CDHBS4TO02 KCU10	B184	4054410	C8FX150603RMP KCP25	E12	4056178	SS20KST135AR5M	K38	4059069	T631M420X450R6HX-XL KP6525	M31
4053324	CDHBS4TO04 KCU10	B184	4054412	C8FX180812LRN KCP25	E11	4056179	SS20KST155AR5M	K38	4059090	T620M240X300R6HX-D6 KP6525	M8
4053325	CDHHS4TO02L KCU10	B184	4054413	C8FX180808RRN KCP25	E11	4056390	RHM14000KST115H7HF KT6215	K31	4059092	T620M300X350R6HX-D6 KP6525	M8
4053326	CDHHS4TO02R KCU10	B184	4054414	C8FX180812RRN KCP25	E11	4056513	RPGN120400E KYSP30	V155	4059113	T620M330X350R6HX-D6 KP6525	M8
4053327	CDHHS4TO04L KCU10	B184	4054416	C8FX180805RMP KCP25	E12	4056980	RHM14000KST115H7HF KT325	K31	4059115	T620M360X400R6HX-D6 KP6525	M8
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4053340	TDHH07T1202R KCU10	B249	4054444	C2FX110408LMN KCP25	E8	4056986	RHM17463KST135H7HF KT325	K31	4059126	T630M420X450R6HX-D6 KP6525	M28
4053341	TDHH07T1204L KCU10	B249	4054447	D4FX140608RMM KCP25	E11	4056987	RHM18000KST155H7HF KT325	K31	4059129	T631M240X300R6HX-D6 KP6525	M29
4053342	TDHH07T1204R KCU10	B249	4054449	D4FX140608LMN KCP25	E11	4056988	RHM19000KST155H7HF KT325	K31	4059131	T631M300X350R6HX-D6 KP6525	M29
4053344	TPGH160304 KCU10	B253	4054450	C8FX120504RRP KCP25	E12	4056989	RHM19050KST155H7HF KT325	K31	4059132	T631M330X350R6HX-D6 KP6525	M29
4053352	DNGG150402LF KCU10	B74	4054451	C8FX120508RRP KCP25	E12	4056990	RHM14288KST115H7HF KT6215	K31	4059134	T631M360X400R6HX-D6 KP6525	M29
4053363	DNGG150404LF KCU10	B74	4054453	C8FX150612RRN KCP25	E11	4056993	RHM16000KST135H7HF KT6215	K31	4059136	T631M420X450R6HX-D6 KP6525	M29
4053364	DNGG150408LF KCU10	B74	4054455	C8FX120508LRP KCP25	E12	4056994	RHM17000KST135H7HF KT6215	K31	4059463	KSHR80A04RS45HN13	S25
4053366	DNGP150402 KCU10	B74	4054456	C8FX150612LRN KCP25	E11	4056995	RHM17463KST135H7HF KT6215	K31	4059485	KSHR160C09RS45HN13	S25
4053367	DNGP150404 KCU10	B74	4054474	D2FX110403RHP KCP25	E9	4056996	RHM17000KST155H7HF KT6215	K31	4059486	KSHR315C14RS45HN13	S25
4053368	DNGP150408 KCU10	B74	4054475	D2FX110405RMM KCP25	E9	4056997	RHM19000KST155H7HF KT6215	K31	4059938	LNEU1240R08 4 KC725M	U19
4053369	DNGP150604 KCU10	B74	4054477	C2FX110405LMN KCP25	E8	4056998	RHM19050KST155H7HF KT6215	K31	4059939	LNEU1240R16 4 KC725M	U19
4053370	DNGP150608 KCU10	B74	4054478	C2FX110405RMM KCP25	E8	4056999	RHM19050KST155H7HF KT6215	K31	4059940	LNEU1235R03 4 KC725M	U19
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4053380	DNMG150404RP KCU10	B81	4054495	B976A03454 KC7315	G138	4057044	RHM14000KST115H7HF KT6215	K29	4060529	KST135155AS	K38
4053381	DNMG150404UP KCU10	B82	4054496	B976A03734 KC7315	G138	4057045	RHM14288KST115H7HF KT6215	K29	4060912	KSHR200C10RS45HN13	S25
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4053396	DNMG150604MP KCU10	B79	4054507	B976A06909 KC7315	G139	4057062	AFM74115	K131	4063183	KTP120RSSCF25M	H32
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4053404	DNMG150608UP KCU10	B82	4054511	B976A09093 KC7315	G140	4057096	886038045	K132	4063187	KTP120RSSCF25M	H32
4053406	DNMG150612MP KCU10	B79	4054512	B976A10262 KC7315	G140	4057097	PKG-8001	K128-130	4063188	KTP120RSSCF25M	H31
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4053408	RNMG120400RN KCU10	B94	4054514	B976A16670 KC7315	G142	4057099	DV40FBHMKT164M	K123, K127	4063190	KTP120RSSCF25M	H31
4053409	RNMG190600RN KCU10	B94	4054515	B977A03175 KC7315	G138	4057100	BT40FBHMKT164M	K123, K127	4063191	KTP120RSSCF25M	H31
4054272	D2FX110405LMP KCP25	E9	4054516	B977A03734 KC7315	G138	4057101	KM50TSFBHMKT164M	K123, K127	4063192	KTP120RSSCF25M	H31
4054299	D2FX110405LMN KCP40	E9	4054517	B977A03797 KC7315	G138	4057204	EB630128650	K140	4063996	SDB24RBHT06F	K122
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4054377	C8FX150603RMP KCP40	E12	4054648	C2FX110405LMN KCP40	E8	4057865	HNGJ1307ANENG KCPK30	S26	4068604	RCMH3209M0RU KCP25	E60
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4054386	C2FX110405LMN KCP25	E8	4054680	DFR040304D28MD KCF140	H89, J84	4058551	LNEU1240R03SGP 4 KC725M	U20	4071068	A4R0505M05U00GMN KCP10	C97
4054387	C2FX110405RMM KCP25	E8	4054681	DFR040304D28LD KCF225	H89						

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4109955	NTF2R KCU25	D23	4111790	B221A07145HP KCPK15	G47	4111882	B221A14400HP KCPK15	G49	4111979	B222A09300HP KCPK15	G48
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4112487	B225A10600HP KCPK15	G53	4112570	B225A21000HP KCPK15	G55	4112664	B225A09525HP KCPK15	G53	4112748	B224A12700HP KCPK15	G54
4112488	B225A10700HP KCPK15	G53	4112583	B225A03455HP KCPK15	G51	4112665	B225A09600HP KCPK15	G53	4112749	B224A13000HP KCPK15	G54
4112489	B225A10716HP KCPK15	G53	4112584	B225A03500HP KCPK15	G51	4112666	B225A09700HP KCPK15	G53	4112750	B224A13096HP KCPK15	G54
4112490	B225A10800HP KCPK15	G53	4112585	B225A03571HP KCPK15	G51	4112667	B225A09800HP KCPK15	G53	4112751	B224A13500HP KCPK15	G54
4112491	B225A10900HP KCPK15	G53	4112586	B225A03600HP KCPK15	G51	4112668	B225A09900HP KCPK15	G53	4112752	B224A13891HP KCPK15	G54
4112492	B225A11000HP KCPK15	G53	4112587	B225A03700HP KCPK15	G51	4112669	B225A09921HP KCPK15	G53	4112753	B224A14000HP KCPK15	G54
4112493	B225A11100HP KCPK15	G53	4112588	B225A03800HP KCPK15	G51	4112670	B225A01000HP KCPK15	G53	4112754	B224A14288HP KCPK15	G54
4112494	B225A11113HP KCPK15	G53	4112589	B225A03900HP KCPK15	G51	4112672	B224A03048HP KCPK15	G51	4112755	B224A14684HP KCPK15	G54
4112495	B225A11200HP KCPK15	G53	4112590	B225A03970HP KCPK15	G51	4112673	B224A03000HP KCPK15	G51	4112756	B224A15083HP KCPK15	G54
4112496	B225A11300HP KCPK15	G53	4112591	B225A04000HP KCPK15	G51	4112674	B224A03100HP KCPK15	G51	4112758	B224A15500HP KCPK15	G54
4112497	B225A11400HP KCPK15	G53	4112592	B225A04100HP KCPK15	G51	4112675	B224A03175HP KCPK15	G51	4112759	B224A15600HP KCPK15	G54
4112498	B225A11500HP KCPK15	G53	4112593	B225A04200HP KCPK15	G51	4112676	B224A03200HP KCPK15	G51	4112760	B224A15875HP KCPK15	G54
4112499	B225A11509HP KCPK15	G53	4112594	B225A04300HP KCPK15	G51	4112677	B224A03264HP KCPK15	G51	4112761	B224A16000HP KCPK15	G54
4112500	B225A11600HP KCPK15	G53	4112595	B225A04366HP KCPK15	G51	4112678	B224A03300HP KCPK15	G51	4112762	B224A16500HP KCPK15	G54
4112501	B225A11700HP KCPK15	G53	4112596	B225A04400HP KCPK15	G51	4112679	B224A03400HP KCPK15	G51	4112763	B224A17000HP KCPK15	G55
4112502	B225A11800HP KCPK15	G53	4112597	B225A04500HP KCPK15	G51	4112680	B224A03455HP KCPK15	G51	4112764	B224A17463HP KCPK15	G55
4112503	B225A11900HP KCPK15	G53	4112598	B225A04600HP KCPK15	G51	4112681	B224A03500HP KCPK15	G51	4112765	B224A17500HP KCPK15	G55
4112504	B225A11908HP KCPK15	G53	4112599	B225A04700HP KCPK15	G51	4112683	B224A03600HP KCPK15	G51	4112766	B224A18000HP KCPK15	G55
4112505	B225A12000HP KCPK15	G53	4112600	B225A04763HP KCPK15	G51	4112684	B224A03658HP KCPK15	G51	4112767	B224A19000HP KCPK15	G55
4112506	B225A12100HP KCPK15	G54	4112601	B225A04800HP KCPK15	G51	4112685	B224A03700HP KCPK15	G51	4112768	B224A19050HP KCPK15	G55
4112507	B225A12200HP KCPK15	G54	4112602	B225A04900HP KCPK15	G52	4112686	B224A0374HP KCPK15	G51	4112769	B224A20000HP KCPK15	G55
4112508	B225A12300HP KCPK15	G54	4112603	B225A05000HP KCPK15	G52	4112687	B224A03800HP KCPK15	G51	4113708	A4C0155N00CF01 KCU25	C102
4112509	B225A12400HP KCPK15	G54	4112604	B225A05100HP KCPK15	G52	4112688	B224A03900HP KCPK15	G51	4113709	A4C0155R10CF01 KCU25	C103
4112510	B225A12500HP KCPK15	G54	4112605	B225A05159HP KCPK15	G52	4112689	B224A03970HP KCPK15	G51	4113710	A4C0205L06CF02 KCU25	C103
4112511	B225A12600HP KCPK15	G54	4112606	B225A05200HP KCPK15	G52	4112690	B224A04000HP KCPK15	G51	4113711	A4C0205N00CF02 KCU25	C102
4112512	B225A12700HP KCPK15	G54	4112607	B225A05300HP KCPK15	G52	4112691	B224A04039HP KCPK15	G51	4113712	A4C0205R06CF02 KCU25	C103
4112513	B225A12800HP KCPK15	G54	4112608	B225A05400HP KCPK15	G52	4112692	B224A04090HP KCPK15	G51	4113983	KF2X25Z02M12W009	V38
4112514	B225A12900HP KCPK15	G54	4112609	B225A05410HP KCPK15	G52	4112693	B224A04100HP KCPK15	G51	4113984	KF2X32Z03M16W009	V38
4112515	B225A13000HP KCPK15	G54	4112610	B225A05500HP KCPK15	G52	4112694	B224A04217HP KCPK15	G51	4113985	KF2X35Z03M16W009	V38
4112516	B225A13100HP KCPK15	G54	4112611	B225A05558HP KCPK15	G52	4112695	B224A04366HP KCPK15	G51	4113986	KF2X42Z04M16W009	V38
4112517	B225A13200HP KCPK15	G54	4112612	B225A05600HP KCPK15	G52	4112696	B224A04366HP KCPK15	G51	4113987	KF2X25Z02A25W009L140	V39
4112518	B225A13300HP KCPK15	G54	4112613	B225A05700HP KCPK15	G52	4112697	B224A04763HP KCPK15	G51	4113988	KF2X25Z02A25W009L200	V39
4112519	B225A13400HP KCPK15	G54	4112614	B225A05800HP KCPK15	G52	4112698	B224A04852HP KCPK15	G51	4113989	KF2X25Z02A25W009L300	V39
4112520	B225A13500HP KCPK15	G54	4112615	B225A05900HP KCPK15	G52	4112699	B224A05000HP KCPK15	G52	4113990	KF2X28Z02A25W009L200	V39
4112521	B225A13600HP KCPK15	G54	4112616	B225A05954HP KCPK15	G52	4112700	B224A05100HP KCPK15	G52	4113991	KF2X32Z03A32W009L150	V39
4112522	B225A13700HP KCPK15	G54	4112617	B225A06000HP KCPK15	G52	4112701	B224A05159HP KCPK15	G52	4113992	KF2X32Z03A32W009L200	V39
4112523	B225A13800HP KCPK15	G54	4112618	B225A06100HP KCPK15	G52	4112702	B224A05410HP KCPK15	G52	4113993	KF2X32Z03A32W009L300	V39
4112525	B225A13891HP KCPK15	G54	4112619	B225A06200HP KCPK15	G52	4112703	B224A05500HP KCPK15	G52	4113994	KF2X35Z03A32W009L200	V39
4112526	B225A13900HP KCPK15	G54	4112620	B225A06300HP KCPK15	G52	4112704	B224A05558HP KCPK15	G52	4113995	KF2X40Z04W009	V40
4112527	B225A14000HP KCPK15	G54	4112621	B225A06350HP KCPK15	G52	4112705	B224A05616HP KCPK15	G52	4113996	KF2X50Z05W009	V40
4112528	B225A14100HP KCPK15	G54	4112622	B225A06400HP KCPK15	G52	4112706	B224A05954HP KCPK15	G52	4113997	KF2X52Z05W009	V40
4112529	B225A14200HP KCPK15	G54	4112623	B225A06500HP KCPK15	G52	4112707	B224A06000HP KCPK15	G52	4113998	KF2X63Z05W009	V40
4112530	B225A14288HP KCPK15	G54	4112624	B225A06528HP KCPK15	G52	4112708	B224A06350HP KCPK15	G52	4113999	KF2X66Z06W009	V40
4112531	B225A14300HP KCPK15	G54	4112625	B225A06600HP KCPK15	G52	4112709	B224A06500HP KCPK15	G52	4114000	KF2X80Z07W009	V40
4112532	B225A14400HP KCPK15	G54	4112626	B225A06700HP KCPK15	G52	4112710	B224A06630HP KCPK15	G52	4114283	A4C0205R10CF02 KCU25	C103
4112533	B225A14500HP KCPK15	G54	4112627	B225A06746HP KCPK15	G52	4112711	B224A06746HP KCPK15	G52	4114284	A4C0255N00CF02 KCU25	C102
4112534	B225A14600HP KCPK15	G54	4112628	B225A06800HP KCPK15	G52	4112712	B224A06800HP KCPK15	G52	4114285	A4C0305L06CF02 KCU25	C103
4112535	B225A14684HP KCPK15	G54	4112629	B225A06900HP KCPK15	G52	4112713	B224A07000HP KCPK15	G52	4114286	A4C0305R10CF02 KCU25	C103
4112536	B225A14700HP KCPK15	G54	4112630	B225A07000HP KCPK15	G52	4112714	B224A07145HP KCPK15	G52	4114287	A4C0305N00CF02 KCU25	C102
4112537	B225A14800HP KCPK15	G54	4112631	B225A07100HP KCPK15	G52	4112715	B224A07500HP KCPK15	G52	4114288	A4C0305R06CF02 KCU25	C103
4112538	B225A14900HP KCPK15	G54	4112632	B225A07145HP KCPK15	G52	4112716	B224A07541HP KCPK15	G52	4114289	A4C0305R10CF02 KCU25	C103
4112539	B225A15000HP KCPK15	G54	4112633	B225A07200HP KCPK15	G52	4112717	B224A07938HP KCPK15	G52	4114290	A4C0405L06CF02 KCU25	C103
4112540	B225A15083HP KCPK15	G54	4112634	B225A07300HP KCPK15	G52	4112718	B224A08000HP KCPK15	G52	4114291	A4C0405L10CF02 KCU25	C103
4112541	B225A15100HP KCPK15	G54	4112635	B225A07400HP KCPK15	G52	4112719	B224A08200HP KCPK15	G52	4114292	A4C0405R10CF02 KCU25	C102
4112542	B225A15200HP KCPK15	G54	4112636	B225A07500HP KCPK15	G52	4112720	B224A08334HP KCPK15	G53	4114293	A4C0405R06CF02 KCU25	C103
4112543	B225A15300HP KCPK15	G54	4112637	B225A07541HP KCPK15	G52	4112721	B224A08433HP KCPK15	G53	4114294	A4C0405R10CF02 KCU25	C103
4112544	B225A15400HP KCPK15	G54	4112638	B225A07600HP KCPK15	G52	4112722	B224A08500HP KCPK15	G53	4114295	A4G0205M02U02GMP KCU25	C95
4112545	B225A15479HP KCPK15	G54	4112639	B225A07700HP KCPK15	G52	4112723	B224A08700HP KCPK15	G53	4114296	A4G0205M02U02GMP KCU25	C96
4112546	B225A15500HP KCPK15	G54	4112640	B225A07800HP KCPK15	G52	4112724	B224A08733HP KCPK15	G53	4114297	A4G0205M02U02GMP KCU25	C95
4112547	B225A15600HP KCPK15	G54	4112641	B225A07900HP KCPK15	G52	4112725	B224A08800HP KCPK15	G53	4114298	A4G0205M02U02GMP KCU25	C95
4112548	B225A15700HP KCPK15	G54	4112642	B225A07938HP KCPK15	G52	4112726	B224A09000HP KCPK15	G53	4114299	A4G0300M03P02GMP KCU25	C95
4112549	B225A15800HP KCPK15	G54	4112643	B225A08000HP KCPK15	G52	4112727	B224A09129HP KCPK15	G53	4114300	A4G0300M03P04GMP KCU25	C95
4112550	B225A15875HP KCPK15	G54	4112644	B225A08100HP KCPK15	G52	4112728	B224A09500HP KCPK15	G53	4114301	A4G0305M03U02B KCU25	C98
4112551	B225A15900HP KCPK15	G54	4112645	B225A08200HP KCPK15	G52	4112729	B224A09525HP KCPK15	G53	4114302	A4G0305M03U02GMP KCU25	C96
4112552	B225A16000HP KCPK15	G54	4112646	B225A08300HP KCPK15	G53	4112730	B224A09921HP KCPK15	G53	4114303	A4G0305M03U02GMP KCU25	C95
4112553	B225A16100HP KCPK15	G54	4112647	B225A08334HP KCPK15	G53	4112731	B224A10000HP KCPK15	G53	4114304	A4G0305M03U04GMP KCU25	C96
4112554	B225A16500HP KCPK15	G54	4112648	B225A08400HP KCPK15	G53	4112732	B224A10200HP KCPK15	G53	4114305	A4G0305M03U04GMP KCU25	C95
4112555	B225A16670HP KCPK15	G55	4112649	B225A08433HP KCPK15	G53	4112733	B224A10300HP KCPK15	G53	4114306	A4G0400M04P02GMP KCU25	C95
4112556	B225A17000HP KCPK15	G55	4112650	B225A08500HP KCPK15	G53	4112734	B224A10320HP KCPK15	G53	4114307	A4G0400M04P04GMP KCU25	C95
4112557	B225A17463HP KCPK15	G55	4112651	B225A08600HP KCPK15	G53	4112735	B224A10400HP KCPK15	G53	4114308	A4G0400M04P08GMP KCU25	C95
4112558	B225A17500HP KCPK15	G55	4112652	B225A08700HP KCPK15	G53	4112736	B224A10500HP KCPK15	G53	4114309	A4G0405M04U04GMP KCU25	C96
4112559	B225A17700HP KCPK15	G55	4112653	B225A08733HP KCPK15	G53	4112737	B224A10716HP KCPK15	G53	4114310	A4G0405M04U04GMP KCU25	C95
4112560	B225A18000HP KCPK15	G55	4112654	B225A08800HP KCPK15	G53	4112738	B224A10800HP KCPK15	G53	4114311	A4G0405M04U08GMP KCU25	C96
4112561	B225A18500HP KCPK15	G55	4112655	B225A08900HP KCPK15	G53	4112739	B224A11000HP KCPK15	G53	4114312	A4G0405M04U08GMP KCU25	C95
4112562	B225A19000HP KCPK15	G55	4112656	B225A09000HP KCPK15	G53	4112740	B224A11113HP KCPK15	G53	4114313	A4G050	



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4114322	A4G0605M06U04B KCU25	C98	4121505	B052A03300CPG KC7325	G19	4124353	UGDE1000A5BRD KC643M	P37	4129457	KTIP150R1SS16M	H31
4114323	A4G0605M06U04GMN KCU25	C96	4121528	B051A03200CPG KC7325	G19	4124354	UGDE1200A5ARA KC643M	P36	4129458	KTIP160R1SS18M	H31
4114325	A4G0605M06U08GMN KCU25	C96	4121529	B051A04000CPG KC7325	G19	4124355	UGDE1200A5ARB KC643M	P36	4129459	KTIP170R1SS18M	H31
4114328	A4G0800M08P08GMP KCU25	C95	4121532	B051A05900CPG KC7325	G19	4124356	UGDE1200A5ARC KC643M	P36	4129460	KTIP180R1SS20M	H31
4114329	A4G0805M08U08GMN KCU25	C96	4121534	B051A06000CPG KC7325	G20	4124357	UGDE1200A5ARD KC643M	P36	4129461	KTIP190R1SS20M	H31
4114330	A4G0805M08U08GMP KCU25	C95	4121574	HNGJ0604ANFNLDJ K313	S6, S11, S15	4124358	UGDE1200A5ARB KC643M	P37	4129462	KTIP200R1SS25M	H31
4114331	A4G0805M08U12GMN KCU25	C96	4121575	HNGJ0604ANFNLDJ K410M	S6, S11, S15	4124359	UGDE1200A5BRB KC643M	P37	4129463	KTIP210R1SS25M	H31
4114333	A4G1005M10U08GMN KCU25	C96	4121576	HNGJ0604ANFNLDJ K510M	S6, S12, S15	4124360	UGDE1200A5BRC KC643M	P37	4129464	KTIP220R1SS25M	H31
4114334	A4G1005M10U08GMP KCU25	C95	4121577	HNGJ0604ANFNLDJ K520M	S6, S12, S15	4124361	UGDE1200A5BRD KC643M	P37	4129465	KTIP230R1SS25M	H31
4114335	A4G1250I03P05GMN KCU25	C97	4121578	HNGJ0604ANFNLDJ K522M	S6, S12, S15	4124362	UGDE1600A5ARA KC643M	P36	4129466	KTIP240R1SS25M	H31
4114336	A4G1250I03P1GMN KCU25	C97	4121604	XNGJ0604ANFNLDJ3W KC410M	S11	4124363	UGDE1600A5ARB KC643M	P36	4129467	KTIP250R1SS32M	H31
4114337	A4G1870I04P1GMN KCU25	C97	4121605	XNGJ0604ANFNLDJ3W KC510M	S12	4124364	UGDE1600A5ARC KC643M	P36	4129468	KTIP260R1SS32M	H31
4114338	A4G1870I04P2GMN KCU25	C97	4121607	XNGJ0604ANFNLDJ3W KC522M	S12	4124365	UGDE1600A5ARD KC643M	P36	4129469	KTIP270R1SS32M	H31
4114339	A4G250I06P1GMN KCU25	C97	4121683	SNMG120408MS KCU25	B99	4124366	UGDE1600A5ARE KC643M	P36	4129470	KTIP080R1SCF12M	H32
4114340	A4G250I06P2GMN KCU25	C97	4121684	SNMG120408RP KCU25	B101	4124367	UGDE1600A5ARB KC643M	P37	4129471	KTIP085R1SCF12M	H32
4114341	A4G3120I8P1GMN KCU25	C97	4121685	SNMG120412MS KCU25	B99	4124368	UGDE1600A5BRB KC643M	P37	4129472	KTIP090R1SCF12M	H32
4114343	A4R0200M02P00GMP KCU25	C96	4121686	SNMG150608MS KCU25	B99	4124369	UGDE1600A5BRC KC643M	P37	4129483	KTIP095R1SCF12M	H32
4114344	A4R0205M02U00GMN KCU25	C97	4121687	SNMG150612MS KCU25	B99	4124370	UGDE1600A5BRD KC643M	P37	4129484	KTIP100R1SCF12M	H32
4114345	A4R0300M03P00GMP KCU25	C96	4121688	SNMG150616RP KCU25	B101	4124371	UGDE1600A5BRE KC643M	P37	4129485	KTIP105R1SCF12M	H32
4114346	A4R0305M03U00GMN KCU25	C97	4121689	SNMG190612MS KCU25	B99	4124372	UGDE2000A5ARA KC643M	P36	4129486	KTIP110R1SCF16M	H32
4114347	A4R0400M04P00GMP KCU25	C96	4121690	SNMG190616RP KCU25	B101	4124373	UGDE2000A5ARB KC643M	P36	4129487	KTIP115R1SCF16M	H32
4114348	A4R0405M04U00GMN KCU25	C97	4121695	TNMG160402MS KCU25	B126	4124374	UGDE2000A5ARC KC643M	P36	4129488	KTIP120R1SCF16M	H32
4114349	A4R0500M05P00GMP KCU25	C96	4121696	TNMG160404MS KCU25	B126	4124375	UGDE2000A5ARD KC643M	P36	4129489	KTIP125R1SCF16M	H32
4114350	A4R0505M05U00GMN KCU25	C97	4121697	TNMG160408MS KCU25	B128	4124376	UGDE2000A5ARE KC643M	P36	4129490	KTIP130R1SCF16M	H32
4114351	A4R0600M06P00GMP KCU25	C96	4121698	TNMG160408RP KCU25	B128	4124377	UGDE2000A5BRB KC643M	P37	4129491	KTIP135R1SCF16M	H32
4114352	A4R0605M06U00GMN KCU25	C97	4121699	TNMG160412RP KCU25	B128	4124378	UGDE2000A5BRC KC643M	P37	4129492	KTIP140R1SCF16M	H32
4114353	A4R0800M08P00GMP KCU25	C96	4121700	TNMG220404MS KCU25	B126	4124379	UGDE2000A5BRD KC643M	P37	4129493	KTIP145R1SCF16M	H32
4114354	A4R0805M08U00GMN KCU25	C97	4121701	TNMG220408MS KCU25	B126	4124380	UGDE2000A5BRE KC643M	P37	4129494	KTIP150R1SCF20M	H32
4114355	A4R1005M10U00GMN KCU25	C97	4121702	TNMG220408RP KCU25	B128	4124381	UGDE2000A5BRC KC643M	P37	4129495	KTIP160R1SCF20M	H32
4114356	A4R1250I03P00GMN KCU25	C97	4121703	TNMG220412RP KCU25	B128	4124382	UGDE2000A5ARE KC643M	P36	4129496	KTIP170R1SCF20M	H32
4114357	A4R1870I04P00GMN KCU25	C97	4121705	TNMG220416RP KCU25	B128	4124383	UGDE2500A5ARB KC643M	P36	4129497	KTIP180R1SCF25M	H32
4114358	A4R250I06P00GMN KCU25	C97	4121706	TNMG270608MS KCU25	B126	4124384	UGDE2500A5ARC KC643M	P36	4129498	KTIP190R1SCF25M	H32
4114696	B967A09800 KC7315	G133	4121707	TNMG270612RP KCU25	B128	4124385	UGDE2500A5ARD KC643M	P37	4129499	KTIP200R1SCF25M	H32
4114713	B967A11800 KC7315	G134	4121708	VNMG160402FS KCU25	B143	4124386	UGDE2500A5ARE KC643M	P36	4129500	KTIP210R1SCF25M	H32
4115401	DFR040304ST KD1425	J85	4121710	VNMG160404FS KCU25	B143	4124387	UGDE2500A5BRB KC643M	P37	4129501	KTIP220R1SCF25M	H32
4115433	DFT05308ST KD1425	J85	4121711	VNMG160408FS KCU25	B143	4124388	UGDE2500A5BRC KC643M	P37	4129502	KTIP145R1SCF16M	H32
4115434	DFT067308ST KD1425	J85	4121712	VNMG160402MS KCU25	B146	4124389	UGDE2500A5BRE KC643M	P37	4129503	KTIP240R1SCF25M	H32
4115435	DFT070408ST KD1425	J85	4121713	VNMG160401MS KCU25	B146	4124390	UGDE2500A5BRC KC643M	P37	4129504	KTIP250R1SCF25M	H32
4115436	DFT090508ST KD1425	J85	4121714	VNMG160404MS KCU25	B146	4124391	UGDE2500A5BRD KC643M	P37	4129505	KTIP260R1SCF25M	H32
4115437	DFT110508ST KD1425	J85	4121715	VNMG160408MS KCU25	B146	4124962	B051A02000CPG KC7325	G18	4129506	KTIP270R1SCF25M	H32
4118347	VCGR160404 KCP25	E34	4121716	VNMG160408RP KCU25	B147	4125849	A4G0505M05U04GMN KCP10	C96	4129542	CNGN120416T01020 KYS25	B332
4119190	HNGJ0604ANENLD KCPK30	S6, S12, S15	4121717	VNMG160404MS KCU25	B146	4125882	KSHR025D0316HN06	S8	4129546	CNGN120416T01020 KYS25	B335
4119224	HNGJ0604ANENLD KC725M	S6, S12, S15	4121718	VNMG160402MS KCU25	B146	4126343	KSHR032D0316HN06	S8	4129549	SNGN190616E KYS25	B335
4119227	HNGJ0604ANENLD KCK15	S6, S12, S15	4121719	VNMG220404MS KCU25	B158	4126344	KSHR032D0416HN06	S8	4129552	TNMG220412T01020 KYS25	B336
4119228	HNPJ0604ANSNHD KCPK30	S7, S13, S16	4121720	VNMG220408MS KCU25	B158	4126348	KSHR025D0320HN06	S8	4129553	TNMG220416T01020 KYS25	B336
4119229	HNPJ0604ANSNHD KC725M	S7, S13, S16	4121721	VNMG060408RP KCU25	B159	4126349	KSHR032D03B25HN06	S8	4129554	CNGA120408E KYS25	B332
4119230	HNPJ0604ANSNHD KCK15	S7, S13, S16	4121722	VNMG080402MS KCU25	B158	4126350	KSHR032D04B25HN06	S10	4129555	CNGA120408T01020 KYS25	B332
4119253	XNGJ0604ANENLD3W KC725M	S12	4121723	VNMG080404MS KCU25	B158	4126351	KSHR025D02A20HN06L120	S9	4129557	CNGA120412T01020 KYS25	B332
4119639	HNGJ060432ANENLD KCPK30	S6, S12, S15	4121724	VNMG080408MS KCU25	B158	4126352	KSHR025D03A20HN06L120	S9	4129562	SNGA120412T01020 KYS25	B335
4119640	HNGJ060432ANENLD KC725M	S6, S12, S15	4121725	VNMG080408RP KCU25	B159	4126353	KSHR032D03A25HN06L130	S9	4129563	RCGX060400E KYS25	B333
4119696	HNPJ0604ANSNGD KC520M	S7, S13, S16	4121726	VNMG080412RP KCU25	B159	4126384	KSHR032D04A25HN06L130	S9	4129567	CNGN120416T01020 KYS25	B333
4119697	HNPJ0604ANSNGD KC522M	S7, S13, S16	4121727	VNMG080416RP KCU25	B159	4126386	KSHR025D03A25HN06L200	S9	4129568	CNGX120708T01020 KYS25	B332
4119699	HNPJ0604ANSNGD KCK15	S7, S13, S16	4122886	KSHR050A05RS45HN06	S10	4126387	KSHR040A04RS45HN06	S10	4129569	CNGX120712T01020 KYS25	B332
4119700	HNPJ0604ANSNGD KCPK30	S7, S13, S16	4122887	KSHR063A04RS45HN06	S10	4126388	KSHR050A05RS45HN06	S10	4129570	DNGX120700T01020 KYS25	B333
4119701	HNPJ0604ANSNGD KC725M	S7, S13, S16	4122888	KSHR063A06RS45HN06	S10	4126389	KSHR050A06RS45HN06	S10	4129571	DNGX150712T01020 KYS25	B333
4119702	HNPJ0604ANSNHD KC520M	S7, S13, S16	4124262	KSHR125B16RS45HN06	S10	4126390	KSHR063A08RS45HN06	S10	4129576	RNGN120700T01020 KYS25	B334
4119703	HNPJ0604ANSNHD KC522M	S7, S13, S16	4124313	KSHR040A05RS45HN06	S10	4126391	KSHR080A05RS45HN06	S10	4129577	RCGX120700T01020 KYS25	B333
4119989	HNPJ060432ANSNHD KC522M	S7, S13, S16	4124324	UGDE0600A5ARA KC643M	P36	4126392	KSHR080A08RS45HN06	S10	4129656	MEGA90D125B06LN22	S122
4119991	HNPJ060432ANSNHD KCK15	S7, S13, S16	4124325	UGDE0600A5ARB KC643M	P36	4126403	KSHR080A10RS45HN06	S10	4129657	MEGA90D160C07LN22	S122
4119992	HNPJ060432ANSNHD KCPK30	S7, S13, S16	4124326	UGDE0600A5ARC KC643M	P36	4126404	KSHR100B06RS45HN06	S10	4129658	MEGA90D200C07LN22	S122
4120003	HNPJ060432ANSNHD KC725M	S7, S13, S16	4124327	UGDE0600A5BRB KC643M	P37	4126405	KSHR100B09RS45HN06	S10	4129659	MEGA90D200C09LN22	S122
4120661	A4G0305M03U04GMN KCP25	C96	4124328	UGDE0600A5BRC KC643M	P37	4126406	KSHR100B12RS45HN06	S10	4129660	MEGA90D250C09LN22	S122
4121491	B051A14000CPG KC7325	G21	4124329	UGDE0800A5ARC KC643M	P36	4126407	KSHR125B08RS45HN06	S10	4129661	MEGA90D250C11LN22	S122
			4124330	UGDE0800A5ARA KC643M	P36	4126408	KSHR125B12RS45HN06	S10	4129662	MEGA90D315C10LN22	S122
			4124331	UGDE0800A5ARB KC643M	P36	4129398	RCGX120700E KYS25	B333	4129664	MEGA90D315C13LN22	S122
			4124332	UGDE0800A5ARC KC643M	P36	4129399	RCGX120700T01020 KYS25	B333	4130392	RCGX090700E KYS25	B333
			4124333	UGDE0800A5BRB KC643M	P37	4129400	RPGX090700E KYS25	B334	4130423	RCGX090700T01020 KYS25	B333
			4124334	UGDE0800A5BRC KC643M	P37	4129402	RPGX120700E KYS25	B334	4132602	1.18025R110	E15
			4124345	UGDE1000A5ARC KC643M	P36	4129443	KTIP080R1SS10M	H31	4132633	1.78025L100	E18
			4124346	UGDE1000A5ARA KC643M	P36	4129444	KTIP085R1SS10M	H31	4132634	1.78025R100	E18
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4135577	TM711M060X100R2DHA KCU33	...M85	4138355	TM741MF080X100R2DHA KCU36	...M90	4147459	MEGA60D160C07LN22S120	4148921	B051F04200CPG KC7325G24
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4135579	TM711M100X150R2DHA KCU33	...M85	4138366	TM741NC2500-20R2DHA KCU36	...M89	4147461	MEGA60D200C09LN22S120	4148923	B051F04400CPG KC7325G24
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4135665	TM711MF040X050R2DHA KCU33	...M85	4138375	TM741NF3750-24R2DHA KCU36	...M89	4147485	MEGA60D315C13LN22S120	4148929	B051F05000CPG KC7325G24
4135666	TM711MF050X050R2DHA KCU33	...M85	4138376	TM741NF3750-24R2DHA KCU36	...M89	4147713	KSHR040A05RS60HN06S14	4148930	B051F05100CPG KC7325G24
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4135763	TM721M060X100R2DHA KCU32	...M87	4146402	CNGA120408T01020 KYS30B332	4148475	B051A18000CPG KC7325G22	4148941	B051F06200CPG KC7325G25
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4135783	TM721M180X650R2DHA KCU32	...M87	4146459	CNGX120708T01020 KYS30B332	4148594	B051A19600CPG KC7325G23	4148960	B051F08100CPG KC7325G25
4135784	TM721M180X700R2DHA KCU32	...M87	4146461	CNGX120712T01020 KYS30B332	4148595	B051A19700CPG KC7325G23	4148961	B051F08200CPG KC7325G25
4135785	TM721M180X750R2DHA KCU32	...M87	4146462	CNGX120716E KYS30B332	4148596	B051A19800CPG KC7325G23	4148962	B051F08300CPG KC7325G25
4135786	TM721M180X800R2DHA KCU32	...M87	4146464	DNGX150712T01020 KYS30B333	4148597	B051A19900CPG KC7325G23	4148963	B051F08400CPG KC7325G25
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4135788	TM721M180X900R2DHA KCU32	...M87	4146466	SNGX120712T01020 KYS30B335	4148804	B051A01500CPG KC7325G18	4148965	B051F08600CPG KC7325G25
4135789	TM721M180X950R2DHA KCU32	...M87	4146467	SNGX120716T01020 KYS30B335	4148805	B051A01600CPG KC7325G18	4148966	B051F08700CPG KC7325G25
4135790	TM721M180X1000R2DHA KCU32	...M87	4146468	RPNG090300E KYS30B334, V155	4148806	B051A01700CPG KC7325G18	4148967	B051F08800CPG KC7325G25
4135791	TM721M180X1050R2DHA KCU32	...M87	4146469	RCGX060400E KYS30B333	4148807	B051A01800CPG KC7325G18	4148968	B051F08900CPG KC7325G25
4135792	TM721M180X1100R2DHA KCU32	...M87	4146470	RCGX090700E KYS30B333	4148808	B051A01900CPG KC7325G18	4148969	B051F09000CPG KC7325G25
4135793	TM721M180X1150R2DHA KCU32	...M87	4146471	RCGX090700T00525 KYS30B333	4148809	B051A01980CPG KC7325G18	4148970	B051F09100CPG KC7325G25
4135794	TM721M180X1200R2DHA KCU32	...M87	4146472	RCGX090700T01020 KYS30B333	4148810	B051A02100CPG KC7325G18	4148971	B051F09200CPG KC7325G25
4135795	TM721M180X1250R2DHA KCU32	...M87	4146473	RCGX120700E KYS30B333	4148811	B051A02200CPG KC7325G18	4148972	B051F09300CPG KC7325G25
4135796	TM721M180X1300R2DHA KCU32	...M87	4146474	RCGX120700T01020 KYS30B333	4148812	B051A02300CPG KC7325G18	4148973	B051F09400CPG KC7325G25
4135797	TM721M180X1350R2DHA KCU32	...M87	4146475	RCGX120716E KYS30B334	4148839	B051F03000CPG KC7325G24	4148974	B051F09500CPG KC7325G25
4135798	TM721M180X1400R2DHA KCU32	...M87	4146476	RCGX120716T01020 KYS30B334	4148840	B051F03100CPG KC7325G24	4148975	B051F09600CPG KC7325G25
4135799	TM721M180X1450R2DHA KCU32	...M87	4146477	RCGX120700E KYS30B334	4148841	B051F03200CPG KC7325G24	4148976	B051F09700CPG KC7325G25
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4135802	TM721M180X1600R2DHA KCU32	...M87	4146583	RNGJ1204MOELD KCPK30V57	4148844	B051A02400CPG KC7325G18	4148979	B051F10000CPG KC7325G25
4135803	TM721M180X1650R2DHA KCU32	...M87	4146584	RNGJ1204MOELD KCS22MV57	4148845	B051A02439CPG KC7325G18	4148980	B051F10100CPG KC7325G25
4135804	TM721M180X1700R2DHA KCU32	...M87	4146585	RNGJ1204MOELD KCS22MV57	4148846	B051A02489CPG KC7325G18	4148981	B051F10200CPG KC7325G25
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4151463	B041F12600CPG KC7325	G16	4151630	B041A01191CPG KC7325	G8	4151799	B042A02400CPG KC7325	G8	4154110	T600M140X200R6HX-D6 KSP21	M13
4151464	B041F12700CPG KC7325	G16	4151631	B041A01200CPG KC7325	G8	4151800	B042A02439CPG KC7325	G8	4154111	T600M160X200R6HX-D6 KSP21	M13
4151465	B041F12800CPG KC7325	G16	4151632	B041A01300CPG KC7325	G8	4151801	B042A02489CPG KC7325	G8	4154112	T600M180X250R6HX-D6 KSP21	M13
4151466	B041F12900CPG KC7325	G16	4151633	B041A01321CPG KC7325	G8	4151802	B042A02500CPG KC7325	G8	4154113	T600M200X250R6HX-D6 KSP21	M13
4151467	B041F13000CPG KC7325	G16	4151634	B041A01397CPG KC7325	G8	4151803	B042A02578CPG KC7325	G8	4154114	T600M080X100R6HX-D4 KSP21	M13
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4151469	B041F13200CPG KC7325	G16	4151636	B041A01500CPG KC7325	G8	4151805	B042A02642CPG KC7325	G8	4154116	T600M100X125R6HX-D4 KSP21	M13
4151470	B041F13300CPG KC7325	G16	4151637	B041A01600CPG KC7325	G8	4151806	B042A02700CPG KC7325	G8	4154117	T600M120X125R6HX-D4 KSP21	M13
4151471	B041F13400CPG KC7325	G16	4151638	B041A01700CPG KC7325	G8	4151807	B042A02705CPG KC7325	G9	4154118	T600M120X150R6HX-D4 KSP21	M13
4151472	B041F13500CPG KC7325	G16	4151639	B041A01800CPG KC7325	G8	4151808	B042A02779CPG KC7325	G9	4154119	T600M140X150R6HX-D4 KSP21	M13
4151473	B041F13600CPG KC7325	G16	4151640	B041A01900CPG KC7325	G8	4151809	B042A02800CPG KC7325	G9	4154120	T600M160X100R6HX-D4 KSP21	M13
4151474	B041F13700CPG KC7325	G16	4151641	B041A01984CPG KC7325	G8	4151810	B042A02820CPG KC7325	G9	4154647	T622M030X050R6HX-D74 KSN28	M74
4151475	B041F13800CPG KC7325	G16	4151642	B041A02000CPG KC7325	G8	4151811	B042A02870CPG KC7325	G9	4154648	T622M040X070R6HX-D74 KSN28	M74
4151476	B041F13900CPG KC7325	G16	4151643	B041A02100CPG KC7325	G8	4151812	B042A02900CPG KC7325	G9	4154649	T622M050X080R6HX-D74 KSN28	M74
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4151478	B041F14100CPG KC7325	G16	4151645	B041A02300CPG KC7325	G8	4152204	UEBC0200A2A KC643M	P194	4154651	T622M080X125R6HX-D74 KSN28	M74
4151479	B041F14200CPG KC7325	G16	4151646	B041A02383CPG KC7325	G8	4152205	UEBC0300A2A KC643M	P194	4154652	T622M100X125R6HX-D74 KSN28	M74
4151480	B041F14300CPG KC7325	G16	4151647	B041A02400CPG KC7325	G8	4152206	UEBC0400A2A KC643M	P194	4154693	T622M120X175R6HX-D74 KSN28	M74
4151481	B041F14400CPG KC7325	G16	4151648	B041A02439CPG KC7325	G8	4152207	UEBC0500A2A KC643M	P194	4154694	T622M160X200R6HX-D74 KSN28	M74
4151482	B041F14500CPG KC7325	G16	4151649	B041A02489CPG KC7325	G8	4152208	UEBC0600A2A KC643M	P194	4154695	T622M180X100R6HX-D74 KSN28	M74
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4151484	B041F14700CPG KC7325	G16	4151651	B041A02578CPG KC7325	G8	4152210	UEBC1000A2A KC643M	P194	4154697	T622M100X125R6HX-D74 KSN28	M74
4151485	B041F14800CPG KC7325	G16	4151652	B041A02600CPG KC7325	G8	4152211	UEBC1200A2A KC643M	P194	4154698	T622M120X125R6HX-D74 KSN28	M74
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4151487	B041F15000CPG KC7325	G16	4151654	B041A02700CPG KC7325	G8	4153688	KSHRHF032D04M16HN06	S4	4154700	T622M140X150R6HX-D74 KSN28	M74
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4151490	B041F15300CPG KC7325	G16	4151657	B041A02800CPG KC7325	G9	4153706	KSHRHF040A05R515HN06	S5	4155725	EDPT140408PDSRGD2 KCPC30	T54, T63
4151491	B041F15400CPG KC7325	G16	4151658	B041A02820CPG KC7325	G9	4153707	KSHRHF050A05R515HN06	S5	4155726	EDPT140408PDSRGD2 KC520M	T54, T63
4151492	B041F15500CPG KC7325	G16	4151659	B041A02870CPG KC7325	G9	4153708	KSHRHF063A06R515HN06	S5	4156131	UGDE1400A5ARD KC643M	P36
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4151526	B041F18900CPG KC7325	G17	4151780	B042A01100CPG KC7325	G8	4154013	T632M180X300R6HX-D6 KP6525	M26	4157965	T41	

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4158927KTIP1026HPM KCP15	H26	4159240KTIP1670HPM KCP15	H27	4159624T623M100X150R6H-D74 KSN28	M75	4169242B269A04600HP KCPK15	G68
4158928KTIP1030HPM KCP15	H26	4159241KTIP1680HPM KCP15	H27	4159625T623M120X175R6H-D74 KSN28	M75	4169243B269A04000HP KCPK15	G68
4158929KTIP1032HPM KCP15	H26	4159242KTIP1690HPM KCP15	H27	4159626T623M160X200R6H-D74 KSN28	M75	4169244B269A04500HP KCPK15	G68
4158930KTIP1040HPM KCP15	H26	4159243KTIP1700HPM KCP15	H27	4159627T623M180X250R6H-D74 KSN28	M75	4169245B269A04600HP KCPK15	G68
4158931KTIP1049HPM KCP15	H26	4159244KTIP1707HPM KCP15	H27	4159628T623M200X300R6H-D74 KSN28	M75	4169246B269A04763HP KCPK15	G68
4158932KTIP1050HPM KCP15	H26	4159245KTIP1710HPM KCP15	H27	4159629T623M250X400R6H-D74 KSN28	M75	4169247B269A04800HP KCPK15	G68
4158933KTIP1060HPM KCP15	H26	4159246KTIP1720HPM KCP15	H27	4159630T623M300X500R6H-D74 KSN28	M75	4169248B269A05000HP KCPK15	G68
4158934KTIP1070HPM KCP15	H26	4159247KTIP1730HPM KCP15	H27	4159631T623M350X600R6H-D74 KSN28	M75	4169249B269A05100HP KCPK15	G68
4158935KTIP1072HPM KCP15	H26	4159248KTIP1740HPM KCP15	H27	4159632T623M400X800R6H-D74 KSN28	M75	4169250B269A05200HP KCPK15	G68
4158936KTIP1080HPM KCP15	H26	4159249KTIP1748HPM KCP15	H27	4159633T623M450X1000R6H-D74 KSN28	M75	4169251B269A05300HP KCPK15	G68
4158937KTIP1090HPM KCP15	H26	4159250KTIP1750HPM KCP15	H27	4159634T623M500X1250R6H-D74 KSN28	M75	4169252B269A05410HP KCPK15	G68
4158938KTIP1100HPM KCP15	H26	4159251KTIP1760HPM KCP15	H27	4159635T623M550X1500R6H-D74 KSN28	M75	4169253B269A05500HP KCPK15	G68
4158939KTIP1110HPM KCP15	H26	4159252KTIP1770HPM KCP15	H27	4159636T623M600X1750R6H-D74 KSN28	M75	4169254B269A05580HP KCPK15	G68
4158940KTIP1111HPM KCP15	H26	4159253KTIP1780HPM KCP15	H27	4159637T623M650X2000R6H-D74 KSN28	M75	4169255B269A05600HP KCPK15	G68
4158941KTIP1120HPM KCP15	H26	4159254KTIP1786HPM KCP15	H27	4159638T623M700X2250R6H-D74 KSN28	M75	4169256B269A05700HP KCPK15	G68
4158942KTIP1130HPM KCP15	H26	4159255KTIP1790HPM KCP15	H27	4159639T623M750X2500R6H-D74 KSN28	M75	4169257B269A05800HP KCPK15	G68
4158943KTIP1140HPM KCP15	H26	4159256KTIP1800HPM KCP15	H27	4159640T623M800X2750R6H-D74 KSN28	M75	4169258B269A06000HP KCPK15	G68
4158944KTIP1150HPM KCP15	H26	4159257KTIP1810HPM KCP15	H27	4159641T623M850X3000R6H-D74 KSN28	M75	4169259B269A06200HP KCPK15	G68
4158945KTIP1151HPM KCP15	H26	4159258KTIP1820HPM KCP15	H27	4159642T623M900X3250R6H-D74 KSN28	M75	4169260B269A06350HP KCPK15	G68
4158946KTIP1160HPM KCP15	H26	4159259KTIP1826HPM KCP15	H27	4159643T623M950X3500R6H-D74 KSN28	M75	4169261B269A06500HP KCPK15	G68
4158947KTIP1170HPM KCP15	H26	4159260KTIP1850HPM KCP15	H27	4159644T623M1000X3750R6H-D74 KSN28	M75	4169262B269A06528HP KCPK15	G68
4158948KTIP1180HPM KCP15	H26	4159261KTIP1860HPM KCP15	H27	4159645T623M1050X4000R6H-D74 KSN28	M75	4169263B269A06600HP KCPK15	G68
4158949KTIP1190HPM KCP15	H26	4159262KTIP1865HPM KCP15	H27	4159646T623M1100X4250R6H-D74 KSN28	M75	4169264B269A06746HP KCPK15	G68
4158950KTIP1191HPM KCP15	H27	4159263KTIP1870HPM KCP15	H27	4159647T623M1150X4500R6H-D74 KSN28	M75	4169265B269A06800HP KCPK15	G68
4158951KTIP1200HPM KCP15	H27	4159264KTIP1880HPM KCP15	H27	4159648T623M1200X4750R6H-D74 KSN28	M75	4169266B269A06900HP KCPK15	G68
4158952KTIP1210HPM KCP15	H27	4159265KTIP1890HPM KCP15	H27	4159649T623M1250X5000R6H-D74 KSN28	M75	4169267B269A07000HP KCPK15	G68
4158953KTIP1220HPM KCP15	H27	4159266KTIP1900HPM KCP15	H27	4159650T623M1300X5250R6H-D74 KSN28	M75	4169268B269A07145HP KCPK15	G68
4158954KTIP1230HPM KCP15	H27	4159267KTIP1905HPM KCP15	H27	4159651T623M1350X5500R6H-D74 KSN28	M75	4169269B269A07500HP KCPK15	G68
4158955KTIP1240HPM KCP15	H27	4159268KTIP1910HPM KCP15	H27	4159652T623M1400X5750R6H-D74 KSN28	M75	4169270B269A07541HP KCPK15	G68
4158956KTIP1247HPM KCP15	H27	4159269KTIP1920HPM KCP15	H27	4159653T623M1450X6000R6H-D74 KSN28	M75	4169271B269A07700HP KCPK15	G68
4158957KTIP1250HPM KCP15	H27	4159270KTIP1923HPM KCP15	H27	4159654T623M1500X6250R6H-D74 KSN28	M75	4169272B269A07800HP KCPK15	G68
4158958KTIP1260HPM KCP15	H27	4159271KTIP1925HPM KCP15	H27	4159655T623M1550X6500R6H-D74 KSN28	M75	4169273B269A07938HP KCPK15	G68
4158959KTIP1270HPM KCP15	H27	4159272KTIP1930HPM KCP15	H27	4159656T623M1600X6750R6H-D74 KSN28	M75			
4158960KTIP1280HPM KCP15	H27	4159273KTIP1940HPM KCP15	H27	4159657T623M1650X7000R6H-D74 KSN28	M75			
4158961KTIP1290HPM KCP15	H27	4159274KTIP1946HPM KCP15	H27	4159658T623M1700X7250R6H-D74 KSN28	M75			
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4169274	B269A0800HP KCPK15	G69	4171838	TNMG160404FP KCU10	B124	4175851	NGD2047RK KCU10	C146	4175968	NRD3062R KCU10	C159
4169275	B269A08100HP KCPK15	G69	4171839	TNMG160408FP KCU10	B124	4175852	NGD2062L KCU10	C155	4175969	NRP3031L KCU10	C153
4169276	B269A08334HP KCPK15	G69	4171840	TNMG160412FP KCU10	B124	4175853	NGD2062LK KCU10	C147	4175970	NRP3031R KCU10	C153
4169277	B269A08433HP KCPK15	G69	4171841	TNMG220404FP KCU10	B124	4175854	NGD2062R KCU10	C154	4175971	NRP3047L KCU10	C153
4169278	B269A08700HP KCPK15	G69	4171842	TNMG220408FP KCU10	B124	4175855	NGD2062RK KCU10	C146	4175972	NRP3047R KCU10	C153
4169279	B269A08733HP KCPK15	G69	4171843	WNMG160404FP KCU10	B145	4175856	NGD2094L KCU10	C155	4175975	NRP3062R KCU10	C153
4169280	B269A09000HP KCPK15	G69	4171844	WNMG160408FP KCU10	B145	4175857	NGD2094LK KCU10	C147	4175976	NRP3094L KCU10	C153
4169281	B269A09100HP KCPK15	G69	4171845	WNMG060404FP KCU10	B155	4175858	NGD2094R KCU10	C154	4175977	NRP3094R KCU10	C153
4169282	B269A09129HP KCPK15	G69	4171848	WNMG080404FP KCU10	B155	4175859	NGD2094RK KCU10	C146	4175978	NT3L KCU10	D19
4169283	B269A09500HP KCPK15	G69	4171849	WNMG080408FP KCU10	B156	4175860	NGD2125L KCU10	C155	4175979	NT3CLK KCU10	D21
4169284	B269A09525HP KCPK15	G69	4171851	WNMG080408FP KCU10	B156	4175861	NGD2125LK KCU10	C148	4175980	NT3LKL KCU10	D24
4169285	B269A09921HP KCPK15	G69	4171853	KNUX150405L25 KCU10	E31	4175862	NGD2125R KCU10	C154	4175981	NT3R KCU10	D19
4169286	B269A10320HP KCPK15	G69	4171854	KNUX150410L25 KCU10	E31	4175863	NGD2125RK KCU10	C146	4175982	NT3RCK KCU10	D21
4169287	B269A10200HP KCPK15	G69	4171855	KCLX110302L15 KCU10	E32	4175864	NGD2M080LK KCU10	C147	4175983	NT3RK KCU10	D24
4169288	B269A10300HP KCPK15	G69	4171856	KCLX110305L15 KCU10	E32	4175865	NGD2M080RK KCU10	C146	4175984	NTF3L KCU10	D23
4169289	B269A10320HP KCPK15	G69	4171857	KNUX150405R20 KCU10	E31	4175866	NGD2M100L KCU10	C147	4175985	NTF3R KCU10	D23
4169290	B269A10500HP KCPK15	G69	4171858	KNUX150410R25 KCU10	E31	4175867	NGD2M100RK KCU10	C146	4175986	NTK3L KCU10	D23
4169291	B269A10716HP KCPK15	G69	4171860	KCLX110305R15 KCU10	E32	4175868	NGD2M120L KCU10	C147	4175987	NTK3R KCU10	D23
4169292	B269A10800HP KCPK15	G69	4175270	B731AD42004FP KCPK15	G120	4175869	NGD2M120RK KCU10	C146	4175988	NT3RKL KCU10	D24
4169293	B269A11000HP KCPK15	G69	4175271	B731AD50004FP KCPK15	G120	4175870	NGD2M140LK KCU10	C147	4175989	NTP3R KCU10	D24
4169294	B269A11113HP KCPK15	G69	4175272	B731AD6800HP KCPK15	G120	4175871	NGD2M140RK KCU10	C146	4176009	NG4125L KCU10	C155
4169295	B269A11500HP KCPK15	G70	4175403	B731AD8500HP KCPK15	G120	4175873	NGD2M170RK KCU10	C146	4176010	NG4125LK KCU10	C148
4169296	B269A11800HP KCPK15	G70	4175404	B731A10200HP KCPK15	G120	4175875	NGD2M195RK KCU10	C146	4176011	NG4125R KCU10	C154
4169297	B269A12000HP KCPK15	G70	4175405	B731A10500HP KCPK15	G120	4175876	NGD2M200L KCU10	C147	4176012	NG4125RK KCU10	C147
4169298	B269A12100HP KCPK15	G70	4175406	B731A12000HP KCPK15	G120	4175877	NGD2M200RK KCU10	C146	4176015	NA3L4 KCU10	D12
4169299	B269A12304HP KCPK15	G70	4175407	B731A12500HP KCPK15	G120	4175878	NGD2M225LK KCU10	C147	4176018	NA3L8 KCU10	D12
4169300	B269A12700HP KCPK15	G70	4175408	B731A14000HP KCPK15	G120	4175879	NGD2M225RK KCU10	C146	4176019	NA3R10 KCU10	D12
4169301	B269A13000HP KCPK15	G70	4175409	B732AD4200HP KCPK15	G121	4175880	NGD2M275RK KCU10	C146	4176020	NA3R12 KCU10	D12
4169302	B269A13100HP KCPK15	G70	4175410	B732AD5000HP KCPK15	G121	4175881	NGD2M300LK KCU10	C148	4176021	NA3R16 KCU10	D12
4169303	B269A13500HP KCPK15	G70	4175411	B732AD6800HP KCPK15	G121	4175882	NGD2M300RK KCU10	C146	4176023	NA3R5 KCU10	D12
4169304	B269A14100HP KCPK15	G70	4175412	B732AD8500HP KCPK15	G121	4175883	NGP3125R KCU10	C152	4176024	NA3R6 KCU10	D12
4169305	B269A14288HP KCPK15	G70	4175413	B732A10200HP KCPK15	G121	4175884	NGP3156R KCU10	C152	4176025	NA3R8 KCU10	D12
4169306	B269A14500HP KCPK15	G70	4175414	B732A10500HP KCPK15	G121	4175886	NJ3014R12 KCU10	D17	4176026	NAS3L10 KCU10	D13
4169307	B269A14684HP KCPK15	G70	4175415	B732A12000HP KCPK15	G121	4175888	NJF3005R32 KCU10	D17	4176027	NAS3L5 KCU10	D13
4169308	B269A15000HP KCPK15	G70	4175416	B732A12500HP KCPK15	G121	4175893	NGP2031L KCU10	C152	4176028	NAS3L6 KCU10	D13
4169309	B269A15500HP KCPK15	G70	4175417	B732A14000HP KCPK15	G121	4175894	NGP2031R KCU10	C152	4176029	NAS3L8 KCU10	D13
4169310	B269A15875HP KCPK15	G70	4175418	B731AD3734HP KCPK15	G120	4175895	NGP2062L KCU10	C152	4176030	NAS3R10 KCU10	D13
4169311	B269A16000HP KCPK15	G70	4175419	B731AD4496HP KCPK15	G120	4175896	NGP2062R KCU10	C152	4176031	NAS3R5 KCU10	D13
4169312	B269A16500HP KCPK15	G70	4175420	B731AD5106HP KCPK15	G120	4175897	NGP2125L KCU10	C152	4176032	NAS3R6 KCU10	D13
4169313	B269A17000HP KCPK15	G70	4175421	B731AD5410HP KCPK15	G120	4175898	NGP2125R KCU10	C152	4176033	NAS3R8 KCU10	D13
4169314	B269A17463HP KCPK15	G70	4175422	B731AD6528HP KCPK15	G120	4175899	NP2002RK KCU10	C151	4176034	NG3047L KCU10	C155
4169315	B269A17500HP KCPK15	G70	4175423	B731AD6909HP KCPK15	G120	4175901	NR2031L KCU10	C158	4176035	NG3047LK KCU10	C148
4169316	B269A18000HP KCPK15	G70	4175424	B731AD7938HP KCPK15	G120	4175902	NR2031R KCU10	C158	4176036	NG3047R KCU10	C154
4169317	B269A18500HP KCPK15	G70	4175425	B731AD8433HP KCPK15	G120	4175903	NR2062L KCU10	C158	4176037	NG3047RK KCU10	C146
4169318	B269A19000HP KCPK15	G70	4175426	B731AD9921HP KCPK15	G120	4175904	NR2062R KCU10	C158	4176038	NG3062L KCU10	C155
4169319	B269A19500HP KCPK15	G70	4175427	B731A10716HP KCPK15	G120	4175905	NR2M050L KCU10	C158	4176039	NG3062LK KCU10	C148
4169320	B269A19500HP KCPK15	G70	4175428	B731A12304HP KCPK15	G120	4175906	NR2M050R KCU10	C158	4176040	NG3062R KCU10	C154
4169321	B269A20000HP KCPK15	G70	4175429	B731A13096HP KCPK15	G120	4175907	NR2M075R KCU10	C158	4176041	NG3062RK KCU10	C146
4169322	B269A20000HP KCPK15	G70	4175430	B731A13495HP KCPK15	G120	4175908	NR2M100R KCU10	C158	4176042	NG3072L KCU10	C155
4169323	B269A20000HP KCPK15	G70	4175431	B731A16670HP KCPK15	G120	4175909	NT2L KCU10	D19	4176043	NG3072LK KCU10	C148
4169324	B269A20000HP KCPK15	G70	4175432	B731A17463HP KCPK15	G120	4175910	NT2LK KCU10	D24	4176044	NG3072RK KCU10	C154
4169325	B269A20000HP KCPK15	G70	4175433	B731A19446HP KCPK15	G120	4175911	NT2R KCU10	D19	4176045	NG3072RK KCU10	C146
4169326	B269A20000HP KCPK15	G70	4175434	B732AD3734HP KCPK15	G121	4175912	NT2RK KCU10	D24	4176046	NG3078L KCU10	C155
4169327	B269A20000HP KCPK15	G70	4175435	B732AD4496HP KCPK15	G121	4175928	NJ3008R20 KCU10	D18	4176047	NG3078LK KCU10	C148
4169328	B269A20000HP KCPK15	G70	4175436	B732AD5106HP KCPK15	G121	4175932	NJP3010R16 KCU10	D18	4176048	NG3078R KCU10	C154
4169329	B269A20000HP KCPK15	G70	4175437	B732AD5410HP KCPK15	G121	4175933	NTF2L KCU10	D23	4176049	NG3078RK KCU10	C146
4169330	B269A20000HP KCPK15	G70	4175438	B732AD6528HP KCPK15	G121	4175934	NTF2R KCU10	D23	4176050	NG3088L KCU10	C155
4169331	B269A20000HP KCPK15	G70	4175439	B732AD6909HP KCPK15	G121	4175935	NTK2L KCU10	D23	4176051	NG3088R KCU10	C154
4169332	B269A20000HP KCPK15	G70	4175440	B732AD7938HP KCPK15	G121	4175936	NTK2R KCU10	D23	4176052	NG3094L KCU10	C155
4169333	B269A20000HP KCPK15	G70	4175441	B732AD8433HP KCPK15	G121	4175937	NTP2L KCU10	D24	4176053	NG3094LK KCU10	C148
4169334	B269A20000HP KCPK15	G70	4175442	B732AD9921HP KCPK15	G121	4175938	NTP2R KCU10	D24	4176054	NG3094R KCU10	C154
4169335	B269A20000HP KCPK15	G70	4175443	B732A10716HP KCPK15	G121	4175944	NJP3014R12 KCU10	D18	4176055	NG3094RK KCU10	C146
4169336	B269A20000HP KCPK15	G70	4175445	B732A13096HP KCPK15	G121	4175946	NP3002RK KCU10	C151	4176056	NG3097L KCU10	C155
4169337	B269A20000HP KCPK15	G70	4175446	B732A13495HP KCPK15	G121	4175947	NP3012RK KCU10	C151	4176057	NG3097R KCU10	C154
4169338	B269A20000HP KCPK15	G70	4175447	B732A16670HP KCPK15	G121	4175948	NR3031L KCU10	C158	4176058	NG3105L KCU10	C155
4169339	B269A20000HP KCPK15	G70	4175448	B732A17463HP KCPK15	G121	4175949	NR3031LK KCU10	C150	4176059	NG3105R KCU10	C154
4169340	B269A20000HP KCPK15	G70	4175834	NGD3125RK KCU10	C149	4175950	NR3031R KCU10	C158	4176060	NG3125L KCU10	C155
4169341	B269A20000HP KCPK15	G70	4175835	NGD3189L KCU10	C157	4175951	NR3031RK KCU10	C150	4176061	NG3125LK KCU10	C148
4169342	B269A20000HP KCPK15	G70	4175836	NGD3189LK KCU10	C149	4175952	NR3047L KCU10	C158	4176062	NG3125R KCU10	C154
4169343	B269A20000HP KCPK15	G70	4175837	NGD3189R KCU10	C157	4175953	NR3047LK KCU10	C150	4176063	NG3125RK KCU10	C147
4169344	B269A20000HP KCPK15	G70	4175838	NGD3189RK KCU10	C149	4175954	NR3047R KCU10	C158	4176064	NG3142L KCU10	C155
4169345	B269A20000HP KCPK15	G70	4175839	NGD3M200RK KCU10	C149	4175955	NR3047RK KCU10	C150	4176065	NG3156LK KCU10	C148
4169346	B269A20000HP KCPK15	G70	4175840	NGP3088L KCU10	C152	4175956	NR3062L KCU10	C158	4176066	NG3156R KCU10	C154
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4176077	NG4250LK KCU10	C155	5004291	RIQ09R0400FBF KT6225	K65	5065663	DFT030204HP KCU40	J87	5069161	A4R0305M03U00GMN KCP25	C97
4176078	NG4250LK KCU10	C148	5006833	B978A03800 KC7315	G146	5065664	DFT030204MD KCU40	J87	5069162	A4R0505M05U00GMN KCP25	C97
4176079	NG4250RK KCU10	C154	5015690	193.545	H102-103	5065665	DFT030204GD KCU40	J87	5069163	A4R0605M06U00GMN KCP25	C97
4176081	NG4M400LK KCU10	C148	5023558	B269A03700HP KCPK15	G68	5065666	DFT030304HP KCU40	J87	5069164	A4R0805M08U00GMN KCP25	C97
4176083	NG4M500LK KCU10	C148	5025597	SF300M1LA1RA	K64	5065667	DFT030304MD KCU40	J87	5069354	A4G0405M04U04GMP KCP10	C95
4176084	NG4M500RK KCU10	C147	5025598	SF750M1LA1RA	K64	5065916	DFT030304GD KCU40	J87	5069359	A4G0505M05U04GMP KCP10	C95
4176085	NGD4125LK KCU10	C149	5025599	SF300M1RS	K64	5066013	DFT05T308HP KCU40	J87	5069390	A4G0505M05U08GMP KCP10	C95
4176086	NGD4125RK KCU10	C149	5025670	SF750M1RS	K64	5066014	DFT05T308MD KCU40	J87	5069394	A4G0205M02U02GMN KCP10	C96
4176087	NGD4189LK KCU10	C149	5025671	SFSLRS	K65	5066015	DFT05T308GD KCU40	J87	5069430	A4G0305M03U02GMN KCP10	C96
4176088	NGD4189RK KCU10	C149	5025672	SFSLLS	K65	5066016	DFT06T308HP KCU40	J87	5069431	A4G0305M03U04GMN KCP10	C96
4176089	NGD4250LK KCU10	C157	5025673	SFSLRA	K65	5066019	DFT06T308MD KCU40	J87	5069432	A4G0605M06U04GMN KCP10	C96
4176090	NGD4250LK KCU10	C149	5025674	SFSLLA	K65	5066064	DFT06T308GD KCU40	J87	5069433	A4G0805M08U08GMN KCP10	C96
4176091	NGD4250RK KCU10	C157	5025675	SFMSGS	K67	5066146	DFT070408HP KCU40	J87	5069435	A4G0805M08U12GMN KCP10	C96
4176092	NGD4250RK KCU10	C149	5025676	SFCR20	K67	5066147	DFT070408MD KCU40	J87	5069437	A4G1005M10U08GMN KCP10	C96
4176093	NG3M120RK KCU10	C146	5025677	SFCRHSK3263	K67	5066148	DFT070408GD KCU40	J87	5069439	A4R0205M02U00GMN KCP10	C97
4176094	NG3M225LK KCU10	C148	5025678	SFCRHSK63100	K67	5066149	DFT090508HP KCU40	J87	5069470	A4R0305M03U00GMN KCP10	C97
4176095	NG3M225RK KCU10	C146	5025679	SFCR20S	K67	5066190	DFT090508MD KCU40	J87	5069471	A4R0805M08U00GMN KCP10	C97
4176096	NG3M275LK KCU10	C148	5025680	SFVB	K65	5066191	DFT090508GD KCU40	J87	5077334	B269A03300HP KCPK15	G68
4176097	NG3M275RK KCU10	C147	5025681	SFEBS	K66	5066192	DFR040304D28GD KCU40	H89	5077336	B269A04200HP KCPK15	G68
4176098	NG3M300LK KCU10	C148	5025682	SFEBCH	K66	5066193	DFT05T308D32HP KCU40	H88	5077337	B269A08200HP KCPK15	G69
4176099	NG3M300RK KCU10	C147	5025683	SFSLSS	K65	5066195	DFT05T308D33HP KCU40	H88	5078982	NGD2M200LK KCU10	C149
4176100	NG3M400LK KCU10	C148	5025684	SFSB450	K66	5066196	DFT06T308D36HP KCU40	H88	5080992	SPG060304MD KCPK10	J89
4176101	NG3M400RK KCU10	C147	5025685	SFSB900	K66	5066197	DFT06T308D39HP KCU40	H88	5085631	M1H40J4R80B32S90ED14C12	T57
4176102	NG3M425LK KCU10	C148	5025686	SFCPS	K66	5066198	DFT06T308D44HP KCU40	H88	5090284	RPNG060200E KYS30	B334, V155
4176104	NGP4189RK KCU10	C152	5039055	B269A04300HP KCPK15	G68	5066199	DFT070408D45HP KCU40	H88	5090285	RPNG090300T01020 KYS30	B334, V155
4176105	NGP4250LK KCU10	C152	5048735	CNMU120612M KCP15	B51	5066220	DFT070408D50HP KCU40	H88	5090286	RPNG120400E KYS30	B334, V155
4176107	NR4062LK KCU10	C150	5057900	B976A10600 KC7315	G141	5066221	DFT090508D56HP KCU40	H88	5090287	RPNG120400T01020 KYS30	B334, V155
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4176109	NR4094LK KCU10	C150	5059278	B978A03400 KC7315	G146	5066225	DFT090508D63HP KCU40	H88	5090495	CNMG120401MS KCU10	B52
4176110	NR4094RK KCU10	C150	5062104	SNMG090308FP KCU10	B97	5066226	DFR020204MD KCU25	J84	5090496	CNMG120404MS KCU10	B52
4176112	NR4125LK KCU10	C150	5062106	SNMG120408MP KCU10	B98	5066227	DFR030204GD KCU25	J84	5090497	CNMG120408MS KCU10	B52
4176113	NR4125RK KCU10	C158	5062108	SNMG120408RP KCU10	B101	5066231	DFR030204MD KCU25	J84	5090498	CNMG120412MS KCU10	B52
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4176116	NRD4062RK KCU10	C159	5062111	SNMG120412RP KCU10	B101	5066231	DFR030204MD KCU25	J84	5090680	CNMG160608MS KCU10	B52
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4176119	NRD4125LK KCU10	C159	5062114	SNMG150612RP KCU10	B102	5066231	DFT030204MD KCU25	J87	5090684	CNMG190616MS KCU10	B52
4176121	NT4L KCU10	D19	5062115	SNMG190612 KCU10	B96	5066231	DFT030204MD KCU25	J87	5090685	CNMG190616MS KCU10	B52
4176122	NT4LK KCU10	D24	5062117	SNMG190612RP KCU10	B101	5066231	DFT030204MD KCU25	J87	5090685	CNMG190616MS KCU10	B52
4176123	NG3M425RK KCU10	C147	5062120	SNMG190616RP KCU10	B101	5066231	DFT030204MD KCU25	J87	5090686	CNMG190616MS KCU10	B52
4176124	NGD3062LK KCU10	C149	5062121	SNMG250924 KCU10	B96	5066231	DFT030204MD KCU25	J87	5090688	CNMG150404MS KCU10	B79
4176125	NGD3062RK KCU10	C149	5062122	SNMG250924RM KCU10	B100	5066231	DFT030204MD KCU25	J87	5090689	CNMG150408MS KCU10	B79
4176126	NGD3094LK KCU10	C149	5062123	TNGG160402LF KCU10	B122	5066231	DFT030204MD KCU25	J87	5090740	CNMG150412MS KCU10	B79
4176127	NGD3094RK KCU10	C149	5062126	TNGP160402 KCU10	B122	5066231	DFT030204MD KCU25	J87	5090741	CNMG150604MS KCU10	B79
4176128	NGD3125LK KCU10	C149	5062127	TNGP160404 KCU10	B122	5066231	DFT030204MD KCU25	J87	5090742	CNMG150608MS KCU10	B79
4176133	NT4R KCU10	D19	5062128	TNGP160408 KCU10	B122	5066231	DFT030204MD KCU25	J87	5090743	CNMG150612MS KCU10	B79
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4176167	ND3C27V75 KCU10	D16	5062137	TNMG160408RP KCU10	B128	5066231	DFT030204MD KCU25	J87	5090768	CNMG120416RP KCU10	B101
4176177	ND68RDR75M KCU10	D15	5062139	TNMG220404P KCU10	B127	5066231	DFT030204MD KCU25	J87	5090769	CNMG120416RP KCU10	B101
4176178	ND8C115V75M KCU10	D16	5062140	TNMG220408MP KCU10	B125	5066231	DFT030204MD KCU25	J87	5090770	CNMG120416RP KCU10	B101
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4176182	NTB2LB KCU10	D20	5062144	TNMG220412P KCU10	B127	5066231	DFT030204MD KCU25	J87	5090773	CNMG120416RP KCU10	B101
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4176187	NTB3RA KCU10	D19	5062147	TNMG270612RP KCU10	B128	5066231	DFT030204MD KCU25	J87	5090775	CNMG120416RP KCU10	B101
4176188	NTB3RB KCU10	D20	5062148	TNMG330924RP KCU10	B128	5066231	DFT030204MD KCU25	J87	5090776	CNMG120416RP KCU10	B101
4176190	NTB4RA KCU10	D19	5062149	CNMG190612MS KCU25	B52	5066231	DFT030204MD KCU25	J87	5090777	CNMG120416RP KCU10	B101
4176191	NTB4RB KCU10	D20	5063675	RPET1204M0EJLJ KC522M	V73	5066231	DFT030204MD KCU25	J87	5090778	CNMG120416RP KCU10	B101
4176192	NTC3L10E KCU10	D22	5063676	RPET1204M0EJLJ KC725M	V73	5066231	DFT030204MD KCU25	J87	5090779	CNMG120416RP KCU10	B101
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4176206	NTC3R32E KCU10	D22	5065400	KTIP1338HPM KCP15	H27	5066231	DFT030204MD KCU25	J87	5090785	CNMG120416RP KCU10	B101
4176207	NTC3R8E KCU10	D22	5065401	KTIP1538HPM KCP15	H27	5066231	DFT030204MD KCU25	J87	5090786	CNMG120416RP KCU10	B101
4176208	NTC3R9E KCU10	D22	5065552	DFR020204LD KCU40	J84	5066231	DFT030204MD KCU25	J87	5090787	CNMG120416RP KCU10	B101
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4177633	KDMT0806SRHF KC515M	V133	5065559	DFR030204MD KCU40	J84	5066231	DFT030204MD KCU25	J87	5090792	CNMG120416RP KCU10	B101
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5104318RNGJ1204MOSNGDXJ KC725MV65	5116136KSEMP6668FDS63B1MH85, H95	5133547RMBE15000H6HF KC6305K20	5134038RHME22000KST175H6HF KC6305K34
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5116016KSEMP3300FDS28B1MH84, H94				5133609RHME27000KST200H6SF KC6305K33	5134126RHME23813KST200H6HF KC6005K34
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5116018KSEMP3334FDS28B1MH84, H94				5133611RHME28000KST250H6SF KC6305K33	5134128RHME25000KST200H6HF KC6005K34
5116019KSEMP3400FDS28B1MH84, H94				5133612RHME30000KST250H6SF KC6305K33	5134129RHME25400KST200H6HF KC6005K34
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5116039KSEMP3920FDS36B1MH84, H95				5133622RHME48000KST350H6SF KC6305K33	5134139RHME40000KST350H6HF KC6005K34
5116040KSEMP3970FDS36B1MH84, H95				5133623RHME17463KST135H6HF KC6005K33	5134140RHME42000KST350H6HF KC6005K34
5116041KSEMP4000FDS40B1MH84, H95				5133624RHME18000KST155H6SF KC6005K33	5134141KGI0125N0189GD KCU45H76
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5116043KSEMP4128FDS40B1MH84, H95				5133626RHME20000KST175H6SF KC6005K33	5134143KGI0125N0189GD KCU45H76
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5116045KSEMP4300FDS40B1MH84, H95				5133628RHME22000KST175H6SF KC6005K33	5134145KGI0125N0189GD KCU45H76
5116046KSEMP4400FDS40B1MH84, H95				5133629RHME23000KST200H6SF KC6005K33	5136407A4R0605M06U00GUP KCU25C92
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5116114KSEMP5000FDS50B1MH85, H95				5133637RHME31750KST200H6SF KC6005K33	5144599A4R25106P00GUP KCU25C94
5116115KSEMP5080FDS50B1MH85, H95				5133638RHME33000KST200H6SF KC6005K33	5144694KSEM2262HPM KCT7315H43
5116116KSEMP5100FDS50B1MH85, H95				5133639RHME34000KST200H6SF KC6005K33	5144793CNMG120412RP KCPK05B53
5116117KSEMP5200FDS50B1MH85, H95				5133640RHME36000KST200H6SF KC6005K33	5146918A4R0305M03U00GUP KCU25C94
5116118KSEMP5300FDS50B1MH85, H95				5133641RHME38000KST200H6SF KC6005K33	5146919A4R0505M05U00GUP KCU25C94
5116119KSEMP5398FDS50B1MH85, H95				5133642RHME40000KST200H6SF KC6005K33	5147210A4R1005M10O00GUP KCU25C94
5116120KSEMP5400FDS50B1MH85, H95				5133643RHME42000KST200H6SF KC6005K33	5147211A4R0300M03P00GUP KCU25C94
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5152681	KDR25Z0A32R10L250	V48	5211996	T631NF02500-28R3BX-D1	CP6525	5212287	T641NC03125-18R3BX-D1	CP6525	5327944	VCGR160408FP	KCM25	E35
5152683	KDR32Z0A432R10L200	V48			M37			M68	5327945	VCGR160408FP	KCK05	E35
5152684	KDR32Z0A32R10L250	V48	5211997	T631NF03125-24R3BX-D1	CP6525	5212288	T641NC03750-16R3BX-D1	CP6525	5327948	VCGR160412FP	KCP10	E35
5152685	KDR40Z0A516RN10	V49			M37			M68	5327949	VCGR160412FP	KCP25	E35
5152686	KDR40Z0A516RN10	V49	5211998	T631NF03750-24R3BX-D1	CP6525	5212289	T641NC04375-14R3BX-D6	CP6525	5327961	VCGR160412FP	KCK05	E35
5152687	KDR50Z0S22RN10	V49			M37			M68	5327965	VCGR160416FP	KCP25	E35
5152688	KDR50Z0S22RN10	V49	5211999	T631NF04375-20R3BX-D6	CP6525	5212290	T641NC05000-13R3BX-D6	CP6525	5328738	DNGA150408S01225MT	KBH20	B314
5152689	KDR52Z0S22RN10	V49			M37			M68				B324
5152690	KDR63Z0S22RN10	V49	5212000	T631NF05000-20R3BX-D6	CP6525	5212291	T641NF02500-28R3BX-D1	CP6525	5329836	WNGA080404S01015MT	KBH20	B324
5152691	KDR66Z0S22RN10	V49			M37			M68				B324
5152692	KDR80Z0S22RN10	V49	5212152	T620NC#06-32R2BX-D1	CP6525	5212292	T641NF03125-24R3BX-D1	CP6525	5329837	WNGA080408S01015MT	KBH20	B324
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5153839	KDR63Z0S22RN16	V60	5212158	T620NC02500-20R3BX-D1	CP6525	5212295	T641NF05000-20R3BX-D6	CP6525	5330130	WNGA080408S01015FWMT	KBH20	B323
5153890	KDR63Z0S22RN16	V60			M10			M68	5330131	CCGW060202S01225MT	KBH20	B308
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5153893	KDR80Z0S22RN16	V60	5212211	T620NC04375-14R3BX-D6	CP6525	5274661	RNPJ10T3MOSGD	KC522M	5330134	CCGW09T304S01225MT	KBH20	B308
5153894	KDR100Z0S22RN16	V60			M10	5274662	RNPJ10T3MOSGD	KCPK30	5330135	CCGW09T304S01015MT	KBH20	B308
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5153898	KDR125Z0S40RN16	V60	5212215	T620NF#10-32R2BX-D1	CP6525	5274666	RNPJ10T3MOSGD	KCK15	5330139	CCGW09T308S01015FWMT	KBH20	B308
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5159761	RI006R0500FT	KT6315			M10	5274668	RNPJ10T3MOSGD	KCK15	5330141	DCGW070202S01225MT	KBH20	B312
5161120	NA3L16	KCU10	5212218	T620NF03125-24R3BX-D1	CP6525	5274669	RNPJ10T3MOSGD	KCK15	5330142	DCGW070204S01225MT	KBH20	B312
5161475	B978F14500	KC7315			M10	5274670	RNPJ10T3MOSGD	KCK15	5330143	DCGW070204S01015MT	KBH20	B312
5169173	EDPT070308PDSRGE	KC725M	5212219	T620NF03750-24R3BX-D1	CP6525	5274720	RNPJ10T3MOSGD	KC725M	5330144	DCGW11T302S01225MT	KBH20	B312
5169174	EDPT070308PDSRGE	KC522M			M10	5274721	RNPJ10T3MOSGD	KC522M	5330145	DCGW11T304S01225MT	KBH20	B312
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5182481	KTP1490HPM	KCP15	5212232	T620NF03125-24R3BX-D1	CP6525	5276844	KEGT25L516PEERLDJ2	KC410M	5330150	TPGW110202S01015MT	KBH20	B321
5182869	SNMG120412RN	KCPK05			M10	5309298	B977A16300	KC7315	5330151	TPGW110204S01015MT	KBH20	B321
5182893	SNMG150612RN	KCPK05	5212233	T621NC02500-20R3BX-D1	CP6525	5314951	B707A03800FBL	KCMS15	5330152	TPGW110208S01015MT	KBH20	B321
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5190191	16A03R020A16ED07	T24			M11	5324456	DCGR150408FP	KCP10	5330155	TCGW090202S01015MT	KBH20	B319
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5202235	SALS125	S126			M11	5324778	KCGR110304R08FP	KCP10	5330163	VBGW110304S01015MT	KBH20	B322
5202236	SALS160	S126	5212238	T621NF02500-28R3BX-D1	CP6525	5324780	KCGR110304R08FP	KCP25	5330164	VBGW110304S01225MT	KBH20	B322
5202514	SWMS515	S126			M11	5324782	KCGR110304R08FP	KCM25	5330165	TCGW110202S01015MT	KBH20	B319
5211960	T630NC#06-32R2BX-D1	CP6525	5212239	T621NF03125-24R3BX-D1	CP6525	5324786	KCGR110308L08FP	KCP10	5330166	TCGW110202S01015MT	KBH20	B319
5211961	T630NC#08-32R2BX-D1	CP6525			M11	5324787	KCGR110308L08FP	KCP25	5330167	TCGW110208S01015MT	KBH20	B319
5211962	T630NC#10-24R2BX-D1	CP6525	5212240	T621NF04375-20R3BX-D6	CP6525	5324788	KCGR110308L08FP	KCP10	5330168	TCGW110208S01015MT	KBH20	B319
5211963	T630NC#10-24R2BX-D1	CP6525			M11	5324789	KCGR110308R08FP	KCP10	5330169	TPGW16T304S01015MT	KBH20	B321
5211964	T630NC02500-20R3BX-D1	CP6525	5212241	T621NF05000-20R3BX-D6	CP6525	5324790	KCGR110308R08FP	KCU10	5330170	TPGW16T308S01225MT	KBH20	B321
		M36			M11	5324906	VBMR110302FP	KCP25	5330171	TPGW16T308S01015MT	KBH20	B321
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		M36			M11	5324912	VBMR110304FP	KCP25	5330173	TPGW16T308S01015MT	KBH20	B321
5211966	T630NC03750-16R3BX-D1	CP6525	5212243	T621NF05000-20R3BX-D6	CP6525	5324915	VBMR110304FP	KCU25	5330174	TPGW16T308S01015MT	KBH20	B321
		M36			M11	5324916	VBMR110308FP	KCP10	5330175	TPGW16T308S01015MT	KBH20	B321
5211967	T630NC04375-14R3BX-D6	CP6525	5212244	T640NC#06-32R2BX-D1	CP6525	5324921	VBMR110308FP	KCU10	5330176	TPGW16T308S01015MT	KBH20	B321
		M36			M67	5324923	VCMR160404FP	KCP10	5330177	TPGW16T308S01015MT	KBH20	B321
5211968	T630NC05000-13R3BX-D6	CP6525	5212249	T640NC#08-32R2BX-D1	CP6525	5324924	VCMR160404FP	KCP25	5330178	TPGW16T308S01015MT	KBH20	B321
		M36			M67	5324925	VCMR160404FP	KCM25	5330179	TPGW16T308S01015MT	KBH20	B321
5211981	T630NF#06-40R2BX-D1	CP6525	5212270	T640NC#10-24R2BX-D1	CP6525	5324926	VCMR160404FP	KCU10	5330180	TPGW16T308S01015MT	KBH20	B321
		M36			M67	5324927	VCMR160404FP	KCU10	5330181	TPGW16T308S01015MT	KBH20	B321
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		M36			M67	5324929	VCMR160408FP	KCP10	5330183	TPGW16T308S01015MT	KBH20	B321
5211985	T630NF02500-28R3BX-D1	CP6525	5212273	T640NC03125-18R3BX-D1	CP6525	5324930	VCMR160408FP	KCP25	5330184	TPGW16T308S01015MT	KBH20	B321
		M36			M67	5324932	VCMR160408FP	KCU10	5330185	TPGW16T308S01015MT	KBH20	B321
5211987	T630NF03125-24R3BX-D1	CP6525	5212274	T640NC03750-16R3BX-D1	CP6525	5324933	VCMR160408FP	KCM25	5330186	TPGW16T308S01015MT	KBH20	B321
		M36			M67	5324934	VCMR160408FP	KCM25	5330187	TPGW16T308S01015MT	KBH20	B321
5211988	T630NF03750-24R3BX-D1	CP6525	5212275	T640NC04375-14R3BX-D6	CP6525	5324935	VCMR160408FP	KCK05	5330188	TPGW16T308S01015MT	KBH20	B321
		M36			M67	5327662	A4R0305M03U00GUP	KCU10	5330189	TPGW16T308S01015MT	KBH20	B321
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		M36			M67	5327664	A4R1005M10U00GUP	KCU10	5330191	TPGW16T308S01015MT	KBH20	B321
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5330165	VBGW160412S01015MT KBH20	B322	5341813	KSEM3125HPGM KCT315	H43	5350616	UDDE2000A6AS KCSM15	P48	5358399	UDDE2500E5AQE KCSM15	P32
5330166	VBGW110308S01225MT KBH20	B322	5344687	F4AS1400ADL38 KCPM15	P16	5350617	UDDE2000A6AQE KCSM15	P49	5358400	UDDE2500E5AQG KCSM15	P32
5330167	VCGW160404S01225MT KBH20	B322	5347999	EADE0380A4AQE KYS40	P176	5350618	UDDE2000A6AQQ KCSM15	P49	5358401	UDDE2500E5AQN KCSM15	P32
5330168	VCGW160404S01015MT KBH20	B322	5348060	EADE0400A4AQE KYS40	P176	5350619	UDDE2000A6AQQ KCSM15	P49	5358402	UDDE2500E5AQN KCSM15	P32
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5330180	VCGW160408S01015MT KBH20	B322	5348062	EADE0600A4AQF KYS40	P176	5350641	UDDE2000A6AQN KCSM15	P49	5358886	KSM32203M160F06X	S46
5330695	CNGA120404S01225MT KBH20	B310	5348063	EADE0760A4AQG KYS40	P176	5350642	UDDE2000A6ANS KCSM15	P49	5358887	KSM40Z04M160F06X	S46
5330696	CNGA120404S01015MT KBH20	B310	5348064	EADE0800A4AQG KYS40	P176	5350644	UDDE2000E6AQE KCSM15	P49	5358888	KSM32203A320F06X	S47
5330697	CNGA120404S01735MT KBH20	B310	5348065	EADE0950A4AQH KYS40	P176	5350645	UDDE2000E6AQQ KCSM15	P49	5358889	KSM40Z040F06X	S48
5330698	CNGA120404S01015FWMT KBH20	B310	5348066	EADE1000A4AQH KYS40	P176	5350646	UDDE2000E6AQQ KCSM15	P49	5358930	KSM50Z060F06X	S48
5330699	CNGA120408S01225MT KBH20	B310	5348067	EADE1140A4AQJ KYS40	P176	5350647	UDDE2000E6AQM KCSM15	P49	5358931	KSM63Z070F06X	S48
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5330831	CNGA120408S01735MT KBH20	B310	5348069	EADE0400A6ARE KYS40	P177	5350649	UDDE2500A6ARF KCSM15	P48	5362754	CCMT09T312MP KCU10	B177
5330832	CNGA120408S01015FWMT KBH20	B310	5348070	EADE0600A6ARF KYS40	P177	5350650	UDDE2500E6ARF KCSM15	P48	5366566	B269A17100HP KCPK15	G70
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5330834	CNGA120412S01015MT KBH20	B310	5348072	EADE1000A6ARH KYS40	P177	5350652	UDDE2500A6AQE KCSM15	P49	5377582	B269A06100HP KCPK15	G69
5330835	CNGA120412S01735MT KBH20	B310	5348073	EADE1200A6ARJ KYS40	P177	5350653	UDDE2500A6AQQ KCSM15	P49	5378294	B269A11200HP KCPK15	G69
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5330837	DNGA150404S01225MT KBH20	B314	5348572	CNGM120412S01325MTCB1 KBH20	B310	5350655	UDDE2500A6AQM KCSM15	P49	5378231	CNMG120412FM KCP25B	B50
5330838	DNGA150404S01015MT KBH20	B314	5348573	CNGM120404S01325MTCB1 KBH20	B310	5350656	UDDE2500A6AQN KCSM15	P49	5378540	DNMG150612CT KCP25B	B76
5330839	DNGA150404S01735MT KBH20	B314	5348574	CNGM150408S01325MTCB1 KBH20	B314	5350658	UDDE2500E6AQE KCSM15	P49	5378541	DNMG150612MN KCP25B	B78
5330840	DNGA150408S01015MT KBH20	B314	5348575	CNGM150412S01325MTCB1 KBH20	B314	5350659	UDDE2500E6AQQ KCSM15	P49	5378542	DNMG150612RN KCP25B	B81
5330841	DNGA150408S01735MT KBH20	B314	5348576	CNGM150412S01325MTCB1 KBH20	B314	5350660	UDDE2500E6AQQ KCSM15	P49	5378543	DNMG150612RP KCP25B	B81
5330842	DNGA150412S01225MT KBH20	B314	5348577	CNGM150612S01325MTCB1 KBH20	B314	5350661	UDDE2500E6AQM KCSM15	P49	5378544	DNMG150616RN KCP25B	B81
5330843	DNGA150412S01015MT KBH20	B314	5348578	CNGM150612S01325MTCB1 KBH20	B314	5350662	UDDE2500E6AQN KCSM15	P49	5378545	DNMG150616RP KCP25B	B81
5330844	DNGA150412S01735MT KBH20	B314	5348579	CNGM160408S01325MTCB1 KBH20	B320	5356982	UADE0600B4AL KCPM15	P20	5378547	DPMT11T308LF KCP25B	B215
5330845	DNGA150408S01015FWMT KBH20	B313	5348582	VNGM160408S01325MTCB1 KBH20	B320	5356983	UADE0800B4AL KCPM15	P20	5378550	SCMT09T304LF KCP25B	B230
5330846	DNGA150412S01015FWMT KBH20	B313	5348583	VNGM160412S01325MTCB1 KBH20	B323	5356984	UADE1000B4AL KCPM15	P20	5378551	SCMT09T308FP KCP25B	B230
5330847	DNGA150604S01225MT KBH20	B314	5348584	CCGM09T304S01325MTCB1 KBH20	B308	5356985	UADE1200B4AL KCPM15	P20	5378553	SCMT09T308MF KCP25B	B231
5330848	DNGA150604S01015MT KBH20	B314	5348585	CCGM09T308S01325MTCB1 KBH20	B308	5356986	UADE1600B4AL KCPM15	P20	5378554	SCMT09T308MP KCP25B	B231
5330849	DNGA150604S01735MT KBH20	B314	5348586	DCGM11T304S01325MTCB1 KBH20	B311	5356987	UADE2000B4AL KCPM15	P20	5378555	SCMT09T312MF KCP25B	B231
5330850	DNGA150608S01225MT KBH20	B314	5350287	UJDE1000A6ARE KCSM15	P48	5356988	UADE2000B4AL KCPM15	P20	5378556	SCMT120408MF KCP25B	B230
5330851	DNGA150608S01015MT KBH20	B314	5350288	UJDE1000A6AS KCSM15	P48	5356989	UADE0600A4AL KCPM15	P20	5378557	SCMT120408MF KCP25B	B231
5330852	DNGA150608S01735MT KBH20	B314	5350289	UJDE1000A6AQE KCSM15	P49	5356990	UADE0800A4AL KCPM15	P20	5378558	SCMT120412LF KCP25B	B230
5330853	DNGA150612S01225MT KBH20	B314	5350320	UJDE1000A6AQG KCSM15	P49	5357000	UADE1000A4AL KCPM15	P20	5378559	SCMT120412MF KCP25B	B231
5330854	DNGA150612S01015MT KBH20	B314	5350321	UJDE1000A6AQQ KCSM15	P49	5357002	UADE1600A4AL KCPM15	P20	5378563	SNMG120412RP KCP25B	B101
5330855	DNGA150612S01735MT KBH20	B314	5350322	UJDE1000A6AQM KCSM15	P49	5357003	UADE2000A4AL KCPM15	P20	5378567	CNMG150612RP KCP25B	B101
5330856	SNGA120408S01015MT KBH20	B318	5350323	UJDE1000A6AGN KCSM15	P49	5357004	RUDC0004B3BN KCPM15	P80	5378571	SPMT09T308LF KCP25B	B238
5330857	SNGA120412S01225MT KBH20	B318	5350324	UJDE1200A6ARF KCSM15	P48	5357042	RUDC0500B3BN KCPM15	P80	5378575	TNMG160412RP KCP25B	B128
5330858	TNGA160404S01225MT KBH20	B320	5350325	UJDE1200A6AS KCSM15	P48	5357043	RUDC0600B3BN KCPM15	P80	5378577	TNMG160412RP KCP25B	B128
5330859	TNGA160404S01015MT KBH20	B320	5350326	UJDE1200A6AQG KCSM15	P48	5357044	RUDC0800B3BN KCPM15	P80	5378579	TPMT110208LF KCP25B	B255
5330860	TNGA160404S01735MT KBH20	B320	5350327	UJDE1200A6AQE KCSM15	P49	5357045	RUDC1000B4BN KCPM15	P80	5378580	TPMT110208MF KCP25B	B255
5330861	TNGA160408S01225MT KBH20	B320	5350328	UJDE1200A6AQQ KCSM15	P49	5357046	RUDC1200B4BN KCPM15	P80	5378581	TPMT16T308LF KCP25B	B255
5330862	TNGA160408S01015MT KBH20	B320	5350329	UJDE1200A6AGN KCSM15	P49	5357047	RUDC1400B4BN KCPM15	P80	5378584	VBMT160404FP KCP25B	B265
5330863	TNGA160408S01735MT KBH20	B320	5350330	UJDE1200A6AQM KCSM15	P49	5357048	RUDC1600B4BN KCPM15	P80	5378587	VBMT160408MP KCP25B	B265
5330864	TNGA160412S01225MT KBH20	B320	5350331	UJDE1200A6ANS KCSM15	P49	5357049	RUDC1800B4BN KCPM15	P80	5378588	VBMT160412FP KCP25B	B265
5330865	TNGA160412S01015MT KBH20	B320	5350332	UJDE1200E6AQE KCSM15	P49	5357090	RUDC2000B4BN KCPM15	P80	5378610	WNMG060408RN KCP25B	B159
5330866	TNGA160412S01735MT KBH20	B320	5350333	UJDE1200E6AQQ KCSM15	P49	5357091	RUDC2500B5BN KCPM15	P80	5378611	WNMG080408MN KCP25B	B157
5330867	TNGA160404S01225MT KBH20	B323	5350334	UJDE1200E6AQG KCSM15	P49	5357097	UBDE1200E4AQE KCSM15	P18	5378612	WNMG080408MN KCP25B	B158
5330868	TNGA160404S01015MT KBH20	B323	5350335	UJDE1200E6AQQ KCSM15	P49	5357098	UBDE1200E4AQQ KCSM15	P18	5378614	WNMG080412MN KCP25B	B157
5330869	TNGA160404S01735MT KBH20	B323	5350336	UJDE1400A6ARF KCSM15	P48	5357099	UBDE1200E4AQQ KCSM15	P18	5378615	WNMG080412MW KCP25B	B158
5330870	TNGA160408S01225MT KBH20	B323	5350337	UJDE1400E6ARF KCSM15	P48	5357150	UBDE1200E4AQM KCSM15	P18	5378616	WNMG080412RN KCP25B	B159
5330871	TNGA160408S01015MT KBH20	B323	5350338	UJDE1400E6AQQ KCSM15	P48	5357151	UBDE1200E4AQN KCSM15	P18	5378617	WNMG080412RN KCP25B	B159
5330872	TNGA160408S01735MT KBH20	B323	5350339	UJDE1600A6ARF KCSM15	P48	5357152	UBDE1600E4AQE KCSM15	P18	5378627	CCMT09T304LF KCP25B	B177
5330873	TNGA160412S01225MT KBH20	B323	5350340	UJDE1600E6ARF KCSM15	P48	5357153	UBDE1600E4AQQ KCSM15	P18	5378628	CCMT09T308LF KCP25B	B177
5337754	KM4X100NEL3	D32	5350341	UJDE1600E6AQQ KCSM15	P49	5357154	UBDE1600E4AQQ KCSM15	P18	5378629	CCMT09T308MF KCP25B	B177
5337755	KM4X100NEL4	D32	5350342	UJDE1600A6AGN KCSM15	P49	5357155	UBDE1600E4AQM KCSM15	P18	5378661	CCMT120408MF KCP25B	B177
5337756	KM4X100NEL5	D32	5350343	UJDE1600A6AQQ KCSM15	P49	5357156	UBDE1600E4AQN KCSM15	P18	5378662	CNMG120408MN KCP25B	B50
5337757	KM4X100NEL6	D32	5350344	UJDE1600A6AQM KCSM15	P49	5357157	UBDE2000E4AQE KCSM15	P18	5378663	CNMG120408MN KCP25B	B52
5337758	KM4X100NER3	D32	5350345	UJDE1600A6AQN KCSM15	P49	5357158	UBDE2000E4AQQ KCSM15	P18	5378664	CNMG120408RN KCP25B	B53
5337759	KM4X100NER4	D32	5350346	UJDE1600A6AGN KCSM15	P49	5357159	UBDE2000E4AQQ KCSM15	P18	5378665	CNMG120408RP KCP25B	B53
5337770	KM4X100NER5	D32	5350347	UJDE1600E6ARF KCSM15	P48	5357160	UBDE2000E4AQM KCSM15	P18	5378667	CNMG120412MN KCP25B	B50
5337771	KM4X100NER6	D32	5350348	UJDE1600E6AQE KCSM15	P49	5357161	UBDE2000E4AQN KCSM15	P18	5378668	CNMG120412RN KCP25B	B53
			5350349	UJDE1600E6AQQ KCSM15	P49	5357162	UBDE2500E4AQE KCSM15	P18	5378681	CNMG120416RN KCP25B	B53
			5350350	UJDE1600E6AQQ KCSM15	P49	5357163	UBDE2500E4AQQ KCSM15	P18	5378688	CNMG190612RN KCP25B	B50
			5350351	UJDE1600E6AQM KCSM15	P49	5357164	UBDE2500E4AQQ KCSM15	P18	5378689	CNMG190612RN KCP25B	B53
			5350352	UJDE1600E6AQN KCSM15	P49	5357165	UBDE2500E4AQM KCSM15	P18	5378691	CNMG190616RN KCP25B	B53
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5387755	CNMG120408MW KCK15B	B52	5397492	KSEM2504HPGM KCPM45	H46	5403092	CNMG120408MR KCK15B	B51	5413748	RNPJ204MOSHD KC725M	V58
5387801	CNMG120412UN KCK15B	B54	5397493	KSEM2560HPGM KCPM45	H46	5403093	CNMG120412MR KCM15	B51	5413749	RNPJ1605MOSHD KC725M	V61
5387802	CNMG120408UN KCK15B	B54	5397494	KSEM2565HPGM KCPM45	H46	5403094	CNMG120412MR KCM25	B51	5414455	ABDE1000A3ARG K600	P112
5387804	TNMG160408UN KCK15B	B128	5397495	KSEM2567HPGM KCPM45	H46	5403095	CNMG120412MR KCM35	B51	5414456	ABDE1000A3AFK K600	P112
5387805	SNMG120412UN KCK15B	B102	5397496	KSEM2581HPGM KCPM45	H46	5403096	CNMG120412MR KCP10B	B51	5414458	ABDE1000A3AFN K600	P112
5387806	RNMG120400UN KCK15B	B94	5397497	KSEM2600HPGM KCPM45	H46	5403097	CNMG120412MR KCP25B	B51	5414459	ABDE1200A3ARG K600	P112
5387807	TNMG160412UN KCK15B	B128	5397498	KSEM2619HPGM KCPM45	H46	5403099	CNMG120412MR KCK15B	B51	5414470	ABDE1200A3AFK K600	P112
5387808	WNMG080408UN KCK15B	B160	5397499	KSEM2700HPGM KCPM45	H46	5403103	CNMG160612MR KCP10B	B51	5414471	ABDE1200A3AFN K600	P112
5387809	WNMG080416UN KCK15B	B160	5397500	KSEM2800HPGM KCPM45	H46	5403104	CNMG160612MR KCP25B	B51	5414473	ABDE1200A3AFN K600	P112
5387810	DNMG110408UN KCK15B	B82	5397501	KSEM2858HPGM KCPM45	H46	5403105	CNMG160612MR KCP40	B51	5414474	ABDE1600A3AFN K600	P113
5387811	CNMG160616UN KCK15B	B54	5397502	KSEM3000HPGM KCPM45	H46	5403108	CNMG120416MR KCP10B	B51	5414475	ABDE1600A3AFN K600	P113
5387812	CNMG150616UN KCK15B	B82	5397503	KSEM3016HPGM KCPM45	H46	5403112	CNMG160616MR KCP10B	B51	5414476	ABDE2000A3ARG K600	P113
5387851	DNMG150616RP KCP10B	B81	5397504	KSEM3175HPGM KCPM45	H46	5403113	CNMG160616MR KCP25B	B51	5414477	ABDE2000A3AFK K600	P113
5387853	DPMT11T308LF KCP10B	B215	5397505	KSEM3200HPGM KCPM45	H46	5403116	CNMG190612MR KCM25	B51	5414478	ABDE2000A3AFN K600	P113
5387856	SCMT09T304LF KCP10B	B230	5397506	KSEM3300HPGM KCPM45	H46	5403119	CNMG190612MR KCP25B	B51	5414479	ABDE2500A3ARE K600	P113
5387858	SCMT09T308MF KCP10B	B231	5397507	KSEM3334HPGM KCPM45	H46	5405652	PSC50KGMER65C	C65, C135	5414480	ABDE2500A3ARG K600	P113
5387864	SCMT120412LF KCP10B	B230	5397508	KSEM3360HPGM KCPM45	H46	5405653	PSC50KGMEL65C	C65, C135	5414481	ABDE2500A3AFK K600	P113
5387874	SNMG120412RP KCP10B	B101	5397509	KSEM3810HPGM KCPM45	H46	5405654	PSC50KGMRS65C	C64, C134	5414482	ABDE2500A3AFN K600	P113
5387882	SNMG150612RP KCP10B	B101	5397510	KSEM4000HPGM KCPM45	H46	5405655	PSC50KGMSSL65C	C64, C134	5414483	ABDE2500A3AFN K600	P113
5387884	SPMT09T308LF KCP10B	B238	5397513	KSEMP7200FDS71A1M	H82, H92, H99	5406563	170.365	H99	5415049	RIQ06GR06 KD1415	K56
5387896	TNMG160412RP KCP10B	B128	5397514	KSEMP7400FDS71A1M	H82, H92, H99	5408657	KGEM1588R1WN20M	H76	5417205	T820M020X040R6H-D1 KSP32	M14
5387901	TNMG220432RP KCP10B	B128	5397515	KSEMP7600FDS71A1M	H82, H93, H99	5413058	CNMG120416UN KCK15B	B54	5417206	T820M020X040R6H-D1 KSP39	M14
5387903	TPMT110208LF KCP10B	B255	5397516	KSEMP7620FDS71A1M	H82, H93, H99	5413059	CNMG250924RH KCP25B	B55	5417207	T820M035X060R6H-D1 KSP39	M14
5387905	TPMT16T308LF KCP10B	B255	5397517	KSEMP7800FDS71A1M	H82, H93, H99	5413170	CCMT09T312MF KCP25B	B177	5417208	T820M025X045R6H-D1 KSP39	M14
5387907	VBMT160404FP KCP10B	B265	5397518	KSEMP8000FDS80A1M	H82, H93, H99	5413171	CNMG120412CT KCP10B	B48	5417209	T820M025X045R6G-D1 KSP39	M14
5387910	VBMT160412FP KCP10B	B265	5397519	KSEMP8200FDS80A1M	H82, H93, H99	5413172	CNMG120412CT KCP25B	B48	5417220	T820M030X050R6H-D1 KSP32	M14
5387915	WNMG080408RP KCP10B	B159	5397550	KSEMP8255FDS80A1M	H82, H93, H99	5413173	CNMG120412MW KCK15B	B52	5417221	T820M030X050R6H-D1 KSP39	M14
5387919	WNMG080412RP KCP10B	B159	5397551	KSEMP8400FDS80A1M	H82, H93, H99	5413174	CNMG120412RP KCP10B	B53	5417222	T820M030X050R6G-D1 KSP39	M14
5388031	CCMT09T304LF KCP10B	B177	5397552	KSEMP8600FDS80A1M	H82, H93, H99	5413175	CNMG120412RP KCP25B	B53	5417223	T820M050X080R6H-D1 KSP39	M14
5388032	CCMT09T308LF KCP10B	B177	5397553	KSEMP8800FDS80A1M	H82, H93, H99	5413176	CNMG120416RP KCP10B	B53	5417224	T820M040X070R6H-D1 KSP32	M14
5388033	CCMT09T308MF KCP10B	B177	5397554	KSEMP8890FDS80A1M	H82, H93, H99	5413177	CNMG120416RP KCP25B	B53	5417225	T820M040X070R6H-D1 KSP39	M14
5388035	CCMT120408MF KCP10B	B177	5397555	KSEMP9000FDS90A1M	H82, H93, H99	5413178	CNMG160612MN KCP10B	B50	5417226	T820M040X070R6H-D1 KSP39	M14
5388036	CNMG120408MN KCP10B	B50	5397556	KSEMP9200FDS90A1M	H82, H93, H99	5413179	CNMG160612MN KCP25B	B50	5417227	T820M040X070R6G-D1 KSP39	M14
5388037	CNMG120408MW KCP10B	B52	5397557	KSEMP9400FDS90A1M	H82, H93, H99	5413180	CNMG160612RP KCP10B	B53	5417228	T820M050X080R6H-D1 KSP32	M14
5388038	CNMG120408RN KCP10B	B53	5397558	KSEMP9525FDS90A1M	H82, H93, H99	5413181	CNMG160612RP KCP25B	B53	5417229	T820M050X080R6H-D1 KSP39	M14
5388039	CNMG120408RP KCP10B	B53	5397559	KSEMP9600FDS90A1M	H82, H93, H99	5413182	CNMG160616RP KCP10B	B53	5417230	T820M050X080R6H-D4 KSP39	M14
5388061	CNMG120412MN KCP10B	B50	5397560	KSEMP9800FDS90A1M	H82, H93, H99	5413183	CNMG160616RP KCP25B	B53	5417231	T820M050X080R6G-D1 KSP39	M14
5388062	CNMG120412RN KCP10B	B53	5397561	KSEMP10160FDS90A1M	H82, H93, H99	5413184	CPMT060100R6H KCP25B	B190	5417232	T820M060X100R6H-D1 KSP32	M14
5388064	CNMG120416RN KCP10B	B53	5397562	KSEMP7620FDS71B1M	H86, H96	5413185	CPMT09T308LF KCP10B	B190	5417233	T820M060X100R6H-D1 KSP39	M14
5388082	CNMG190612RN KCP10B	B53	5397563	KSEMP8255FDS80B1M	H86, H96	5413186	CPMT09T308LF KCP25B	B190	5417234	T820M060X100R6H-D4 KSP39	M14
5388084	CNMG120412RN KCP10B	B53	5397564	KSEMP8890FDS80B1M	H86, H96	5413187	CPMT09T308MF KCP10B	B190	5417235	T820M060X100R6H-D4 KSP39	M14
5388085	CNMM120412RM KCP10B	B55	5397565	KSEMP9525FDS90B1M	H86, H96	5413188	CPMT09T308MF KCP25B	B190	5417236	T820M060X100R6G-D1 KSP39	M14
5388086	CNMM120412RP KCP10B	B56	5397566	KSEMP10160FDS90B1M	H86, H96	5413189	CPMT09T308MF KCP25B	B190	5417237	T820M070X100R6H-D1 KSP32	M14
5388088	CNMM160612RM KCP10B	B55	5397942	WD50FDS71292M	H102	5413190	DCMT11T308MF KCP10B	B208	5417238	T820M070X100R6H-D1 KSP39	M14
5388089	CNMM160616RP KCP10B	B56	5397943	WD50FDS71452M	H103	5413191	DCMT11T308MF KCP25B	B208	5417239	T820M070X100R6G-D1 KSP39	M14
5388090	CNMM190616RM KCP10B	B55	5397944	WD50FDS80327M	H102	5413193	DNMG110412MN KCP25B	B78	5417240	T820M080X125R6H-D1 KSP32	M14
5388095	DCMT11T308LF KCP10B	B207	5397945	WD50FDS80507M	H103	5413194	DNMG150412RP KCP25B	B76	5417241	T820M080X125R6H-D1 KSP39	M14
5388097	DCMT11T312MF KCP10B	B208	5397946	WD50FDS90362M	H102	5413195	DNMG150412RP KCP10B	B81	5417242	T820M080X125R6H-D4 KSP39	M14
5388111	DNMG150408MN KCP10B	B78	5397947	WD50FDS90562M	H103	5413196	DNMG150412RP KCP25B	B81	5417243	T820M080X125R6G-D1 KSP39	M14
5388112	DNMG150408RN KCP10B	B81	5400814	B272Z06400HPS KN25	G76	5413197	DNMG150608RP KCP10B	B81	5417244	T820M100X150R6H-D1 KSP32	M14
5388116	DNMG150608FN KCP10B	B77	5402877	SNMG120412MR KCM25	B99	5413198	DNMG150608RP KCP25B	B81	5417245	T820M100X150R6H-D1 KSP39	M14
5388117	DNMG150608MN KCP10B	B78	5402879	SNMG120412MR KCP10B	B99	5413199	DNMG150612CT KCP10B	B76	5417246	T820M100X125R6H-D4 KSP39	M14
5393242	CNMG120408RN KCK15B	B53	5402920	SNMG120412MR KCP25B	B99	5413200	DNMG150612MN KCP10B	B78	5417247	T820M100X150R6H-D1 KSP39	M14
5393244	CNMG120408RN KCP40B	B53	5402924	TNMG160408MR KCM25	B126	5413201	DNMG150612RN KCP10B	B81	5417248	T820M060X100R6H-D6 KSP39	M14
5396014	KF2X63Z05S22W009	V40	5402926	TNMG160408MR KCP10B	B126	5413202	DNMG150612RP KCP10B	B81	5417249	T820M080X125R6H-D6 KSP39	M14
5396015	KF2X66Z06S22W009	V40	5402927	TNMG160408MR KCP25B	B126	5413203	CNMG120412RP KCK15B	B101	5417250	T820M100X150R6H-D6 KSP39	M14
5397385	KSEM1270HPGM KCPM45	H45	5402930	TNMG160412MR KCP10B	B126	5413205	VNMG160412RP KCK15B	B147	5417251	T820M120X175R6H-D6 KSP32	M15
5397386	KSEM1293HPGM KCPM45	H45	5402931	TNMG160412MR KCP25B	B126	5413206	WNMG080408RP KCP25B	B159	5417252	T820M120X175R6H-D6 KSP39	M15
5397387	KSEM1400HPGM KCPM45	H45	5402932	TNMG160412MR KCK15B	B126	5413207	WNMG080412RP KCP25B	B159	5417253	T820MF120X125R6H-D4 KSP39	M14
5397388	KSEM1429HPGM KCPM45	H45	5402935	WNMG080408MR KCM25	B157	5413208	WNMG080416RP KCP25B	B159	5417254	T820MF120X150R6H-D4 KSP39	M14
5397389	KSEM1609HPGM KCPM45	H45	5402936	WNMG080408MR KCM35	B157	5413209	DNMM150616RP KCP10B	B83	5417255	T820M120X175R6G-D6 KSP39	M15
5397470	KSEM1620HPGM KCPM45	H45	5402937	WNMG080408MR KCP10B	B157	5413210	CNMM250924RM KCP25B	B55	5417256	T820M140X200R6H-D6 KSP32	M15
5397471	KSEM1667HPGM KCPM45	H45	5402938	WNMG080408MR KCP25B	B157	5413211	SNMM250724RH KCP25B	B102	5417257	T820M140X200R6H-D6 KSP39	M15
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5397474	KSEM1800HPGM KCPM45	H45	5402963	WNMG080412MR KCM35	B157	5413242	SCMT09T308LF KCP10B	B230	5417259	T820MF140X150R6H-D4 KSP39	M15
5397475	KSEM1826HPGM KCPM45	H45	5402964	WNMG080412MR KCP10B	B157	5413249	TNMG160408FN KCP10B	B124	5417260	T820M140X200R6G-D6 KSP39	M15
5397476	KSEM1900HPGM KCPM45	H45	5402965	WNMG080412MR KCP25B	B157	5413250	TNMG160408MN KCP10B	B124	5417261	T820M160X200R6H-D6 KSP32	M15
5397477	KSEM1920HPGM KCPM45	H45	5402966	DNMG150408MR KCM15	B80	5413251	TNMG160412MR KCP10B	B124	5417262	T820M160X200R6H-D6 KSP39	M15
5397478	KSEM1905HPGM KCPM45	H45	5402969	DNMG150408MR KCP10B	B80	5413255	VBMT110304LF KCP10B	B265	5417263	T820MF160X150R6H-D4 KSP39	M15
5397479	KSEM1925HPGM KCPM45	H45	5402980	DNMG150408MR KCP25B	B80	5413256	VBMT160404LF KCP10B	B265	5417264	T820M180X250R6G-D6 KSP39	M15
5397480	KSEM1927HPGM KCPM45	H45	5402983	DNMG150608MR KCM25	B80	5413257	WNMG160408LF KCP10B	B265	5417265	T820M180X250R6H-D6 KSP32	M15
5397481	KSEM1950HPGM KCPM45	H45	5402985	DNMG150608MR KCP10B	B80	5413260	WNMG080408MN KCP10B	B157	5417266	T820M180X250R6H-D6 KSP39	M15
5397482	KSEM1984HPGM KCPM45	H45	5402986	DNMG150608MR KCP25B	B80	5413261	WNMG080408MW KCP10B	B158	5417267	T820MF180X150R6H-D4 KSP39	M15
5397483	KSEM2000HPGM KCPM45	H45	5402987	DNMG150608MR KCK15B	B80	5413263	WNMG160				

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5417277	T830M020X040R6G-D1	KSP39	5417389	T832M080X100R6H-D4	KSP39	5420679	B551A15875DAL	KN15	5434719	B284D05600HPS	KN15
5417278	T830M025X045R6H-D1	KSP39	5417390	T820MF160X150R6H-J	KSU30	5420800	B556A04763DAL	KN15	5434721	B284D05800HPS	KN15
5417279	T830M025X045R6G-D1	KSP39	5417391	T832M100X150R6H-D1	KSP32	5420801	B556A04826DAL	KN15	5434722	B284D05954HPS	KN15
5417280	T830M030X050R6H-D1	KSP32	5417392	T820M180X250R6H-J	KSU30	5420802	B556A06350DAL	KN15	5434723	B284D06000HPS	KN15
5417281	T830M030X050R6G-D1	KSP39	5417393	T832M100X150R6H-D1	KSP39	5420803	B556A06375DAL	KN15	5434724	B284D06400HPS	KN15
5417282	T830M030X050R6G-D1	KSP39	5417394	T820M200X250R6H-J	KSU30	5420804	B556A07938DAL	KN15	5434725	B284D06500HPS	KN15
5417283	T830M035X060R6H-D1	KSP39	5417395	T832MF100X125R6H-D4	KSP32	5420805	B556A09525DAL	KN15	5434726	B284D06746HPS	KN15
5417284	T830M040X070R6H-D1	KSP32	5417396	T832MF100X125R6H-D4	KSP39	5420806	B556A11113DAL	KN15	5434727	B284D06800HPS	KN15
5417285	T830M040X070R6G-D1	KSP39	5417397	T832M120X150R6H-D1	KSP32	5420807	B556A12700DAL	KN15	5434728	B284D07000HPS	KN15
5417286	T830M040X070R6G-D1	KSP39	5417398	T832M120X175R6H-D6	KSP39	5420808	B556A14288DAL	KN15	5434729	B284D07145HPS	KN15
5417287	T830M050X080R6H-D1	KSP32	5417399	T832MF120X150R6H-D4	KSP32	5420809	B556A15875DAL	KN15	5434730	B284D07400HPS	KN15
5417288	T830M050X080R6G-D1	KSP39	5417400	T832MF120X150R6H-D4	KSP39	5420832	HNGX090530MCI	KCK15	5434731	B284D07000HPS	KN15
5417289	T830M050X080R6G-D1	KSP39	5417401	T832M140X200R6H-D6	KSP32	5420836	SNVFX120412ENLD	KCK15	5434732	B284D07541HPS	KN15
5417290	T830M060X100R6H-D1	KSP32	5417402	T832M140X200R6H-D6	KSP39	5420837	SNVFX12042ZENLD	KCK15	5434733	B284D07938HPS	KN15
5417291	T830M060X100R6G-D1	KSP39	5417403	T832MF140X150R6H-D4	KSP32	5420838	SNVFX120412NSNGP	KCK15	5434734	B284D08000HPS	KN15
5417292	T830M060X100R6G-D1	KSP39	5417404	T832MF140X150R6H-D4	KSP39	5420839	SNVFX12042NSNGP	KCK15	5434735	B284D08334HPS	KN15
5417293	T830M070X100R6H-D1	KSP39	5417405	T832M160X200R6H-D6	KSP39	5420840	SNVFX120412SNHE	KCK15	5434736	B284D08500HPS	KN15
5417294	T830M080X125R6H-D1	KSP39	5417406	T832M180X250R6H-D6	KSP39	5420841	SNVFX12042ZSNHE	KCK15	5434737	B284D09000HPS	KN15
5417295	T830M080X125R6H-D1	KSP39	5417407	T832M180X250R6H-D6	KSP39	5420842	SNVFX12042ZENLDW	KCK15	5434738	B284D09000HPS	KN15
5417296	T830MF080X100R6H-D4	KSP32	5417408	T832M200X250R6H-D6	KSP32	5425492	WNMG080408RN	KCP25B	5434739	B284D09219HPS	KN15
5417297	T830MF080X100R6H-D4	KSP39	5417409	T832M200X250R6H-D6	KSP39	5425545	SNMG160612RN	KCP25B	5434740	B284D09500HPS	KN15
5417298	T830M080X125R6G-D1	KSP39	5417410	T830M030X050R6H-J	KSU31	5425546	CNMG160616RN	KCP25B	5434741	B284D09525HPS	KN15
5417299	T830M100X150R6H-D1	KSP32	5417411	T830M030X050R6H-J	KSU30	5425547	CNMG190616MN	KCP25B	5434742	B284D09921HPS	KN15
5417300	T830M100X150R6H-D1	KSP39	5417412	T830M040X070R6H-J	KSU31	5425548	DNMG150412MN	KCP25B	5434743	B284D10000HPS	KN15
5417301	T830MF100X125R6H-D4	KSP32	5417413	T830M040X070R6H-J	KSU30	5425549	DNMG150412RN	KCP25B	5434744	B284D10200HPS	KN15
5417302	T830MF100X125R6H-D4	KSP39	5417414	T830M050X080R6H-J	KSU31	5425581	RNMG120400RN	KCP10B	5434745	B284D10320HPS	KN15
5417303	T830M100X150R6H-D1	KSP39	5417415	T830M050X080R6H-J	KSU30	5425582	SNMG090308MN	KCP10B	5434746	B284D10500HPS	KN15
5417304	T830M060X100R6H-D6	KSP39	5417416	T830M060X100R6H-J	KSU31	5425583	SNMG120412MN	KCP10B	5434747	B284D10716HPS	KN15
5417305	T830M080X125R6H-D6	KSP39	5417417	T830M060X100R6H-J	KSU30	5425584	SNMG120412RN	KCP10B	5434748	B284D11000HPS	KN15
5417306	T830M100X150R6H-D6	KSP39	5417418	T830M080X125R6H-J	KSU30	5425585	SNMG120416RN	KCP10B	5434749	B284D11113HPS	KN15
5417307	T830M120X175R6H-D6	KSP32	5417419	T830M080X125R6H-J	KSU31	5425586	SNMG150612MN	KCP10B	5434750	B284D11908HPS	KN15
5417308	T830M120X175R6H-D6	KSP39	5417420	T830M100X150R6H-J	KSU30	5425587	SNMG150612RN	KCP10B	5434751	B284D12000HPS	KN15
5417309	T830MF120X150R6H-D4	KSP39	5417421	T830M100X150R6H-J	KSU31	5425588	TNMG160412MN	KCP10B	5434752	B284D12500HPS	KN15
5417310	T830MF120X150R6H-D4	KSP32	5417422	T830M120X175R6H-J	KSU30	5425589	TNMG160412RN	KCP10B	5434753	B284D12700HPS	KN15
5417311	T830MF120X150R6H-D4	KSP39	5417423	T830MF120X150R6H-J	KSU30	5425591	VNMG160408MN	KCP10B	5434754	B284D14000HPS	KN15
5417312	T830M120X175R6G-D6	KSP39	5417424	T830MF120X150R6H-J	KSU30	5425592	VNMG060408RN	KCP10B	5434755	B284D14288HPS	KN15
5417313	T830M140X200R6H-D6	KSP32	5417425	T830MF140X150R6H-J	KSU30	5425593	WNMG080412MN	KCP10B	5434756	B284D15875HPS	KN15
5417314	T830M140X200R6H-D6	KSP39	5417426	T830M140X200R6H-J	KSU30	5425594	WNMG080412RN	KCP10B	5434757	B284D19050HPS	KN15
5417315	T830MF140X150R6H-D4	KSP32	5417427	T830MF160X150R6H-J	KSU30	5425595	WNMG080416RN	KCP10B	5434758	B284D20000HPS	KN15
5417316	T830MF140X150R6H-D4	KSP39	5417428	T830M160X200R6H-J	KSU30	5425596	RNMG090300RN	KCP25B	5434759	B285D03000HPS	KN15
5417317	T830M140X200R6G-D6	KSP39	5417429	T830M180X250R6H-J	KSU30	5425597	RNMG120400RN	KCP25B	5434760	B285D03000HPS	KN15
5417318	T830M160X200R6H-D6	KSP39	5417430	T830M200X250R6H-J	KSU30	5425598	SNMG090308MN	KCP25B	5434761	B285D03200HPS	KN15
5417319	T830MF160X150R6H-D4	KSP39	5418689	SNHJ120616ENLD	KC520M	5425599	SNMG120412RN	KCP25B	5434762	B285D03300HPS	KN15
5417320	T830M160X200R6G-D6	KSP39	5418800	SNHJ120616ENLD	KC725M	5425600	SNMG120412RN	KCP25B	5434763	B285D04000HPS	KN15
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5417322	T830MF180X150R6H-D4	KSP39	5418802	SNHJ120616ENLD	KCK15	5425602	SNMG150612RN	KCP25B	5434765	B285D04200HPS	KN15
5417323	T830M200X250R6H-D6	KSP39	5418803	SNHJ120608ENLD	KC520M	5425603	SNMG150612RN	KCP25B	5434766	B285D04500HPS	KN15
5417324	T830M220X250R6H-D6	KSP39	5418804	SNHJ120608ENLD	KC725M	5425604	TNMG160412MN	KCP25B	5434767	B285D04763HPS	KN15
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5417327	T830M300X350R6H-D6	KSP39	5418807	SNHJ10T308ENLD	KC520M	5425607	VNMG160408MN	KCP25B	5434770	B285D05000HPS	KN15
5417328	T830M330X350R6H-D6	KSP39	5418808	SNHJ10T308ENLD	KC725M	5430965	WNMG080412RN	KCK15B	5434771	B285D05100HPS	KN15
5417329	T830M360X400R6H-D6	KSP39	5418809	SNHJ10T308ENLD	KCK15	5430966	CNMG160612RN	KCP10B	5434772	B285D05200HPS	KN15
5417330	T820M030X050R6H-J	KSU31	5418810	SNHJ10T308ENLD	KCPK30	5430967	CNMG160616RN	KCP10B	5434773	B285D05500HPS	KN15
5417331	T820M030X050R6G-D1	KSP39	5418811	SNHJ10T312ENLD	KC725M	5430968	CNMG190616MN	KCP10B	5434774	B285D0558HPS	KN15
5417332	T820M040X070R6H-J	KSU31	5418812	SNHJ10T312ENLD	KCK15	5430969	DNMG150404MN	KCP10B	5434775	B285D05600HPS	KN15
5417333	T820M040X070R6G-D1	KSP39	5419993	SNPF120412NSNGP	KCK15	5431070	DNMG150412MN	KCP10B	5434776	B285D06000HPS	KN15
5417334	T820M050X080R6H-J	KSU31	5419998	KSSM87D005Z05SN12	S62	5431071	DNMG150412RN	KCP10B	5434777	B285D06300HPS	KN15
5417335	T820M050X080R6G-D1	KSP39	5420110	KSSM87D063Z05SN12	S62	5431591	CW16	S32-381	5434778	B285D06400HPS	KN15
5417336	T820M060X100R6H-J	KSU31	5420111	KSSM87D063Z07SN12	S62	5434658	PDC251A04763DA	KD1415	5434779	B285D06500HPS	KN15
5417337	T820M060X100R6G-D1	KSP32	5420112	KSSM87D080Z07SN12	S62	5434659	PDC251A06350DA	KD1415	5434780	B285D06600HPS	KN15
5417338	T820M060X100R6H-D1	KSP39	5420113	KSSM87D080Z09SN12	S62	5434690	PDC251A07938DA	KD1415	5434781	B285D06700HPS	KN15
5417339	T820M080X125R6H-J	KSU30	5420114	KSSM87D100Z08SN12	S62	5434691	PDC251A09525DA	KD1415	5434782	B285D07000HPS	KN15
5417340	T820M080X125R6G-D1	KSP39	5420115	KSSM87D100Z12SN12	S62	5434692	PDC251A11113DA	KD1415	5434783	B285D07145HPS	KN15
5417341	T820M100X150R6H-J	KSU31	5420116	KSSM87D1125Z09SN10	S62	5434693	PDC251A12700DA	KD1415	5434784	B285D07700HPS	KN15
5417342	T820M100X150R6G-D1	KSP32	5420117	KSSM87D125Z14SN12	S62	5434697	B284D03000HPS	KN15	5434786	B285D07800HPS	KN15
5417343	T820M100X150R6H-D1	KSP39	5420118	KSSM87D160Z12SN12	S62	5434699	B284D03175HPS	KN15	5434787	B285D07938HPS	KN15
5417344	T820M120X175R6H-J	KSU30	5420163	KSSM88D050Z05SN10	S60	5434700	B284D03200HPS	KN15	5434788	B285D08334HPS	KN15
5417345	T820M120X175R6G-D1	KSP39	5420164	KSSM88D050Z06SN10	S60	5434701	B284D03300HPS	KN15	5434789	B285D08400HPS	KN15
5417346	T820M140X200R6H-J	KSU30	5420165	KSSM88D063Z05SN10	S60	5434702	B284D03500HPS	KN15	5434790	B285D08500HPS	KN15
5417347	T820M140X200R6G-D1	KSP39	5420166	KSSM88D063Z07SN10	S60	5434704	B284D03571HPS	KN15	5434791	B285D08733HPS	KN15
5417348	T820M160X200R6H-J	KSU30	5420167	KSSM88D080Z07SN10	S60	5434706	B284D03970HPS	KN15	5434792	B285D09000HPS	KN15
5417349	T820M160X200R6G-D1	KSP32	5420168	KSSM88D080Z09SN10	S60	5434707	B284D04000HPS	KN15	5434793	B285D09300HPS	KN15
5417350	T820M180X250R6H-J	KSU30	5420169	KSSM88D100Z08SN10	S60	5434709	B284D04000HPS	KN15	5434794	B285D09500HPS	KN15
5417351	T820M180X250R6G-D1	KSP39	5420250	KSSM88D100Z11SN10	S60	5434710	B284D04366HPS	KN15	5434795	B285D09525HPS	KN15
5417352	T820M200X250R6H-J	KSU30	5420672	B551A04763DAL	KN15	5434712	B284D04500HPS	KN15	5434796	B285D10000HPS	KN15
5417353	T820M200X250R6G-D1	KSP32	5420673	B551A06350DAL	KN15	5434713	B284D04763HPS	KN			

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5434803	B285D14500HPS KN15	G90	5479781	T820MF100X100R6H-D4 KSP39	M14	5506106	B271209000HPG KCPK20	G75	5506341	B272207938HPG KCPK20	G77
5434804	B285D18000HPS KN15	G90	5479782	T820MF120X100R6H-D4 KSP39	M14	5506107	B274207700HPG KCPK20	G80	5506342	B272208000HPG KCPK20	G77
5477295	EDPT140408PDERHD2 KC725M	T53, T62	5479783	T820MF140X100R6H-D4 KSP39	M15	5506108	B271209100HPG KCPK20	G75	5506343	B272208334HPG KCPK20	G77
5477296	EDPT140408PDERHD2 KCKP30	T53, T62	5479784	T820MF160X100R6H-D4 KSP39	M15	5506109	B274207938HPG KCPK20	G80	5506344	B272208433HPG KCPK20	G77
5477297	EDPT140408PDERHD2 KCK15	T53, T62	5479785	T820MF180X200R6H-D4 KSP39	M15	5506110	B271209200HPG KCPK20	G75	5506345	B272208500HPG KCPK20	G77
5477299	EDPT140408PDERHD2 KC522M	T53, T62	5479786	T820MF200X150R6H-D4 KSP39	M15	5506111	B274208000HPG KCPK20	G80	5506346	B272208733HPG KCPK20	G77
5479648	T820NC#04-40R2B-D1 KSP39	M16	5479787	T820MF200X200R6H-D4 KSP39	M15	5506112	B271209500HPG KCPK20	G75	5506347	B272209000HPG KCPK20	G77
5479649	T820NC#04-40R3B-D1 KSP39	M17	5479788	T820MF220X150R6H-D4 KSP39	M15	5506113	B274208334HPG KCPK20	G80	5506348	B272209100HPG KCPK20	G77
5479690	T820NC#05-40R2B-D1 KSP39	M16	5479789	T820MF220X200R6H-D4 KSP39	M15	5506114	B271209525HPG KCPK20	G75	5506349	B272209500HPG KCPK20	G77
5479691	T820NC#06-32R2B-D1 KSP39	M16	5479790	T820MF240X150R6H-D4 KSP39	M15	5506115	B274208500HPG KCPK20	G80	5506350	B272209525HPG KCPK20	G77
5479692	T820NC#06-32R3B-D1 KSP39	M17	5479864	KTIP0983HPM KCP15	H26	5506116	B271209750HPG KCPK20	G75	5506351	B272209750HPG KCPK20	G77
5479693	T820NF#06-40R2B-D1 KSP39	M16	5489410	WNMG080416MM KCP25B	B157	5506117	B274208700HPG KCPK20	G80	5506352	B272210000HPG KCPK20	G77
5479694	T820NC#08-32R2B-D1 KSP39	M16	5490089	CNMG190616RP KCPK05	B53	5506118	B271210000HPG KCPK20	G75	5506353	B272210200HPG KCPK20	G77
5479695	T820NC#08-32R3B-D1 KSP39	M17	5491717	RIQ06EDR06 KD1415	K56	5506119	B274209000HPG KCPK20	G80	5506354	B272210500HPG KCPK20	G77
5479696	T820NC#10-24R2B-D1 KSP39	M16	5492520	B269A04550HP KCPK15	G68	5506120	B271210200HPG KCPK20	G75	5506355	B272210716HPG KCPK20	G77
5479697	T820NF#10-32R2B-D1 KSP39	M16	5497332	RIQ09EDR06 KD1415	K56	5506121	B274209525HPG KCPK20	G80	5506356	B272211000HPG KCPK20	G77
5479698	T820NF#10-32R3B-D1 KSP39	M17	5497351	CFM0402R00RHP KCJ40	H34	5506122	B271210500HPG KCPK20	G75	5506357	B272211500HPG KCPK20	G77
5479699	T820NC02500-20R2B-D1 KSP39	M16	5505778	B271Z02383KMG KCPK20	G74	5506123	B274210000HPG KCPK20	G80	5506358	B272211800HPG KCPK20	G77
5479700	T820NF02500-28R2B-D1 KSP39	M16	5505779	B271Z02500KMG KCPK20	G74	5506124	B271210716HPG KCPK20	G75	5506359	B272212000HPG KCPK20	G77
5479701	T820NF02500-28R3B-D1 KSP39	M17	5505938	KTMDUSREW1	W29-31	5506125	B274210200HPG KCPK20	G80	5506360	B272212500HPG KCPK20	G77
5479702	T820NC03125-18R2B-D1 KSP39	M16	5506030	B271Z02642KMG KCPK20	G74	5506126	B271Z10800HPG KCPK20	G75	5506361	B272212700HPG KCPK20	G77
5479703	T820NF03125-24R2B-D1 KSP39	M16	5506031	B271Z02705KMG KCPK20	G74	5506127	B274210500HPG KCPK20	G80	5506362	B272213000HPG KCPK20	G77
5479704	T820NF03125-24R3B-D1 KSP39	M17	5506032	B271Z02779KMG KCPK20	G74	5506128	B271Z11000HPG KCPK20	G75	5506363	B272213100HPG KCPK20	G77
5479705	T820NC03750-16R2B-D1 KSP39	M16	5506033	B271Z02820KMG KCPK20	G74	5506129	B274210716HPG KCPK20	G80	5506364	B272213500HPG KCPK20	G77
5479706	T820NF03750-24R2B-D1 KSP39	M16	5506034	B271Z03000HPG KCPK20	G74	5506130	B271Z11500HPG KCPK20	G75	5506365	B272214000HPG KCPK20	G77
5479707	T820NF03750-24R3B-D1 KSP39	M17	5506035	B271Z03175HPG KCPK20	G74	5506131	B274211000HPG KCPK20	G80	5506366	B272214500HPG KCPK20	G77
5479708	T820NC04375-14R2B-D6 KSP39	M16	5506036	B271Z03200HPG KCPK20	G74	5506132	B271Z12000HPG KCPK20	G75	5506367	B272215000HPG KCPK20	G77
5479709	T820NF04375-20R2B-D6 KSP39	M16	5506037	B271Z03500HPG KCPK20	G74	5506133	B274211800HPG KCPK20	G80	5506368	B272215000HPG KCPK20	G77
5479710	T820NF04375-20R3B-D6 KSP39	M17	5506038	B271Z03600HPG KCPK20	G74	5506134	B274212000HPG KCPK20	G80	5506369	B272215500HPG KCPK20	G77
5479711	T820NC05000-13R2B-D6 KSP39	M16	5506039	B271Z03700HPG KCPK20	G74	5506135	B271Z12500HPG KCPK20	G75	5506370	B272215875HPG KCPK20	G77
5479712	T820NF05000-20R2B-D6 KSP39	M16	5506040	B271Z03970HPG KCPK20	G74	5506136	B271Z12000HPG KCPK20	G75	5506371	B272216000HPG KCPK20	G77
5479713	T820NF05000-20R3B-D6 KSP39	M17	5506041	B271Z03970HPG KCPK20	G74	5506137	B274211500HPG KCPK20	G80	5507556	TNMG220408MP KCP10B	B125
5479714	T820NC05625-12R2B-D6 KSP39	M16	5506042	B271Z04000HPG KCPK20	G74	5506138	B271Z12500HPG KCPK20	G75	5507610	TNMG220408FN KCP10B	B124
5479715	T820NF05625-18R2B-D6 KSP39	M16	5506043	B271Z04673HPG KCPK20	G74	5506139	B274211800HPG KCPK20	G80	5507611	WNMG080408FW KCP10B	B156
5479716	T820NC06250-11R2B-D6 KSP39	M16	5506044	B271Z04763HPG KCPK20	G74	5506140	B271Z12000HPG KCPK20	G75	5507612	WNMG080408FN KCP10B	B159
5479717	T820NF06250-18R2B-D6 KSP39	M16	5506045	B271Z04800HPG KCPK20	G74	5506141	B274212000HPG KCPK20	G80	5511788	B273202383KMG KCPK20	G78
5479718	T820NC07500-10R2B-D6 KSP39	M16	5506046	B271Z05000HPG KCPK20	G74	5506142	B271Z13000HPG KCPK20	G75	5511789	B273202500KMG KCPK20	G78
5479719	T820NF07500-16R2B-D6 KSP39	M16	5506047	B271Z05000HPG KCPK20	G74	5506143	B274212500HPG KCPK20	G80	5511930	B273202600KMG KCPK20	G78
5479720	T820NC08750-9R2B-D6 KSP39	M16	5506048	B271Z05260HPG KCPK20	G74	5506144	B271Z13500HPG KCPK20	G75	5511933	B27320283KMG KCPK20	G78
5479721	T820NF08750-14R2B-D6 KSP39	M16	5506049	B271Z05410HPG KCPK20	G74	5506145	B274212700HPG KCPK20	G80	5511934	B273203175HPG KCPK20	G78
5479722	T820NC10000-8R2B-D6 KSP39	M16	5506060	B271Z05558HPG KCPK20	G74	5506146	B271Z14000HPG KCPK20	G75	5511935	B273203500HPG KCPK20	G78
5479723	T820NF10000-12R2B-D6 KSP39	M16	5506061	B271Z05558HPG KCPK20	G74	5506147	B274213000HPG KCPK20	G80	5511936	B273204000HPG KCPK20	G78
5479724	T830NC#04-40R2B-D1 KSP39	M49	5506062	B274Z02383KMG KCPK20	G79	5506148	B271Z14288HPG KCPK20	G75	5511937	B273204500HPG KCPK20	G78
5479725	T830NC#04-40R3B-D1 KSP39	M49	5506063	B271Z05800HPG KCPK20	G74	5506149	B271Z14500HPG KCPK20	G75	5511938	B273205000HPG KCPK20	G78
5479726	T830NC#05-40R2B-D1 KSP39	M46	5506064	B274Z02500KMG KCPK20	G79	5506150	B271Z15000HPG KCPK20	G75	5511939	B273205000HPG KCPK20	G78
5479727	T830NC#06-32R2B-D1 KSP39	M46	5506065	B271Z05900HPG KCPK20	G74	5506151	B271Z15875HPG KCPK20	G75	5511940	B273205500HPG KCPK20	G78
5479728	T830NC#06-32R3B-D1 KSP39	M49	5506066	B271Z06000HPG KCPK20	G74	5506152	B271Z16000HPG KCPK20	G75	5511941	B273205800HPG KCPK20	G78
5479729	T830NF#06-40R2B-D1 KSP39	M46	5506067	B274Z02600KMG KCPK20	G79	5506153	B272Z02383KMG KCPK20	G76	5511942	B273206000HPG KCPK20	G78
5479730	T830NC#08-32R2B-D1 KSP39	M46	5506068	B274Z02600KMG KCPK20	G79	5506154	B272Z03000HPG KCPK20	G76	5511943	B273206350HPG KCPK20	G78
5479731	T830NC#08-32R3B-D1 KSP39	M49	5506069	B271Z06200HPG KCPK20	G74	5506155	B272Z03175HPG KCPK20	G76	5511944	B273206500HPG KCPK20	G78
5479732	T830NC#10-24R2B-D1 KSP39	M46	5506070	B274Z02800KMG KCPK20	G79	5506156	B272Z03175HPG KCPK20	G76	5511945	B273206746HPG KCPK20	G78
5479733	T830NF#10-32R2B-D1 KSP39	M46	5506071	B271Z06350HPG KCPK20	G74	5506157	B272Z02400KMG KCPK20	G76	5511946	B273207000HPG KCPK20	G78
5479734	T830NF#10-32R3B-D1 KSP39	M49	5506072	B274Z03000HPG KCPK20	G79	5506158	B272Z02489KMG KCPK20	G76	5511947	B273207500HPG KCPK20	G78
5479735	T830NC#10-32R2B-D1 KSP39	M46	5506073	B271Z06528HPG KCPK20	G75	5506159	B272Z02500KMG KCPK20	G76	5511948	B273208000HPG KCPK20	G78
5479736	T830NC02500-20R2B-D1 KSP39	M46	5506074	B274Z03175HPG KCPK20	G79	5506303	B272Z02779KMG KCPK20	G76	5511949	B273208000HPG KCPK20	G78
5479737	T830NF02500-28R2B-D1 KSP39	M46	5506075	B271Z06528HPG KCPK20	G75	5506305	B272Z03000HPG KCPK20	G76	5511950	B273208500HPG KCPK20	G78
5479738	T830NF02500-28R3B-D1 KSP39	M49	5506076	B271Z06528HPG KCPK20	G75	5506306	B272Z03175HPG KCPK20	G76	5511951	B273208733HPG KCPK20	G78
5479739	T830NC03125-18R2B-D1 KSP39	M46	5506077	B271Z06746HPG KCPK20	G75	5506307	B272Z03300HPG KCPK20	G76	5511952	B273209000HPG KCPK20	G78
5479760	T830NF03125-24R2B-D1 KSP39	M46	5506078	B274Z03500HPG KCPK20	G79	5506308	B272Z03500HPG KCPK20	G76	5511953	B273210000HPG KCPK20	G78
5479761	T830NF03125-24R3B-D1 KSP39	M49	5506079	B271Z06900HPG KCPK20	G75	5506309	B272Z03850HPG KCPK20	G76	5511954	B273210500HPG KCPK20	G78
5479762	T830NC03750-16R2B-D1 KSP39	M46	5506080	B274Z04000HPG KCPK20	G79	5506310	B272Z03970HPG KCPK20	G76	5511955	B273210000HPG KCPK20	G78
5479763	T830NF03750-14R2B-D6 KSP39	M46	5506081	B271Z07000HPG KCPK20	G75	5506311	B272Z04000HPG KCPK20	G76	5511956	B273211500HPG KCPK20	G78
5479764	T830NF03750-24R3B-D1 KSP39	M49	5506082	B274Z04300HPG KCPK20	G79	5506312	B272Z04500HPG KCPK20	G76	5511957	B273212000HPG KCPK20	G78
5479765	T830NC04375-14R2B-D6 KSP39	M46	5506083	B271Z07145HPG KCPK20	G75	5506313	B272Z04623HPG KCPK20	G76	5511958	B273212500HPG KCPK20	G78
5479766	T830NF04375-20R2B-D6 KSP39	M46	5506084	B274Z04500HPG KCPK20	G79	5506314	B272Z04763HPG KCPK20	G76	5511959	B273212700HPG KCPK20	G78
5479767	T830NF04375-20R3B-D6 KSP39	M49	5506085	B271Z07541HPG KCPK20	G75	5506315	B272Z05000HPG KCPK20	G76	5511960	B273213000HPG KCPK20	G78
5479768	T830NC05000-13R2B-D6 KSP39	M46	5506086	B274Z05000HPG KCPK20	G79	5506316	B272Z05200HPG KCPK20	G76	5511961	B273213500HPG KCPK20	G78
5479769	T830NF05000-20R2B-D6 KSP39	M46	5506087	B271Z07541HPG KCPK20	G75	5506317	RCMT2006MOUN KCP10B	E60	5511962	B273214000HPG KCPK20	G78
5479770	T830NF05000-20R3B-D6 KSP39	M49	5506088	B274Z05000HPG KCPK20	G79	5506318	B272Z05260HPG KCPK20	G76	5511963	B273214288HPG KCPK20	G78
5479771	T830NC05625-12R2B-D6 KSP39	M46	5506089	B271Z07938HPG KCPK20	G75	5506319	RCMT2006MOUN KCP25B	E60	5511964	B273214500HPG KCPK20	G78
5479772	T830NF05625-18R2B-D6 KSP39	M46	5506090	B274Z05100HPG KCPK20	G79	5506320	B272Z05500HPG KCPK20	G76	5511965		

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5515179	KSEM4000HPCCLM KC7410	H49, H87	5528630	M4D025202B25LN15	T15	5533151	EC020M02R06CF02 KCU25	C24	5534147	SPGX060304FP KCU40	J90
5515220	KSEMP3500HPGM KC7315	H87	5528631	M4D032203B32LN15	T15	5533156	EC020M02N00CR02 KCU25	C27	5534148	SPGX060304RHP KCU40	J89
5515221	KSEMP3600HPGM KC7315	H87	5528632	M4D040204S16LN15	T17	5533171	EC060M06L06CR04 KCU25	C27	5534149	SPGX060304MD KCU40	J89
5515222	KSEMP3700HPGM KC7315	H87	5528633	M4D050205S22LN15	T17	5533172	EC060M06R06CR04 KCU25	C27	5534230	SPGX070304FP KCU40	J90
5515223	KSEMP3800HPGM KC7315	H87	5528634	M4D050206S22LN15	T17	5533173	EC080M08L06CR04 KCU25	C27	5534231	SPGX070304RHP KCU40	J89
5515224	KSEMP3900HPGM KC7315	H87	5528635	M4D063206S22LN15	T17	5533174	EC080M08R06CR04 KCU25	C27	5534232	SPGX070304MD KCU40	J89
5515225	KSEMP4000HPGM KC7315	H87	5528636	M4D063207S22LN15	T17	5533178	EG380110U3GUP KCU25	C19	5534233	SPGX070304FP KCU40	J90
5515226	KSEMP2900HPGM KCPM45	H46	5528637	M4D080207S27LN15	T17	5533179	EG06311FU05GUN KCU25	C23	5534234	SPPX09T308RHP KCU40	J89
5515746	LNGU15T612SRGE KC520M	T19	5528638	M4D100208S32LN15	T17	5533210	EG380110U3GUP KCU25	C23	5534235	SPPX09T308MD KCU40	J89
5515747	LNGU15T612SRGE KC522M	T19	5528977	OFK07L6AFENGB KCSM30	S55	5533212	EG0512M05U04GUP KCU25	C17	5534236	SPPX120408FP KCU40	J90
5515748	LNGU15T612SRGE KC725M	T19	5531233	CNGG120401FS KCU10	B46	5533214	EG0512M05U08GUP KCU25	C17	5534237	SPPX120408RHP KCU40	J89
5515749	LNGU15T612SRGE KCK15	T19	5531234	CNGG120402FS KCU10	B46	5533216	EG0712M06U08GUP KCU25	C17	5534238	SPPX120408MD KCU40	J89
5515759	LNGU15T608SRGE KCS20M	T19	5531235	CNGG120404FS KCU10	B46	5533220	EG1012M10U12GUP KCU25	C17	5534239	SPPX09T308FP KCU40	J90
5515890	LNGU15T608SRGE KC522M	T19	5531236	CNGG120408FS KCU10	B46	5533221	EG0512M05U04GUP KCU25	C22	5534250	SPPX15T508RHP KCU40	J89
5515891	LNGU15T608SRGE KC725M	T19	5531238	CNMG190612MS KCU10	B52	5533222	EG0512M05U08GUP KCU25	C22	5534251	SPPX15T508MD KCU40	J89
5515892	LNGU15T608SRGE KCP15	T19	5531240	SNMG150616MP KCU10	B98	5533223	EG1012M10U12GUP KCU25	C22	5534252	SPGX060304FP KCU25	J90
5515893	LNGU15T608SRGE KCPK30	T19	5531241	TCGT16T301LF KCU10	B243	5533361	ER130I03U00GUP KCU25	C21	5534253	SPGX060304RHP KCU25	J89
5516070	LNGU15T612SRGE KCPK30	T19	5531835	CNMG120404FP KCP25B	B49	5533363	ER192I04U00GUP KCU25	C21	5534254	SPGX060304MD KCU25	J89
5516073	LNGU15T604SRGE KCS20M	T19	5531836	CNMG120404FN KCP10B	B49	5533365	ER25106U00GUP KCU25	C21	5534255	SPGX070304FP KCU25	J90
5516074	LNGU15T604SRGE KC522M	T19	5531837	CNMG120404FN KCK15B	B49	5533367	ER317I08U00GUP KCU25	C21	5534256	SPGX070304RHP KCU25	J89
5516075	LNGU15T604SRGE KC725M	T19	5531838	CNMG120404FN KCP25B	B49	5533368	ER130I03U00GUP KCU25	C24	5534257	SPGX070304MD KCU25	J89
5516076	LNGU15T604SRGE KCK15	T19	5531839	CNMG120408FN KCP10B	B49	5533369	ER192I04U00GUP KCU25	C24	5534258	SPPX120408FP KCU25	J90
5516077	LNGU15T604SRGE KCPK30	T19	5531890	CNMG120408FN KCP25B	B49	5533370	ER25106U00GUP KCU25	C24	5534259	SPPX09T308RHP KCU25	J89
5517575	RCGT2006MOSGFJ KCSM30	V83	5531891	CNMG120408FP KCP10B	B49	5533371	ER317I08U00GUP KCU25	C24	5534260	SPPX09T308MD KCU25	J89
5517600	SNMM190624RW KCP25B	B103	5531892	CNMG120408FP KCP25B	B49	5533348	EC014M1BL06CL01 KCU25	C25	5534261	SPPX120408FP KCU25	J90
5517760	RPE1204MOEJEL KCSM30	V73	5531893	CNMG120412FN KCP25B	B49	5533449	EC014M1BR06CL01 KCU25	C25	5534262	SPPX120408RHP KCU25	J89
5517761	RPE1204MOSGEJ KCSM30	V73	5531894	CNMG120412FN KCP10B	B49	5533510	EC020M02L06CL02 KCU25	C25	5534263	SPPX120408MD KCU25	J89
5517764	RPE1605MOSGEJ KCSM30	V79	5531896	DNMG110404FN KCP10B	B77	5533511	EC020M02R06CL02 KCU25	C25	5534264	SPGX15T508FP KCU25	J90
5517767	WOEJ090512SRGD KCSM30	V41	5531897	DNMG110408FN KCP25B	B77	5533512	EC030M03L06CL02 KCU25	C25	5534265	SPPX15T508RHP KCU25	J89
5517773	RNGJ1204MOELDJ KCSM30	V57	5531898	DNMG150404FN KCK15B	B77	5533513	EC030M03R06CL02 KCU25	C25	5534266	SPPX15T508MD KCU25	J89
5517778	RNGJ10T3MOSGDJ KCSM30	V51	5531899	DNMG150404FN KCP25B	B77	5533514	EC040M04L06CL02 KCU25	C25	5534267	SPGX060304FP KCPK10	J90
5518566	DNMG150612MR KCP25B	B80	5531900	DNMG150408FN KCP10B	B77	5533515	EC040M04R06CL02 KCU25	C25	5534268	SPGX070304FP KCPK10	J90
5519287	EDPT070308PDSRGE KCSM30	T25	5531901	DNMG150604FN KCP10B	B77	5533516	EC014M1BL06CF01 KCU25	C24	5534269	SPPX09T308FP KCPK10	J90
5519923	SDET1204PDSRGE KCSM30	T105, T112, U51	5531902	DNMG150604FN KCK15B	B77	5533517	EC014M1BR06CF01 KCU25	C24	5534270	SPPX120408FP KCPK10	J90
5519967	SDCT120432ENL2D KCSM30	T104, T111, U51	5531903	DNMG150604FN KCP25B	B77	5533518	EC050M05N00CF03 KCU25	C24	5534271	SPPX15T508FP KCPK10	J90
5519983	EDPT140431PDERHD KCSM30	T53, T62	5531904	DNMG150608FP KCP10B	B77	5533519	EC014M1BL06CF01 KCU25	C26	5534272	ER0312M03U00GUP KCU25	J20
5520493	EDPT140416PDERHD KCSM30	T53, T62	5531905	DNMG150608FP KCP25B	B77	5533520	EC014M1BR06CF01 KCU25	C26	5534276	ER0412M04U00GUP KCU25	C20
5520494	EDPT140440PDERHD KCSM30	T53, T62	5531906	DNMG150608FN KCP25B	B77	5533521	EC020M02L06CM02 KCU25	C26	5534278	ER0512M05U00GUP KCU25	C20
5520684	EDPT10T316PDERHD KCSM30	T36	5531907	DNMG150608FN KCK15B	B77	5533522	EC020M02R06CM02 KCU25	C26	5534290	ER0612M06U00GUP KCU25	C20
5520687	SPCT10T316ENL2D KCSM30	T100, U36	5531908	DNMG150612FN KCP10B	B77	5533523	EC050M05N00CM03 KCU25	C26	5534292	ER0812M08U00GUP KCU25	C20
5520736	T353M040X070R6HX-D1 KCK17	M59	5531908	DNMG150612FN KCP10B	B77	5533524	EC070M06N00CM04 KCU25	C26	5534293	ER0312M03U00GUP KCU25	C23
5520737	T353M050X080R6HX-D1 KCK17	M59	5531909	SNMG090308FN KCK15B	B97	5533525	EC080M08N00CM04 KCU25	C26	5534294	ER0412M04U00GUP KCU25	C23
5520738	T353M060X100R6HX-D1 KCK17	M59	5531910	SNMG120404FN KCP10B	B97	5533526	EC050M05N00CR03 KCU25	C27	5534295	ER0512M05U00GUP KCU25	C23
5520739	T353M080X125R6HX-D1 KCK17	M59	5531911	M4D025202M12LN15	T14	5533527	EC070M06N00CR04 KCU25	C27	5534296	ER0612M06U00GUP KCU25	C23
5520790	T353M100X150R6HX-D1 KCK17	M59	5531912	M4D032203M16LN15	T14	5533528	EC020M02L06CR02 KCU25	C27	5534297	ER0812M08U00GUP KCU25	C23
5520791	T353M120X175R6HX-D6 KCK17	M59	5531913	M4D040205M16LN15	T14	5533529	EC020M02R06CR02 KCU25	C27	5534282	CNMG120404FP KCP10B	B48
5520792	T353M140X200R6HX-D6 KCK17	M59	5531914	M4D040203B32LN15	T15	5533546	DFR020204LD KCU25	J84	5535020	CNMG120408CT KCP25B	B48
5520793	T351M060X100R6HX-D1 KCK17	M58	5531915	M4D025202A25LN15L10	T16	5533547	DFR030204LD KCU25	J84	5535021	CNMG120408FP KCP10B	B76
5520794	T351M070X100R6HX-D1 KCK17	M58	5531916	M4D025202A25LN15L170	T16	5533548	DFR040304LD KCU25	J84	5535022	DNMG120408FP KCP10B	B48
5520795	T351M080X125R6HX-D1 KCK17	M58	5531917	M4D032203A32LN15L110	T16	5533549	DFR020204LD KCPK10	J84	5535023	DNMG110408CT KCP10B	B76
5520796	T351M090X125R6HX-D1 KCK17	M58	5531918	M4D032203A32LN15L200	T16	5533590	DFR030204LD KCPK10	J84	5535024	DNMG150408FP KCP10B	B78
5520798	T351M100X150R6HX-D1 KCK17	M58	5531919	M4D040203A32LN15L200	T16	5533631	DFR040304LD KCPK10	J84	5535025	DNMG150608FP KCP10B	B78
5520799	T351M100X100R6HX-D4 KCK17	M58	5532000	M4D125212S40LN15	T17	5533632	DFR030204LD KCU25	J84	5535027	DNMG150608CT KCP10B	B76
5520800	T351M100X125R6HX-D4 KCK17	M58	5532930	EG0212M02U02GUP KCU25	C17	5533633	DFR030204LD KCU25	J84	5535044	DNMG150608FP KCP10B	B78
5520801	T351M120X175R6HX-D6 KCK17	M58	5532931	EG0212M02U02GUP KCU25	C17	5533634	DFR040304LD KCU25	J84	5535045	DNMG150608FP KCP25B	B83
5520802	T351M120X125R6HX-D4 KCK17	M58	5532932	EG0212M02U02GUP KCU25	C22	5533635	SPHX060204R21 KCPK10	J100	5535046	DNMP150608K KCP25B	B83
5520803	T351M120X150R6HX-D4 KCK17	M58	5532937	EG0212M02U02GUP KCU25	C22	5533635	SPHX070304R21 KCPK10	J100	5537375	CCMT060204FP KCP10B	B176
5520804	T351M140X200R6HX-D6 KCK17	M58	5532941	EG0812M08U08GUP KCU25	C17	5533636	SPHX090304R21 KCPK10	J100	5537376	CCMT060204FP KCP25B	B176
5520805	T351M140X125R6HX-D4 KCK17	M58	5532944	EG0812M08U08GUP KCU25	C22	5533637	SPHX090304R21 KCPK10	J100	5537378	CCMT060208FP KCP25B	B176
5520806	T351M140X150R6HX-D4 KCK17	M58	5532945	EG0812M08U08GUP KCU25	C22	5533638	SPHX090308R21 KCPK10	J100	5537379	CCMT09T308FP KCP25B	B176
5520807	T471M060X100R6HX-D1 KCN14	M61	5532949	EG0812M08U12GUP KCU25	C22	5533639	SPHX120404R21 KCPK10	J100	5537420	CCMT09T308FP KCP10B	B176
5520808	T471M080X125R6HX-D1 KCN14	M61	5533012	EG255106U1GUP KCU25	C19	5533640	SPHX060204R20 KCU25	J99	5537421	CCMT09T304FP KCP25B	B176
5520809	T471M100X150R6HX-D1 KCN14	M61	5533013	EG255106U2GUP KCU25	C19	5533641	SPHX070304R20 KCU25	J99	5537422	CCMT09T308FP KCP10B	B176
5520810	T491M060X100R6HX-D7 KCN14	M73	5533015	EG255106U1GUP KCU25	C23	5533642	SPHX090304R20 KCU25	J99	5537423	CCMT09T308FP KCP25B	B176
5520811	T491M080X125R6HX-D7 KCN14	M73	5533016	EG255106U2GUP KCU25	C23	5533643	SPHX090308R20 KCU25	J99	5537425	CCMT120404FP KCP10B	B176
5520812	T491M100X150R6HX-D7 KCN14	M73	5533080	EC030M03N00CL02 KCU25	C25	5533644	SPHX120404R20 KCU25	J99	5537426	CNMG120404FP KCP25B	B176
5523116	RIO06EGR06 KCG305	M56	5533081	EC014M1BN00CF01 KCU25	C24	5533645	SPHX150508R20 KCU25	J99	5537427	CCMT120408FP KCP25B	B176
5523306	CNMG090308FN KCP10B	B49	5533082	EC020M02N00CF02 KCU25	C24	5533646	SPHX150508R20 KCU25	J99	5537429	CCMT060204FP KCP25B	B176
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5538891	TCMT090204FP KCP25B	B244	5548040	LNPU15T608SRGE KC725M	T19	5555607	M4D04Z04B32LN15	T15	5591158	SCMT120404LF KCM25B	B230
5538894	TCMT11T304FP KCP10B	B244	5548041	LNPU15T608SRGE KCK15	T19	5555608	M4D03Z204A32LN15L110	T16	5591159	TCMT16T308LF KCM25B	B240
5538900	TPMT110304FP KCP10B	B254	5548042	LNPU15T608SRGE KCPK30	T19	5555609	M4D03Z204A32LN15L200	T16	5591160	TCMT110208LF KCM25B	B244
5538903	VBMT160408FP KCP10B	B265	5548378	B967A09300 KC7315	G133	5555716	B224A04100HP KCPK15	G51	5591161	TPMT16T304LF KCM25B	B255
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5542025	SDPT120412PDSNHPZ KCPM40	V141	5550794	HNGJ0905ANSNHD KCPM40	S19, S23	5555804	M4D125Z09S40LN15	T17	5591168	SPMT09T308MF KCM25B	B239
5542028	RNPJ10T3MOSGD KCPM40	V51	5550795	HNPJ0905ANSNGD KCPM40	S19, S23	5555805	M4D160Z12S40LN15	T17	5591169	CPMT09T308MF KCM25B	B190
5542029	RNPJ10T3MOSHDK KCPM40	V51	5550796	HNPJ0905ANSNHD KCPM40	S19, S24	5555806	M4D160Z16S40LN15	T17	5591170	TCMT16T312MF KCM25B	B240
5542179	CNMA120412 KCK15B	B47	5550797	HNPJ090543ANSNHD KCPM40	S19, S24	5556965	SDET120464SNGB KCSM30	T105, T112, U1	5591172	CPMT09T304MF KCM25B	B177
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5542191	RNPJ1204MOSHDK KCPM40	V58	5550816	HNPJ130720ANSNHD KCPM40	S27	5572826	SDPT1204PDERGB2 KCPM40	T105, T112, U2	5591174	CCMT060204MF KCM25B	B177
5542192	RNPJ1605MOSGD KCPM40	V61	5550817	HNGJ1307ANENGD KCPM40	S26	5572827	SDPT1204PDSRGB2 KCPM40	T105, T112, U2	5591175	SCMT09T308MF KCM25B	B231
5542193	RNPJ1605MOSHDK KCPM40	V61	5550819	OFPT07L6AFENGB KCPM40	S55	5573990	DCMT150408LF KCP10B	B207	5591176	CCMT09T312MF KCM25B	B177
5542210	CNMA160612 KCK15B	B47	5550901	OFPT06L5AFENGB KCPM40	S51	5575828	LNPU15T608SRGEM KC520M	T19	5591610	TNMG220404FP KCM25B	B124
5542242	W0EJ090512SRHD KCPM40	V41	5551030	T340NC#6-32R3BX KCK17	M54	5575829	LNPU15T608SRGEM KCK15	T19	5591611	SNMG120408FP KCM25B	B97
5542243	W0EJ090512SRGD KCPM40	V41	5551031	T340NC#8-32R3BX KCK17	M54	5575828	LNPU15T608SRGEM KCPK30	T19	5591612	SNMG250924RH KCP40B	B102
5542246	RPPT1204MOSGP KCPM40	V74	5551032	T340NC#10-24R3BX KCK17	M54	5576320	VNMG160408FP KCP25B	B145	5591613	SNMG250924RH KCP40B	B102
5542247	RPPT1204MOSGD KCPM40	V74	5551033	T340NF#10-32R3BX KCK17	M54	5577076	LNPU1245R08 KCPM40	U19	5591615	CNMM190616RH KCP40B	B55
5542248	RPPT1605MOSH KCPM40	V80	5551034	T340NC02500-20R3BX KCK17	M54	5577077	LNPU1245R08 KCPM40	U19	5591616	CNMM190624RH KCP40B	B102
5542321	RCGT2006MOSHFK KCPM40	V83	5551035	T340NC03125-18R3BX KCK17	M54	5577078	LNPU1245R04 KCPM40	U19	5591617	CNMM190624RM KCP40B	B103
5542324	RCGT2006MOSGFJ KCPM40	V83	5551036	T340NC03750-16R3BX KCK17	M54	5577079	LNPU1255R04 KCPM40	U19	5591633	CNMM190624RP KCM25B	B56
5543553	KM4X63KGMEL65C	C63, C133	5551037	T340NF03750-24R3BX KCK17	M54	5577120	LNPU1245R08SGP KCPM40	U20	5591634	CNMM250924RP KCM25B	B103
5543555	KM4X63KGMER65C	C63, C133	5551038	T340NC05000-13R3BX KCK17	M54	5577121	LNPU1240R08 4 KCPM40	U19	5591711	CPMT060208MF KCM25B	B190
5543558	KM4X63KGMSEL65C	C62, C133	5551039	T340NF05000-20R3BX KCK17	M54	5577122	LNPU1245R04 4 KCPM40	U19	5591712	CPMT09T312MF KCM25B	B190
5543560	KM4X63KGM6SR65C	C62, C133	5551041	T340NF05625-18R3BX KCK17	M54	5577123	LNPU1260R04 KCPM40	U20	5591713	TCMT110208MF KCM25B	B245
5544143	SS20RBHT24	K120	5551042	T340M040X070R6HX KCK17	M55	5577124	LNPU1260R04 KCPM40	U19	5591714	SNMG120408MN KCP40B	B98
5544144	SS20FBHS24	K135	5551043	T340M050X080R6HX KCK17	M55	5580585	VNMG080412MP KCP25B	B157	5591716	CNMG120412MN KCP40B	B50
5544145	SS25RBHT30	K120	5551044	T340M060X100R6HX KCK17	M55	5580595	B224A05508HP KCPK15	G52	5591718	WNMG250924RP KCM25B	B157
5544146	SS25FBHS31	K135	5551045	T340M080X125R6HX KCK17	M55	5586046	SNHX1102T KCPM40	U14	5591776	SCMT09T308MF KCM25B	B231
5544148	ER25RBHT40	K119	5551046	T340M100X150R6HX KCK17	M55	5586047	SNHX1103T KCPM40	U14	5591777	CCMT120408MP KCM25B	B177
5544190	ER32RBHT50	K119	5551047	T340M120X175R6HX KCK17	M55	5586048	SNHX1203T KCPM40	U14	5591778	VBMT160408MP KCM25B	B265
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5544192	ER40RBHT66	K119	5551049	T340MF140X150R6HX KCK17	M55	5586061	SNHX1102PZTNGP KCPM40	U15	5591780	CNMG160612MP KCM25B	B51
5544193	ER40FBHS67	K134	5551050	T340M140X200R6HX KCK17	M55	5586062	SNHX1203PZTNGP KCPM40	U15	5591781	WNMG160416MP KCM25B	B146
5544755	DNMG110412FN KCP10B	B77	5551051	T340M160X200R6HX KCK17	M55	5586626	LNJX031940RRH KCP10B	E51	5591782	DNMG150408MP KCM25B	B79
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5545066	EDPT140412PDSRGRD KCPM40	T54, T63	5551053	T340M200X250R6HX KCK17	M55	5588386	LNPU15T608ERGE KCSM30	T18	5591784	TCMT11T308MF KCM25B	B208
5545067	EDCT140408PDERGD KCPM40	T52, T61	5551053	T351NC#6-32R3BX KCK17	M56	5588387	LNPU15T608ERGE KCPM40	T18	5591785	TNMG160404MP KCM25B	B125
5545068	EDCT140404PDERGD KCPM40	T52, T61	5551054	T351NC#8-32R3BX KCK17	M56	5588388	LNPU15T608ERGE KC522M	T18	5591786	VBMT160404MP KCM25B	B265
5545069	EDPT140412PDERHD KCPM40	T53, T62	5551055	T351NF#10-32R3BX KCK17	M56	5588513	LNPU15T604ERGE KCPM40	T18	5591787	CNMG160616MP KCM25B	B51
5545160	EDPT140408PDERHD KCPM40	T53, T62	5551056	T351NC02500-20R3BX KCK17	M56	5588514	LNPU15T604ERGE KCSM30	T18	5591788	DNMG150604MP KCM25B	B79
5545161	EDPT140408PDSRGE KCPM40	T53, T62	5551057	T351NC03125-18R3BX KCK17	M56	5588515	LNPU15T604ERGE KCPM40	T18	5591789	VNMG160404MP KCM25B	B146
5545162	SDET1204PDSRGB KCPM40	T105, T112, U1	5551058	T351NC03750-16R3BX KCK17	M56	5588516	LNPU15T604ERGE KC522M	T18	5591790	WNMG080412MP KCM25B	B157
5545163	SDCT1204PDERLD2 KCPM40	T104, T111, U1	5551059	T351NC04375-14R3BX KCK17	M56	5588517	LNPU15T612ERGE KC725M	T18	5591791	DNMG110408MP KCM25B	B79
5545164	SDET1204PDERGB2 KCPM40	T104, T111, U1, U2	5551060	T351NC05000-13R3BX KCK17	M56	5588518	LNPU15T612ERGE KCSM30	T18	5591792	CCMT09T304MP KCM25B	B177
5545398	EDPT180516PDERGD KCPM40	T74	5551061	T351NC06250-11R3BX KCK17	M56	5588519	LNPU15T612ERGE KCPM40	T18	5591793	CCMT120412MP KCM25B	B177
5545399	EDPT180508PDERGD KCPM40	T74	5551062	T351NC07500-10R3BX KCK17	M56	5588550	LNPU15T612ERGE KC522M	T18	5591794	SCMT120408MP KCM25B	B231
5545400	EDPT180512PDERGD KCPM40	T74	5551063	T351M040X070R6HX KCK17	M57	5588973	DFT110580MD KC7140	J87	5591795	DNMG150612MP KCM25B	B79
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			5551070	T351M120X175R6HX KCK17	M57	5591126	CCMT060208FP KCM25B	B176	5591904	TCMT16T304MP KCM25B	B245
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			5551072	T351M140X200R6HX KCK17	M57	5591128	CCMT09T304FP KCM25B	B176	5591907	SNMG120408MP KCM25B	B98
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5591936SNMG190616RP KCM25B B101	5593151TM24D16L28Z2 W4	5593759TM41ENBLANK W26	5596416VBMT160408LF KCM25B B265
5591937	.....WNMG060404MP KCM25B	..... B157	5593152	.....TM24D16L36Z1	..... W4	5593760	.....TM40N20UN KC635M	..... W20	5596417	.....DCMT11T308LF KCM25B	..... B207
5591938	.....WNMG080412RP KCM25B	..... B159	5593153	.....TMT24D14L26Z1	..... W5	5593762	.....TM40N16UN KC635M	..... W20	5596418	.....VBMT160404LF KCM25B	..... B265
5591939	.....SNMG150608MP KCM25B	..... B98	5593159	.....TM41D21L45Z1	..... W24	5593764	.....TM40N12UN KC635M	..... W20	5596419	.....DCMT11T304LF KCM25B	..... B207
5591950	.....CNMG120404RP KCM25B	..... B53	5593170	.....TM41D25L43Z2	..... W24	5593767	.....TM40N8UN KC635M	..... W20	5596450	.....CCMT09T304LF KCM25B	..... B177
5591952	.....SNMG120416MP KCM25B	..... B98	5593171	.....TM41D30L43Z3	..... W24	5593768	.....TM40N10ISO KC635M	..... W20	5596451	.....CCMT060204LF KCM25B	..... B177
5591953	.....SNMG150616RP KCM25B	..... B101	5593172	.....TM41D30L65Z3	..... W24	5593769	.....TM40N15ISO KC635M	..... W20	5596455	.....CCMT09T308MF KCM25B	..... B177
5591954	.....SNMG150612MP KCM25B	..... B98	5593173	.....TM41D36L43Z5	..... W24	5593780	.....TM40N20ISO KC635M	..... W20	5596456	.....CCMT120408MF KCM25B	..... B177
5591955	.....CNMG190616RP KCM25B	..... B53	5593174	.....TM41D36L65Z4	..... W24	5593782	.....TM40N30ISO KC635M	..... W20	5596457	.....CNMG120408MN KCP40B	..... B50
5591956	.....TNMG160412MP KCM25B	..... B125	5593175	.....TMS41D48L50Z5	..... W25	5593785	.....TM40N1BSF KC635M	..... W20	5596460	.....CNMG120408RP KCM25B	..... B51
5591957	.....CNMG120416RP KCM25B	..... B53	5593176	.....TMS41D58L50Z6	..... W25	5593788	.....TM40EN008NPT KC635M	..... W20	5596461	.....TNMG160408MP KCM25B	..... B125
5591959	.....WNMG080408RP KCM25B	..... B159	5593184	.....TM40D22L43Z3	..... W17	5593790	.....TM40EN008NPTF KC635M	..... W21	5596462	.....CNMG190624RH KCP40B	..... B55
5591960	.....CNMG160616RP KCM25B	..... B53	5593185	.....TM40D22L65Z3	..... W17	5593791	.....TM40EN01BSPT KC635M	..... W21	5596463	.....CNMT11T304LF KCP40B	..... B103
5591962	.....TNMG220408RP KCM25B	..... B128	5593186	.....TM40D30L55Z4	..... W17	5593792	.....TM40ENBLANK	..... W21	5596465	.....CNMG120412RN KCP40B	..... B53
5591963	.....CNMG120408MW KCM25B	..... B52	5593187	.....TM40D30L80Z3	..... W17	5593793	.....TM24N32UN KC610M	..... W6	5596466	.....CNMG120416RN KCP40B	..... B53
5591964	.....TNMG220412RP KCM25B	..... B128	5593188	.....TMS40D44L48Z6	..... W18	5593794	.....TM24N18UN KC610M	..... W6	5596468	.....CNMG120408RP KCM25B	..... B53
5591967	.....TNMG270612RP KCM25B	..... B128	5593189	.....TMS40D52L50Z8	..... W18	5593795	.....TM24N24UN KC610M	..... W6	5596469	.....CNMG120412RP KCM25B	..... B53
5591968	.....SNMG150612RN KCP40B	..... B101	5593190	.....TMST40D45L48Z6	..... W19	5593797	.....TM24N20UN KC610M	..... W6	5596480	.....TNMG220412RP KCM25B	..... B130
5591970	.....TNMG330924RN KCP40B	..... B127	5593383	.....KTMDU11L0515N60 KC635M	..... W32	5593798	.....TM24N18UN KC610M	..... W6	5596481	.....CNMG120408RP KCM25B	..... B56
5591971	.....CNMG190612RP KCP40B	..... B53	5593385	.....KTMDU11L1520N60 KC635M	..... W32	5593799	.....TM24N16UN KC610M	..... W6	5596483	.....SNMG190616RP KCM25B	..... B103
5591972	.....WNMG080408RP KCP40B	..... B159	5593386	.....KTMDU11L2025N60 KC635M	..... W32	5593800	.....TM24N14UN KC610M	..... W6	5596485	.....CNMG190616RP KCM25B	..... B56
5591973	.....CNMG190612RN KCP40B	..... B53	5593387	.....KTMDU11L2525N60 KC635M	..... W32	5593801	.....TM24N12UN KC610M	..... W6	5596488	.....CNMG160612RP KCM25B	..... B56
5591974	.....TNMG330924RP KCP40B	..... B128	5593388	.....KTMDU11L2540N60 KC635M	..... W32	5593802	.....TM24N10UN KC610M	..... W6	5596489	.....CNMG190612RP KCM25B	..... B56
5591975	.....CNMG190616RN KCP40B	..... B53	5593389	.....KTMDU11L1520N60 KC635M	..... W36	5593803	.....TM24N05ISO KC610M	..... W6	5596489	.....KTIPT1328HP KCP15	..... H27
5591976	.....DNMG150408RP KCM25B	..... B81	5593680	.....KTMDU16L2535N60 KC635M	..... W36	5593804	.....TM24N075ISO KC610M	..... W6	5596899	.....LNJX301940RRP KCP25	..... E52
5591977	.....SNMG190616RN KCP40B	..... B101	5593681	.....KTMDU16L4060N60 KC635M	..... W36	5593805	.....TM24N10ISO KC610M	..... W6	5602422	.....KSEM3234HPGM KCP7315	..... H43
5591979	.....WNMG080412RN KCP40B	..... B159	5593682	.....KTMDU11L4816N55 KC635M	..... W32	5593806	.....TM24N125ISO KC610M	..... W6	5604719	.....B269A13000HP KCP15	..... G70
5591982	.....SNMG120412RP KCM25B	..... B101	5593683	.....KTMDU11L1612N55 KC635M	..... W32	5593807	.....TM24N15ISO KC610M	..... W6	5606542	.....UJBE1000A6AL KCSM15	..... P54
5591983	.....CNMG160612RN KCP40B	..... B53	5593684	.....KTMDU11L107N55 KC635M	..... W32	5593808	.....TM24N175ISO KC610M	..... W6	5606543	.....UJBE1200A6AL KCSM15	..... P54
5591986	.....TNMG220408RN KCP40B	..... B127	5593686	.....KTMDU16L1107N55 KC635M	..... W36	5593809	.....TM24N200ISO KC610M	..... W6	5606544	.....UJBE1600A6AL KCSM15	..... P54
5591987	.....CNMG120408UP KCM25B	..... B54	5593687	.....KTMDU16L0604N55 KC635M	..... W36	5593830	.....TM24N250ISO KC610M	..... W6	5606545	.....UJBE2000A6AL KCSM15	..... P54
5591988	.....SNMG120412RN KCP40B	..... B101	5593688	.....KTMDU11L0515N60 KC610M	..... W32	5593831	.....TM24EN18NPT KC610M	..... W7	5606546	.....UJBE1000A6AN KCSM15	..... P54
5591989	.....CNMG190612UP KCM25B	..... B54	5593689	.....KTMDU11L1520N60 KC610M	..... W32	5593832	.....TM24EN18NPTF KC610M	..... W7	5606547	.....UJBE1200A6AN KCSM15	..... P54
5591990	.....SNMG120416RN KCP40B	..... B101	5593690	.....KTMDU11L2025N60 KC610M	..... W32	5593833	.....TM24EN19BSF KC610M	..... W6	5606548	.....UJBE1600A6AN KCSM15	..... P54
5591991	.....CNMG120412UP KCM25B	..... B54	5593691	.....KTMDU11L2525N60 KC610M	..... W32	5593834	.....TM24EN14BSF KC610M	..... W6	5606549	.....UJBE2000A6AN KCSM15	..... P54
5591992	.....TNMG270616RN KCP40B	..... B127	5593692	.....KTMDU11L2540N60 KC610M	..... W32	5593835	.....TM24EN19BSPT KC610M	..... W7	5607996	.....LNPU157612SRGE KCS20M	..... T19
5591993	.....CNMG120404UP KCM25B	..... B54	5593693	.....KTMDU16L1520N60 KC610M	..... W36	5593837	.....TM41N8UN KC610M	..... W26	5607997	.....LNPU157612SRGE KCS22M	..... T19
5591995	.....DNMG150408UP KCM25B	..... B82	5593694	.....KTMDU16L2535N60 KC610M	..... W36	5593838	.....TM41N7UN KC610M	..... W26	5607998	.....LNPU157612SRGE KCS25M	..... T19
5591998	.....DNMG150616RN KCP40B	..... B81	5593695	.....KTMDU16L4060N60 KC610M	..... W36	5593839	.....TM41N6UN KC610M	..... W26	5608030	.....LNPU157612SRGE KCPK30	..... T19
5592000	.....SNMG120408RN KCP40B	..... B101	5593696	.....KTMDU11L4816N55 KC610M	..... W32	5593840	.....TM41N5UN KC610M	..... W26	5608034	.....LNPU157604SRGE KCS20M	..... T19
5592003	.....WNMG060408UP KCM25B	..... B160	5593697	.....KTMDU11L1612N55 KC610M	..... W32	5593841	.....TM41N45UN KC610M	..... W26	5608035	.....LNPU157604SRGE KCS22M	..... T19
5592005	.....WNMG080408UP KCM25B	..... B160	5593698	.....KTMDU11L107N55 KC610M	..... W32	5593842	.....TM41N4UN KC610M	..... W26	5608036	.....LNPU157604SRGE KCPK30	..... T19
5592006	.....RNMG190600RN KCP40B	..... B94	5593699	.....KTMDU16L1612N55 KC610M	..... W36	5593843	.....TM41N300ISO KC610M	..... W26	5608037	.....LNPU157604SRGE KCK15	..... T19
5592007	.....DNMG150608UP KCM25B	..... B82	5593710	.....KTMDU16L1107N55 KC610M	..... W36	5593844	.....TM41N350ISO KC610M	..... W26	5608038	.....LNPU157604SRGE KCPK30	..... T19
5592008	.....DNMG150608RN KCP40B	..... B81	5593711	.....KTMDU16L0604N55 KC610M	..... W36	5593845	.....TM41N50ISO KC610M	..... W26	5608090	.....CNMG190616RP KCP25B	..... B56
5592010	.....TNMG220412RN KCP40B	..... B127	5593712	.....TM24N32UN KC635M	..... W6	5593846	.....TM41N450ISO KC610M	..... W26	5615509	.....HNHX090516ENLE KCK15	..... S90, S96
5592012	.....CNMG160612UP KCM25B	..... B54	5593713	.....TM24N28UN KC635M	..... W6	5593847	.....TM41N500ISO KC610M	..... W26	5615514	.....HNXP090530SNGE KCK15	..... S91, S97
5592103	.....CNMG160608MR KCP25B	..... B51	5593714	.....TM24N24UN KC635M	..... W6	5593848	.....TM41N500ISO KC610M	..... W26	5615518	.....HNHX090516SNGE KCK15	..... S91, S97
5592107	.....WNMG060408MR KCP25B	..... B157	5593715	.....TM24N20UN KC635M	..... W6	5593850	.....TM41N600ISO KC610M	..... W26	5615519	.....HNHX090516SNGE KCS14M	..... S91, S97
5592121	.....TNMG220408MR KCP25B	..... B126	5593716	.....TM24N18UN KC635M	..... W6	5593851	.....TM41EN8NPT KC610M	..... W26	5615534	.....VNMP160408K KCP10B	..... B148
5592123	.....TNMG220408MR KCM25	..... B126	5593717	.....TM24N16UN KC635M	..... W6	5593853	.....TM40N20UN KC610M	..... W20	5615608	.....HNHX090520ENLE KCK15	..... S90, S96
5592124	.....SNMG120408MR KCP25B	..... B99	5593718	.....TM24N14UN KC635M	..... W6	5593854	.....TM40N18UN KC610M	..... W20	5615609	.....VNMG160408FN KCP10B	..... B145
5592128	.....CNMG190616MR KCP25B	..... B51	5593719	.....TM24N12UN KC635M	..... W6	5593855	.....TM40N16UN KC610M	..... W20	5615610	.....HNHX090516ENLE KCS14M	..... S90, S96
5592141	.....DNMG110408MR KCP25B	..... B80	5593720	.....TM24N10UN KC635M	..... W6	5593856	.....TM40N14UN KC610M	..... W20	5615650	.....VNMP160408FF KCP25B	..... B145
5592142	.....DNMG110408MR KCP10B	..... B80	5593721	.....TM24N05ISO KC635M	..... W6	5593857	.....TM40N12UN KC610M	..... W20	5615680	.....HNXP090520SNGE KCK15	..... S91, S97
5592146	.....TNMG270612MR KCP25B	..... B126	5593722	.....TM24N075ISO KC635M	..... W6	5593858	.....TM40N10UN KC610M	..... W20	5615682	.....HNHX090520SNGE KCK15	..... S91, S97
5592160	.....VNMG160412MR KCM15	..... B146	5593723	.....TM24N100ISO KC635M	..... W6	5593859	.....TM40N9UN KC610M	..... W20	5615683	.....HNHX090520SNGE KCS14M	..... S91, S97
5592162	.....WNMG080416MR KCP10B	..... B157	5593724	.....TM24N125ISO KC635M	..... W6	5593870	.....TM40N8UN KC610M	..... W20	5615684	.....HNXP090516SNGE KCK15	..... S91, S97
5592163	.....WNMG080416MR KCP25B	..... B157	5593725	.....TM24N150ISO KC635M	..... W6	5593871	.....TM40N100ISO KC610M	..... W20	5615687	.....HNHX090530SNGE KCK15	..... S91, S97
5593078	.....KTMDUWD15L040Z1	..... W29	5593726	.....TM24N175ISO KC635M	..... W6	5593872	.....TM40N150ISO KC610M	..... W20	5616165	.....HNHX090520ENLE KCK15	..... S90, S96
5593079	.....KTMDUWD20L060Z2	..... W29	5593727	.....TM24N200ISO KC635M	..... W6	5593873	.....TM40N200ISO KC610M	..... W20	5616166	.....HNHX090520ENLE KCS14M	..... S90, S96
5593100	.....KTMDUWD23L070Z2	..... W29	5593728	.....TM24N250ISO KC635M	..... W6	5593874	.....TM40N250ISO KC610M	..... W20	5616167	.....HNHX0905ANSNGE KCK15	..... S90, S96
5593101KTMDUWD26L080Z3 W29	5593729TM24EN18NPT KC635M W6	5593875TM40N300ISO KC610M W20	5616168HNHX0905ANSNGE KCS14M S90, S96
5593102KTMDUWD36L095Z3 W34	5593740TM24EN18NPTF KC635M W7						



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5620360	LNP221012PNSRHD2 KCPK30	S121, S123	5628831	CNMG160616RN KCPK05	B53	5639840	VBMT110308LF KCK20B	B265	5640997	WNGA080408S01015FWHBM	BH20 B324
5620745	LNP2410ANSRHD2 KCPM40	S117	5628832	CNMG160616RP KCPK05	B53	5639845	CCMT060204FW KCK20B	B176	5641044	SNMG150612MR KCM15B	B99
5620747	LNP2410ANSRHD2 KCPK30	S117	5628833	DNMG150408MR KCPK05	B80	5639849	CCMT060208LF KCK20B	B177	5641046	WNMG080408MR KCM15B	B157
5620748	SM-906LH KC720	S116, S120, S122	5628835	DNMG150412MR KCPK05	B80	5640382	CCMT09T304MF KCK20B	B177	5641047	WNMG080412MR KCM15B	B157
5626642	KSEM1250HPGM KCPM45	H45	5628837	DNMG150412MR KCPK05	B80	5640383	CCMT09T304MP KCK20B	B177	5641048	CNMG120404MR KCM15B	B51
5626643	KSEM1280HPGM KCPM45	H45	5628838	DNMG150612RN KCPK05	B81	5640386	CCMT09T308MW KCK20B	B178	5641055	DNMG150608MR KCM15B	B80
5626644	KSEM1300HPGM KCPM45	H45	5628841	SNMG150616RN KCPK05	B101	5640387	CCMT09T308MW KCK20B	B178	5641062	VNMG160408MR KCM15B	B146
5626645	KSEM1350HPGM KCPM45	H45	5628844	WNMG080408RP KCPK05	B159	5640388	CCMT09T312MF KCK20B	B177	5641064	WNMG060408MR KCM15B	B157
5626646	KSEM1360HPGM KCPM45	H45	5628845	WNMG080408MR KCPK05	B157	5640391	CCMT120408MF KCK20B	B177	5641067	CPGH09T304 KCM15B	B188
5626648	KSEM1380HPGM KCPM45	H45	5628847	WNMG080412RN KCPK05	B159	5640392	CCMT120408MW KCK20B	B178	5641069	CPMT060208MF KCM15B	B190
5626649	KSEM1389HPGM KCPM45	H45	5628849	WNMG080412MR KCPK05	B159	5640393	CCMT120408MW KCK20B	B178	5641090	CPMT09T304LF KCM15B	B190
5626700	KSEM1410HPGM KCPM45	H45	5628850	WNMG080412MR KCPK05	B157	5640397	CCMT120412LF KCK20B	B177	5641091	CPMT09T308MF KCM15B	B190
5626701	KSEM1450HPGM KCPM45	H45	5629530	CNMG120412RN KCPK05	B53	5640399	CCMT120408MF KCK20B	B178	5641093	DCMT070204LF KCM15B	B207
5626702	KSEM1468HPGM KCPM45	H45	5629532	CNMG190616RN KCPK05	B53	5640400	CCMT120408MF KCK20B	B178	5641094	DCMT11T308MF KCM15B	B208
5626703	KSEM1500HPGM KCPM45	H45	5629534	CNMG160616RP KCPK05	B56	5640401	CCMT120412 KCK20B	B178	5641095	DNMG110408FW KCM15B	B78
5626704	KSEM1508HPGM KCPM45	H45	5629536	DNMG150408MN KCPK05	B78	5640402	CNMA120404 KCK20B	B47	5641096	DNMG150604MF KCM15B	B76
5626705	KSEM1550HPGM KCPM45	H45	5629538	WNMG080408MW KCPK05	B158	5640403	CNMA160616 KCK20B	B47	5641098	CNMG150404MP KCM15B	B79
5626706	KSEM1580HPGM KCPM45	H45	5630018	LNGU15T616SRGM KC520M	T19	5640406	CNMA190616 KCK20B	B47	5641099	DNMG150408MP KCM15B	B79
5626707	KSEM1588HPGM KCPM45	H45	5630019	LNGU15T616SRGM KCK15	T19	5640408	CNMG120416RP KCK20B	B53	5641101	DNMG150604MP KCM15B	B79
5626708	KSEM1600HPGM KCPM45	H45	5630070	LNGU15T616SRGM KCPK30	T19	5640409	CNMG120416RP KCK20B	B53	5641102	CNMG150604MP KCM15B	B79
5626709	KSEM1627HPGM KCPM45	H45	5630740	SNPJ10T308SNGD KC520M	S61	5640416	CPMT060208MF KCK20B	B190	5641105	SNMG120408MP KCM15B	B98
5626710	KSEM1650HPGM KCPM45	H45	5630741	SNPJ10T308SNGD KCPM40	S61	5640418	CPMT09T304FW KCK20B	B189	5641107	SNMG150616RP KCM15B	B101
5626711	KSEM1700HPGM KCPM45	H45	5630742	SNPJ10T308SNGD KCK15	S61	5640419	CPMT09T304LF KCK20B	B190	5641108	TCMT110204LF KCM15B	B244
5626712	KSEM1707HPGM KCPM45	H45	5630743	SNPJ10T308SNGD KCPK30	S61	5640421	CPMT09T308LF KCK20B	B190	5641109	TNMG160404FF KCM15B	B124
5626713	KSEM1750HPGM KCPM45	H45	5630744	SNPJ10T312SNGD KCPM40	S61	5640422	CPMT09T308MF KCK20B	B190	5641110	TNMG160404MP KCM15B	B125
5626714	KSEM1786HPGM KCPM45	H45	5630745	SNPJ10T312SNGD KCK15	S61	5640424	CPMT09T308MW KCK20B	B191	5641111	TNMG160412MP KCM15B	B125
5626715	KSEM1850HPGM KCPM45	H45	5630746	SNPJ120608SNGD KC520M	S64	5640425	VBMT160404FP KCK20B	B265	5641113	TNMG220408MP KCM15B	B125
5626716	KSEM1865HPGM KCPM45	H45	5630747	SNPJ120608SNGD KCPM40	S64	5640427	VBMT160408FP KCK20B	B265	5641114	VNMG160404FF KCM15B	B145
5626717	KSEM1923HPGM KCPM45	H45	5630748	SNPJ120608SNGD KCK15	S64	5640428	VNMG160408MP KCK20B	B265	5641115	VNMG160404MP KCM15B	B146
5626718	KSEM1945HPGM KCPM45	H45	5630751	SNPJ120616SNGD KCPM40	S64	5640429	VBMT160412LF KCK20B	B265	5641116	VNMG160408MP KCM15B	B146
5626719	KSEM2024HPGM KCPM45	H45	5630752	SNPJ120616SNGD KCK15	S64	5640431	VNMG160408RP KCK20B	B147	5641117	VNMG160412MP KCM15B	B146
5626720	KSEM2050HPGM KCPM45	H45	5631151	SNMG120408RP KCP25B	B101	5640436	WNMG080408RP KCK20B	B159	5641118	WNMG080404FW KCM15B	B156
5626721	KSEM2143HPGM KCPM45	H45	5631155	SNMG120408RN KCP25B	B101	5640437	WNMG080412RP KCK20B	B159	5641119	WNMG080404P KCM15B	B158
5626722	KSEM2150HPGM KCPM45	H45	5635433	ND3040L KCJ25	D14	5640442	CCMT060204LF KCM15B	B177	5641120	WNMG080408MP KCM15B	B157
5626723	KSEM2183HPGM KCPM45	H45	5639385	DCMT11T308FP KCK20B	B207	5640443	CCMT09T304LF KCM15B	B177	5641121	WNMG080408RP KCM15B	B158
5626724	KSEM2244HPGM KCPM45	H45	5639388	DCMT11T308MP KCK20B	B208	5640444	CCMT09T308LF KCM15B	B177	5641122	WNMG080408RP KCM15B	B159
5626725	KSEM2250HPGM KCPM45	H45	5639660	DCMT11T312MF KCK20B	B208	5640445	CCMT09T308MF KCM15B	B177	5641123	WPMT060204LF KCK20B	B177
5626726	KSEM2324HPGM KCPM45	H45	5639663	DNMA150408 KCK20B	B75	5640448	CCMT120408MF KCM15B	B177	5641236	CCMT060304LF KCK20B	B177
5626727	KSEM2350HPGM KCPM45	H45	5639666	DNMA150612 KCK20B	B75	5640449	CNMG120408FP KCM15B	B49	5641237	CCMT09T308LF KCK20B	B177
5626728	KSEM2450HPGM KCPM45	H45	5639667	DNMG110408RP KCK20B	B81	5640480	CNMG120408MP KCM15B	B51	5641238	CCMT09T308MF KCK20B	B177
5626729	KSEM2461HPGM KCPM45	H46	5639668	DNMG150612RP KCK20B	B81	5640482	CNMG120408RP KCM15B	B51	5641239	CCMT120408MF KCK20B	B177
5626730	KSEM2550HPGM KCPM45	H46	5639681	DNMG150612RP KCK20B	B81	5640483	CNMG120412RP KCM15B	B53	5641360	CNMA120408 KCK20B	B47
5626731	KSEM2650HPGM KCPM45	H46	5639683	DPMT070208FW KCK20B	B215	5640484	DCMT11T304LF KCM15B	B207	5641361	CNMA120412 KCK20B	B47
5626732	KSEM2659HPGM KCPM45	H46	5639689	RCMT0803M0 KCK20B	B224	5640485	DCMT11T308LF KCM15B	B207	5641363	CNMG160612 KCK20B	B47
5626733	KSEM2750HPGM KCPM45	H46	5639690	RCMT10T3M0 KCK20B	B224	5640486	DNMG110404FP KCM15B	B77	5641364	CNMG120404UN KCK20B	B54
5626734	KSEM2778HPGM KCPM45	H46	5639691	RCMT1204M0 KCK20B	B224	5640487	DNMG150612FP KCM15B	B77	5641365	CNMG120408RP KCK20B	B53
5626735	KSEM2818HPGM KCPM45	H46	5639693	RCMT2006M0 KCK20B	B224	5640490	TNMG160408MP KCM15B	B125	5641366	CNMG120408RP KCK20B	B54
5626736	KSEM2850HPGM KCPM45	H46	5639699	SCMT09T308MF KCK20B	B231	5640491	TPMT090204LF KCM15B	B255	5641367	CNMG120412RP KCK20B	B53
5626737	KSEM2937HPGM KCPM45	H46	5639700	SCMT09T308MP KCK20B	B231	5640492	VBMT160404LF KCM15B	B265	5641369	DCMT11T304LF KCK20B	B207
5626738	KSEM2950HPGM KCPM45	H46	5639701	SCMT120408LF KCK20B	B230	5640493	VBMT160408LF KCM15B	B265	5641370	DCMT11T308LF KCK20B	B207
5626739	KSEM2977HPGM KCPM45	H46	5639702	SCMT120408MF KCK20B	B231	5640494	WNMG080408FP KCM15B	B156	5641371	SCMT09T308LF KCK20B	B230
5626740	KSEM3050HPGM KCPM45	H46	5639703	SCMT120408MP KCK20B	B231	5640496	WNMG080412MW KCM15B	B158	5641372	SNMA120412 KCK20B	B96
5626741	KSEM3096HPGM KCPM45	H46	5639705	SCMT120412MF KCK20B	B231	5640498	CCMT060204FP KCM15B	B176	5641373	SNMG150612UN KCK20B	B102
5626742	KSEM3100HPGM KCPM45	H46	5639707	SCMW09T308 KCK20B	B232	5640905	CCMT060204MF KCM15B	B177	5641375	VBMT160404LF KCK20B	B265
5626743	KSEM3150HPGM KCPM45	H46	5639708	SCMW120408 KCK20B	B232	5640906	CCMT060204MP KCM15B	B177	5641377	WNMA080408 KCK20B	B155
5626744	KSEM3250HPGM KCPM45	H46	5639709	SCMW120412 KCK20B	B232	5640907	CCMT060208LF KCM15B	B177	5641379	WNMG060408UN KCK20B	B160
5626745	KSEM3254HPGM KCPM45	H46	5639710	SNMA120408 KCK20B	B96	5640908	CCMT09T304FP KCM15B	B176	5642146	CNMG120412UN KCK20B	B54
5626746	KSEM3350HPGM KCPM45	H46	5639761	SNMG120408RP KCK20B	B101	5640909	CCMT09T304MF KCM15B	B176	5642147	CNMG120416UN KCK20B	B54
5626747	KSEM3354HPGM KCPM45	H46	5639767	SPMT09T308LF KCK20B	B238	5640960	CCMT09T304MP KCM15B	B177	5642148	CNMG160608UN KCK20B	B54
5626748	KSEM3350HPGM KCPM45	H46	5639781	TCMT110204FP KCK20B	B244	5640961	CCMT09T304MW KCM15B	B178	5642149	CNMG160612UN KCK20B	B54
5626749	KSEM3400HPGM KCPM45	H46	5639782	TCMT110204LF KCK20B	B244	5640962	CCMT09T308FP KCM15B	B176	5642150	CNMG160616UN KCK20B	B54
5626750	KSEM3450HPGM KCPM45	H46	5639784	TCMT110208LF KCK20B	B244	5640963	CCMT09T308MF KCM15B	B176	5642154	DNMA110408 KCK20B	B75
5626751	KSEM3493HPGM KCPM45	H46	5639785	TCMT110208MF KCK20B	B245	5640964	CCMT09T308MP KCM15B	B177	5642155	DNMA150416 KCK20B	B75
5626752	KSEM3500HPGM KCPM45	H46	5639786	TCMT110208MP KCK20B	B245	5640965	CCMT09T308MW KCM15B	B178	5642158	DNMG150408UN KCK20B	B82
5626753	KSEM3651HPGM KCPM45	H46	5639787	TCMT16T304LF KCK20B	B244	5640969	CNMG090308MP KCM15B	B51	5642159	DNMG150412UN KCK20B	B82
5626754	KSEM3700HPGM KCPM45	H46	5639788	TCMT16T304MP KCK20B	B245	5640970	CNMG120404FP KCM15B	B48	5642160	DNMG150416UN KCK20B	B82
5626755	KSEM3731HPGM KCPM45	H46	5639790	TCMT16T308LF KCK20B	B244	5640971	CNMG120404MP KCM15B	B51	5642161	DNMG150608UN KCK20B	B82
5626756	KSEM3750HPGM KCPM45	H46	5639791	TCMT16T308MF KCK20B	B245	5640973	CNMG120404MP KCM15B	B51	5642162	DNMG150612UN KCK20B	B82
5626757	KSEM3800HPGM KCPM45	H46	5639792	TCMT16T308MP KCK20B	B245	5640974	CNMG120408FP KCM15B	B48	5642165	RCMT2006M0RP KCK20B	B226
5626758	KSEM3846HPGM KCPM45	H46	5639793	TCMT16T312LF KCK20B	B244	5640975	CNMG120408FW KCM15B	B49	5642167	SNMG120408UN KCK20B	B102
5626759	KSEM3900HPGM KCPM45	H46	5639794	TCMT16T312MF KCK20B	B245	5640976	CNMG120408RP KCM15B	B51	5642168	SNMG120416UN KCK20B	B102

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5651479RPHT1204MOE421X4 X500V95	5659264RPHT1204MOE442X4 SP6519V95	5667944XE030MTN4-C SP4060P72	56732377792VP06CA020Z3R154V5-6
5652131XPNT2020T306RF SP6519V105	5659355SDMW120412TN SP6519T120	5667946ZDET16M504FR721 GH1T90	56732385720VZ16SA032Z3R50T86
5652140SDHT120412EN422 SP6519T119	5659561RPHT1204MOE462X5 X700V96	5668058XER020NTN4-C SP4060P73	56732407792VP06CA016Z2R140V5-6
5652239XDLW090408SRD X400V16	5659562RPHT10T3MOE422X8 X700V91	5668059XER040NTN4-E SP4060P73	5673275F8017 SV102
5652248XDLT120512ERD411 X500V24	56595637792VXE16CA050Z3R102V20	5668061XER200NN4-G SP4060P73	56732975505VX50WA050R150V102
5652249XDLT120508ERD411 SP6519V15	5659603ZDET16M525FR721 GH1T90	5668072RPHT1204MOE442X4 X700V95	56733165720VZ16-A080Z5RT88
5652489RPHT1204MOTX4 SP6519V96	5659867RPHT10T3MOE422X4 SP6519V91	56671376M8 1.25 X 25 SHCST88, V12, V89, V94	56733295505VX32WA032R75V102
5652490XDLT090408ERD41 SP6519V14	5659912ZDET16M520FR721 GH1T90	5671642TB15V9, V11-12, V21, V87-89	56733407713VR10-A050Z06RV89
56525249XDLT120508ERD41 SC6525V23	5659913ZDET16M532FR721 GH1T90	5671643M20 X 2.5 X 50 SHCST118, V21, T28	56733417713VR10SA035Z5R35 SV87, V89
5652800RPEX10T3M0F701X4 SP4019V90	5659914ZDET16M560FR721 GH1T90	56722307713VR10SA025Z2R35 SV87, V89	56733427713VR12-A040Z05RV94
5652874XPNT32302612RF SP6519V105	56599477792VXD09CA025Z2R50V11, V13	56722317713VR10SA032Z3R35 SV87, V89	56733437713VR12-A063Z08RV89
5652878XPNT404071716RF SP6519V105	56599557792VXE16-A063Z5RV28-29	56722327713VR12-A040Z04RV94	56733447713VR10-A063Z08RV89
5652899XDLT120512ERD411 SP6519V24	56599567792VXE16-A100Z2RV28-29	56722337713VR12-A050Z05RV94	56733477713VR12-A066Z07RV94
5653062XPNT16160308RF SP6519V105	5660025XE060MN4-C SP4060P72	56722347713VR12-A063Z06RV94	56734797713VR12-A066Z07RV94
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5653137SDHT120412EN423 X500T119	5660220XER060NN4-G SP4060P73	56722715720VZ16CA032Z2R75 ST87	56735047792VXD12-A050Z4RV20-21
5653138SDHT091308EN422 X500T116	5660221XER120NN4-C SP4060P73	5672329D6014T SV102	5673519M-18-M10-CA20-130 SV32
5653139XELT160512ERD41 X500V30	5660222XER120NN4-L SP4060P73	5672332FP2506TV4-5	56735215505VX40WA040R150V105
5653140XELT160512ERD41 SP6519V30	5660223XER160NN4-J SP4060P73	5672365SB3230T118	56735285720VZ16-A063Z5R ST88
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5654214XPNT25250408RF SP6519V105	56610167792VXD09CA032Z3R70V11, V13	5672381T9 ST115, T118	56735897713VR12-A063Z07RV94
5654220XDLT120508ERD41 SP6519V23	56610177792VXD12CA032Z2R70V19, V22	5672387D4012T SV21	56736105505VX25CA025R55V104
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5654405SDHT091308EN423 X500T116	5665491RPHT10T3MOE422X4 X700V91	5672412SB3232T118	56737425230VS12-A100Z6R76T118
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5655255XDLW090408SRD SC6525V16	5665949ZDET16M508FR721 GH1T90	5672829M-13-M8-CA16-130 SV35	56738015230VS09-A050Z4R80T115
5655265XPLT060308ERD41 SC6525V7	5665960XE025MTN4-C SP4060P72	5672830M-18-M10-CA20-190 SV35	56738287713VR10-A050Z07RV89
5655472XDLT090408ERD721 GH2V14	56659647792VX06SA025Z3R35 SV4, V6	5672831M-21-M12-CA25-206 SV35	56738297713VR12-A080Z08RV94
5655817XELW160512SRD SC3025V31	5665970XER030NTN4-C SP4060P73	5672832M-29-M16-CA32-160 SV35	56738307713VR12CA032Z3R70V93-94
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5656252XDLT120508ERD721 GH2V23	56661877792VXD12-A052Z4RV20-22	56728705720VZ16-A063Z4R ST88	5674780RPHT1204MOE442X8 SC6525V96
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5656381RPMT10T3MOE41X4 X500V91	5666394RPMT10T3MOE41X4 MP91MV91	56728925720VZ16CA025Z2R75T87	5675037RPMT1204MOE432X5 SP6519V97
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56567277792VXD09-A040Z3RV12-13	5666838XER200NN4-M SP4060P73	5672984M-18-M10-CA20-170 SV35	5675237ZDET16M530ER721 GH1T90
56567287792VXD12-A052Z3RV20-22	5666871XER160NN4-L SP4060P73	5672985M-21-M12-CA25-131 SV35	5676726RI0E11306 KC6105K53
56567297792VXD12-A063Z4RV20-22	56670067792VXE16-A080Z6RV28-29	5672986M-21-M12-CA25-181 SV35	5676727RI0A4E1312 KC6105K53
56567307792VXD12-A080Z5RV20-22	56671327792VX06SA025Z4R35 SV4, V6	5672987M-21-M12-CA25-231 SV35	5676728RI0Q0E1306 KC6105K55
5656765SDMT091308EN41 X500T117	5667156XER100NN4-C SP4060P73	5672988M-29-M16-CA32-210 SV35	5676729RI0Q0E1312 KC6105K55
5656911RPHT10T3MOE421X4 X700V90	5667399RPMT1204MOE41X4 MP91MV96	5672989M-29-M16-CA32-310 SV35	5676760RI0Q0E1300 KC6005K55
56569147792VXD09-A050Z5RV12-13	5667400RPMT1204MOTX4 MP91MV97	56730477713VR10CA025Z3R50V88-89	5676761RI0Q0E1300 KC6105K55
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5676777	RIQ09EGR00 KC6305	K56	5689542	DFSP540R5WD40M	J28	5692272	DFSP265R4WD32M	J26	5692813	SPHX120404R21 KCJ25	J100
5676778	RIQ09EGR00 KC6005	K56	5689543	DFSP155R2WD20M	J22	5692273	DFSP270R4WD32M	J26	5694055	CCMT060204MF KCP25B	B177
5676779	RIQ09EGR00 KC6005	K56	5689544	DFSP550R5WD50M	J28-29	5692274	DFSP280R4WD32M	J26	5694056	CCMT060204MF KCP25B	B178
5676780	RIQ09EGR00 KC6105	K56	5689545	DFSP160R2WD20M	J22	5692275	DFSP290R4WD32M	J26	5694057	CCMT060208LF KCP25B	B177
5676781	RIQ09EGR00 KC6305	K56	5689546	DFSP165R2WD32M	J22	5692277	DFSP300R4WD32M	J26	5694058	CCMT09T304MF KCP25B	B177
5676782	RIQ09EGR12 KC6005	K56	5689548	DFSP170R2WD32M	J22-23	5692278	DFSP310R4WD32M	J26	5694059	CCMT120412MF KCP25B	B177
5676783	RIQ09EGR12 KC6105	K56	5689549	DFSP175R2WD32M	J22	5692279	DFSP320R4WD32M	J26-27	5694080	CNMG090304MN KCP25B	B50
5676784	RIQ09EGR12 KC6305	K56	5689550	DFSP180R2WD32M	J22	5692291	DFSP330R4WD32M	J26	5694081	CNMG090308MN KCP25B	B50
5676785	RIQ06EDR00 KC6105	K56	5689551	DFSP185R2WD32M	J22	5692292	DFSP340R4WD32M	J26	5694082	CNMG120404MN KCP25B	B50
5676786	RIQ06EDR00 KC6305	K56	5689552	DFSP190R2WD32M	J22	5692294	DFSP350R4WD32M	J26	5694083	CNMG120404RP KCP25B	B53
5676787	RIQ06EDR00 KC6005	K56	5689553	DFSP195R2WD32M	J22	5692295	DFSP360R4WD32M	J26	5694084	CNMG120412MW KCP25B	B52
5676788	RIQ06EDR06 KC6005	K56	5689554	DFSP200R2WD32M	J22	5692296	DFSP370R4WD32M	J26	5694085	CNMG120416MN KCP25B	B50
5676790	RIQ06EDR06 KC6105	K56	5689555	DFSP210R2WD32M	J22-23	5692298	DFSP375R4WD32M	J26	5694086	CNMG160608MN KCP25B	B50
5676791	RIQ06EDR06 KC6305	K56	5689556	DFSP220R2WD32M	J22	5692299	DFSP380R4WD32M	J26	5694087	CNMG160608RN KCP25B	B53
5676792	RIQ06EDR12 KC6005	K56	5689557	DFSP230R2WD32M	J22	5692300	DFSP390R4WD32M	J26	5694088	CNMG160608RP KCP25B	B53
5676794	RIQ06EDR12 KC6105	K56	5689630	DFSP140R3WD20M	J24	5692302	DFSP400R4WD32M	J26-27	5694090	CNMG190608MN KCP25B	B50
5676795	RIQ06EDR12 KC6305	K56	5689631	DFSP145R3WD20M	J24	5692303	DFSP410R4WD32M	J26	5694091	CNMG190608RN KCP25B	B53
5676796	RIQ09EDR06 KC6005	K56	5689632	DFSP150R3WD20M	J24	5692304	DFSP420R4WD32M	J27	5694092	CNMG190612RP KCP25B	B53
5676797	RIQ09EDR06 KC6105	K56	5689633	DFSP155R3WD20M	J24	5692305	DFSP430R4WD32M	J27	5694093	CNMG190616RP KCP25B	B53
5676798	RIQ09EDR06 KC6305	K56	5689634	DFSP160R3WD20M	J24	5692306	DFSP440R4WD32M	J27	5694094	CNMG190624RP KCP25B	B53
5676799	RIQ09EDR12 KC6005	K56	5689635	DFSP165R3WD32M	J24	5692307	DFSP450R4WD40M	J27	5694095	CNMP120404K KCP25B	B57
5676800	RIQ09EDR12 KC6105	K56	5689636	DFSP170R3WD32M	J24-25	5692308	DFSP460R4WD40M	J27	5694096	CNMP120408K KCP25B	B57
5676801	RIQ09EDR12 KC6305	K56	5689637	DFSP175R3WD32M	J24	5692309	DFSP470R4WD40M	J27	5694097	CPGH09T308 KCP25B	B188
5681105	7792VXP06SA01622R25 S	V4, V6	5689638	DFSP180R3WD32M	J24	5692310	DFSP480R4WD40M	J27	5694098	CPMT060208LF KCP25B	B190
5681115	5720VZ16CA03Z23R75 S	T87	5689639	DFSP185R3WD32M	J24	5692311	DFSP490R4WD40M	J27	5694100	CPMT060208MF KCP25B	B190
5681122	7792VXP06SA02023R35 S	V4, V6	5689640	DFSP190R3WD32M	J24	5692312	DFSP500R4WD40M	J27	5694101	CNMG1906044LF KCP25B	B190
5681124	7792VXP06CA03225R190 S	V5-6	5689641	DFSP195R3WD32M	J24	5692313	DFSP510R4WD40M	J27	5694102	DCMT070204LF KCP25B	B207
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5682157	XE100MN4-CP S4060	P72	5689643	DFSP210R3WD32M	J24-25	5692315	DFSP530R4WD40M	J27	5694104	DCMT150404LF KCP25B	B207
5682563	RPEX12040M0701X4 GH1	V95	5689644	DFSP220R3WD32M	J24	5692316	DFSP540R4WD40M	J27	5694105	DCMT150408LF KCP25B	B207
5682725	M16X2X40 LHSCS S	V28	5689645	DFSP230R3WD32M	J24	5692317	DFSP550R4WD50M	J27	5694106	DNMG110404MN KCP25B	B78
5682757	TB20	V28, V94	5689684	DFSP175R4WD32M	J26	5692319	DFSP240R2WD32M	J22	5694107	DNMG110408RN KCP25B	B78
5682767	M12 X 1.75 X 30 SHCS S	T88, T115, T118, V12, V21, V28, V94	5689685	DFSP180R4WD32M	J26	5692320	DFSP250R2WD32M	J22-23	5694108	DNMG110408RP KCP25B	B81
5682768	M10 1.5 X 25 SHCS S	T88, V12, V21, V28, V89, V94	5689686	DFSP185R4WD32M	J26	5692321	DFSP260R2WD32M	J22	5694109	DNMG110412RP KCP25B	B81
5682773	M16 X 2 X 40 SHCS S	T118, V21	5689687	DFSP190R4WD32M	J26	5692322	DFSP265R2WD32M	J22	5694120	DNMG150404MN KCP25B	B78
5682897	NLW-0.375 S	T115, T118	5689688	DFSP195R4WD32M	J26	5692323	DFSP270R2WD32M	J22	5694121	DNMG150408RP KCP25B	B81
5684657	LNPU15T600SRGE KCPM40	T19	5689689	DFSP200R4WD32M	J26	5692324	DFSP280R2WD32M	J22	5694122	DNMG150604MN KCP25B	B78
5684744	RNGN120400TGN KYSP30	V148	5689690	DFSP210R4WD32M	J26-27	5692325	DFSP290R2WD32M	J22	5694123	DNMG150608RN KCP25B	B81
5684745	RNGN120400EGN KYSP30	V148	5689691	DFSP220R4WD32M	J26	5692326	DFSP300R2WD32M	J22	5694125	DNMP150404K KCP25B	B83
5684746	RNGN120400TGN KYSP30	V148	5689692	DFSP230R4WD32M	J26	5692327	DFSP310R2WD32M	J22	5694126	DNMP150408K KCP25B	B83
5684747	RNGN120400EGN KYSP30	V148	5689905	DFSP200R5WD32M	J28	5692329	DFSP320R2WD32M	J22-23	5694127	DPMT070204LF KCP25B	B215
5685937	CNMG120408MN KCPK05	B50	5689906	DFSP210R5WD32M	J28-29	5692330	DFSP330R2WD32M	J22	5694128	DPMT11T304LF KCP25B	B215
5686413	RCMH3209MOTUP KCP25B	E60	5689907	DFSP220R5WD32M	J28	5692331	DFSP340R2WD32M	J22	5694157	RCGT0602MORP KCP25B	B223
5687543	KSEM1938HPLM KC7320	H50	5689908	DFSP230R5WD32M	J28	5692332	DFSP350R2WD32M	J22	5694158	RCGT05024RFP KCP25B	B223
5689447	DFSP240R5WD32M	J28	5691861	DFSP240R3WD32M	J24	5692333	DFSP360R2WD32M	J22	5694170	RCMT1606MORP KCP25B	B226
5689448	DFSP250R5WD32M	J28-29	5691862	DFSP250R3WD32M	J24-25	5692334	DFSP370R2WD32M	J22	5694171	RCMT1003MORP KCP25B	B226
5689449	DFSP260R5WD32M	J28	5691863	DFSP260R3WD32M	J24	5692335	DFSP375R2WD32M	J22	5694172	CNMG1250924RW KCP25B	B129
5689500	DFSP265R5WD32M	J28	5691864	DFSP265R3WD32M	J24	5692336	DFSP380R2WD32M	J22	5694202	170.370	J23, J25, J31, J33, J35, J37
5689501	DFSP270R5WD32M	J28	5691865	DFSP270R3WD32M	J24	5692337	DFSP390R2WD32M	J22	5694627	RCMT1204MORP KCP10B	B226
5689502	DFSP280R5WD32M	J28	5691866	DFSP280R3WD32M	J24	5692338	DFSP400R2WD32M	J22-23	5694628	RCMX1003MORP KCP10B	B226
5689503	DFSP290R5WD32M	J28	5691867	DFSP290R3WD32M	J24	5692341	DFSP430R2WD32M	J23	5694629	SNMG250724RH KCP10B	B102
5689504	DFSP300R5WD32M	J28	5691868	DFSP300R3WD32M	J24	5692342	DFSP440R2WD32M	J23	5694740	SNMG250924RH KCP10B	B102
5689505	DFSP310R5WD32M	J28	5691869	DFSP310R3WD32M	J24	5692343	DFSP450R2WD40M	J23	5694866	CNMG120404UN KCK15B	B54
5689506	DFSP320R5WD32M	J28-29	5691870	DFSP320R3WD32M	J24-25	5692344	DFSP460R2WD40M	J23	5694867	CNMG160608UN KCK15B	B54
5689507	DFSP330R5WD32M	J28	5691871	DFSP330R3WD32M	J24	5692345	DFSP470R2WD40M	J23	5694868	CNMG160612UN KCK15B	B54
5689508	DFSP340R5WD32M	J28	5691872	DFSP340R3WD32M	J24	5692346	DFSP480R2WD40M	J23	5694871	CNMG190612UN KCK15B	B54
5689509	DFSP350R5WD32M	J28	5691873	DFSP350R3WD32M	J24	5692347	DFSP490R2WD40M	J23	5694872	DNMG110412UN KCK15B	B82
5689510	DFSP360R5WD32M	J28	5691874	DFSP360R3WD32M	J24	5692348	DFSP500R2WD40M	J23	5694873	DNMG150608UN KCK15B	B82
5689511	DFSP370R5WD32M	J28	5691875	DFSP370R3WD32M	J24	5692349	DFSP505R2WD40M	J23	5694874	SNMG120408UN KCK15B	B102
5689512	DFSP375R5WD32M	J28	5691876	DFSP375R3WD32M	J24	5692350	DFSP510R2WD40M	J23	5694877	SNMG150612UN KCK15B	B102
5689513	DFSP380R5WD32M	J28	5691877	DFSP380R3WD32M	J24	5692351	DFSP520R2WD40M	J23	5694882	VNMG160408UN KCK15B	B147
5689514	DFSP390R5WD32M	J28	5691878	DFSP390R3WD32M	J24	5692352	DFSP530R2WD40M	J23	5694883	WNMG080412UN KCK15B	B160
5689515	DFSP400R5WD32M	J28-29	5691879	DFSP400R3WD32M	J24-25	5692353	DFSP540R2WD40M	J23	5696853	TNMP160404K KCP25B	B130
5689516	DFSP410R5WD32M	J28	5691880	DFSP410R3WD32M	J24	5692354	DFSP550R2WD50M	J23	5696854	TNMP160408K KCP25B	B130
5689517	DFSP420R5WD32M	J28	5691881	DFSP420R3WD32M	J25	5692727	SPGX050204HP KCJ25	J89	5696855	TNMP220408K KCP25B	B130
5689518	DFSP430R5WD32M	J28-29	5691882	DFSP430R3WD32M	J25	5692728	SPGX050204MD KCJ25	J89	5696856	TPMT110204LF KCP25B	B255
5689519	DFSP440R5WD32M	J28	5691883	DFSP440R3WD32M	J25	5692729	SPGX050204HP KCJ40	J89	5696857	TPMT16T304LF KCP25B	B255
5689520	DFSP450R5WD40M	J28	5691884	DFSP450R3WD40M	J25	5692800	SPGX050204MD KCJ40	J89	5696859	VBMT110308LF KCP25B	B265
5689531	DFSP460R5WD40M	J28	5691885	DFSP460R3WD40M	J25	5692801	SPGX050204MD KCJ40	J89	5696930	VNMG160404MN KCP25B	B145
5689532	DFSP470R5WD40M	J28	5691886	DFSP470R3WD40M	J25	5692802	SPGX050204MD KC7140	J89	5696931	VNMG160408RN KCP25B	B147
5689533	DFSP480R5WD40M	J28-29	5691887	DFSP480R3WD40M	J25	5692803	DFTX20204HP KCJ25	J87	5696932	VNMG150408RN KCP25B	B147
5689534	DFSP490R5WD40M	J28	5691888	DFSP490R3WD40M	J25	5692804	DFTX20204MD KCJ25	J87	5696933	VNMG220408RN KCP25B	B147
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5696939	SNMG190608RN KCP25B	B101	5697960	DCMT11T312LF KCP10B	B207	5698188	TNMG160408FN KCP25B	B124	5699578	DNMG150408MR KCM25B	B80
5696940	CNMP120408 KCP25B	B56	5697962	DNMG110404MN KCP10B	B78	5698189	TNMG160408RP KCP25B	B128	5699580	DNMG150608MR KCM25B	B80
5696941	VNMG220408LF KCP25B	B144	5697964	DNMG110408FW KCP10B	B78	5698193	TNMM160408RM KCP25B	B129	5699582	SNMG120408MR KCM25B	B99
5696942	VNMG220404LF KCP25B	B144	5697965	DNMG110408MN KCP10B	B78	5698194	TNMM220412RM KCP25B	B129	5699584	TNMG160408MR KCM25B	B126
5697010	CCMT060204LF KCP10B	B177	5697967	DNMG150408MW KCP10B	B80	5698195	TNMM220416RM KCP25B	B129	5699586	TNMG220412MR KCM25B	B126
5697011	CNMT120408LF KCP10B	B177	5697968	DNMG150408RP KCP10B	B80	5698196	TPMT09204LF KCP25B	B255	5699590	VNMG080408MR KCM25B	B157
5697012	CNMM160612RP KCP10B	B56	5697969	DNMG150412CT KCP10B	B76	5698197	VNMG160404FN KCP25B	B145	5699591	VNMG080412MR KCM25B	B157
5697013	CNMM160616RM KCP10B	B55	5697970	DNMG150604MN KCP10B	B78	5698198	VNMG080404FN KCP25B	B155	5700484	SCMT09T308MF KCK15B	B231
5697014	CNMM190616RH KCP10B	B55	5697971	DNMG150608RM KCP10B	B80	5698199	VNMG080408FN KCP25B	B155	5700485	VNMA080412 KCK15B	B155
5697015	CNMM190616RP KCP10B	B56	5697972	DNMG150608RN KCP10B	B81	5698210	TNMM220408RM KCP25B	B129	5700487	VNMA160408 KCK15B	B144
5697016	CNMM190624RH KCP10B	B55	5697973	DNMG150612MW KCP10B	B80	5698211	SNMM190624RM KCP25B	B103	5701293	MS2263	T4-7
5697017	CNMM190624RH KCP10B	B56	5697974	DNMG190608RN KCP10B	B81	5698212	CNMA160608RP KCP25B	B56	5704053	KCRA02003A32RN12	V146
5697018	CPMT060204LF KCP10B	B190	5697976	DNMG190612RN KCP10B	B81	5698214	CCMT060204LF KCK15B	B177	5704054	KCRA50204S22RN12	V147
5697019	DCMT11T304LF KCP10B	B207	5697978	DNMP150408K KCP10B	B83	5698215	CCMT09T308LF KCK15B	B177	5704055	KCRA50206S22RN12	V147
5697020	DNMG110408FN KCP10B	B77	5697979	DNMP150412K KCP10B	B83	5698216	CCMT09T308LF KCK15B	B177	5704056	KCRA63206S22RN12	V147
5697021	DNMG150404FN KCP10B	B77	5697980	DNMP150608K KCP10B	B83	5698217	CCMT09T308MF KCK15B	B177	5704057	KCRA63209S22RN12	V147
5697022	DNMG150408FF KCP10B	B76	5697981	DPMT070204LF KCP10B	B215	5698218	CCMT120404LF KCK15B	B177	5704058	KCRA80208S22RN12	V147
5697023	DNMG150412FN KCP10B	B77	5697982	DPMT11T304LF KCP10B	B215	5698260	CCMT120408MF KCK15B	B177	5707893	TNMG160408RP KCP25B	B125
5697027	SNMG120408FN KCP10B	B97	5698082	RNMG150608RN KCP25B	B94	5698261	CNMA120404 KCK15B	B47	5709281	DNMG150408FN KCPK05	B77
5697029	TNMG160404FN KCP10B	B124	5698083	RNMG190608RN KCP25B	B94	5698262	CNMA120408 KCK15B	B47	5712913	W1008	V146-147
5697030	TNMG160408RP KCP10B	B128	5698084	SCMT120408LF KCP25B	B230	5698263	CNMA120416 KCK15B	B47	5720114	KW5008000HPS KNT15	B89
5697031	TNMG220412FN KCP10B	B124	5698085	SNMG120404MN KCP25B	B98	5698265	CNMA190612 KCK15B	B47	5824127	4CH0200DK004A KC633M	Q24
5697032	TNMM220408RP KCP10B	B130	5698086	SNMG120408MN KCP25B	B98	5698266	CNMA190616 KCK15B	B47	5824128	4CH0250DL008A KC633M	Q24
5697034	TPMT09204LF KCP10B	B255	5698088	SNMG120416MN KCP25B	B98	5698268	CNMG120408RP KCK15B	B53	5824129	4CH0300DK005A KC633M	Q24
5697035	VNMG160404FN KCP10B	B145	5698089	SNMG150616MN KCP25B	B98	5698269	CNMG120412RP KCK15B	B53	5824130	4CH0350DL010A KC633M	Q24
5697036	VNMG080404FN KCP10B	B155	5698110	SNMG150616RN KCP25B	B101	5698270	CPMT060204LF KCK15B	B190	5824171	4CH0400DK008A KC633M	Q24
5697037	VNMG080408FN KCP10B	B155	5698111	SNMG190612MN KCP25B	B98	5698272	DCMT11T308LF KCK15B	B207	5824172	4CH0400DL011A KC633M	Q24
5697119	RCMT120400 KCP10B	B224	5698112	SNMG190612RN KCP25B	B101	5698277	RCMT120400 KCK15B	B224	5824173	4CH0450DL011A KC633M	Q24
5697160	SCMT120408LF KCP10B	B230	5698113	SNMG190612RP KCP25B	B101	5698278	SCMT09T308LF KCK15B	B230	5824174	4CH0500DK009A KC633M	Q24
5697161	SNMG120408MN KCP10B	B98	5698116	SPMT09T308MF KCP25B	B239	5698279	SNMA120408 KCK15B	B96	5824175	4CH0500DL013A KC633M	Q24
5697163	SNMG150616RP KCP10B	B101	5698117	TCMT110204LF KCP25B	B244	5698280	SNMA120412 KCK15B	B96	5824176	4CH0550DL013A KC633M	Q24
5697164	SNMG190612RN KCP10B	B101	5698118	TCMT110208LF KCP25B	B244	5698281	SNMA150612 KCK15B	B96	5824177	4CH0600DK010A KC633M	Q24
5697165	SPMT09T304UF KCP10B	B239	5698119	TCMT110208MF KCP25B	B245	5698284	TNMA160408 KCK15B	B123	5824178	4CH0600DL013A KC633M	Q24
5697166	TCMT110204LF KCP10B	B244	5698120	TCMT16T304LF KCP25B	B244	5698287	TNMA220412 KCK15B	B123	5824179	4CH0650DL016A KC633M	Q24
5697167	TCMT16T304LF KCP10B	B244	5698121	TCMT16T308LF KCP25B	B244	5698288	TNMG160404FN KCK15B	B124	5824180	4CH0700DK011A KC633M	Q24
5697168	TCMT16T308LF KCP10B	B244	5698122	TCMT16T308MF KCP25B	B245	5698289	TNMG160408FN KCK15B	B124	5824181	4CH0700DL016A KC633M	Q24
5697169	TCMT220408LF KCP10B	B244	5698123	TCMT16T312MF KCP25B	B245	5698300	VBMT160404LF KCK15B	B265	5824182	4CH0800DK012A KC633M	Q24
5697170	TNMG160404MN KCP10B	B125	5698124	TCMT220408LF KCP25B	B245	5698301	VBMT160408LF KCK15B	B265	5824183	4CH0800DL019A KC633M	Q24
5697171	TNMG160408FF KCP10B	B124	5698125	TNMG160404MN KCP25B	B125	5698302	VNMG160404FN KCK15B	B145	5824184	4CH0900DK013A KC633M	Q24
5697172	TNMG160408FW KCP10B	B125	5698126	TNMG160408MW KCP25B	B127	5698305	VNMG060408FN KCK15B	B155	5824185	4CH0900DL019A KC633M	Q24
5697173	TNMG160408RN KCP10B	B127	5698127	TNMG160408RN KCP25B	B127	5698306	VNMG080408FN KCK15B	B155	5824186	4CH1000DK014A KC633M	Q24
5697174	TNMG160412FW KCP10B	B125	5698128	TNMG220404MN KCP25B	B125	5698307	VNMG080408MW KCK15B	B158	5824187	4CH1000DL022A KC633M	Q24
5697175	TNMG160412MW KCP10B	B127	5698129	TNMG220408MN KCP25B	B125	5698436	M4D050204S22LN15	T17	5824188	4CH1200DK016A KC633M	Q24
5697176	TNMG220408MN KCP10B	B125	5698130	TNMG220408RN KCP25B	B127	5698437	M4D063205S22LN15	T17	5824189	4CH1400DL026A KC633M	Q24
5697177	TNMG220408RN KCP10B	B127	5698131	TNMG220408RP KCP25B	B128	5698438	M4D080205S22LN15	T17	5824190	4CH1400DK018A KC633M	Q24
5697178	TNMG220408RN KCP10B	B128	5698133	TNMG220412MN KCP25B	B125	5698439	M4D100206S32LN15	T17	5824191	4CH1400DL026A KC633M	Q25
5697179	TNMG220412RN KCP10B	B127	5698134	TNMG220412RN KCP25B	B127	5698490	M4D12507S40LN15	T17	5824192	4CH1600DK022A KC633M	Q25
5697180	TNMG270612RN KCP10B	B127	5698135	TNMG220412RP KCP25B	B128	5698491	M4D160208S40LN15	T17	5824193	4CH1600DL032A KC633M	Q25
5697181	TNMG330924RN KCP10B	B127	5698136	TNMG220432RP KCP25B	B128	5698743	CCMT060208LF KCK15B	B177	5824194	4CH1800DK024A KC633M	Q25
5697183	TPMT110204LF KCP10B	B255	5698137	TNMG270608RN KCP25B	B127	5698744	CCMT09T308MF KCK15B	B177	5824195	4CH1800DL032A KC633M	Q25
5697184	TPMT16T304LF KCP10B	B255	5698139	TNMG270616RN KCP25B	B127	5698747	CNMG120408FW KCK15B	B49	5824196	4CH2000DK026A KC633M	Q25
5697185	VNMG160404FF KCP10B	B145	5698140	TNMG270616RP KCP25B	B128	5698770	CPMT09T304LF KCK15B	B190	5824197	4CH2000DL038A KC633M	Q25
5697186	VNMG160404FN KCP10B	B145	5698141	TNMG330924RN KCP25B	B127	5698772	CPMT09T308LF KCK15B	B190	5824198	4CH2000DL011A KC633M	Q26
5697187	VNMG160408RN KCP10B	B147	5698146	CCMT060204LF KCP25B	B177	5698773	CPMT09T308MF KCK15B	B190	5824199	4CH0500DD013A KC633M	Q26
5697188	VNMG220408RN KCP10B	B147	5698147	CCMT120404LF KCP25B	B177	5698775	DCMT070204LF KCK15B	B207	5824200	4CH0600DD013A KC633M	Q26
5697189	VNMP160404K KCP10B	B148	5698148	CCMT120408LF KCP25B	B177	5698777	DNMG150408FN KCK15B	B78	5824201	4CH0800DD019A KC633M	Q26
5697202	VNMG060408MN KCP10B	B157	5698149	CCMT120412LF KCP25B	B177	5698778	DNMG150608RP KCK15B	B81	5824202	4CH1000DD022A KC633M	Q26
5697203	VNMG060408RP KCP10B	B159	5698160	CNMG120408MP KCP25B	B51	5698781	SCMT09T304LF KCK15B	B230	5824203	4CH1200DD026A KC633M	Q26
5697204	VNMG080412FW KCP10B	B156	5698161	CNMM120408RM KCP25B	B55	5698782	SCMT120408LF KCK15B	B230	5824204	4CH1400DD026A KC633M	Q26
5697910	CCMT060204MF KCP10B	B177	5698162	CNMM120408RP KCP25B	B56	5698783	SCMT120408MF KCK15B	B231	5824205	4CH1600DD032A KC633M	Q26
5697912	CCMT09T304MF KCP10B	B177	5698163	CNMM160616RM KCP25B	B55	5698785	SCMT120412MF KCK15B	B231	5824206	4CH1800DD032A KC633M	Q26
5697914	CCMT09T308UF KCP10B	B178	5698164	CNMM160624RM KCP25B	B55	5698787	SPMT09T304LF KCK15B	B238	5824207	4CH2000DK038A KC633M	Q26
5697917	CNMG090308MN KCP10B	B50	5698165	CNMM190612RM KCP25B	B55	5698788	SPMT09T308LF KCK15B	B238	5824208	4CH1200DK016B KC633M	Q24
5697919	CNMG120404FW KCP10B	B49	5698166	CNMM190612RP KCP25B	B56	5698789	SPMT09T308MF KCK15B	B239	5824209	4CH1200DL026B KC633M	Q24
5697921	CNMG120404MN KCP10B	B50	5698167	CNMM190616RH KCP25B	B55	5698791	TCMT110204LF KCK15B	B244	5824210	4CH1400DK018B KC633M	Q24
5697923	CNMG120408FW KCP10B	B49	5698168	CNMM190624RW KCP25B	B56	5698792	TCMT110208LF KCK15B	B244	5824211	4CH1400DL026B KC633M	Q25
5697925	CNMG120412FW KCP10B	B49	5698169	CPMT060204LF KCP25B	B190	5698793	TCMT16T308LF KCK15B	B244	5824212	4CH1600DK022B KC633M	Q25
5697927	CNMG120412MW KCP10B	B52	5698170	DCMT11T304LF KCP25B	B207	5698794	TCMT16T308MF KCK15B	B245	5824213	4CH1800DL032B KC633M	Q25
5697929	CNMG120416MN KCP10B	B50	5698171	DNMG110404FN KCP25B	B77	5698796					

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5824305	4BN1800DL032B KC633M	Q29	5873032	2CH1000MX045A KC633M	Q9	5882580					

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5894815	SDET120416SNGB KC725M	T105, T112, U51	5941112	EG187I04P1GUP KCU25	C20	5954289	A32SEVELM0312M	C47	5957778	FSDE1200E9DYG KC643M	P94
5897007	B967A16500 KC7315	G134	5941113	EG187I04P2GUP KCU25	C20	5954290	A32SEVELM0412M	C47	5957780	FSDE1200E9DYL KC643M	P94
5903579	SNMG150612MR KCPK05	B99	5941114	EG125I03P05GUP K313	C20	5955391	EVBSN19G1F16	C49	5957782	FSDE1600EBDYG KC643M	P94
5904367	CNMG160616MG KCP10B	B57	5941115	EG125I03P1GUP K313	C20	5955392	EVBSN26J1F17	C49	5957784	FSDE1600EBDYM KC643M	P94
5904368	DNMG150616MG KCP10B	B80	5941116	EG187I04P1GUP K313	C20	5955415	EVM50R0526MC	C50	5957786	FSDE2000EFDYG KC643M	P94
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5910213	CPMT060208MF KCP10B	B190	5941706	EVBSN19G1B14	C49	5955417	EVM65R0626MC	C50	5957790	FSDE2000EFDYL KC643M	P94
5914006	SCW5E	C49	5941707	EVBSN19G0220	C49	5955418	EVM65R0826MC	C50	5957792	FSDE2500EJDYG KC643M	P94
5914007	SCW8E	C49	5941708	EVBSN26J1B15	C49	5955419	EVM65L0826MC	C51	5964045	KSEM1250SPLM KCMS35	H52
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5914889	NGD4M400LK KCU25	C149	5941710	EVBSN26M0230	C49	5955421	EVM65L0626MC	C51	5964047	KSEM1300SPLM KCMS35	H52
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5939440	EVSML2020K0416C	C37	5947511	LNGU15T612SRGEM KCK15	T19	5955493	NGD2M150RK KCU10	C149	5964105	KSEM1600SPLM KCMS35	H52
5939441	EVSML2020K0322C	C37	5947517	KTIP0794FEGM KCPM45	H29	5955494	NGD2M200RK KCU10	C149	5964106	KSEM1609SPLM KCMS35	H52
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5939443	EVSMR3232P0432C	C36	5949101	RCMT1204M0 KCM25B	B224	5955496	NGD2M250RK KCU10	C149	5964108	KSEM1627SPLM KCMS35	H52
5939444	EVSMR3232P0426C	C36	5949288	KSEM2955HPGM KC7315	H43	5955498	NGD3M300LK KCU10	C149	5964109	KSEM1650SPLM KCMS35	H52
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5941057	EG0312M03U04GUP KCU25	C17	5954212	EVSML4040R0840C	C38	5955624	NGD3M200RK KCU25	C149	5964131	KSEM1935SPLM KCMS35	H52
5941058	EG0312M03U02GUN KCU25	C22	5954213	EVSML4040R0640C	C38	5955625	NGD3M250LK KCU25	C149	5964133	KSEM1945SPLM KCMS35	H52
5941059	EG0312M03U04GUN KCU25	C22	5954214	EVSML3232P1032C	C38	5955626	NGD3M250RK KCU25	C149	5964135	KSEM1950SPLM KCMS35	H52
5941071	EG0412M04U04GUP KCU25	C17	5954215	EVSML3232P0832C	C38	5955627	NGD3M300LK KCU25	C149	5964137	KSEM1984SPLM KCMS35	H52
5941072	EG0412M04U04GUN KCU25	C22	5954216	EVSML3232P0826C	C38	5955628	NGD3M300RK KCU25	C149	5964139	KSEM2000SPLM KCMS35	H52
5941073	EC030M03L06CF02 KCU25	C24	5954217	EVSML3232P0632C	C38	5955629	NGD3M400LK KCU25	C149	5964151	KSEM2050SPLM KCMS35	H52
5941074	EC030M03L06CF02 KCU25	C24	5954218	EVSML3232P0626C	C38	5955630	NGD3M400RK KCU25	C149	5964153	KSEM2064SPLM KCMS35	H52
5941075	EC040M04R06CF02 KCU25	C24	5954219	EVSML3232P0532C	C37	5955631	NGD4M500LK KCU25	C149	5964155	KSEM2100SPLM KCMS35	H52
5941076	EC040M04R06CF02 KCU25	C24	5954220	EVSML3232P0526C	C37	5955632	NGD4M500RK KCU25	C149	5964157	KSEM2100SPLM KCMS35	H52
5941077	EC040M04R06CF02 KCU25	C24	5954221	EVSML2525M0826C	C38	5956374	UADE1200A4BV KCPM15	P17	5964159	KSEM2200SPLM KCMS35	H52
5941079	EC030M03N00CM02 KCU25	C26	5954232	EVSML2525M0626C	C37	5956375	UADE1600A4BV KCPM15	P17	5964161	KSEM2223SPLM KCMS35	H52
5941080	EC040M04N00CM02 KCU25	C26	5954233	EVSML2525M0616C	C37	5956376	UADE2000A4BV KCPM15	P17	5964163	KSEM2250SPLM KCMS35	H52
5941081	EC030M03N00CM02 KCU25	C26	5954234	EVSML2525M0526C	C37	5956377	UADE2500A4BV KCPM15	P17	5964165	KSEM2381SPLM KCMS35	H52
5941082	EC040M04N00CM02 KCU25	C27	5954235	EVSML2525M0516C	C37	5956378	UADE1200B4BV KCPM15	P17	5964167	KSEM2400SPLM KCMS35	H52
5941083	EG0412M04U08GUP KCU25	C17	5954236	EVSML2020K0622C	C37	5956379	UADE1600B4BV KCPM15	P17	5964169	KSEM2500SPLM KCMS35	H52
5941084	EG0412M04U08GUN KCU25	C22	5954237	EVSML2020K0616C	C37	5956380	UADE2000B4BV KCPM15	P17	5964171	KSEM2540SPLM KCMS35	H52
5941085	EC030M03L06CM02 KCU25	C26	5954238	EVSML2020K0522C	C37	5956421	UADE2500B4BV KCPM15	P17	5964173	KSEM2560SPLM KCMS35	H52
5941086	EC030M03R06CM02 KCU25	C26	5954239	EVSML2020K0516C	C37	5956817	M4K1TD5020S22SGEKCPM40	T21	5964175	KSEM2565SPLM KCMS35	H52
5941087	EC040M04L06CM02 KCU25	C26	5954240	EVSML2020K0516C	C37	5956818	M4K1TD3220A32SGEKCPM40	T21	5964177	KSEM2567SPLM KCMS35	H52
5941088	EC040M04R06CM02 KCU25	C26	5954241	EVSML4040R1040C	C37	5956819	M4K1TD4020A516SGEKCPM40	T21	5964179	KSEM2581SPLM KCMS35	H52
5941089	EC030M03L06CR02 KCU25	C27	5954242	EVSML4040R0840C	C37	5956820	M4K1TD5020S22SGEKCPM40	T21	5964181	KSEM2600SPLM KCMS35	H52
5941090	EC030M03R06CR02 KCU25	C27	5954243	EVSML4040R0640C	C37	5956872	M4K1TD5020S22SGEKCPM40	T21	5964183	KSEM2619SPLM KCMS35	H52
5941091	EC040M04L06CR02 KCU25	C27	5954244	EVSML3232P0832C	C37	5956873	M4K1TD6320S22SGEKCPM40	T21	5964184	KSEM2700SPLM KCMS35	H52
5941092	EC040M04R06CR02 KCU25	C27	5954245	EVSML3232P0826C	C37	5956874	M4K1TD8020S27SGEKCPM40	T21	5964185	KSEM2858SPLM KCMS35	H53
5941093	EG130I03U05GUP KCU25	C19	5954246	EVSML3232P0632C	C37	5956875	M4K1TD10020S8S32SGEKCPM40	T21	5964186	KSEM3000SPLM KCMS35	H53
5941094	EG130I03U1GUP KCU25	C19	5954247	EVSML3232P0626C	C37	5956876	M4K1TD2520A25EGEK725M	T21	5964187	KSEM3175SPLM KCMS35	H53
5941095	EG130I03U05GUN KCU25	C23	5954248	EVSML3232P0532C	C37	5956877	M4K1TD3220A32EGEK725M	T21	5964188	KSEM3200SPLM KCMS35	H53
5941096	EG130I03U1GUN KCU25	C23	5954249	EVSML3232P0526C	C36	5956878	M4K1TD4020A516EGEK725M	T21	5964189	KSEM3846SPLM KCMS35	H53
5941097	EG192I04U1GUP KCU25	C19	5954250	EVSML2525M0826C	C37	5956879	M4K1TD5020S22EGEK725M	T21	5964190	KSEM4000SPLM KCMS35	H53
5941098	EG192I04U1GUN KCU25	C23	5954251	EVSML2525M0626C	C37	5956880	M4K1TD5020S22EGEK725M	T21	5964798	UADE0600A4BV KCPM15	P17
5941099	EG192I04U2GUP KCU25	C19	5954252	EVSML2525M0616C	C37	5956891	M4K1TD6320S22EGEK725M	T21	5964799	UADE0800A4BV KCPM15	P17
5941100	EG192I04U2GUN KCU25	C23	5954253	EVSML2525M0526C	C36	5956892	M4K1TD8020S27EGEK725M	T21	5964800	UADE1000A4BV KCPM15	P17
5941101	EG0300M03P02GUP KCU25	C18	5954254	EVSML2525M0516C	C36	5956893	M4K1TD2520A25SGEMK520M	T21	5964801	UADE0000A4BV KCPM15	P17
5941102	EG0300M03P04GUP KCU25	C18	5954255	EVSML2020K0622C	C37	5956894	M4K1TD3220A32SGEMK520M	T21	5964802	UADE0800B4BV KCPM15	P17
5941103	EG0400M04P04GUP KCU25	C18	5954256	EVSML2020K0616C	C37	5956895	M4K1TD4020A516SGEMK520M	T21	5964803	UADE1000B4BV KCPM15	P17
5941104	EG0400M04P08GUP KCU25	C18	5954257	EVSML2020K0522C	C36	5956897	M4K1TD5020S22SGEMK520M	T21	5964865	RPP12204M0E432X8 X700	V97
5941105	EG0300M03P02GUP K313	C18	5954258								



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5967806	NG2M080LK KCP10B	C147	5968010	NG2M195RK KCP25B	C146	5968105	NG4M600RK KCP25B	C147	5979201	EVM50R0412MC	C50
5967807	NG2M080RK KCP10B	C146	5968011	NG2M200LK KCP25B	C147	5968391	KTP0800FEGM KCPM45	H29	5979202	EVM50L0312MC	C51
5967808	NG2M100LK KCP10B	C147	5968012	NG2M200RK KCP25B	C146	5968392	KTP0850FEGM KCPM45	H29	5979203	EVM50L0412MC	C51
5967810	NG2M100RK KCP10B	C146	5968013	NG2M220LK KCP25B	C147	5968393	KTP0900FEGM KCPM45	H29	5979745	KGMSR2525M65C	C58
5967821	NG2M120LK KCP10B	C147	5968014	NG2M220RK KCP25B	C146	5968394	KTP0950FEGM KCPM45	H29	5979746	KGMSR3232P50C	C58
5967822	NG2M120RK KCP10B	C146	5968015	NG2M225LK KCP25B	C147	5968395	KTP1000FEGM KCPM45	H29	5979747	KGMSR3232P65C	C58
5967823	NG2M140LK KCP10B	C147	5968016	NG2M225RK KCP25B	C146	5968396	KTP1050FEGM KCPM45	H29	5979748	KGMSL2525M65C	C58
5967825	NG2M140RK KCP10B	C146	5968017	NG2M250LK KCP25B	C147	5968397	KTP1100FEGM KCPM45	H29	5979749	KGMSL3232P50C	C58
5967826	NG2M170LK KCP10B	C147	5968018	NG2M250RK KCP25B	C146	5968398	KTP1150FEGM KCPM45	H29	5979750	KGMSL3232P65C	C58
5967827	NG2M170RK KCP10B	C146	5968019	NG2M275LK KCP25B	C147	5968399	KTP1200FEGM KCPM45	H29	5979765	KGMSR2525M65C	C59
5967828	NG2M195LK KCP10B	C147	5968020	NG2M275RK KCP25B	C146	5968400	KTP1250FEGM KCPM45	H29	5979766	KGMSR3232P50C	C59
5967829	NG2M195RK KCP10B	C146	5968021	NG2M300LK KCP25B	C148	5968401	KTP1270FEGM KCPM45	H29	5979767	KGMSR3232P65C	C59
5967830	NG2M200LK KCP10B	C147	5968022	NG2M300RK KCP25B	C146	5968402	KTP1300FEGM KCPM45	H29	5979768	KGMSL2525M65C	C59
5967831	NG2M200RK KCP10B	C146	5968023	NG2M320LK KCP25B	C146	5968403	KTP1350FEGM KCPM45	H29	5979769	KGMSL3232P50C	C59
5967832	NG2M225LK KCP10B	C147	5968024	NG2M325LK KCP25B	C148	5968404	KTP1400FEGM KCPM45	H29	5979770	KGMSL3232P65C	C59
5967833	NG2M225RK KCP10B	C146	5968025	NG2M325RK KCP25B	C146	5968405	KTP1450FEGM KCPM45	H29	5979852	WNMG080408MG KCP10B	B156
5967834	NG2M275RK KCP10B	C146	5968026	NG3047LK KCP25B	C148	5968406	KTP1500FEGM KCPM45	H29	5979853	WNMG080408MG KCP25B	B156
5967835	NG2M300LK KCP10B	C148	5968027	NG3047RK KCP25B	C146	5968407	KTP1550FEGM KCPM45	H29	5980138	KGMSR2525M0316C	C39
5967836	NG2M300RK KCP10B	C146	5968028	NG3062RK KCP25B	C146	5968408	KTP1600FEGM KCPM45	H29	5980139	EVSTR1616K0216	C39
5967837	NG3047LK KCP10B	C148	5968029	NG3072LK KCP25B	C148	5968409	KTP1650FEGM KCPM45	H29	5980140	EVSTR1616K0316C	C39
5967838	NG3047RK KCP10B	C146	5968030	NG3072RK KCP25B	C146	5968410	KTP1700FEGM KCPM45	H29	5980518	A12KEVMR1F05M	C46
5967839	NG3062RK KCP10B	C146	5968031	NG3078LK KCP25B	C148	5968411	KTP1750FEGM KCPM45	H29	5980519	A12KEVMR0205M	C46
5967840	NG3072LK KCP10B	C148	5968032	NG3078RK KCP25B	C146	5968412	KTP1800FEGM KCPM45	H29	5980520	A16MEVMR1F07M	C46
5967841	NG3072RK KCP10B	C146	5968033	NG3094LK KCP25B	C148	5968413	KTP1850FEGM KCPM45	H29	5980621	A16MEVMR1F07M	C46
5967842	NG3078LK KCP10B	C148	5968035	NG3125LK KCP25B	C148	5968414	KTP1900FEGM KCPM45	H29	5980622	A20QEVMR1F07M	C46
5967843	NG3078RK KCP10B	C146	5968036	NG3125RK KCP25B	C147	5968416	KTP1905FEGM KCPM45	H29	5980623	A20QEVMR0207M	C46
5967844	NG3094LK KCP10B	C148	5968037	NG3156LK KCP25B	C148	5968417	KTP1950FEGM KCPM45	H29	5980624	A20QEVMR0210M	C46
5967845	NG3125LK KCP10B	C148	5968038	NG3156RK KCP25B	C147	5970180	UJBE0400A6CP KCSM15	P62	5980625	A12KEVMR1F05M	C47
5967846	NG3125RK KCP10B	C147	5968039	NG3189LK KCP25B	C148	5970211	UJBE0400A6BP KCSM15	P62	5980626	A12KEVMR0205M	C47
5967847	NG3156LK KCP10B	C148	5968040	NG3189RK KCP25B	C147	5970212	UJBE0500A6CP KCSM15	P62	5980627	A16MEVMR1F07M	C47
5967848	NG3156RK KCP10B	C147	5968041	NG3M100LK KCP25B	C148	5970213	UJBE0500A6BP KCSM15	P62	5980628	A16MEVMR0207M	C47
5967849	NG3189LK KCP10B	C148	5968042	NG3M100RK KCP25B	C146	5970214	UJBE0600A6BP KCSM15	P62	5980629	A20QEVMR1F07M	C47
5967850	NG3189RK KCP10B	C147	5968043	NG3M120LK KCP25B	C148	5970215	UJBE0600A6CP KCSM15	P62	5980630	A20QEVMR0207M	C47
5967872	NG3M120LK KCP10B	C148	5968044	NG3M120RK KCP25B	C146	5970216	UJBE0700A6BP KCSM15	P62	5980631	A25REVMR0210M	C47
5967873	NG3M120RK KCP10B	C146	5968045	NG3M150LK KCP25B	C148	5970217	UJBE0700A6CP KCSM15	P62	5980761	EVSTR1616K0416C	C39
5967874	NG3M225LK KCP10B	C148	5968047	NG3M150RK KCP25B	C146	5970218	UJBE0800A6CP KCSM15	P62	5980762	EVSTR2020K0216	C39
5967875	NG3M225RK KCP10B	C146	5968048	NG3M175LK KCP25B	C148	5970219	UJBE0800A6BP KCSM15	P62	5980763	EVSTR2020K0316C	C39
5967876	NG3M275LK KCP10B	C148	5968049	NG3M175RK KCP25B	C146	5970220	UJBE1000A6CP KCSM15	P62	5980764	EVSTR2020K0326C	C39
5967877	NG3M275RK KCP10B	C147	5968050	NG3M200LK KCP25B	C148	5970221	UJBE1000A6BP KCSM15	P62	5980765	EVSTR2020K0416C	C39
5967878	NG3M300LK KCP10B	C148	5968051	NG3M200RK KCP25B	C146	5970234	RPPT1204M0E432X4 X700	V97	5980766	EVSTR2020K0426C	C39
5967879	NG3M300RK KCP10B	C146	5968052	NG3M220LK KCP25B	C148	5970235	RPPT1204M0E432X4 X500	V97	5980767	EVSTR2525M0216	C39
5967880	NG3M400LK KCP10B	C148	5968053	NG3M220RK KCP25B	C146	5970237	RPPT1204M0E432X4 SO6525	V97	5980768	EVSTR2525M0226	C39
5967881	NG3M400RK KCP10B	C147	5968054	NG3M225LK KCP25B	C148	5971570	200C09RS90RC20CHP	V82	5980769	EVSTR2525M0326C	C39
5967882	NG3M425LK KCP10B	C148	5968055	NG3M225RK KCP25B	C146	5971596	160C08RS90RC20CHP	V82	5980770	EVSTR2525M0426C	C39
5967883	NG3M425RK KCP10B	C147	5968056	NG3M250LK KCP25B	C148	5971597	160C07RS90RC20CHP	V82	5980771	EVSTR2525M0432C	C39
5967884	NG4125LK KCP10B	C148	5968057	NG3M250RK KCP25B	C146	5972039	KTP1394HPM KCP15	H27	5980772	EVSTR2525M0526C	C39
5967885	NG4125RK KCP10B	C147	5968058	NG3M275LK KCP25B	C148	5975092	LINEU1235R03 4 KCPM40	U19	5980773	EVSTR2525M0532C	C39
5967886	NG4189LK KCP10B	C148	5968059	NG3M275RK KCP25B	C147	5975093	LINEU1250R04 KCPM40	U19	5980774	EVSTR2525M0432C	C39
5967887	NG4189RK KCP10B	C147	5968060	NG3M300LK KCP25B	C148	5975094	LINEU1250R08 KCPM40	U19	5980775	EVSTR3232P0540C	C39
5967888	NG4250LK KCP10B	C148	5968061	NG3M300RK KCP25B	C147	5976169	LNPU157612SRGE KCPM40	T19	5980776	EVSTL2525M0316C	C40
5967889	NG4250RK KCP10B	C146	5968062	NG3M320LK KCP25B	C148	5976170	LNPU157608SRGEM KCPM40	T19	5980777	EVSTL1616K0216	C40
5967891	NG4M400LK KCP10B	C148	5968063	NG3M320RK KCP25B	C147	5976671	LNPU157612SRGEM KCPM40	T19	5980778	EVSTL1616K0316C	C40
5967892	NG4M400RK KCP10B	C147	5968064	NG3M325LK KCP25B	C148	5976672	LNPU157616SRGEM KCPM40	T19	5980779	EVSTL1616K0416C	C40
5967893	NG4M500LK KCP10B	C148	5968065	NG3M325RK KCP25B	C147	5976676	MCC0800HP	V82	5980780	EVSTL2020K0216	C40
5967894	NG4M500RK KCP10B	C147	5968066	NG3M350LK KCP25B	C148	5976677	MCCM160HP	V82	5980801	EVSTL2020K0316C	C40
5967943	NG2031LK KCP25B	C147	5968067	NG3M350RK KCP25B	C147	5976678	SDSW66	V82	5980802	EVSTL2020K0326C	C40
5967944	NG2031RK KCP25B	C146	5968068	NG3M400LK KCP25B	C148	5977291	LNJX301960RRP KCP10B	E48	5980803	EVSTL2020K0416C	C40
5967945	NG2047LK KCP25B	C147	5968069	NG3M400RK KCP25B	C147	5977292	LNJX301960RRP KCP25B	E48	5980804	EVSTL2020K0426C	C40
5967946	NG2047RK KCP25B	C146	5968071	NG3M425LK KCP25B	C148	5977635	EVBSN26J0540	C49	5980805	EVSTL2525M0216	C40
5967947	NG2062LK KCP25B	C147	5968072	NG3M425RK KCP25B	C147	5977636	EVBSN26J0640	C49	5980806	EVSTL2525M0226	C40
5967948	NG2062RK KCP25B	C146	5968073	NG3M450LK KCP25B	C148	5977637	EVBSN32M0560	C49	5980807	EVSTL2525M0326C	C40
5967949	NG2094LK KCP25B	C147	5968074	NG3M450RK KCP25B	C147	5977638	EVBSN32M0660	C49	5980808	EVSTL2525M0426C	C40
5967950	NG2094RK KCP25B	C146	5968075	NG4125LK KCP25B	C148	5977639	EVBSN32M0860	C49	5980809	EVSTL2525M0432C	C40
5967991	NG2125LK KCP25B	C148	5968076	NG4125RK KCP25B	C147	5977640	EVBSN52X06120	C49	5980810	EVSTL2525M0526C	C40
5967992	NG2125RK KCP25B	C146	5968077	NG4189LK KCP25B	C148	5977721	EVBSN52X08120	C49	5980811	EVSTL2525M0532C	C40
5967993	NG2M050LK KCP25B	C147	5968078	NG4189RK KCP25B	C147	5979010	EVM50R0316MC	C50	5980812	EVSTL3232P0432C	C40
5967994	NG2M050RK KCP25B	C146	5968079	NG4250LK KCP25B	C148	5979181	EVM50R0322MC	C50	5980813	EVSTL3232P0540C	C40
5967995	NG2M080LK KCP25B	C147	5968080	NG4250RK KCP25B	C147	5979182	EVM50R0416MC	C50	5981500	KSEM1650FEGM KCPM45	H54
5967996	NG2M080RK KCP25B	C146	5968081	NG4M300LK KCP25B	C148	5979183	EVM50R0422MC	C50	5981571	KSEM1700FEGM KCPM45	H54
5967997	NG2M100LK KCP25B	C147	5968082	NG4M300RK KCP25B	C147	5979184	EVM50R0432MC	C50	5981572	KSEM1750FEGM KCPM45	H54
5967998	NG2M100RK KCP25B	C146	5968083	NG4M320LK KCP25B	C148	5979185	EVM50L0316MC	C51	5981573	KSEM1800FEGM KCPM45	H54
5967999	NG2M120LK KCP25B	C147	5968084	NG4M350LK KCP25B	C148	5979186	EVM50L0322MC	C51	5981574	KSEM1850FEGM KCPM45	H54
5968000	NG2M120RK KCP25B	C146	5968085	NG4M350RK KCP25B	C147	5979187	EVM50L0416MC	C51	5981575	KSEM1900FEGM KCPM45	H54
5968001	NG2M140LK KCP25B	C146	5968086	NG4M400LK KCP25B	C148	5979188	EVM50L0422MC	C51	5981576	KSEM1905FEGM KCPM45	H54
5968002	NG2M140RK KCP25B	C146	5968087	NG4M400RK KCP25B	C147	5979189	EVM50L0432MC	C51	5981577	KSEM1950FEGM KCPM45	H54
5968003	NG2M150LK KCP25B	C147	5968088	NG4M450LK KCP25B	C148	5979190	KGMSR2525M50C	C58	5981578	KSEM2000FEGM KCPM45	H54
5968004	NG2M150RK KCP25B	C147	5968089	NG4M450RK KCP25B	C147	5979191	KGMSL2525M50C	C58	5981579	KSEM2005FEGM KCPM45	H54
5968005	NG2M170LK KCP25B	C146	5968090	NG4M500LK KCP25B	C148	5979192	KGMSR2525M50C	C59	5981580	KSEM2100FEGM KCPM45	H54
5968006	NG2M170RK KCP25B	C146	5968101	NG4M500RK KCP25B	C147	5979193	KGMSL2525M50C	C59	5981581	KSEM2150FEGM KCPM45	H54
5968007	NG2M175LK KCP25B	C147	5968102	NG4M550LK KCP25B	C148	5979198	EVM50R0426MC	C50	5981582	KSEM2200FEGM KCPM45	H54
5968008	NG2M175RK KCP25B	C146	5968103	NG4M550RK KCP25B	C147	5979199	EVM				

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5981585	KSEM2350FEGM KCPM45	H54	5987590	B286D07541HPS KN15	G89	5987755	B284D03900HPS KN15	G88	5988779	EG100M10P12GUP KCU25	C18
5981586	KSEM2400FEGM KCPM45	H54	5987591	B286D07600HPS KN15	G89	5987756	B284D04039HPS KN15	G88	5988780	ER0300M03P00GUP KCU25	C21
5981587	KSEM2450FEGM KCPM45	H54	5987592	B286D07700HPS KN15	G89	5987757	B284D04100HPS KN15	G88	5988781	ER0400M04P00GUP KCU25	C21
5981588	KSEM2500FEGM KCPM45	H54	5987593	B286D07938HPS KN15	G89	5987758	B284D04305HPS KN15	G88	5988782	ER0500M05P00GUP KCU25	C21
5981589	KSEM2540FEGM KCPM45	H54	5987595	B286D08000HPS KN15	G89	5987759	B284D04400HPS KN15	G88	5988783	ER0600M06P00GUP KCU25	C21
5981591	KSEM2550FEGM KCPM45	H54	5987596	B286D08334HPS KN15	G89	5987760	B284D04600HPS KN15	G88	5988785	ER0800M08P00GUP KCU25	C21
5981592	KSEM2600FEGM KCPM45	H54	5987597	B286D08400HPS KN15	G89	5987761	B284D04700HPS KN15	G88	5988787	EG0940I2P05GUP KCU25	C20
5981593	KSEM2650FEGM KCPM45	H54	5987598	B286D08433HPS KN15	G89	5987762	B284D04900HPS KN15	G88	5988788	EG2500I6P1GUP KCU25	C20
5981594	KSEM2700FEGM KCPM45	H54	5987599	B286D08500HPS KN15	G89	5987763	B284D05106HPS KN15	G88	5988789	EG2500I6P2GUP KCU25	C20
5981595	KSEM2750FEGM KCPM45	H54	5987600	B286D08700HPS KN15	G89	5987764	B284D05200HPS KN15	G88	5988790	EG3120I8P3GUP KCU25	C20
5981596	KSEM2850FEGM KCPM45	H54	5987601	B286D08733HPS KN15	G89	5987765	B284D05300HPS KN15	G88	5988811	EG0631I1FP05GUP KCU25	C20
5981597	KSEM2900FEGM KCPM45	H54	5987602	B286D08800HPS KN15	G89	5987766	B284D05400HPS KN15	G88	5988812	EG3751I1OP3GUP KCU25	C20
5981598	KSEM2950FEGM KCPM45	H54	5987603	B286D08900HPS KN15	G89	5987767	B284D05410HPS KN15	G88	5988813	ER1250I3P00GUP KCU25	C22
5981599	KSEM3000FEGM KCPM45	H54	5987604	B286D09000HPS KN15	G89	5987768	B284D05500HPS KN15	G88	5988814	ER1870I4P00GUP KCU25	C22
5981600	KSEM3100FEGM KCPM45	H54	5987605	B286D09100HPS KN15	G89	5987769	B284D05791HPS KN15	G89	5988815	ER2500I6P00GUP KCU25	C22
5981601	KSEM3175FEGM KCPM45	H54	5987606	B286D09129HPS KN15	G89	5987770	B284D06200HPS KN15	G89	5988816	ER3120I8P00GUP KCU25	C22
5981602	KSEM3200FEGM KCPM45	H54	5987607	B286D09300HPS KN15	G89	5987771	B284D06300HPS KN15	G89	5988818	EG0200I2P02GUP K313	C18
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5981604	KSEM3400FEGM KCPM45	H54	5987609	B286D09500HPS KN15	G89	5987773	B284D06528HPS KN15	G89	5988834	EG0600M06P04GUP K313	C18
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5981606	KSEM3600FEGM KCPM45	H55	5987611	B286D09900HPS KN15	G89	5987775	B284D06630HPS KN15	G89	5988836	EG0500M05P04GUP K313	C18
5981607	KSEM3700FEGM KCPM45	H55	5987612	B286D09921HPS KN15	G89	5987776	B284D06700HPS KN15	G89	5988837	EG0500M05P08GUP K313	C18
5981608	KSEM3800FEGM KCPM45	H55	5987613	B286D10000HPS KN15	G89	5987777	B284D06900HPS KN15	G89	5988838	EG0700M07P08GUP K313	C18
5981609	KSEM3810FEGM KCPM45	H55	5987614	B286D10100HPS KN15	G89	5987778	B284D07300HPS KN15	G89	5988839	EG0800M08P08GUP K313	C18
5981610	KSEM3900FEGM KCPM45	H55	5987615	B286D10200HPS KN15	G89	5987779	B284D07600HPS KN15	G89	5988840	EG0800M08P12GUP K313	C18
5982089	VBM1160404MP KCP25B	B265	5987616	B286D10300HPS KN15	G89	5987780	B284D07700HPS KN15	G89	5988851	EG1000M10P12GUP K313	C18
5984676	KSEM2670FEGM KCPM45	H54	5987617	B286D10320HPS KN15	G89	5987781	B284D08400HPS KN15	G89	5988858	ER0400M04P00GUP K313	C21
5986819	KGIP0300N189GD KCU45	H76	5987618	B286D10500HPS KN15	G89	5987782	B284D08433HPS KN15	G89	5988859	ER0500M05P00GUP K313	C21
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5987475	B286D03100HPS KN15	G88	5987620	B286D10716HPS KN15	G90	5987784	B284D08800HPS KN15	G89	5988861	ER0800M08P00GUP K313	C21
5987476	B286D03175HPS KN15	G88	5987631	B286D10800HPS KN15	G90	5987785	B284D08900HPS KN15	G89	5988903	EG0940I2P05GUP K313	C20
5987477	B286D03200HPS KN15	G88	5987632	B286D11000HPS KN15	G90	5987786	B284D09100HPS KN15	G89	5988904	EG0631I1FP05GUP K313	C20
5987478	B286D03264HPS KN15	G88	5987633	B286D11100HPS KN15	G90	5987787	B284D09300HPS KN15	G89	5988905	ER1250I3P00GUP K313	C22
5987479	B286D03300HPS KN15	G88	5987634	B286D11113HPS KN15	G90	5987788	B284D09400HPS KN15	G89	5988961	EG2500I6P1GUP K313	C20
5987480	B286D03455HPS KN15	G88	5987635	B286D11200HPS KN15	G90	5987789	B284D09900HPS KN15	G89	5988962	EG2500I6P2GUP K313	C20
5987531	B286D03500HPS KN15	G88	5987636	B286D11300HPS KN15	G90	5987790	B284D10100HPS KN15	G89	5988963	EG3120I8P3GUP K313	C20
5987532	B286D03571HPS KN15	G88	5987637	B286D11400HPS KN15	G90	5987791	B284D10300HPS KN15	G89	5988964	EG3751I1OP3GUP K313	C20
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5987535	B286D03900HPS KN15	G88	5987640	B286D11800HPS KN15	G90	5987794	B284D11100HPS KN15	G90	5988967	ER3120I8P00GUP K313	C22
5987536	B286D03970HPS KN15	G88	5987641	B286D11908HPS KN15	G90	5987795	B284D11200HPS KN15	G90	5989962	CNMG120408MG KCP25B	B57
5987537	B286D04000HPS KN15	G88	5987642	B286D12000HPS KN15	G90	5987796	B284D11300HPS KN15	G90	5989963	CNMG120412MG KCP25B	B57
5987538	B286D04039HPS KN15	G88	5987643	B286D12304HPS KN15	G90	5987797	B284D11400HPS KN15	G90	5989965	CNMG120408MG KCP10B	B57
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5990953	B285D09900HPS KN15	G89	6000159	PSC63KGMER50C	C65, C135	6012657	EG0412M04U08GUN KCP10B	C22	6012898	EG0412M04U04GUN KCU10	C22
5990954	B285D09921HPS KN15	G89	6000160	PSC63KGMEL50C	C65, C135	6012658	EG192I04U1GUN KCP10B	C23	6012899	EG0412M04U08GUN KCU10	C22
5990955	B285D10100HPS KN15	G89	6000199	CNMU120612MN KCP05B	B51	6012659	EG192I04U2GUN KCP10B	C23	6012900	EG0512M05U04GUN KCU10	C22
5990956	B285D10200HPS KN15	G89	6000211	PSC63KGM5R50C	C64, C134	6012660	EG255I06U1GUN KCP10B	C23	6012901	EG0512M05U08GUN KCU10	C22
5990957	B285D10300HPS KN15	G89	6000213	PSC63KGM5L50C	C64, C134	6012671	EG255I06U2GUN KCP10B	C23	6012902	EG0612M06U04GUN KCU10	C22
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5990960	B285D10716HPS KN15	G90	6000216	PSC80KGM5R50C	C64, C134	6012674	EG0612M06U04GUN KCP10B	C22	6012905	EG0812M08U12GUN KCU10	C22
5990971	B285D10800HPS KN15	G90	6000217	PSC80KGM5L50C	C64, C134	6012675	EG317I08U3GUN KCP10B	C23	6012906	EG1012M10U12GUN KCU10	C22
5990972	B285D11100HPS KN15	G90	6000404	KM4X63KGMER50C	C63, C133	6012676	EG0512M05U04GUN KCP10B	C22	6012907	EG192I04U1GUN KCU10	C23
5990973	B285D11200HPS KN15	G90	6000405	KM4X63KGMEL50C	C63, C133	6012677	EG0512M05U08GUN KCP10B	C22	6012908	EG0612M06U04GUN KCU10	C23
5990974	B285D11300HPS KN15	G90	6000407	KM4X63KGM5R50C	C62-63, C133	6012678	EG380I10U3GUN KCP10B	C23	6012909	EG255I06U1GUN KCU10	C23
5990975	B285D11400HPS KN15	G90	6000408	KM4X63KGM5L50C	C62-63, C133	6012679	EG1012M10U12GUN KCP10B	C23	6012910	EG255I06U2GUN KCU10	C23
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5990981	B285D12600HPS KN15	G90	6000430	KM63TSKGMEL65C	C61, C132	6012685	ER317I08U00GUN KCP10B	C24	6012917	ER0812M08U00GUN KCU10	C23
5990982	B285D12700HPS KN15	G90	6000431	KM63TSKGM5R65C	C60, C131	6012686	ER0812M08U00GUN KCP10B	C23	6012918	ER192I04U00GUN KCU10	C24
5990983	B285D13000HPS KN15	G90	6000433	KM63TSKGM5L65C	C60, C131	6012687	EG0200M02P02GUP KCU10	C18	6012919	ER255I06U00GUN KCU10	C24
5990984	B285D13096HPS KN15	G90	6000434	KM63KMKZKGMER65C	C61, C132	6012688	EG0300M03P02GUP KCU10	C18	6012920	ER317I08U00GUN KCU10	C24
5990985	B285D13100HPS KN15	G90	6000436	KM63KMKZKGMEL65CY	C61, C132	6012689	EG0300M03P04GUP KCU10	C18	6012944	EG0412M04U04GUP KCU10	C17
5990986	B285D13300HPS KN15	G90	6000462	PSC63KGMER65C	C65, C135	6012690	EG0400M04P04GUP KCU10	C18	6012945	EG0412M04U08GUP KCU10	C17
5990987	B285D13400HPS KN15	G90	6000463	PSC63KGMEL65C	C65, C135	6012701	EG0400M04P08GUP KCU10	C18	6012946	EG0512M05U04GUP KCU10	C17
5990988	B285D13500HPS KN15	G90	6000464	PSC63KGM5R65C	C64, C134	6012702	EG0500M05P04GUP KCU10	C18	6012947	EG0512M05U08GUP KCU10	C17
5990989	B285D14200HPS KN15	G90	6000465	PSC63KGM5L65C	C64, C134	6012703	EG0500M05P08GUP KCU10	C18	6012948	EG0612M06U04GUP KCU10	C17
5990990	B285D14288HPS KN15	G90	6000466	PSC80KGMER65C	C65, C135	6012704	EG0600M06P04GUP KCU10	C18	6012949	EG0612M06U08GUP KCU10	C17
5990991	B285D14684HPS KN15	G90	6000467	PSC80KGMEL65C	C65, C135	6012705	EG0600M06P08GUP KCU10	C18	6012950	EG0712M07U08GUP KCU10	C17
5990992	B285D15000HPS KN15	G90	6000468	PSC80KGM5R65C	C64, C134	6012706	EG063I1FP05GUP KCU10	C20	6012961	EG0812M08U08GUP KCU10	C17
5990993	B285D15083HPS KN15	G90	6000469	PSC80KGM5L65C	C64, C134	6012707	EG0700M06P08GUP KCU10	C18	6012962	EG0812M08U12GUP KCU10	C17
5990994	B285D15100HPS KN15	G90	6001036	ONGX080620SNHB KCK15	S36	6012708	EG0800M08P08GUP KCU10	C18	6012963	EG1012M10U12GUP KCU10	C17
5990995	B285D15300HPS KN15	G90	6001106	ONGX080620ENLE KC514M	S35	6012709	EG0800M08P12GUP KCU10	C18	6012964	EG192I04U1GUP KCU10	C19
5990996	B285D15400HPS KN15	G90	6001107	ONGX080620SNGP KC514M	S35	6012710	EG094I02P05GUP KCU10	C20	6012965	EG192I04U2GUP KCU10	C19
5990997	B285D15875HPS KN15	G90	6001108	ONGX080620SNGP KCK15	S35	6012711	EG1000M10P12GUP KCU10	C18	6012966	EG255I06U1GUP KCU10	C19
5990998	B285D16000HPS KN15	G90	6001231	LNGU15T604ERGEJ KC422M	T18	6012712	EG125I03P05GUP KCU10	C20	6012967	EG255I06U2GUP KCU10	C19
5990999	B285D16500HPS KN15	G90	6001232	LNGU15T608ERGEJ KC422M	T18	6012713	EG125I03P1GUP KCU10	C20	6012968	EG317I08U3GUP KCU10	C19
5991000	B285D16670HPS KN15	G90	6001233	LNPU15T620SRGE KC725M	T19	6012714	EG187I04P1GUP KCU10	C20	6012969	EG380I10U3GUP KCU10	C19
5991001	B285D16800HPS KN15	G90	6001234	LNPU15T620SRGE KCPK30	T19	6012715	EG187I04P2GUP KCU10	C20	6012970	ER0412M04U00GUP KCU10	C20
5991002	B285D16900HPS KN15	G90	6001235	LNPU15T620SRGE KCK15	T19	6012716	EG255I06P1GUP KCU10	C20	6012971	ER0512M05U00GUP KCU10	C20
5991003	B285D17000HPS KN15	G90	6001236	LNPU15T620SRGE KCPM40	T19	6012717	EG255I06P2GUP KCU10	C20	6012972	ER0612M06U00GUP KCU10	C20
5991004	B285D17300HPS KN15	G90	6001237	LNPU15T620SRGE KC522M	T19	6012718	EG312I08P3GUP KCU10	C20	6012973	ER0812M08U00GUP KCU10	C20
5991005	B285D17463HPS KN15	G90	6001244	ONGX080620SNHB KC514M	S36	6012719	EG375I10P3GUP KCU10	C21	6012974	ER192I04U00GUP KCU10	C21
5991006	B285D17500HPS KN15	G90	6001245	ONGX080620SNHB KCPK30	S36	6012720	ER0300M03P00GUP KCU10	C20	6012975	ER255I06U00GUP KCU10	C21
5991007	B285D17859HPS KN15	G90	6001247	ONGX080620SNHB KCK20	S36	6012721	ER0400M04P00GUP KCU10	C21	6012976	ER317I08U00GUP KCU10	C21
5991008	B285D19000HPS KN15	G90	6001258	ONGX080630SNHB KC514M	S36	6012722	ER0500M05P00GUP KCU10	C21	6013031	EG0212M02U02GUP KCU10	C17
5991009	B285D19050HPS KN15	G90	6001259	ONGX080630SNHB KCK15	S36	6012723	ER0600M06P00GUP KCU10	C21	6013032	EG0212M02U02GUP KCU10	C17
5991010	B285D20000HPS KN15	G90	6001260	ONGX080630SNHB KCK20	S36	6012724	ER0800M08P00GUP KCU10	C21	6013033	EG0312M03U02GUP KCU10	C17
5991410	KSEM2370HPM KCPM45	H45	6001316	ONGX0806A5NSGP KC514M	S35	6012725	ER125I03P00GUP KCU10	C22	6013034	EG0312M03U04GUP KCU10	C17
5996610	B978F12500 KCP7315	G149	6001317	ONGX0806A5NSGP KCK15	S35	6012726	ER187I04P00GUP KCU10	C22	6013035	EG130I03U05GUP KCU10	C19
5999788	KM40TSKGMER50C	C61, C132	6001321	ONPX080608SNGP KCK15	S36	6012727	ER255I06P00GUP KCU10	C22	6013036	EG130I03U1GUP KCU10	C19
5999789	KM40TSKGMEL50C	C61, C132	6001322	ONPX080620SNHB KCK15	S36	6012728	ER312I08P00GUP KCU10	C22	6013037	ER0312M03U00GUP KCU10	C20
5999790	KM40TSKGM5R50C	C60, C131	6001323	ONGX080608SNGP KCK15	S36	6012729	EG0412M04U04GUP KCP10B	C17	6013038	ER130I03U00GUP KCU10	C21
5999861	KM40TSKGM5L50C	C60, C131	6001324	ONGX080608SNGP KCK15	S36	6012730	EG0412M04U08GUP KCP10B	C17	6013040	EG0312M03U02GUP KCP10B	C22
5999862	KM50TSKGMER50C	C61, C132	6001972	MILL16D050Z050N08W	S32	6012741	EG192I04U1GUP KCP10B	C19	6013061	EG0312M03U04GUN KCP10B	C22
5999863	KM50TSKGM5L50C	C61, C132	6001973	MILL16D0630Z060N08W	S32	6012742	EG192I04U2GUP KCP10B	C19	6013062	EG130I03U05GUP KCP10B	C23
5999864	KM50TSKGM5R50C	C60, C131	6001974	MILL16D080Z100N08W	S32	6012743	EG255I06U1GUP KCP10B	C19	6013063	EG130I03U1GUN KCP10B	C23
5999865	KM50TSKGM5L50C	C60, C131	6001975	MILL16D100Z140N08W	S32	6012744	EG255I06U2GUP KCP10B	C19	6013064	EG0212M02U02GUN KCP10B	C22
5999946	KM63TSKGMER50C	C61, C132	6001976	MILL16D125Z180N08W	S32	6012745	EG0812M08U08GUP KCP10B	C17	6013065	EG025I06U02GUN KCP10B	C22
5999947	KM63TSKGMEL50C	C61, C132	6001977	MILL16D160Z220N08W	S32	6012746	EG0812M08U12GUP KCP10B	C17	6013066	EG063I1FU05GUN KCP10B	C23
5999948	KM63TSKGM5R50C	C60, C131	6001978	MILL16D200Z280N08W	S32	6012747	EG0612M06U04GUP KCP10B	C17	6013067	ER0312M03U00GUN KCP10B	C23
5999949	KM63TSKGM5L50C	C60, C131	6002128	KCRA40Z04S22R112	V147	6012748	EG0612M06U08GUP KCP10B	C17	6013068	ER130I03U00GUN KCP10B	C24
5999950	KM63KMKZKGMER50CY	C61, C132	6003372	B269A14600HP KCPK15	G70	6012749	EG317I08U3GUP KCP10B	C19	6013069	EG0312M03U02GUP KCP10B	C17
5999971	KM63KMKZKGMEL50CY	C61, C132	6003373	B269A15200HP KCPK15	G70	6012750	EG0512M05U04GUP KCP10B	C17	6013070	EG0312M03U04GUP KCP10B	C17
5999972	KM63KMKZKGM5R50CY	C60, C131	6003401	B269A17600HP KCPK15	G70	6012751	EG0512M05U08GUP KCP10B	C17	6013091	EG130I03U05GUP KCP10B	C19
5999973	KM63KMKZKGM5L50CY	C60, C131	6003402	B269A18600HP KCPK15	G70	6012752	EG0712M06U08GUP KCP10B	C17	6013092	EG130I03U1GUP KCP10B	C19
6000012	KM80TSKGMER50C	C61, C132	6010729	XDPT090408RD41 X500	V15	6012753	EG380I10U3GUP KCP10B	C19	6013093	EG0212M02U02GUP KCP10B	C17
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6017358	EG0212M02U02GUN KCK20B	C22	6017608	ER0512M05U00GUN KCP25B	C23	6025822	SPGX050204LP KCJ40	J90	6041909	KSEMP7900FDS71A1M	H82, H93, H99
6017359	EG0251M02U02GUN KCK20B	C22	6017609	ER0612M06U00GUN KCP25B	C23	6025823	DFT05T308D33DS KCJ40	J88	6041910	KSEMP8100FDS80A1M	H82, H93, H99
6017360	EG0631FU05GUN KCK20B	C23	6017610	ER255I06U00GUN KCP25B	C24	6025824	SPPX09T308LP KCJ40	J90	6041921	KSEMP8300FDS80A1M	H82, H93, H99
6017391	ER0312M03U00GUN KCK20B	C23	6017611	ER317I08U00GUN KCP25B	C24	6025825	DFT05T308D32DS KCJ40	H88	6041922	KSEMP8500FDS80A1M	H82, H93, H99
6017392	ER130I03U00GUN KCK20B	C24	6017612	ER0812M08U00GUN KCP25B	C23	6025826	DFT05T308D33DS KCJ40	H88	6041923	KSEMP8700FDS80A1M	H82, H93, H99
6017393	EG0412M04U04GUN KCK20B	C22	6017625	MILL16D250Z340N08W	S32	6025827	DFT06T308D36DS KCJ40	H88	6041924	KSEMP8900FDS80A1M	H82, H93, H99
6017394	EG0412M04U08GUN KCK20B	C22	6017693	KM80TSKGMER65C	C61, C132	6025828	DFT06T308D39DS KCJ40	H88	6041925	KSEMP9100FDS90A1M	H82, H93, H99
6017395	EG192I04U1GUN KCK20B	C23	6017694	KM80ATCKGMEL65C	C61, C132	6025829	DFT06T308D44DS KCJ40	H88	6041926	KSEMP9300FDS90A1M	H82, H93, H99
6017396	EG192I04U2GUN KCK20B	C23	6017695	KM80TSKGMRS65C	C60, C131	6025830	DFT070408D45DS KCJ40	H88	6041927	KSEMP9500FDS90A1M	H82, H93, H99
6017397	EG255I06U1GUN KCK20B	C23	6017696	KM80TSKGMSL65C	C60, C131	6025891	DFT070408D50DS KCJ40	H88	6041928	KSEMP9700FDS90A1M	H82, H93, H99
6017398	EG255I06U2GUN KCK20B	C23	6017697	KM80ATCKGMER65C	C61, C132	6025892	DFT090508D56DS KCJ40	H88	6041929	KSEMP9900FDS90A1M	H82, H93, H99
6017399	EG0812M08U08GUN KCK20B	C22	6017698	KM80ATCKGMEL65C	C61, C132	6025893	DFT090508D63DS KCJ40	H88	6041930	KSEMP10000FDS90A1M	H82, H93, H99
6017400	EG0812M08U12GUN KCK20B	C22	6017868	WNMG060404FW KCP05B	B156	6025894	DFT090508D83 KCJ40	J88	6041931	KSEMP11000FDS90A1M	H82, H93, H99
6017481	EG0612M06U04GUN KCK20B	C22	6017935	EC040M04N00CF02 KCM35B	C24	6025895	DFC040310D28DS KCJ40	H90	6041932	KSEMP12000FDS90A1M	H82, H93, H99
6017482	EG0612M06U08GUN KCK20B	C22	6017936	EC040M04L06CF02 KCM35B	C24	6025896	DFC05T312D32DS KCJ40	H90	6041933	KSEMP13000FDS90A1M	H82, H93, H99
6017483	EG317I08U3GUN KCK20B	C23	6017937	EC040M04R06CF02 KCM35B	C24	6025897	DFC06T312D36DS KCJ40	H90	6041934	KSEMP14000FDS90A1M	H82, H93, H99
6017484	EG0512M05U04GUN KCK20B	C22	6017938	EC040M04N00CF02 KCM35B	C25	6025898	DFC070416D45DS KCJ40	H90	6041935	KSEMP15000FDS90A1M	H82, H93, H99
6017485	EG0512M05U08GUN KCK20B	C22	6017939	EC030M03N00CF02 KCM35B	C24	6025899	DFC090520D56DS KCJ40	H88	6041936	KSEMP16000FDS90A1M	H82, H93, H99
6017486	EG380I10U3GUN KCK20B	C23	6017940	EC030M03N00CLO2 KCM35B	C25	6026363	DFT06T308DS KCJ40	J88	6041937	KSEMP17000FDS71B1M	H86, H95
6017487	EG1012M10U12GUN KCK20B	C22	6018001	EC050M05N00CF03 KCM35B	C24	6026364	SPGX060304LP KCJ40	J90	6041938	KSEMP18000FDS71B1M	H86, H95
6017488	ER0412M04U00GUN KCK20B	C23	6019340	ONGX0806ANENLIE KC514M	S35	6026365	TPGN220408K KCP25B	B171	6041939	KSEMP19000FDS71B1M	H86, H95
6017489	ER192I04U00GUN KCK20B	C24	6019506	LNP15T616SRGE KCPM40	T19	6026366	SPGR120308K KCP25B	B169	6041940	KSEMP20000FDS71B1M	H86, H95
6017490	ER0512M05U04GUN KCK20B	C23	6019507	LNGU15T620SRGEM KC520M	T19	6026367	TPGR160308K KCP25B	B171	6041941	KSEMP21000FDS71B1M	H86, H95
6017491	ER0612M06U00GUN KCK20B	C23	6019508	LNGU15T620SRGEM KCK15	T19	6027457	TPMR160308 KCP25B	B171	6041942	KSEMP22000FDS71B1M	H86, H95
6017492	ER255I06U00GUN KCK20B	C24	6019509	LNGU15T620SRGEM KCPK30	T19	6030969	EVMS0R0212M	C50	6041943	KSEMP23000FDS71B1M	H86, H95
6017493	ER317I08U00GUN KCK20B	C24	6019510	LNGU15T620SRGEM KCPM40	T19	6030970	EVMS0L0212M	C51	6041944	KSEMP24000FDS71B1M	H86, H95
6017494	ER0812M08U00GUN KCK20B	C23	6020741	SDET1204PSRSG KCSM40	T105, T112, U51	6031031	EVMS0R0512MC	C50	6041945	KSEMP25000FDS71B1M	H86, H95
6017497	EC030M03L06CF02 KCM35B	C24	6023085	B053A01000CPG KC7325	G18	6031032	EVMS0L0512MC	C51	6041946	KSEMP26000FDS71B1M	H86, H95
6017498	EC030M03R06CF02 KCM35B	C24	6023086	B053A01016CPG KC7325	G18	6031033	EVMS0R0516MC	C50	6041947	KSEMP27000FDS71B1M	H86, H95
6017499	EC014M1BNO0CF01 KCM35B	C24	6023087	B053A01067CPG KC7325	G18	6031034	EVMS0L0516MC	C51	6041948	KSEMP28000FDS71B1M	H86, H95
6017500	EC020M02N00CF02 KCM35B	C24	6023088	B053A01100CPG KC7325	G18	6031035	EVMS0R0616MC	C50	6041949	KSEMP29000FDS71B1M	H86, H95
6017511	EC014M1BNO0CLO1 KCM35B	C25	6023089	B053A01181CPG KC7325	G18	6031036	EVMS0L0616MC	C51	6041950	KSEMP30000FDS71B1M	H86, H95
6017512	EC020M02N00CLO2 KCM35B	C25	6023090	B053A01191CPG KC7325	G18	6031037	EVMS0R0632MC	C50	6041951	KSEMP31000FDS71B1M	H86, H95
6017513	EC020M02L06CF02 KCM35B	C24	6023091	B053A01200CPG KC7325	G18	6031038	EVMS0L0632MC	C51	6041952	KSEMP32000FDS71B1M	H86, H95
6017514	EC020M02R06CF02 KCM35B	C24	6023121	B053A01200CPG KC7325	G18	6031039	EVMS0R0816MC	C50	6041953	KSEMP33000FDS71B1M	H86, H95
6017515	EC014M1BLO0CLO1 KCM35B	C25	6023122	B053A01300CPG KC7325	G18	6031040	EVMS0L0816MC	C51	6041954	KSEMP34000FDS71B1M	H86, H95
6017516	EC014M1BR06CLO1 KCM35B	C25	6023123	B053A01321CPG KC7325	G18	6031041	EVMS0R1F12M	C50	6041955	KSEMP35000FDS71B1M	H86, H95
6017517	EC020M02L06CLO2 KCM35B	C25	6023124	B053A01397CPG KC7325	G18	6031042	EVMS0L1F12M	C51	6041956	KSEMP36000FDS71B1M	H86, H95
6017518	EC020M02R06CLO2 KCM35B	C25	6023125	B053A01400CPG KC7325	G18	6031130	KTP0852FEM KCPM45	H29	6041957	KSEMP37000FDS71B1M	H86, H95
6017519	EC030M03L06CLO2 KCM35B	C25	6024320	7792VX06SA035Z6R43	V4, V6	6033254	XDPW120515SRD KCPM40	V25	6041958	KSEMP38000FDS71B1M	H86, H95
6017520	EC030M03R06CLO2 KCM35B	C25	6024361	7792VX09SA025Z3R35	V9, V13	6033255	XDPW120515SRD KCPK30	V25	6041959	KSEMP39000FDS71B1M	H86, H95
6017521	EC014M1BLO0CF01 KCM35B	C24	6024362	7792VX09SA032Z4R43	V9, V13	6033256	XDPW120515SRD KC522M	V25	6041960	KSEMP40000FDS71B1M	H86, H95
6017522	EC014M1BR06CF01 KCM35B	C24	6024363	7792VX09SA035Z4R43	V9, V13	6033257	XDPW120515SRD KCK15	V25	6041961	KSEMP41000FDS71B1M	H86, H95
6017525	EG0412M04U04GUN KCP25B	C17	6024365	7792VX09SA042Z3R43	V9, V13	6033258	XDPW120515SRD KC510M	V25	6041962	KSEMP42000FDS71B1M	H86, H95
6017526	EG0412M04U08GUN KCP25B	C17	6024366	7792VX09CA025Z3R50	V11, V13	6034358	LNLX191950RFP KCP10B	E48	6041963	KSEMP43000FDS71B1M	H86, H95
6017527	EG192I04U1GUP KCP25B	C19	6024367	7792VX09CA032Z4R70	V11, V13	6034359	LNLX191950RFP KCP25B	E48	6041964	KSEMP44000FDS71B1M	H86, H95
6017528	EG192I04U2GUP KCP25B	C19	6024368	7792VX09CA050Z7R	V12-13	6034360	LNLX191950RFP KCP10B	E48	6041965	KSEMP45000FDS71B1M	H86, H95
6017529	EG255I06U1GUP KCP25B	C19	6024369	7792VX09CA052Z5R	V12-13	6034411	LNLX191950RFP KCP25B	E48	6041966	KSEMP46000FDS71B1M	H86, H95
6017530	EG255I06U2GUP KCP25B	C19	6024370	7792VX09CA052Z6R	V12-13	6039659	HNGJ0604ANSNHD KCPM40	S7, S12, S16	6041967	KSEMP47000FDS71B1M	H86, H95
6017541	EG0812M08U08GUN KCP25B	C17	6024371	7792VX09CA052Z7R	V12-13	6039660	HNGJ0604ANSNHD KCK15	S7, S12, S16	6041968	KSEMP48000FDS71B1M	H86, H95
6017542	EG0812M08U12GUN KCP25B	C17	6024372	7792VX09CA063Z5R	V12-13	6039811	HNGJ0604ANSNHD KC522M	S7, S12, S16	6041969	KSEMP49000FDS71B1M	H86, H95
6017543	EG0612M06U04GUN KCP25B	C17	6024373	7792VX09CA063Z6R	V12-13	6039812	HNGJ0604ANSNHD KCPK30	S7, S12, S16	6041970	KSEMP50000FDS71B1M	H86, H95
6017544	EG0612M06U08GUN KCP25B	C17	6024374	7792VX09CA063Z9R	V12-13	6039814	SNHJ120608SNGD KCPM40	S63	6041971	KSEMP51000FDS71B1M	H86, H95
6017545	EG317I08U3GUN KCP25B	C19	6024375	7792VX09CA066Z5R	V12-13	6039815	SNHJ120608SNGD KCPK30	S63	6041972	KSEMP52000FDS71B1M	H86, H95
6017546	EG0512M05U04GUN KCP25B	C17	6024376	7792VX09CA066Z6R	V12-13	6039816	SNHJ120608SNGD KCK15	S63	6041973	KSEMP53000FDS71B1M	H86, H95
6017547	EG0512M05U08GUN KCP25B	C17	6024377	7792VX09CA066Z9R	V12-13	6039817	SNHJ120608SNGD KC520M	S63	6041974	KSEMP54000FDS71B1M	H86, H95
6017548	EG0712M06U08GUN KCP25B	C17	6025272	7792VXD12-A040Z4R	V20-22	6039818	SNHJ120608SNGD KC522M	S63	6041975	KSEMP55000FDS71B1M	H86, H95
6017549	EG380I10U3GUN KCP25B	C19	6025273	7792VXD12-A060Z6R	V20-22	6041797	KSEMP7200FDS71B1M	H86, H95	6041976	KSEMP56000FDS71B1M	H86, H95
6017550	EG1012M10U12GUN KCP25B	C17	6025274	7792VXD12-A052Z6R	V20-22	6041798	KSEMP7400FDS71B1M	H86, H95	6041977	KSEMP57000FDS71B1M	H86, H95
6017551	ER0412M04U00GUN KCP25B	C20	6025275	7792VXD12-A063Z7R	V20-22	6041799	KSEMP7600FDS71B1M	H86, H95	6041978	KSEMP58000FDS71B1M	H86, H95
6017552	ER192I04U00GUN KCP25B	C21	6025276	7792VXD12-A066Z7R	V20-22	6041882	KSEMP8000FDS80B1M	H86, H96	6041979	KSEMP59000FDS71B1M	H86, H95
6017553	ER0512M05U00GUN KCP25B	C20	6025277	7792VXD12-A080Z10R	V20-22	6041883	KSEMP8400FDS80B1M	H86, H96	6041800	KSEMP6000FDS80B1M	H86, H96
6017555	ER0612M06U00GUN KCP25B	C20	6025278	7792VXD12-A100Z11R	V20-22	6041884	KSEMP8800FDS80B1M	H86, H96	6041881	KSEMP6400FDS80B1M	H86, H96
6017556	ER255I06U00GUN KCP25B	C21	6025279	7792VXD12-A125Z13R	V20-22	6041885	KSEMP9200FDS80B1M	H86, H96	6041882	KSEMP6800FDS80B1M	H86, H96
6017557	ER317I08U00GUN KCP25B	C21	6025280	7792VXD12SA032Z3R43	V18, V22	6041886	KSEMP9600FDS80B1M	H86, H96			

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6054195	KSCMA90QFBF KD1420	S134	6059101	T877G03750-19R-D56 KSU31	M78	6065059	RPPT1204MOSGD4 KCM40	V97	6072508	UDDV3200X5CQN KC643M	013
6055137	RMR14000H7SF KCU05	K15	6059102	T877G05000-14R-D56 KSP39	M78	6066131	ABDE1200A3ARL K600	P112	6072561	UDJV1600X6CQK KCSM15	016
6055138	RMR15000H7SF KCU05	K15	6059103	T877G05000-14R-D56 KSU31	M78	6066132	ABDE1600A3ARL K600	P113	6072562	UDJV1600X6CQL KCSM15	016
6055139	RMR16000H7SF KCU05	K15	6059104	T877G06250-14R-D56 KSP39	M78	6066133	F2AA1200AWL45R250 K600	P120	6072563	UDJV1600X6CQM KCSM15	016
6055140	RMR17000H7SF KCU05	K15	6059105	T877G06250-14R-D56 KSU31	M78	6066134	F2AA1600AWX45R250 K600	P120	6072564	UDJV2000X6CQG KCSM15	016
6055148	CNMM190616MR KCP25B	B54	6059106	T877G07500-14R-D56 KSP39	M78	6068043	HNGJ090543ANSNHD KCPM40	S19, S23	6072565	UDJV2000X6CQK KCSM15	016
6055261	RMR18000H7SF KCU05	K15	6059107	T877G07500-14R-D56 KSU31	M78	6068798	HNPJ060432ANSNHD KCPM40	S7, S13, S16	6072566	UDJV2000X6CQL KCSM15	016
6055262	RMR19000H7SF KCU05	K15	6059108	T877G08750-14R-D56 KSP39	M78	6069649	KTIP1490FEGM KCPM45	H29	6072567	UDJV2000X6CQM KCSM15	016
6055263	RMR20000H7SF KCU05	K15	6059109	T877G08750-14R-D56 KSU31	M78	6072110	UKDV1000X4CV KCPM15	08	6072568	UDJV2000X6CQN KCSM15	016
6055264	RMR14000H7HF KCU05	K16	6059110	T877G10000-11R-D56 KSP39	M78	6072161	UKDV1200X4CV KCPM15	08	6072569	UDJV2500X6CQL KCSM15	016
6055265	RMR15000H7HF KCU05	K16	6059111	T877G10000-11R-D56 KSU31	M78	6072162	UKDV1600X4CV KCPM15	08	6072570	UDJV2500X6CQN KCSM15	016
6055266	RMR16000H7HF KCU05	K16	6059167	T857G01250-28R-D56 KSP39	M78	6072163	UKDV1200X4CV KCPM15	08	6072571	UDJV3200X6CQL KCSM15	016
6055267	RMR17000H7HF KCU05	K16	6059168	T857G01250-28R-D56 KSU31	M78	6072164	UKDV2500X4CV KCPM15	08	6072572	UDJV3200X6CQN KCSM15	016
6055268	RMR18000H7HF KCU05	K16	6059169	T857G02500-19R-D56 KSP39	M78	6072165	UKDV2000X4CV KCPM15	08	6074027	XDPT120515SRGP KCPM40	V24
6055270	RMR19000H7HF KCU05	K16	6059170	T857G02500-19R-D56 KSU31	M78	6072166	UKDV3200X4CV KCPM15	08	6074028	XDPT120515SRGP KCPK30	V24
6055271	RMR20000H7HF KCU05	K16	6059171	T857G03750-19R-D56 KSP39	M78	6072167	ULDV1000X4CQE KCSM15	09	6074029	XDPT120515SRGP KC725M	V24
6055272	RHR14000KST115H7SF KCU05	K27	6059172	T857G03750-19R-D56 KSU31	M78	6072168	ULDV1000X4CQK KCSM15	09	6074030	XDPT120515SRGP KC522M	V24
6055273	RHR15000KST115H7SF KCU05	K27	6059173	T857G05000-14R-D56 KSP39	M78	6072169	ULDV1000X4CQJ KCSM15	09	6075455	DFSP140R2WB20M	J30
6055274	RHR16000KST135H7SF KCU05	K27	6059174	T857G05000-14R-D56 KSU31	M78	6072188	ULDV1000X4CQK KCSM15	09	6075456	DFSP145R2WB20M	J30
6055275	RHR17000KST135H7SF KCU05	K27	6059175	T857G06250-14R-D56 KSP39	M78	6072189	ULDV1200X4CQJ KCSM15	09	6075457	DFSP165R2WB20M	J30
6055276	RHR18000KST155H7SF KCU05	K27	6059176	T857G06250-14R-D56 KSU31	M78	6072170	ULDV1200X4CQK KCSM15	09	6075458	DFSP155R2WB20M	J30
6055277	RHR19000KST155H7SF KCU05	K27	6059177	T857G07500-14R-D56 KSP39	M78	6072181	ULDV1200X4CQJ KCSM15	09	6075459	DFSP160R2WB20M	J30
6055278	RHR20000KST175H7SF KCU05	K27	6059178	T857G07500-14R-D56 KSU31	M78	6072182	ULDV1200X4CQL KCSM15	09	6075460	DFSP165R2WB20M	J30
6055279	RHR21000KST175H7SF KCU05	K27	6059179	T857G08750-14R-D56 KSP39	M78	6072183	ULDV1600X4CQK KCSM15	09	6075491	DFSP170R2WB20M	J30-J31
6055280	RHR22000KST175H7SF KCU05	K27	6059180	T857G08750-14R-D56 KSU31	M78	6072184	ULDV1600X4CQJ KCSM15	09	6075492	DFSP175R2WB25M	J30
6055281	RHR23000KST200H7SF KCU05	K27	6059181	T857G10000-11R-D56 KSP39	M78	6072185	ULDV1600X4CQK KCSM15	09	6075493	DFSP180R2WB25M	J30
6055282	RHR24000KST200H7SF KCU05	K27	6059182	T857G10000-11R-D56 KSU31	M78	6072186	ULDV1600X4CQL KCSM15	09	6075494	DFSP185R2WB25M	J30
6055283	RHR25000KST200H7SF KCU05	K27	6059288	T848NPT00625-27R-D56 KSU30	M79	6072187	ULDV1600X4CQM KCSM15	09	6075495	DFSP190R2WB25M	J30
6055284	RHR26000KST200H7SF KCU05	K27	6059289	T848NPT01250-27R-D56 KSU30	M79	6072188	ULDV2000X4CQK KCSM15	09	6075496	DFSP195R2WB25M	J30
6055285	RHR27000KST200H7SF KCU05	K27	6059290	T848NPT02500-18R-D56 KSU30	M79	6072189	ULDV2000X4CQK KCSM15	09	6075497	DFSP200R2WB25M	J30
6055287	RHR28000KST250H7SF KCU05	K27	6059321	T848NPT03750-18R-D56 KSU30	M79	6072190	ULDV2000X4CQJ KCSM15	09	6075498	DFSP205R2WB25M	J30
6055288	RHR29000KST250H7SF KCU05	K27	6059322	T848NPT05000-14R-D56 KSU30	M79	6072191	ULDV2000X4CQM KCSM15	09	6075499	DFSP209R2WB25M	J30
6055289	RHR30000KST250H7SF KCU05	K27	6059323	T848NPT07500-14R-D56 KSU30	M79	6072192	ULDV2000X4CQN KCSM15	09	6075500	DFSP210R2WB25M	J30
6055290	RHR31000KST250H7SF KCU05	K27	6059324	T848NPT10000-11,5R-D56 KSU30	M79	6072193	ULDV2500X4CQL KCSM15	09	6075501	DFSP215R2WB25M	J30-J31
6055291	RHR32000KST250H7SF KCU05	K27	6059325	T848NPTF00625-27R-D56 KSU30	M79	6072194	ULDV2500X4CQN KCSM15	09	6075502	DFSP219R2WB25M	J30
6055292	RHR33000KST300H7SF KCU05	K27	6059326	T848NPTF01250-27R-D56 KSU30	M79	6072195	ULDV3200X4CQL KCSM15	09	6075503	DFSP225R2WB25M	J30
6055293	RHR34000KST300H7SF KCU05	K27	6059327	T848NPTF02500-18R-D56 KSU30	M79	6072196	ULDV3200X4CQN KCSM15	09	6075504	DFSP230R2WB25M	J30
6055294	RHR35000KST300H7SF KCU05	K27	6059328	T848NPTF01250-27R-D56 KSU30	M79	6072386	UJWB1000X6CN KCSM15	019	6075505	DFSP235R2WB25M	J30
6055295	RHR36000KST300H7SF KCU05	K27	6059329	T848NPTF02500-18R-D56 KSU30	M79	6072387	UJWB1200X6CN KCSM15	019	6075506	DFSP239R2WB25M	J30
6055296	RHR37000KST300H7SF KCU05	K27	6059330	T848NPTF03750-18R-D56 KSU30	M79	6072388	UJWB1600X6CN KCSM15	019	6075507	DFSP240R2WB25M	J30
6055297	RHR38000KST350H7SF KCU05	K27	6059331	T848NPTF03750-18R-D56 KSU30	M79	6072389	UJWB2000X6CN KCSM15	019	6075508	DFSP245R2WB25M	J30
6055298	RHR39000KST350H7SF KCU05	K27	6059332	T848NPTF05000-14R-D56 KSU30	M79	6072390	UJWB2500X6CN KCSM15	019	6075610	DFSP140R3WB20M	J32
6055299	RHR40000KST350H7SF KCU05	K27	6059333	T848NPTF07500-14R-D56 KSU30	M79	6072411	UKBV1000X4CN KCPM15	018	6075631	DFSP145R3WB20M	J32
6055300	RHR41000KST350H7SF KCU05	K27	6059334	T848NPTF07500-14R-D56 KSU30	M79	6072412	UKBV1200X4CN KCPM15	018	6075632	DFSP150R3WB20M	J32
6055301	RHR42000KST350H7SF KCU05	K27	6059335	T848NPTF10000-11,5R-D56 KSU30	M79	6072413	UKBV1600X4CN KCPM15	018	6075633	DFSP155R3WB20M	J32
6055302	RHR14000KST115H7HF KCU05	K28	6063443	UDDE1600A5ARP KC643M	P32	6072414	UKBV2000X4CN KCPM15	018	6075634	DFSP160R3WB20M	J32
6055303	RHR15000KST115H7HF KCU05	K28	6063444	UDDE2000A5ARP KC643M	P32	6072415	UKBV2500X4CN KCPM15	018	6075635	DFSP165R3WB20M	J32
6055304	RHR16000KST135H7HF KCU05	K28	6063445	UDDE2500A5ARP KC643M	P32	6072442	UJWD1000X6CQE KCSM15	016	6075636	DFSP170R3WB20M	J32-J33
6055305	RHR17000KST135H7HF KCU05	K28	6063446	UDDE2500A5ARP KC643M	P32	6072443	UJWD1000X6CQG KCSM15	016	6075637	DFSP175R3WB25M	J32
6055306	RHR18000KST155H7HF KCU05	K28	6063447	UJDE1600A6AQP KCSM15	P49	6072444	UJWD1200X6CQK KCSM15	016	6075638	DFSP180R3WB25M	J32
6055307	RHR19000KST155H7HF KCU05	K28	6063448	UJDE2000A6AQP KCSM15	P49	6072445	UJWD1600X6CQK KCSM15	016	6075639	DFSP185R3WB25M	J32
6055308	RHR20000KST175H7HF KCU05	K28	6063449	UJDE2500A6AQP KCSM15	P49	6072446	UJWD1200X6CQG KCSM15	016	6075640	DFSP190R3WB25M	J32
6055309	RHR21000KST175H7HF KCU05	K28	6063450	UGDE1600A5BRP KC643M	P37	6072447	UJWD1600X6CQJ KCSM15	016	6075651	DFSP195R3WB25M	J32
6055310	RHR22000KST175H7HF KCU05	K28	6063451	UGDE2000A5BRP KC643M	P37	6072448	UJWD1200X6CQL KCSM15	016	6075652	DFSP200R3WB25M	J32
6055311	RHR23000KST200H7HF KCU05	K28	6063452	UGDE2500A5BRP KC643M	P37	6072449	UJWD1600X6CQG KCSM15	016	6075653	DFSP205R3WB25M	J32
6055312	RHR24000KST200H7HF KCU05	K28	6063599	FSDE1600EBDYL KC643M	P94	6072450	UJWD1600X6CQJ KCSM15	016	6075654	DFSP209R3WB25M	J32
6055313	RHR25000KST200H7HF KCU05	K28	6063661	FSDE1600EBDYP KC643M	P94	6072481	UCDV1000X5CV KCPM15	012	6075655	DFSP210R3WB25M	J32
6055314	RHR26000KST200H7HF KCU05	K28	6063663	FSDE2000EFDYP KC643M	P94	6072482	UCDV1200X5CV KCPM15	012	6075656	DFSP215R3WB25M	J32-J33
6055315	RHR27000KST200H7HF KCU05	K28	6063665	FSDE2500EJDYL KC643M	P94	6072483	UCDV1600X5CV KCPM15	012	6075657	DFSP220R3WB25M	J32
6055316	RHR28000KST250H7HF KCU05	K28	6063667	FSDE2500EJDYP KC643M	P94	6072484	UCDV2000X5CV KCPM15	012	6075658	DFSP225R3WB25M	J32
6055317	RHR29000KST250H7HF KCU05	K28	6064367	KTIP1080FEGM KCPM45	H29	6072485	UCDV2500X5CV KCPM15	012	6075659	DFSP230R3WB25M	J32
6055318	RHR30000KST250H7HF KCU05	K28	6064575	F4AS1600AWX38R600 KCPM15	P18	6072486	UCDV3200X5CV KCPM15	012	6075660	DFSP235R3WB25M	J32
6055319	RHR31000KST250H7HF KCU05	K28	6064576	F4AS2000AWX38R600 KCPM15	P18	6072487	UDDV1000X5CQE KC643M	013	6075671	DFSP239R3WB25M	J32
6055320	RHR32000KST250H7HF KCU05	K28	6064577	F4AS2500AWX38R600 KCPM15	P18	6072488	UDDV1000X5CQG KC643M	013	6075672	DFSP240R3WB25M	J32
6055321	RHR33000KST300H7HF KCU05	K28	6064578	F4AS1600BWX38R600 KCPM15	P18	6072489	UDDV1000X5CQJ KC643M	013	6075673	DFSP245R3WB25M	J32
6055322	RHR34000KST300H7HF KCU05	K28	6064579	F4AS2000BWX38R600 KCPM15	P18	6072491	UDDV1200X5CQE KC643M	013	6075677	DFSP140R4WB20M	J34
6055323	RHR35000KST300H7HF KCU05	K28	6064580	F4AS2500BWX38R600 KCPM15	P18	6072492	UDDV1200X5CQG KC643M	013	607		

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6075747	DFSP230R4WB25M	J34	6079451	EVM50R0416B060075C	C55	6079900	DFR125R4WB20M	J15	6080059	EVSBL2525M0320100180C	C44
6075748	DFSP235R4WB25M	J34	6079452	EVM50R0416B075100C	C55	6079901	DFR127R4WB20M	J15	6080060	EVSBL2525M0320180250C	C43
6075749	DFSP239R4WB25M	J34	6079453	EVM50R0426B100180C	C55	6079902	DFR130R4WB20M	J15	6080061	EVSBL2525M0320180250C	C44
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6075751	DFSP245R4WB25M	J34	6079455	EVM50R0426B250350C	C56	6079904	DFR140R4WB20M	J15	6080068	EVSBL2525M0312100180C	C44
6075752	DFSP140R4WD20M	J26	6079456	EVM50R0426B350999C	C56	6079905	DFR145R4WB20M	J15	6080069	EVSBR2525M0312180250C	C43
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6075763	DFSP190R5WB25M	J36	6079465	EVM50L0416B050060C	C56	6079916	DFSP264R2WB32M	J30	6080391	DFSP290R5WB32M	J36
6075764	DFSP195R5WB25M	J36	6079466	EVM50L0416B060075C	C56	6079917	DFSP265R2WB32M	J30	6080392	DFSP294R5WB32M	J37
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6079272	EVM65L0820B080180C	C57	6079779	DFR127R2WB20M	J13	6079981	DFSP310R4WB40M	J35			

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6088652	VCMR160404 KCM15B	E33	6116567	EVSBR2020K0312060075C	C43	6123607	KTIP135R12SS14M	H31	6124693	EVSBR3232P0632250350C	C44
6088653	VCMR160408 KCM15B	E33	6116568	EVSBL2020K0312060075C	C44	6123608	KTIP140R12SS16M	H31	6124694	EVSBL3232P0632250350C	C45
6091572	SALS063S	S126	6116569	EVSBR2020K0312075100C	C43	6123609	KTIP145R12SS16M	H31	6124695	EVSBR3232P0632350999C	C44
6097181	EVM50R0312A035040C	C52	6116570	EVSBL2020K0312075100C	C44	6123610	KTIP150R12SS16M	H31	6124696	EVSBL3232P0632350999C	C45
6097182	EVM50R0312A040050C	C52	6116571	EVSBR2020K0416060075C	C43	6123611	KTIP160R12SS18M	H31	6125373	B271Z15300HPG KCPK20	G75
6097183	EVM50R0312A050060C	C52	6116572	EVSBL2020K0416060075C	C44	6123612	KTIP170R12SS18M	H31	6126887	ROBB1000X4CN KCPM15	036
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6102279	LNPJ221012PNLSHD2 KCPM40	S121, S123	6117023	KSEM3115HPGM KCPM45	H46	6123710	KSEM371R3WD40M	H60	6127077	FSDE1200X9CQ KCG43M	043
6103457	TNMG160408MG KCP10B	B126	6117061	EVM50R0312B075100C	C55	6123741	KSEM380R3WD40M	H60	6127078	FSDE1600XBCQ KCG43M	043
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6105100	TPUN220408 KCP25B	B171	6117071	EVM50R0312A250350C	C52	6123751	KSEM380R5WD40M	H60	6127088	FSDE2500XJCL KCG43M	043
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6105102	TPMR110308 KCP25B	B171	6117073	EVM50R0312B250350C	C55	6123753	KSEM400R5WD40M	H60	6127199	FMD1200X6CQ KCPM15	042
6105103	TPUN160308 KCP25B	B171	6117074	EVM50L0312B250350C	C56	6124198	EVSBR2525M0526050060C	C44	6127200	FMD1600X6CQ KCPM15	042
6105104	TPUN220412 KCP25B	B171	6117075	EVM50R0312A350999C	C52	6124199	EVSBL2525M0526050060C	C45	6127286	ROBB1000X4CV KCPM15	034
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6109122	SDC120464ENLD2 KCSM40	T104, T111, U51	6117077	EVM50R0312B350999C	C55	6124211	EVSBL2525M0516060075C	C45	6127288	RQDB1600X4CV KCPM15	034
6109124	SDET120464SNGB KCSM40	T105, T112, U51	6117078	EVM50L0312B350999C	C56	6124212	EVSBR2525M0526060075C	C44	6127289	RQDB2000X4CV KCPM15	034
6109130	SDET120424ENGB KCSM40	T105, T112, U51	6117091	EVM50R0416B100180C	C55	6124213	EVSBL2525M0526060075C	C45	6127290	RQDB2500X5CV KCPM15	034
6109210	KTIP1595FEGM KCPM45	H29	6117092	EVM50L0416B100180C	C56	6124214	EVSBR2525M0516060075C	C44	6127311	FMD1200X6CQ KCPM15	042
6109265	SDET120424SNGB KCSM40	T105, T112, U51	6117093	EVM50R0416B180250C	C53	6124215	EVSBL2525M0516075100C	C45	6127312	FMD2000X6CQ KCPM15	042
6111468	OFK0706L5AFENGB KCPM40	S50	6117094	EVM50L0416B180250C	C53	6124216	EVSBR2525M0526075100C	C44	6127382	XRDA1000X4CHU KCPM15	049
6111469	OFK0707L6AFENGB KCPM40	S55	6117095	EVM50R0416B180250C	C55	6124217	EVSBL2525M0526075100C	C45	6127383	XRDA1000X4CRM KCPM15	049
6111470	OFK0707L6AFENHB KCPM40	S55	6117096	EVM50L0416B180250C	C56	6124218	EVSBR2525M0516100180C	C44	6127384	XRDA1200X5CRG KCPM15	049
6111671	SDET120412PDERGB KCPM40	T105, T112, U51	6117099	EVM50R0416B250350C	C55	6124219	EVSBL2525M0516100180C	C45	6127385	XRDA1200X5CRG KCPM15	049
6111672	SDET120412PDERGB2 KCPM40	T104, T111, U52	6117097	EVM50R0416B250350C	C56	6124222	EVSBR2525M0516180250C	C44	6127386	XRDA1200X5CRM KCPM15	049
6111673	SDET120420SNGB2 KCPM40	T104, T111, U52	6117098	EVM50L0416A250350C	C53	6124223	EVSBL2525M0516180250C	C45	6127387	XRDA1600X6CRK KCPM15	049
6111674	SDET1204PDSRGB2 KCPM40	T104, T111, U52	6117098	EVM50R0416A250350C	C53	6124226	EVSBR2525M0516250350C	C44	6127388	XRDA1600X6CRM KCPM15	049
6111676	SEKT1404AEENGP2 KCPM40	S42	6117100	EVM50L0416B250350C	C55	6124227	EVSBL2525M0516250350C	C45	6127389	XRDA1600X6CRM KCPM15	049
6111677	SEKT1404AESNGP2 KCPM40	S42	6117101	EVM50R0416A350999C	C52	6124230	EVSBR2525M0516350999C	C44	6127404	XADA1000X4CH45 KCPM15	048
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6116300	A40TEVSAL0312M041050	C48	6117419	CNMU120616MN KCP25B	B51	6124238	EVSBL3232P0532250350C	C44	6127886	EDPT107308PDSRGE KCPM40	T36
6116521	A25REVSAR0212M026030	C48	6123362	KSEM3450FEGM KCPM45	H54	6124239	EVSBR3232P0532250350C	C45	6127887	EDPT107312PDERHD KCPM40	T36
6116522	A25REVSAR0312M030035	C48	6123525	KTIP080R12SS10M	H31	6124240	EVSBL3232P0532250350C	C45	6127888	EDPT107316PDERHD KCPM40	T36
6116527	A25REVSAL0212M026030	C48	6123526	KTIP085R12SS10M	H31	6124241	EVSBR3232P0532350999C	C44	6127889	EDPT107320PDERHD KCPM40	T36
6116528	A25REVSAL0312M030035	C48	6123527	KTIP090R12SS10M	H31	6124242	EVSBL3232P0532350999C	C45	6128132	EDPT140404PDERHD KCPM40	T53, T62
6116561	EVSBR2020K0312040050C	C43	6123528	KTIP095R12SS10M	H31	6124605	EVSBR2525M0616060075C	C44	6128133	EDPT140408PDSRGD KCPM40	T54, T63
6116562	EVSBL2020K0312040050C	C44	6123529	KTIP100R12SS12M	H31	6124606	EVSBL2525M0616060075C	C45	6128134	EDPT140416PDERHD KCPM40	T53, T62
6116563	EVSBR2020K0312050060C	C43	6123530	KTIP105R12SS12M	H31	6124607	EVSBR2525M0626060075C	C44	6128135	EDPT140416PDSRGD KCPM40	T54, T63
			6123570	WD32FDS28076M	H102	6124608	EVSBL2525M0626060075C	C45	6128136	EDPT140424PDERHD KCPM40	T53, T62
			6123571	WD32FDS32082M	H102	6124609	EVSBR2525M0616075100C	C44	6128137	EDCT180504PDERGD KCPM40	T74
			6123572	WD32FDS36092M	H102	6124610	EVSBL2525M0616075100C	C45	6128138	EDCT180508PDERGD KCPM40	T74
			6123573	WD50FDS40100M	H102	6124671	EVSBR2525M0626075100C	C44	6128139	EDCT180512PDERGD KCPM40	T74
			6123575	WD50FDS45112M	H102	6124672	EVSBL2525M0616100180C	C45	6128780	KTIP1770FEGM KCPM45	H29
			6123576	WD50FDS50122M	H102	6124673	EVSBR2525M0616100180C	C44	6130644	SEPT1404AEENGB2 KCPM40	S43
			6123577	WD50FDS56140M	H102	6124674	EVSBL2525M0616100180C	C45	6130645	SEPT1404AESNGB2 KCPM40	S43
			6123578	WD50FDS63154M	H102	6124677	EVSBR2525M0616180250C	C44	6130740	UADE5000A4BV KCPM15	P17
			6123579	WD50FDS71172M	H102	6124678	EVSBL2525M0616180250C	C45	6130871	UADE4000B4BV KCPM15	P17
			6123580	WD50FDS80192M	H102	6124681	EVSBR2525M0616250350C	C44	6130874	UADE5000A4BV KCPM15	P17
			6123581	WD50FDS90212M	H102	6124682	EVSBL2525M0616250350C	C45	6130875	UADE5000B4BV KCPM15	P17
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6131423	LNGU110412SRGEM KCK15	T9	6135052	SS20DL10200M	057	6143989	3CH0800MX028A KC633M	Q20	6146951	3CH1000DL019A KC633M	Q18
6131424	LNGU110412SRGEM KCPK30	T9	6135053	SS20SLDL12105M	056	6143990	3CH1000MX032A KC633M	Q20	6146952	3CH1200DL022A KC633M	Q19
6131425	LNGU110412SRGEM KC520M	T9	6135054	SS20DL12200M	057	6144061	3CH1200MX045A KC633M	Q20	6146953	3CH1400DL022A KC633M	Q19
6131426	LNGU110412SRGEM KCPM40	T9	6135055	SS20SLDL16080M	056	6144062	3CH1600MX056A KC633M	Q20	6146954	3CH1600DL026A KC633M	Q19
6131428	LNPUI10412SRGE KC522M	T9	6135056	SS20DL16200M	056	6144063	3CH2000MX064A KC633M	Q20	6146955	3CH1800DL026A KC633M	Q19
6131429	LNPUI10412SRGE KCPM40	T9	6135057	SS20SLDL20080M	057	6144064	3CH1200MX019B KC633M	Q20	6146956	3CH2000DL032A KC633M	Q19
6131430	LNPUI10412SRGE KC725M	T9	6135058	SS20DL20200M	057	6144066	3CH0500MX020B KC633M	Q20	6146957	3CH2000DL006B KC633M	Q18
6131502	LNPUI10408SRGE KC522M	T9	6135059	SS25SLDL16115M	056	6144067	3CH0600MX028B KC633M	Q20	6146958	3CH2500DL007B KC633M	Q18
6131503	LNPUI10408SRGE KCPM40	T9	6135060	SS25DL16250M	057	6144068	3CH0800MX028B KC633M	Q20	6146959	3CH3000DL007B KC633M	Q18
6131504	LNPUI10408SRGE KC725M	T9	6135061	SS25SLDL20095M	056	6144069	3CH1000MX032B KC633M	Q20	6146960	3CH3500DL007B KC633M	Q18
6131505	LNPUI10408SRGE KCPK30	T9	6135062	SS25DL20250M	057	6144070	3CH1200MX045B KC633M	Q20	6146961	3CH4000DL008B KC633M	Q18
6131506	LNPUI10408SRGE KC520M	T9	6135063	SS25SLDL25090M	056	6144071	3CH1600MX056B KC633M	Q20	6146962	3CH4500DL008B KC633M	Q18
6131507	LNPUI10408SRGE KCK15	T9	6135064	SS25DL25250M	057	6144072	3CH2000MX064B KC633M	Q20	6146963	3CH5000DL010B KC633M	Q18
6131511	LNPUI10412SRGE KCPK30	T9	6135065	SS32SLDL25105M	056	6145374	1-16NPTF-JIC	C75	6146964	3CH5500DL010B KC633M	Q18
6131512	LNPUI10412SRGE KC520M	T9	6135066	SS32DL25250M	057	6145375	1-8NPTF-JIC	C75	6146965	3CH6000DL010B KC633M	Q18
6131513	LNPUI10412SRGE KCK15	T9	6135067	SS32SLDL32105M	056	6145376	G18-JIC	C75	6146966	3CH7000DL013B KC633M	Q18
6131514	LNGU110404ERGE KC725M	T8	6135068	SS32DL32250M	057	6145377	M10-JIC	C75	6146967	3CH8000DL016B KC633M	Q18
6131515	LNGU110404ERGE KC522M	T8	6135069	SS40SLDL32140M	056	6145378	M8-JIC	C75	6146968	3CH9000DL019B KC633M	Q18
6131516	LNGU110404ERGE KCPM40	T8	6135070	SS40DL32250M	057	6145379	JICM-JICF-ELB	C75	6146969	3CH1200DL022B KC633M	Q19
6131541	LNGU110408ERGE KC725M	T8	6135081	SS50SLDL32200M	056	6145380	COOL-HOSE-200	C75	6146970	3CH1400DL022B KC633M	Q19
6131542	LNGU110408ERGE KC522M	T8	6135082	SS50DL32250M	057	6145381	COOL-HOSE-300	C75	6146971	3CH1600DL026B KC633M	Q19
6131543	LNGU110408ERGE KCPM40	T8	6135413	TWDLTM	058	6145382	M6-JIC	C75	6146972	3CH1800DL026B KC633M	Q19
6131544	LNGU110408ERGE KCSM30	T8	6135414	TWTMINSERTDL10	058	6145383	JICM-JICM-STR	C75	6146973	3CH2000DL032B KC633M	Q19
6131556	LNGU110408ERLEJ KC422M	T8	6135415	TWTMINSERTDL12	058	6145386	G14-G18-RED	C75	6151025	ABDE1000X3C0Q K600	Q29
6131557	LNPUI10416SRGE KC522M	T9	6135416	TWTMINSERTDL16	058	6146871	3CH0250DK003A KC633M	Q18	6151026	ABDE1000X3C0G K600	Q29
6131558	LNPUI10416SRGE KCPM40	T9	6135417	TWTMINSERTDL20	058	6146872	3CH0300DK004A KC633M	Q18	6151027	ABDE1000X3C0J K600	Q29
6131559	LNPUI10416SRGE KCPK30	T9	6135418	TWTMINSERTDL25	058	6146874	3CH0350DK004A KC633M	Q18	6151028	ABDE1200X3C0E K600	Q29
6131560	LNPUI10416SRGE KCPK30	T9	6135419	TWTMINSERTDL32	058	6146875	3CH0400DK005A KC633M	Q18	6151029	ABDE1200X3C0G K600	Q29
6131601	LNPUI10416SRGE KC520M	T9	6135420	TWTMINSERTDL10W	058	6146876	3CH0450DK005A KC633M	Q18	6151030	ABDE1200X3C0J K600	Q29
6131602	LNGU110408SRGEM KCK15	T9	6135421	TWTMINSERTDL12W	058	6146877	3CH0500DK006A KC633M	Q18	6151031	ABDE1200X3C0L K600	Q29
6131603	LNGU110408SRGEM KCPK30	T9	6135422	TWTMEXT	058	6146878	3CH0550DK007A KC633M	Q18	6151032	ABDE1600X3C0G K600	Q29
6131604	LNGU110408SRGEM KC520M	T9	6135423	TWTMBC	058	6146879	3CH0600DK007A KC633M	Q18	6151033	ABDE1600X3C0J K600	Q29
6131605	LNGU110408SRGEM KC522M	T9	6136737	M4D016Z02A16LN11L150	T6	6146880	3CH0700DK008A KC633M	Q18	6151034	ABDE1600X3C0K K600	Q29
6131606	LNGU110408SRGEM KCPM40	T9	6136738	M4D016Z02M08LN11	T4	6146881	3CH0800DK009A KC633M	Q18	6151035	ABDE1600X3C0L K600	Q29
6131627	M4D016Z02A16LN11L090	T6, T11	6136739	M4D020Z03A20LN11L150	T6	6146882	3CH1000DK011A KC633M	Q18	6151036	ABDE1600X3C0M K600	Q29
6131628	M4D016Z02B16LN11	T5	6136740	M4D020Z03B20LN11	T5	6146883	3CH1200DK012A KC633M	Q18	6151037	ABDE2000X3C0G K600	Q29
6131629	M4D020Z02A20LN11L150	T5, T11	6136780	TCMT16T312LF KCP10B	B244	6146884	3CH1400DK014A KC633M	Q19	6151038	ABDE2000X3C0K K600	Q29
6131630	M4D020Z02B20LN11	T5, T11	6136791	M4D025Z04A25LN11L170	T6	6146885	3CH1600DK016A KC633M	Q19	6151039	ABDE2000X3C0L K600	Q29
6131681	M4D020Z03A20LN11L090	T6, T11	6136792	M4D032Z05A32LN11L200	T6	6146886	3CH1800DK018A KC633M	Q19	6151040	ABDE2000X3C0M K600	Q29
6131682	M4D020Z03M10LN11	T4	6136793	M4D032Z05M16LN11	T4	6146888	3CH2000DK020A KC633M	Q19	6151042	ABDE2000X3C0N K600	Q29
6131683	M4D025Z03A25LN11L170	T6	6136794	M4D040Z05A32LN11L200	T6	6146890	3CH2500DK003B KC633M	Q18	6151043	ABDE2000X3C0Q K600	Q29
6131684	M4D025Z03B25LN11	T5, T11	6136795	M4D040Z05B32LN11	T5	6146891	3CH0300DK004B KC633M	Q18	6151044	ABDE2500X3C0N K600	Q29
6131685	M4D025Z04A25LN11L100	T6, T11	6136796	M4D040Z07S16LN11	T7	6146892	3CH0350DK004B KC633M	Q18	6151062	ABDF1000X2C0J K600	Q28
6131686	M4D025Z04M12LN11	T4	6136797	M4D050Z09S22LN11	T7	6146893	3CH0400DK005B KC633M	Q18	6151063	ABDF1200X2C0J K600	Q28
6132022	LNGU110408SRGE KC522M	T9	6136798	M4D080Z10S27LN11	T7	6146894	3CH0450DK005B KC633M	Q18	6151064	ABDF1600X2C0J K600	Q28
6132023	LNGU110408SRGE KCPM40	T9	6136949	HSK63ADL10048M	052	6146895	3CH0500DK006B KC633M	Q18	6151066	ABDF2000X2C0J K600	Q28
6132024	LNGU110408SRGE KC725M	T9	6136950	HSK63ADL12052M	052	6146896	3CH0550DK007B KC633M	Q18	6151491	VDIB1M402544C	C67
6132025	LNGU110408SRGE KCPK30	T9	6136951	HSK63ADL16057M	052	6146897	3CH0600DK007B KC633M	Q18	6151492	VDIB1M402544C	C67
6132026	LNGU110408SRGE KCK15	T9	6136952	HSK63ADL20057M	052	6146898	3CH0700DK008B KC633M	Q18	6151493	VDIB2M402544C	C67
6132452	KSEM3750SPLM KCM35	H53	6136953	HSK63ADL25061M	052	6146899	3CH0800DK009B KC633M	Q18	6151494	VDIB2M402544C	C67
6133107	B976F15400 KC715	G145	6136954	HSK63ADL32072M	052	6146900	3CH1000DK011B KC633M	Q18	6151495	VDIB3M302040C	C68
6133656	KSEM2950SPLM KCM35	H53	6136955	PSC63DL10050M	052	6146901	3CH1200DK012B KC633M	Q19	6151497	VDIB3M402544C	C68
6134054	MILL16D080Z08N08W	S32	6136956	PSC63DL12050M	052	6146902	3CH1400DK014B KC633M	Q18	6151498	VDIB4M302040C	C68
6134055	MILL16D100Z100N08W	S32	6136957	PSC63DL16055M	052	6146903	3CH1600DK016B KC633M	Q19	6151499	VDIB4M402544C	C68
6134056	MILL16D125Z140N08W	S32	6136958	PSC63DL20055M	052	6146904	3CH1800DK018B KC633M	Q19	6151500	VDIB5M302040C	C69
6134057	MILL16D160Z160N08W	S32	6136959	PSC63DL25060M	052	6146905	3CH2000DK020B KC633M	Q19	6151511	VDIB5M402544C	C69
6134058	MILL16D200Z200N08W	S32	6136960	PSC63DL32068M	052	6146906	3CH0100MS004A KC633M	Q20	6151512	VDIB6M302040C	C69
6134059	MILL16D250Z240N08W	S32	6136971	CV40BDL10041M	053	6146907	3CH0150MS004A KC633M	Q20	6151513	VDIB6M402544C	C69
6134184	M4D032Z04A32LN11L200	T6	6136972	CV40BDL12041M	053	6146908	3CH0200MS006A KC633M	Q20	6151514	VDIC1M302070C	C70
6134185	M4D032Z04B32LN11	T5, T11	6136973	CV40BDL16050M	053	6146909	3CH0250MS006A KC633M	Q20	6151515	VDIC1M402585C	C70
6134186	M4D032Z05A32LN11L110	T6, T11	6136974	CV40BDL20050M	053	6146910	3CH0300MS009A KC633M	Q20	6151516	VDIC2M302070C	C70
6134187	M4D032Z06M16LN11	T4	6136975	CV40BDL25056M	053	6146911	3CH0400MS012A KC633M	Q20	6151517	VDIC2M402585C	C70
6134188	M4D040Z04S16LN11	T7, T11	6136976	CV40BDL32065M	053	6146913	3CH0600MS016A KC633M	Q20	6151518	VDIC3M302070C	C71
6134189	M4D040Z06S16LN11	T7, T11	6136977	BT40BDL10049M	053	6146914	3CH0800MS019A KC633M	Q20	6151519	VDIC3M402585C	C71
6134190	M4D050Z05S22LN11	T7, T11	6136978	BT40BDL12049M	053	6146915	3CH1000MS022A KC633M	Q20	6151520	VDIC4M302070C	C71
6134231	M4D050Z07S22LN11	T7, T11	6136979	BT40BDL16058M	053	6146916	3CH1200MS025A KC633M	Q20	6151521	VDIC4M402585C	C71
6134232	M4D063Z06S22LN11	T7	6136980	BT40BDL20058M	053	6146917	3CH1600MS032A KC633M	Q20	6151522	CNMGM120402LF KCP25B	B50
6134233	M4D063Z09S22LN11	T7, T11	6136991	BT40BDL25060M	053	6146935	3CH0600MS016B KC633M	Q20	6151523	CNMGM120404LF KCP25B	B50
6134234	M4D080Z08S27LN11	T7	6136992	BT40BDL32068M	053	6146937	3CH1000MS022B KC633M	Q20	6151524	CNMGM120408LF KCP25B	B50
6134889	SS10SLDL10055M	056	6136993	DV40BDL10041M	054	6146938	3CH1200MS025B KC633M	Q20	6151525	CNMGM160612MG KCP25B	B57
6134890	SS10DL10100M	057	6136994	DV40BDL12041M	054	6146939	3CH1600MS032B KC633M	Q20	6151527	CNMGM190612MG KCP25B	B57
6135041	SS12SLDL10065M	056	6136995	DV40BDL16050M	054	6146940	3CH2000DL006A KC633M	Q18	6151528	CNMGM120408MR KCP25B	B54
6135042	SS12DL10120M	057	6136996	DV40BDL20050M	054	6146941	3CH0250DL007A KC633M	Q18	6151529	CNMGM160612MR KCP25B	B54
6135043	SS12SLDL12065M	056	6136997	DV40BDL25056M	054	6146942	3CH0500DL07A KC633M	Q18	6151530	CNMGM160616MR KCP25B	B54
6135044	SS12DL12120M	057	6136998	DV40BDL32065M	054	6146943	3CH0350DL007A KC633M	Q18	6151562	DNMP110408K KCP25B	B83
6135045	SS16SLDL10090M	056	6137128	DNMGM10408FP KCPK05	B77	6146944	3CH0400DL008A KC633M	Q18	6151565	VNMG160408LF KCP25B	B144
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6159024	MILL16D050Z040N08SC	S34	6165861	HNPJ060432ANSNHD KCSM40	S7, S13, S16	6172125	EDPT140420PDERHD KCSM40	T53, T62	6172688	T839M120X175R6H-D6 KSU31	M45
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6159028	MILL16D080Z070N08SC	S34	6165863	XNGJ0604ANENLD3W KCSM40	S12	6172129	EDPT140408PDSRGD KCSM40	T54, T63	6172704	T839M180X250R6H-D6 KSU31	M45
6159029	MILL16D100Z060N08SC	S34	6167618	FSDE1000A9BC K643M	P92	6172130	EDPT140412PDSRGD KCSM40	T54, T63	6172705	T839M200X250R6H-D6 KSP39	M45
6159030	MILL16D100Z080N08SC	S34	6167619	FSDE1000A9BC K643M	P92	6172191	EDPT140416PDSRGE KCSM40	T53, T62	6172706	T839M200X250R6H-D6 KSU31	M45
6159061	MILL16D125Z080N08SC	S34	6167620	FSDE1200A9BC K643M	P92	6172192	EDPT140408PDSRGE KCSM40	T53, T62	6172707	T839M200X250R6H-D6 KSP39	M45
6159062	MILL16D125Z100N08SC	S34	6167621	FSDE1200A9BC K643M	P92	6172193	EDPT140412PDSRGE KCSM40	T53, T62	6172708	T839M200X250R6H-D6 KSP39	M45
6159063	MILL16D160Z100N08SC	S34	6167622	FSDE1600A9BC K643M	P92	6172194	EDPT140416PDSRGE KCSM40	T53, T62	6172709	T839M200X250R6H-D6 KSU31	M45
6159064	MILL16D160Z120N08SC	S34	6167623	FSDE1600A9BC K643M	P92	6172195	EDPT140431PDSRGE KCSM40	T53, T62	6172710	T839M200X250R6H-D6 KSP39	M45
6159065	MILL16D200Z100N08SC	S34	6167624	FSDE1600A9BC K643M	P92	6172348	EDPT180508PDSRGD KCSM40	T75	6172711	T839M200X250R6H-D6 KSU31	M45
6159066	MILL16D200Z140N08SC	S34	6167625	FSDE1600A9BC K643M	P92	6172349	EDPT180512PDSRGD KCSM40	T75	6172712	T839M200X250R6H-D6 KSP39	M45
6159067	MILL16D250Z120N08SC	S34	6167626	FSDE1600A9BC K643M	P92	6172350	EDPT180516PDSRGD KCSM40	T75	6172713	T839M200X250R6H-D6 KSU31	M45
6160117	5720VZ16HA050Z4R75	T89	6167627	FSDE2000AFBC K643M	P92	6172391	EDPT180532PDSRGD KCSM40	T75	6172714	T839M200X250R6H-D6 KSP39	M45
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6162869	KSEM1830SPLM KCMS35	H52	6167630	FSDE2000AFBC K643M	P92	6172394	EDPT180508PDSRGE KCSM40	T75	6172717	T839M200X250R6H-D6 KSU31	M45
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6163121	KSEM2250SPLM KCMS35	H52	6167632	FSDE2500AJBC K643M	P92	6172396	EDPT180516PDSRGE KCSM40	T75	6172719	T839M200X250R6H-D6 KSU31	M45
6163122	KSEM2350SPLM KCMS35	H52	6167633	FSDE2500AJBC K643M	P92	6172397	EDPT180532PDSRGE KCSM40	T75	6172720	T839M200X250R6H-D6 KSP39	M45
6163123	KSEM2450SPLM KCMS35	H52	6167634	FSDE2500AJBC K643M	P92	6172398	EDPT180508PDERGD KCSM40	T74	6172721	T839M200X250R6H-D6 KSU31	M45
6163124	KSEM2525SPLM KCMS35	H52	6167635	FSDE2500AJBC K643M	P92	6172399	EDPT180516PDERGD KCSM40	T74	6172722	T839M200X250R6H-D6 KSP39	M45
6163125	KSEM2530SPLM KCMS35	H52	6168013	SDCT1204PDERLD2 KCSM40	T104, T111, U51	6172400	EDPT180532PDERGD KCSM40	T74	6172723	T839M200X250R6H-D6 KSU31	M45
6163126	KSEM2550SPLM KCMS35	H52	6168014	SDCT120412PDERLD2 KCSM40	T104, T111, U51	6172411	EDPT180548PDERGD KCSM40	T74	6172724	T839M200X250R6H-D6 KSP39	M45
6163127	KSEM2630SPLM KCMS35	H52	6168015	SDCT120412PDERGB KCSM40	T105, T112, U51	6172412	EDPT180564PDERGD KCSM40	T74	6172725	T839M200X250R6H-D6 KSU31	M45
6163128	KSEM2650SPLM KCMS35	H52	6168016	SDCT120416ENLD2 KCSM40	T104, T111, U51	6172413	EDPT180508PDERHD KCSM40	T75	6172726	T839M200X250R6H-D6 KSP39	M45
6163129	KSEM2659SPLM KCMS35	H52	6168017	SDCT120432ENLD2 KCSM40	T104, T111, U51	6172414	EDPT180512PDERHD KCSM40	T75	6172727	T839M200X250R6H-D6 KSU31	M45
6163130	KSEM2750SPLM KCMS35	H52	6168018	SDCT120442ENLD2 KCSM40	T104, T111, U51	6172415	EDPT180516PDERHD KCSM40	T75	6172728	T839M200X250R6H-D6 KSP39	M45
6163131	KSEM2800SPLM KCMS35	H52	6168019	SDCT120446ENGB KCSM40	T105, T112, U51	6172416	EDPT180532PDERHD KCSM40	T75	6172729	T839M200X250R6H-D6 KSU31	M45
6163132	KSEM2850SPLM KCMS35	H52	6168020	SDCT120448ENGB KCSM40	T105, T112, U51	6172417	EDPT180540PDERHD KCSM40	T75	6172730	T839M200X250R6H-D6 KSP39	M45
6163133	KSEM2900SPLM KCMS35	H53	6168021	SDCT120448ENGB KCSM40	T105, T112, U51	6172418	EDPT180548PDERHD KCSM40	T75	6172731	T839M200X250R6H-D6 KSU31	M45
6163134	KSEM3005SPLM KCMS35	H53	6168022	SDCT120448ENGB KCSM40	T105, T112, U51	6172513	B967A03000 KC7315	G132	6172732	T839M200X250R6H-D6 KSP39	M45
6163135	KSEM3100SPLM KCMS35	H53	6168023	SDCT120448ENGB KCSM40	T105, T112, U51	6172514	B967A03100 KC7315	G132	6172733	T839M200X250R6H-D6 KSU31	M45
6163136	KSEM3150SPLM KCMS35	H53	6168024	SDCT120448ENGB KCSM40	T105, T112, U51	6172515	B967A03200 KC7315	G132	6172734	T839M200X250R6H-D6 KSP39	M45
6163137	KSEM3250SPLM KCMS35	H53	6168025	SDCT120448ENGB KCSM40	T105, T112, U51	6172516	B967A03300 KC7315	G132	6172735	T839M200X250R6H-D6 KSU31	M45
6163138	KSEM3350SPLM KCMS35	H53	6168026	SDCT120448ENGB KCSM40	T105, T112, U51	6172517	B967A03500 KC7315	G132	6172736	T839M200X250R6H-D6 KSP39	M45
6163139	KSEM3400SPLM KCMS35	H53	6168027	SDCT120448ENGB KCSM40	T105, T112, U51	6172518	B967A03800 KC7315	G132	6172737	T839M200X250R6H-D6 KSU31	M45
6163141	KSEM3450SPLM KCMS35	H53	6168028	SDCT120448ENGB KCSM40	T105, T112, U51	6172519	B967A04000 KC7315	G132	6172738	T839M200X250R6H-D6 KSP39	M45
6163142	KSEM3500SPLM KCMS35	H53	6168029	SDCT120448ENGB KCSM40	T105, T112, U51	6172520	B967A04200 KC7315	G132	6172739	T839M200X250R6H-D6 KSU31	M45
6163143	KSEM3550SPLM KCMS35	H53	6168030	SDCT120448ENGB KCSM40	T105, T112, U51	6172531	B967A04300 KC7315	G132	6172740	T839M200X250R6H-D6 KSP39	M45
6163144	KSEM3600SPLM KCMS35	H53	6168031	SDCT120432ENGB KCSM40	T105, T112, U51	6172532	B967A04500 KC7315	G132	6172741	T839M200X250R6H-D6 KSU31	M45
6163145	KSEM3650SPLM KCMS35	H53	6168032	SDCT120432ENGB KCSM40	T105, T112, U51	6172533	B967A04800 KC7315	G132	6172742	T839M200X250R6H-D6 KSP39	M45
6163146	KSEM3700SPLM KCMS35	H53	6168033	SDCT120432ENGB KCSM40	T105, T112, U51	6172534	B967A05100 KC7315	G132	6172743	T839M200X250R6H-D6 KSU31	M45
6163147	KSEM3800SPLM KCMS35	H53	6168034	SDCT120432ENGB KCSM40	T105, T112, U51	6172535	B967A05200 KC7315	G132	6172744	T839M200X250R6H-D6 KSP39	M45
6163148	KSEM3850SPLM KCMS35	H53	6168035	SDCT120432ENGB KCSM40	T105, T112, U51	6172536	B967A05500 KC7315	G132	6172745	T839M200X250R6H-D6 KSU31	M45
6163149	KSEM3900SPLM KCMS35	H53	6168036	SDCT120432ENGB KCSM40	T105, T112, U51	6172537	B967A05800 KC7315	G132	6172746	T839M200X250R6H-D6 KSP39	M45
6163150	KSEM3950SPLM KCMS35	H53	6168037	SDCT120432ENGB KCSM40	T105, T112, U51	6172538	B967A06100 KC7315	G132	6172747	T839M200X250R6H-D6 KSU31	M45
6163300	KTIP0913FEGM KCPM45	H29	6168038	SDCT120432ENGB KCSM40	T105, T112, U51	6172539	B967A06600 KC7315	G133	6172748	T839M200X250R6H-D6 KSP39	M45
6163381	KTIP1010FEGM KCPM45	H29	6168039	SDCT120432ENGB KCSM40	T105, T112, U51	6172540	B967A06800 KC7315	G133	6172749	T839M200X250R6H-D6 KSU31	M45
6163382	KTIP1170FEGM KCPM45	H29	6168040	SDCT120432ENGB KCSM40	T105, T112, U51	6172541	B967A07800 KC7315	G133	6172750	T839M200X250R6H-D6 KSP39	M45
6163383	KSEM1984FEGM KCPM45	H54	6168041	SDCT120432ENGB KCSM40	T105, T112, U51	6172542	B967A08100 KC7315	G133	6172751	T839M200X250R6H-D6 KSU31	M45
6163384	KSEM2580FEGM KCPM45	H54	6168042	SDCT120432ENGB KCSM40	T105, T112, U51	6172543	B967A08600 KC7315	G133	6172752	T839M200X250R6H-D6 KSP39	M45
6163385	KSEM2581FEGM KCPM45	H54	6168043	SDCT120432ENGB KCSM40	T105, T112, U51	6172544	B967A08800 KC7315	G133	6172753	T839M200X250R6H-D6 KSU31	M45
6163386	KSEM2619FEGM KCPM45	H54	6168044	SDCT120432ENGB KCSM40	T105, T112, U51	6172655	T839M030X050R6H-D1 KSP39	M45	6172754	T839M200X250R6H-D6 KSP39	M45
6163387	KSEM3050FEGM KCPM45	H54	6168045	SDCT120432ENGB KCSM40	T105, T112, U51	6172656	T839M040X070R6H-D1 KSP39	M45	6172755	T839M200X250R6H-D6 KSU31	M45
6163388	KSEM3150FEGM KCPM45	H54	6168046	SDCT120432ENGB KCSM40	T105, T112, U51	6172657	T839M040X070R6H-D1 KSP39	M45	6172756	T839M200X250R6H-D6 KSP39	M45
6163389	KSEM3250FEGM KCPM45	H54	6168047	SDCT120432ENGB KCSM40	T105, T112, U51	6172658	T839M050X080R6H-D1 KSP39	M45	6172757	T839M200X250R6H-D6 KSU31	M45
6163390	KSEM3350FEGM KCPM45	H54	6168048	SDCT120432ENGB KCSM40	T105, T112, U51	6172659	T839M050X080R6H-D1 KSP39	M45	6172758	T839M200X250R6H-D6 KSP39	M45
6163411	KSEM3550FEGM KCPM45	H54	6168049	SDCT120432ENGB KCSM40	T105, T112, U51	6172660	T839M050X080R6H-D1 KSU31	M45	6172759	T839M200X250R6H-D6 KSU31	M45
6163412	KSEM3650FEGM KCPM45	H54	6168050	SDCT120432ENGB KCSM40	T105, T112, U51	6172661	T839M060X100R6H-D1 KSP39	M45	6172760	T839M200X250R6H-D6 KSP39	M45
6163413	KSEM3750FEGM KCPM45	H55	6168051	SDCT120432ENGB KCSM40	T105, T112, U51	6172662	T839M060X100R6H-D1 KSU31	M45	6172761	T839M200X250R6H-D6 KSU31</	

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6173082	T838NC10000-8R2B-D6 KSU31	M47	6173270	T838NF#10-32R2B-D1 KSP39	M47	6178237SDHT120412EN422 KCSM40	T119	6187511XPPW060310SRD KCPM40	V7
6173083	T838NF10000-12R2B-D4 KSP39	M47	6173271	T838NF#10-32R2B-D1 KSU31	M47	6178238	.....SDMT120412EN41 KCSM40	T120	6187512	.....XPPW060310SRD KCPK30	V7
6173084	T838NF10000-12R2B-D4 KSU31	M47	6173272	T838NC#12-24R2B-D1 KSP39	M47	6178239	.....SDMT120412EN41 KCSM40	T120	6187513	.....XPPW060310SRD KC522M	V7
6173085	T838NC11250-7R2B-D6 KSP39	M48	6173273	T838NC#12-24R2B-D1 KSU31	M47	6178240	.....SDMM120412TN KCSM40	T120	6187514	.....XPPW060310SRD KC510M	V7
6173086	T838NC11250-7R2B-D6 KSU31	M48	6173274	T838NF#12-28R2B-D1 KSP39	M47	6178251	.....SDHT09308EN422 KCSM40	T116	6187535	.....XDPW090412SRD KCPM40	V16
6173087	T838NF11250-12R2B-D4 KSP39	M48	6173275	T838NF#12-28R2B-D1 KSU31	M47	6178252	.....SDHT09308EN423 KCSM40	T116	6187536	.....XDPW090412SRD KCPK30	V16
6173088	T838NF11250-12R2B-D4 KSU31	M48	6173276	T838NC02500-20R2B-D1 KSP39	M47	6178253	.....SDMT09308EN41 KCSM40	T117	6187537	.....XDPW090412SRD KCK15	V16
6173089	T838NC12500-7R2B-D6 KSP39	M48	6173277	T838NC02500-20R2B-D1 KSU31	M47	6178254	.....SDMM09308TN KCSM40	T117	6187538	.....XDPW090412SRD KC522M	V16
6173090	T838NC12500-7R2B-D6 KSU31	M48	6173278	T838NC02500-20R2B-D6 KSP39	M47	6178255	.....SDMM09308TN KCSM40	T117	6187539	.....XDPW090412SRD KC510M	V16
6173091	T838NF12500-12R2B-D4 KSP39	M48	6173279	T838NF02500-28R2B-D1 KSP39	M47	6179709	.....EVSCFL1010K1B10	C42	6187714	.....XEPW160520SRD KCPM40	V31
6173092	T838NF12500-12R2B-D4 KSU31	M48	6173280	T838NF02500-28R2B-D1 KSU31	M47	6179710	.....EVSCFL1010K1F10	C42	6187715	.....XEPW160520SRD KCPK30	V31
6173093	T838NC13750-6R2B-D6 KSP39	M48	6173281	T838NF02500-28R2B-D6 KSP39	M47	6179755	.....EVSCFR1212K0316C	C39	6187716	.....XEPW160520SRD KCK15	V31
6173094	T838NC13750-6R2B-D6 KSU31	M48	6173282	T838NF02500-28R2B-D4 KSP39	M47	6179756	.....EVSCFR1212K0316C	C40	6187717	.....XDPW090412SRD KC522M	V16
6173095	T838NF13750-12R2B-D4 KSP39	M48	6173283	T838NF02500-28R2B-D4 KSU31	M47	6179757	.....EVSCFR1212K1B16	C39	6187806	.....XDPT120508ERD41 KCSM40	V23
6173096	T838NF13750-12R2B-D4 KSU31	M48	6173284	T838NF03125-18R2B-D1 KSP39	M47	6179758	.....EVSCFR1212K1F16	C39	6187808	.....XDPT120512ERD41 KCSM40	V24
6173097	T838NC15000-6R2B-D6 KSP39	M48	6173285	T838NF03125-18R2B-D1 KSU31	M47	6179759	.....EVSCFR1212K0216	C39	6191237	.....KSDR100031EOWOS KD1400	S127
6173098	T838NC15000-6R2B-D6 KSU31	M48	6173286	T838NF03125-24R2B-D4 KSP39	M47	6179760	.....EVSCFR1212K1B16	C40	6191238	.....KSDR100031EOWOS KD1425	S127
6173099	T838NF15000-12R2B-D4 KSP39	M48	6173287	T838NF03125-24R2B-D4 KSU31	M47	6179761	.....EVSCFR1010K1F10	C41	6191356	.....RCGT2006MOLFF KCSM40	V83
6173100	T838NF15000-12R2B-D4 KSU31	M48	6173288	T838NC03750-16R2B-D6 KSP39	M47	6179762	.....EVSCFR1010K0210	C41	6191357	.....RCGT2006MOLFF KCSM40	V83
6173101	T838NC17500-5R2B-D6 KSP39	M48	6173289	T838NC03750-16R2B-D6 KSU31	M47	6179763	.....EVSCFR1010K1B10	C41	6191557	.....XPT160516ERD41 KCPM40	V31
6173102	T838NC17500-5R2B-D6 KSU31	M48	6173290	T838NC03750-16R2B-D1 KSP39	M47	6179764	.....EVSCFR1212K1B10	C41	6191558	.....XPT160516ERD41 KCPK30	V31
6173103	T838NC20000-4.5R2B-D6 KSP39	M48	6173301	T838NC03750-16R2B-D1 KSU31	M47	6179765	.....EVSCFR1212K1F10	C41	6191559	.....XPT160516ERD41 KC522M	V31
6173104	T838NC20000-4.5R2B-D6 KSU31	M48	6173302	T838NF03750-24R2B-D4 KSP39	M47	6179766	.....EVSCFR1212K1F13	C41	6191642	.....XDPT090412SRG KCPM40	V16
6173111	T838M160X200R6H-D4 KSP39	M43	6173303	T838NF03750-24R2B-D4 KSU31	M47	6179767	.....EVSCFR1212K0316C	C41	6191643	.....XDPT090412SRG KCPK30	V16
6173112	T838MF180X150R6H-D4 KSP39	M43	6173304	T838NF03750-24R2B-D4 KSP39	M47	6179768	.....EVSCFR1212K0216	C41	6191644	.....XDPT090412SRG KC725M	V16
6173113	T838MF180X150R6H-D4 KSU31	M43	6173305	T838NF03750-24R2B-D4 KSU31	M47	6179769	.....EVSCFR1212K1F10	C41	6191645	.....XDPT090412SRG KC522M	V16
6173114	T838MF180X200R6H-D4 KSP39	M43	6173306	T838NF03750-24R2B-D4 KSP39	M47	6179770	.....EVSCFR1212K0310C	C41	6197561	.....DFT051040	S32-33
6173115	T838MF180X200R6H-D4 KSU31	M43	6173307	T838NF03750-24R2B-D4 KSU31	M47	6179771	.....EVSCFR1212K0216	C41	6200729	.....LNGU110416SRGEM KCK15	T9
6173116	T838M180X250R6H-D6 KSP39	M43	6173308	T838NF04375-20R2B-D4 KSP39	M47	6179772	.....EVSCFR1212K0316C	C41	6200730	.....LNGU110416SRGEM KCPK30	T9
6173117	T838M180X250R6H-D6 KSU31	M43	6173309	T838NF04375-20R2B-D4 KSU31	M47	6179773	.....EVSCFR1212K0216	C41	6201021	.....LNGU110416SRGEM KC520M	T9
6173118	T838MF200X150R6H-D4 KSP39	M43	6173310	T838NF05000-13R2B-D6 KSP39	M47	6179774	.....EVSCFR1212K0316C	C41	6201022	.....LNGU110416SRGEM KCPM40	T9
6173119	T838MF200X150R6H-D4 KSU31	M43	6173311	T838NF05000-13R2B-D6 KSU31	M47	6179775	.....EVSCFR1616K1F16	C41	6201279	.....LNGU110404SRGE KC522M	T9
6173120	T838MF200X200R6H-D4 KSP39	M43	6173312	T838NF05000-20R2B-D4 KSP39	M47	6179776	.....EVSCFR1616K0316C	C41	6201280	.....LNGU110404SRGE KCPM40	T9
6173121	T838MF200X200R6H-D4 KSU31	M43	6173313	T838NF05000-20R2B-D4 KSU31	M47	6179777	.....EVSCFR2020K1F16	C41	6201291	.....LNGU110404SRGE KCSM40	T9
6173132	T838M200X250R6H-D6 KSP39	M44	6173314	LNPU221012PNSRHD2 KCSM40	S121, S123	6179778	.....EVSCFR2020K0216	C41	6201292	.....LNGU110404ERLE KC422M	T8
6173133	T838M200X250R6H-D6 KSU31	M44	6174999	FSDE1200A9BCN KC643M	P92	6179779	.....EVSCFR2020K1B16	C41	6201351	.....LNGU1104042ERGE KCSM40	T8
6173134	T838MF220X150R6H-D4 KSP39	M44	6175000	FSDE1600ABBCN KC643M	P92	6179780	.....EVSCFR1010K0210	C42	6201352	.....LNGU110412ERGE KC522M	T8
6173135	T838MF220X150R6H-D4 KSU31	M44	6175756	EDPT10T308PDERHD KCSM40	T36	6179921	.....EVSCFL1212K1B10	C42	6201353	.....LNGU110412ERGE KCPM40	T8
6173136	T838MF220X200R6H-D4 KSP39	M44	6175757	EDPT10T312PDERHD KCSM40	T36	6179922	.....EVSCFL1212K1B13	C42	6201354	.....LNGU110412ERGE KCSM40	T8
6173137	T838MF220X200R6H-D4 KSU31	M44	6175758	EDPT10T316PDERHD KCSM40	T36	6179923	.....EVSCFL1212K1F10	C42	6202331	.....250C246FR60HNO9C	S94
6173138	T838M220X250R6H-D6 KSP39	M44	6175759	EDPT10T320PDERHD KCSM40	T36	6179924	.....EVSCFL1212K0216	C42	6202332	.....315Z328FR60HNO9WC	S94
6173139	T838M220X250R6H-D6 KSU31	M44	6175760	EDPT10T324PDERHD KCSM40	T36	6179925	.....EVSCFL1212K0216	C42	6202340	.....ONPXR080608SNHG KCK20	S36
6173140	T838MF240X150R6H-D4 KSP39	M44	6175761	EDPT10T331PDERHD KCSM40	T36	6179926	.....EVSCFL1212K0310C	C42	6202371	.....ONPXR080608SNHB KCK20	S36
6173141	T838MF240X150R6H-D4 KSU31	M44	6176091	EDPT10T331PDERLD KCSM40	T35	6179927	.....EVSCFL1212K0316C	C42	6205876	.....BTDQW3L90	S32-33
6173142	T838MF240X200R6H-D4 KSP39	M44	6176092	EDPT10T331PDSRGE KCSM40	T36	6179928	.....EVSCFL1212K1B16	C42	6207836	.....KBDM250SD30	S126
6173143	T838MF240X200R6H-D4 KSU31	M44	6176093	EDPT10T331PDSRGE KCSM40	T36	6179929	.....EVSCFL1616K1F16	C42	6210796	.....HDHNO70408SR KKB50	S112
6173144	T838M240X300R6H-D6 KSP39	M44	6176094	EDCT10T308PDERLD KCSM40	T35	6179930	.....EVSCFL1616K0216	C42	6210797	.....SDHM1204ZSN4W KKB50	S112
6173145	T838M240X300R6H-D6 KSU31	M44	6176095	EDCT10T312PDERLD KCSM40	T35	6179931	.....EVSCFL1616K0316C	C42	6210836	.....KCFMCA45SD12C	S111
6173146	T838MF270X150R6H-D4 KSP39	M44	6176096	EDCT10T312PDERLD KCSM40	T35	6179932	.....EVSCFL2020K1B16	C42	6210837	.....KCFMCA45HD07	S111
6173147	T838MF270X150R6H-D4 KSU31	M44	6176097	EDCT10T312PDERLD KCSM40	T35	6179933	.....EVSCFL2020K0316C	C42	6210838	.....HDHNO70408SR KC514M	S112
6173148	T838M270X300R6H-D6 KSP39	M44	6177823	.....SNHJ120608SNGD KCSM40	S63	6179934	.....EVSCFL2020K1F16	C42	6210839	.....SDHM1204ZSN4W KCS14M	S112
6173149	T838M270X300R6H-D6 KSU31	M44	6177924	.....OFK06L5AFENLB KCSM40	S50	6179935	.....EVSCFL2020K0316C	C42	6210840	.....HDHNO70408SR KY3500	S112
6173150	T838MF300X150R6H-D4 KSP39	M44	6177925	.....OFK06L5AFENLB KCSM40	S50	6180436	.....DNMG110412CT KCP10B	B76	6212370	.....M4-1K1TD16Z2A16SGEKC725M	T11
6173151	T838MF300X150R6H-D4 KSU31	M44	6177926	.....OFK06L5AFENLB KCSM40	S51	6181213	.....LNLU191940S-WT5 KCP25B	E53	6214071	.....M4-1K1TD20Z3A20SGEKC725M	T11
6173152	T838M300X200R6H-D4 KSP39	M44	6177927	.....OFK06L5AFENLB KCSM40	S51	6181214	.....LNLU191940S-WT5 KCP25B	E53	6214072	.....M4-1K1TD20Z3A20SGEKC725M	T11
6173153	T838M300X200R6H-D4 KSU31	M44	6177928	.....OFK07L6AFENLB KCSM40	S54	6181215	.....SNMX190640S-WT5 KCP25B	E53	6214073	.....M4-1K1TD25Z3B20SGEKC725M	T11
6173154	T838M300X350R6H-D6 KSP39	M44	6177929	.....OFK07L6AFENLB KCSM40	S55	6181216	.....KCLU110305R15 KCP25B	E32	6214074	.....M4-1K1TD25Z4A25SGEKC725M	T11
6173155	T838M300X350R6H-D6 KSU31	M44	6177930	.....OFK07L6AFENLB KCSM40	S55	6181217	.....KNUX150405R25 KCP25B	E31	6214075	.....M4-1K1TD32Z4B32SGEKC725M	T11
6173156	T838M330X350R6H-D6 KSP39	M44	6178101	.....HNPJ1307ANSNHD KCSM40	S22	6181311	.....CNMM190740RRP KCP10B	E53	6214076	.....M4-1K1TD32Z5A32SGEKC725M	T11
6173157	T838M330X350R6H-D6 KSU31	M44	6178102	.....HNPJ1307ANSNHD KCSM40	S22	6181316	.....RCMK2507M076 KCP25B	E53	6214077	.....M4-1K1TD32Z5A32SGEKC725M	T11
6173158	T838M360X400R6H-D6 KSP39	M44	6178103HNGJ0905ANSNHD KCSM40	S18, S22	6183779RQB6C4500S KBHK10	K56	6214078M4-1K1TD40Z4S16SGEKC725M	T11
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6173161	T838M390X400R6H-D6 KSU31	M44	6178106HNGJ0905ANSNHD KCSM40	S19, S23	6183832RQB8C4500S KBHK10	K56	6214081M4-1K1TD62Z2A16SGEKC725M	T11
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6228171	NG2031L KCK20B	C155	6295946	DNGA150408S01225FWMT KBH10	B313	6296037	VBGW110304S01015MT KBH10	B322	6349035	B275Z03571HPS KN25	G81
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6228175	NG2047R KCK20B	C154	6295950	DNGA150412S01735MT KBH10	B314	6300607	KNUX160405L1 KCM15B	E31	6349039	B275Z04500HPS KN25	G81
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6228177	NG2062R KCK20B	C154	6295952	DNGA150608S01015MT KBH10	B314	6300609	KNUX160405L2 KU10	E31	6349041	B275Z05000HPS KN25	G81
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6228180	NG2125L KCK20B	C155	6295955	DNGA150612S01225MT KBH10	B314	6300612	KNUX160405R1 KCM25B	E31	6349044	B275Z06000HPS KN25	G81
6228181	NG3047L KCK20B	C155	6295956	SNGA120408S01015MT KBH10	B318	6300613	KNUX160405R2 KCM25B	E31	6349045	B275Z06350HPS KN25	G81
6228182	NG3047R KCK20B	C154	6295957	SNGA120408S01225MT KBH10	B318	6300614	KNUX160410R1 KCM25B	E31	6349046	B275Z06500HPS KN25	G81
6228183	NG3062L KCK20B	C155	6295958	SNGA120412S01225MT KBH10	B318	6320146	RCMH2507MOTUPG KCP10B	E60	6349047	B275Z06800HPS KN25	G81
6228184	NG3062R KCK20B	C154	6295959	TNGA160404S01015MT KBH10	B320	6320147	RCMH2507MOTUPG KCP25B	E60	6349048	B275Z07000HPS KN25	G81
6228185	NG3072R KCK20B	C154	6295960	TNGA160408S01015MT KBH10	B320	6320148	RCMH2507MOTUPG KCP10B	E61	6349049	B275Z07145HPS KN25	G81
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6228189	NG3094R KCK20B	C154	6295974	TNGA160412S01735MT KBH10	B320	6320352	RCMH3209MOTUPG KCP10B	E61	6349053	B275Z08500HPS KN25	G81
6228190	NG3097R KCK20B	C154	6295975	TNGA160412S01735MT KBH10	B320	6320353	RCMH3209MOTUPG KCP25B	E61	6349054	B275Z08500HPS KN25	G81
6228191	NG3105R KCK20B	C154	6295976	VNGA160404S01015MT KBH10	B323	6320354	RCMT1606MOUNG KCPK05	E60	6349055	B275Z09000HPS KN25	G81
6228192	NG3125L KCK20B	C155	6295977	VNGA160408S01015MT KBH10	B323	6320355	RCMT1606MOUNG KCP10B	E60	6349056	B275Z09255HPS KN25	G81
6228193	NG3125R KCK20B	C154	6295978	VNGA160404S01225MT KBH10	B323	6320356	RCMT1606MOUNG KCP25B	E60	6349057	B275Z10000HPS KN25	G81
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6228195	NG3189L KCK20B	C155	6295980	WNGA80408S01015MT KBH10	B324	6320358	RCMT2006MOUNG KCPK05	E60	6349059	B275Z10320HPS KN25	G81
6228196	NG3189R KCK20B	C154	6295991	WNGA80408S01225MT KBH10	B324	6320359	RCMT2006MOUNG KCP10B	E60	6349060	B275Z10320HPS KN25	G81
6228197	NG4125R KCK20B	C154	6295992	CCGW060202S01015MT KBH10	B308	6320360	RCMT2006MOUNG KCP25B	E60	6350374	B21A03000SGL KCM15	G38
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6228199	NG4189R KCK20B	C154	6295994	CCGW09T302S01015MT KBH10	B308	6320362	RCMT2006MOUNG KCPK05	E60	6350376	B21A03084SGL KCM15	G38
6228200	NG4250L KCK20B	C155	6295995	CCGW09T304S01015MT KBH10	B308	6320363	RCMT2006MOUNG KCP10B	E60	6350377	B21A03175SGL KCM15	G38
6228201	NG4250R KCK20B	C154	6295996	CCGW09T308S01015MT KBH10	B308	6320364	RCMT2006MOUNG KCP25B	E60	6350378	B21A03200SGL KCM15	G38
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6231917	ER18704U00GUN KCU10	C24	6296000	CCGW09T308S01225MT KBH10	B308	6320367	TWDL121TM	058	6350381	B21A03355SGL KCM15	G38
6231918	ER250106U00GUN KCU10	C24	6296002	DCGW7020S01015MT KBH10	B312	6320368	TWDL161TM	058	6350382	B21A03500SGL KCM15	G38
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6231925	ER09402U00GUN KCP10B	C24	6296022	DCGW11T304S01225MT KBH10	B312	6342971	B275Z02500KMG KCPK20	G81	6350389	B21A03800SGL KCM15	G38
6231926	ER12503U00GUN KCP10B	C24	6296023	DCGW11T308S01225MT KBH10	B312	6342972	B275Z03000KMG KCPK20	G81	6350390	B21A03800SGL KCM15	G38
6231927	ER18704U00GUN KCP10B	C24	6296024	DCGW11T308S01225FWMT KBH10	B312	6342973	B275Z03175HPG KCPK20	G81	6350391	B21A03800SGL KCM15	G38
6231928	ER250106U00GUN KCP10B	C24	6296025	TCGW110202S01015MT KBH10	B319	6342974	B275Z03500HPG KCPK20	G81	6350392	B21A04039SGL KCM15	G38
6231929	ER31208U00GUN KCP10B	C24	6296026	TCGW110202S01015MT KBH10	B319	6342975	B275Z03500HPG KCPK20	G81	6350393	B21A04100SGL KCM15	G38
6231930	ER09402U00GUN KCP25B	C24	6296027	TCGW110208S01015MT KBH10	B319	6342976	B275Z0371HPG KCPK20	G81	6350394	B21A04100SGL KCM15	G38
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6231932	ER18704U00GUN KCP25B	C24	6296029	TCGW110208S01225MT KBH10	B319	6342978	B275Z04000HPG KCPK20	G81	6350396	B21A04217SGL KCM15	G38
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100B12RP90SP12C3WFP	S76	125H08NK90SD12N20K	U43	160H10NK90SD12N18K	U42	170.350	H98
100B12RS90ED10D	T33	125H08NK90SD12N20K	U43	160H10NK90SP10N14K	U30	170.352	H98
100B14RF45HN09C	S89	125H08NK90SP10N14K	U30	160H10NK90SP10N16K	U31	170.353	H98
100B14RP70SP12CFP	S72	125H08NK90SP10N16K	U31	160H10RK90SD12N18K	U40	170.355	H98-99
100B14RP90SP12CFP	S76	125H08NK90SP10N16K	U31	160H10RK90SP10N14K	U27	170.356	H98-99
100B15RF84SN12B	S102	125H08NK90SP10N16K	U31	160H11LP90SP10	U25	170.365	H99
100B15RF84SN12B3W	S103	125H08RK90SD12N18K	U40	160H11LP90SP12	U38	170.370	J23, J25, J31, J33, J35, J37
100B22RF60HN09C	S94	125H08RK90SD12N18K	U40	160H12NP90SP10N16K	U26	17X1R022B16STN16N	W40
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100G10NS90LN12N06	U17	125H08RK90SD12N18K	U44	160H12RP90SD12	U38	190.371	I24
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RCMT1606MORP KCP10B	E60						

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RNMG150600RN KCP30	B94	RPH110T3M0E421X4 X700	V90	RUDC2000B4BN KCPM15	P80	SCMT09T3044F KCK15B	B230
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RNMG190600 KCP25	B94	RPH110T3M0E422X4 X500	V91	S1006PKG	E59	SCMT09T3044F KCM25	B230
RNMG190600 KCP40	B94	RPH110T3M0E422X4 X700	V91	S2160	V82	SCMT09T3044F KCP10	B230
RNMG190600RN KCS010	B94	RPH110T3M0E422X8 SP6519	V91	S325CCLNR12MX7	B372	SCMT09T3044F KCP10B	B230
RNMG190600RN KCP25	B94	RPH110T3M0E422X8 X500	V91	S40T-CCLNL12-MN7	B372	SCMT09T3044F KCP25	B230
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RNMG190600RN KCP40B	B94	RPH110T3M0TX4 SP6519	V91	S40T-CCLNR12-MN4	B372	SCMT09T3044F KCP30	B230
RNMG190600RN KCU10	B94	RPH110T3M0TX4 X500	V91	S40T-CCLNR12-MN7	B372	SCMT09T3044F KT315	B230
RNMG250900RN KCP10	B94	RPH11204M0E421X4 X500	V95	S40T-CCLNR12-MX7	B372	SCMT09T3044F KCK20	B231
RNMG250900RN KCP25	B94	RPH11204M0E422X4 SP6519	V95	S40T-CSSN12-MX7	B373	SCMT09T3044F KCM15	B231
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RNMG250900RN KCP40	B94	RPH11204M0E422X4 X700	V95	S40T-CSYNR12-MN7	B373	SCMT09T3044F KCP25	B231
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RNMG250900RN KCP40	B94	RPH11204M0TX4 X500	V96	SB3413	T115	SCMT09T308FF KCU25	B230
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RNMG250900RN KCP10	B94	RPMT10T3M0E41X4 MP91M	V91	SCACR1010M06Q	B179	SCMT09T308LF KCS010	B230
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T633MF160X150R6HX-D4 KP6525	M27	T651M420X450R6HX-D6 KP6525	M33	T820M270X300R6H-D6 KSP39	M15	T830M030X050R6H-J KSJ31	M50
T640M040X070R6HX-D1 KP6525	M63	T651M420X450R6HX-XL KP6525	M33	T820M300X350R6H-D6 KSP39	M15	T830M060X100R6G-D1 KSP39	M40
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T640M060X100R6HX-D1 KP6525	M63	T670M030X050R6H-D1 KSN38	M12	T820M330X350R6H-D6 KSP39	M15	T830M060X100R6H-D1 KSP39	M40
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T640M120X175R6HX-D6 KP6525	M63	T670M060X100R6H-D1 KSN38	M12	T820MF060X075R6H-D4 KSP39	M14	T830M060X100R6H-D6 KSP39	M40
T640M140X200R6HX-D6 KP6525	M63	T670M080X125R6H-D1 KSN38	M12	T820MF080X100R6H-D4 KSP39	M14	T830M060X100R6H-J KSJ30	M50
T640M160X200R6HX-D6 KP6525	M63	T670M100X150R6H-D1 KSN38	M12	T820MF100X100R6H-D4 KSP39	M14	T830M060X100R6H-J KSJ31	M50
T640M180X250R6HX-D6 KP6525	M63	T670M120X175R6H-D6 KSN38	M12	T820MF100X125R6H-D4 KSP39	M14	T830M070X100R6H-D1 KSP39	M40
T640M200X250R6HX-D6 KP6525	M63	T670M160X200R6H-D6 KSN38	M12	T820MF120X125R6H-D4 KSP39	M14	T830M070X100R6H-D1 KSP39	M40
T640M220X250R6HX-D6 KP6525	M63	T680M030X050R6H-D1 KSN38	M38	T820MF120X150R6H-D4 KSP39	M14	T830M080X125R6H-D1 KSP39	M40
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T640NC02500-20R3BX-D1 KP6525	M67	T680M080X125R6H-D1 KSN38	M38	T820MF160X150R6H-J KSJ31	M18	T830M080X125R6H-D6 KSP39	M40
T640NC03125-18R3BX-D1 KP6525	M67	T680M100X150R6H-D1 KSN38	M38	T820MF180X150R6H-D4 KSP39	M15	T830M100X150R6G-D1 KSP39	M40
T640NC03750-16R3BX-D1 KP6525	M67	T680M120X175R6H-D6 KSN38	M38	T820MF180X150R6H-J KSJ30	M18	T830M100X150R6H-D1 KSP39	M40
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T640NC05000-13R3BX-D6 KP6525	M67	T680M200X250R6H-D6 KSN38	M38	T820MF200X150R6H-J KSJ30	M18	T830M120X175R6H-D6 KSP39	M40
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T640NF02500-28R3BX-D1 KP6525	M67	T820M020X040R6G-D1 KSP39	M14	T820MF240X150R6H-D4 KSP39	M15	T830M140X200R6H-J KSJ30	M50
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TM25N250ISO KC635M	W14	TM711M030X050R2DHA KCU33	M85	TMT25D22L43Z3	W11	TNMG160402MS KCU25	B126
TM25N300ISO KC610M	W14	TM711M040X070R2DHA KCU33	M85	TMT25D28L43Z4	W11	TNMG160404FF KC5010	B124
TM25N300ISO KC635M	W14	TM711M050X080R2DHA KCU33	M85	TNGA160404S01015MT KBH10	B320	TNMG160404FF KCM15B	B124
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WNMG080408RP KCM25	B159	WNMG080412RP KCU25	B159	XDLW120508SRD X400	V25	XNGJ0604ANENLD3W KC522M	S12
WNMG080408RP KCM25B	B159	WNMG080412UN KCK05	B160	XDLW120508SRD X500	V25	XNGJ0604ANENLD3W KC725M	S12
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WNMG080408UP KCM15	B160	WNMG080416RP KCP25B	B159	XDPW090412SRD KC510M	V16	XPNT40407716RF SP6519	V105
WNMG080408UP KCM25	B160	WNMG080416RP KCU25	B159	XDPW090412SRD KC522M	V16	XPNT50507716RF SP6519	V105
WNMG080408UP KCM25B	B160	WNMG080416UN KCK15B	B160	XDPW090412SRD KCK15	V16	XPPT060308ERD41 KCSM40	V7
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WNMG080412FP KC5010	B156	WOEJ090512SRGD KC522M	V41	XDPW090412SRD KCPM40	V16	XPW060310SRD KC522M	V7
WNMG080412FP KCM15	B156	WOEJ090512SRGD KCK725M	V41	XDPW120515SRD KC510M	V25	XPW060310SRD KCPK30	V7
WNMG080412FW KCP05	B156	WOEJ090512SRGD KCPK30	V41	XDPW120515SRD KCK15	V25	XPW060310SRD KCPM40	V7
WNMG080412FW KCP10	B156	WOEJ090512SRGD KCPM40	V41	XDPW120515SRD KCPK30	V25	XRDA1000X4CH KCPM15	049
WNMG080412FW KCP10B	B156	WOEJ090512SRGD KCSM30	V41	XDPW120515SRD KCPM40	V25	XRDA1000X5CRG KCPM15	049
WNMG080412MN KCP10	B157	WOEJ090512SRHD KC522M	V41	XDPW120515SRD KCPM40	V25	XRDA1200X5CRG KCPM15	049
WNMG080412MN KCP10B	B157	WOEJ090512SRHD KCK725M	V41	XE020MTN4-C SP4060	P72	XRDA1200X5CRG KCPM15	049
WNMG080412MN KCP25	B157	WOEJ090512SRHD KCPK30	V41	XE025MTN4-C SP4060	P72	XRDA1200X6GRM KCPM15	049
WNMG080412MN KCP25B	B157	WOEJ090512SRHD KCPM40	V41	XE030MTN4-C SP4060	P72	XRDA1600X6GRM KCPM15	049
WNMG080412MN KCP40B	B157	WPGT040202UF KCU10	B272	XE040MTN4-C SP4060	P72	XRDA1600X6GRM KCPM15	049
WNMG080412MP KC5010	B157	WPGTS30101UF KC5010	B272	XE050MTN4-C SP4060	P72	XRDA1600X6GRM KCPM15	049
WNMG080412MP KCM15	B157	WPGTS30102UF KCU10	B272	XE060MN4-C SP4060	P72	ZDET16M504FR721 GH1	T90
WNMG080412MP KCM25	B157	WPGTS30102UF KC5010	B272	XE080MN4-C SP4060	P72	ZDET16M508FR721 GH1	T90
WNMG080412MP KCM25B	B157	WPGTS30102UF KCU10	B272	XE100MN4-C SP4060	P72	ZDET16M512FR721 GH1	T90
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WNMG080412MP KCP25B	B157	WPMT040204FP KCU10	B272	XELT160512ERD41 SC6525	V30	ZDET16M525FR721 GH1	T90
WNMG080412MP KCU10	B157	WPMT040204LF KC5010	B272	XELT160512ERD41 SP6519	V30	ZDET16M525FR721 GH1	T90
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WNMG080412MR KCM25B	B157	WPMT040204LF KCK20	B272	XELW160512SRD SC3025	V31	ZDET16M530FR721 GH1	T90
WNMG080412MR KCM35	B157	WPMT040204LF KCP10	B272	XELW160512SRD X400	V31	ZDET16M532FR721 GH1	T90
WNMG080412MR KCP10B	B157	WPMT06T304FP KCU10	B272	XEPT160512ERD41 KCSM40	V31	ZDET16M540ER721 GH1	T90
WNMG080412MR KCP25B	B157	WPMT06T304LF KC5010	B272	XEPT160516ERD41 KC522M	V31	ZDET16M540FR721 GH1	T90
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WNMG080412MW KCM15B	B158	WPMT06T304LF KCP25	B272	XEPT160516ERD41 KCPM40	V31	ZDET16M560FR721 GH1	T90
WNMG080412MW KCP05	B158	WPMT06T308FP KCU10	B272	XEPW160520SRD KC522M	V31	ZDET16M560FR721 GH1	T90
WNMG080412MW KCP10	B158	WPMT06T308LF KC5010	B272	XEPW160520SRD KCK15	V31		
WNMG080412MW KCP10B	B158	WPMT06T308LF KCK05	B272	XEPW160520SRD KCPK30	V31		
WNMG080412MW KCP25	B158	WPMT06T308LF KCM15	B272	XEPW160520SRD KCPM40	V31		
WNMG080412MW KCP25B	B158	WPMT06T308LF KCP25B	B272	XER020NTN4-C SP4060	P73		
WNMG080412RN KCP05	B159	WPMTS3T104FP KCP25	B272	XER030NTN4-C SP4060	P73		
WNMG080412RN KCP10	B159	WPMTS3T104FP KCU10	B272	XER040NTN4-C SP4060	P73		
WNMG080412RN KCP10B	B159	WPMTS3T104LF KC5025	B272	XER040NTN4-E SP4060	P73		
WNMG080412RN KCP25	B159	WXXNL4455X-FL	E54	XER050NTN4-E SP4060	P73		
WNMG080412RN KCP25B	B159	WXXNR4455X-FL	E54	XER060NN4-C SP4060	P73		
WNMG080412RN KCP30	B159	XADA1000X4CH45 KCPM15	048	XER060NN4-E SP4060	P73		
WNMG080412RN KCP30B	B159	XADA1000X4CH60 KCPM15	048	XER060NN4-G SP4060	P73		
WNMG080412RN KCP40B	B159	XADA1200X5CH45 KCPM15	048	XER080NN4-C SP4060	P73		
WNMG080412RN KCPK05	B159	XADA1200X5CH60 KCPM15	048	XER080NN4-E SP4060	P73		
WNMG080412RP KC5010	B159	XADA1600X6CH45 KCPM15	048	XER080NN4-G SP4060	P73		
WNMG080412RP KCK05	B159	XADA1600X6CH60 KCPM15	048	XER100NN4-C SP4060	P73		
WNMG080412RP KCK15	B159	XDLT090408ERD41 SC6525	V14	XER100NN4-E SP4060	P73		
WNMG080412RP KCK15B	B159	XDLT090408ERD41 SP6519	V14	XER100NN4-G SP4060	P73		
WNMG080412RP KCK20	B159	XDLT090408ERD41 X500	V14	XER120NN4-C SP4060	P73		
WNMG080412RP KCK20B	B159	XDLT090408ERD721 GH2	V14	XER120NN4-E SP4060	P73		
WNMG080412RP KCM15	B159	XDLT090412ERD411 SP6519	V15	XER120NN4-G SP4060	P73		
WNMG080412RP KCM25	B159	XDLT090412ERD411 X500	V15	XER120NN4-J SP4060	P73		
WNMG080412RP KCM25B	B159	XDLT120508ERD41 SC6525	V23	XER120NN4-L SP4060	P73		

For page references F-X, please see Volume II • Rotating Tools Catalogue.



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Turning Icons

Shank: KM-TS™ (ISO 26622)	Shank: KM4X™	Shank: VDI Shank	DIN Number 69880	Through Coolant
Through Coolant: 100 bar	Through Coolant: 1500 psi	Through Coolant: 80 bar	Through Coolant: 1200 psi	ISO: 26622
ISO: 10889	Turning	Profiling	Facing	Face Grooving
Chamfering	Back Boring	Threading	Grooving	Cut-Off
I.D. Turning	I.D. Chamfering	I.D. Facing	I.D. Grooving	I.D. Face Grooving
Deep Grooving	I.D. Internal Threading			

Holemaking Icons

Countersinking/Stroke Chamfering	Taper Drilling	Counterboring	Drilling	Drilling: Inclined Entry
Drilling: Inclined Exit	Drilling: Exit Offset	Drilling: Flat Bottom	Drilling: Stacked Plates	Drilling: Convex
Drilling: Blind Hole	Drilling: Concave	Drilling: Chain	Drilling: Cross Hole	Drilling: Half Cylinder
Drilling: Corner Drilling 45°	Reaming: Through Hole	Reaming: Blind Hole	Reaming: Through Cross	Reaming: Blind and Cross Holes
Reaming: Interrupted Cut	Drilling Depth: 1 x D	Drilling Depth: 3 x D	Drilling Depth: 5 x D	Drilling Depth: 8 x D
Drilling Depth: 10 x D	Drilling Depth: 12 x D	Drilling Depth: 7 x D	Drilling Depth: 4 x D	Drilling Depth: 1.5 x D

(continued)

(Holemaking Icons – continued)

Corner Style: Corner Chamfer	Corner Style: Square End	Shank: Cylindrical Plain	Shank: Cylindrical Plain ≤h6	Shank: Cylindrical Weldon®
Shank: Cylindrical Whistle Notch	Shank: Cylindrical Whistle Notch ≤h6	Shank: Cylindrical Whistle Notch 2°	Shank: Cylindrical with Flat	Flat Shank
SK Shank: Rübüg	Shank: SK BT JIS B 6339	Shank: SK CAT(CV) ANSI B5.50	Shank: SK DV DIN 69871	Shank: Cylindrical Whistle Notch with Drive and Flange
Shank: Cylindrical with Flat and Flange	KM™ Shank	Shank: HSK DIN 69893	Shank: HSK DIN 69893 Form A	Shank: KM-TS™ (ISO 26622)
Shank: KM-XMZ	Shank: ER	Helix Angle: 0°	Helix Angle: 15°	Helix Angle: 30°
Tip Angle: 118°	Tip Angle: 130°	Balance (G 6.3/25,000)	Balance (G 6.3/10,000)	Balance (G 6.3/6,000)
Balance (G 16/20,000)	DIN Number 6537	DIN Number 6535	DIN Number 69893	DIN Number 69090-3
Drilling: No Coolant	Through Coolant: Radial: Drilling	Through Coolant: Radial: Reaming	Through Coolant: Radial: Indexable Drilling	Flood Coolant: Drilling
Through Coolant: MQL (Minimum Quantity Lubricant): Drilling	Through Coolant: Axial: Drilling	Through Coolant: Axial: Reaming	Through Coolant: Coolant Entry AD	Through Coolant: Coolant Entry AD/B
Tool Dimensions: 2 Flute/2 Margin/ 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	Tool Dimensions: 3 Flute/3 Margin/ No Coolant	Tool Dimensions: Flute Configuration: 2	Tool Dimensions: Flute Configuration: 3
Tool Dimensions: Flute Configuration: 4				

Tapping Icons

Countersinking/ Stroke Chamfering	Drilling: Flat Bottom	Drilling: Blind	Tapping: Through Hole	Tapping: Blind Hole
Threading: Through Hole	HSS-E: High-Speed Steel with Cobalt Alloy for Materials with Higher Hardnes	HSS-E-PM: High-Speed Steel with Cobalt Alloy for Materials with Higher Hardness (PM = Powder Metal Steel)	HM: (Carbide)	Drilling Depth: 2xD
Chamfer Form B (3.5-5.5)	Chamfer Form C (2-3)	Chamfer Form D (3.5-5)	Chamfer Form E (1.5-2)	Plug Chamfer Form B (3-5)
Tapping Helix Angle: 0°	Tapping Helix Angle: 10°	Tapping Helix Angle: L8°	Tapping Helix Angle: 15°	Tapping Helix Angle: L15°
Tapping Helix Angle: 25°	Tapping Helix Angle: 30°	Tapping Helix Angle: 42°	Tapping Helix Angle: 45°	Multipurpose Taps: Spiral Point
Tension/ Compression	DIN Number 371	DIN Number 374	DIN Number 376	DIN Number 5156
DIN Number 2174	Through Coolant: Radial: Tapping	Flood Coolant: Tapping	Through Coolant: Axial: Tapping	Manufacturer's Specs: ISO 2
Manufacturer's Specs: ISO 3	Manufacturer's Specs: JIS	Class of Fit: 2B	Class of Fit: 3B	Class of Fit: 6H
Class of Fit: 6HX	Class of Fit: 6G	Class of Fit: 2BX	Class of Fit: 3BX	Unified Fine Thread
Unified Course Thread	American Tapered Pipe Thread for Threads with Dryseal Material	American Tapered Pipe Thread for Threads without Dryseal Material	Whitworth Pipe Thread	Unified Course Thread: J Profile
Unified Fine Thread: J Profile	ISO Metric Coarse Thread	ISO Metric Fine Thread		

Solid End Milling Icons

Face Milling	Helical Milling	Plunge Milling	Plunge Milling: Ball Nose	Ramping: Blank
Ramping: Up to 3°	Slotting: Ball Nose	Slotting: Ball Nose with AP Dimension	Slotting: Square End	Slotting: Square End with AP Dimension
Trochoidal Milling	Trochoidal Milling: Ball Nose	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: Eased Chamfer	Side Milling/Shoulder Milling: Eased Chamfer with AE/AP Dimensions	Side Milling/Shoulder Milling: Fine Finishing	Side Milling/Shoulder Milling: Fine Finishing with AE/AP Dimensions
Side Milling/Shoulder Milling: Finishing	Side Milling/Shoulder Milling: Finishing with AE/AP Dimensions	Side Milling/Shoulder Milling: Thin Wall Solid End Milling	Side Milling/Shoulder Milling: Radius	Side Milling/Shoulder Milling: Radius with AE/AP Dimensions
3D Profiling	3D Profiling with AE/AP Dimensions	3D Profiling with Square End Mill	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®
Shank: SK BT JIS B 6339	Shank: SK CAT(CV) ANSI B5.50	Shank: HSK: CAT: Drawbar Thread: 5/8-11 UNC	Shank: HSK A/ DIN69893	Shank: Safe-Lock™ ≤h6
Shank: Safe-Lock™	Shank: PSC Shank	Duo-Lock™ Connection	Helix Angle: 0°	Helix Angle: 15°
Helix Angle: 20°	Helix Angle: 25°	Helix Angle: 30°	Helix Angle: 35°	Helix Angle: 38°
Helix Angle: 40°	Helix Angle: 45°	Helix Angle: 50°	Helix Angle: 60°	Helix Angle: 43°
Helix Angle: 36°	Helix Angle: 35°/38°	Helix Angle: 37°/39°	Balance (G 2.5/25,000)	DIN Number 6527
DIN Number 6528	Drilling: Through Coolant	Through Coolant	Through Coolant: Axial: Solid End Mill	Tool Dimensions: Flute Configuration: X (Variable)

(continued)

(Solid End Milling Icons — continued)

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
Tool Dimensions: Flute Configuration: 1	Tool Dimensions: Flute Configuration: 12	ISO 26622		

Indexable Milling Icons

Counterboring	Spiral Circular	Face Milling	Helical Milling	Plunge Milling
Plunge Milling: Ball Nose	Ramping: Blank	Slotting: Ball Nose	Slotting: Side	Slotting: Side with AE/AP Dimensions
Slotting: Side Milling: Ball Nose	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: Square End	Side Milling/ Shoulder Milling: Eased Chamfer	Slotting: Shoulder Profiling	Slotting: Shoulder
3D Profiling	3D Profiling with Square End Mill	PCD PCD Tool	Pocketing	Shank: Cylindrical Plain
Shank: Cylindrical Weldon®	Shank: Cylindrical Weldon 2 Flat	Shank: Screw-On	Shank: HSK DIN 69893	Shell Mill Shank
Milling: Through Coolant	Through Coolant: Pressurised Air Coolant: Radial: Indexable Milling			

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

material group	description	content	tensile strength RM (MPa)*	hardness (HB)	hardness (HRC)	material number
P0	Low-Carbon Steels, Long Chipping	C <0,25%	<530	<125	-	-
P1	Low-Carbon Steels, Short Chipping, Free Machining	C <0,25%	<530	<125	-	C15, Ck22, ST37-2, S235JR, 9SMnPb28, GS38
P2	Medium- and High-Carbon Steels	C >0,25%	>530	<220	<25	ST52, S355JR, C35, GS60, Cf53
P3	Alloy Steels and Tool Steels	C >0,25%	600–850	<330	<35	16MnCr5, Ck45, 21CrMoV5-7, 38SMn28
P4	Alloy Steels and Tool Steels	C >0,25%	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	Grey 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 Aluminium	-	-	-	-	AlMg1, Al99.5, AlCuMg1, AlCuBiPb, AlMgSi1, AlMgSiPb
N2	Low-Silicon Aluminium Alloys and Magnesium Alloys	Si <12,2%	-	-	-	GAISiCu4, GDAISi10Mg
N3	High-Silicon Aluminium Alloys and Magnesium 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, Fibreglass	-	-	-	-	Lexan®, Hostalen™, Polystyrol, Makrolon®
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	-
C1	CFRP, CFRP/CFRP	-	-	-	-	-
C2	CFRP/Non-Ferrous	-	-	-	-	-
C3	CFRP/High Temp	-	-	-	-	-
C4	CFRP/Stainless Steel	-	-	-	-	-
C5	CFRP/Non-Ferrous/High-Temp	-	-	-	-	-

P0 ■ Workpiece Materials Listing • Steel • P0

P0 Low-Carbon Steels, Long Chipping

Content: C <.25%

Tensile Strength RM (MPa)*: <530

Hardness (HB): <125

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Material Number	Manufacturer Reference
1013	US1 34-1	-	-	G10130	-	-	-	1233	-	-	1.0055	-
1010	C 10	045 M 10	S 10 C	G10100	C 10	XC 10	C 10	-	-	-	1.0301	-
1008	DD 11 (SIW 22)	HR 3	SPHD	-	DD 11	1 C	-	-	-	-	1.0332	-
1020	C 22	050 A 20	S 22 C	G10200	1 C 22	C 20	C 20	1450	-	-	1.0402	-
1025	C 25	070 M 26	S 22 C	G10250	1 C 25	C 25	C 25	-	-	-	1.0406	-
1012	B 500 H	-	S 12 C	G10120	B 500 B	XC 12	B 500 B	1332	-	-	1.0439	-
1018	C16.8	080 A 17	-	G10180	-	-	-	-	-	-	1.0453	-
1108	10 S 20	210 M 15	-	G 11080	10 S 20	10 F 1	CF 10 S 20	-	-	-	1.0721	-
1010	Ck 10	040 A 10	S 10 C	G10100	2 C 10	XC 10	C 10	1265	-	-	1.1121	-
1022	20 Mn 5	120 M 19	SMn 420	G 10220	20 Mn 5	20 M 5	G 22 Mn 3	-	-	-	1.1133	-
1015	Ck 15	080 M 15	S 15 C	G 10150	2 C 15	XC 15	C 15	1370	-	-	1.1141	-
1021	22 B 2	-	SWRCHB 220	G10210	C 22 BE 69	21 B 3	-	-	-	-	1.5508	-
-	PS 275 TM	S 275 M	-	-	S 275 M	S 275 M	S 275 M	-	-	-	1.8818	-
-	DI-MC 355 B	-	-	-	S 355 M	E 355	S 355 M	-	-	-	1.8823	-
-	DI-MC 420 B	S 420 M	-	-	S 420 M	E 420	S 420 M	-	-	-	1.8825	-
-	S 460 M	S 460 M	-	-	S 460 M	E460; S460M	S460M	-	-	-	1.8827	-
-	BTSIE 355 TM	S 355 ML	-	-	S 355 ML	E 355	S 355 ML	-	-	-	1.8834	-
-	BTSIE 420 TM	S 420 MI	-	-	S 420 ML	E 420	S 420 ML	-	-	-	1.8836	-
-	St E 320-3Z	-	-	-	S 320 GD + ZA	-	-	-	-	-	1.0250	-

P1 ■ Workpiece Materials Listing • Steel • P1

P1 Low-Carbon Steels, Short Chipping, Free Machining

Content: C <.25%

Tensile Strength RM (MPa)*: <530

Hardness (HB): <125

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Material Number	Manufacturer Reference
-	R St 34-2/ S 205 G2T	34/20CR	-	K02502	-	-	-	-	-	-	1.0034	-
-	St 33	HR 15	SS 330	K01400	-	A 33	Fe 320	-	-	-	1.0035	-
A 570 Gr. 33	UST 37-2	4360-40 B	SS 34	K 02502	S 235 JR G1	E 24-2	Fe 360 BFU	1311	-	-	1.0036	-
-	St 37-2	HS 37/23	STKR 400	K02702	S 235 JR	E 28-2	Fe 430 C	1412	-	-	1.0037	-
A 570 Gr. 36	R St 37-2/S235 JRG2	4260-40 C	SS 34	K 02502	S235 JR G 2	E 24-2 NE	Fe 360 BFN	1312	-	-	1.0038	-
-	S 235 JRH	S 235 JRH	-	-	S235JRH	E 24-2	S 235 JRH	-	-	-	1.0039	-
-	R St 42-1	-	-	K02507	-	-	-	-	-	-	1.0077	-
-	S235J2G3/Fe 360 D1	S 235 J 2 G 3	-	K01501	S 235 J2 G3	E 24-4	S 235 J2G3	1313	-	-	1.0161	-
-	C 10 Pb	-	-	-	C 10 GPb	-	-	-	-	-	1.0302	-
-	QSt 32-3	-	SWRCH6R	-	CB 4 FF KD	-	CB 4 F U	-	-	-	1.0303	-
-	St 35.8	-	STPT 38	K01201	-	-	-	-	-	-	1.0305	-
-	St 37-2	360	STKM 12 A	K02504	S 235 JR	E 24-2	Fe 360	1412	-	-	1.0308	-
-	C10D	-	SWRM 10	-	C 10 D	FM 10	C 10 D	-	-	-	1.0310	-
-	C12D	-	SWRM 12	-	C 12 D	-	C 12 D	-	-	-	1.0311	-
-	R St 15	FeP05	-	-	Fe P05	FeP05	FeP05	-	-	-	1.0312	-
-	D 6-2	0 1 5 A 03	SWRM 6	G10050	C 4 D	-	3 CD 5	-	-	-	1.0314	-
-	St 37.8	-	STB 35	-	-	-	Fe 37	-	-	-	1.0315	-
-	St 13	CR 3	SPCD	-	-	-	-	-	-	-	1.0333	-
-	D D 13 (SIW 24)	HS 3	SPHE	-	D D 13	3C	-	-	-	-	1.0335	-
-	UST 4/DC 04 G	-	-	-	D C 04 G 1	-	-	-	-	-	1.0336	-
-	Ro St 4/DC 04 GT	-	-	-	DC 04 GT	-	-	-	-	-	1.0337	-
-	St 4	DC 04/FeP04	SPCE	-	Fe P04	Fe 14	DC04/FeP04	-	-	-	1.0338	-
-	DC01Cu	-	-	-	DC 01 Cu	-	-	-	-	-	1.0344	-
-	RR St 3	CR 3	SPCD	-	Fe P03	F 13	DC 03/FeP 03	-	-	-	1.0347	-
-	U H /P 195GH	-	SGV 480	-	P 195 Gh	-	-	-	-	-	1.0348	-
-	St 14 Cu 3	-	-	-	DC 04 Cu	-	-	-	-	-	1.0354	-
-	-	3 CR	-	-	D D 12	D D 12	-	-	-	-	1.0398	-
1015	C 15	080 M 15	S 15 C	G10170	C 15	C 12	C 15	1350	-	-	1.0401	-
-	LSt 45.8	-	-	-	C 16	-	C 16	-	-	-	1.0407	-
-	C15D	-	SWRM 15	-	C 15 D	FM 15	C 15 D	-	-	-	1.0413	-
-	C20D	-	SWRM 20	-	C 20 D	FM 20	C 20 D	-	-	-	1.0414	-
-	C26D	-	SWRH 27	-	C 26 D	FM 26	C 26 D	-	-	-	1.0415	-
-	C18D	-	SWRM 17	-	C 18 D	FM 18	C 18 D	-	-	-	1.0416	-
-	RSt 44-2	440	-	G10160	-	-	-	-	-	-	1.0419	-
-	P265 NB	-	SG 295	-	P 265 NB	BS 2	-	-	-	-	1.0423	-
-	P 265 GH	151-400	SG 30	K02801	P 265 GH	A42CP	P 265 GH	1430	-	-	1.0425	-
-	C 22.3	-	-	-	C 22 G 1	-	-	-	-	-	1.0427	-
-	BSt 420 S	-	-	-	Fe B 400	-	-	-	-	-	1.0428	-
-	C 21	-	SFVC 1	K03504	P 305 GH	-	-	-	-	-	1.0432	-
-	GS-45	A1	SC 450	J03001	GE 230	E23-45M	-	1305	-	-	1.0446	-
-	TStE 275 (S 275 NL)	40EE	-	-	S 275 NL	S 275 NL	S 275 NL	-	-	-	1.0491	-
-	St 42.8	-	STPT 42	-	-	-	Fe 42	-	-	-	1.0498	-
-	S 335 N (StE 355)	50 E	-	-	S 355 N	E 355	S 355 N	2134	-	-	1.0545	-
-	S 355 NL (TStE 355)	50 E E	-	-	S 355 NL	E 355	S 355 N L	2135	-	-	1.0546	-
-	R 7 S 6/C 7 RG 2	-	-	-	C 7 RG 2	-	-	-	-	-	1.0709	-
B1112	9 S 20	220 M 07	SUM 21	G 11120	-	-	CF 9 S 22	-	-	-	1.0711	-
1213	9 SMn 28/11 SMn 30	230 M 07	SUM 22	G 12130	11 SMn 28	S 250	CF 9 SMn 28	1912	-	-	1.0715	-
12L13	9 SMnPb 28	-	SUM 22 L	G 12134	11 SMnPb 28	S 250 Pb	CF 9 SMnPb 28	1914	-	-	1.0718	-
-	15 S 22/15 S 20	En32M	SUM 32	-	15 S 22	-	-	1922	-	-	1.0723	-
-	15 SMn 13	15 SMn 13	-	-	15 SMn 13	15 SMn 13	-	-	-	-	1.0725	-
1215	9 SMn 36/11 S Mn 37	240 M 07	SUM 25	G 12150	11 SMn 37	S 300	CF 9 SMn 36	-	-	-	1.0736	-
12L14	9 SMnPb 36/11 SMnPb 37	-	-	G 12144	11 SMnPb 37	S 300 Pb	CF 9 SMnPb 36	1926	-	-	1.0737	-
-	11 SMnPbTe 37	11 SMn 37	-	-	11 SMn 37	-	-	-	-	-	1.0738	-
-	15 SPb 20/15 SPb 22	-	-	-	15 SPb 22	-	-	-	-	-	1.0753	-
-	36 SMn 14	36SMn14	-	-	36SMn14	36SMn14	-	-	-	-	1.0764	-
-	C10D2	-	-	-	C 10 D 2	FM 10	C 10 D 2	-	-	-	1.1114	-
-	Cq 10 (C 10 C)	-	SWRCH 10 K	-	C 10 KD	-	-	-	-	-	1.1122	-
-	C15D2	-	-	-	C 15 D 2	FM 15	C 15 D 2	-	-	-	1.1126	-
-	C 18D2	-	-	-	C 18 D 2	FM 18	C 18 D 2	-	-	-	1.1129	-

(continued)

P1
Workpiece Materials Listing • Steel • P1 (continued)
P1 Low-Carbon Steels, Short Chipping, Free Machining
Content: C <.25%
Tensile Strength RM (MPa): <530*
Hardness (HB): <125

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Material Number	Manufacturer Reference
-	GS-16 Mn 5	-	-	-	G 17 Mn 5	G 17 Mn 5	G17Mn5	-	-	-	1.1131	-
-	C20D2	-	-	-	C 20 D 2	FM 20	C20D 2	-	-	-	1.1137	-
-	C26D2	-	-	-	C 26 D 2	FM 26	C26D 2	-	-	-	1.1139	-
-	GC 16 E/GS-Ck 16	-	-	-	GC 16 E	-	-	-	-	-	1.1142	-
-	C 16 E	C 16 E	-	-	C 16 E	XC 18	-	-	-	-	1.1148	-
-	Cm 22	070 M 20	C 22 R (3 C 22)	-	3 C 22	XC 18 u	C 22 R	-	-	-	1.1149	-
-	Ck 22	050 A 20	S 22 C	G10230	2 C 22	XC 25	C 20	-	-	-	1.1151	-
-	Cq 22	-	SWRCH20K	-	C 21 KD	-	CB 20 FF	-	-	-	1.1152	-
-	Ck 25	070 M 26	S 25 C	G10250	2 C 25	XC 25	C 25	-	-	-	1.1158	-
-	C2D1	-	-	-	C 2 D 1	-	C 2 D 1	-	-	-	1.1185	-
-	19 MnVS 6	-	-	-	19 MnVS 6	-	-	-	-	-	1.1301	-
-	PS 275 TM	S 275 M	-	-	S 275 M	S 275 M	S 275 M	-	-	-	1.8818	-
-	DI-MC 355 B	-	-	-	S 355 M	E 355	S 355 M	-	-	-	1.8823	-
-	DI-MC 420 B	S 420 M	-	-	S 420 M	E 420	S 420 M	-	-	-	1.8825	-
-	S 460 M	S 460 M	-	-	S 460 M	E460/S460M	S460M	-	-	-	1.8827	-
-	BTSIE 355 TM	S 355 ML	-	-	S 355 ML	E 355	S 355 ML	-	-	-	1.8834	-
-	BTSIE 420 TM	S 420 ML	-	-	S 420 ML	E 420	S 420 ML	-	-	-	1.8836	-
-	S 235 J 0 W (Allwesta 360)	S 235 J 0 W	SMA 400 BW	-	S 235 JO W	S 235 J 0 W	-	-	-	-	1.8958	-
-	S 355 J 0 W (Allwesta 510)	WR 50 B	SMA 490 BW	-	S 235 JO W	E24W-3	S 235 JO W	-	-	-	1.8959	-
-	WTSt 37-2/S235JRW	WR 50 B	SMA 41 A	K11538	S 235 JR W	E 24 W-2	-	-	-	-	1.8960	-
-	WTSt 37-3	WR 50 C	SMA 50 A	-	S 235 J2 W	S 235 J 2 W	Fe 360 D FF	-	-	-	1.8961	-
-	USI 42-2	-	SS 41	-	-	HS 18-0-2-10	-	-	-	-	1.0040	-
-	St 37-2	-	-	-	S 235 JRC	E 24-2	S 235 JRC	-	-	-	1.0120	-
-	S 235 JR G1F	-	-	-	S 235 JRG 1 F	-	-	-	-	-	1.0160	-
-	St 12	DC 01/Fe P01	SPCC	-	Fe P01	DC 01/fe P01	DC 01/FeP0 1	-	-	-	1.0330	-
-	GS-38	A1	-	-	GE 200	230-400M	-	1306	-	-	1.0420	-
-	GS-20 Mn 5	-	SMnC 420	H15220	-	-	-	-	-	-	1.1120	-
-	G 20 Mn 5	-	-	-	G 20 Mn 5	-	G 20 Mn 5	-	-	-	1.6220	-

P2
Workpiece Materials Listing • Steel • P2
P2 Medium- and High-Carbon Steels
Content: C >.25%
Tensile Strength RM (MPa): >530*
Hardness (HB): <220 (HRC): <25

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Material Number	Manufacturer Reference
-	S 355 JR	En 50 B	SM 490 YA	-	S 1207	E36-2	Fe 510 BFN	-	-	-	1.0045	-
1035	C 35	060 A 35	S 35 C	G 10350	1 C 35	CC 35	C 35	1550	-	-	1.0501	-
1045	GS-C 45	080 M 46	S 45 C	G10450	1 C 45	CC 45	C 45	1650	-	-	1.0503	-
1040	C 40	080 M 40	S 40 C	G 10 400	1 C 40	C 40	C 40	-	-	-	1.0511	-
1046	S 355 K 2 G 4 Cu	-	-	G10460	S 355 K2 G4 Cu	-	-	-	-	-	1.0519	-
1030	C30	080 M 30	SUP 7	G 10 300	1 C 30	C 32	C 30	-	-	-	1.0528	-
1055	C 55	070 M 55	S 55 C	J05000	1 C 55	C 55	C 55	1655	-	-	1.0535	-
1551	C 50 Pb	-	-	G15510	C 50 G Pb	-	-	-	-	-	1.0542	-
-	GS-60	A3	-	-	GE 300	320-560M	C 45	1606	-	-	1.0558	-
1037	36 Mn4	170 H 36	-	G10370	-	-	-	-	-	-	1.0561	-
-	PSt 52-3 (S 355 J2 G3 F)	-	-	-	S 355 J2 G3 F	-	FE 510 C	-	-	-	1.0572	-
-	S 355 J2H (RoSt 52-3)	50D	-	-	S355J2H	-	S355J2H	-	-	-	1.0576	-
1060	C 60	080 A 62	S 60 C-CSP	G 10600	1 C 60	AF 70 C 55	C 60	-	-	-	1.0601	-
1070	C 67	CS 70	S 70 C -CSP	G10700	1 CS 67	C 68	C 67	-	-	-	1.0603	-
1074	C 75	CS 80	-	G10740	1 CS 75	C 75	C 75	-	-	-	1.0605	-
1059	C58D	-	S 58 C	G10590	C 58 D	FM 58	C 58 D	-	-	-	1.0609	-
1075	C76D	-	-	G10750	C 76 D	FM 76	C 76 D	-	-	-	1.0614	-
1080	C86D	CS 80	-	G10860	C 86 D	FM 86	C 86 D	-	-	-	1.0616	-
1095	C92D	95 CS	-	G10950	C 92 D	-	C 92 D	-	-	-	1.0618	-
1110	U 10 S 10	-	SUM 12	G11100	-	-	-	-	-	-	1.0702	-
11L08	10 SPb 20	-	-	G 11084	10 SPb 20	10 Pb F 2	CF 10 SPb 20	-	-	-	1.0722	-
1140	35 S 20	212 M 36	-	G 11400	35 S 20	35 MF 4	-	1957	-	-	1.0726	-
1146	45 S 20	212 M 44	-	G 11460	45 S 20	45 MF 4	-	1973	-	-	1.0727	-
1151	60 S 20	-	-	G11510	60 S 20	60 MF 4	-	-	-	-	1.0728	-
1141	36 Mn 6	212 M 36	S Mn 443	G 11410	-	-	-	-	-	-	1.1127	-
1039	40 Mn 4	150 M 36	-	G10390	-	35 M 5	-	-	-	-	1.1157	-
1536	34 Mn 5	En15B	SS 55	G15360	-	-	-	-	-	-	1.1166	-
1030	Cq 35	-	F.1133 (C 35 DF)	G 10300	C 35 KD	-	CB 35	-	-	-	1.1172	-
1034	Ck 34	080 M 34	S 34 C	G 10340	2 C 34	-	C 34	-	-	-	1.1173	-
1038 H	Ck 38	-	-	G 10380	-	XF 38	-	-	-	-	1.1176	-
1030	Ck 30	080 M 30	S 30 C	G 10300	2 C 30	XC 32	C 30	-	-	-	1.1178	-
1034	Ck 35	080 M 36	S 35 C	G 10340	2 C 35	XC 38 H1	C 35	1572	-	-	1.1181	-
1035	Cf 35	060 A 35	S 35 C	G 10350	C 35 G	XC 38 TS	C 35	1572	-	-	1.1183	-
1040	Ck 40	080 A 40	S 40 C	G 10400	2 C 40	XC 42 H1	C 40	-	-	-	1.1186	-
1045	Cf 45	060 A 47	S 45 C	G10450	C 45 G	XC 42 TS	C 43	1672	-	-	1.1193	-
1055	Ck 55	070 M 55	S 55 C	G10550	2 C 55	XC 55 H1	C 55	1655	-	-	1.1203	-
1050	Ck 50	080 M 50	S 50 C	G10500	2 C 50	XC 48 H1	C 50	1674	-	-	1.1206	-
1055	Cm 55	070 M 55	-	G 10550	3 C 55	XC 55 H1	C 55 R	-	-	-	1.1209	-
1053	Ck 53	En43C	S 53 C	G 10530	-	-	-	-	-	-	1.1210	-
1050	Cf 53	060 A 57	S 50 C	G 10500	C 53 G	XC 48 TS	C 48	1674	-	-	1.1213	-
1060	Ck 60	060 A 62	S 58 C	G 10640	2 C 60	XC 60	C 60	1678	-	-	1.1221	-
1552	52 Mn 5	-	-	G15520	-	-	-	-	-	-	1.1226	-
1065	FD (Federstahlrohr)	095 A 65	-	G10650	C 68 D	-	-	-	-	-	1.1230	-
1070	Ck 67	060 A 67	S 70 C-CSP	G 10700	C 67 S	XC 68	C 70	1770	-	-	1.1231	-
1069	Ck 68	-	-	G10690	C 70 D	-	-	-	-	-	1.1234	-
1080	Ck 75	060 A 78	C 75	G 10800	C 75 S	XC 75	C 75	1774	-	-	1.1248	-
-	Cf 70	-	-	-	C 70 G	XC 70	-	-	-	-	1.1249	-
1090	Ck 85	-	SK 5 -CSP	G 10900	C 85 S	XC 90	C 90	-	-	-	1.1269	-
1085	90 Mn 4	080 A 83	SUP4	G 10850	-	-	-	-	-	-	1.1273	-
1095	Ck 101	060 A 96	SUP 4	G 10950	C 100 S	XC 100	C 100	1870	-	-	1.1274	-
1050	C 50	080 M 50	S 50 C	G 10 500	1 C 50	C 50	C 50	1674	-	-	1.0540	-
-	St 52-3 G	4360-50 B	SM 50 YB	-	S 355 J 2 G 3	E 36-3	Fe 510 B	2132	-	-	1.0570	-
1078	C78D	-	SWRH 77 B	G10780	C 78 D	FM 78	C 78 D	-	-	-	1.0620	-
1035	Cm 35	080 M 36	-	G 10350	3 C 35	38 H1 k	C 35 R	1572-03	-	-	1.1180	-
1566	66 Mn 4	-	-	G15660	-	-	-	-	-	-	1.1260	-
1084	C 85 W	-	SK 5	G10840	C 90 U	Y3 90	-	-	-	-	1.1830	-

NOTE: For legend, see page Y217.

P3

Workpiece Materials Listing • Steel • P3

P3 Alloy Steels and Tool Steels

Content: C >.25%

Tensile Strength RM (MPa)*: 600–850

Hardness (HB): <330 (HRC): <35

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Material Number	Manufacturer Reference
1330	GS-30 Mn 5	120 M 36	SMn 433 H; SCMn 2	K13300	–	35 M 5	–	1330	–	–	1.1165	–
1330	28 Mn 6	150 M 28	SCMn 1	G 13300	28 Mn 6	35 M 5	C 28 Mn	–	–	–	1.1170	–
1335	36 Mn 5	150 M 36	SMn 438(H)	G13350	–	40 M 5	–	2120	–	–	1.1167	–
1345	StSch 90 C/GP 280 GH	–	–	G13450	GP 280 GH	GP 280 GH	GP 280 GH	–	–	–	1.0625	–
1513	P265	HR 40/30	–	G15130	–	12 M 5	–	–	–	–	1.0424	–
4142	43 CrMo 4	–	–	G41420	–	43 Cr Mo 4	–	–	–	–	1.3563	–
4147	48 CrMo 4	817 M 40	SNC 836	H41470	–	48 Cr Mo 4	–	–	–	–	1.3565	–
4419	GS-22 Mo 4	243-430	SCPH 11	G44190	G 20 Mo 5	G20Mo5	G 22 Mo 5	–	–	–	1.5419	–
4520	16 Mo 5	1503-245-420	SBC 690	K11522	–	16 Mo 5	–	–	–	–	1.5423	–
5015	15 Cr 3	523 M15	SCr 415 H	G50150	15 Cr 2	12 C 3	–	–	–	–	1.7015	–
5046	44 Cr 2	–	–	H50460	46 Cr 1 KD	44 Cr 2	–	–	–	–	1.3561	–
5115	16 MnCr 5	527 M 17	SCR 415	G 51150	16 MnCr 5 KD	16 MC 5	16 MnCr 5	2173	–	–	1.7131	–
5117	17 Cr 3	17 Cr 3	–	G51170	(15 Cr 2 KD)	18 C 3	–	–	–	–	1.7016	–
5130	28 Cr 4	530 A 30	–	G51300	28 Cr 4	30 CD 4	–	–	–	–	1.7030	–
5140	41 Cr 4	530 M 40	SCR 440 H	G51400	41 Cr 4	42 C 4	41 Cr 4	–	–	–	1.7035	–
5140	42 Cr 4	530 A 40	SCR 440	–	40 NiCrMo 3	42 C 4 TS	40 NiCrMo 3	2245	–	–	1.7045	–
9255	51 Si 7	250 A 53	–	G92550	–	51 S 7	48 Si 7	2090	–	–	1.0903	–
9255	55 Si 7	250 A 53	SKH 1; SKT 4	G92550	55 NiCrMoV 7	55 S 7	55 Si 8	2085	–	–	1.0904	–
9260	60 Si 7	251 A 60	–	G92600	60 Si 7	60 S 7	60 Si 7	–	–	–	1.5027	–
9262	60 SiCr 7	250 A 61	SUP 7	G92620	60 SiCr 8	60 SC 7	60 SiCr 8	–	–	–	1.0961	–
9262	60 SC 7	–	–	G92620	60 SiCr 8	61 SC 7	60 SiCr 8	–	–	–	1.5092	–
9262	60 SiCr 7	–	–	–	–	–	–	–	–	–	1.7108	–
15B21 H	19 MnB 4	170 H 20	SWRCHB 420	H15211	19 MnB 4	20 MB 5	–	–	–	–	1.5523	–
15B21 H	20 MnB 5	–	SWRCHB 620	–	20 MnB 5	20 MnB 5	20 MnB 5	–	–	–	1.5530	–
50B40	37 CrB 1	120 M 36	SMnc 3 H	H50401	38 Cr 2	–	35 CB 1	–	–	–	1.7007	–
5130 H	34 Cr 4	530 A 32	SCR 430 H	G51300	34 Cr 4 KD	32 C 4	34 Cr 4 KB	–	–	–	1.7033	–
5132 H	37 Cr 4	530 A 36	SCR 435 H	G51320	37 Cr 4	38 C 4	36 CrMn 4	–	–	–	1.7034	–
A 204 Gr. A	15 Mo 3	1501-240	STFA 12	K11820	16 Mo 3	15 D 3	16 Mo 3 KW	2912	–	–	1.5415	–
A 350-LF 5	10 Ni 14	503	SL 3 N 26	K31718	12 Ni 14	12Ni14	18 Ni 14 KT	–	–	–	1.5637	–
A 387 Gr. 12 Cl. 2	16 CrMo 4 4	–	–	K11564	–	–	A 18 CrMo 4 5 KW	–	–	–	1.7337	–
A 570 Gr. 36	St 37-3	4360-40 C	–	K01501	S 235 J2 G3	Fe 360 D1(2); E 24-3	Fe 360 D1(2)	1312	–	–	1.0116	–
A 570 Gr. 40	St 44-2	4360-43 B	SM 41 B	K 02502	S 275 JR	E 28-2	Fe 430 BFN	1412	–	–	1.0044	–
A 570 Gr. 50	St 50-2	4360-50 B	SS 50	–	E 295	A 50-2	Fe 490	2172	–	–	1.0050	–
A 573 Gr. 70	St 44-3	4360-43 C	SM 41 B	–	Fe 430 D1(2); S 275 J2 G3 (4)	Fe 430 D1(2); E 28-4	Fe 430 D FF	1414	–	–	1.0144	–
A 633 Gr. C	St E 355	P 355 N	SM 50 YB	K12000	P 355 N	E 355 R/FP	Fe E 355 KG	2132	–	–	1.0562	–
A 633 Gr. E	St E 420	S 420 N	SM 50 C	K02002	FeE 420 KGN	E 420-I	Fe E 420 KG	2143	–	–	1.8902	–
A 633 Gr. E	St E 460	P 460 N	SM 53 B	K02900	P 460 N	E 460-I	Fe E 460 KG	2143	–	–	1.8905	–
A-6	C 67 W	–	–	T30106	–	Y1 70	–	–	–	–	1.1744	–
E 52100	100 Cr 6	535 A 99	SUJ 2	G52986	100 Cr 6	100 C 6	100 Cr 6	2258	–	–	1.3505	–
O 2	90 MnCrV 8	BO 2	–	T31502	90 Mn V 8	90 MV 8	90 MnCrV 8 KU	–	–	–	1.2842	–
P21	90 Cr 3	–	–	T51621	–	–	–	–	–	–	1.2056	–
P3	10 NC 6	–	–	T51603	15 NiCr 6	10 NC 6	–	–	–	–	1.5713	–
P6	15 NiCr 14	–	SNC 22	T51606	–	10 NC 12	–	–	–	–	1.2735	–
T 8	C 80 W2	BW 1B	SKC 3	T12008	–	Y1 80	C 80 KU	–	–	–	1.1625	–
W 108	C 80 W1	–	–	T72301	C 80 U	Y1 90	C 80 KU	1880	–	–	1.1525	–
W 110	C 105 W1	B W 1 A	–	T72301	C 105 U	Y 105	C 100 KU	1880	–	–	1.1545	–
W 112	C 125 W	–	–	–	C 125 U	–	–	–	–	–	1.1563	–
W 112	C 125 W	–	SK 2	T72301	C 120 U	Y2 120	C 120 KU	–	–	–	1.1663	–
W 210	100 V 1	BW 2	SKS 43	T72302	100 V 2	Y1 105 V	102 V 2 KU	–	–	–	1.2833	–
–	St 50-1	–	–	–	–	–	–	–	–	–	1.0052	–
–	S 235 JO/ Fe 360 C	En 40C	–	–	S 235 JO	E24-3	Fe 360 CFN	–	–	–	1.0114	–
–	QSt 37-3	–	SWRCH 12R	–	–	–	–	–	–	–	1.0123	–
–	S 275 JO	En43C; S275JO	–	–	S 275 JO/ Fe 430 C	S 275 JO; E 28-3	S275JO; Fe430CFN	–	–	–	1.0143	–
–	S 275 J2 G4/ Fe 430 D 2	S 275 J2 G4	–	–	S 275 J2 G4	E28-4; S 275 J2 G4	S 275 J2 G4	1414	–	–	1.0145	–
–	Ro St 44-2	43C	–	–	S 275 JO H	–	S 275 JO H	–	–	–	1.0149	–
–	St 37.0	–	STPG 38	–	P 235 T1	–	–	–	–	–	1.0254	–
–	C9D	–	SWRM 8	–	C 9 D	FM 9	C 9 D	–	–	–	1.0304	–
–	C7D	C 7 D	SWRM 8	G10060	C 7 D	FM 8	C 7 D	–	–	–	1.0313	–
–	P235 GH	P 235 GH	SPV 50	K02503	P 235 GH	A 37 CP	Fe E 235	1330	–	–	1.0345	–
–	C 25 Pb	–	–	–	C 25 GPb	–	–	–	–	–	1.0411	–
–	L 245 MB	430	–	K03006	L 245 MB	L 245 MB	L 245 MB	–	–	–	1.0418	–
–	P310 NB	224-410	SG 325	K02100	P280GH	BS 2	P 275 N	2103	–	–	1.0426	–
–	L 290 MB	–	–	–	L290MB	L 290 MB	–	–	–	–	1.0429	–
–	H III/P285NH	–	Sm 38	–	P 285 NH	–	–	–	–	–	1.0435	–
–	P310 NB	224-430	SG 325	K02100	P305GH	P 275 N	P 275 N	2103	–	–	1.0436	–
–	A St 41	P 275 N	STK 400	K02100	S 275 N	BS 3	P 275 N	2103	–	–	1.0437	–
–	B 500 A	–	SD 490	–	B 500 A	–	B 500 A	–	–	–	1.0438	–
–	H IV/P295NH	–	SG 37	K03102	–	–	Fe 460-2 KW	–	–	–	1.0445	–
–	SIE 240.7	–	–	–	L 245 NB	L 245 NB	–	–	–	–	1.0457	–
–	TSIE 255	–	–	K11535	–	–	–	–	–	–	1.0463	–
–	15 Mn 3 Al	–	–	–	C 14 GAI	–	–	–	–	–	1.0468	–
–	19 Mn 6/P 355 GH	P 355 GH	SGV 46	K03300	P355GH	A 52 CP	Fe E355-2	2101	–	–	1.0473	–
–	17 Mn 4/P 295 GH	224-460B	SG 37	K03501	P 295 GH	A 48 CP	Fe E 295	2102	–	–	1.0481	–
–	19 Mn 5	224-460	SG 37	K 03102	–	A 52 CP; AP; FP	Fe 460-2 KW	–	–	–	1.0482	–
–	L 290 AG	–	–	–	L290GA	TS E 290	–	–	–	–	1.0483	–
–	L 290 NB	–	–	–	L290NB	L 290 NB	–	–	–	–	1.0484	–
–	21 Mn 6	–	–	K12320	–	–	–	–	–	–	1.0485	–
–	St E 285	P 275 N	SM 41 A	K 01802	P 275 N	P 275 N	Fe E 285 KG	–	–	–	1.0486	–
–	W St E 285	P 275 N	–	K 01802	P 275 NH	P 275 N	Fe E 285 KW	–	–	–	1.0487	–
–	T St E 285	P 275 NL 1	SLA 235 A	K 01803	P 275 NL 1	P 275 NL 1	Fe E 285 KT	–	–	–	1.0488	–
–	H 300/ZSt E 300	H280LA	–	–	H 280 LA	E 280 C	–	–	–	–	1.0489	–
–	S 275 NH	S 275 NH	–	–	S 275 NH	–	S 275 NH	–	–	–	1.0493	–
–	S 275 NLH	S275NLH	–	–	S 275 NLH	–	S275NLH	–	–	–	1.0497	–
–	C 35 Pb/C 35 GPb	–	–	–	C 35 Pb	–	–	–	–	–	1.0502	–
–	St E 315/P 315N	–	SM 50 A	K11506	P 315 N	–	Fe E 315 KG	–	–	–	1.0505	–
–	W St E 315	–	SNC 1	K02404	P 315 NH	–	Fe E 315 KW	2107	–	–	1.0506	–
–	St 55	–	STKM 16A	–	–	–	Fe 540	–	–	–	1.0507	–
–	T St E315	–	SLA 325 A	K02404	P 315 NL	–	–	2106	–	–	1.0508	–
–	C 40 Pb	–	–	–	C 40 G Pb	–	–	–	–	–	1.0512	–
–	C38D	–	SWRH 37	–	C 38 D	FM 38	C 38 D	–	–	–	1.0516	–
–	C48D	–	SWRH 48	–	C 48 D	FM 48	C 48 D	–	–	–	1.0517	–
–	C56D	–	–	–	C 56 D	FM 56	C 56 D	–	–	–	1.0518	–
–	S 355 NH	S 355 NH	–	–	S 355 NH	–	S 355 NH	–	–	–	1.0539	–
–	C42D	–	SWRH 42 B	–	C 42 D	FM 42	C 42 D	–	–	–	1.0541	–
–	S 355 JO H	50 C	–	–	S 355 JO H	–	S 355 JO H	–	–	–	1.0547	–
–	ZSIE 340/ H 340	H 320 L A	–	–	H 320 LA	E 315 C	–	–	–	–	1.0548	–
–	S 335 NLH	50 EE	–	–	S 355 N LH	–	S 355 N L H	–	–	–	1.0549	–
–	S 355 JO	En 50 C; S 355 JO	SM 520 M	–	S 355 JO	S 355 JO; E 36-3	S 355 JO; Fe 510 C FN	–	–	–	1.0553	–
–	GS-70	50 C	–	–	S 355 JO C	E 36-3	Fe 510 C	–	–	–	1.0554	–

P3
Workpiece Materials Listing • Steel • P3 (continued)

P3 Alloy Steels and Tool Steels

Content: C >.25%

Tensile Strength RM (MPa)*: 600–850

Hardness (HB): <330 (HRC): <35

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Material Number	Manufacturer Reference
-	ZStE 420/H 420	46/40HR, HS, CS	-	-	H 400 LA	H 400 LA	-	-	-	-	1.0556	-
-	P355 NB	-	SG 365	-	P 355 NB	BS 4	-	-	-	-	1.0557	-
-	W St E 355	P 355 NH	-	K01600	P 355 NH	P 355 NH	Fe E 355 KW	-	-	-	1.0565	-
-	T St E355	P 355 NL1	SLA 37	-	P 355 NL1	P 355 NL1	Fe E 355 KT	-	-	-	1.0566	-
-	P355 QH1	P 355 QH	-	-	P 355 OH	P 355 OH	-	-	-	-	1.0571	-
-	S 355 J 2 G 4	S 355 J 2 G 4	-	-	S 355 J 2 G 4	S 355 J 2 G 4	S 355 J 2 G 4	-	-	-	1.0577	-
-	L 360 MB	-	-	-	L 360 MB	L 360 MB	-	-	-	-	1.0578	-
-	St 52.4	-	STS 49	-	-	-	-	-	-	-	1.0581	-
-	L 360 NB/STE 360.7	-	-	-	L360NB	L 360 NB	-	-	-	-	1.0582	-
-	S 355 J 2 G 3 Cu/St 52-3 Cu3	-	-	-	S 355 J2 G3 Cu + CR	-	-	-	-	-	1.0585	-
-	C50D	-	-	-	C 50 D	FM 50	C 50 D	-	-	-	1.0586	-
-	QSt 52-3 Cu 3	-	-	-	S 355 J2 G3 Cu C	-	-	-	-	-	1.0587	-
-	D 53-2	-	SWRH 52 B	-	C 52 D	FM 52	C 52 D	-	-	-	1.0588	-
-	S 355 J 2 G 4 Cu	-	-	-	S 355 J2 G4 Cu	-	-	-	-	-	1.0592	-
-	S355k2G3/Fe 510 DD1 (MULTIST)	S 355 K 2 G 3	SM 520 C	K02505	S 355 K 2 G 3	E36-4	S 355 K 2 G 3	-	-	-	1.0595	-
-	S355k2G4/Fe 510 DD 2 (MULTIST)	S 355 K 2 G 4	-	-	S 355 K 2 G 4	S 355 K 2 G 4	S 355 K 2 G 4	-	-	-	1.0596	-
-	C62D	-	SWRH 62 B	-	C 62 D	FM 62	C 62 D	-	-	-	1.0611	-
-	C66D	-	-	-	C 66 D	FM 66	C 66 D	-	-	-	1.0612	-
-	C68D	-	SWRH 67 B	-	C 68 D	FM 68	C 68 D	-	-	-	1.0613	-
-	C70D	-	-	-	C 70 D	FM 70	C 70 D	-	-	-	1.0615	-
-	C72D	-	SWRH 72 B	-	C 72 D	FM 72	C 72 D	-	-	-	1.0617	-
-	GS-C 25	-	SCPH 1	-	GP 240 GH	GP 240 GH	GP 240 Gh	-	-	-	1.0619	-
-	C80D	-	-	-	C 80 D	FM 80	C 80 D	-	-	-	1.0622	-
-	C82D	-	SWRH 82 B	-	C 82 D	FM 82	C 82 D	-	-	-	1.0626	-
-	35 SPb 20	35 SPb 20	-	-	35 SPb 20	35 SPb 20	-	-	-	-	1.0756	-
-	45 SPb 20	-	-	-	46 SPb 20	-	-	-	-	-	1.0757	-
-	38 SMnPb 28	38 SMnPb 28	-	-	38 SMnPb 28	38 SMnPb 28	-	-	-	-	1.0761	-
-	44 SMn 28	44 SMn 28	-	-	44 SMn 28	44 SMn 28	-	-	-	-	1.0762	-
-	44 SMnPb 28	44 SMnPb 28	-	-	44 SMnPb 28	44 SMnPb 28	-	-	-	-	1.0763	-
-	36 SMnPb 14	36 SMnPb 14	-	-	36 SMnPb 14	36 SMnPb 14	-	-	-	-	1.0765	-
-	QSt E 690 TM (S 700 MC)	-	-	-	S 700 MC	S 690 MC	S 700 MC	-	-	-	1.0966	-
-	QSt E 260 N 7 S 260 NC	-	AE 275 NC	-	S 260 NC	-	S 260 NCX	-	-	-	1.0971	-
-	QSt E 300 TM/S 315 MC	43 F35 HR, HS, CS	-	-	S 315 MC	E 315 D	S 315 MC	-	-	-	1.0972	-
-	QSt E 300 N 7/ S 315 NC	-	AE 340 NC	-	S 315 NC	-	S 315 NC	-	-	-	1.0973	-
-	QSt E340 TM	HR 40/30	-	-	S 340 MC	E 335 D	-	-	-	-	1.0974	-
-	QSt E340 N	-	-	-	S 340 NC	-	Fe E 355 TD	-	-	-	1.0975	-
-	QSt E 360TM	-	-	-	S 355 MC	E 355 D	Fe E 355 TM	-	-	-	1.0976	-
-	QSt E360 N	-	-	-	S 355 NC	-	Fe E 355 TD	-	-	-	1.0977	-
-	QSt E380 TM	-	-	-	S 380 MC	E 390 D	-	-	-	-	1.0978	-
-	QSt E380 N	-	-	-	S 380 NC	-	Fe E 380 TD	-	-	-	1.0979	-
-	QSt E420 TM	HR 50 F 45	-	-	S 420 MC	E 430 D	Fe E 420 TM	-	-	-	1.0980	-
-	QSt E 420 N	-	-	-	S 420 NC	-	Fe E 420 TD	-	-	-	1.0981	-
-	QSt E 460 TM	50/45 HR	-	-	S 460 MC	E 445 D	-	-	-	-	1.0982	-
-	QSt E 460 N	-	-	-	S 460 NC	-	Fe E 460 TD	-	-	-	1.0983	-
-	QSt E500 TM	-	-	-	S 500 MC	E 490 D	Fe E 490 TM	2662	-	-	1.0984	-
-	QSt E500 N	-	-	-	S 500 NC	-	-	-	-	-	1.0985	-
-	QSt E550 TM	60/55 HS	-	-	S 550 MC	E 560 D	Fe E 560 TM	-	-	-	1.0986	-
-	QSt E550 N	-	-	-	S 550 NC	-	-	-	-	-	1.0987	-
-	ESiE 285	P 275 NL 2	STK 400	-	P 275 NL 2	P 275 NL 2	P 275 NL 2	-	-	-	1.1104	-
-	ESiE 315	-	-	-	S 315 NL 1	-	-	-	-	-	1.1105	-
-	ESiE 355	P 355 NL 2	STK 500	-	P 355 NL 2	P 355 NL 2	P 355 NL 2	-	-	-	1.1106	-
-	C5D2	-	-	-	C 5 D 2	FM 6	C 5 D 2	-	-	-	1.1111	-
-	C8D2	-	-	-	C 8 D 2	FM 8	C 8 D 2	-	-	-	1.1113	-
-	C 10 E W/RSD 11	-	-	-	C 10 EW	-	-	-	-	-	1.1115	-
-	C32D2	-	-	-	C 32 D 2	FM 32	C 32 D 2	-	-	-	1.1143	-
-	C36D2	-	-	-	C 36 D 2	FM 36	C 36 D 2	-	-	-	1.1145	-
-	C40D2	-	-	-	C 40 D 2	FM 40	C 40 D 2	-	-	-	1.1153	-
-	C42D2	-	-	-	C 42 D 2	FM 42	C 42 D 2	-	-	-	1.1154	-
-	C46D2	-	-	-	C 46 D 2	FM 46	C46D 2	-	-	-	1.1162	-
-	C 25 R	C 25 R	-	-	C 25 R	C 25 R	C 25 R	-	-	-	1.1163	-
-	C48D2	-	-	-	C 48 D 2	FM 48	C48 D 2	-	-	-	1.1164	-
-	20 Mn 6	150 M 19	-	-	-	20 M 5	20 Mn 6	-	-	-	1.1169	-
-	C50D2	-	-	-	C 50 D 2	FM 50	C50D 2	-	-	-	1.1171	-
-	C 30 R	C 30 R	C 30 R (3 C 30)	-	C 30 R	C 30 R	C 30 R	-	-	-	1.1179	-
-	C3D1	-	-	-	C 3 D 1	-	C 3 D 1	-	-	-	1.1187	-
-	C40R/Cm 40	C 40 R	-	-	C 40 R	C 40 R	C 40	-	-	-	1.1189	-
-	Ck 45	080 M 46	S 45 C	-	2 C 45	XC 42	C 40	1672	-	-	1.1191	-
-	Cq 45	-	SWRCH45K	-	C 45 KD	-	-	-	-	-	1.1192	-
-	C 45 R	080 M 46	S 50 C	-	C 45 R	XC 48 Htu	C 45 R	1672	-	-	1.1201	-
-	C52D2	-	-	-	C 52 D 2	FM 52	C 52 D 2	-	-	-	1.1202	-
-	C 53 R/Cm 53	-	-	-	C 53 R	-	-	-	-	-	1.1205	-
-	C 10 R	C 10 R	-	-	C 10 R	C 10 R	-	-	-	-	1.1207	-
-	C 16 R	C 16 R	-	-	C 16 R	C 16 R	-	-	-	-	1.1208	-
-	C58D2	-	-	-	C 58 D 2	FM 58	C 58 D 2	-	-	-	1.1212	-
-	C62D2	-	-	-	C 62 D 2	FM 62	C 62 D 2	-	-	-	1.1222	-
-	Cm 60	C 60 R	-	-	3 C 60	C 60 R	C 60 R	-	-	-	1.1223	-
-	C60D2	-	-	-	C 60 D 2	FM 60	C 60 D 2	-	-	-	1.1228	-
-	C68D2	-	-	-	C 68 D 2	FM 68	C 68 D 2	-	-	-	1.1232	-
-	C66D2	-	-	-	C 66 D 2	FM 66	C 66 D 2	-	-	-	1.1236	-
-	C50R	C 50 R	-	-	C 50 R	FM 50	C 50 R	-	-	-	1.1241	-
-	C72D2	-	-	-	C 72 D 2	FM 72	C 72 D 2	-	-	-	1.1242	-
-	C70D2	-	-	-	C 70 D 2	FM 70	C 70 D 2	-	-	-	1.1251	-
-	C78D2	-	-	-	C 78 D 2	FM 78	C 78 D 2	-	-	-	1.1252	-
-	C76D2	-	-	-	C 76 D 2	FM 76	C 76 D 2	-	-	-	1.1253	-
-	C80D2	-	-	-	C 80 D 2	FM 80	C 80 D 2	-	-	-	1.1255	-

NOTE: For legend, see page Y217.

(continued)

P3

Workpiece Materials Listing • Steel • P3 (continued)

P3 Alloy Steels and Tool Steels

Content: C >.25%

Tensile Strength RM (MPa)*: 600–850

Hardness (HB): <330 (HRC): <35

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Material Number	Manufacturer Reference
-	C82D2	-	-	-	C 82 D 2	FM 82	C 82 D 2	-	-	-	1.1262	-
-	C86D2	-	-	-	C 86 D 2	FM 86	C 86 D 2	-	-	-	1.1265	-
-	C88D2	-	-	-	C 88 D 2	-	C 88 D 2	-	-	-	1.1272	-
-	C92D2	-	-	-	C 92 D 2	-	C 92 D 2	-	-	-	1.1282	-
-	C98D2	-	-	-	C 98 D 2	-	C 98 D 2	-	-	-	1.1283	-
-	46 MnVS 6	-	-	-	46 MnVS 6	-	-	-	-	-	1.1304	-
-	C 90 U	-	-	-	C90U	-	-	-	-	-	1.1535	-
-	85 Cr 1	-	-	-	-	Y1 100 C 2	-	-	-	-	1.2004	-
-	140 Cr 3	-	-	-	140 Cr 2	Y2 140 C	-	-	-	-	1.2008	-
-	21 MnCr 5	-	SKS 8	-	21 MnCr 5	20 NC 5	-	-	-	-	1.2162	-
-	40 CrMnNiMo 8 6 4	-	SCR 420 H	-	40 CrMnNiMo 8-6-4	-	-	-	-	-	1.2738	-
-	16 CrNiMo 6	820A16	-	-	-	16 NCD 6	16NiCrMo6	-	-	-	1.3531	-
-	100 CrMn 7 3	-	-	-	100 CrMnMo 7	100 CD 7	-	-	-	-	1.3536	-
-	100 CrMo 7	-	SUS 4	K19965	100 CrMo 7	100 CD 7	100CrMo7	-	-	-	1.3537	-
-	100 CrMnMo 8	-	-	-	-	100 CrMnMo 8	-	-	-	-	1.3539	-
-	46 Si 7	-	-	-	45 Si	46 S 7	-	-	-	-	1.5024	-
-	55 Si 7	250 A 53	-	G92550	56 Si 7	55 S 7	55 Si 8	2085	-	-	1.5026	-
-	37 MnSi 5	-	-	-	-	38 MS 5	-	F.130.A	-	-	1.5122	-
-	15 MnMoV 4 5	-	-	-	15 MnMoV 4-5	15 MDV 4.05	-	-	-	-	1.5402	-
-	11 MnMo 4 5	-	-	K11123	11 MnMo 45 KE	-	-	-	-	-	1.5425	-
-	13 MnMo 6 5	-	-	K11424	11 MnMo 65 KE	-	-	-	-	-	1.5426	-
-	35 B 2	-	SWRCHB 237	-	C 35 B	35 B 3	-	-	-	-	1.5511	-
-	24 Ni 8	-	SCPL 21	J22501	G 9 Ni 10	22 N 8	G9Ni10	-	-	-	1.5633	-
-	10 NiCr 5 4	10NiCr5-4	-	-	10 NiCr 5-4	10 NiCr 5-4	-	-	-	-	1.5805	-
-	18 MnMoNi 5 5	-	-	-	18 MnMoNi 5-5	-	-	-	-	-	1.6308	-
-	20 MnMoNi 4 5	-	SQV 2 B	K12539	20 MnMoNi 4-5	-	-	-	-	-	1.6311	-
-	15 MnCrMoNiV 5 3	-	-	-	15 MnCrMoNiV 5-3	-	-	-	-	-	1.6920	-
-	17 CrS 3	17 CrS3	-	-	17 CrS 3	17 CrS 3	-	-	-	-	1.7014	-
-	28 CrS 4	-	-	-	28CrS4	28CrS4	-	-	-	-	1.7036	-
-	34 CrS 4	34 CrS 4	-	-	34 CrS 4	34 CrS 4	34 CrS 4	-	-	-	1.7037	-
-	41 CrS 4	41 CrS 4	-	-	41 CrS 4	41 CrS 4	41 CrS 4	2245	-	-	1.7039	-
-	38 Cr 4	-	-	-	38 Cr 4	-	-	-	-	-	1.7043	-
-	16 CrMo 4	18 CrMo4	SCM 418 H	-	18 CrMo 4	15 CD 3.5	18 CrMo 4	-	-	-	1.7242	-
-	12 CrMo 11 10	-	-	-	-	-	-	-	-	-	1.7305	-
-	22 CrMoS 3 5	-	-	-	22 CrMoS 3-5	22 CrMoS 3-5	-	-	-	-	1.7333	-
-	12 CrMo 19 5	3606-625	SCMV 6	K41545	X 12 CrMo 5	2 10 CD 5.05	16 CrMo 20 5	-	-	-	1.7362	-
-	X 7 CrMo 6 1	B 5	-	S50281	CM 5-IG	-	-	-	-	-	1.7373	-
-	51 CrMoV 4	-	-	-	51 CrMoV 4	51 CDV 4	51 CrMoV 4	-	-	-	1.7701	-
-	21 CrMoV 5 7	-	-	K14073	21 CrMoV 5-7	20 CDV 5.07	-	-	-	-	1.7709	-
-	20 CrMoVTiB 4 10	-	-	-	20 CrMoVTiB 4-10	20 CrMoVTiB 4-10	-	-	-	-	1.7729	-
-	PS 275 TMK	S 275 ML	-	-	S 275 ML	S 275 ML	S 275 ML	-	-	-	1.8819	-
-	S 500 M	-	-	-	S 500 m	-	-	-	-	-	1.8829	-
-	BTSIE 460 TM	S 460 ML	-	-	S 460 ML	E 460	S 460 ML	-	-	-	1.8838	-
-	S 500 ML	-	-	-	S 500 ML	-	-	-	-	-	1.8839	-
-	S 275 MH	-	-	-	S 275 MH	-	S 275 MH	-	-	-	1.8843	-
-	S 275 MLH	-	-	-	S 275 MLH	-	S 275 MLH	-	-	-	1.8844	-
-	S 355 MH	-	-	-	S 355 MH	-	S 355 MH	-	-	-	1.8845	-
-	S 355 MLH	-	-	-	S 355 MLH	-	S 355 MLH	-	-	-	1.8846	-
-	S 420 MH	-	-	-	S 420 MH	-	S 420 MH	-	-	-	1.8847	-
-	S 420 MLH	-	-	-	S 420 MLH	-	S 420 MLH	-	-	-	1.8848	-
-	S 460 MH	-	-	-	S 460 MH	-	S 460 MH	-	-	-	1.8849	-
-	SIE 460	S 460 N	-	-	S 460 N	E 460	S 460 N	-	-	-	1.8901	-
-	TSIE 460	S 460 L	-	-	S 460 NL	E460	S 460 NL	-	-	-	1.8903	-
-	S 550 Q	-	-	-	S 550 Q	E 550	S 550 Q	-	-	-	1.8904	-
-	S 460 Q	55 F	-	-	S 460 Q	E 460	S 460 Q	-	-	-	1.8908	-
-	S 420 NL/TSIE 420	S 420 NL	STK 540	K02002	S 420 NL	E 420 T-I	Fe E 420 KT	-	-	-	1.8912	-
-	S 620 Q	-	-	-	S 620 Q	E 620	S 620 Q	-	-	-	1.8914	-
-	T St E 460/P460NL1	P 460 NL 1	-	K02900	P 460 NL1	E 460 T-I	Fe E 460 KT	-	-	-	1.8915	-
-	S 460 QL1	55 F	-	-	S 460 QL 1	-	-	-	-	-	1.8916	-
-	T St E 500	-	-	K02001	-	E 500 T-I	-	-	-	-	1.8917	-
-	ESIE 460/P460NI2	P 460 NL 2	-	-	P 460 NL 2	P 460 NL 2	P 460 NL 2	-	-	-	1.8918	-
-	ESIE 500/S500NL1	-	-	-	S 500 NL 1	-	-	-	-	-	1.8919	-
-	TSIE 690 VA/S690G1QL	-	-	-	S 690 G 1 QL	-	-	-	-	-	1.8920	-
-	TSIE 690 VB/S690G2QL	-	-	K11646	S 690 G 2 QL	-	-	-	-	-	1.8921	-
-	S 690 G 4 QL/TSIE 690 VC	-	-	-	S 690 G 4 QL	-	-	-	-	-	1.8922	-
-	S 590 QL/TSIE 590 V	-	-	-	S 590 QL	-	-	-	-	-	1.8923	-
-	S 500 Q (SIE 500 V)	-	-	-	S 500 Q	E 500	S 500 Q	2614	-	-	1.8924	-
-	S 890 QL 1 (ESIE 90 V)	-	-	-	S 890 QL 1	-	-	-	-	-	1.8925	-
-	S 690 QL (TSIE 690 V)	-	-	-	S 690 QL	-	-	-	-	-	1.8928	-
-	S 690 Q/SIE 690 V	-	SHY 685 NS	-	S 690 Q	E 690	S 690 Q	-	-	-	1.8931	-
-	WSt E 420/P420NH	S 420 NL	STK 540	K02002	S 420 NL	S 420 NL	Fe E 420 KW	-	-	-	1.8932	-
-	S 960 QL/TSIE 960 V	-	-	-	S 960 QL	-	-	-	-	-	1.8933	-
-	WSt E 460/P460NH	P 460 NH	-	K02900	P 460 NH	P 460 NH	Fe E 460 KW	-	-	-	1.8935	-
-	S 960 Q	-	-	-	S 960 Q	E 960 T-II	S 960 Q	-	-	-	1.8941	-
-	S 355 J 0 WP	WR 50 A	-	-	S 355 JO WP	E 36 W-A3	S 355 JO WP	-	-	-	1.8945	-
-	S 355 J 2 WP	S 355 J 2 WP	-	-	S 355 J2 WP	E36W-A4	S 355 J2 WP	-	-	-	1.8946	-
-	L 415 QB	-	-	-	L 415 QB	L 415 QB	-	-	-	-	1.8947	-
-	L 360 QB	-	-	-	L 360 QB	L 360 QB	-	-	-	-	1.8948	-
-	L 450 QB	-	-	-	L 450 QB	L 450 QB	-	-	-	-	1.8952	-
-	S 460 NH (FGS 47)	-	-	-	S 460 NH	-	S 460 NH	-	-	-	1.8953	-
-	L 485 QB	-	-	-	L 485 QB	L 485 QB	-	-	-	-	1.8955	-
-	S 460 NLH/FG S 47	-	-	-	S 460 NLH	-	S460NLH	-	-	-	1.8956	-
-	L 555 QB	-	-	-	L 555 QB	L 555 QB	-	-	-	-	1.8957	-
-	9 CrNiCuP 3 2 4	WR 50 A	SPA-H	K11430	-	-	-	-	-	-	1.8962	-
-	WTSI 52-3	WR 50 C	SMA 58 W	K11430	S 355 J 2 G 1 W	E 36 W-A2	-	-	-	-	1.8963	-
-	S 355 J 2 G 2 W	S 355 J 2 G 2 W	-	-	S 355 J 2 G 2 W	S 355 J 2 G 2 W	S 355 J 2 G 2 W	-	-	-	1.8965	-

(continued)

P3
Workpiece Materials Listing • Steel • P3 (continued)
P3 Alloy Steels and Tool Steels
Content: C >.25%
Tensile Strength RM (MPa): 600–850*
Hardness (HB): <330 (HRC): <35

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Material Number	Manufacturer Reference
–	S 355 K 2 G 1 W	S 355 K 2 G 1 W	SMA 490 CW	–	S 355 K2 G1 W	S 355 K2 G1 W	S 355 K 2 G 1 W	–	–	–	1.8966	–
–	S 355 K 2 G 2 W	S 355 K 2 G 2 W	–	–	S 355 K2G2W	S 355 K 2 G 2 W	S 355 K 2 G 2 W	–	–	–	1.8967	–
–	QStE 600 TM/S 600 MC	–	–	–	S 600 MC	E 620 D	S 600 MC	–	–	–	1.8969	–
–	SfE 415.7/L 415 NB	–	–	–	L 415 NB	L 415 NB	–	–	–	–	1.8972	–
–	SfE 415.7 TM/L 415 MB	–	–	–	L 415 MB	L 415 MB	–	–	–	–	1.8973	–
–	S 700 MC (QStE 690 TM)	–	–	–	S 700 MC	E 690 D	S 700 MC	–	–	–	1.8974	–
–	L 450 MB/SfE 445.7 TM	–	–	–	L 450 MB	L 450 MB	–	–	–	–	1.8975	–
–	S 650 MC (QStE 650 TM)	–	–	–	S 650 MC	E 620 D	S 650 MC	–	–	–	1.8976	–
–	L 485 MB/SfE 480.7 TM	–	–	–	L 485 MB	L 485 MB	–	–	–	–	1.8977	–
–	SfE 550.7 TM/L 555 MB	–	–	–	L 555 MB	L 555 MB	–	–	–	–	1.8978	–
–	St 60-2	4360-55 E	SM 58	–	E 335	A 60-2	Fe 60-2	1650	–	–	1.0060	–
–	St 70-2	E 360	–	–	E 360	A 70-2	Fe 70-2	1655	–	–	1.0070	–
–	C 4D	–	–	–	C 4 D	FM 5	C 4 D	–	–	–	1.0300	–
–	C 22 B	–	–	–	P 250 GH	–	–	–	–	–	1.0460	–
–	H 260/ZSt E 260	H 240 LA	–	–	H 240 LA	E 240 C	–	–	–	–	1.0480	–
–	C 32D	–	SWRH 32	K02701	C 32 D	FM 32	C 32 D	–	–	–	1.0530	–
–	ZStE 380/H 380	H 360 L A	–	–	H 360 LA	E 355 C	–	–	–	–	1.0550	–
–	C 60D	–	–	–	C 60 D	FM 60	C 60 D	–	–	–	1.0610	–
–	38 SMn 28	38 SMn 28	–	–	38 SMn 28	38 SMn 28	–	–	–	–	1.0760	–
–	QSt E 260 TM/S 260 MC	–	–	–	S 260 MC	41 S 7	Fe E 275 TM	–	–	–	1.0970	–
–	C 3D2	–	–	–	C 3 D 2	FM 5	C 3 D 2	–	–	–	1.1110	–
–	C 38D2	–	–	–	C 38 D 2	FM 38	C 38 D 2	–	–	–	1.1150	–
–	C 42 E AI/Ck 42 AI	–	–	–	S 355 G15	–	–	–	–	–	1.1190	–
–	C 56D2/D 55-2	–	–	–	C 56 D 2	FM 56	C 56 D 2	–	–	–	1.1220	–
–	C 70 W1	–	–	–	CT 70	C 70 E 2 U	C 70 K U	–	–	–	1.1520	–
–	C 45 W	–	–	–	C 45 U	Y3 42	–	–	–	–	1.1730	–
–	C 60 W	–	SK 7	–	–	Y3 55	–	–	–	–	1.1740	–
–	100 CrMn 6	–	–	K19195	100 CrMn 6	100 CM 6	–	–	–	–	1.3520	–
–	28 B 2	–	SWRCHB 26	–	C 30 B	20 B 3	–	–	–	–	1.5510	–
–	St E 380	–	SM 50 B	–	S 380 N	–	Fe E 390 KG	–	–	–	1.8900	–
–	TSfE 380/S380NL	–	–	–	S 380 NL	–	Fe E 390 KT	2117	–	–	1.8910	–
–	S 890 Q	–	–	–	S 890 Q	S 890 Q	–	–	–	–	1.8940	–
–	46 Si 7	–	–	–	45 Si	46 S 7	–	–	–	–	1.5024	–
–	55 Si 7	250 A 53	–	G92550	56 Si 7	55 S 7	55 Si 8	2085	–	–	1.5026	–
–	37 MnSi 5	–	–	–	–	38 MS 5	–	F.130.A	–	–	1.5122	–
–	15 MnMoV 4 5	–	–	–	15 MnMoV 4-5	15 MDV 4.05	–	–	–	–	1.5402	–
–	11 MnMo 4 5	–	–	K11123	11 MnMo 45 KE	–	–	–	–	–	1.5425	–
–	13 MnMo 6 5	–	–	K11424	11 MnMo 65 KE	–	–	–	–	–	1.5426	–
–	35 B 2	–	SWRCHB 237	–	C 35 B	35 B 3	–	–	–	–	1.5511	–
–	24 Ni 8	–	SCPL 21	J22501	G 9 Ni 10	22 N 8	G9Ni10	–	–	–	1.5633	–
–	10 NiCr 5 4	10NiCr5-4	–	–	10 NiCr 5-4	10 NiCr 5-4	–	–	–	–	1.5805	–
–	18 MnMoNi 5 5	–	–	–	18 MnMoNi 5-5	–	–	–	–	–	1.6308	–
–	20 MnMoNi 4 5	–	SQV 2 B	K12539	20 MnMoNi 4-5	–	–	–	–	–	1.6311	–
–	15 MnCrMoNiV 5 3	–	–	–	15 MnCrMoNiV 5-3	–	–	–	–	–	1.6920	–
–	17 CrS 3	17 CrS3	–	–	17 CrS 3	17 CrS 3	–	–	–	–	1.7014	–
–	28 CrS 4	–	–	–	28CrS4	28CrS4	–	–	–	–	1.7036	–
–	34 CrS 4	34 CrS 4	–	–	34 CrS 4	34 CrS 4	34 CrS 4	–	–	–	1.7037	–
–	41 CrS 4	41 CrS 4	–	–	41 CrS 4	41 CrS 4	41 CrS 4	2245	–	–	1.7039	–
–	38 Cr 4	–	–	–	38 Cr 4	–	38 Cr 4	–	–	–	1.7043	–
–	16 CrMo 4	18 CrMo4	SCM 418 H	–	18 CrMo 4	15 CD 3.5	18 CrMo 4	–	–	–	1.7242	–
–	12 CrMo 11 10	–	–	–	–	–	–	–	–	–	1.7305	–
–	22 CrMoS 3 5	–	–	–	22 CrMoS 3-5	22 CrMoS 3-5	–	–	–	–	1.7333	–
–	12 CrMo 19 5	3606-625	SCMV 6	K41545	X 12 CrMo 5	Z 10 GD 5.05	16 CrMo 20 5	–	–	–	1.7362	–
–	X 7 CrMo 6 1	B 5	–	S50281	CM 5-IG	–	–	–	–	–	1.7373	–
–	51 CrMoV 4	–	–	–	51 CrMoV 4	51 CDV 4	51 CrMoV 4	–	–	–	1.7701	–
–	21 CrMoV 5 7	–	–	K14073	21 CrMoV 5-7	20 CDV 5.07	–	–	–	–	1.7709	–
–	20 CrMoVTiB 4 10	–	–	–	20 CrMoVTiB 4-10	20 CrMoVTiB 4-10	–	–	–	–	1.7729	–
–	PS 275 TMK	S 275 ML	–	–	S 275 ML	S 275 ML	S 275 ML	–	–	–	1.8819	–
–	S 500 M	–	–	–	S 500 m	–	–	–	–	–	1.8829	–
–	BTSfE 460 TM	S 460 ML	–	–	S 460 ML	E 460	S 460 ML	–	–	–	1.8838	–
–	S 500 ML	–	–	–	S 500 ML	–	–	–	–	–	1.8839	–
–	S 275 MH	–	–	–	S 275 MH	–	S 275 MH	–	–	–	1.8843	–
–	S 275 MLH	–	–	–	S 275 MLH	–	S 275 MLH	–	–	–	1.8844	–
–	S 355 MH	–	–	–	S 355 MH	–	S 355 MH	–	–	–	1.8845	–
–	S 355 MLH	–	–	–	S 355 MLH	–	S 355 MLH	–	–	–	1.8846	–
–	S 420 MH	–	–	–	S 420 MH	–	S 420 MH	–	–	–	1.8847	–
–	S 420 MLH	–	–	–	S 420 MLH	–	S 420 MLH	–	–	–	1.8848	–
–	S 460 MH	–	–	–	S 460 MH	–	S 460 MH	–	–	–	1.8849	–
–	SfE 460	S 460 N	–	–	S 460 N	E 460	S 460N	–	–	–	1.8901	–
–	TSfE 460	S 460 L	–	–	S 460 NL	E460	S 460 NL	–	–	–	1.8903	–
–	S 550 Q	–	–	–	S 550 Q	E 550	S 550 Q	–	–	–	1.8904	–
–	S 460 Q	55 F	–	–	S 460 Q	E 460	S 460 Q	–	–	–	1.8908	–
–	S 420 NL/TSfE 420	S 420 NL	STK 540	K02002	S 420 NL	E 420 T-I	Fe E 420 KT	–	–	–	1.8912	–
–	S 620 Q	–	–	–	S 620 Q	E 620	S 620 Q	–	–	–	1.8914	–
–	T St E 460/P460NL1	P 460 NL 1	–	K02900	P 460 NL 1	E 460 T-I	Fe E 460 KT	–	–	–	1.8915	–
–	S 460 QL 1	55 F	–	–	S 460 QL 1	–	–	–	–	–	1.8916	–
–	T St E 500	–	–	K02001	–	E 500 T-I	–	–	–	–	1.8917	–
–	ESfE 460/P460Ni2	P 460 NL 2	–	–	P 460 NL 2	P 460 NL 2	P 460 NL 2	–	–	–	1.8918	–
–	ESfE 500/S500NL1	–	–	–	S 500 NL 1	–	–	–	–	–	1.8919	–
–	TSfE 690 VA/S690G1QL	–	–	–	S 690 G 1 QL	–	–	–	–	–	1.8920	–
–	TSfE 690 VB/S690G2QL	–	–	K11646	S 690 G 2 QL	–	–	–	–	–	1.8921	–
–	S 690 G 4 QL/TSfE 690 VC	–	–	–	S 690 G 4 QL	–	–	–	–	–	1.8922	–
–	S 590 QL/TSfE 590 V	–	–	–	S 590 QL	–	–	–	–	–	1.8923	–
–	S 500 Q (SfE 500 V)	–	–	–	S 500 Q	E 500	S 500 Q	2614	–	–	1.8924	–
–	S 890 QL 1 (ESfE 90 V)	–	–	–	S 890 QL 1	–	–	–	–	–	1.8925	–
–	S 690 QL (TSfE 690 V)	–	SHY 685 NS	–	S 690 QL	–	–	–	–	–	1.8928	–
–	S 690 Q/SfE 690 V	–	SHY 685 N	–	S 690 Q	E 690	S 690 Q	–	–	–	1.8931	–

NOTE: For legend, see page Y217.

(continued)

P3

Workpiece Materials Listing • Steel • P3 (continued)

P3 Alloy Steels and Tool Steels

Content: C >.25%

Tensile Strength RM (MPa)*: 600–850

Hardness (HB): <330 (HRC): <35

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Material Number	Manufacturer Reference
-	WSt E 420/P420NH	S 420 NL	STK 540	K02002	S 420 NL	S 420 NL	Fe E 420 KW	-	-	-	1.8932	-
-	S 960 QL/TSIE 960 V	-	-	-	S 960 QL	-	-	-	-	-	1.8933	-
-	WSt E 460/P460NH	P 460 NH	-	K02900	P 460 NH	P 460 NH	Fe E 460 KW	-	-	-	1.8935	-
-	S 960 Q	-	-	-	S 960 Q	E 960 T-II	S 960 Q	-	-	-	1.8941	-
-	S 355 J 0 WP	WR 50 A	-	-	S 355 J0 WP	E 36 W-A3	S 355 J0 WP	-	-	-	1.8945	-
-	S 355 J 2 WP	S 355 J 2 WP	-	-	S 355 J2 WP	E36W-A4	S 355 J2 WP	-	-	-	1.8946	-
-	L 415 OB	-	-	-	L 415 OB	L 415 OB	-	-	-	-	1.8947	-
-	L 360 OB	-	-	-	L 360 OB	L 360 OB	-	-	-	-	1.8948	-
-	L 450 OB	-	-	-	L 450 OB	L 450 OB	-	-	-	-	1.8952	-
-	S 460 NH (FGS 47)	-	-	-	S 460 NH	-	S 460 NH	-	-	-	1.8953	-
-	L 485 OB	-	-	-	L 485 OB	L 485 OB	-	-	-	-	1.8955	-
-	S 460 NLH/FG S 47	-	-	-	S 460 NLH	-	S460NLH	-	-	-	1.8956	-
-	L 555 OB	-	-	-	L 555 OB	L 555 OB	-	-	-	-	1.8957	-
-	9 CrNiCuP 3 2 4	WR 50 A	SPA-H	K11430	-	-	-	-	-	-	1.8962	-
-	WTSt 52-3	WR 50 C	SMA 58 W	K11430	S 355 J 2 G 1 W	E 36 W-A2	-	-	-	-	1.8963	-
-	S 355 J 2 G 2 W	S 355 J 2 G 2 W	-	-	S 355 J 2 G 2 W	S 355 J 2 G 2 W	S 355 J 2 G 2 W	-	-	-	1.8965	-
-	S 355 K 2 G 1 W	S 355 K 2 G 1 W	SMA 490 CW	-	S 355 K2 G1 W	S 355 K2 G1 W	S 355 K 2 G 1 W	-	-	-	1.8966	-
-	S 355 K 2 G 2 W	S 355 K 2 G 2 W	-	-	S 355 K2G2W	S 355 K 2 G 2 W	S 355 K 2 G 2 W	-	-	-	1.8967	-
-	QStE 600 TM/S 600 MC	-	-	-	S 600 MC	E 620 D	S 600 MC	-	-	-	1.8969	-
-	SIE 415.7/L 415 NB	-	-	-	L 415 NB	L 415 NB	-	-	-	-	1.8972	-
-	SIE 415.7 TML 415 MB	-	-	-	L 415 MB	L 415 MB	-	-	-	-	1.8973	-
-	S 700 MC (QStE 690 TM)	-	-	-	S 700 MC	E 690 D	S 700 MC	-	-	-	1.8974	-
-	L 450 MB/SIE 445.7 TM	-	-	-	L 450 MB	L 450 MB	-	-	-	-	1.8975	-
-	S 650 MC (QStE 650 TM)	-	-	-	S 650 MC	E 620 D	S 650 MC	-	-	-	1.8976	-
-	L 485 MB/SIE 480.7 TM	-	-	-	L 485 MB	L 485 MB	-	-	-	-	1.8977	-
-	SIE 550.7 TML 555 MB	-	-	-	L 555 MB	L 555 MB	-	-	-	-	1.8978	-
-	St 60-2	4360-55 E	SM 58	-	E 335	A 60-2	Fe 60-2	1650	-	-	1.0060	-
-	St 70-2	E 360	-	-	E 360	A 70-2	Fe 70-2	1655	-	-	1.0070	-
-	C 4 D	-	-	-	C 4 D	FM 5	C 4 D	-	-	-	1.0300	-
-	C 22 8	-	-	-	P 250 GH	-	-	-	-	-	1.0460	-
-	H 260/ZSt E 260	H 240 LA	-	-	H 240 LA	E 240 C	-	-	-	-	1.0480	-
-	C 32 D	-	SWRH 32	K02701	C 32 D	FM 32	C 32 D	-	-	-	1.0530	-
-	ZStE 380/H 380	H 360 LA	-	-	H 360 LA	E 355 C	-	-	-	-	1.0550	-
-	C 60 D	-	-	-	C 60 D	FM 60	C 60 D	-	-	-	1.0610	-
-	38 SMn 28	38 SMn 28	-	-	38 SMn 28	38 SMn 28	-	-	-	-	1.0760	-
-	QSt E 260 TM/5260 MC	-	-	-	S 260 MC	41 S 7	Fe E 275 TM	-	-	-	1.0970	-
-	C 3 D 2	-	-	-	C 3 D 2	FM 5	C 3 D 2	-	-	-	1.1110	-
-	C 38 D 2	-	-	-	C 38 D 2	FM 38	C 38 D 2	-	-	-	1.1150	-
-	C 42 E Al/Ck 42 Al	-	-	-	S 355 G15	-	-	-	-	-	1.1190	-
-	C 56 D 2/D 55-2	-	-	-	C 56 D 2	FM 56	C 56 D 2	-	-	-	1.1220	-
-	C 70 W 1	-	-	-	CT 70	C 70 E 2 U	C 70 K U	-	-	-	1.1520	-
-	C 45 W	-	-	-	C 45 U	Y3 42	-	-	-	-	1.1730	-
-	C 60 W	-	SK 7	-	-	Y3 55	-	-	-	-	1.1740	-
-	100 CrMn 6	-	-	K19195	100 CrMn 6	100 CM 6	-	-	-	-	1.3520	-
-	28 B 2	-	SWRCHB 26	-	C 30 B	20 B 3	-	-	-	-	1.5510	-
-	St E 380	-	SM 50 B	-	S 380 N	-	Fe E 390 KG	-	-	-	1.8900	-
-	TSIE 380/S380NL	-	-	-	S 380 NL	-	Fe E 390 KT	2117	-	-	1.8910	-
-	S 890 Q	-	-	-	S 890 Q	S 890 Q	S 890 Q	-	-	-	1.8940	-

P4

Workpiece Materials Listing • Steel • P4

P4 Alloy Steels and Tool Steels

Content: C >.25%

Tensile Strength RM (MPa)*: 850–1400

Hardness (HB): 350–450 (HRC): 35–48

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Material Number	Manufacturer Reference
A 570 Gr. 40	St 44-2	4360-43 B	SM 41 B	K 02502	S 275 JR	E 28-2	Fe 430 BFN	1412	-	-	1.0044	-
-	S 235 J0/Fe 360 C	En 40C	-	-	S 235 J0	E24-3	Fe 360 CFN	-	-	-	1.0114	-
A 570 Gr. 36	St 37-3	4360-40 C	-	K01501	S 235 J2 G3	Fe 360 D1(2); E 24-3	Fe 360 D1(2)	1312	-	-	1.0116	-
-	QSt 37-3	-	SWRCH 12R	-	-	-	-	-	-	-	1.0123	-
-	S 275 J0	En43C; S275J0	-	-	S 275 J0/Fe 430 C	S 275 J0; E 28-3	S275J0; Fe430CFN	-	-	-	1.0143	-
A 573 Gr. 70	St 44-3	4360-43 C	SM 41 B	-	Fe 430 D1(2); S 275 J2 G3 (4)	Fe 430 D1(2); E 28-4	Fe 430 D FF	1414	-	-	1.0144	-
-	S 275 J2 G4/Fe 430 D 2	S 275 J2 G4	-	-	S 275 J2 G4	E28-4; S 275 J2 G4	S 275 J2 G4	1414	-	-	1.0145	-
-	Ro St 44-2	43C	-	-	S 275 J0 H	-	S 275 J0 H	-	-	-	1.0149	-
-	St 37.0	-	STPG 38	-	P 235 T1	-	-	-	-	-	1.0254	-
-	C 9 D	-	SWRM 8	-	C 9 D	FM 9	C 9 D	-	-	-	1.0304	-
-	C 7 D	C 7 D	SWRM 8	G10060	C 7 D	FM 8	C 7 D	-	-	-	1.0313	-
-	L 210 GA	-	-	-	L 210 GA	TS E 220 class 2	-	-	-	-	1.0319	-
-	USD 7/C 8 G 1 W	-	-	-	C 8 G 1 W	-	-	-	-	-	1.0323	-
-	RSD 7/C8G2W	-	-	-	C 8 G 2 W	-	-	-	-	-	1.0324	-
-	RSD 10 Si/C10WSi	-	-	-	C 10 W Si	-	-	-	-	-	1.0339	-
-	P 235 GH	P 235 GH	SPV 50	K02503	P 235 GH	A 37 CP	Fe E 235	1330	-	-	1.0345	-
-	RRSD 10/C10 W	-	-	-	C 10 W	-	-	-	-	-	1.0351	-
-	St 45.8	-	STB 410	K02727	-	-	-	-	-	-	1.0405	-
-	C 25 Pb	-	-	-	C 25 GPb	-	-	-	-	-	1.0411	-
-	L 245 MB	430	-	K03006	L 245 MB	L 245 MB	-	-	-	-	1.0418	-
1513	P 265	HR 40/30	-	G15130	-	12 M 5	-	-	-	-	1.0424	-
-	P 310 NB	224-410	SG 325	K02100	P280GH	BS 2	P 275 N	2103	-	-	1.0426	-
-	L 290 MB	-	-	-	L290MB	L 290 MB	-	-	-	-	1.0429	-
-	H III/P285NH	-	Sm 38	-	P 285 NH	-	-	-	-	-	1.0435	-
-	P 310 NB	224-430	SG 325	K02100	P305GH	P 275 N	P 275 N	2103	-	-	1.0436	-
-	A St 41	P 275 N	STK 400	K02100	S 275 N	BS 3	P 275 N	2103	-	-	1.0437	-
-	B 500 A	-	SD 490	-	B 500 A	-	B 500 A	-	-	-	1.0438	-
-	GS-45	-	SC 450	-	-	-	-	-	-	-	1.0443	-
-	H IV/P295NH	-	SG 37	K03102	-	-	Fe 460-2 KW	-	-	-	1.0445	-

(continued)

P4
Workpiece Materials Listing • Steel • P4 (continued)

P4 Alloy Steels and Tool Steels

Content: C>.25%

Tensile Strength RM (MPa)*: 850–1400

Hardness (HB): 350–450 (HRC): 35–48

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Material Number	Manufacturer Reference
-	StE 240.7	-	-	-	L 245 NB	L 245 NB	-	-	-	-	1.0457	-
-	H11/L 235 GA	-	-	-	L 235 GA	-	-	-	-	-	1.0458	-
-	L 245 GA/RRStE 240.7	-	-	-	L 245 GA	TS E 250	-	-	-	-	1.0459	-
-	St E255	-	-	K01800	-	-	-	-	-	-	1.0461	-
-	TSIE 255	-	-	K11535	-	-	-	-	-	-	1.0463	-
-	15 Mn 3 Al	-	-	-	C 14 GAl	-	-	-	-	-	1.0468	-
-	21 Mn 4	-	-	-	-	-	20 Mn 4	-	-	-	1.0469	-
-	19 Mn 6/P 355 GH	P 355 GH	SGV 46	K03300	P355GH	A 52 CP	Fe E355-2	2101	-	-	1.0473	-
-	17 Mn 4/P 295 GH	224-460B	SG 37	K03501	P 295 GH	A 48 CP	Fe E 295	2102	-	-	1.0481	-
-	19 Mn 5	224-460	SG 37	K 03102	-	A 52 CP; AP; FP	Fe 460-2 KW	-	-	-	1.0482	-
-	L 290 AG	-	-	-	L290GA	TS E 290	-	-	-	-	1.0483	-
-	L 290 NB	-	-	-	L290NB	L 290 NB	-	-	-	-	1.0484	-
-	21 Mn 6	-	-	K12320	-	-	-	-	-	-	1.0485	-
-	St E 285	P 275 N	SM 41 A	K 01802	P 275 N	P 275 N	Fe E 285 KG	-	-	-	1.0486	-
-	W St E 285	P 275 N	-	K 01802	P 275 NH	P 275 N	Fe E 285 KW	-	-	-	1.0487	-
-	T St E 285	P 275 NL 1	SLA 235 A	K 01803	P 275 NL 1	P 275 NL 1	Fe E 285 KT	-	-	-	1.0488	-
-	H 300/ZSt E 300	H280LA	-	-	H 280 LA	E 280 C	-	-	-	-	1.0489	-
-	S 275 NH	S 275 NH	-	-	S 275 NH	-	S 275 NH	-	-	-	1.0493	-
-	S 275 NLH	S275NLH	-	-	S 275 NLH	-	S275NLH	-	-	-	1.0497	-
-	L 360 GA	-	-	-	L 360 GA	-	-	-	-	-	1.0499	-
-	C 35 Pb/C 35 GPb	-	-	-	C 35 Pb	-	-	-	-	-	1.0502	-
-	St E 315/P 315N	-	SM 50 A	K11506	P 315 N	-	Fe E 315 KG	-	-	-	1.0505	-
-	W St E 315	-	SNC 1	K02404	P 315 NH	-	Fe E 315 KW	2107	-	-	1.0506	-
-	St 55	-	STKM 16A	-	-	-	Fe 540	-	-	-	1.0507	-
-	T St E315	-	SLA 325 A	K02404	P 315 NL	-	-	2106	-	-	1.0508	-
-	C 40 Pb	-	-	-	C 40 G Pb	-	-	-	-	-	1.0512	-
-	C38D	-	SWRH 37	-	C 38 D	FM 38	C 38 D	-	-	-	1.0516	-
-	C48D	-	SWRH 48	-	C 48 D	FM 48	C 48 D	-	-	-	1.0517	-
-	C56D	-	-	-	C 56 D	FM 56	C 56 D	-	-	-	1.0518	-
-	StSch 700 (R 0 700)	-	-	-	R 0700	-	-	-	-	-	1.0521	-
-	StSch800 (R 0 800)	-	-	-	R 0800	-	-	-	-	-	1.0524	-
-	Cf 45 Pb	-	-	-	-	-	C 46	-	-	-	1.0526	-
-	C32D	-	SWRH 32	K02701	C 32 D	FM 32	C 32 D	-	-	-	1.0530	-
-	GL-A 40 (S 390 G 1 S)	-	-	-	S 390 G 1 S	-	-	-	-	-	1.0532	-
-	S 355 NH	S 355 NH	-	-	S 355 NH	-	S 355 NH	-	-	-	1.0539	-
-	C42D	-	SWRH 42 B	-	C 42 D	FM 42	C 42 D	-	-	-	1.0541	-
-	Schienen 60 F(R 0600/ St Sch 60)	-	-	-	R 0600	-	-	-	-	-	1.0544	-
-	S 355 JO H	50 C	-	-	S 355 JO H	-	S 355 JO H	-	-	-	1.0547	-
-	ZStE 340/H 340	H 320 L A	-	-	H 320 LA	E 315 C	-	-	-	-	1.0548	-
-	S 335 NLH	50 EE	-	-	S 355 N LH	-	S 355 N L H	-	-	-	1.0549	-
-	GS-52	A2	-	-	GE 260	-	-	-	-	-	1.0552	-
-	S 355 JO	En 50 C; S 355 JO	SM 520 M	-	S 355 JO	S 355 JO; E 36-3	S 355 JO; Fe 510 C FN	-	-	-	1.0553	-
-	GS-70	50 C	-	-	S 355 JO C	E 36-3	Fe 510 C	-	-	-	1.0554	-
-	GS-62	-	-	-	S 355 GO 1	-	-	-	-	-	1.0555	-
-	ZStE 420/H 420	46/40HR,HS,CS	-	-	H 400 LA	H 400 LA	-	-	-	-	1.0556	-
-	P355 NB	-	SG 365	-	P 355 NB	BS 4	-	-	-	-	1.0557	-
-	GS-62.3	-	-	-	S 355 GO 2	-	-	-	-	-	1.0559	-
A 633 Gr. C	St E 355	P 355 N	SM 50 YB	K12000	P 355 N	E 355 R/FP	Fe E 355 KG	2132	-	-	1.0562	-
-	N 80	-	-	-	-	-	-	-	-	-	1.0564	-
-	W St E 355	P 355 NH	-	K01600	P 355 NH	P 355 NH	Fe E 355 KW	-	-	-	1.0565	-
-	T St E355	P 355 NL1	SLA 37	-	P 355 NL1	P 355 NL1	Fe E 355 KT	-	-	-	1.0566	-
-	32 Mn 3	-	-	-	-	-	-	-	-	-	1.0567	-
-	P355 QH1	P 355 QH	-	-	P 355 QH	P 355 QH	-	-	-	-	1.0571	-
-	ZStE 460/H 460	-	-	-	-	-	-	-	-	-	1.0574	-
-	S 355 J 2 G 4	S 355 J 2 G 4	-	-	S 355 J 2 G 4	S 355 J 2 G 4	S 355 J 2 G 4	-	-	-	1.0577	-
-	L 360 MB	-	-	-	L 360 MB	L 360 MB	-	-	-	-	1.0578	-
-	St 52.4	-	STS 49	-	-	-	-	-	-	-	1.0581	-
-	L 360 NB/StE 360.7	-	-	-	L360NB	L 360 NB	-	-	-	-	1.0582	-
-	S 355 J 2 G 3 Cu/St 52-3 Cu3	-	-	-	S 355 J2 G3 Cu + CR	-	-	-	-	-	1.0585	-
-	C50D	-	-	-	C 50 D	FM 50	C 50 D	-	-	-	1.0586	-
-	QSt 52-3 Cu 3	-	-	-	S 355 J2 G3 Cu C	-	-	-	-	-	1.0587	-
-	D 53-2	-	SWRH 52 B	-	C 52 D	FM 52	C 52 D	-	-	-	1.0588	-
-	FSIE 355 OS 3/S355G03	-	-	K12000	S 355 G03	-	-	-	-	-	1.0591	-
-	S 355 J 2 G 4 Cu	-	-	-	S 355 J2 G4 Cu	-	-	-	-	-	1.0592	-
-	S355K2G3/Fe 510 DD1 (MULTIST)	S 355 K 2 G 3	SM 520 C	K02505	S 355 K 2 G 3	E36-4	S 355 K 2 G 3	-	-	-	1.0595	-
-	S355K2G4/Fe 510 DD 2 (MULTIST)	S 355 K 2 G 4	-	-	S 355 K 2 G 4	S 355 K 2 G 4	S 355 K 2 G 4	-	-	-	1.0596	-
-	C 30 Pb	-	-	-	C 3 0 GPb	-	-	-	-	-	1.0598	-
-	C 60 Pb	-	-	-	C 60 GPb	-	-	-	-	-	1.0602	-
-	C 67 GPb/C 67 Pb	-	-	-	C 67 GPb	-	-	-	-	-	1.0606	-
-	C 75 GPb/C 75 Pb	-	-	-	C 75 GPb	-	-	-	-	-	1.0607	-

NOTE: For legend, see page Y217.

(continued)

P4

■ Workpiece Materials Listing • Steel • P4 (continued)

P4 Alloy Steels and Tool Steels

Content: C>.25%

Tensile Strength RM (MPa)*: 850–1400

Hardness (HB): 350–450 (HRC): 35–48

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Material Number	Manufacturer Reference
-	C62D	-	SWRH 62 B	-	C 62 D	FM 62	C 62 D	-	-	-	1.0611	-
-	C66D	-	-	-	C 66 D	FM 66	C 66 D	-	-	-	1.0612	-
-	C68D	-	SWRH 67 B	-	C 68 D	FM 68	C 68 D	-	-	-	1.0613	-
-	C70D	-	-	-	C 70 D	FM 70	C 70 D	-	-	-	1.0615	-
-	C72D	-	SWRH 72 B	-	C 72 D	FM 72	C 72 D	-	-	-	1.0617	-
-	GS-C 25	-	SCPH 1	-	GP 240 GH	GP 240 GH	GP 240 Gh	-	-	-	1.0619	-
-	GP 240 GR	-	-	-	GP 240 GR	GP 240 GR	GP 240 GR	-	-	-	1.0621	-
-	C80D	-	-	-	C 80 D	FM 80	C 80 D	-	-	-	1.0622	-
-	StSch 900 A (R 0900)	-	-	-	R 0900	-	-	-	-	-	1.0623	-
-	StSch 900 B (R 0900 Mn)	-	-	-	R 0900 Mn	-	-	-	-	-	1.0624	-
1345	StSch 90 C/GP 280 GH	-	-	G13450	GP 280 GH	GP 280 GH	GP 280 GH	-	-	-	1.0625	-
-	C82D	-	SWRH 82 B	-	C 82 D	FM 82	C 82 D	-	-	-	1.0626	-
-	C88D	-	-	-	C 88 D	-	C 88 D	-	-	-	1.0628	-
-	StSch 1200 (R 1200)	-	-	-	R 1200	-	-	-	-	-	1.0631	-
-	C 61/60 Mn 3	-	-	-	C 61	-	C 61	-	-	-	1.0642	-
-	C 85/85 Mn 3	-	-	-	C 85	-	C 85	-	-	-	1.0647	-
-	35 SPb 20	35 SPb 20	-	-	35 SPb 20	35 SPb 20	-	-	-	-	1.0756	-
-	45 SPb 20	-	-	-	46 SPb 20	-	-	-	-	-	1.0757	-
-	38 SMnPb 28	38 SMnPb 28	-	-	38 SMnPb 28	38 SMnPb 28	38 SMnPb 28	-	-	-	1.0761	-
-	44 SMn 28	44 SMn 28	-	-	44 SMn 28	44 SMn 28	44 SMn 28	-	-	-	1.0762	-
-	44 SMnPb 28	44 SMnPb 28	-	-	44 SMnPb 28	44 SMnPb 28	44 SMnPb 28	-	-	-	1.0763	-
-	36 SMnPb 14	36 SMnPb 14	-	-	36 SMnPb 14	36 SMnPb 14	36 SMnPb 14	-	-	-	1.0765	-
9255	51 Si 7	250 A 53	-	G92550	-	51 S 7	48 Si 7	2090	-	-	1.0903	-
9255	55 Si 7	250 A 53	SKH 1; SKT 4	G92550	55 NiCrMoV 7	55 S 7	55 Si 8	2085	-	-	1.0904	-
-	StSch 1100 (R 1100 Cr)	-	-	-	R 1100 Cr	-	-	-	-	-	1.0915	-
9262	60 SiCr 7	250 A 61	SUP 7	G92620	60 SiCr 8	60 SC 7	60 SiCr 8	-	-	-	1.0961	-
-	QSt E 690 TM (S 700 MC)	-	-	-	S 700 MC	S 690 MC	S 700 MC	-	-	-	1.0966	-
-	QSt E 260 N 7 S 260 NC	-	AE 275 NC	-	S 260 NC	-	S 260 NCX	-	-	-	1.0971	-
-	QSt E 300 TM/S 315 MC	43 F35 HR,HS,CS	-	-	S 315 MC	E 315 D	S 315 MC	-	-	-	1.0972	-
-	QSt E 300 N 7/S 315 NC	-	AE 340 NC	-	S 315 NC	-	S 315 NC	-	-	-	1.0973	-
-	QSt E 340 TM	HR 40/30	-	-	S 340 MC	E 335 D	-	-	-	-	1.0974	-
-	QSt E 340 N	-	-	-	S 340 NC	-	Fe E 355 TD	-	-	-	1.0975	-
-	QSt E 360TM	-	-	-	S 355 MC	E 355 D	Fe E 355 TM	-	-	-	1.0976	-
-	QSt E 360 N	-	-	-	S 355 NC	-	Fe E 355 TD	-	-	-	1.0977	-
-	QSt E 380 TM	-	-	-	S 380 MC	E 390 D	-	-	-	-	1.0978	-
-	QSt E 380 N	-	-	-	S 380 NC	-	Fe E 380 TD	-	-	-	1.0979	-
-	QSt E 420 TM	HR 50 F 45	-	-	S 420 MC	E 430 D	Fe E 420 TM	-	-	-	1.0980	-
-	QSt E 420 N	-	-	-	S 420 NC	-	Fe E 420 TD	-	-	-	1.0981	-
-	QSt E 460 TM	50/45 HR	-	-	S 460 MC	E 445 D	-	-	-	-	1.0982	-
-	QSt E 460 N	-	-	-	S 460 NC	-	Fe E 460 TD	-	-	-	1.0983	-
-	QSt E 500 TM	-	-	-	S 500 MC	E 490 D	Fe E 490 TM	2662	-	-	1.0984	-
-	QSt E 500 N	-	-	-	S 500 NC	-	-	-	-	-	1.0985	-
-	QSt E 550 TM	60/55 HS	-	-	S 550 MC	E 560 D	Fe E 560 TM	-	-	-	1.0986	-
-	QSt E 550 N	-	-	-	S 550 NC	-	-	-	-	-	1.0987	-
-	FSiE 355 QS 3/S355G04	-	-	-	S 355 G04	-	-	-	-	-	1.1102	-
-	ESiE 285	P 275 NL 2	STK 400	-	P 275 NL 2	P 275 NL 2	P 275 NL 2	-	-	-	1.1104	-
-	ESiE 315	-	-	-	S 315 NL 1	-	-	-	-	-	1.1105	-
-	ESiE 355	P 355 NL 2	STK 500	-	P 355 NL 2	P 355 NL 2	P 355 NL 2	-	-	-	1.1106	-
-	C5D2	-	-	-	C 5 D 2	FM 6	C 5 D 2	-	-	-	1.1111	-
-	USD 5/C 8 E1 W	-	-	-	C 8 E 1 W	-	-	-	-	-	1.1112	-
-	C8D2	-	-	-	C 8 D 2	FM 8	C 8 D 2	-	-	-	1.1113	-
-	C 10 E W/RSD 11	-	-	-	C 10 EW	-	-	-	-	-	1.1115	-
-	USD 6/C 8 E2 W	-	-	-	C 8 E 2 W	-	-	-	-	-	1.1116	-
-	G 24 Mn 4/GS 24 Mn 4	-	-	-	G 24 Mn 4	-	-	-	-	-	1.1136	-
-	C32D2	-	-	-	C 32 D 2	FM 32	C 32 D 2	-	-	-	1.1143	-
-	C36D2	-	-	-	C 36 D 2	FM 36	C 36 D 2	-	-	-	1.1145	-
-	C38D2	-	-	-	C 38 D 2	FM 38	C 38 D 2	-	-	-	1.1150	-
-	C 25 R	C 25 R	-	-	C 25 R	C 25 R	C 25 R	-	-	-	1.1163	-
-	C48D2	-	-	-	C 48 D 2	FM 48	C 48 D 2	-	-	-	1.1164	-
1330	GS-30 Mn 5	120 M 36	SMn 433 H; SCMn 2	K13300	-	35 M 5	-	1330	-	-	1.1165	-
1335	36 Mn 5	150 M 36	SMn 438(H)	G13350	-	40 M 5	-	2120	-	-	1.1167	-
-	G 40 Mn 5/GS 40 Mn 5	-	-	-	G 40 Mn 5	-	-	-	-	-	1.1168	-
-	20 Mn 6	150 M 19	-	-	-	20 M 5	20 Mn 6	-	-	-	1.1169	-
-	C50D2	-	-	-	C 50 D 2	FM 50	C50D 2	-	-	-	1.1171	-
-	Ck 38 Pb	-	-	-	25 Mn 4	-	-	-	-	-	1.1177	-
-	C 30 R	C 30 R	C 30 R (3 C 30)	-	C 30 R	C 30 R	C 30 R	-	-	-	1.1179	-
-	Ck 35 Pb	-	-	-	S 355 G 13	-	-	-	-	-	1.1182	-
-	Ck 36	-	-	-	S 355 G 14	-	-	-	-	-	1.1184	-
-	C301	-	-	-	C 3 D 1	-	C 3 D 1	-	-	-	1.1187	-
-	C40R/Cm 40	C 40 R	-	-	C 40 R	C 40 R	C 40	-	-	-	1.1189	-
-	C52D2	-	-	-	C 52 D 2	FM 52	C 52 D 2	-	-	-	1.1202	-
-	C 53 R/Cm 53	-	-	-	C 53 R	-	-	-	-	-	1.1205	-
-	C 10 R	C 10 R	-	-	C 10 R	C 10 R	-	-	-	-	1.1207	-
-	C 16 R	C 16 R	-	-	C 16 R	C 16 R	-	-	-	-	1.1208	-
-	C58D2	-	-	-	C 58 D 2	FM 58	C 58 D 2	-	-	-	1.1212	-
-	Ck 53 Pb	-	-	-	C 90 S	-	-	-	-	-	1.1217	-
-	C62D2	-	-	-	C 62 D 2	FM 62	C 62 D 2	-	-	-	1.1222	-
-	Cm 60	C 60 R	-	-	3 C 60	C 60 R	C 60 R	-	-	-	1.1223	-
-	C60D2	-	-	-	C 60 D 2	FM 60	C 60 D 2	-	-	-	1.1228	-
-	C68D2	-	-	-	C 68 D 2	FM 68	C 68 D 2	-	-	-	1.1232	-
-	C66D2	-	-	-	C 66 D 2	FM 66	C 66 D 2	-	-	-	1.1236	-
-	C50R	C 50 R	-	-	C 50 R	FM 50	C 50 R	-	-	-	1.1241	-
-	C72D2	-	-	-	C 72 D 2	FM 72	C 72 D 2	-	-	-	1.1242	-
-	C70D2	-	-	-	C 70 D 2	FM 70	C 70 D 2	-	-	-	1.1251	-
-	C78D2	-	-	-	C 78 D 2	FM 78	C 78 D 2	-	-	-	1.1252	-
-	C76D2	-	-	-	C 76 D 2	FM 76	C 76 D 2	-	-	-	1.1253	-
-	C80D2	-	-	-	C 80 D 2	FM 80	C 80 D 2	-	-	-	1.1255	-
-	C82D2	-	-	-	C 82 D 2	FM 82	C 82 D 2	-	-	-	1.1262	-
-	C86D2	-	-	-	C 86 D 2	FM 86	C 86 D 2	-	-	-	1.1265	-
-	C88D2	-	-	-	C 88 D 2	-	C 88 D 2	-	-	-	1.1272	-
-	C92D2	-	-	-	C 92 D 2	-	C 92 D 2	-	-	-	1.1282	-
-	C98D2	-	-	-	C 98 D 2	-	C 98 D 2	-	-	-	1.1283	-
-	46 MnVS 6	-	-	-	46 MnVS 6	-	-	-	-	-	1.1304	-
-	C 90 U	-	-	-	C90U	-	-	-	-	-	1.1535	-
-	C 110 U	-	-	-	C 110 U	-	-	-	-	-	1.1554	-
-	C 120 U	-	-	-	C120U	-	-	-	-	-	1.1555	-
T 8	C 80 W2	BW 1B	SKC 3	T12008	-	Y1 80	C 80 KU	-	-	-	1.1625	-
-	C 105 W2	-	SK 3	-	-	-	-	-	-	-	1.1645	-
-	C 135 W	-	SK 1	-	-	Y2 140	C 140 KU	-	-	-	1.1673	-
A-6	C 67 W	-	-	T30106	-	Y1 70	-	-	-	-	1.1744	-

(continued)

P4
Workpiece Materials Listing • Steel • P4 (continued)
P4 Alloy Steels and Tool Steels
Content: C>.25%
Tensile Strength RM (MPa): 850–1400*
Hardness (HB): 350–450 (HRC): 35–48

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Material Number	Manufacturer Reference
–	125 Cr 1	–	–	–	125 Cr 2	Y2 120 C	–	–	–	–	1.2002	–
–	85 Cr 1	–	–	–	–	Y1 100 C 2	–	–	–	–	1.2004	–
–	140 Cr 3	–	SKS 8	–	140 Cr 2	Y2 140 C	–	–	–	–	1.2008	–
–	105 Cr 4	–	SKC 11	–	–	–	–	–	–	–	1.2057	–
–	21 MnCr 5	–	SCR 420 H	–	21 MnCr 5	20 NC 5	–	–	–	–	1.2162	–
–	35 CrMo 7	–	–	–	35 CrMo 7	–	–	–	–	–	1.2302	–
–	48 CrMoV 67	–	–	–	–	45 CDV 6	–	–	–	–	1.2323	–
P6	15 NiCr 14	–	SNC 22	T51606	–	10 NC 12	–	–	–	–	1.2735	–
–	40 CrMnNiMo 8 6 4	–	–	–	40 CrMnNiMo 8-6-4	–	–	–	–	–	1.2738	–
–	57 NiCrMoV 7 7	–	–	–	55 NiCrMoV 7	–	–	–	–	–	1.2744	–
–	70 MnMoCr 8	–	–	–	70 MnMoCr 8	–	–	–	–	–	1.2824	–
–	95 MnWCr 5	–	–	–	95 MnWCr 5	–	–	–	–	–	1.2825	–
–	60 MnSi 4	–	–	–	–	60 MSC 4	–	–	–	–	1.2826	–
–	101 Cr 6	–	–	–	–	–	102 Cr 6 KU	–	–	–	1.3514	–
–	16 CrNiMo 6	820A16	–	–	–	16 NCD 6	16NiCrMo6	–	–	–	1.3531	–
–	100 CrMn 7 3	–	–	–	100 CrMnMo 7	100 CD 7	–	–	–	–	1.3536	–
–	100 CrMo 7	–	SUS 4	K19965	100 CrMo 7	100 CD 7	100CrMo7	–	–	–	1.3537	–
–	100 CrMnMo 8	–	–	–	–	100 CrMnMo 8	–	–	–	–	1.3539	–
5046	44 Cr 2	–	–	H50460	46 Cr 1 KD	44 Cr 2	–	–	–	–	1.3561	–
4142	43 CrMo 4	–	–	G41420	–	43 Cr Mo 4	–	–	–	–	1.3563	–
4147	48 CrMo 4	817 M 40	SNC 836	H41470	–	48 CrMo 4	–	–	–	–	1.3565	–
–	46 Si 7	–	–	–	45 Si	46 S 7	–	–	–	–	1.5024	–
9259H	51 Si 7	–	–	–	50 Si 7	–	48 Si 7	2090	–	–	1.5025	–
–	55 Si 7	250 A 53	–	G92550	56 Si 7	55 S 7	55 Si 8	2085	–	–	1.5026	–
9260	60 Si 7	251 A 60	–	G92600	60 Si 7	60 S 7	60 Si 7	–	–	–	1.5027	–
–	65 Si 7	–	SUP 7	–	–	–	–	–	–	–	1.5028	–
–	12 Mn 8	–	–	–	11 Mn 8 KE	–	–	–	–	–	1.5086	–
9262	60 SC 7	–	–	G92620	60 SiCr 8	61 SC 7	60 SiCr 8	–	–	–	1.5092	–
–	37 MnSi 5	–	–	–	–	38 MS 5	–	F.130.A	–	–	1.5122	–
–	50 MnSi 4	–	–	K04800	–	–	–	–	–	–	1.5131	–
–	15 MnMoV 4 5	–	–	–	15 MnMoV 4-5	15 MDV 4.05	–	–	–	–	1.5402	–
A 204 Gr. A	15 Mo 3	1501-240	STFA 12	K11820	16 Mo 3	15 D3	16 Mo 3 KW	2912	–	–	1.5415	–
4419	GS-22 Mo 4	243-430	SCPH 11	G44190	G 20 Mo 5	G20Mo5	G 22 Mo 5	–	–	–	1.5419	–
–	20 MnMo 3 5	–	–	K12121	–	–	–	–	–	–	1.5421	–
–	G 18 Mo 5	–	–	–	G18Mo5	–	G 18 Mo5	–	–	–	1.5422	–
4520	16 Mo 5	1503-245-420	SBC 690	K11522	–	–	16 Mo 5	–	–	–	1.5423	–
–	11 MnMo 4 5	–	–	K11123	11 MnMo 45 KE	–	–	–	–	–	1.5425	–
–	13 MnMo 6 5	–	–	K11424	11 MnMo 65 KE	–	–	–	–	–	1.5426	–
–	13 MnMo 8 5	–	–	K11423	11 MnMo 85 KE	–	–	–	–	–	1.5427	–
–	35 B 2	–	SWRCHB 237	–	C 35 B	35 B 3	–	–	–	–	1.5511	–
15B21 H	19 MnB 4	170 H 20	SWRCHB 420	H15211	19 MnB 4	20 MB 5	–	–	–	–	1.5523	–
15B21 H	20 MnB 5	–	SWRCHB 620	–	20 MnB 5	20 MB 5	20 MnB 5	–	–	–	1.5530	–
–	24 Ni 8	–	SCPL 21	J22501	G 9 Ni 10	22 N 8	G9Ni10	–	–	–	1.5633	–
A 350-LF 5	10 Ni 14	503	SL 3 N 26	K31718	12 Ni 14	12Ni14	18 Ni 14 KT	–	–	–	1.5637	–
P3	10 NC 6	–	–	T51603	15 NiCr 6	10 NC 6	–	–	–	–	1.5713	–
–	10 NiCr 5 4	10NiCr5-4	–	–	10 NiCr 5-4	10 NiCr 5-4	–	–	–	–	1.5805	–
–	18 MnMoNi 5 5	–	–	–	18 MnMoNi 5-5	–	–	–	–	–	1.6308	–
–	20 MnMoNi 4 5	–	SQV 2 B	K12539	20 MnMoNi 4-5	–	–	–	–	–	1.6311	–
–	10 NiMnMo 6 5	–	–	K11160	–	–	–	–	–	–	1.6312	–
–	16 NiCrMo 12 6	–	–	–	–	16 NCD 13	–	–	–	–	1.6782	–
–	15 MnCrMoNiV 5 3	–	–	–	15 MnCrMoNiV 5-3	–	–	–	–	–	1.6920	–
50B40	37 CrB 1	120 M 36	SMnC 3 H	H50401	38 Cr 2	–	35 CB 1	–	–	–	1.7007	–
–	13 Cr 2	–	–	–	–	–	–	–	–	–	1.7012	–
–	17 CrS 3	17 CrS3	–	–	17 CrS 3	17 CrS 3	–	–	–	–	1.7014	–
5015	15 Cr 3	523 M15	SCr 415 H	G50150	15 Cr 2	12 C 3	–	–	–	–	1.7015	–
5117	17 Cr 3	17 Cr 3	–	G51170	(15 Cr 2 KD)	18 C 3	–	–	–	–	1.7016	–
5130 H	34 Cr 4	530 A 32	SCr 430 H	G51300	34 Cr 4 KD	32 C 4	34 Cr 4 KB	–	–	–	1.7033	–
5132 H	37 Cr 4	530 A 36	SCr 435 H	G51320	37 Cr 4	38 C 4	36 CrMn 4	–	–	–	1.7034	–
5140	41 Cr 4	530 M 40	SCr 440 H	G51400	41 Cr 4	42 C 4	41 Cr 4	–	–	–	1.7035	–
–	28 CrS 4	–	–	–	28CrS4	28CrS4	–	–	–	–	1.7036	–
–	34 CrS 4	34 CrS 4	–	–	34 CrS 4	34 CrS 4	34 CrS 4	–	–	–	1.7037	–
–	41 CrS 4	41 CrS 4	–	–	41 CrS 4	41 CrS 4	41 CrS 4	2245	–	–	1.7039	–
–	38 Cr 4	–	–	–	38 Cr 4	–	38 Cr 4	–	–	–	1.7043	–
5140	42 Cr 4	530 A 40	SCr 440	–	40 NiCrMo 3	42 C 4 TS	40 NiCrMo 3	2245	–	–	1.7045	–
–	54 SiCr 6	–	–	–	–	54 SC 6	–	–	–	–	1.7102	–
–	67 SiCr 5	–	–	–	67 SiCr 5	–	67 SiCr 5	–	–	–	1.7103	–
9262	60 SiCr 7	–	–	–	60 SiCr 8	–	–	–	–	–	1.7108	–
–	52 SiCrNi 5	–	–	–	–	52 SCN 5	–	–	–	–	1.7117	–
5115	16 MnCr 5	527 M 17	SCR 415	G 51150	16 MnCr 5 KD	16 MC 5	16 MnCr 5	2173	–	–	1.7131	–
–	49 CrMo 4	–	SCM 445	–	–	–	–	–	–	–	1.7238	–
–	16 CrMo 4	18 CrMo4	SCM 418 H	–	18 CrMo 4	15 CD 3.5	18 CrMo 4	–	–	–	1.7242	–
–	10 CrMo 11	–	–	–	–	12 CD 10	–	–	–	–	1.7276	–
–	16 CrMo 9 3	–	–	–	–	20 CD 8	–	–	–	–	1.7281	–
–	22 CrMoS 3 5	–	–	–	22 CrMoS 3-5	22 CrMoS 3-5	–	–	–	–	1.7333	–
A 387 Gr. 12 Cl. 2	16 CrMo 4 4	–	–	K11564	–	–	A 18 CrMo 4 5 KW	–	–	–	1.7337	–
–	12 CrMo 8 5	–	–	K21509	–	–	–	–	–	–	1.7358	–
–	12 CrMo 19 5	3606-625	SCMV 6	K41545	X 12 CrMo 5	Z 10 CD 5.05	16 CrMo 20 5	–	–	–	1.7362	–
–	X 7 CrMo 6 1	B 5	–	S50281	CM 5-IG	–	–	–	–	–	1.7373	–
–	12 CrMo 9 10	–	–	–	–	12 CrMo 9-10	–	–	–	–	1.7375	–
–	SG-CrMo 9	–	–	S50480	–	–	–	–	–	–	1.7388	–
–	51 CrMoV 4	–	–	–	51 CrMoV 4	51 CDV 4	51 CrMoV 4	–	–	–	1.7701	–
–	21 CrMoV 5 7	–	–	K14073	21 CrMoV 5-7	20 CDV 5.07	–	–	–	–	1.7709	–
–	20 CrMoVTiB 4 10	–	–	–	20 CrMoVTiB 4-10	20 CrMoVTiB 4-10	–	–	–	–	1.7729	–
6150	50 CrV 4	735 A 50	SUP 10	G61500	51 CrV 4	50 CV 4	50 CrV 4	2230	–	–	1.8159	–
–	PS 275 TMK	S 275 ML	–	–	S 275 ML	S 275 ML	S 275 ML	–	–	–	1.8819	–
–	S 355 G1 M	–	–	–	S 355 G 1 M	–	–	–	–	–	1.8822	–
–	BTSIE 460 TM	S 460 ML	–	–	S 460 ML	E 460	S 460 ML	–	–	–	1.8838	–
–	S 500 ML	–	–	–	S 500 ML	–	–	–	–	–	1.8839	–

NOTE: For legend, see page Y217.

(continued)

P4

Workpiece Materials Listing • Steel • P4 (continued)

P4 Alloy Steels and Tool Steels

Content: C>.25%

Tensile Strength RM (MPa)*: 850–1400

Hardness (HB): 350–450 (HRC): 35–48

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Material Number	Manufacturer Reference
-	S 275 MH	-	-	-	S 275 MH	-	S 275 MH	-	-	-	1.8843	-
-	S 275 MLH	-	-	-	S 275 MLH	-	S 275 MLH	-	-	-	1.8844	-
-	S 355 MH	-	-	-	S 355 MH	-	S 355 MH	-	-	-	1.8845	-
-	S 355 MLH	-	-	-	S 355 MLH	-	S 355 MLH	-	-	-	1.8846	-
-	S 420 MH	-	-	-	S 420 MH	-	S 420 MH	-	-	-	1.8847	-
-	S 420 MLH	-	-	-	S 420 MLH	-	S 420 MLH	-	-	-	1.8848	-
-	S 460 MH	-	-	-	S 460 MH	-	S 460 MH	-	-	-	1.8849	-
-	S 460 MLH	-	-	-	S 460 MLH	-	S 460 MLH	-	-	-	1.8850	-
-	FSiE 355 OS 4/ S420G5Q	-	-	-	S 420 G 2	-	-	-	-	-	1.8853	-
-	P 550 QL	-	-	-	P 550 QL	-	-	-	-	-	1.8878	-
-	SiE 460	S 460 N	-	-	S 460 N	E 460	S 460N	-	-	-	1.8901	-
A 633 Gr. E	St E 420	S 420 N	SM 50 C	K02002	FeE 420 KGN	E 420-I	Fe E 420 KG	2143	-	-	1.8902	-
-	TSiE 460	S 460 L	-	-	S 460 NL	E460	S 460 NL	-	-	-	1.8903	-
-	S 550 Q	-	-	-	S 550 Q	E 550	S 550 Q	-	-	-	1.8904	-
A 633 Gr. E	St E 460	P 460 N	SM 53 B	K02900	P 460 N	E 460-I	Fe E 460 KG	2143	-	-	1.8905	-
-	BGH 8906	55 F	-	-	S 460 QL	S 460 QL	S 460 QL	-	-	-	1.8906	-
-	St E 500	-	SM 58	K02001	-	-	-	-	-	-	1.8907	-
-	S 460 Q	55 F	-	-	S 460 Q	E 460	S 460 Q	-	-	-	1.8908	-
-	S 420 NL/TSiE 420	S 420 NL	STK 540	K02002	S 420 NL	E 420 T-I	Fe E 420 KT	-	-	-	1.8912	-
-	ESiE 420/ S420NL1	-	STK 540	-	-	-	-	-	-	-	1.8913	-
-	S 620 Q	-	-	-	S 620 Q	E 620	S 620 Q	-	-	-	1.8914	-
-	T Si E 460/ P460NL1	P 460 NL 1	-	K02900	P 460 NL1	E 460 T-I	Fe E 460 KT	-	-	-	1.8915	-
-	S 460 QL1	55 F	-	-	S 460 QL 1	-	-	-	-	-	1.8916	-
-	T Si E 500	-	-	K02001	-	E 500 T-I	-	-	-	-	1.8917	-
-	ESiE 460/ P460NL2	P 460 NL 2	-	-	P 460 NL 2	P 460 NL 2	P 460 NL 2	-	-	-	1.8918	-
-	ESiE 500/ S500NL1	-	-	-	S 500 NL 1	-	-	-	-	-	1.8919	-
-	TSiE 690 VB/ S690G2QL	-	-	K11646	S 690 G 2 QL	-	-	-	-	-	1.8921	-
-	S 690 G 4 QL/ TSiE 690 VC	-	-	-	S 690 G 4 QL	-	-	-	-	-	1.8922	-
-	S 590 QL/TSiE 590 V	-	-	-	S 590 QL	-	-	-	-	-	1.8923	-
-	S 500 Q (StE 500 V)	-	-	-	S 500 Q	E 500	S 500 Q	2614	-	-	1.8924	-
-	S 890 QL 1 (ESiE 90 V)	-	-	-	S 890 QL 1	-	-	-	-	-	1.8925	-
-	S 690 QL (TSiE 690 V)	-	SHY 685 NS	-	S 690 QL	-	-	-	-	-	1.8928	-
-	TSiE 690 VD/ S690G3QL	-	-	-	S 690 G 3 QL	-	-	-	-	-	1.8929	-
-	S 690 Q/TSiE 690 V	-	SHY 685 N	-	S 690 Q	E 690	S 690 Q	-	-	-	1.8931	-
-	WSt E 420/ P420NH	S 420 NL	STK 540	K02002	S 420 NL	S 420 NL	Fe E 420 KW	-	-	-	1.8932	-
-	S 960 QL/TSiE 960 V	-	-	-	S 960 QL	-	-	-	-	-	1.8933	-
-	WSt E 460/ P460NH	P 460 NH	-	K02900	P 460 NH	P 460 NH	Fe E 460 KW	-	-	-	1.8935	-
-	P420 QH	-	-	-	P 420 QH	-	-	-	-	-	1.8936	-
-	TSiE 770 V/ S770QL	-	-	-	S 770 QL	-	-	-	-	-	1.8938	-
-	ESiE 790 V/ S790QL1	-	-	-	S 790 QL 1	-	-	-	-	-	1.8939	-
-	S 960 Q	-	-	-	S 960 Q	E 960 T-II	S 960 Q	-	-	-	1.8941	-
-	S 550 G 1 QL 1/ ESiE 550 VA	-	-	-	S 550 G 1 QL 1	-	-	-	-	-	1.8944	-
-	S 355 J 0 WP	WR 50 A	-	-	S 355 J0 WP	E 36 W-A3	S 355 J0 WP	-	-	-	1.8945	-
-	S 355 J 2 WP	S 355 J 2 WP	-	-	S 355 J2 WP	E36W-A4	S 355 J2 WP	-	-	-	1.8946	-
-	L 415 QB	-	-	-	L 415 QB	L 415 QB	-	-	-	-	1.8947	-
-	L 360 QB	-	-	-	L 360 QB	L 360 QB	-	-	-	-	1.8948	-
-	L 450 QB	-	-	-	L 450 QB	L 450 QB	-	-	-	-	1.8952	-
-	S 460 NH (FGS 47)	-	-	-	S 460 NH	-	S 460 NH	-	-	-	1.8953	-
-	ESiE620VA/S 620 G 1 QL 1	-	-	-	S 620 G 1 QL 1	-	-	-	-	-	1.8954	-
-	L 485 QB	-	-	-	L 485 QB	L 485 QB	-	-	-	-	1.8955	-
-	S 460 NLH/FGS 47	-	-	-	S 460 NLH	-	S460NLH	-	-	-	1.8956	-
-	L 555 QB	-	-	-	L 555 QB	L 555 QB	-	-	-	-	1.8957	-
-	9 CrNiCuP 3 2 4	WR 50 A	SPA-H	K11430	-	-	-	-	-	-	1.8962	-
-	WTSt 52-3	WR 50 C	SMA 58 W	K11430	S 355 J 2 G 1 W	E 36 W-A2	-	-	-	-	1.8963	-
-	ESiE 690 VA	-	-	-	S 690 G1 QL1	-	-	-	-	-	1.8964	-
-	S 355 J 2 G 2 W	S 355 J 2 G 2 W	-	-	S 355 J 2 G 2 W	S 355 J 2 G 2 W	S 355 J 2 G 2 W	-	-	-	1.8965	-
-	S 355 K 2 G 1 W	S 355 K 2 G 1 W	SMA 490 CW	-	S 355 K2 G1 W	S 355 K2 G1 W	S 355 K 2 G 1 W	-	-	-	1.8966	-
-	S 355 K 2 G 2 W	S 355 K 2 G 2 W	-	-	S 355 K2G2W	S 355 K 2 G 2 W	S 355 K 2 G 2 W	-	-	-	1.8967	-
-	QSiE 600 TM/S 600 MC	-	-	-	S 600 MC	E 620 D	S 600 MC	-	-	-	1.8969	-
-	SiE 415..7/L 415 NB	-	-	-	L 415 NB	L 415 NB	-	-	-	-	1.8972	-
-	SiE 415.7 TM/L 415 MB	-	-	-	L 415 MB	L 415 MB	-	-	-	-	1.8973	-
-	S 700 MC (QSiE 690 TM)	-	-	-	S 700 MC	E 690 D	S 700 MC	-	-	-	1.8974	-
-	L 450 MB/TSiE 445.7 TM	-	-	-	L 450 MB	L 450 MB	-	-	-	-	1.8975	-
-	S 650 MC (QSiE 650 TM)	-	-	-	S 650 MC	E 620 D	S 650 MC	-	-	-	1.8976	-
-	L 485 MB/TSiE 480.7 TM	-	-	-	L 485 MB	L 485 MB	-	-	-	-	1.8977	-
-	SiE 550.7 TM/L 555 MB	-	-	-	L 555 MB	L 555 MB	-	-	-	-	1.8978	-

(continued)



P4

Workpiece Materials Listing • Steel • P4 (continued)

P4 Alloy Steels and Tool Steels

Content: C>.25%

Tensile Strength RM (MPa)*: 850–1400

Hardness (HB): 350–450 (HRC): 35–48

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Material Number	Manufacturer Reference
A 570 Gr. 50	St 50-2	4360-50 B	SS 50	–	E 295	A 50-2	Fe 490	2172	–	–	1.0050	–
–	St 60-2	4360-55 E	SM 58	–	E 335	A 60-2	Fe 60-2	1650	–	–	1.0060	–
–	St 70-2	E 360	–	–	E 360	A 70-2	Fe 70-2	1655	–	–	1.0070	–
–	C4D	–	–	–	C 4 D	FM 5	C 4 D	–	–	–	1.0300	–
–	C 22 8	–	–	–	P 250 GH	–	–	–	–	–	1.0460	–
–	H 260/ZSt E 260	H 240 LA	–	–	H 240 LA	E 240 C	–	–	–	–	1.0480	–
–	ZStE 380/H 380	H 360 L A	–	–	H 360 LA	E 355 C	–	–	–	–	1.0550	–
–	GL-E - 40 (S 390 G 3 S)	–	–	–	S 390 G 3 S	–	–	–	–	–	1.0560	–
–	C60D	–	–	–	C 60 D	FM 60	C 60 D	–	–	–	1.0610	–
–	C 64/64 Mn 3	–	–	–	C 64	–	–	–	–	–	1.0640	–
–	38 SMn 28	38 SMn 28	–	–	38 SMn 28	38 SMn 28	–	–	–	–	1.0760	–
–	QSt E 260 TM/5260 MC	–	–	–	S 260 MC	41 S 7	Fe E 275 TM	–	–	–	1.0970	–
–	C3D2	–	–	–	C 3 D 2	FM 5	C 3 D 2	–	–	–	1.1110	–
1330	28 Mn 6	150 M 28	SCMn 1	G 13300	28 Mn 6	35 M 5	C 28 Mn	–	–	–	1.1170	–
–	C 42 E Al/Ck 42 Al	–	–	–	S 355 G15	–	–	–	–	–	1.1190	–
–	C56D2/D 55-2	–	–	–	C 56 D 2	FM 56	C 56 D 2	–	–	–	1.1220	–
–	C 70 W1	–	–	–	CT 70	C 70 E 2 U	C 70 KU	–	–	–	1.1520	–
–	C 70 W2	–	–	–	C 70 U	–	–	–	–	–	1.1620	–
–	C 45 W	–	–	–	C 45 U	Y3 42	–	–	–	–	1.1730	–
–	C 60 W	–	SK 7	–	–	Y3 55	–	–	–	–	1.1740	–
–	100 CrMn 6	–	–	K19195	100 CrMn 6	100 CM 6	–	–	–	–	1.3520	–
–	28 B 2	–	SWRCHB 26	–	C 30 B	20 B 3	–	–	–	–	1.5510	–
5130	28 Cr 4	530 A 30	–	G51300	28 Cr 4	30 CD 4	–	–	–	–	1.7030	–
–	S 420 G1 M	–	–	–	P 550 M	–	–	–	–	–	1.8830	–
–	St E 380	–	SM 50 B	–	S 380 N	–	Fe E 390 KG	–	–	–	1.8900	–
–	TSIE 380/ S380NL	–	–	–	S 380 NL	–	Fe E 390 KT	2117	–	–	1.8910	–
–	TSIE 690 VA/ S690G1QL	–	–	–	S 690 G 1 QL	–	–	–	–	–	1.8920	–
–	WSt E 380/ P380Nh	–	–	–	P 380 NH	–	Fe E 390 KW	2116	–	–	1.8930	–
–	S 890 Q	–	–	–	S 890 Q	S 890 Q	S 890 Q	–	–	–	1.8940	–

P5

Workpiece Materials Listing • Steel • P5

P5 Ferritic, Martensitic, and PH Stainless Steels

Tensile Strength RM (MPa)*: 600–900

Hardness (HB): <330 (HRC): <35

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Material Number	Manufacturer Reference
410 S	X 7 Cr 14	–	–	–	–	–	–	–	–	–	1.4001	–
405	X 6 CrAl 13	405 S 17	SUS 405	S40500	X 6 CrAl 13	Z 6 CA 13	X 6 CrAl 13	2302	–	–	1.4002	–
–	X 2 CrNi 1 2	–	–	–	Hyfab3/12	CLCA003	F12N(Mn<1.50)	–	–	–	1.4003	–
416	X 12CrS 13	416 S 21	SUS416	S41600	X 12 CrS 13	Z 12 CF 13	X12CrS13	2380	–	–	1.4005	ATI 416™
410	X 12Cr 13	410 S 21	SUS410	S 41000	(X 12 Cr 13 KD)	Z 12 C 13	X12Cr13	2302	–	–	1.4006	ATI 410™
414	GX 8 CrNi 1 3	410 C 21	SCS 1	S41400	GX 7 CrNiMo 12-1	Z 12 CN 13 M	GX 12 Cr 13	–	–	–	1.4008	–
–	X 8 Cr 14	–	SUS Y 410	S41080	X 8 Cr 13 KE	–	–	–	–	–	1.4009	B13Fe
–	GX 12 Cr 1 2	–	–	–	GX12Cr12	GX12Cr12	–	–	–	–	1.4011	–
–	N 3 2 0 (LW)	–	–	–	3S62	–	–	–	–	–	1.4014	–
–	X 8 Cr 18	–	SUS Y 430	S43080	–	–	–	–	–	–	1.4015	B17Fe
430	X 8 Cr 17	430 S 15	SUS430	S 43000	X 8 Cr 17	Z8C17	X8Cr17	2320	–	–	1.4016	ATI 430™
–	X 6 CrNi 17 1	–	–	–	X6CrNi17-1	F17N	X6CrNi17-1	–	–	–	1.4017	–
420	X20Cr13	420 S 37	SUS 420J1	S42000	X 20 Cr 13	Z20C13	X20Cr13	2303	–	–	1.4021	ATI 420™
403	X 15 Cr 13	420 S 29	SUS 410 J1	J91201	X 15 Cr 13	Z 12 C 13 M	X 12 Cr 13	2301	–	A403M	1.4024	ATI 403™
–	GX 20 Cr 1 4	420 C 29	SCS 2	–	–	Z 20 C 13 M	–	–	–	A743-4	1.4027	–
420	X 40 Cr 13	–	SUS 420 J2	S42080	X 40 Cr 13	Z 40 C 14	X 40 Cr 14	2304	–	–	1.4031	–
–	GX 120 Cr 29	425 C 11	–	–	–	–	–	–	–	F30C	1.4086	–
430 F	X 12 CrMoS 17	441 S 29	SUS 430 F	S 43020	X 14 CrMoS 17	Z 10 CF 17	X 10 CrS 17	2383	–	–	1.4104	–
430	X 4 CrMoS 18	–	SUS 430F	–	X 6 CrMoS 17	Z 6 CDF 18 - 02	–	–	–	–	1.4105	–
–	X 2 CrMoSiS 18 2 1	–	–	J91151	–	–	–	–	–	CA15	1.4106	–
–	GX 8 CrNi 1 2	–	–	–	GX 8 CrNi 12	GX8CrNi 12	G X 8 CrNi 12	–	–	–	1.4107	–
434	X 6CrMo 17	434 S 17	SUS434	S43400	434S17	Z8CD17-01	X8CrMo17	2325	–	–	1.4113	AL 434
–	X 15 CrMo 13	–	–	–	–	–	–	–	–	–	1.4119	–
–	GX 70 CrMo 29 2	–	–	–	–	Z 60 CD 29.2 M	–	–	–	–	1.4136	–
–	X 2 CrNi 24 12	309 S 93	–	–	X 2 CrNi 24 13 KE	Z 2 CN 24-14	–	–	–	–	1.4332	CN23/12-IG
–	X 5 NiCr 32 21	–	–	S33200	–	–	–	–	–	B536	1.4333	H521
–	GX 5 CrNiMo 16 5	–	–	–	GX 4 CrNiMo 16-5-1	GX4CrNiMo 16-5-1	G X 4 CrNiMo 16-5-1	–	–	–	1.4405	–
–	ERO 4411 A	–	–	–	GX 4 CrNiMo 16-5-2	GX 4 CrNiMo 16-5-2	–	–	–	–	1.4411	–
–	X 38 CrMo 14	–	–	–	–	–	–	–	–	–	1.4419	–
–	X 8 CrTi 18	–	–	–	X 6 Cr 18 KE	–	–	–	–	–	1.4502	–
430 Nb	X 6 CrNb 17	–	SUS 430 LX	–	X 3 CrNb 17	Z 8 CNb 17	X 6 CrNb 17	–	–	–	1.4511	AXC525
409	X 6 CrTi 12	409 S 19	SUH 409	S40900	X 5 CrTi 12	Z 6 CT 12	X 6 CrTi 12	–	–	–	1.4512	–
–	X 6 CrNiTi 12	–	–	–	X 6 CrNiTi 12	X 6 CrNiTi 12	X 6 CrNiTi 12	–	–	–	1.4516	–
–	X 2 CrTi 12	–	SUS 430 LX	–	X 2 CrTi 17	F 20T	X 2 CrTi 17	–	–	–	1.4520	–
–	X 8 CrMoTi 17	–	–	–	X 2 CrMoTiS 18 2	X2CrMoTiS18-2	–	–	–	–	1.4523	1802
–	GX 5 CrNiCu 16 4	–	–	–	GX 5 CrNiCu 16-4	GX 5 CrNiCu 16-4	–	–	–	–	1.4525	–
–	X 6 CrMoNb 17 1	–	–	–	X 6 CrMoNb 17-1	X6CrMoNb 17-1	F 17 Mnb	–	–	–	1.4526	–
904 L	X 1 NiCrMoCuN 25 20 5	904 S 13	–	N08904	X 1 NiCrMoCuN 25 20 5	Z 1 NCDU 25 20	–	2562	–	–	1.4539	ATI 904L™
348	X 5 CrNiNb 18 10	S 527	–	J92640	–	–	X 6 CrNiNb 18 11	–	–	–	1.4546	ATI 348™
–	X 5 CrNiNb 19 9	–	SUS Y 347	S34780	X 5 CrNiNb 20 10 KE	Z 6 CNNb 20-10	–	–	–	–	1.4551	–
–	GX 7 NiCrMoCuNb 42 20	–	–	–	GX 7 NiCrMoCuNb 4220	–	–	–	–	–	1.4559	–
–	X 5 CrNiMoNb 19 12	318 S 96	–	S31980	X 5 CrNiMoNb 19 12 03 KE	Z 4 CND5Nb 19-12-03	–	–	–	–	1.4576	–
–	X 2 CrAlTi 18 2	–	–	–	X 2 CrAlTi 18-2	DMV 59	X 2 CrAlTi 18-2	–	–	–	1.4605	–
–	X 10 CrAl 7	–	–	–	X 10 CrAl 7	–	–	–	–	–	1.4713	–

NOTE: For legend, see page Y217.

(continued)



P5

Workpiece Materials Listing • Steel • P5 (continued)

P5 Ferritic, Martensitic, and PH Stainless Steels

Tensile Strength RM (MPa)*: 600–900

Hardness (HB): <330 (HRC): <35

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Material Number	Manufacturer Reference
-	X 215 Cr 12	-	-	-	-	-	-	-	-	-	1.4721	-
H-12	X 10 CrAl 13	BH 12	SUS 405	T20812	X 10 CrAl 13	Z 10 C 13	X 10 CrAl 12	-	-	-	1.4724	-
430	X 10 CrAl 18	(430 S 15)	SUH 21	S43000	-	Z 10 CAS 18	(X 8 Cr 17)	-	-	-	1.4742	-
446	X 10 CrAl 25	-	SUH 442	S44600	X 10 CrAl 24	Z 10 CAS 24	X 16 Cr 26	2322	-	-	1.4762	-
-	GX 40 CrNiSi 27 4	-	-	J92605	-	-	-	-	-	-	1.4823	-
-	X 12 CrNi 22 12	311 S 94	SUS Y 309	S30980	X 15 CrNi 23 13	-	X 16 CrNi 23 14	-	-	309	1.4829	-
-	X 9 CrNiSiNCe 21 11 2	-	-	-	X 9 CrNiSiNCe 21-11-2	-	-	-	-	-	1.4835	-
314	X 15 CrNiSi 25 20	314 S 25	SUH 310	S31400	X 15 CrNiSi 25 20	Z 15 CNS 25.20	X 16 CrNiSi 25 20	-	-	-	1.4841	Cronifer® 2520
-	X 12 CrNi 25 20	310 S 94	-	S31080	X 12 CrNi 26 21 KE	Z 12 CN 26-21	-	-	-	-	1.4842	-
-	CrNi 25 20	-	SCS 18	S31400	-	-	-	-	-	-	1.4843	-
310 S	X 12 CrNi 25 21	310 S 24	SUS 310 S	S31008	X 8 CrNi 25 21	Z 12 CN 25.20	X 6 CrNi 25 20	2361	-	-	1.4845	ATI 310S™
HK	X 40 CrNiSi 25 20	310 C 40	SCH 21	J94204	-	-	GX 40 CrNi 26 20	-	-	-	1.4848	-
-	GX 40 NiCrSiNb 38-18	-	-	-	3072.76	-	-	-	-	-	1.4849	-
-	GX 10 NiCrNb 32 20	-	-	J95151	-	-	-	-	-	-	1.4859	-
330	X 12 NiCrSi 35 16	NA 17	SUH 330	N08330	X 12 NiCrSi 35 1 6	Z 12 NCS 37.18	-	-	-	-	1.4864	-
-	X40NiCrSi38-18	330 C 40	SCH15/SCH16	J94605	330C11/330C40/331C40	-	GX50NiCr39-19	-	-	-	1.4865	-
-	GX 50 CrNi 30-30	-	-	N08801	-	Z5NCT3220	-	-	-	-	1.4868	-
B163	X 10 NiCrAlTi 32 20	NA 15	NCF800(TP)	-	NA15(H)	Z10NC32.21	-	-	B163	-	1.4876	B163
-	X 6 NiCrNbCe 32 27	-	-	-	X 6 NiCrNbCe 32-27	-	-	-	-	-	1.4877	-
-	X 12 NiCrSi 35 19	-	-	N08830	X1 0 NiCrSi 35 19	-	-	-	-	-	1.4886	330
-	X 10 NiCrSiNb 35 22	-	-	-	X10NiCrSiNb35-22	-	-	-	-	-	1.4887	-
-	X 10 CrMoV 9 1	-	-	S59180	X 10 CrMoV 9-1	-	-	-	-	-	1.4903	-
-	X 20 CrMoV 12 1	-	-	-	X 20 CrMoV 11-1	-	X 20 CrMoV 12 01 KW	2317	-	-	1.4922	-
-	GX 22 CrMoV 12 1	-	-	-	G-X 22 CrMoV 12 1	GX23CrMoV12-1	G X 23 CrMoV 12-1	-	-	-	1.4931	-
422	X 20 CrMoWV 12 1	-	SUH 616	S42200	-	-	X 22 CrMoWV 12 1	-	-	-	1.4935	-
661	X 12 CrCoNi 21 20	-	SUH 661	R30155	-	-	-	-	-	-	1.4971	-
R30155	X 12 CrCoNiMoWNB 21 20 20	-	-	R30155	X 12 CrCoNiMoWNB 21 20 20	Z 12 CKNDWNB 21.20.20	N-155	-	-	-	1.4974	-
-	X 40 CoCrNi 20 20	-	-	-	-	Z 42 CNKDWNB	-	-	-	-	1.4977	-
403	X 6 Cr 13	403 S 17	SUS 403	S 40300	X 6 Cr 13	Z 6 C 13	X 6 Cr 13	2301	-	A240	1.4000	ATI 410S™
439	X 6 CrTi 17	-	SUS 430 LX	S 43035	X 8 CrTi 1 7	Z 8 CT 1 7	X 6 CrTi 17	-	-	-	1.4510	430 Ti
-	X 22 CrMoV 1 -1 = ST12T	-	-	-	-	-	-	-	-	A437-76 Grade B4B	-	ATI FV448™
409 Cb	-	-	-	-	-	-	-	-	-	-	-	ATI 409Cb™
436 S	-	-	-	-	-	-	-	-	-	-	-	ATI 436S™
439 HP	-	-	-	S43035	-	-	-	-	-	-	-	ATI 439 HP™
441 HP	-	-	-	-	-	-	-	-	-	-	-	ATI 441 HP™
-	-	-	-	S44735	-	-	-	-	-	A240	-	AL 29-4C®
-	-	-	-	-	-	-	-	-	-	B625	-	ATI E-BRITE®
403Cb	-	-	-	-	-	-	-	-	-	-	-	T656
420 modified	-	-	-	-	-	-	-	-	-	-	-	Stavax ESR
-	-	-	-	-	-	-	-	-	-	-	-	420HC
-	-	-	-	-	-	-	-	-	-	-	-	CPM 154
-	-	-	-	-	-	-	-	-	-	-	-	CPM® S30V®
-	-	-	-	-	-	-	-	-	-	-	-	CPM® S35VN®
420 V	-	-	-	-	-	-	-	-	-	-	-	CPM® S90V®
-	-	-	-	-	-	-	-	-	-	-	-	M390
422	-	-	-	S42200	-	-	-	-	-	-	-	616

P6 ■ Workpiece Materials Listing • Steel • P6
P6 High-Strength Ferritic, Martensitic, and PH Stainless Steels Tensile Strength RM (MPa)*: 900–1350
Hardness (HB): 350–450 (HRC): 35–48

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Material Number	Manufacturer Reference
–	17-7 PH	301 S 81	SUS 631	S17700	X 7 CrNiAl 17-7	X7CrNiAl17-7; Z9CNA17-07	X 7 CrNiAl 17-7	2388	–	A693	1.4564	ATI 17-7™
–	GX 22 CrNi 17	ANC 2	–	J91803	–	Z 20 CN 17.2 M	–	–	–	CB30	1.4059	–
–	GX 30 CrSi 6	–	–	–	–	–	–	–	–	–	1.4710	–
–	GX 4 CrNi 13 4	–	–	–	GX 4 CrNi 13-4	GX 4 CrNi 13-4	GX 4 CrNi 13-4	–	–	–	1.4317	–
–	GX 40 CrSi 17	–	–	–	–	–	–	–	–	–	1.4740	–
–	GX 40 CrSi 24	–	SCH 1	–	–	–	GX 35 Cr 13	–	–	–	1.4745	–
–	GX 40 CrSi 28	452 C 11	SCH 2	J92605	–	–	GX 35 Cr 28	–	–	CC50	1.4776	–
–	X 105 CrCoMo 18 2	–	–	–	–	–	–	–	–	–	1.4528	N690
440 C	X 105CrMo 17	–	SUS 440C	S44004	X 105 CrMo 17	Z 100 CD 17	X 105 CrMo 17	–	–	–	1.4125	ATI 440C™
–	X 110 CrMoV 15	–	SUS 430 LX	–	–	Z 4 CN b 17	X 6 CrNb 17	–	–	–	1.4111	–
5718.9	X 12 CrNiMo 12	S.151	–	S64152	–	Z12CNDV12	–	–	–	–	1.4939	ATI Jethete™ M152
–	X 12 CrNiMoV 12 3	–	–	–	X 12 CrNiMoV 12-3	X 12 CrNiMoV 12-3	–	–	–	–	1.4938	T522
–	X 15 TN	–	–	–	420S25	Z40CDV16-02	X40CrNiMoVN16-2	–	–	F899	1.4123	X 15 TN
15-5 PH	X 15 U 5 W	–	–	S15500	–	Z6CNU15.05	–	–	–	A564/ A693/A705	1.4545	ATI 15-5™
–	X 19 CrMoNbVN 11 1	–	–	–	–	Z 21 CDNb 11	–	–	–	–	1.4913	Jethete X19
431	X 19 CrNi 17 2	431 S 29	SUS 431	S 43100	X 19 CrNi 17 2	Z 15 CN 16.02	X 16 CrNi 16	2321	–	–	1.4057	431 (HT)
–	X 20 CrMo 17 1	–	–	–	–	–	–	–	–	–	1.4115	B17MoFe
420F Mod	X 22 CrMoNiS 13 1	–	–	–	–	–	–	–	–	–	1.4121	Bioline 4C27A
–	X 22 CrMoV 12 1	762	–	–	X 22 CrMoV 12-1	Z 21 CDV 12	X 22 CrMoV 12 1	–	–	–	1.4923	Jethete X20
420	X 29 CrS 13	416 S 37	SUS 416	–	X 29 CrS 13	Z29CF13	X 29 CrS 13	–	–	–	1.4029	–
–	X 3 CrNiCuTi 12 9	–	–	S45500	–	–	X 6 CrNiNb 18 11	–	–	–	1.4543	ATI 455™
13-8 PH	X 3 CrNiMoAl 13 8 2	–	–	S13800	–	Z4 CNDAT 13 09	–	–	–	–	1.4534	ATI 13-8Mo™
420 F	X 30 Cr 13	420 S 45	SUS420J2	S42020	X 30 Cr 13	Z 30 C 13	X 30 Cr 13	2304	–	CA40	1.4028	–
–	X 30CrMoN 15 1	–	–	–	420S45	Z33C13	–	2304	–	–	1.4108	N360
–	X 35 CrMo 17	–	–	–	X 39 CrMo 17 1	X39CrMo17-1	X 35 CrMo 17	–	–	–	1.4122	–
–	X 4 CrNiCuNb 16 4	–	–	J92200	–	Z 4 CNUb 16.4 M	–	–	–	–	1.4540	–
415 M	X 4 CrNiMo 16 5 1	–	–	–	X 4 CrNiMo 16 5 1	Z 6 CND 16.05.01	–	2387	–	–	1.4418	APX4
–	X 40 CrNi 25 21	310 S 98	SCH 13	–	–	–	–	–	–	–	1.4846	–
–	X 40 CrSiMo 10 2	–	SUH3	–	X 40 CrSiMo 10-2	Z40CSD10	–	–	–	–	1.4731	–
420	X 45 Cr 13	(420 S45)	–	–	–	Z 40 C 14	X 40 Cr 14	–	–	–	1.4034	–
–	X 45 CrMoV 15	–	–	–	X 50 CrMoV 15	Z 50 CD 15	X 50 CrMo V 15	–	–	–	1.4116	UGI 4116N
HNV3	X 45 CrSi 9 3	–	SUH1	–	401S45	Z45CS9	X45CrSi8	–	HNV3	–	1.4718	–
HNV 2	X 45 SiCr 4	–	–	S64006	–	–	–	–	–	–	1.4704	–
CA 6-NM	X 5 CrNi 134	425 C 11	SCS 5	J91540	X 3 CrNiMo 13 4	Z 4 CDN 13.4	X 6 CrNi 13 04	2385	–	–	1.4313	–
630	X 5 CrNiCuNb 16 4	–	SUS 630	–	X 5 CrNiCuNb 16-4	Z6CNU17.04	–	–	–	CB7Cu	1.4542	UGIMA® 4542
17-4 PH	X 5 CrNiCuNb 17 4 4	–	SUS 630	S17400	X 5 CrNiCuNb 16-4	X5CrNiCuNb16.4	–	–	–	A693	1.4548	–
–	X 5 CrNiMoCuNb 14 5	–	–	–	X 5 CrNiMoCuNb 14-5	X 5 CrNiMoCuNb 14-5	X 5 CrNiMoCuNb 14-5	–	–	–	1.4594	–
–	X 50 CoCrNi 20 20	–	–	–	–	–	–	–	–	–	1.4978	–
EV8	X 53 CrMnNiN 2 9	349 S 54	SUH35/SUH36	S63008	349S54	Z52CMN21.09	X53CrMnNiN21-9	–	EV8	–	1.4871	–
–	X 55 CrMo 14	–	–	–	–	Z 50 CD 13	–	–	–	–	1.4110	–
–	X 60 CrMnMoVNB 21 10	–	–	–	–	Z 60 CMDVNb 21-10 Az	–	–	–	–	1.4785	–
440 A	X 65 CrMo 14	–	SUS 440A	S44002	X 70 CrMo 15	Z 70 CD 14	–	–	–	–	1.4109	ATI 440A™
–	X 7 CrNiAl 17 7	301 S 81	SUS 631	S17700	X 7 CrNiAl 17-7	X7CrNiAl17-7; Z9CNA17-07	X 7 CrNiAl 17-7	2388	–	A693	1.4568	–
632	X 7 CrNiMoAl 15 7	–	–	S15700	–	–	–	–	–	–	1.4574	PH 15-7 Mo®
–	X 8 CrCoNiMo 10 6	Z 9 CKD 11	–	–	S152	Z10CKD10	–	–	–	–	1.4911	ATI FV535™
15-7 PH	X 8 CrNiMoAl 15 7 2	–	–	S15700	X 8 CrNiMoAl 15-7-2	Z8CNDAl15.07	X 8 CrNiMoAl 15-7-2	–	–	A693	1.4532	ATI 15-7™
HNV 6	X 80 CrNiSi 20	443 S 65	SUH 4	S65006	X 80 CrNiSi 20	Z 80 CSN 20.02	X 80 CrSiNi 20	–	–	–	1.4747	–
–	X 85 CrMoV 18 2	–	–	–	X 85 CrMoV 18 2	Z 85 CDMV 18.02	X 85 CrMoV 19 3	–	–	–	1.4748	–
440 B	X 90 CrMoV 18	409 S 1 9	SUS 440 B	S44003	X 90 CrMoV 18	Z 3 CT 1 2	X 6 Cr Ti 1 2	–	–	–	1.4112	–
–	X45CrNiW18-9	331 S 40	SUH31	–	X 45 CrNiW 18 9	Z35CNWS14.14	X45CrNiW18-9	–	–	–	1.4873	–

NOTE: For legend, see page Y217.

M1 ■ Workpiece Materials Listing • Stainless Steel • M1

M1 Austenitic Stainless Steel

Tensile Strength RM (MPa)*: <600

Hardness (HB): 130–200

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Material Number	Manufacturer Reference
CF-8	X 6 CrNi 18 9	304 C 15	SCS 13	–	X 2 CrNiN 18 7	Z 6 CN 18.10 M	G X 5 CrNi 19-10	2333	–	CF8	1.4308	CF-8
–	X 2 NiCr 18 16	–	–	–	–	Z 3 CDT 18-02	–	–	–	–	1.4321	–
–	X 1 CrNi 25 21	–	–	–	X 1 CrNi 25 21	X1CrNi25-21	X 1 CrNi 25-21	–	–	–	1.4335	Uranus 65
610	X1CrNiSi 18-15-4	–	–	S30600	X 1 CrNiSi 18-15-4	Z1 CNS 17.5	X 1 CrNiSi 18-15-4	–	–	A240-97A	1.4361	ATI 610™
CF-8M	X 6 CrNiMo 18 10	316 C 16	SCS 14	J92900	GX 5 CrNiMo 19-11-2	GX5CrNiMo 19-11-2	G X 5 CrNiMo 19-11-2	2343	–	–	1.4408	–
–	GX 2 CrNiMo 19 11 2	–	–	–	GX 2 CrNiMo 19-11-2	GX 2 CrNiMo 19-11-2	GX 2 CrNiMo 19-11-2	–	–	–	1.4409	–
–	ERO 4412 AHMo	–	–	J92900	GX 5 CrNiMo19-11-3	GX 5 CrNiMo 19-11-3	–	–	–	A743CF8M	1.4412	–
–	ERO 4416 AHCRMo	–	–	–	GX 2 NiCrMoN 25-20-5	GX2NiCrMoN 25-20-5	–	–	–	–	1.4416	–
–	GX 6 CrNiMo 18 12	317 C 12	–	–	–	–	–	–	–	–	1.4437	–
–	X 2 CrNiMo 18 16 5	–	–	S31780	–	–	–	–	–	–	1.4440	–
–	GX 2 CrNiMoN 17 1 3 4	–	–	–	GX 2 CrNiMoN 17 1 3 4	–	–	–	–	–	1.4446	–
–	GX 6 CrNiMo 17 13	317 C 16	–	J93000	–	–	–	–	–	C68M	1.4448	–
–	GX 2 NiCrMo 28 20 2	–	–	–	GX 2 NiCrMo 28-20-2	GX 2 NiCrMo 28-20-2	GX 2 NiCrMo 28-20-2	–	–	–	1.4458	–
–	GX 4 NiCrCuMo 30 20 4	–	–	–	GX 4 NiCrCuMo 30-20-4	GX 4 NiCrCuMo 30-20-4	–	–	–	–	1.4527	–
–	GX 5 CrNiNb 18 9	347 C 17	SCS 21	J92710	GX 5 CrNiNb 19-11	Z 4 C2NNb 19.10 M	G-X 5 CrNiNb 19-11	–	–	–	1.4552	–
–	GX 2 CrNiMoCuN 20 18 6	–	–	–	GX 2 CrNiMoCuN 20-18-6	GX 2 CrNiMoCuN 20-18-6	–	–	–	–	1.4557	–
–	X 3 CrNiCuMo 17 11 3 2	–	–	–	X 3 CrNiCuMo17 11 3 2	X3CrNiCuMo 17-11-3-2	X 3 CrNiCuMo 17-11-3-2	–	–	–	1.4578	–
–	GX 5 CrNiMoNb 18 10	318 C 17	SCS 22	–	GX 5 CrNiMoNb 19-11-2	Z 4 C2NDNb 18.12 M	GX 5 CrNiMoNb 19-11-2	–	–	–	1.4581	–
–	GX 2 NiCrMoCu 25 2 0 5	–	–	–	GX 2 NiCrMoCu 25-20-5	GX 2 NiCrMoCu 25-20-5	–	–	–	–	1.4584	–
–	GX 7 CrNiMoCuNb 18 18	–	–	J94651	–	–	–	–	–	–	1.4585	–
–	GX 2 NiCrMoCuN 29 25 5	–	–	–	GX 2 NiCrMoCuN 29-25-5	GX 2 NiCrMoCuN 29-25-5	–	–	–	–	1.4587	–
–	GX 2 NiCrMoCuN 25 20 6	–	–	–	GX 2 NiCrMoCuN 25-20-6	GX 2 NiCrMoCuN 25-20-6	–	–	–	–	1.4588	–
–	GX 25 CrNiSi 18 9	302 C 35	–	J92602	–	–	G X 16 CrNi 20 10	–	–	CF20	1.4825	–
–	GX 40 CrNiSi 22 9	–	SCH 12	J92603	–	–	–	–	–	–	1.4826	–
–	GX 50 CrNiNb 25 22	–	–	–	–	–	–	–	–	–	1.4836	–
–	GX 40 CrNiSi 25 12	309 C 30	SCS 17	J93503	–	–	GX 35 CrNi 25 12	–	–	CE30	1.4837	–
334	X 8 CrNiAlTi 20 20	–	–	S33400	–	–	–	–	–	–	1.4847	ATI 334™
–	GX 40 NiCrSiNb 38 18	–	–	N08004	–	–	–	–	–	–	1.4849	–
–	GX 40 NiCrSiNb 35 25	–	–	–	–	–	–	–	–	–	1.4852	–
–	GX 40 NiCrSi 35 25	–	–	J95705	–	–	GX 50 NiCr 35 25	–	–	–	1.4857	–
105 MA	BGH 4892	–	–	–	–	–	–	–	–	–	1.4892	–
–	X 3 CrNi 18 11	–	–	–	–	–	X 2 CrNiN 18 11	–	–	–	1.4949	–
–	X 2 CrNiMo 19 12	316 S 93	–	S31683	x 2 CrNiMo 19 13 03 KE	Z 2 CND 19-12-03	–	–	–	–	1.4430	–
–	GX 7 NiCrMoCuNb 25 20	–	SCS 23	J95150	10.204.3.1B	Z 3 NCDU 25.20 M	GX 5 NiCrCuMo 29 21	–	–	–	1.4500	–
–	X 3 CrNiCu 19 9 2	–	–	–	S 124 M	PHYHQ 4560	304 RH1	–	–	–	1.4560	ACX276
–	–	–	–	S63198	–	–	–	–	–	19-9 DL	–	19-9 DL
–	X 2 CrNiMoN 17 13 3	–	–	–	–	Z 2 CND 17.13	X 2 CrNiMoN 17 13 3	–	–	–	–	–
332	–	–	–	N08800	–	–	–	–	–	–	–	ATI 332™
–	–	–	–	N08367	–	–	–	–	–	–	–	AL-6XN®
611	–	–	–	S30601	–	–	–	–	–	A240-97A	–	ATI 611™

M2 ■ Workpiece Materials Listing • Stainless Steel • M2

M2 High-Strength Austenitic Stainless and Cast Stainless Steels

Tensile Strength RM (MPa)*: 600–800

Hardness (HB): 150–230 (HRC): <25

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Material Number	Manufacturer Reference
304 H	X 5 CrNi 18 10	304 S 15	SUS 304	S30409	X 6 CrNi 18 10 KD	Z 6 CN 18.09	X 5 CrNi 18 10	2332	–	–	1.4301	–
–	X 5 CrNi 19 9	308 S 96	–	S30888	X 6CrNi 20 10 KE	–	–	–	–	–	1.4302	–
305	X 4 CrNi 18 12	305 S 19	SUS 305	S30500	X 4 CrNi18 12 KD	Z 5 CN 18.12	X 4 CrNi 19 10	–	–	–	1.4303	–
303	X 10 CrNiS 18 9	303 S 21	SUS 303	S30300	X 10 CrNiS 18 9	Z 10 CNF 18.09	X 10 CrNiS 18 09	2346	–	–	1.4305	ATI 303™
304 L	X 2 CrNi 19 11	304 C 12	SUS 304L	S30403	X 3 CrNi18 10 KD	Z 2 CN 18.09	GX 2 CrNi 19 10	2352	–	CF3	1.4306	ATI 304L™
304 L	X 2 CrNi 18 9	304 S 11	SUS 304L	–	X 2 CrNi 18 9	CLC18.9.L	X 2 CrNi 18-9	–	–	–	1.4307	–
–	GX 2 CrNi 19 11	304 C 12	–	J92500	GX2CrNi19-11	GX2CrNi19-11	GX2CrNi19-11	2352	–	CF3	1.4309	–
304 LN	X 2 CrNiN 18 10	304 S 62	SUS 304 LN	S30453	X 2 CrNiN 18 10	Z 8 CN 18.12	X 8 CrNi 19 10	2371	–	–	1.4311	–
305	GX 10 CrNi 18 8	302 C 25	SCS 12	–	–	Z 10 CN 18.9 M	–	–	–	–	1.4312	ATI 305™
308 L	X 2 CrNi 19 9	308 S 92	SUS Y 308L	S30883	X 2 CrNi 20 10 KE	Z 2 CN 20.10	–	–	–	–	1.4316	–
–	X 2 CrNiN 18 7	–	–	–	X 2 CrNiN 18-7	18-7L	18-7L	–	–	–	1.4318	–
302	X 10 CrNi 18 9	302 S 26	SUS 302	S20200	302S31	Z10CN18-09	X 10 CrNi 18 09	2330	–	–	1.4319	ATI 302™
301	X 10 CrNi 18 9	302 S 26	–	J92501	X 10 CrNi 18 9	–	–	–	–	–	1.4324	–
–	X 10 CrNi 30 9	312 S 94	–	–	X 12 CrNi 30 09 KE	Z 10 CN 31-10	–	–	–	–	1.4337	–
–	X 3 CrNi 13 4	–	–	S41086	X 3 CrNi 14 04 KE	–	–	–	–	–	1.4351	410NiMo
202	X 3CrMnNiN 18 8 7	–	–	–	284S16	Z8CMN18-08-05	–	–	–	–	1.4371	–
201	X 12 CrMnNiN 17 7 5	284 S 16	SUS 201	–	X 12 CrMnNiN 17-7-5	X 12 CrMnNiN17-7-5	X 12 CrMnNiN 17-7-5	–	–	–	1.4372	ACX060
316	X 5 CrNiMo 17 12 2	316 S 16	SUS 316	S31600	X6 CrNiMo 17 12 2 KD	Z 6 CND 17.11	X 5 CrNiMo 17 12	2347	–	–	1.4401	ATI 316™
316L	X 2 CrNiMo 17 13 2	316 S 12	SUS 316 L	S31603	GX 3 CrNiMo 17 12 2 KD	Z 3 CND 19.10 M	GX 2 CrNiMo 19 11	2348	–	–	1.4404	ATI 316L™
316 LN	X 2 CrNiMoN 17 12 2	316 S 61	SUS 316 LN	S31653	X 3 CrNiMoN 17 12 2	Z 2 CND 17.12 Az	X 2 CrNiMoN 17 12	2353	–	–	1.4406	ATI 316LN™
–	X 5 CrNiMo 13 4	–	–	J91550	–	Z 6 CND 16.05.01	–	–	–	–	1.4407	–
–	X12CrNiMoS18-11	–	–	–	–	Z3CND17-13	–	–	–	–	1.4427	Chronifer® Special KL
316L	X 2 CrNiMo 17 12 3	316 S 13	SUS 316L	–	X 2 CrNiMo 17 12 2	Z 3 CND 17-13-30	X 2 CrNiMo 17-12-3	2348/2353/2354	–	–	1.4432	–
–	X 2 CrNiMoN 18 12 4	–	–	–	317 LN	CLC18.12.4.LN	X2CrNiMoN1812-4	–	–	–	1.4434	–
316 L	X 2 CrNiMo 18 14 3	316 S 11	SCS 16	S31603	X 2 CrNiMo 18 16	Z 2 CND 17.13	X 2 CrNiMo 17 13	2353	–	–	1.4435	–
316	X 5 CrNiMo 17 1 3 3	316 S 16	SUS 316	S31600	X6 CrNiMo 18 13 3 KD	Z 6 CND 17.12	X 5 CrNiMo 17 13	2343	–	–	1.4436	–
317 L	X 2 CrNiMo 18 16 4	317 S 12	SUS 317 L	S31703	X 3 CrNiMo 18 16 4	Z 2 CND 19.15	X 2 CrNiMo 18 15	2367	–	–	1.4438	ATI 317L™
–	X 2 CrNiMoN 17 13 5	–	–	–	X 3 CrNiMo 17 13 5	Z 3 CND 18.14-05 AZ	–	–	–	–	1.4439	–
–	X 2 CrNiMo 18 15 4	–	–	S31675	–	X 3 CrNiMoN 19-14	–	–	–	–	1.4442	–
317	X 5 CrNiMo 17 13	317 S 16	SUS 317	S31700	–	–	X 5 CrNiMo 18 15	–	–	–	1.4449	AL 317L+E55
–	X 5 CrNiCuNb 16 4	–	–	–	–	Z7CNU16.04	–	–	–	–	1.4452	–
–	–	–	–	S21904	–	–	–	–	–	A666	1.4454	ATI 219
–	X 2 CrNiMnMoN 20 16	–	–	–	X 2 CrNiMnMoN 20 15 08 KE	–	–	–	–	–	1.4455	–
–	X 1 CrNiMoN 25 2 5 2	–	–	S31050	–	–	–	–	–	–	1.4465	2RE69

M2 ■ Workpiece Materials Listing • Stainless Steel • M2 (continued)
M2 High-Strength Austenitic Stainless and Cast Stainless Steels Tensile Strength RM (MPa)*: 600–800
Hardness (HB): 150–230 (HRC): <25

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Material Number	Manufacturer Reference
–	X 1 CrNiMoN 25 22 2	–	–	–	725 LN	DMV 25.22.2	X 1 CrNiMoN 25-22-2	–	–	–	1.4466	–
–	X 1 NiCrMoCuN 25 20 6	–	–	–	–	–	–	–	–	–	1.4529	Uranus B26 6Mo
–	GX 2 NiCrMoCuN 25 20	–	–	J94650	GX 2 CrNiMoCuN 25-20-6	–	–	–	–	–	1.4536	–
–	X 1 CrNiMoCuN 25 25 5	–	–	–	–	X 1 CrNiMoCuN 25-25-5	X 1 CrNiMoCuN 25-25-5	–	–	–	1.4537	–
321	X 6 CrNiTi 18 10	321 S 12	SUS 321	S32100	X 6 CrNiTi 18 10	Z 6 CNT 18.10	X 6 CrNiTi 18 11	2337	–	–	1.4541	ATI 321™
321	A 700	304 S 31	–	J92630	–	Z 10 CNT 18 11	X 6 CrNiTi 18 11	–	–	–	1.4544	–
–	X 1 CrNiMoCuN 20 18 7	X 1 CrNiMoCuN 20 18 7	–	S31254	X 1 CrNiMoCuN 20-18-7	X 1 CrNiMoCuN 20-18-7	X 1 CrNiMoCuN 20-18-7	–	–	–	1.4547	Uranus B25 6Mo
–	X 2 NiCrAlTi 32 20	–	NCF 800 TB	–	–	–	–	–	–	–	1.4558	–
–	X 1 NiCrMoCuN 31 27 4	–	–	–	X 1 NiCrMoCu 31 27 4	X 1 NiCrMoCuN 31-27-4	X 1 NiCrMoCuN 31-27-4	2584	–	–	1.4563	–
–	X 3 CrNiCu 18 9 4	394 S 17	SUS XM7	–	X3CrNiCu18-9-4	304CU	304K	–	–	–	1.4567	–
316 Ti	X 6 CrNiMoTi 17 12 2	320 S 31	SUS 316Ti	–	X 6 CrNiMoTi 17 12 2	Z 6 CNDT 17.12	X 6 CrNiMoTi 17 12	2350	–	–	1.4571	ATI 316Ti™
–	GX 5 CrNiMoNb 23 9	–	–	–	–	–	–	–	–	–	1.4572	–
316 Ti	X 10 CrNiMoTi 18 12	320 S 33	SUS 316Ti	S31635	–	–	X 6 CrNiMoTi 17 13	–	–	–	1.4573	–
318	X 10 CrNiMoNb 18 12	–	–	–	–	–	X 6 CrNiMoNb 17 13	–	–	–	1.4583	–
–	X 2 CrNiCu 19 10	–	–	–	X 2 CrNiCu 19-10	TX 304L	–	–	–	–	1.4650	–
–	X1CrNiMoCuN24-22-8	–	–	S32654	–	–	–	–	–	–	1.4652	654 SMO®
–	153 MA	–	–	S30415	X 6 CrNiSiNce 19 10	–	–	–	–	–	1.4818	153 MA™
–	X 20 CrNiSi 25 4	–	–	S44635	X 15 CrNiSi 25 4	Z 20 CNS 25.04	X 20 CrNiSi 25 4	–	–	–	1.4821	–
309	X 15 CrNiSi 20 12	309 S 24	SUH 309	S30900	X 15 CrNiSi 20 12	Z 15 CNS 20.12	X 16 CrNiSi 25,20	–	–	–	1.4828	ATI 309™
309 S	X 7 CrNi 23 14	309 S 24	SUS 309 S	J93400	X 12 CrNi 23 13	Z 15 CN 24.13	X 6 CrNi 23 14	–	–	–	1.4833	–
–	353 MA	–	–	S35315	X 6 NiCrSiNce 35-25	–	–	–	–	–	1.4854	353 MA®
–	X 8 NiCrSi 38 18	NA 17	–	N08330	–	Z 12 NCS 37.18	–	–	–	–	1.4862	–
–	X 33 CrNiMnN 23 8	–	–	–	X 33 CrNiMnN 23-8	X 33 CrNiMnN 23-8	–	–	–	–	1.4866	–
EV 12	X 55 CrMnNiN 20 8	–	–	S63012	X 55 CrMnNiN 20-8	Z 55 CMN 20.08 Az	–	–	–	–	1.4875	–
321	X 12 CrNiTi 18 9	321 S 20	SUS 321	S32100	X 10 CrNiTi 18 10	Z 6 CNT 18.12	X 6 CrNiTi 18.11	2337	–	–	1.4878	ACX315
EV 11	X 70 CrMnNiN 21 6	–	–	S63011	–	–	X 70 CrMnNiN 21 6	–	–	–	1.4881	–
–	X 50 CrMnNiNbN 21 9	–	–	–	X 50 CrMnNiNbN 21-9	Z 50 CMNnb 21.09	–	–	–	–	1.4882	–
–	X 7 CrNiNb 18 10	–	SUS347H	S34709	X7CrNiNb18-10	X7CrNiNb18-10	–	–	–	–	1.4912	–
316 H	X 6 CrNiMo 17 13	316 S 51	–	S31609	X 6 CrNiMo 17 12 2	Z 6 CND 17-13 B	–	–	–	–	1.4919	–
321 H	X 8 CrNiTi 18 10	–	–	–	X 6 CrNiTiB 18-10	Z 6 CNT 18-10 B	X 6 CrNiTiB 11	–	–	–	1.4941	–
A660	X 4 NiCrTi 25 15	HR251	SUH 660	S66286	–	Z 6 NCTDV 25.15 B	–	–	–	–	1.4943	Discaloy
–	X 6 CrNiWNB 16 16	–	–	–	–	–	–	–	–	–	1.4945	–
–	X 6 CrNi 18 11	304 S 51	–	S30480	X 6 CrNi 18 10	Z 6 CN 18-09	X 5 CrNi 18 10 KW	2333	–	–	1.4948	–
–	X 6 CrNi 25 20	–	–	–	310 H	–	–	–	–	–	1.4951	–
–	X 8 CrNiNb 16 13	347 S 51	–	–	–	–	–	–	–	–	1.4961	–
–	Esshete 12 50	–	–	S21500	X 10 CrNiMoMnNbVB 15-10-1	X 10 CrNiMoMnNbVB 15-10-1	–	–	–	A213	1.4982	Esshete 1250
–	X 8 CrNiMoNBn 16 16	–	–	–	X 7 CrNiMoNBn 16-16	–	–	–	–	–	1.4986	–
301	X 12 CrNi 17 7	301 S 21	SUS 301	S30100	X 12 CrNi 17 7	Z 12 CN 17.07	X 12 CrNi 17 07	2331	–	–	1.4310	ATI 301™
–	GX 40 CrNi 27 4	–	–	J92615	–	–	GX 35 CrNi 28 05	–	–	–	1.4340	–
304	X 5 CrNi 18 9	304 S 31	SUS 304	S30400	1	Z6CN18.09	X5CrNi1810	2332/2333	–	A276	1.4350	ATI 304™
–	X 15 CrNiMn 18 8	307 S 98	–	–	X 15 CrNiMn 18 08 KE	Z 8 CNM 19-09-07	–	–	–	–	1.4370	–
S32750	GX 10 CrNiMo 18 9	–	SCS 14 A	S32750	X 2 CrNiMoN 25-7-4	Z 5 CND 20.10 M	X 2 CrNiMoN 25-7-4	–	–	–	1.4410	–
–	X 5 CrNiMo 18 11	315 S 16	–	–	–	–	–	2340	–	–	1.4420	–
347	X 6 CrNiNb 18 10	347 S 17	SUS 347	S34700	X 6 CrNiNb 18 10	Z 6 CANN 18.10	X 6 CrNiNb 18 11	2338	–	–	1.4550	ATI 347™
316 Cb	X 6 CrNiMoNb 17 12 2	318 S 17	–	–	X 6 CrNiMoNb 17 12 2	Z 6 CNDNb 17.12	X 6 CrNiMoNb 17 12	–	–	–	1.4580	–
–	X 3 CrNiMoN 17 13	–	–	–	X 3 CrNiMoN 17-13-3	–	X 2 CrNiMoN 17 12	–	–	–	1.4910	–
–	X 6 CrNi 23 13	–	–	–	309 H	–	–	–	–	–	1.4950	–
A286	X 6 NiCrTiMoVB 25-15-2	286 S 31	–	S66286	X 6 NiCrTiMoVB 21-15-2	–	–	–	–	–	1.4980	Incoloy A 286
XM-19	–	–	–	S20910	–	–	–	–	–	F1314	–	ATI XM-19™
303 plus X	–	–	–	S30310	–	–	–	–	–	XM-5	–	303 plus X
–	X 2 CrNi 18 13 3	–	–	–	–	–	–	–	–	–	–	Staybrite® 4435NCu
218	–	–	–	S21800	–	–	–	–	–	–	–	Nitronic 60
201LN	–	–	–	S20153	–	–	–	–	–	–	–	ATI 201LN™-MIL
–	X 2 CrNiMoN 17 13 3	–	–	–	–	Z 2 CND 17.13	X 2 CrNiMoN 17 13 3	–	–	–	–	AL 316LXN
–	–	–	–	S31675	–	–	–	–	–	F1586	–	ATI REX 734™
–	–	–	–	–	–	–	–	–	–	–	–	P558
–	X 1 NiCrMoCu 22 24 6	–	–	–	–	–	–	–	–	–	–	Uranus B66
–	–	–	–	–	–	–	–	–	–	–	–	ATI Datalloy 2®
–	–	–	–	–	–	–	–	–	–	–	–	ATI Staballoy® AG17®
–	–	–	–	–	–	–	–	–	–	–	–	P530
–	X 1 NiCrMoCu 31 27 4	–	–	N08028	–	–	–	–	–	–	–	Uranus B28
–	–	–	–	–	–	–	–	–	–	–	–	P750
–	–	–	–	–	–	–	–	–	–	–	–	P750-I
–	X 4 CrNiMoN 21 9 4	–	–	–	–	–	–	–	–	F1586	–	M30NW
–	–	–	–	–	–	–	–	–	–	–	–	P550
–	–	–	–	–	–	–	–	–	–	–	–	P580
–	–	–	–	–	–	–	–	–	–	–	–	P650
–	–	–	–	–	–	–	–	–	–	–	–	ATI Datalloy HP™

NOTE: For legend, see page Y217.

M3 ■ Workpiece Materials Listing • Stainless Steel • M3

M3 Duplex Stainless Steel Tensile Strength RM (MPa)*: <800 Hardness (HB): 135–275 (HRC): <30

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Material Number	Manufacturer Reference
–	GX 120 CrMo 29 2	–	–	–	–	–	–	–	–	F30M	1.4138	PK324
–	X 2 CrMnNiN 21 5 1	–	–	S32101	–	–	–	–	–	–	1.4162	LDX2101
–	GX 6 CrNiN 26 7	–	–	–	GX 6 CrNiN 26-7	–	–	–	–	–	1.4347	–
S32304	X 2 CrNiN 23 4	–	–	S32304	SAF 2304	35 N	X 2 CrNiN 23-4	2327	–	A240	1.4362	ATI 2304™
S31500	X 2 CrNiMoSi 19 5	–	–	S39215	GX 2 CrNiMoN 25-7-3	GX 2 CrNiMoN 25-7-3	–	2376	–	–	1.4417	–
S31803	X 2 CrNiMoN 22 5 3	318 S 13	SUS 329J 3L	S31803, S32205	X 2 CrNiMoN 22 5 3	Z 3 CNL 22.05 AZ	X 2 CrNiMoN 22-5-3	2377	F51	2205	1.4462	ATI 2205™
–	GX 6 CrNiMo 24 8 2	–	–	–	–	–	–	–	–	–	1.4463	–
–	GX 2 CrNiMoN 25 6 3	–	–	–	GX 2 CrNiMoN 25-6-3	GX 2 CrNiMoN 25-6-3	–	–	–	–	1.4468	–
–	GX 2 CrNiMoN 26 7 4	–	–	J93404	GX 2 CrNiMoN 26-7-4	GX 2 CrNiMoN 26-7-4	GX 2 CrNiMoN 26-7-4	–	–	–	1.4469	–
–	X 2 CrNiMoCuWN 25 7 4	–	–	S32760	X 2 CrNiMoCuWN 25 7 4	X 2 CrNiMoCuWN 25-7-4	X 2 CrNiMoCuWN 25-7-4	–	F 55	–	1.4501	F55
2507	X 2 CrNiMoCuN 25 6 3	–	–	–	X 2 CrNiMoCuN 25-6-3	DMV25.7Cu	329SK	–	–	–	1.4507	Uranus 52N+
–	GX 2 CrNiMoCuWN 25 8 4	–	–	–	X 6 CrNiCu 18 10 4 KD	Z 4 CNUD 17-11-03 FF	–	–	–	–	1.4508	–
–	GX 2 CrNiMoCuN 25 6 3 3	–	–	–	GX 2 CrNiMoCuN 25-6-3-3	GX 2 CrNiMoCuN 25-6-3-3	GX 2 CrNiMoCuN 25-6-3-3	–	–	–	1.4517	–
–	X 4 CrNiMoNb 25 7	–	SCS 22	–	–	–	–	–	–	–	1.4582	PK343
–	BGH 4593	–	–	–	GX 3 CrNiMoCuN 24 6 2 3	–	–	–	–	–	1.4593	Noridur®
329	X 4 CrNiMo 27 5 2	–	SUS 329 J1	S32900	X 3 CrNiMo 27 5 2	X 2 CrNiMo 25-7-3	X 3 CrNiMo 27-5-2	2324	–	A240	1.4460	10RE51
–	GX 2 CrNiMoN 22 5 3	–	–	–	GX 2 CrNiMoN 22-5-3	GX 2 CrNiMoN 22-5-3	GX 2 CrNiMoN 22-5-3	–	–	–	1.4470	–
S32550	–	–	–	S32550	–	–	–	–	–	–	–	Ferralum® alloy 255
–	–	–	–	S32003	–	–	–	–	–	–	–	ATI 2003®
–	–	–	–	S80211	–	–	–	–	–	–	–	ATI 2102™
–	–	–	–	S32550	–	–	–	–	–	–	–	ATI 255™
–	–	–	–	S34565	–	–	–	–	–	–	–	ATI 4565™
–	X 2 CrNiMoN 25 6 3	–	–	–	–	–	–	–	–	–	–	Uranus 47N+
–	–	–	–	–	–	–	F60	–	–	32760	–	Zeron® 100

Cast Iron

K1 ■ Workpiece Materials Listing • Cast Iron • K1

K1 Grey Cast Iron Tensile Strength RM (MPa)*: 125–500 Hardness (HB): 120–290 (HRC): <32

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Material Number	Manufacturer Reference
–	GG-150HB	–	–	–	GJL-HB 170	–	–	–	–	–	0.6012	–
A48-25 B	GG-15	Grade 150	FC 150	–	GJL-150	FGL 150	G 15	0115-00	–	A 48 Class 25	0.6015	–
–	GG-170HB	–	–	N06985	GJL-HB 205	–	–	–	–	–	0.6017	–
–	GG-190HB	–	–	N06022	GJL-HB 230	–	–	–	–	–	0.6022	–
A48-35 B	GG-25	Grade 260	FC 250	–	GJL-250	FGL 250	G 25	0125-00	–	A 48 Class 35	0.6025	–
–	GG-26	–	FC260	–	–	–	G 26	0126-00	–	–	0.6026	–
–	GG-220HB	–	–	W06027	GJL-HB 250	FGL 250	–	–	–	–	0.6027	–
–	GG-240HB	–	–	–	GJL-HB 275	–	–	–	–	–	0.6032	–
A48-50 B	GG-35	Grade 350	FC 350	–	GJL-350	FGL 350	G 35	0135-00	–	A 48 Class 50	0.6035	–
–	GG-260HB	–	–	–	GJL-HB 275	–	–	–	–	–	0.6037	–
A48-20 B	GG-10	Grade 100	FC 100	–	GJL-100	FGL 100	G 10	0110-00	–	A 48 Class 20	0.6010	–
A48-30 B	GG-20	Grade 220	FC 200	W06020	GJL-200	FGL 200	G 20	0120-00	–	A 48 Class 30	0.6020	–
A48-45 B	GG-30	Grade 300	FC 300	–	GJL-300	FGL 300	G 30	0130-00	–	A 48 Class 45	0.6030	–
A48-55 B	GG-40	Grade 400	–	–	GJL-400	FGL 400	–	0140-00	–	A 48 Class 55	0.6040	–
A48-40	–	–	–	–	–	–	–	–	–	A 48 Class 40	–	–
A48-60	–	–	–	–	–	–	–	–	–	A 48 Class 60	–	–
–	–	–	–	–	–	–	–	–	G1800	A 159 G1800	–	–
–	–	–	–	–	–	–	–	–	G3000	A 159 G3000	–	–
–	–	–	–	–	–	–	–	–	G10H18	A 159 G3000	–	–
–	–	–	–	–	–	–	–	–	G11H18	A 159 G3000	–	–
–	–	–	–	–	–	–	–	–	G3500	A 159 G3500	–	–
–	–	–	–	–	–	–	–	–	G11H20	A 159 G3500	–	–
–	–	–	–	–	–	–	–	–	G4000	A 159 G4000	–	–
–	–	–	–	–	–	–	–	–	G13H19	A 159 G4000	–	–
–	–	–	–	–	–	–	–	–	G12H21	A 159 G4000	–	–
–	–	–	–	–	–	–	–	–	G9H12	A 159 G1800	–	–
–	GG-26-Cr	–	–	–	–	–	–	–	–	–	–	–
–	GG-25-Cr	–	–	–	–	–	–	–	–	–	–	–

K2 ■ Workpiece Materials Listing • Cast Iron • K2

 K2 Low- and Medium-Strength Ductile Irons (Nodular Irons) and Compacted Graphite Irons (CGI)
 Hardness (HB): 130–260 (HRC): <28

Tensile Strength RM (MPa)*: <600

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Material Number	Manufacturer Reference
-	GGL-NiMn137	L-NiMn 13 7	FCA NiMn 13 7	F43000	GJLA-XNiMn 13-7	L-NM 13 7	-	-	-	-	0.6652	-
A 436 Type 1	GGL-NiCuCr1562	L-NiCuCr 15 6 2	FCA-NiCuCr 15 6 2	F41000	GJLA-XNiCuCr 15-6-2	L-NUC 15 6 2	-	-	-	-	0.6655	-
A 436 Type 1b	GGL-NiCuCr1563	L-NiCuCr 15 6 3	FCA-NiCuCr 15 6 3	F41001	GJLA-XNiCuCr 15-6-3	L-NUC 15 6 3	-	-	-	-	0.6656	-
A 436 Type 2b	GGL-NiCr203	L-NiCr 20 3	FCA-NiCr 20 3	F41003	GJLA-XNiCr 20-3	L-NC 20 3	-	-	-	-	0.6661	-
-	GGL-NiSiCr2053	L-NiSiCr 20 5 3	FCA-NiSiCr 20 5 3	-	GJLA-XNiSiCr 20-5-3	L-NSC 20 5 3	-	-	-	-	0.6667	-
A 436 Type 3	GGL-NiCr303	L-NiCr 30 3	FCA-NiCr 30 3	F41004	GJLA-XNiCr 30-3	L-NC 30 3	-	-	-	-	0.6676	-
-	GGG-35.3	-	-	-	GJS-350-22	-	-	0717-15	-	-	0.7033	-
-	GGG-40.3	SNG 370/17	FCD 370	-	GJS-400-18	FGS 370-17	GSO 42/15	0717-15	-	-	0.7043	-
-	GGG-45	-	FCD 450	-	-	-	-	-	-	-	0.7045	-
-	-	-	-	-	-	FGS450.10	-	-	-	-	0.7049	-
-	GGG-65	-	-	-	-	-	-	-	-	-	0.7065	-
-	GGG-NiMn137	S-NiMn 13 7	FCDA-NiMn 13 7	-	GJSA-XNiMn 13-7	S-Mn 13 7	-	0772-00	-	-	0.7652	-
-	GGG-NiCrNb202	S2W	FCDA-NiCrNb 20 2	-	GJSA-XNiCrNb 20-2	-	-	-	-	-	0.7659	-
A 439 Type D-2B	GGG-NiCr203	S-NiCr 20 3	FCDA-NiCr 20 3	F43001	GJSA-XNiCr 20-3	-	-	-	-	-	0.7661	-
-	GGG-NiSiCr2052	S-NiSiCr 20 5 2	FCDA-NiSiCr 20 5 2	-	GJSA-XNiSiCr 20-5-2	S-NSC 20 5 2	-	-	-	-	0.7665	-
A 571 Type D-2M	GGG-NiMn234	S-NiMn 23 4	FCDA-NiMn 23 4	-	GJSA-XNiMn 23-4	S-NM 23 4	-	-	-	-	0.7673	-
A 439 Type D-3	GGG-NiCr303	S-NiCr 30 3	FCDA-NiCr 30 3	F43003	GJSA-XNiCr 30-3	S-NC 30 3	-	-	-	-	0.7676	-
A 439 Type D-3A	GGG-NiCr301	S-NiCr 30 1	FCDA-NiCr 30 1	F43004	GJSA-XNiCr 30-1	S-NC 30 1	-	-	-	-	0.7677	-
-	GGG-NiSiCr3055	-	FCDA-NiSiCr 30 5 5	-	GJSA-XNiSiCr 30-5-5	-	-	-	-	-	0.7679	-
A 439 Type D-5	GGG-Ni35	S-Ni 35	FCDA-Ni 35	F43006	GJSA-XNi 35	S-N 35	-	-	-	-	0.7683	-
A 439 Type D-5A	GGG-NiCr353	S-NiCr 35 3	FCDA-NiCr 35 3	F43007	GJSA-XNiCr 35-3	S-NC 35 3	-	-	-	-	0.7685	-
-	GGG-NiSiCr3552	-	FCDA-NiSiCr 35 5 2	-	GJSA-XNiSiCr 35-5-2	FGS Ni35 Si 5 Cr2	-	-	-	-	0.7688	-
-	GTW-35-04	W 35-04	FCMW 330 class 1	-	GJMW-35-0-4	MB 35-7	W 35-04	-	-	-	0.8035	-
-	GTW-S-38-1 2	W 38-12	-	-	GJMW-360-12	MB 300-12	-	-	-	-	0.8038	-
-	GTW-45-07	W 45-07	FCMWP 440 class 3	-	GJMW-450-7	MB 450-7	GMB 45	-	-	-	0.8045	-
-	GTW-55	-	-	-	-	-	GMB 55	-	-	-	0.8055	-
-	GTW-65	-	-	-	-	-	GMB 65	-	-	-	0.8065	-
32510	GTS-35-10	B 340/12	FCMP 330	-	GJMB-350-10	MN 350-10	-	815	-	-	0.8135	-
40010	GTS-45-06	P 440/7	FCMP 440	-	GJMB-450-6	MN 450 - 6	P 45-06	852	-	-	0.8145	-
50005	GTS-55-04	P 510/4	FCMP 490	-	GJMB-550-4	MN 550-4	P 55-04	854	-	-	0.8155	-
70003	GTS-65-02	P 570/3	FCMP 540	-	GJMB-650-2	MN 650-3	P 65-02	0858-00, 0856-00	-	-	0.8165	-
90001	GTS-70-02	P 690/2	FCMP 690	-	GJMB-700-2	MN 700-2	P 70-02	0862-03; 0864-03	-	-	0.8170	-
-	GGV-30	-	-	-	GJV-300	-	-	-	-	-	0.9991	-
A 436 Type 2	GGL-NiCr202	L-NiCr 20 2	FCA-NiCr 20 2	F41002	GJLA-XNiCr 20-2	L-NC 20 2	-	0523-00	-	-	0.6660	-
A 436 Type 4	GGL-NiSiCr3055	L-NiSiCr 30 5 5	FCA-NiSiCr 30 5 5	F41005	GJLA-XNiSiCr 30-5-5	L-NSC 30 5 5	-	-	-	-	0.6680	-
60-40-18	GGG-40	SNG 420/12	FCD 400 class 1	F32800	GJS-400-15	FGS400-12	GS400-12	0717-02	60-40-18	60-40-18	0.7040	-
65-45-12	GGG-50	SNG 500/7	FCD 500	F33100	GJS-500-7	FGS 500-7	GS 500/7	0727-02	65-45-12	65-45-12	0.7050	-
-	GGG-60	SNG 600/3	FCD 600-3	-	GJS-600-3	-	GS 600/3	-	80-55-06	80-55-06	0.7060	-
100-70-03	GGG-70	SNG 700/2	FCD 700	F34800	GJS-700-2	FGS 700-2	GS 700-2	0737-01	100-70-03	100-70-03	0.7070	-
120-90-02	GGG-80	SNG 800/2	FCD 800	F36200	GJS-800-2	FGS 800-2	GS 800-2	-	120-90-02	120-90-02	0.7080	-
A 439 Type D-2	GGG-NiCr202	L-NiCuCr 20 2	FCDA-NiCr 20 2	-	GJSA-XNiCr 20-2	L-NC 20 2	-	0523-00	-	-	0.7660	-
A 439 Type D-2C	GGG-Ni22	S-Ni 22	FCDA-Ni 22	F43002	GJSA-XNi 22	S-N 22	-	-	-	-	0.7670	-
A 439 Type D-4	GGG-NiSiCr3053	S-NiSiCr 30 5 3	FCDA-NiSiCr 30 5 3	F43005	GJSA-XNiSiCr 30-5-3	S-NSC 30 5 3	-	-	-	-	0.7680	-
-	GTW-40-05	W 40-05	FCMW 370	-	GJMW-400-5	MB 400-5	GMB 40	-	-	-	0.8040	-
-	GGV-40	-	-	-	GJV-400	-	-	-	-	-	0.9990	-
80-55-06	-	-	-	F33800	-	FGS 350-22	-	0732-03	D5506	-	-	-
-	-	-	-	-	-	-	-	-	D4018	-	-	-
-	-	-	-	-	-	-	-	-	D400	-	-	-
-	-	-	-	-	-	-	-	-	D4512	-	-	-
-	-	-	-	-	-	-	-	-	D450	-	-	-
-	-	-	-	-	-	-	-	-	M3210	-	-	-
-	-	-	-	-	-	-	-	-	M4504	-	-	-
-	-	-	-	-	-	-	-	-	M5003	-	-	-
-	-	-	-	-	-	-	-	-	M5503	-	-	-
-	-	-	-	-	-	-	-	-	M7002	-	-	-
-	-	-	-	-	-	-	-	-	D7003	-	-	-
-	-	-	-	-	-	-	-	-	M8501	A 602 M8501	-	-
-	GGV-45	-	-	-	GJV-450	-	-	-	-	-	-	-
-	GGG-SiMn3.08	-	-	-	-	-	-	-	-	-	-	-
-	GGG-SiMn4.10	-	-	-	-	-	-	-	-	-	-	-
-	GGG-SiMn5.10	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	HPI C13 06
-	GGV-35	-	-	-	GJV-350	-	-	-	-	-	-	-
-	GGV-50	-	-	-	GJV-500	-	-	-	-	-	-	-

K3 ■ Workpiece Materials Listing • Cast Iron • K3

K3 High-Strength Ductile Irons and Austempered Ductile Iron (ADI)

Tensile Strength RM (MPa)*: >600

Hardness (HB): 180–350 (HRC): <43

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Material Number	Manufacturer Reference
-	-	-	-	-	-	-	-	-	-	A 897 125-80-10	-	-
-	-	-	-	-	-	-	-	-	-	A 897 150-100-7	-	-
-	-	-	-	-	-	-	-	-	-	A 897 175-125-4	-	-
-	-	-	-	-	-	-	-	-	-	A 897 200-150-1	-	-
-	-	-	-	-	-	-	-	-	-	A 897 230-185	-	-

NOTE: For legend, see page Y217.

N1

■ Workpiece Materials Listing • Non-Ferrous Metals • N1

N1 Wrought Aluminium

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Material Number	Manufacturer Reference
1080	Al99.8	-	1A	-	-	-	-	-	-	-	3.0128	-
1050	Al99.5	L 31	1B	-	-	A 59050 C	-	-	-	-	3.0255	-
-	SG-Al 99,5	-	-	-	-	-	-	-	-	-	3.0259	-
1070	Al99.7	-	-	-	-	-	4508	-	-	-	3.0275	-
3103	AlMn	-	N3	-	-	-	-	-	-	-	3.0515	-
3003	AlMnCu	-	-	-	-	-	-	-	-	-	3.0517	-
3005	AlMn1Mg0.5	-	-	-	-	-	-	-	-	-	3.0525	-
3004	AlMn1Mg1	-	-	-	-	-	-	-	-	-	3.0526	-
-	AlMgSiPb	-	-	-	-	-	-	-	-	-	3.0615	-
-	SG-Al 99.5Ti	-	-	-	-	-	-	-	-	-	3.0805	-
-	SG-Al 99.5 Ti	-	-	-	-	-	-	-	-	-	3.0805	-
2014	AlCuSiMn	-	H15	-	-	A-U4SG	3581	-	-	-	3.1255	-
2017	AlCuMg 1	-	-	-	AW-2017 A	A-U4G	3579	-	-	-	3.1325	-
2024	AlCuMg 2	-	L97	-	AW-2024	A-U4G1	-	-	-	-	3.1355	-
-	AlCuMgPb	-	-	-	-	-	-	-	-	-	3.1645	-
2011	AlCuBiPb	-	FC1	-	-	A-U5PbBi	6362	-	-	-	3.1655	-
6082	AlMgSi 1	-	H30	-	AW-6005 A	A-SGMO.7	3571	-	-	-	3.2315	-
6060	AlMgSi0.5	-	-	-	-	-	-	-	-	-	3.3206	-
6063	AlMgSi0.7	-	H9	-	-	A-GS	3569	-	-	-	3.3206	-
6463	EAlMgSi0.5	-	91E	-	-	-	-	-	-	-	3.3207	-
5005	AlMg 1	-	N41	-	AW-6082	A-G0.6	5764-66	-	-	-	3.3315	-
5050	-	-	-	-	-	-	-	-	-	-	3.3316	-
5052	AlMg2.5	-	2L56	-	-	A-G2.5C	4574	-	-	-	3.3523	-
5754	AlMg 3	-	N5	-	-	A-G3M	3575	-	-	-	3.3535	-
5454	AlMg2.5Mn	-	N51	-	-	A-G2.5MC	7789	-	-	-	3.3537	-
5086	AlMg4Mn	-	-	-	-	-	-	-	-	-	3.3545	-
-	SG-Al Mg 4.5 Mn Zr	-	-	-	-	-	-	-	-	-	3.3546	-
5083	AlMg4.5Mn	-	N8	-	-	A-G4.5MC	7790	-	-	-	3.3547	-
5056	AlMg5	-	N6	-	-	A-G5	3576	-	-	-	3.3549	-
-	AlMg 5	-	-	-	-	-	-	-	-	-	3.3555	-
7050	AlZnMgCu0.5	L 86	-	-	-	AZ 4 GU/9051	811-04	-	-	-	3.4144	-
7020	AlZn4.5Mg1	-	H17	-	-	A-Z5G	-	-	-	-	3.4335	-
7022	AlZnMgCu0.5	-	-	-	-	-	-	-	-	-	3.4345	-
-	AlZn5.5MgCu	-	-	-	-	-	-	-	-	-	3.4365	-
7075	AlZnMgCu 1.5	-	DTD5074	A97075	AL-P7075	A-Z5GU	3735	-	7075	-	3.4365	-
1000	Al99.5H	L31	-	-	-	A59050C	-	-	-	-	3.0250	-
-	Al99.8	-	-	-	-	-	-	-	-	-	3.0280	-
-	AlMg3Mn	-	-	-	-	-	-	-	-	-	-	-
2025	-	-	A 2025 FD	A92025	-	-	-	-	2025	B 247 2025	-	-
1100	-	-	-	-	-	-	-	-	-	-	-	-
3105	-	-	-	-	-	-	-	-	-	-	-	-
5657	AlMg0.8Si	-	-	-	-	-	-	-	-	-	-	-
6070	-	-	-	-	-	-	-	-	-	-	-	-
6262	-	-	-	-	-	-	-	-	-	-	-	-
7003	-	-	-	-	-	-	-	-	-	-	-	-
2050	-	-	-	-	-	-	-	-	-	-	-	-
7475	-	-	-	-	-	-	-	-	-	-	-	-
7175	-	-	-	-	-	-	-	-	-	-	-	-
7178	-	-	-	-	-	-	-	-	-	-	-	-
5251	AlMg2Mo3	-	N4	-	-	A-G2M	3574	-	-	-	-	-
6151	-	-	-	-	-	-	-	-	-	-	-	-
7001	-	-	-	-	-	-	-	-	-	-	-	-
7040	-	-	-	-	-	-	-	-	-	-	-	-

N2

■ Workpiece Materials Listing • Non-Ferrous Metals • N2

N2 Low-Silicon Aluminium Alloys and Magnesium Alloys Content: Si <12,2%

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Material Number	Manufacturer Reference
-	SG-Al99.8	-	-	-	-	-	-	-	-	-	3.0286	-
-	G-AlCu 4 TiMg	-	-	-	-	-	-	-	-	-	3.1371	-
-	G-AlCu 4 TiMg	-	-	-	-	-	-	-	-	-	3.1371	-
-	G-AlCu 5 Ni 1.5	-	-	-	-	-	-	-	-	-	3.1754	-
-	G-AlCu 4 Ti	-	-	-	-	-	-	-	-	-	3.1841	-
-	G-AlSi 5 Cu 1	-	-	-	-	-	-	-	-	-	3.2131	-
-	G-AlSi 6 Cu 4	-	-	-	-	-	-	-	-	-	3.2151	-
-	G-AlSi 8 Cu 3	-	-	-	-	-	-	-	-	-	3.2161	-
-	G-AlSi 9 Cu 3	-	-	-	-	-	-	-	-	-	3.2163	-
-	G-AlSi 1 1	-	-	-	-	-	-	-	-	-	3.2211	-
-	SG-AlSi 5	-	-	-	-	-	-	-	-	-	3.2245	-
-	SG-AlSi 5	-	-	-	-	-	-	-	-	-	3.2245	-
-	G-AlSi 5 Mg	-	-	-	-	-	-	-	-	-	3.2341	-
4218 B	G-AlSi 7 Mg	-	-	-	-	-	-	-	-	-	3.2371	-
-	G-AlSi 9 Mg	-	-	-	-	-	-	-	-	-	3.2373	-
-	G-AlSi 10 Mg	-	-	-	-	-	-	-	-	-	3.2381	-
-	G-D AlSi 10 Mg	-	-	-	-	-	-	-	-	-	3.2382	-
A 360.2	G-AlSi 10 Mg(Cu)	LM 9	-	-	-	-	-	4253	-	-	3.2383	-
A 413.0	G-D AlSi 12	-	-	-	-	-	-	4247	-	-	3.2582	-
-	SG-AlSi 12	-	-	-	-	-	-	-	-	-	3.2585	-
-	G-D AlSi 12(Cu)	-	-	-	-	-	-	-	-	-	3.2982	-
6061	AlMgSiCu	-	H20	-	-	A-GSUC	6170	-	-	-	3.3211	-
-	G-AlMg 3 Si	-	-	-	-	-	-	-	-	-	3.3241	-
-	G-AlMg 5 Si	-	-	-	-	-	-	-	-	-	3.3261	-
-	G-D AlMg 9	-	-	-	-	-	-	-	-	-	3.3292	-
-	G-AlMg5Si(Cu,Mn)	-	-	-	-	-	-	-	-	-	3.3458	-
-	SG-AlMg 3	-	-	-	-	-	-	-	-	-	3.3536	-

N2

Workpiece Materials Listing • Non-Ferrous Metals • N2 *(continued)*

N2 Low-Silicon Aluminium Alloys and Magnesium Alloys Content: Si <12,2%

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Material Number	Manufacturer Reference
-	G-AlMg 3	-	-	-	-	-	-	-	-	-	3.3541	-
-	SG-AlMg 4,5 Mn	-	-	-	-	-	-	-	-	-	3.3548	-
-	SG-AlMg 5	-	-	-	-	-	-	-	-	-	3.3556	-
-	G-AlMg 5	-	-	-	-	-	-	-	-	-	3.3561	-
ZE 41	G-MgZn 4 SE 1 Zr 1	MAG 5	-	-	MCMgZn 4 RE 1 Zr	G-Z 4 TR	-	-	-	-	3.5101	-
-	G-MgZn 5 Th 2 Zr 1	-	-	-	-	-	-	-	-	-	3.5102	-
EZ 33	MgSE 3 Zn 2 Zr 1	MAG 6	-	-	MCMgRE 3 Zn 2 Zr	G-TR 3 Z 2	-	-	-	-	3.5103	-
-	MgAl 9 Zn 1	-	-	-	-	-	-	-	-	-	3.5104	-
-	G-MgTh 3 Zn 2 Zr 1	-	-	-	-	-	-	-	-	-	3.5105	-
QE 22	G-MgAg 3 SE 2 Zr 1	MAG 12	-	-	MCMgRE 2 Ag 2 Zr	G-Ag 22,5	-	-	-	-	3.5106	-
-	G-D MgAl 6 Zn 1	-	-	-	-	-	-	-	-	-	3.5612	-
-	G-D MgAl 6	-	-	-	-	-	-	-	-	-	3.5662	-
AZ 81	G-MgAl 8 Zn 1	MAG 1	-	-	MCMgAl 8 Zn 1	G-A 9	-	-	-	-	3.5812	-
AZ 91	G-MgAl 9 Zn 1	MAG 7	-	-	MCMgAl 9 Zn 1	G-A 9 Z 1	-	-	-	-	3.5912	-
-	G-MgAl 8 Zn 1	-	-	-	-	-	-	-	-	-	3.5200	-
AS 41	G-D MgAl 4 Si 1	-	-	-	MCMgAl4Si	G-A4S 1	-	-	-	-	3.5470	-
-	G-AlZn10Si8Mg	-	-	-	-	-	-	-	-	-	-	-
AS 7 G	AlSi7Mg	-	-	-	-	-	-	-	-	-	-	-
2117	-	-	-	-	-	-	-	-	-	-	-	-
2218	AlCuMgNi2	-	-	-	-	-	-	-	-	-	-	-
2091	-	-	-	-	-	-	-	-	-	-	-	-
8090	-	-	-	-	-	-	-	-	-	-	-	-
2090	-	-	-	-	-	-	-	-	-	-	-	-
2224	-	-	-	-	-	-	-	-	-	-	-	-
2094	-	-	-	-	-	-	-	-	-	-	-	-
2095	-	-	-	-	-	-	-	-	-	-	-	-
2097	-	-	-	-	-	-	-	-	-	-	-	-
2098	-	-	-	-	-	-	-	-	-	-	-	-
2099	-	-	-	-	-	-	-	-	-	-	-	-
2195	-	-	-	-	-	-	-	-	-	-	-	-
2196	-	-	-	-	-	-	-	-	-	-	-	-
2197	-	-	-	-	-	-	-	-	-	-	-	-
2198	-	-	-	-	-	-	-	-	-	-	-	-
2297	-	-	-	-	-	-	-	-	-	-	-	-
2397	-	-	-	-	-	-	-	-	-	-	-	-
8017	-	-	-	-	-	-	-	-	-	-	-	-
8024	-	-	-	-	-	-	-	-	-	-	-	-
8091	-	-	-	-	-	-	-	-	-	-	-	-
8093	-	-	-	-	-	-	-	-	-	-	-	-
2199	-	-	-	-	-	-	-	-	-	-	-	-

N3

Workpiece Materials Listing • Non-Ferrous Metals • N3

N3 High-Silicon Aluminium Alloys and Magnesium Alloys Content: Si >12,2%

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Material Number	Manufacturer Reference
A 413.1	G-AISI 12(Cu)	LM 20	-	-	-	-	-	4260	-	-	3.2583	-
A 413.2	G-AISI 12	LM 6	-	-	-	-	-	4261	-	-	3.2581	-
-	G-AISI17Cu4Mg	-	-	-	-	-	-	-	-	-	-	-
-	GK-AISI18CuNiMg	-	-	-	-	-	-	-	-	-	-	-
-	GK-AISI21CuNiMg	-	-	-	-	-	-	-	-	-	-	-
-	GK-AISI12CuNiMg	-	-	-	-	-	-	-	-	-	-	-
-	GK-AISI25CuNiMg	-	-	-	-	-	-	-	-	-	-	-
-	G-AISI 21 CuNiMg	-	-	-	-	-	-	-	-	-	-	-
4032	-	-	-	-	-	-	-	-	-	-	-	-

N4

Workpiece Materials Listing • Non-Ferrous Metals • N4

N4 Copper-, Brass-, Zinc-Based on Machinability Index Range of 70–100

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Material Number	Manufacturer Reference
C 11000	E-Cu 58	C 101	-	-	-	Cn-a2	-	-	-	-	2.0065	-
C 81100	G-CuL 45	HCC 1	-	-	-	-	-	-	-	-	2.0082	-
C 81100	G-Cu L 50	HCC 1	-	-	-	-	-	-	-	-	2.0085	-
-	CuZn 40 MnPb	-	-	-	-	-	-	-	-	-	2.0241	-
C 26000	CuZn 30	CZ 102	C 2600	-	-	CuZn 30	-	-	-	-	2.0265	-
C 27200	CuZn 37	CZ 108	-	-	-	CuZn 37	C 2720	-	-	-	2.0321	-
-	CuZn 36 Pb 1.5	-	-	-	-	-	-	-	-	-	2.0331	-
-	S-CuZn40	-	-	-	-	-	-	-	-	-	2.0366	-
-	CuZn 39 Pb 3 + D567	-	-	-	-	-	-	-	-	-	2.0401	-
-	CuZn 40 Pb 2	-	-	-	-	-	-	-	-	-	2.0402	-
B-198	G-CuZn 15Si 4	-	-	-	-	-	-	-	-	-	2.0492	-
-	CuZn 40Al 1	-	-	-	-	-	-	-	-	-	2.0561	-
-	G-KCuZn 38 Al	-	-	-	-	-	-	-	-	-	2.0591	-
C 86500	G-CuZn 35 Al 1	HTB 1	-	-	-	U-Z 36 N 3	-	-	-	-	2.0592	-
-	G-KCuZn 37 Al 1	-	-	-	-	-	-	-	-	-	2.0595	-
C 86200	G-CuZn 34 Al 2	HTB 1	-	-	-	U-Z 36 N 3	-	-	-	-	2.0596	-
-	G-CuZn 25 Al 5	-	-	-	-	-	-	-	-	-	2.0598	-
-	S - CuNi 30 Fe	-	-	-	-	-	-	-	-	-	2.0837	-
-	CuNi 10 Fe 1 Mn	-	-	-	-	-	-	-	-	-	2.0872	-

NOTE: For legend, see page Y217.

(continued)

N4

■ Workpiece Materials Listing • Non-Ferrous Metals • N4 (continued)

N4 Copper-, Brass-, Zinc-Based on Machinability Index Range of 70–100

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Material Number	Manufacturer Reference
-	S - CuNi 10 Fe	-	-	-	-	-	-	-	-	-	2.0873	-
-	CuNi 30 Mn 1 Fe	-	-	-	-	-	-	-	-	-	2.0882	-
-	SG-Cu Al 8	-	-	-	-	-	-	-	-	-	2.0921	-
-	SG-CuAl 8 Ni 2	-	-	-	-	-	-	-	-	-	2.0922	-
-	SG-CuAl 9 Ni5 Fe	-	-	-	-	-	-	-	-	-	2.0927	-
-	CuAl 10 Fe 3 Mn 2	CA 103	-	-	-	U-A 10 Fe	-	-	-	-	2.0936	-
-	SG-Cu Al 10 Fe	-	-	-	-	-	-	-	-	-	2.0937	-
C 63000	CuAl 10 Ni 5 Fe 4	Ca 104	-	-	-	U-A 10 N	-	-	-	-	2.0966	-
B-148-52	G-CuAl 10 Ni	-	-	-	-	-	-	-	-	-	2.0975	-
-	SG-Cu Sn	-	-	-	-	-	-	-	-	-	2.1006	-
-	SG-Cu Sn 6	-	-	-	-	-	-	-	-	-	2.1022	-
C 90800	G-CuSn 12	Pb 2	-	-	-	UE 12 P	-	-	-	-	2.1052	-
-	G-CuSn 12 Pb	-	-	-	-	-	-	-	-	-	2.1061	-
-	G-CuSn 10 Zn	-	-	-	-	-	-	-	-	-	2.1086	-
C 93200	G-CuSn 7 ZnPb	-	-	-	-	U-E 7 Z 5 Pb 4	-	-	-	-	2.1091	-
-	G-CuSn 6 ZnNi	LG 4	-	-	-	-	-	-	-	-	2.1093	-
C 83600	G-CuSn 5 ZnPb	LG 2	-	-	-	U-E 5 Pb 5 Z 5	-	-	-	-	2.1096	-
-	G-CuSn 2 ZnPb	-	-	-	-	-	-	-	-	-	2.1098	-
C 93700	G-CuPb 10 Sn	LB 2	-	-	-	U-E 10 Pb 10	-	-	-	-	2.1176	-
C 93800	G-CuPb 15 Sn	LB 1	-	-	-	U-Pb 15 E 8	-	-	-	-	2.1182	-
C 94100	G-CuPb 20 Sn	LB 5	-	-	-	U-Pb 20	-	-	-	-	2.1188	-
C 81500	G-CuCrF 35	CC1-FF	-	-	-	-	-	-	-	-	2.1292	-
C 18200	CuCrZr	CC 102	-	-	-	U-Cr 0,8 Zr	-	-	-	-	2.1293	-
-	SG-Cu Mn 13 Al 7	-	-	-	-	-	-	-	-	-	2.1367	-
-	SG-Cu Si 3	-	-	-	-	-	-	-	-	-	2.1461	-
CuSi 3 Mn	-	-	-	-	-	-	-	-	-	-	2.1525	-
-	OF-Cu	-	-	-	-	-	-	-	-	-	2.0040	-
B-120	E-Cu 57	-	-	-	-	-	-	-	-	-	2.0060	-
C 10300	SE-Cu	C 101	-	-	-	Cu-c1	-	-	-	-	2.0070	-
-	CuZn 5	-	-	-	-	-	-	-	-	-	2.0220	-
C 23000	CuZn 15	CZ 102	C 2300	-	-	CuZn 15	-	-	-	-	2.0240	-
-	G-CuZn 33 Pb	-	-	-	-	-	-	-	-	-	2.0290	-
-	CuZn 36 Pb 2	-	-	-	-	-	-	-	-	-	2.0330	-
-	G-CuZn 37 Pb	-	-	-	-	-	-	-	-	-	2.0340	-
-	CuZn 40	-	-	-	-	-	-	-	-	-	2.0360	-
-	CuZn 39 Pb 2	-	-	-	-	-	-	-	-	-	2.0380	-
-	CuZn 20 Al 2	-	-	-	-	-	-	-	-	-	2.0460	-
-	CuZn 37Al 1	-	-	-	-	-	-	-	-	-	2.0510	-
-	CuZn 40 Al 2	-	-	-	-	-	-	-	-	-	2.0550	-
-	G-CuZn 40 Fe	-	-	-	-	-	-	-	-	-	2.0590	-
-	G-CuAl 10 Fe	-	-	-	-	-	-	-	-	-	2.0940	-
C 90700	G-CuSn 10	CT 1	-	-	-	-	-	-	-	-	2.1050	-
C 91700	G-CuSn 12 Ni	-	-	-	-	-	-	-	-	-	2.1060	-
-	C35100	-	-	-	-	-	-	-	-	-	-	-
-	17665	-	-	C95500	-	-	-	-	-	-	-	-
-	MS60	-	-	-	-	-	-	-	-	-	-	-

N5

■ Workpiece Materials Listing • Non-Ferrous Metals • N5

N5 Nylon, Plastics, Rubbers, Phenolics, Resins, Fibreglass

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Material Number	Manufacturer Reference
-	LEXAN	-	-	-	-	-	-	-	-	-	-	-
-	HOSTALEN	-	-	-	-	-	-	-	-	-	-	-
-	Polystyrol	-	-	-	-	-	-	-	-	-	-	-
-	Makralon	-	-	-	-	-	-	-	-	-	-	-

N6

■ Workpiece Materials Listing • Non-Ferrous Metals • N6

N6 Carbon, Graphite Composites, CFRP

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Material Number	Manufacturer Reference
-	GFK	-	-	-	-	-	-	-	-	-	-	-
-	CFK	-	-	-	-	-	-	-	-	-	-	-
Graphite	-	-	-	-	-	-	-	-	-	-	-	-
CFRP	-	-	-	-	-	-	-	-	-	-	-	-

S1

Workpiece Materials Listing • High-Temp Alloys • S1

S1 Iron-Based, Heat-Resistant Alloys

Tensile Strength RM (MPa)*: 500–1200

Hardness (HB): 160–260 (HRC): 25–48

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Material Number	Manufacturer Reference
-	X 10 Cr 25	-	-	-	-	-	-	-	-	-	1.3811	-
-	D 1 a	-	-	-	-	-	-	-	-	-	1.3915	-
-	D 3	BD 3	-	-	X 210 Cr 1 2	Z 200 C 12	X 205 Cr 12 KU	-	-	-	1.3916	-
-	RNi 12	-	-	-	-	-	-	-	-	-	1.3926	-
-	RNi 8	-	-	-	-	-	-	-	-	-	1.3927	-
-	GX 2 NiCoMoTi1 7 10	-	-	-	-	-	-	-	-	-	1.6351	Maraging
6501, 6512, 6520	X 2 NiCoMo 18 8 5	-	-	UNS K92890	S162	Z2NKD18.8	-	-	-	ASTM A646	1.6359	ATI VascoMax® C-250
-	X 2 NiCoMo 18-8-5	-	-	K92890	-	-	-	-	-	-	1.6359	Maraging
-	X 1 CrNiCoMo 13 8 5	-	-	-	-	-	-	-	-	-	-	Maraging
-	Ni 36	-	-	-	-	-	-	-	-	-	1.3910	Magnifer 36
-	Ni 46	-	-	-	-	-	-	-	-	-	1.3920	-
-	X 2 CrNiCoMo 12 8 5	-	-	-	-	-	-	-	-	-	1.6980	Maraging
ASTM B463	-	-	-	UNS N08020	-	-	-	-	-	ASTM B463	2.4660	20CB-3
ASTM A666	-	-	-	-	-	-	-	-	-	ASTM A666	-	6/21/09
ASTM B753	-	-	-	-	-	-	-	-	-	ASTM B753	-	AL 4750
S66286	-	-	NAS 660	UNS S66286	-	-	-	A-286	-	-	-	ATI A286™
-	-	-	-	UNS K92810	-	-	-	-	-	-	-	ATI VascoMax® C-200
6514	-	-	-	UNS K93120	-	-	-	-	-	-	-	ATI VascoMax® C-300
-	-	-	-	-	-	-	-	-	-	-	-	ATI VascoMax® C-350
-	-	-	-	-	-	-	-	-	-	-	-	ATI VascoMax® T-200
6518, 6519, 6591	-	-	-	-	-	-	-	-	-	-	-	ATI VascoMax® T-250
-	-	-	-	-	-	-	-	-	-	-	-	ATI VascoMax® T-300
5725	-	-	-	-	-	Z3NCT25	-	-	SAE 16-25-6	-	-	Discaloy 16-25-6
ASTM A638	-	-	-	-	-	Z3NCT25	-	-	Discaloy	ASTM A638	-	Discaloy 24
5768	X 12 CrCoNi 21 20	-	-	R30556	-	Z12CKNDWnb21.20.20	-	-	-	-	-	Haynes® 556
ASTM F30	-	-	-	-	-	-	-	-	Invar	ASTM F30	-	Haynes 556
5768	-	-	-	UNS R30155	-	Z12CNKDW20	-	-	-	-	-	Invar 42
5533	X 40 CoCrNi 20 20	-	-	-	-	Z42CKNDW	-	-	-	-	-	Multimet N-155
-	X 2 NiCrAlTi 32 20	-	-	-	-	-	-	-	-	-	-	Multimet N-156
AISI:665	-	-	-	-	-	Z8NCTDA2613	-	-	-	-	-	S 590
-	-	-	-	-	-	-	-	-	-	-	-	Sanicro 30
-	-	-	-	-	-	-	-	-	-	-	-	W-545

S2

Workpiece Materials Listing • High-Temp Alloys • S2

S2 Cobalt-Based, Heat-Resistant Alloys

Tensile Strength RM (MPa)*: 1000–1450

Hardness (HB): 250–450 (HRC): 25–48

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Material Number	Manufacturer Reference
-	CoCr 26 Ni 9 Mo	-	-	-	-	-	-	-	-	-	2.4681	-
-	CoCr 25 NiW	-	-	-	-	KC25WN	-	-	-	ASTM A567	2.4682	Stellite® 31 (X40)
-	CoCr 22 NiW	-	-	-	-	-	-	-	-	-	2.4683	-
-	CoCr 28 Mo	-	-	-	-	KC27D5NFe	-	-	-	ASTM F-75	2.4691	HS 21
-	CoCr 20 Ni 15 Mo	-	-	-	-	-	-	-	-	-	2.4711	-
-	CoCr 29 Mo	-	-	-	-	-	-	-	-	-	2.4723	-
-	CoCr 33 W	-	-	-	-	-	-	-	-	-	2.4775	-
-	CoCr 28	-	-	-	-	-	-	-	-	-	2.4778	-
-	CoCr 28 Nb	-	-	-	-	-	-	-	-	-	2.4779	-
-	-	-	-	-	-	-	-	-	-	-	2.4964	F 90
-	-	-	-	R30605	-	KC20WN	-	-	-	ASTM F90	2.4964	Haynes 25
-	CoCr 20 W 15 Ni	HR 240	-	R30605	-	KC20WN	-	-	-	5759	2.4964	L 605
-	CoCr 20 W 15 Ni	-	-	CAST Version of L605	-	KC20WN	-	-	-	5759	2.4964	Stellite 25
AMS 5399	NiCr 19 Co 11 MoTi	-	-	-	-	NC 19 KDT	-	-	-	-	2.4973	-
-	CoCr 20 Ni 20 W	-	-	-	-	-	-	-	-	5534	2.4979	S 816
-	CoCr20NiW	-	-	-	-	-	-	-	-	-	2.4989	-
-	-	-	-	R31537 & R31538	-	CoCr28Mo	-	-	-	ASTM F1537	-	F 1537
-	-	-	-	-	-	-	-	-	-	ASTM F562	-	F 562
-	-	-	-	-	-	-	-	-	-	ASTM F563	-	F 563
-	-	-	-	R30188	-	KC22N22W14Fe	-	-	-	-	-	Haynes 188
AISI 670	CoCr 20 W 15 Ni	-	-	-	-	KC20WN	-	-	-	-	-	HS 25
-	CoCr 26 Ni 14 Mo	-	-	-	-	-	-	-	-	5380	-	HS 30
-	CoCr 19 W 14 NiB	-	-	-	-	-	-	-	-	-	-	HS 36
-	-	-	-	-	-	-	-	-	-	-	-	L 251
-	CoCrW 10 TaZrB	-	-	-	-	KC21W10Ta9	-	-	-	-	-	MAR-M 302
-	CoCr 22 W 9 TaZrNb	-	-	-	-	KC21W9Ta	-	-	-	-	-	MAR-M 322
-	CoCr 24 Ni 10 WTaZrB	-	-	-	-	KC23N10W7Ta	-	-	-	-	-	MAR-M 509
-	-	-	-	-	-	KC20N20Ta7	-	-	-	-	-	MAR-M 905
-	CoCr 20 Ni 20 Ta	-	-	-	-	KC20N20Ta7	-	-	-	-	-	MAR-M 918
-	-	-	-	R30159	-	-	-	-	-	-	-	MP159
-	-	-	-	R30035	-	-	-	-	-	-	-	MP35N
-	-	-	-	-	-	KC33W13	-	-	-	-	-	Stellite 1
-	-	-	-	-	-	KC28W8	-	-	-	-	-	Stellite 12
-	-	-	-	-	-	KC22N22W14Fe	-	-	-	-	-	Stellite 188
-	-	-	-	-	-	KC26NW	-	-	-	-	-	Stellite 6
-	-	-	-	-	-	-	-	-	-	-	-	Stellite 8 (F75)
-	CoCr 25 Ni 20 MoWNB	-	-	-	-	KC25N20DFeWNB	-	-	-	-	-	V-36
-	CoCr 21 Mo 11 W	-	-	-	-	KC21W11ANbT	-	-	-	-	-	WI-52
-	-	-	-	-	-	KC25N10W7Fe	-	-	-	-	-	X 45
-	-	-	-	-	-	-	-	-	J-1570	-	-	-
-	K13C20N126Fe15D7	-	-	R3003 & R3008	-	K13C20N126Fe15D7	-	-	-	ASTM F1058	-	-

NOTE: For legend, see page Y217.

S3

Workpiece Materials Listing • High-Temp Alloys • S3

S3 Nickel-Based, Heat-Resistant Alloys

Tensile Strength RM (MPa)*: 600–1700

Hardness (HB): 160–450 (HRC): <48

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Material Number	Manufacturer Reference
--	X 7 NiCrCoMo 54 20	--	--	--	--	--	--	--	--	--	1.2789	--
--	Ni 99.7 Mg 0.07	--	--	J24053	--	--	--	--	--	A 915 J24053	2.4053	--
--	LC-Ni 99.6	--	--	N02201	--	--	--	--	--	--	2.4061	--
--	--	--	--	N02200	--	--	--	--	--	--	2.4066	200
Nickel 200	Ni 99.2	NA 11	--	N02200	--	--	--	--	--	--	2.4066	--
--	--	--	--	N02201	--	--	--	--	--	--	2.4068	201
Nickel 201	LC-Ni 99	NA 12	--	--	--	--	--	--	--	--	2.4068	--
--	NiMn 1	--	--	--	--	--	--	--	--	--	2.4106	--
--	NiMn 1 C	--	--	--	--	--	--	--	--	--	2.4108	--
--	NiMn 1.5	--	--	--	--	--	--	--	--	--	2.4109	--
--	NiMn 3 Al	--	--	--	--	--	--	--	--	--	2.4122	--
--	NiMn 3 SiMg	--	--	--	--	--	--	--	--	--	2.4126	--
--	NiCr 2 Mn	--	--	--	--	--	--	--	--	--	2.4145	--
--	NiCr 2 MnSi	--	--	--	--	--	--	--	--	--	2.4146	--
--	NiCr 5 MnSi	--	--	--	--	--	--	--	--	--	2.4151	--
--	SG-NiTi 4	NA32	--	--	NA 32	--	--	--	--	--	2.4155	--
CZ-100	G-Ni 93 C	--	--	--	--	--	--	--	--	--	2.4175	--
--	NiCr 4 Mn	--	--	--	--	--	--	--	--	--	2.4199	--
M 35-1/2	G-NiCu 30 Nb	--	--	N24030	--	--	--	--	--	--	2.4365	--
--	EL-NiCu 30 Mn	--	--	N04402	--	--	--	--	--	--	2.4366	--
M 30-H	G-NiCu 30 Si 3	--	--	--	--	--	--	--	--	--	2.4367	--
M-255	G-NiCu 30 Si 4	--	--	--	--	--	--	--	--	--	2.4368	--
--	NiCu 30 Al	--	--	--	--	--	--	--	--	--	2.4374	--
--	NiCu 30 Al	NA 18	--	N05500	3072.76	NU 30 AT	--	--	--	--	2.4375	Monel® K500
--	SG-NiCu 30 MnTi	NA 33	--	--	--	--	--	--	--	--	2.4377	--
--	NiFe 16 CuCr	--	--	--	--	--	--	--	--	--	2.4501	--
--	G-NiMo 16 CrW	--	--	--	--	--	--	--	--	--	2.4537	--
--	NiCr 21 Mo 14 W	--	--	N26022	--	--	--	--	--	--	2.4602	INCONEL® alloy 622
--	NiCr 30 FeMo	--	--	--	--	--	--	--	--	--	2.4603	Hastelloy® G-30
--	--	--	--	N06059	--	--	--	--	--	ASTM B575	2.4605	Allcorr
--	NiCr 23 Mo 16 Al	--	--	--	--	--	--	--	--	--	2.4605	--
--	SG/UP-NiCr 23 Mo 16	--	--	--	--	--	--	--	--	--	2.4607	--
--	NiCr 26 MoW	--	--	--	--	--	--	--	--	--	2.4608	--
--	SG-NiMo 27	--	--	--	--	--	--	--	--	--	2.4615	--
--	NiMo 28	--	--	N10665	--	NiMo 28	--	--	--	--	2.4617	--
--	NiCr 22 Mo 6 Cu	--	--	--	--	--	--	--	--	--	2.4618	--
--	--	--	--	N06985	--	--	--	--	--	--	2.4619	Hastelloy G-3
--	NiCr 22 Mo 7 Cu	--	--	N06985	--	--	--	--	--	--	2.4619	--
--	SG-NiCr 23 Al	NA 49	--	--	--	--	--	--	--	--	2.4626	--
--	SG-NiCr 22 Co 12 Mo	NA 50	--	--	--	--	--	--	--	--	2.4627	--
--	NiCr 20 Ti	HR5	--	N06075	HR5, 203.4	NC 20 T	--	--	--	--	2.4630	Nimonic® 75
--	NiCr 20 TiAl	NA 20	NCF 80A	N07080	HR401, 601	NC 20 TA	--	--	--	--	2.4631	Nimonic 80A
--	NiCr 20 Co 18 Ti	NA 36	--	N07090	HR2, 202	NC20KTA	--	--	--	--	2.4632	Nimonic 90
--	NiCo 20 Cr 15 MoAlTi	--	--	N13021	HR3	NCKD20ATV	--	--	--	--	2.4634	Nimonic 105
--	NiCo 15 Cr 15 MoAlTi	HR4	--	--	HR401, 601	NCVK15ATD	--	--	--	--	2.4636	Nimonic 115
AISI 687	NiCo 15 Cr 15 MoAlTi	--	--	--	--	NCKD20AT	--	--	--	--	2.4636	Udimet® 700
--	NiCr 22 Mo 8 AlCuTi	--	--	--	--	--	--	--	--	--	2.4637	--
--	SG-NiCr 20	NA 34	--	--	--	--	--	--	--	--	2.4639	--
--	NiCr 21 Mo 6 Cu	--	NCF 600 TP	--	--	--	--	--	--	--	2.4641	--
--	NiCr 29 Fe	--	NCF 690	N06690	--	NC 30 Fe	--	--	--	--	2.4642	INCONEL® alloy 690
--	NiCr 25 FeAlYC	--	--	--	--	--	--	--	--	--	2.4647	--
--	NiCr 20 CoMoTi	NA 38	NCF 690	N07263	HR10	NCK 20 D	--	--	--	--	2.4650	Nimonic C263
--	EL-NiCr 26 Mo	--	--	--	--	--	--	--	--	--	2.4652	--
--	NiCr 19 Co 14 Mo 4 Ti	--	--	N07001	--	NC20K14Y	--	--	--	--	2.4654	Waspaloy
--	SG-NiCr 29 Mo	--	--	--	--	--	--	--	--	--	2.4656	--
--	NiCr 70 30	--	--	N06008	--	--	--	--	--	--	2.4658	--
--	SG-NiCr 30 Mo 5 W	--	--	--	--	--	--	--	--	--	2.4659	--
--	EL-NiCr 29 Mo 5 W	--	--	--	--	--	--	--	--	--	2.4661	--
--	NiFe 35 Cr 14 MoTi	--	--	N09901	--	Z8NCDT42	--	--	--	--	2.4662	INCOLOY® 901
--	NiCr 13 Mo 6 Ti 3	--	--	N09901	--	Z8NCDT42	--	--	--	--	2.4662	Nimonic 901
--	NiCr 23 Co 12 Mo	--	--	N06617	--	NC22K12D9A	--	--	--	--	2.4663	INCONEL® alloy 617
--	NiCr 22 FeMo	--	--	N06002	HR6, 204	NC22FeD	--	--	--	--	2.4665	Hastelloy X
--	NiCr 22 Fe 18 Mo	NA 40	--	N06002	--	NC22FeD	--	--	--	--	2.4665	INCONEL alloy HX
--	NiCr 18 CoMo	--	--	--	--	NKCD20ATU	--	--	--	--	2.4666	Nimonic PK25
--	SG-NiCr 19 NbMoTi	NA 51	--	--	--	--	--	--	--	--	2.4667	--
--	NiCr 19 FeNbMo	--	--	N07718	HR8	NC 19 Fe Nb	--	--	--	--	2.4668	INCONEL alloy 718
--	NiCr 15 Fe 7 TiAl	--	--	N07750	--	NC 15 Fe 7 TA	--	--	--	--	2.4669	INCONEL alloy X750
--	G-NiCr 12 Al 6 MoNb	--	--	--	--	--	--	--	--	--	2.4671	--
--	G-NiCr 20 Co 20 MoTi	--	--	--	--	--	--	--	--	--	2.4672	--
--	NiCo 15 Cr 10 MoAlTi	--	--	N13100	--	NK15CAT	--	--	--	--	2.4674	IN 100
--	NiCo 15 Cr 10 MoAlTi	--	--	--	--	NK15C10A5T	--	--	--	--	2.4674	René 100
--	G-NiCo 15 Cr 10 AlTiMo	--	--	--	--	--	--	--	--	--	2.4674	--
--	G-NiCo 10 W 10 CrAlNb	--	--	--	--	--	--	--	--	--	2.4676	--
--	G-NiCr 50	--	--	--	--	--	--	--	--	--	2.4678	--
--	G-NiCr 35	--	--	--	--	--	--	--	--	--	2.4679	--
--	--	--	--	N10665	--	--	--	--	--	N7M	2.4685	Hastelloy B-2
CW-12 MW	G-NiMo 17 CrW	--	--	--	--	--	--	--	--	--	2.4686	--
--	NiCr 25 Mo 7 Ti	--	--	--	--	--	--	--	--	--	2.4693	--
--	NiCr 16 Fe 7 TiAl	--	--	N 07751	--	--	--	--	--	--	2.4694	INCONEL alloy 751
--	G-NiCr 20 Mo 15	--	--	--	--	--	--	--	--	--	2.4697	--
--	NiCr 22 W 14 Mo	--	--	--	--	--	--	--	--	--	2.4733	--
--	NiCr 20 AlY	--	--	--	--	--	--	--	--	--	2.4764	--
--	NiCr 17 AlWY	--	--	--	--	--	--	--	--	--	2.4765	--
--	SG-NiCr 20 Nb	NA 35	--	--	--	--	--	--	--	--	2.4806	--
--	G-NiCr 50 Nb	--	--	--	--	--	--	--	--	--	2.4813	--
--	NiCr 15 Fe	NA 14	NCF 600	N06600	3072.76	NC 15 Fe	--	--	--	--	2.4816	INCONEL alloy 600
--	G-NiMo 30	--	--	N10276	--	NC 15 D 14 KFe	--	--	--	--	2.4819	Hastelloy C-276
ASME SB575	NiMo 16 Cr 15 W	--	--	N10276	--	NC 17 D	--	--	--	--	2.4819	Nimonic C276

(continued)

S3

Workpiece Materials Listing • High-Temp Alloys • S3 (continued)

S3 Nickel-Based, Heat-Resistant Alloys

Tensile Strength RM (MPa)*: 600–1700

Hardness (HB): 160–450 (HRC): <48

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Material Number	Manufacturer Reference
–	SG-NiCr 21 Mo 9 Nb	–	–	–	–	–	–	–	–	–	2.4831	–
–	NiCr 20 Mo 15	–	–	–	–	–	–	–	–	–	2.4836	–
–	SG-NiCr 20 Mo 15	–	–	–	–	–	–	–	–	–	2.4839	–
–	–	–	–	N06601	–	–	–	–	–	–	2.4851	Haynes® 601
–	NiCr 23 Fe	–	NCF 601	N06601	–	NC 23 Fe 14 A	–	–	–	–	2.4851	INCONEL alloy 601
–	NiFe 33 Cr 25 Co	–	–	–	–	–	–	–	–	–	2.4854	–
–	NiCr 19 Mo 9 Si	–	–	–	–	–	–	–	–	–	2.4855	–
ASME SB443	NiCr 22 Mo 9 Nb	–	–	N06625	–	NC 22 Fe DNb	–	–	–	–	2.4856	Haynes 625
ASME SB443.4	NiCr 22 Mo 9 Nb	NA 21	NCF 625	N06625	–	NC 22 Fe DNb	–	–	–	–	2.4856	INCONEL alloy 625
ASME SB163	NiCr 21 Mo	–	–	N08825	3072.76	NC21FeDU	–	–	–	–	2.4858	INCOLOY® 825
–	NiCr 60 15	–	–	–	–	–	–	–	–	–	2.4867	–
–	NiCr 80 20	–	–	–	–	–	–	–	–	–	2.4869	–
–	NiCr 20 AISI	–	–	–	–	–	–	–	–	–	2.4872	–
–	G-NiCr 28 W	–	–	–	–	–	–	–	–	–	2.4879	Centralloy® 4879
–	NiCr 17 Mo 17 FeW	–	–	N10002	–	NC17DWY	–	–	–	CW12MW	2.4883	Hastelloy C
–	G-NiMo 16 Cr	–	–	–	–	–	–	–	–	–	2.4883	–
–	SG-NiMo 16 cr 16 W	NA 48	–	–	–	–	–	–	–	–	2.4886	–
–	G-NiCr 13 MoAl	–	–	–	–	–	–	–	–	–	2.4888	–
–	NiCr 20 Ti	HR 5	–	N06621	–	NC 20 T	–	–	–	–	2.4951	–
–	NiCr 20 TiAl	NA 20	NCF 80 A	N07080	–	NC 20 TA	–	–	–	–	2.4952	–
–	NiFe 25 Cr 20 NbTi	–	–	–	NiFe 25 Cr 20 NbTi	–	–	–	–	–	2.4955	–
–	NiCr 20 Co 18 Ti	NA 19	–	N07090	–	–	–	–	–	–	2.4969	–
–	NiCr 22 W 12 Fe	–	–	–	–	–	–	–	–	–	2.4972	–
–	NiCr 19 Co 11 MoTi	–	–	N07041	–	NC19KDT	–	–	–	–	2.4973	René 41
–	NiFeCr 12 Mo	–	–	–	–	–	–	–	–	–	2.4975	–
–	NiCr 20 Mo	–	–	–	–	–	–	–	–	–	2.4976	–
–	NiCr 20 CoMo	–	–	–	–	–	–	–	–	–	2.4982	–
–	NiCr 18 Co	–	–	N07500	–	–	–	–	–	–	2.4983	Co500
AISI 684	NiCr 18 CoMoAlTi	–	–	N07500	–	NCK19DAT	–	–	–	–	2.4983	Udimet® 500
–	Ni 99.6	NA 46	–	–	–	–	–	–	–	–	2.4060	–
–	NiMn 2	–	–	–	–	–	–	–	–	–	2.4110	–
SZ-100	G-Ni 95	–	–	–	–	–	–	–	–	–	2.4170	–
–	G-Ni 93 Si	–	–	–	–	–	–	–	–	–	2.4180	–
–	NiCu 30 Fe	–	–	N04400	3072.76	NU30	–	–	–	–	2.4360	Monel® 400
–	NiCu 30 Ti	–	–	–	–	–	–	–	–	–	2.4370	Monel 60
–	NiFe 44	–	–	–	–	–	–	–	–	–	2.4420	Magnifer 53
–	NiFe 16 CuMo	–	–	–	–	–	–	–	–	–	2.4530	Perm 77
–	NiFeK 6040	–	–	–	–	–	–	–	–	–	2.4560	–
–	NiMo 16 Cr 16 Ti	NA 45	–	N26455	–	–	–	–	–	–	2.4610	Hastelloy C-4
–	NiCr 20 CuMo	–	–	N08020	–	20CB-3	–	–	–	ASTM B463	2.4660	INCOLOY 020
–	G-NiCr 13 Al 16 MoNb	–	–	–	HC203	NC13AD	–	–	–	–	2.4660	–
–	G-NiCr 50 Nb	–	–	–	–	–	–	–	–	–	2.4670	Nimocast 713
–	NiMo 23 Cr 8 Fe	–	–	–	–	–	–	–	–	–	2.4710	–
–	NiMo 30	–	–	–	–	ND27FeV	–	–	–	N-12 MV	2.4810	Hastelloy B
–	NiCr 45 23	–	–	–	–	–	–	–	–	–	2.4890	–
–	–	–	–	N13017	–	NK17C15D5AT	–	–	–	–	–	Astroloy
–	–	–	–	–	–	–	–	–	–	–	–	Centralloy® 60HTD
AISI 686	–	–	–	–	–	NC15Fe10D5AT	–	–	–	–	–	GMR 235
–	NiCr 16 MoAl	–	–	–	–	NC15D5FeAT	–	–	–	–	–	GMR 235-D
–	–	–	–	–	–	–	–	–	–	CW6M	–	Hastelloy C-22
–	–	–	–	N06007	–	NC22Fe19D6KTA	–	–	–	–	–	Hastelloy G
–	–	–	–	N10003	–	–	–	–	–	–	–	Hastelloy N
–	–	–	–	N06635	–	NC15D14KFe	–	–	–	–	–	Hastelloy S
–	–	–	–	N10004	–	–	–	–	–	–	–	Hastelloy W
–	–	–	–	N07263	–	NC20K20D6T	–	–	–	–	–	Haynes® 263
–	–	–	–	–	–	–	–	–	–	–	–	Haynes 282
–	NiCr 15 Fe	–	–	N06600	–	–	–	–	–	–	–	Haynes 600
–	–	–	–	–	–	–	–	–	–	–	–	Haynes 75
–	NiCo 32 Cr 26 Mo	–	–	–	–	–	–	–	–	–	–	HS27
–	–	–	–	N06102	–	–	–	–	–	–	–	IN 102
ASME SB409	X 10 NiCrAlTi 32-20	–	–	N08800	3082.76	Z10NC3221	–	–	–	–	–	INCOLOY 800
–	–	–	–	–	–	Z4NC3221	–	–	–	–	–	INCOLOY 802
–	–	–	–	–	–	NC29Fe25	–	–	–	–	–	INCOLOY 804
–	NiFe 42 K 15 Nb	–	–	N19903	–	Z3NK28	–	–	–	–	–	INCOLOY 903
–	–	–	–	N19907	–	–	–	–	–	–	–	INCOLOY 907
–	–	–	–	N09925	–	–	–	–	–	–	–	INCOLOY 925
–	–	–	–	N09945	–	–	–	–	–	–	–	INCOLOY 945
ASME SB575	–	–	–	–	–	NiMo16Cr15	–	–	–	–	–	INCONEL alloy 22
–	–	–	–	–	–	–	–	–	–	–	–	INCONEL alloy 230
–	–	–	–	–	–	–	–	–	–	–	–	INCONEL alloy 600SP
–	–	–	–	–	–	–	–	–	–	–	–	INCONEL alloy 62
–	–	–	–	N06626	–	–	–	–	–	–	–	INCONEL alloy 625LCF
–	–	–	–	–	–	NC15A	–	–	–	–	–	INCONEL alloy 702
–	–	–	–	N09706	–	NFe10C16NbT	–	–	–	–	–	INCONEL alloy 706
–	–	–	–	N07718	–	–	–	–	–	–	–	INCONEL alloy 718 OP
–	–	–	–	–	–	NC16Fe8TM	–	–	–	–	–	INCONEL alloy 721
–	NiCr 16 FeTi	–	–	–	–	NC16FeTi	–	–	–	–	–	INCONEL alloy 722
–	–	–	–	N07722	–	–	–	–	–	–	–	INCONEL alloy 783
–	–	–	–	R30783	–	–	–	–	–	–	–	INCONEL alloy 783
–	–	–	–	N09925	–	–	–	–	–	B983 N09925	–	INCONEL alloy 925
–	–	–	–	N10276	–	–	–	–	–	–	–	INCONEL alloy C-276
–	–	–	–	N07754	–	–	–	–	–	–	–	INCONEL alloy MA754
–	–	–	–	N07751	–	–	–	–	–	–	–	INCONEL alloy X751
–	–	–	–	K93600 K93603	–	–	–	–	–	ASTM F1684	–	INVAR® 36
–	NiCr 20 Co 18 Ti	–	–	–	–	–	–	–	–	–	–	Jessop G81
–	G-NiCr 19 Co	–	–	N07252	–	–	–	–	–	–	–	M 252
–	–	–	–	N04405	–	–	–	–	–	–	–	Monel® R405

NOTE: For legend, see page Y217.

(continued)

S3

Workpiece Materials Listing • High-Temp Alloys • S3 (continued)

S3 Nickel-Based, Heat-Resistant Alloys

Tensile Strength RM (MPa)*: 600–1700

Hardness (HB): 160–450 (HRC): <48

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Material Number	Manufacturer Reference
–	NiFe 33 Cr 17 Mo	–	–	–	–	–	–	–	–	–	–	Nimocast PD16
–	–	–	–	–	HC202	NC20N13	–	–	–	–	–	Nimocast PE10
–	–	–	–	–	–	NC19K18Fe5TA	–	–	–	–	–	Nimonic® 95
ASME SB575	–	–	–	N06022	–	–	–	–	–	–	–	Nimonic C22
–	NiCr 22 Fe 18 Mo	–	–	–	HR6, 204	NC22FeD	–	–	–	–	–	Nimonic PE13
–	NiFe 33 Cr 17 Mo	–	–	–	HR207	NW11AC	–	–	–	–	–	Nimonic PE16
–	NiCr 20 Co 16 MoTi	–	–	–	–	NC19KDUN	–	–	–	–	–	Nimonic PK33
–	–	–	NCF 3015	–	–	–	–	–	–	–	–	NiReVa 3015
AISI 686	–	–	–	–	–	–	–	–	–	–	–	R-235
AISI 690	–	–	–	–	–	Z6NKCdT38	–	–	–	–	–	Refractaloy 26
–	–	–	–	–	–	NK10C8W7ATaTD	–	–	–	–	–	René 125
–	–	–	–	–	–	NK15C14D6AWT	–	–	–	–	–	René 65
–	–	–	–	–	–	NC15K15ADT	–	–	–	–	–	René 77
–	–	–	–	–	–	NC14K9T5DWA	–	–	–	–	–	René 80
–	–	–	–	–	–	NC14K8	–	–	–	–	–	René 95
–	NiTa 9 Co 8 W 6 CrAl	–	–	–	–	NTa9K7C6W5A5DT	–	–	–	–	–	TRW VIA
–	NiCr 19 NbMo	–	–	–	–	NC18Fe18Nb6DWT	–	–	–	–	–	Udimet® 630
–	–	–	–	–	–	NCK18TDA	–	–	–	–	–	Udimet 710
–	–	–	–	–	–	NC18K15TDA	–	–	–	–	–	Udimet 720

S4

Workpiece Materials Listing • High-Temp Alloys • S4

S4 Titanium and Titanium Alloys

Tensile Strength RM (MPa)*: 900–1600

Hardness (HB): 300–400 (HRC): 33–48

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Material Number	Manufacturer Reference
R 50250	Ti-99.8	2 TA 1	–	UNS R50250	TA6, TA7, TA8, TA9	AIR:9182T35	–	–	–	ASTM B381F1	3.7025	ATI 30 CP Grade 1
R 50400	Ti-99.7	2 TA 2-5	–	UNS R50400	TA2.5	AIR:9182T40	–	–	–	ASTM B381F2	3.7035	ATI 40 CP Grade 2
–	SG-Ti 2	–	–	–	–	–	–	–	–	–	3.7036	–
R 50550	Ti-99.6	TA 3	–	UNS R50550	TA2, TA3, TA4, TA5	AIR:9182T50	–	–	–	ASTM B381F3	3.7055	ATI 55 CP Grade 3
R 50700	Ti-99.5	2 TA 6-9	–	UNS R50700	–	AIR:9182T60	–	–	–	ASTM B381F4	3.7065	ATI 70 CP Grade 4
–	TiNi 0.8 Mo 0.3	–	–	UNS R53400	–	–	–	–	Ti-3Al-1.5Mn	ASTM Grade 12	3.7105	–
Ti 5Al-2.5Sn	TiAl 5 Sn 2.5	–	–	UNS R54520	TA 14,17	T-A5E	–	–	Ti-5Al-2.5Sn	–	3.7115	ATI Grade 6
–	TiCu 2	2 TA 21-24	–	–	–	–	–	–	Ti-2Cu	–	3.7124	–
R 54620	TiAl 6 Sn 2 Zr 4 Mo 2 Si	–	–	UNS R54620	–	–	–	–	Ti-6Al-2Sn-2Zr-4Mo-2Si	–	3.7145	–
–	TiAl 6 ZrMo 0.5	TA 43	–	–	–	–	–	–	Ti-6-5-0.5	–	3.7155	–
R 56400	TiAl 6 V 4	TA 10-13	TC4	UNS R56400	TA10 TA11 TA12 TA13 TA28 TA56	TA6V	–	–	Ti-6Al-4V	–	3.7164	ATI 6-4™
–	TiAl 6 V4	–	TC4	UNS R56400	TA10 TA11 TA12 TA13 TA28 TA56	TA6V; AIR:9183	–	–	Ti-6Al-4V (Beta)	–	3.7164	–
R 56620	TiAl 6 V 6 Sn2	–	–	UNS R56620	–	–	–	–	Ti-6Al-6V-2Sn	–	3.7175	ATI 6-6-2™
–	TiAl 4 Mo 4 Sn 2	TA 45-51	–	–	–	–	–	–	Ti-4Al-4Mo-2Sn	–	3.7185	–
–	TiAl 3 V2.5	–	–	UNS R56320	–	–	–	–	Ti-3Al-2.5V	ASTM Grade 9	3.7195	ATI 3-2.5-MIL™
R 52250	Ti 1 Pd	TP 1	–	UNS R 52250	–	–	–	–	–	ASTM Grade 11	3.7225	–
R 52400	Ti 2 Pd	–	–	UNS R 52400	–	–	–	–	–	ASTM Grade 7	3.7235	–
–	Ti 3 Pd	–	–	–	–	–	–	–	–	–	3.7255	–
–	TiAl 5 Fe 2.5	–	–	–	–	–	–	–	Ti-5Al-2.5Fe	–	3.7110	–
–	TiV13Cr11Al3	–	–	–	–	–	–	–	Ti-13V-11Cr-3Al	–	–	11/13/03
–	Ti-10V-2Fe-3Al	–	–	–	–	–	–	–	Ti-10.2.3	–	–	ATI 10-2-3™
–	–	–	–	UNS R58153	–	–	–	–	Ti-15-333	–	–	ATI 15-333™
–	–	–	–	–	–	–	–	–	Ti-15Mo (Alpha + Beta)	–	–	ATI 15Mo™ (Alpha + Beta)
–	–	–	–	–	–	–	–	–	Ti-15Mo (Beta)	–	–	ATI 15Mo™ (Beta)
–	Ti5Al2Sn2Zr4Cr4Mo	–	–	UNS R58650	–	–	–	–	–	–	–	ATI 17™
–	TiAl 3 V 8 Cr 6 Mo 4 Z 4	–	–	–	–	–	–	–	Ti-3Al-8V-6Cr-4Mo-4Zr	ASTM Grade 19	–	ATI 38-644™
–	–	–	–	UNS R54250	–	–	–	–	Ti-425	ASTM B265	–	ATI 425®
–	–	–	–	–	–	–	–	–	Ti-425 MIL	–	–	ATI 425®-MIL
–	TiAl 4 Mo 4 Sn 2 Si 0.5	–	–	–	5103	T-A4DE	–	–	Ti-4Al-4Mo-2Sn-0.5Si	–	–	ATI 4-4-2™
–	–	–	–	–	–	–	–	–	Ti-45Nb	–	–	ATI 45Nb™
–	–	–	–	–	–	–	–	–	Ti-5Al-5V-5Mo-3Cr	–	–	ATI 5-5-5-3 PM™
–	–	–	–	–	–	–	–	–	Ti-6Al-2Sn-2Zr-2Mn-2Cr-0.2Si	–	–	ATI 6-2222™
–	–	–	–	UNS R54620	–	–	–	–	Ti-6Al-4Zr-2Mo-2Sn	–	–	ATI 6-2-4-2 PM™
–	TiAl6Zr4Mo2Sn2	–	–	UNS R54620 modified	–	–	–	–	Ti-6Al-4Zr-2Mo-2Sn-0.2Si	–	–	ATI 6-2-4-2-Si PM™
–	–	–	–	UNS R56260	–	–	–	–	–	–	–	–
–	–	–	–	UNS R56401	–	–	–	–	Ti-6-2-4-6	–	–	ATI 6-2-4-6™
–	–	–	–	–	–	–	–	–	Ti-6Al-4V ELI	–	–	ATI 6-4 ELI™
–	TiAl 6 V4	–	–	UNS R56400	TA10 TA11 TA12 TA13 TA28 TA56	TA6V; AIR:9183	–	–	Ti-6Al-4V MIL	–	–	ATI 6-4-MIL™
–	TiAl 6 V4	–	–	UNS R56400	TA10 TA11 TA12 TA13 TA28 TA56	TA6V; AIR:9183	–	–	Ti-6Al-4V MIL (HT)	–	–	ATI 6-4-MIL™
–	–	–	–	UNS R56700	–	–	–	–	Ti-6-7	ASTM F 1295	–	ATI 6-7™
–	TiAl8Mo1V1	–	–	UNS R54810	–	–	–	–	Ti-8Al-1Mo-1V	–	–	ATI 8-1-1™
–	–	–	–	–	–	–	–	–	Ti-15Mo-3Nb-3Al-0.2Si	ASTM Grade 21	–	Beta 21-S
–	–	–	–	–	–	–	–	–	Ti-12Mo-6Zr-2Fe	–	–	TMZF
–	TiAl7Nb	–	–	–	–	–	–	–	Ti-6Al-7Nb	–	–	–
–	TiAl7Mo4	–	–	–	–	–	–	–	–	ASTM B381	–	–
–	TiAl 4 Mo 4 Sn 4 Si 0.5	–	–	–	5203	–	–	–	Ti-4Al-4Mo-4Sn-0.5Si	–	–	–
–	TiAl6Zr5Mo0.5Si0.25	–	–	–	–	T.AGZ.50	–	–	Ti-6Al-5Zr-0.5Mo-0.25Si	–	–	–
–	TiAl6Zr5Mo4CuSi0.2	–	–	–	M201	–	–	–	Ti-6Al-5Zr-4Mo-Cu-0.2Si	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	Ti-5Al-5Mo-5V-1Cr-1Fe	–	–	–
–	–	–	–	UNS %58210	–	–	–	–	Ti Beta 21 S	ASTM Grade 21	–	–
Ti 98.8	Ti 98.8	–	–	–	–	–	–	–	–	–	–	–
Ti 99.9	Ti 99.9	–	–	–	–	–	–	–	–	–	–	–
–	TiAl 6 Sn 2 Zr 4 Mo 2	–	–	–	–	–	–	–	–	–	–	–

NOTE: For legend, see page Y217.

H1 Workpiece Materials Listing • Hardened Steels and Irons • H1

H1 Hardened Materials Hardness (HRC): 44–48

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Material Number	Manufacturer Reference
H 11	X 38 CrMoV 5 H1	BH 11	SKD 6	T20811	X 38 CrMoV 5 H1	Z 38 CDV 5	X 37 CrMoV 5 1 KU	–	–	–	1.2343	–
H11	X 38 CrMoV 5 H1	BH 11	SKD 6	T20811	X 38 CrMoV 5 H1	Z 38 CDV 5	X 37 CrMoV 5 1 KU	–	–	–	1.2343	–
H 13	X 40 CrMoV 5 1	BH 13	SKD 61	T20813	X 40 CrMoV 5 1	Z 40 CDV 5	X 40 CrMoV 5 1 1 KU	2242	–	–	1.2344	–
H 10	X 32 CrMoV 3 3	BH 10	SKD 7	T 20810	X 32 CrMoV 12H-28	32 DCV 28	30 CrMoV 12 27 KU	–	–	–	1.2365	–
H19	X 45 CrCoW 5 5 5	–	–	–	–	–	–	–	–	–	1.2678	–
A 532 I B NiCr-LC L6	GX 260 NiCr 42	Grade 2 A	0512-00	F45001	GJH-X260NiCr 4-2	–	–	0512-00	–	–	0.9620	–
	–	–	–	–	–	55 NCDV 07 (HT)	–	–	–	–	–	–

H2 Workpiece Materials Listing • Hardened Steels and Irons • H2

H2 Hardened Materials Hardness (HRC): 48–55

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Material Number	Manufacturer Reference
A 532 I A NiCr-HC	G-X 330 NiCr 42	Grade 2 B	0513-00	F45000	GJH-X330NiCr 4-2	FB Ni 4 Cr2 HC	–	0513-00	–	–	0.9625	–
H 21	X 30 WCrV 93	BH 21	SKD 5	T 20821	X 30 WCrV 9 3	Z 30 WCV 9	X 30 WCrV 9 3 KU	–	–	–	1.2581	–
H 12	X 37 CrMoV 5 1	BH 12	SKD 62	T20812	–	Z 35 CWDV 5	X 35 CrMoV 05 KU	–	–	–	1.2606	–
–	G-X 300 NiMo 3 Mg	–	–	–	GJH-X300NiMo 3 Mg	–	–	–	–	–	0.9610	–
A 532 I B NiCr-LC	GX 260 NiCr 42	Grade 2 A	0512-00	F45001	GJH-X260NiCr 4-2	–	–	0512-00	–	–	0.9620	–
A 532 III A 25% Cr	GX 260 Cr 27	Grade 3 D	0466-00	–	GJH-X260Cr 27	–	–	–	–	–	0.9650	–
–	X 2 NiCoMoTi 180905	–	–	–	–	Z 2 NKD 180905	–	–	–	–	–	Durimphy
K12	–	–	–	–	–	–	–	–	–	–	–	ATI K12 MIL

H3 Workpiece Materials Listing • Hardened Steels and Irons • H3

H3 Hardened Materials Hardness (HRC): 56–60

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Material Number	Manufacturer Reference
A 532 IIC15% CrMo-HC	G-X 300CrMo 15 3	Grade 3 A	–	–	GJH-X300CrMo 15-3	–	–	–	–	–	0.9635	–
–	G-X 300 CrMoNi 15 2 1	Grade 3 B	–	F45005	GJH-X300CrMoNi15-2-1	–	–	–	–	–	0.9640	–
A 532 IID20% CrMo-LC	GX 260 CrMoNi 20 2 1	Grade 3 C	–	F45007	GJH-X260CrMoNi20-2-1	–	–	–	–	–	0.9645	–
A 532 III A 25% Cr	G-X 300 CrMo 27 1	Grade 3 E	–	–	GJH-X300CrMo 27-1	–	–	–	–	–	0.9655	–
A 2	X 100 CrMoV 5 1	SKD 12	–	–	BA 2	Z 100 CDV 5 (HT)	X 100 CrMoV 51 KU	2260	–	–	1.2363	–
D7 (HT)	–	–	–	T30407	–	Z 230 CVA 12 04	–	–	–	–	1.2378	–
Q 2	90 MnCrV 8	B0 2	–	T31502	90 MnV 8	90 MnV 8	90 MnVCr 8 KU	–	–	–	1.2842	–
A 532 I D Ni-HiCr	G-X 300 CrNiSi 95 2	Grade 2 C	0457-00	F45003	GJH-X300CrNiSi 9-5-2	–	–	–	–	–	0.9630	Nihard type 4
S 1	60 WCrV 7	BS 1	–	–	6020 WCrV 8	55 WC 20	55 WCrV 8 KU	–	–	–	1.2550	–
S 1	60 WCrV 7	BS 1	–	–	60 WCrV 8	55 WC 20	55 WCrV 8 UK	–	–	–	1.2550	–
S 7	50 CrMoV 13 14	–	–	–	–	–	–	–	–	–	–	Cryodur 2357
K 12 (HT)	–	–	–	–	–	–	–	–	–	–	–	ATI K12-MIL

H4 Workpiece Materials Listing • Hardened Steels and Irons • H4

H4 Hardened Materials Hardness (HRC): >60

AISI**	DIN	BTS	JIS	UNS	EN	AFNOR	UNI	SIS	SAE	ASTM	Material Number	Manufacturer Reference
W 108	C 80 W 1	–	–	T72301	C 80 U	Y1 90	C 80 KU	1880	–	–	1.1525	–
D 2	X 155 CrVMo 12 1	BD 2	SKD §§	T 30402	X 153 CrMoV 12	Z 160 CDV 12	X 155 CrVMo 12 1 KU	2310	–	–	1.2379	–
–	100 WV4	–	SKS 21	–	–	–	–	–	–	–	1.2515	–
D 3	X 210 Cr 12	BD 3	SKD 1	T30403	X 210 Cr 1 2	Z 200 C 12	X 205 Cr 12 KU	–	–	–	1.2080	–
O 7	110 WCrV 5	–	–	–	–	–	–	–	–	–	–	–
–	Mh97 + Pb	–	–	–	–	–	–	–	–	–	–	LAW 100 Pb

Workpiece Materials Listing Legend

* 1 Mpa = 145 psi.

** Includes ASTM and SAE material specifications.

AISI — American Iron and Steel Institute

AFNOR — French National Organisation for Standardisation

AMS — Aerospace Material Specifications

ASTM — American Society of Mechanical Engineers

BS — British Standards

DIN — German Institute for Standardisation

EN — European Standards

JIS — Japanese Industrial Standards

SAE — Society of Automotive Engineers

SIS — Swedish Standards Institute

UNI — Italian Organisation for Standardisation

UNS — Unified Numbering System





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Numbers shown only serve the originating country listed.

METALCUTTING SAFETY

IMPORTANT SAFETY INSTRUCTIONS

Read before using the tools in this catalogue!

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 catalogue and recommendations on machining practices may not apply to your particular operation. For more information, consult the Kennametal 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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