

**beyond**<sup>TM</sup> **EVOLUTION**<sup>TM</sup>

GROOVING,  
CUT-OFF, AND  
MULTI-DIRECTIONAL  
TURNING  
MADE...

**E**  **SY**

That's Beyond<sup>TM</sup> Evolution<sup>TM</sup>



That's **Different Thinking**

 **KENNAMETAL**<sup>®</sup>

# 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.



Face Grooving

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Grooving

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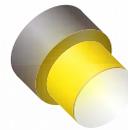


Deep Grooving

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Cut-Off



Side Turning

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Chamfering

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Profiling

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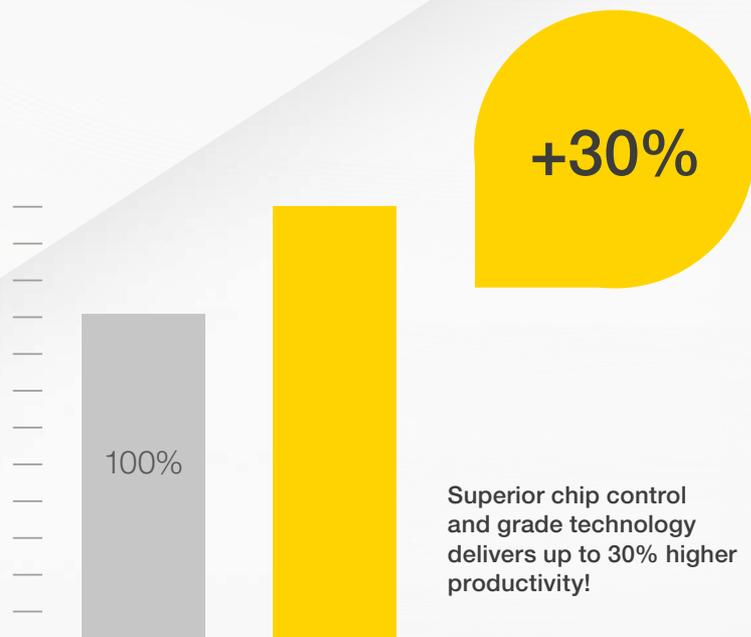


Facing

# 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, resulting in up to 30% higher productivity.



*One tool for all grooving, cut-off and multi-directional turning applications.*

- ✓ Makes tool management **EASY**.
- ✓ Makes switching machining jobs **EASY**.
- ✓ Makes switching workpiece materials **EASY**.

# Productivity made **EASY**

## Active Coolant Control

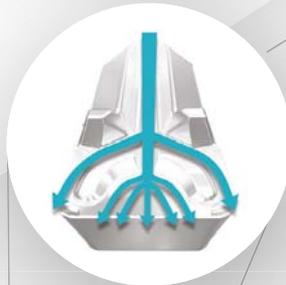
If your coolant delivery is typical to the market, you may be applying more heat to the cutting edge than you think. This reduces tool life and increases cycle time.

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 or higher metal removal rates.



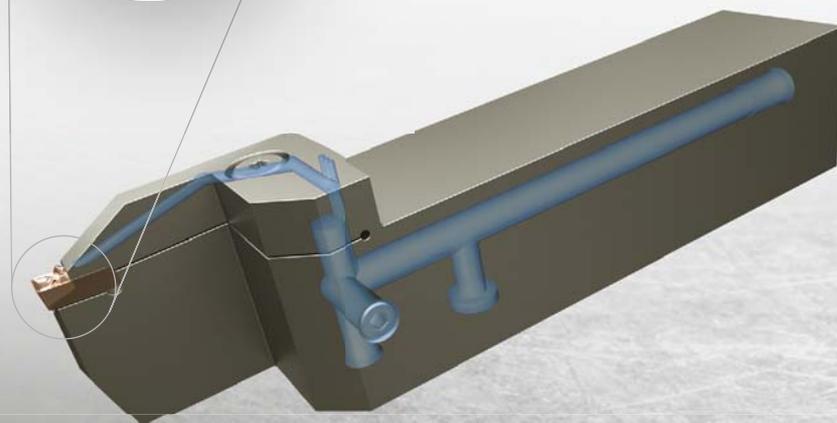
### **1. Fan Effect**

Directs coolant across the top of the insert precisely to the cutting zone underneath the chip and controls temperature.



### **2. Chip Breaking Effect**

Improve chip control in all grooving, cut-off, and multi-directional turning applications.

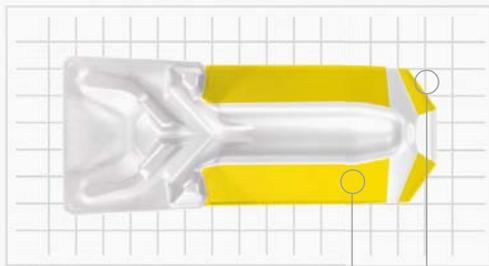


# Smooth surface finish made **EASY**

## Triple-V Seating

Problem: Traditional single-sided grooving and cut-off systems cannot deliver smooth surface finish due to lack of stability.

Solution: Beyond Evolution's proprietary new Triple-V Seating feature provides functional stability and minimizes 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.





# Coolant Accessories

## ➤ Don't know exactly what you need?

To connect Beyond™ Evolution™ tooling to the industry's most common machines, Kennametal's universal coolant packs are ideal!

Each Pack contains the most common thread sizes with a variety of fitting styles for maximum flexibility.

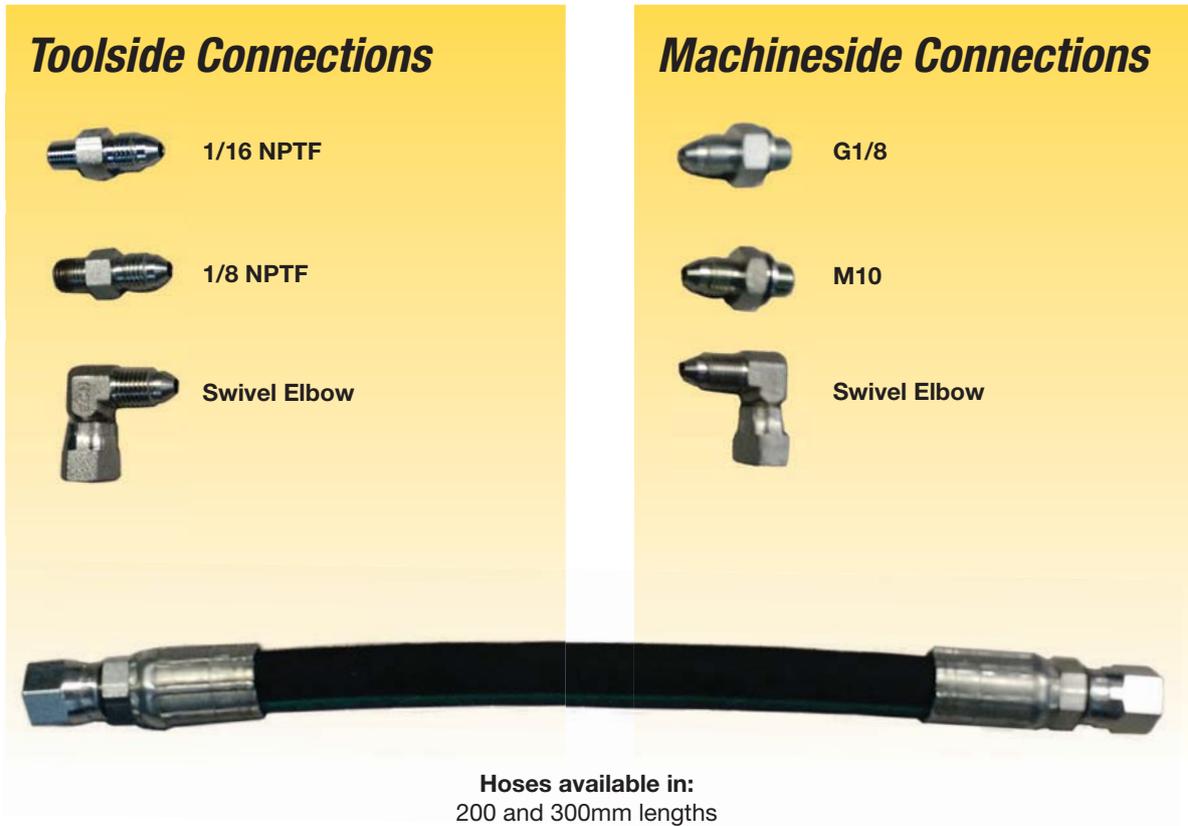
### ■ Universal 200mm Coolant Pack

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 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 Female JIC to Female JIC

## ➤ Coolant Hose Packs



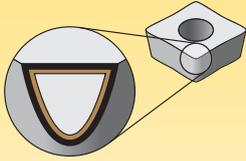
## ➤ Know what you need?

Every component is individually available, including less common fittings.

Knowing the precise components required will allow you to choose only the fittings you need!

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 adapter
6145386	G14-G18-RED	Male G1/4 to Female G1/8 reducer

Turning

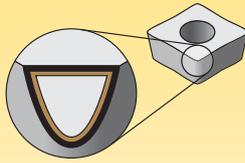


Coatings provide high-speed capability and are engineered for finishing to light roughing.

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		
Grade K313		<p><b>Composition:</b> A hard, low binder content, unalloyed WC/Co fine-grain grade.</p> <p><b>Application:</b> 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>												
	C3-C4		M											
			K											
			N											
			S											
Grade KCU10		<p><b>Composition:</b> 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><b>Application:</b> 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											
	C3-C4		M											
			K											
			N											
			S											
			H											
Grade KCU25		<p><b>Composition:</b> 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><b>Application:</b> 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											
	C2, C6		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

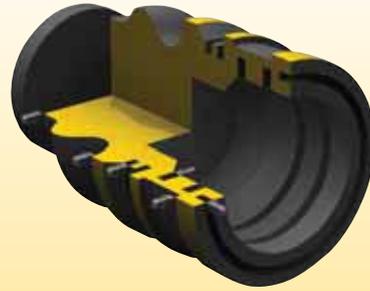
wear resistance ← → toughness

Grade	Coating	Grade Description	Material																
			P	M	K	N	S	H	05	10	15	20	25	30	35	40	45		
KCP10B		<p><b>Composition:</b> A specially engineered wear-resistant carbide grade with a newly designed multilayer MTCVD-TiCN-Al<sub>2</sub>O<sub>3</sub>-TiOCN coating with superior interlayer adhesion.</p> <p><b>Application:</b> 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																
			M																
			K																
C3, C7																			
KCP25B		<p><b>Composition:</b> A tough cobalt-enriched carbide grade with a newly designed multilayer MTCVD-TiCN-Al<sub>2</sub>O<sub>3</sub>-TiOCN coating with superior interlayer adhesion.</p> <p><b>Application:</b> 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																
			M																
			K																
C2-C3, C6-C7																			
KCK20B		<p><b>Composition:</b> A multilayered coating with thick MTCVD TiCN-Al<sub>2</sub>O<sub>3</sub>-TiOCN layers applied over a carbide substrate specifically engineered for cast irons.</p> <p><b>Application:</b> 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																
			M																
			K																
C3, C4																			

**Step 1 • Identify your grooving or cut-off application**

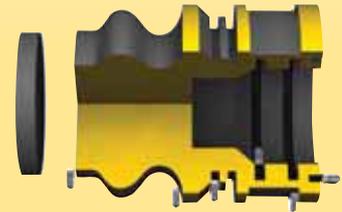
**What you need to know:**

- 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/rev)					
						0.05	0.10	0.15	0.20	0.25	0.30
-GUP	Positive rake angle for lower cutting forces.		1F	0.2	0.06						
			2	0.2	0.08						
			3	0.2	0.09						
				0.4	0.11						
				0.4	0.12						
				0.8	0.15						
				0.4	0.15						
				0.8	0.18						
				1.2	0.20						
				0.8	0.20						
	1.2	0.22									
	1.2	0.24									
-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						
				0.4	0.11						
				0.4	0.12						
				0.8	0.15						
				0.4	0.15						
				0.8	0.18						
				1.2	0.20						
				0.8	0.20						
	1.2	0.22									
	1.2	0.24									

**Maximum Feed Rate Values**

Material Group	Feed Factor
M	1
N	1.2
S	1.5
T	1.5

**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**.

Recommended Starting Speeds [m/min]

Material Group	K313			KCU10			KCU25			KCP10B			KCP25B			KCK20B <sup>A</sup>			
P	0-1	-	-	-	140	<b>280</b>	335	110	<b>225</b>	270	185	<b>400</b>	450	145	<b>290</b>	365	200	<b>440</b>	490
	2	-	-	-	140	<b>200</b>	245	110	<b>160</b>	195	185	<b>270</b>	350	145	<b>200</b>	305	200	<b>300</b>	380
	3	-	-	-	140	<b>155</b>	245	110	<b>125</b>	195	170	<b>190</b>	260	140	<b>155</b>	245	600	<b>200</b>	280
	4	-	-	-	75	<b>110</b>	170	60	<b>90</b>	135	90	<b>145</b>	200	75	<b>110</b>	180	100	<b>160</b>	220
	5	-	-	-	120	<b>200</b>	260	100	<b>160</b>	210	150	<b>220</b>	305	120	<b>200</b>	270	165	<b>240</b>	330
	6	-	-	-	110	<b>150</b>	230	85	<b>120</b>	185	120	<b>180</b>	275	110	<b>150</b>	230	130	<b>190</b>	300
M	1	60	<b>90</b>	120	140	<b>210</b>	260	90	<b>170</b>	245	-	-	-	-	-	-	-	-	-
	2	45	<b>75</b>	110	120	<b>200</b>	245	90	<b>150</b>	245	-	-	-	-	-	-	-	-	-
	3	35	<b>65</b>	100	120	<b>180</b>	245	90	<b>140</b>	210	-	-	-	-	-	-	-	-	-
K	1	30	<b>75</b>	120	120	<b>180</b>	245	100	<b>145</b>	195	170	<b>245</b>	440	140	<b>200</b>	360	210	<b>305</b>	550
	2	25	<b>70</b>	110	90	<b>150</b>	210	70	<b>120</b>	170	120	<b>195</b>	340	100	<b>160</b>	280	150	<b>245</b>	430
	3	20	<b>60</b>	90	60	<b>110</b>	150	50	<b>85</b>	120	120	<b>170</b>	270	100	<b>140</b>	220	150	<b>210</b>	335

### 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
	<b>Boring Bar</b>	• For use in I.D. grooving applications.
	<b>Cut-Off Blade</b>	• Allows user to vary the depth of cut.
	<b>Toolholder – Integral</b>	• Offers the most stability over other styles.
	<b>Toolholder – Modular</b>	• Interchangeable blades for versatility.
	<b>KM™ – Modular KM4X™ – Modular</b>	• Best-in-class KM Quick Change platform.
	<b>PSC – Modular</b>	• 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.

Turning

**Grooving and Cut-Off**  
 Beyond™ Evolution™ Grooving Inserts

■ Groove Turn Universal Positive  
 □ Groove Turn Universal Negative

■ GUP Precision Moulded • Inch

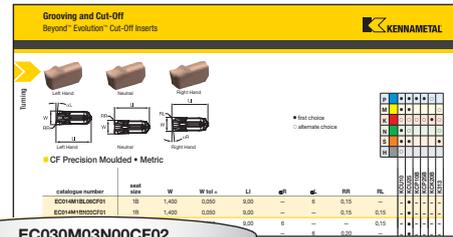
catalogue number	seat size	W	W tol	IR	LI	...
EG0312M03U02GUP	3	3,301	1,50	0,075	0,03	0,08
EG0312M03U02GUP	3	3,301	1,50	0,075	0,03	0,40
EG0312M03U02GUP	4	4,817	1,50	0,075	0,03	0,40
EG0312M03U02GUP	4	4,817	1,50	0,075	0,03	0,79

**EG0312M03U02GUP**

<b>E</b>	<b>G</b>	<b>0312</b>	<b>M</b>	<b>03</b>	<b>U</b>	<b>02</b>	<b>GUP</b>																																		
Family Name	Insert Type	Groove Width	Unit	Seat Size	Tolerance	Corner Radius	Chipbreaker/ Edge Condition																																		
Beyond™ Evolution™	<b>G</b> = Square  <b>R</b> = Full Radius	<b>Metric</b> = 1/100mm	<b>M</b> = Metric		<b>U</b> = Precision Moulded  <b>P</b> = Precision Ground		<b>GUP</b> = Groove-Turn Universal Positive  <b>GUN</b> = Groove-Turn Universal Negative  <b>FB</b> = Flat Top Blank  <b>PB</b> = Positive Chip Control Blank																																		
				<table border="1"> <thead> <tr> <th>seat size</th> <th>groove width mm</th> </tr> </thead> <tbody> <tr><td>1B</td><td>1,40</td></tr> <tr><td>1F</td><td>1,60–1,99</td></tr> <tr><td>02</td><td>2,00–2,99</td></tr> <tr><td>03</td><td>3,00–3,99</td></tr> <tr><td>04</td><td>4,00–4,99</td></tr> <tr><td>05</td><td>5,00–5,99</td></tr> <tr><td>06</td><td>6,00–7,99</td></tr> <tr><td>08</td><td>8,00–8,99</td></tr> <tr><td>10</td><td>9,00–10,12</td></tr> </tbody> </table>	seat size	groove width mm	1B	1,40	1F	1,60–1,99	02	2,00–2,99	03	3,00–3,99	04	4,00–4,99	05	5,00–5,99	06	6,00–7,99	08	8,00–8,99	10	9,00–10,12	<table border="1"> <thead> <tr> <th colspan="2">mm</th> </tr> <tr> <th></th> <th>full radius</th> </tr> </thead> <tbody> <tr><td>00</td><td></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>	mm			full radius	00		01	0,1	02	0,2	04	0,4	08	0,8	12	1,2
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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		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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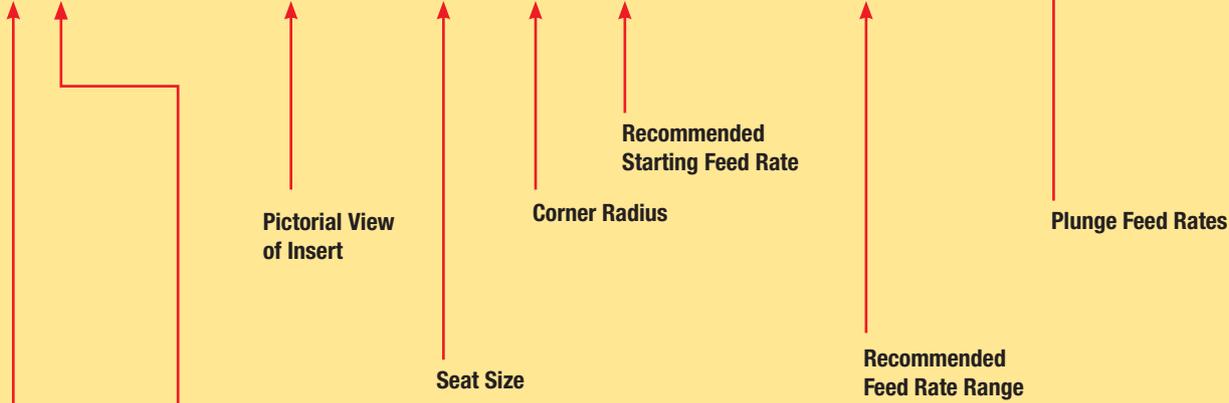


Select the geometry

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
-GUP	Positive rake angle for lower cutting forces.		1F	0,2	0,06	[Feed Rate Range]					
			2	0,2	0,08	[Feed Rate Range]					
			3	0,2	0,09	[Feed Rate Range]					
				0,4	0,11	[Feed Rate Range]					
			4	0,4	0,12	[Feed Rate Range]					
				0,8	0,15	[Feed Rate Range]					



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. <b>Maximum</b> 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

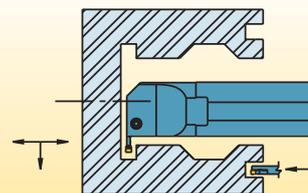
Chip Control	Description	Insert Geometry	Seat Size	Corner Radius	Starting Conditions	Plunge Feed Rates mm/rev						
						mm	mm	0,05	0,10	0,15	0,20	0,25
-GUP	Positive rake angle for lower cutting forces.		1F	0,2	0,06	0,05						
			2	0,2	0,08	0,05	0,10					
			3	0,2	0,09	0,05	0,10	0,15				
				0,4	0,11	0,05	0,10	0,15	0,20			
			4	0,4	0,12	0,05	0,10	0,15	0,20	0,25		
				0,8	0,15	0,05	0,10	0,15	0,20	0,25	0,30	
			6	0,4	0,15	0,05	0,10	0,15	0,20	0,25	0,30	
				0,8	0,18	0,05	0,10	0,15	0,20	0,25	0,30	
			8	0,8	0,20	0,05	0,10	0,15	0,20	0,25	0,30	
				1,2	0,22	0,05	0,10	0,15	0,20	0,25	0,30	
10	1,2	0,24	0,05	0,10	0,15	0,20	0,25	0,30				
-GUN	Stable negative cutting edge allowing for more aggressive applications		1F	0,2	0,06	0,05						
			2	0,2	0,08	0,05	0,10					
			3	0,2	0,09	0,05	0,10					
				0,4	0,11	0,05	0,10	0,15				
			4	0,4	0,12	0,05	0,10	0,15	0,20			
				0,8	0,15	0,05	0,10	0,15	0,20	0,25		
			6	0,4	0,15	0,05	0,10	0,15	0,20	0,25	0,30	
				0,8	0,18	0,05	0,10	0,15	0,20	0,25	0,30	
			8	0,8	0,20	0,05	0,10	0,15	0,20	0,25	0,30	
				1,2	0,22	0,05	0,10	0,15	0,20	0,25	0,30	
10	1,2	0,24	0,05	0,10	0,15	0,20	0,25	0,30				

Maximum Feed Rate Values

Data above is for P and K material groups. <b>Maximum</b> 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

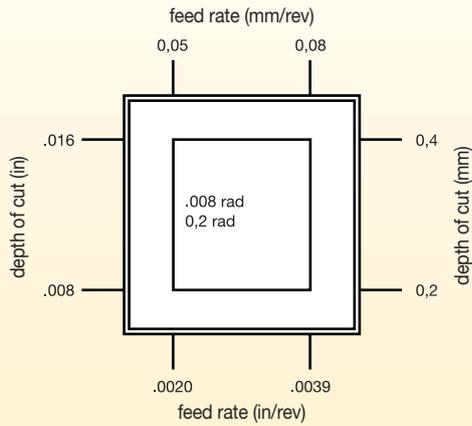
I.D. and Face Grooving

For I.D. and face grooving applications, reduce feed rate by 20%.

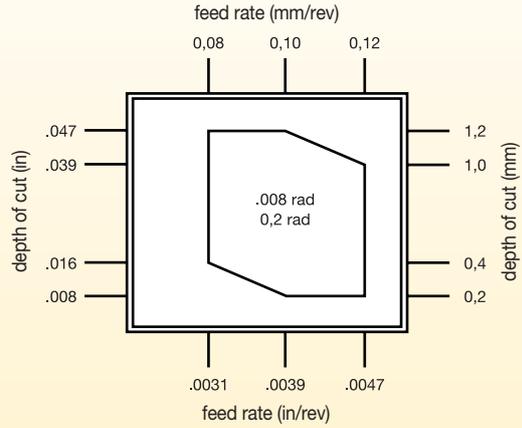


Turn and profile feed rates

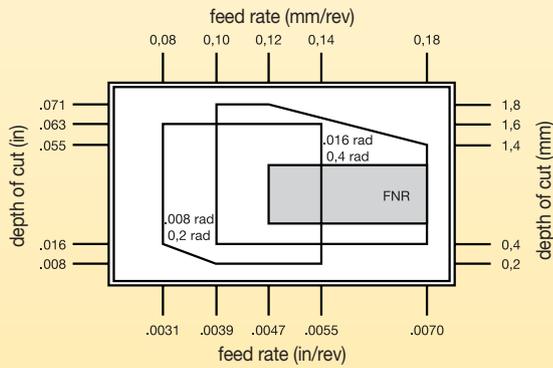
Seat Size 1F



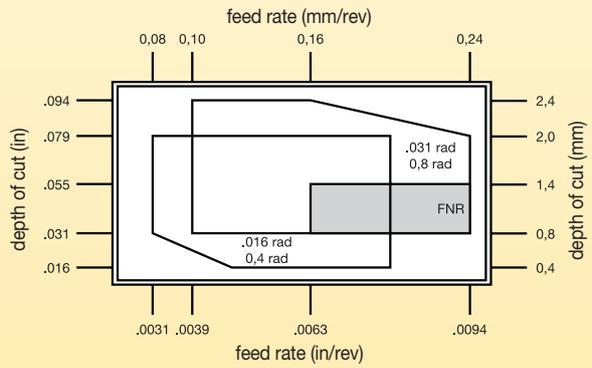
Seat Size 2



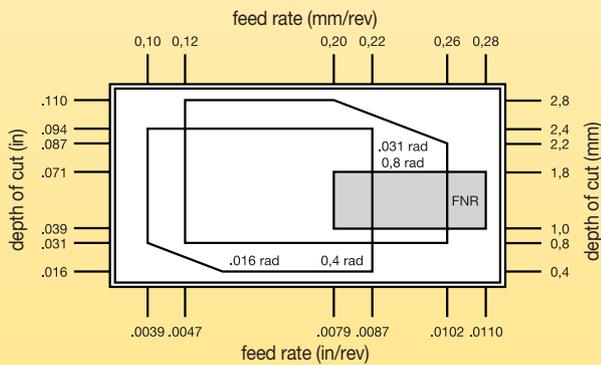
Seat Size 3



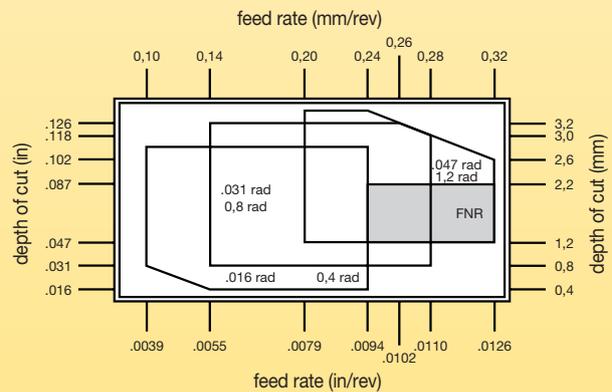
Seat Size 4



Seat Size 5

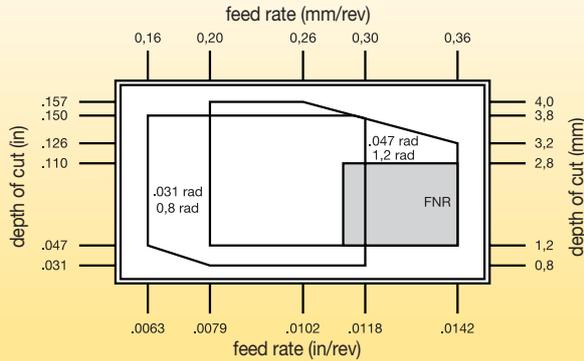
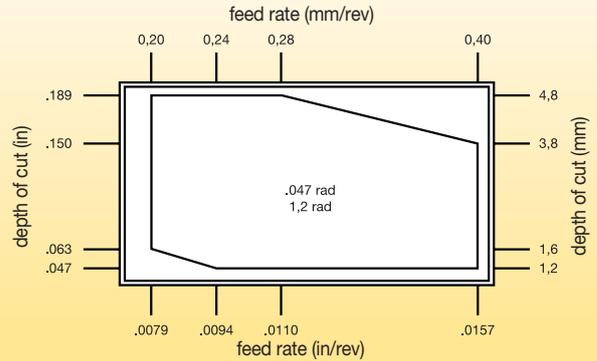


Seat Size 6



(continued)

(Turn and profile feed rates — continued)

**Seat Size 8**

**Seat Size 10**

**Cut-Off Feed Rates**
**Plunge feed rates**

- first choice
- alternate choice

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

Chip Control	Description	Insert Geometry	Seat Size	Starting Conditions	Cut-Off Feed Rates mm/rev					
					mm	0,05	0,10	0,15	0,20	0,25
-CL	Aggressive geometry for hard to break chips.		1B	0,06	0,05	0,10	0,15	0,20	0,25	0,30
			2	0,07	0,05	0,10	0,15	0,20	0,25	0,30
			3	0,08	0,05	0,10	0,15	0,20	0,25	0,30
			4	0,09	0,05	0,10	0,15	0,20	0,25	0,30
-CF	Positive geometry for reduced cutting forces.		1B	0,06	0,05	0,10	0,15	0,20	0,25	0,30
			2	0,07	0,05	0,10	0,15	0,20	0,25	0,30
			3	0,09	0,05	0,10	0,15	0,20	0,25	0,30
			4	0,11	0,05	0,10	0,15	0,20	0,25	0,30
			5	0,13	0,05	0,10	0,15	0,20	0,25	0,30
-CM	Stable cutting edge for aggressive feed rates. Primarily in cast iron.		1B	0,06	0,05	0,10	0,15	0,20	0,25	0,30
			2	0,07	0,05	0,10	0,15	0,20	0,25	0,30
			3	0,09	0,05	0,10	0,15	0,20	0,25	0,30
			4	0,11	0,05	0,10	0,15	0,20	0,25	0,30
			5	0,14	0,05	0,10	0,15	0,20	0,25	0,30
-CR	Most stable cutting edge for steel.		2	0,10	0,05	0,10	0,15	0,20	0,25	0,30
			3	0,14	0,05	0,10	0,15	0,20	0,25	0,30
			4	0,16	0,05	0,10	0,15	0,20	0,25	0,30
			5	0,19	0,05	0,10	0,15	0,20	0,25	0,30

NOTE: For cut-off inserts with a lead angle, maximum feed rate should be reduced by up to 40%.

**Maximum Feed Rate Values**

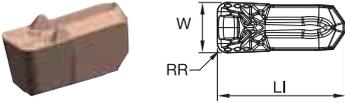
Data above is for P and K material groups. <b>Maximum</b> feed rates should be adjusted by multiplying max feed rate values by following factors for shown material groups.	Material Group	Feed Factor
	<b>M</b>	.8
	<b>N</b>	1.2
	<b>S</b>	.8
	<b>H</b>	.5

### Recommended Starting Speeds [m/min]

Turning

Material Group		K313			KCU10			KCU25			KCP10B			KCP25B			KCK20B		
P	0-1	-	-	-	140	<b>280</b>	335	110	<b>225</b>	270	185	<b>400</b>	450	145	<b>290</b>	365	200	<b>440</b>	490
	2	-	-	-	140	<b>200</b>	245	110	<b>160</b>	195	185	<b>270</b>	350	145	<b>200</b>	305	200	<b>300</b>	380
	3	-	-	-	140	<b>155</b>	245	110	<b>125</b>	195	170	<b>190</b>	260	140	<b>155</b>	245	600	<b>200</b>	280
	4	-	-	-	75	<b>110</b>	170	60	<b>90</b>	135	90	<b>145</b>	200	75	<b>110</b>	180	100	<b>160</b>	220
	5	-	-	-	120	<b>200</b>	260	100	<b>160</b>	210	150	<b>220</b>	305	120	<b>200</b>	270	165	<b>240</b>	330
	6	-	-	-	110	<b>150</b>	230	85	<b>120</b>	185	120	<b>180</b>	275	110	<b>150</b>	230	130	<b>190</b>	300
M	1	60	<b>90</b>	120	140	<b>210</b>	260	90	<b>170</b>	245	-	-	-	-	-	-	-	-	-
	2	45	<b>75</b>	110	120	<b>200</b>	245	90	<b>150</b>	245	-	-	-	-	-	-	-	-	-
	3	35	<b>65</b>	100	120	<b>180</b>	245	90	<b>140</b>	210	-	-	-	-	-	-	-	-	-
K	1	30	<b>75</b>	120	120	<b>180</b>	245	100	<b>145</b>	195	170	<b>245</b>	440	140	<b>200</b>	360	210	<b>305</b>	550
	2	25	<b>70</b>	110	90	<b>150</b>	210	70	<b>120</b>	170	120	<b>195</b>	340	100	<b>160</b>	280	150	<b>245</b>	430
	3	20	<b>60</b>	90	60	<b>110</b>	150	50	<b>85</b>	120	120	<b>170</b>	270	100	<b>140</b>	220	150	<b>210</b>	335
N	1-2	150	<b>370</b>	610	150	<b>550</b>	975	120	<b>440</b>	780	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4	120	<b>275</b>	430	120	<b>365</b>	610	100	<b>290</b>	490	-	-	-	-	-	-	-	-	-
	5	45	<b>90</b>	150	90	<b>170</b>	245	70	<b>135</b>	195	-	-	-	-	-	-	-	-	-
	6	40	<b>75</b>	150	120	<b>210</b>	305	100	<b>170</b>	245	-	-	-	-	-	-	-	-	-
S	1	8	<b>30</b>	75	15	<b>55</b>	135	8	<b>40</b>	60	-	-	-	-	-	-	-	-	-
	2	8	<b>35</b>	75	15	<b>60</b>	135	8	<b>30</b>	75	-	-	-	-	-	-	-	-	-
	3	8	<b>40</b>	75	15	<b>70</b>	135	15	<b>40</b>	75	-	-	-	-	-	-	-	-	-
	4	8	<b>45</b>	75	15	<b>70</b>	170	8	<b>50</b>	110	-	-	-	-	-	-	-	-	-
H	1	-	-	-	30	<b>45</b>	60	-	-	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	15	<b>30</b>	45	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

NOTE: FIRST choice starting speeds are in **bold** type.  
As the average chip thickness increases, the speed should be decreased.



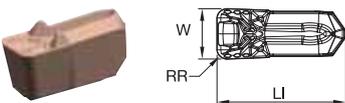
● first choice  
○ alternate choice

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



■ GUP Precision Moulded • Metric

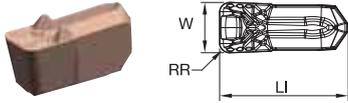
catalogue number	seat size	W	W tol ±	RR	LI	KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313
EG0212M02U02GUP	2	2,125	0,050	0,20	8,97	●	●	●	●	-	-
EG0251M02U02GUP	2	2,511	0,050	0,20	8,97	●	●	●	●	-	-
EG0312M03U02GUP	3	3,125	0,075	0,20	9,60	●	●	●	-	-	-
EG0312M03U04GUP	3	3,125	0,075	0,40	9,60	●	●	●	-	-	-
EG0412M04U04GUP	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	●	●	●	-	-	-



■ GUP Precision Ground • Metric

catalogue number	seat size	W	W tol ±	RR	LI	KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313
EG0200M02P02GUP	2	2,000	0,025	0,20	8,80	●	●	-	-	-	●
EG0300M03P02GUP	3	3,000	0,025	0,20	9,40	●	●	-	-	-	●
EG0300M03P04GUP	3	3,000	0,025	0,40	9,60	●	●	-	-	-	●
EG0400M04P04GUP	4	4,000	0,025	0,40	10,10	●	●	-	-	-	●
EG0400M04P08GUP	4	4,000	0,025	0,80	10,10	●	●	-	-	-	●
EG0500M05P04GUP	5	5,000	0,025	0,40	12,20	●	●	-	-	-	●
EG0500M05P08GUP	5	5,000	0,025	0,80	12,20	●	●	-	-	-	●
EG0600M06P04GUP	6	6,000	0,025	0,40	14,50	●	●	-	-	-	●
EG0600M06P08GUP	6	6,000	0,025	0,80	14,50	●	●	-	-	-	●
EG0700M06P08GUP	6	7,000	0,025	0,80	14,50	●	●	-	-	-	●
EG0800M08P08GUP	8	8,000	0,025	0,80	17,40	●	●	-	-	-	●
EG0800M08P12GUP	8	8,000	0,025	1,20	17,40	●	●	-	-	-	●
EG1000M10P12GUP	10	10,000	0,025	1,20	20,70	●	●	-	-	-	●

Turning

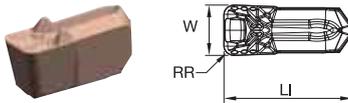


● first choice  
○ alternate choice

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

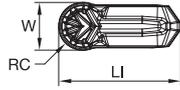
■ GUP Precision Moulded • Inch

catalogue number	seat size	W	W tol ±	RR	LI	KCU10	KCU25	KCP10B	KCP25B	KCK20B	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	●	●	●	●	-	-



■ GUP Precision Ground • Inch

catalogue number	seat size	W	W tol ±	RR	LI	KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313
EG063I1FP05GUP	1F	1,600	0,025	0,20	9,00	●	●	-	-	-	●
EG094I02P05GUP	2	2,388	0,025	0,20	8,90	●	●	-	-	-	●
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	●	●	-	-	-	●

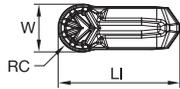


● first choice  
○ alternate choice

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

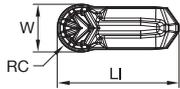
■ GUP Full Radius Precision Moulded • Metric

catalogue number	seat size	W	W tol ±	RC	LI	KCU10	KCU25	KCP10B	KCP25B	KCK20B	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	●	●	●	○	-	-



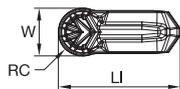
■ GUP Full Radius Precision Ground • Metric

catalogue number	seat size	W	W tol ±	RC	LI	KCU10	KCU25	KCP10B	KCP25B	KCK20B	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	●	●	-	-	-	●



■ GUP Full Radius Precision Moulded • Inch

catalogue number	seat size	W	W tol ±	RC	LI	KCU10	KCU25	KCP10B	KCP25B	KCK20B	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	●	●	●	○	-	-

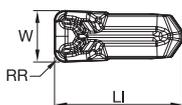


■ GUP Full Radius Precision Ground • Inch

catalogue number	seat size	W	W tol ±	RC	LI	KCU10	KCU25	KCP10B	KCP25B	KCK20B	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	●	●	-	-	-	●



Turning

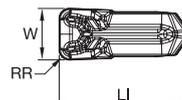


● first choice  
○ alternate choice

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

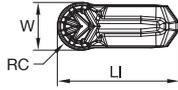
■ GUN Precision Moulded • Metric

catalogue number	seat size	W	W tol ±	RR	LI	KCU10	KCU25	KCP10B	KCP25B	KCK20B	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	●	●	●	○	-	-



■ GUN Precision Moulded • Inch

catalogue number	seat size	W	W tol ±	RR	LI	KCU10	KCU25	KCP10B	KCP25B	KCK20B	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	●	●	●	○	-	-



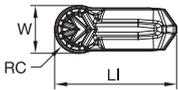
● first choice  
○ alternate choice

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



■ GUN Full Radius Precision Moulded • Metric

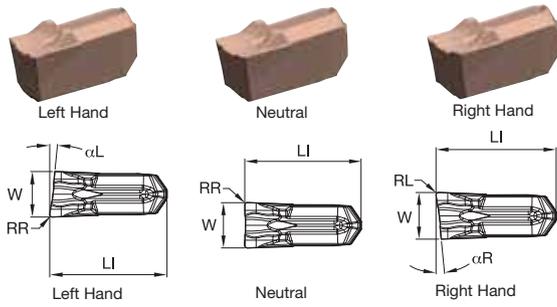
catalogue number	seat size	W	W tol ±	RC	LI	KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313
ER0312M03U00GUN	3	3,125	0,075	1,560	9,60	●	●	●	●	-	-
ER0412M04U00GUN	4	4,125	0,075	2,060	10,20	●	●	●	●	-	-
ER0512M05U00GUN	5	5,125	0,075	2,560	12,20	●	●	●	●	-	-
ER0612M06U00GUN	6	6,125	0,075	3,060	14,60	●	●	●	●	-	-
ER0812M08U00GUN	8	8,125	0,075	4,060	17,47	●	●	●	●	-	-



■ GUN Full Radius Precision Moulded • Inch

catalogue number	seat size	W	W tol ±	RC	LI	KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313
ER130I03U00GUN	3	3,302	0,075	1,650	9,60	●	●	●	●	-	-
ER192I04U00GUN	4	4,873	0,075	2,440	10,20	●	●	●	●	-	-
ER255I06U00GUN	6	6,473	0,075	3,240	14,60	●	●	●	●	-	-
ER317I08U00GUN	8	8,052	0,075	4,030	17,50	●	●	●	●	-	-

Turning

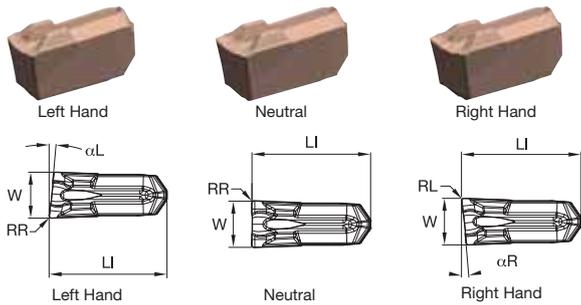


● first choice  
○ alternate choice

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

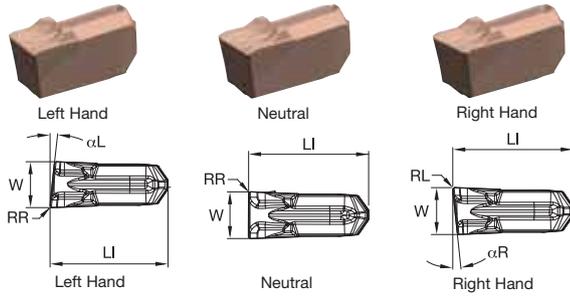
**CF Precision Moulded • Metric**

catalogue number	seat size	W	W tol ±	LI	αR	αL	RR	RL	KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313
EC014M1BL06CF01	1B	1,400	0,050	9,00	—	6	0,15	—	—	●	—	—	—	—
EC014M1BN00CF01	1B	1,400	0,050	9,00	—	—	0,15	0,15	—	●	—	—	—	—
EC014M1BR06CF01	1B	1,400	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	—	●	—	—	—	—



**CL Precision Moulded • Metric**

catalogue number	seat size	W	W tol ±	LI	αR	αL	RR	RL	KCU10	KCU25	KCP10B	KCP25B	KCK20B	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	—	●	—	—	—	—



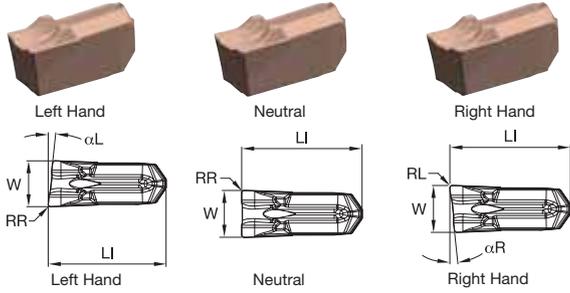
● first choice  
○ alternate choice

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

### CM Precision Moulded • Metric

catalogue number	seat size	W	W tol ±	LI	αR	αL	RR	RL	KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313
EC014M1BN00CM01	1B	1,400	0,050	9,00	—	—	0,15	0,15	-	●	-	-	-	-
EC014M1BL06CM01	1B	1,400	0,050	9,00	—	6	0,20	—	-	●	-	-	-	-
EC014M1BR06CM01	1B	1,400	0,050	9,00	6	—	—	0,20	-	●	-	-	-	-
EC020M02N00CM02	2	2,000	0,050	8,98	—	—	0,20	0,20	-	●	-	-	-	-
EC020M02L06CM02	2	2,000	0,050	9,00	—	6	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	-	●	-	-	-	-

Turning



● 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	K313
EC020M02N00CR02	2	2,000	0,050	8,98	—	—	0,20	0,20	-	●	-	-	-	-
EC020M02L06CR02	2	2,000	0,050	9,00	—	6	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	-	●	-	-	-	-
EC060M06N00CR03	6	6,000	0,075	14,59	—	—	0,30	0,30	-	●	-	-	-	-
EC060M06L06CR04	6	6,000	0,075	14,59	—	6	0,40	—	-	●	-	-	-	-
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	-	●	-	-	-	-

# NOVO™

The logo features the word "NOVO" in a bold, white, sans-serif font. The letter "O" is replaced by a stylized sphere with a blue top half and a grey bottom half, suggesting a globe or a mechanical part. The background is a dark blue gradient with light blue, wavy, energy-like patterns.

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## How Do Catalogue Numbers Work?

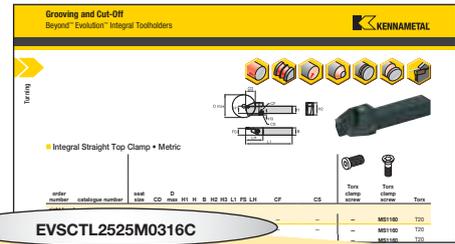
Each character in our catalogue number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.



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><b>M</b> = Maximum support for specific groove width and straight clearance for unlimited workpiece diameter</p> <p><b>A</b> = Face grooving-inboard sweep</p> <p><b>B</b> = Face grooving-outboard sweep</p>				<p><b>Metric</b> = Height x Width in mm letter indicates tool length according to ISO</p>				

## How Do Catalogue Numbers Work?

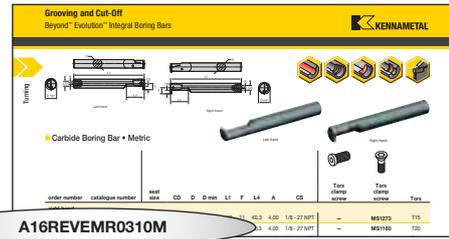
Each character in our catalogue number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.



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  S=Self-clamping	L = Left hand  R = Right hand		1B 1F 02 03 04 05 06 08 10	in millimetres	C = Through the pocket coolant capable
<p><b>M</b> = Maximum support and straight clearance</p> <p><b>E</b> = No steel support for face grooving</p>				<p><b>Metric</b> = Height x Width in mm letter indicates tool length according to ISO</p>				

## 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.



<b>A</b>	<b>16</b>	<b>R</b>	<b>EV</b>	<b>E</b>	<b>M</b>	<b>R</b>	<b>03</b>	<b>10</b>	<b>M</b>
Steel Bar with Coolant	Bar Diameter	Bar Length	Platform	Tool Type	Support Type	Hand of Tool	Insert Seat Size	Max Cutting Depth	Tool Units
Steel boring bar with through coolant capability.			Beyond™ Evolution™	E = End mount (90°)	M = Maximum support	R = Right hand L = Left hand	1F 02 03 04 05 06 08 10	in millimetres	M = Metric

**Metric** = Diameter in mm

symbol	mm
K	125
M	150
Q	180
R	200
S	250
T	300

## 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  
Beyond™ Evolution™ Cut-Off Blades

order number	catalogue number	seat size	H	W	HL	L1	B	CD	assembly version
	<b>EVBSL32J0320</b>	14	15.5	95	2	14			SCWSE
		15.5	95	2	16				SCWSE
		14.4	95	2	16				SCWSE



<b>EV</b>	<b>B</b>	<b>S</b>	<b>L</b>	<b>32</b>	<b>J</b>	<b>03</b>	<b>20</b>
Family Name	Tool Style	Support Type	Hand	Blade Height	Overall Length	Seat Size	Max Cutting Depth
Beyond™ Evolution™	<b>B</b> = 2 pocket blade	<b>S</b> = Standard <b>C</b> = Reinforced	<b>N</b> = Neutral <b>L</b> = Left hand <b>R</b> = Right hand	in millimetres	According to ISO <b>G</b> = 90mm <b>J</b> = 110mm <b>M</b> = 150mm <b>X</b> = Special	<b>1B</b> <b>1F</b> <b>02</b> <b>03</b> <b>04</b> <b>05</b> <b>06</b> <b>08</b> <b>10</b>	in millimetres

Turning

## 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  
Modular Toolholder

Turn

KGMS-C + Inch

order number	catalogue number	H	MS	S	L1	L5	F	MS	MS	blade type	blade grade	Tool	clamp	Tool
right hand										KT20	—	T10	—	T10
left hand	KGMSL2525M50C	1.00	1.00	1.00	0.5	0.27	35	1.67	0.25	KT20	MS1102	T10	—	—
										KT20	MS1102	T10	MS2002	T10
										KT20	MS1102	T10	—	—
										KT20	MS1102	T10	MS2002	T10

**KGMSL2525M50C**

<b>KGM</b>	<b>S</b>	<b>L</b>	<b>2525M</b>	<b>50</b>	<b>C</b>
Family Name	Tool Style	Hand	Shank Size	Blade Size	Coolant
Grooving Modular System	<p><b>S</b> = Straight mount</p> <p><b>E</b> = End mount (90°)</p>	<p><b>L</b> = Left hand</p> <p><b>R</b> = Right hand</p>	<p><b>Metric</b> = Height x Width in mm                      letter indicates tool length according to ISO</p>	<p><b>50</b></p> <p><b>65</b></p>	<p><b>C</b> = Through coolant capable</p>

## 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.

order number	catalog number	seat size	CD	FS	blade size
		1F	12.0	11.00	50
		2	12.0	10.88	50
			12.0	10.88	50
			12.0	10.43	50
			12.0	10.43	50

**EVM50L0314M30035C**

<b>EVM</b>	<b>50</b>	<b>L</b>	<b>03</b>	<b>14</b>	<b>M</b>	<b>30035</b>	<b>C</b>
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



Turning

## 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.

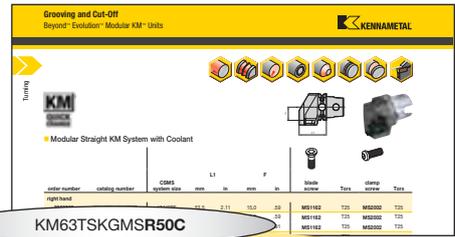
Grooving and Cut-Off  
Beyond™ Evolution™ Modular KM™ Units

order number	catalog number	CBMG system size	mm	in.	W	mm	in.	Module holder	Tool	Holder holder	Tool
MS1162	TS	MS2002	TS								
MS1162	TS	MS2002	TS								
MS1162	TS	MS2002	TS								

**KM63TSKGMRS50C**

<b>KM</b>	<b>63</b>	<b>TS</b>	<b>KGM</b>	<b>S</b>
KM Quick Change	System Size	Feature	Insert Holding Method	Insert Location
<p><b>KM</b> <b>KM4X™</b> <b>PSC</b></p>	<p>40 = 40mm 50 = 50mm 63 = 63mm 80 = 80mm 100 = 100mm</p>	<p><b>TS</b> <b>XMZ</b></p>	<p><b>KGM</b></p> <p>Beyond™ Evolution™ Modular Grooving</p>	<p><b>E</b> = End mount <b>S</b> = Side mount</p>

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

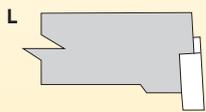
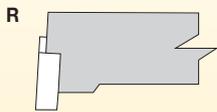


**R**

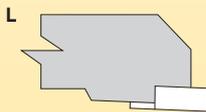
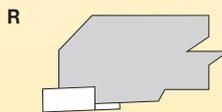
Hand of Tool

R = Right hand  
 L = Left hand

**End Mount**



**Side Mount**



**50**

Blade Size

50  
 60

**C**

Coolant

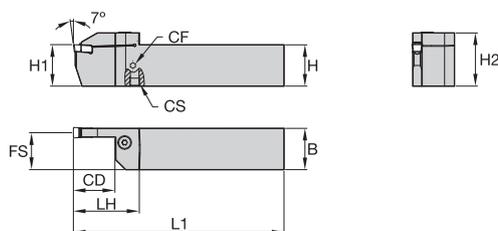
C = Through the pocket coolant capable

**Special Features**

Y = Mazak®  
 INTEGREX®



Turning



## Integral Straight • Metric

order number	catalogue number	seat size	CD	H1	H	B	H2	L1	FS	LH	CF	CS	Torx clamp screw		Torx
													Torx clamp screw	Torx clamp screw	
<b>right hand</b>															
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
5953959	EVSMR2020K0222	2	22	20	20	20	29	125	19	38	—	—	MS2091	—	25 IP
5953957	EVSMR2525M0226	2	26	25	25	25	34	150	24	42	—	—	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
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	EVSMR4040P0640C	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	EVSMR4040P0840C	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	EVSMR4040P1040C	10	40	40	40	40	51	200	36	63	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	—	T45

(continued)

(Integral Straight • Metric — continued)

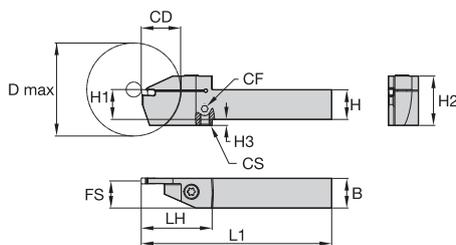


order number	catalogue number	seat size	CD	H1	H	B	H2	L1	FS	LH	CF	CS			Torx
													Torx clamp screw	Torx clamp screw	
left hand															
5953956	EVSMML2020K0216	2	16	20	20	20	27	125	19	31	—	—	—	MS1160	T20
5953954	EVSMML2525M0216	2	16	25	25	25	32	150	24	31	—	—	—	MS1160	T20
5953955	EVSMML2020K0222	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
5954218	EVSMML3232P0626C	6	26	32	32	32	42	170	29	47	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	—	T30
5954217	EVSMML3232P0632C	6	32	32	32	32	43	170	29	55	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	—	T45
5954213	EVSMML4040P0640C	6	40	40	40	40	51	200	37	63	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	—	T45
5954231	EVSMML2525M0826C	8	26	25	25	25	35	150	21	49	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	—	T45
5954216	EVSMML3232P0826C	8	26	32	32	32	43	170	28	49	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	—	T45
5954215	EVSMML3232P0832C	8	32	32	32	32	43	170	28	55	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	—	T45
5954212	EVSMML4040P0840C	8	40	40	40	40	51	200	36	63	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	—	T45
5954214	EVSMML3232P1032C	10	32	32	32	32	43	170	28	55	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	—	T45
5954211	EVSMML4040P1040C	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	M4-0.7p	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	M6-1.0P x 45	T25	KT25	1022725
MS2091	1931147	9	80	M5	25IP	K25IP	2050113

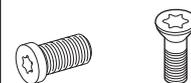


Turning



■ 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																	
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
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)

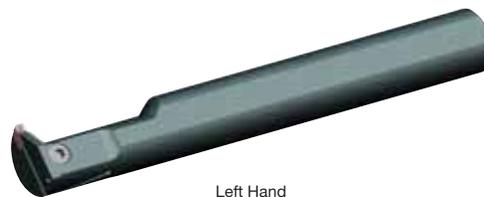
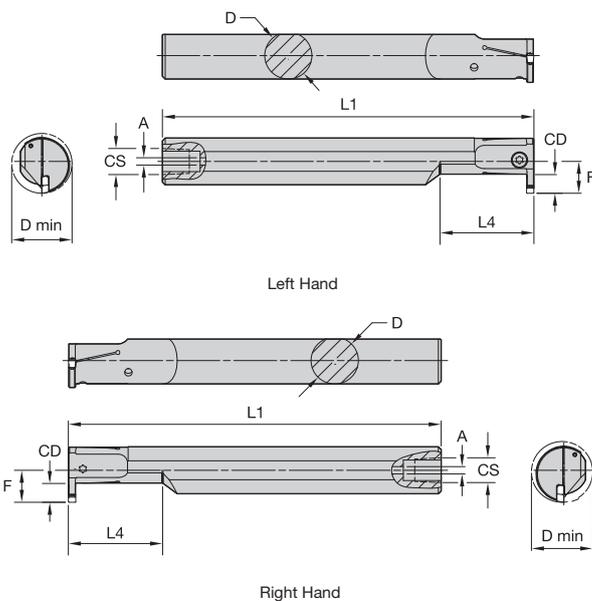
(Integral Straight Top Clamp • Metric — continued)



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
<b>left hand</b>																	
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
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

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	M4-0.7p	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	M6-1.0P x 45	T25	KT25	1022725
MS2091	1931147	9	80	M5	25IP	K25IP	2050113

Turning



Left Hand

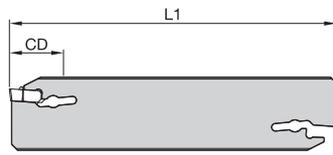


Right Hand

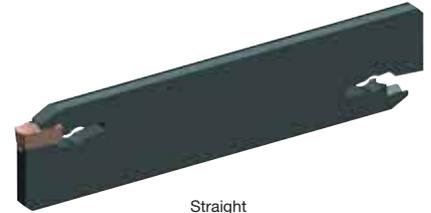
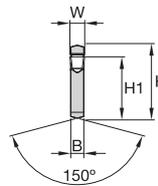
## Carbide Boring Bar • Metric

order number	catalogue number	seat size	CD	D	D min	L1	F	L4	A	CS	Torx clamp screw	Torx clamp screw	Torx
<b>right hand</b>													
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	3	12,00	32	40	250	22	64,0	6,40	1/4 - 18 NPT	MS1595	—	T30
<b>left hand</b>													
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

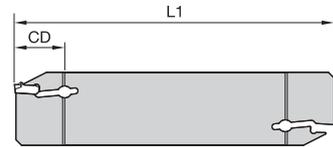
screw		torque		thread	socket	wrench	
catalogue number	order number	Nm	in. lbs.			catalogue number	order number
MS1160	1099645	7	62	M5	T20	KT20	1022703
MS1162	1127019	9	80	M6	T25	KT25	1022725
MS1163	1124104	18	159	M8	T30	KT30L	1099676
MS1273	1020977	4	35.4	M4-0.7p	T15	KT15	1022701
MS1490	2263299	17	151	M8	T45	KT45	1018227
MS1595	1094300	12	106	M6	T30	KT30	1099676
MS1970	1106668	12	106	M6	T30	KT30	1099676
MS2002	1621087	9	80	M6-1.0P x 45	T25	KT25	1022725
MS2091	1931147	9	80	M5	25IP	K25IP	2050113



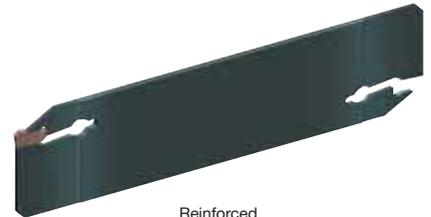
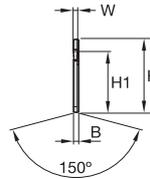
Straight



Straight



Reinforced



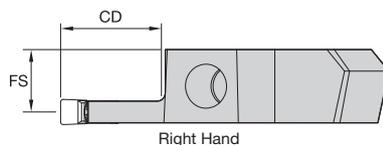
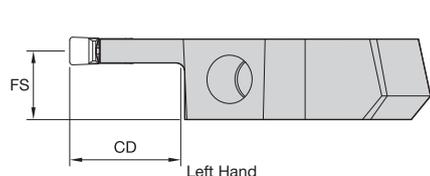
Reinforced

■ Double-Ended Cut-Off Blade

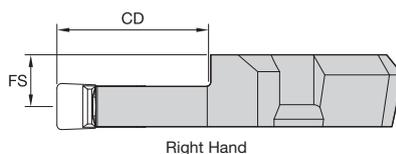
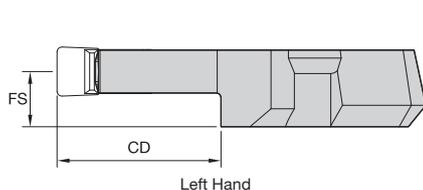
order number	catalogue number	seat size	H	W	H1	L1	B	CD	assembly wrench
<b>left hand</b>									
5941706	EVBSN19G1B14	1B	19	1,4	15,5	90	2	14	SCW5E
5955391	EVBSN19G1F16	1F	19	1,6	15,5	90	2	16	SCW5E
5941707	EVBSN19G0220	2	19	2,0	15,5	90	2	—	SCW5E
5941708	EVBSN26J1B15	1B	26	1,4	21,5	110	2	15	SCW5E
5955392	EVBSN26J1F17	1F	26	1,6	21,5	110	2	17	SCW5E
5941709	EVBSN26J0230	2	26	2,0	21,5	110	2	—	SCW5E
5941710	EVBSN26M0230	2	26	2,0	21,5	150	2	—	SCW5E
5941721	EVBSN26J0340	3	26	3,0	21,5	110	2	—	SCW5E
5941722	EVBSN26M0340	3	26	3,0	21,5	150	2	—	SCW5E
5941723	EVBSN26J0440	4	26	4,0	21,5	110	3	—	SCW5E
5977635	EVBSN26J0540	5	26	5,0	21,5	110	4	—	SCW5E
5977636	EVBSN26J0640	6	26	6,0	21,5	110	5	—	SCW8E
5941725	EVBSN32M0350	3	32	3,0	25,1	150	2	—	SCW5E
5941724	EVBSN32M0250	2	32	2,0	25,1	150	2	—	SCW5E
5941726	EVBSN32M0450	4	32	4,0	25,1	150	3	—	SCW5E
5977637	EVBSN32M0560	5	32	5,0	25,1	150	4	—	SCW5E
5977638	EVBSN32M0660	6	32	6,0	25,1	150	5	—	SCW8E
5977639	EVBSN32M0860	8	32	8,0	25,1	150	7	—	SCW8E
5977640	EVBSN52X06120	6	53	6,0	45,3	260	5	—	SCW8E
5977721	EVBSN52X08120	8	53	8,0	45,3	260	7	—	SCW8E



Turning



(50 blade size shown)



(65 blade size shown)

■ Modular Straight Blade with Coolant

order number	catalogue number	seat size	CD	FS	blade size
<b>right hand</b>					
6031041	EVM50R1F12M	1F	12,0	11,00	50
6030969	EVM50R0212M	2	12,0	10,88	50
5955423	EVM50R0216MC	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
6031035	EVM65R0616MC	5	16,0	9,88	65
5955415	EVM50R0526MC	5	26,0	9,43	50
5955416	EVM50R0532MC	5	32,0	9,43	50
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

(continued)

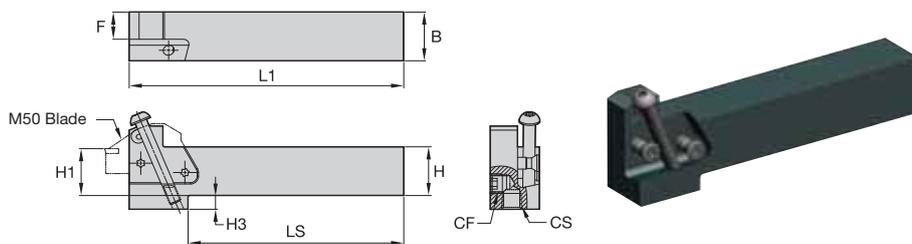
(Modular Straight Blade with Coolant — continued)

order number	catalogue number	seat size	CD	FS	blade size
<b>left hand</b>					
6031042	EVM50L1F12M	1F	12,0	11,00	50
6030970	EVM50L0212M	2	12,0	10,88	50
5955424	EVM50L0216MC	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
6031036	EVM65L0616MC	5	16,0	9,88	65
5955419	EVM50L0526MC	5	26,0	9,43	50
5955420	EVM50L0532MC	5	32,0	9,43	50
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





Turning



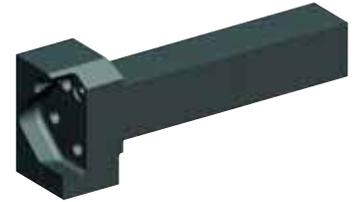
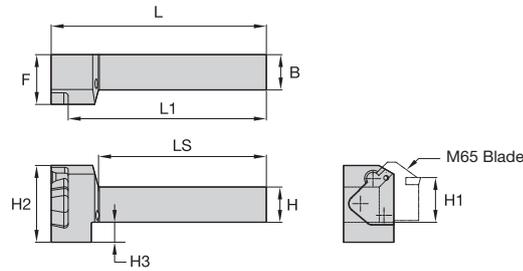
■ KGMS-C • Metric

order number	catalogue number	B	H	H1	L1	F	CS	CF	LS	H2	H3					
												blade size	blade screw	Torx	clamping screw	Torx
<b>right hand</b>																
5979190	KGMSR2525M50C	25	25	25	138,75	13,84	1/8 - 27 NPTF	1/8 - 27 NPTF	109,00	1.67	7,00	50	MS1162	T25	MS2002	T25
5979745	KGMSR2525M65C	25	25	25	150,00	13,00	1/8 - 27 NPTF	1/8 - 27 NPTF	115,00	2.16	14,00	65	MS1163	T30	—	—
5979746	KGMSR3232P50C	32	32	32	158,75	20,81	1/8 - 27 NPTF	1/8 - 27 NPTF	138,62	1.74	—	50	MS1162	T25	MS2002	T25
5979747	KGMSR3232P65C	32	32	32	170,00	20,00	1/8 - 27 NPTF	1/8 - 27 NPTF	142,00	2.12	7,00	65	MS1163	T30	—	—
<b>left hand</b>																
5979191	KGMSL2525M50C	25	25	25	138,75	13,84	1/8 - 27 NPTF	1/8 - 27 NPTF	109,00	1.67	7,00	50	MS1162	T25	MS2002	T25
5979748	KGMSL2525M65C	25	25	25	150,00	13,00	1/8 - 27 NPTF	1/8 - 27 NPTF	115,00	2.16	14,00	65	MS1163	T30	—	—
5979749	KGMSL3232P50C	32	32	32	158,75	20,80	1/8 - 27 NPTF	1/8 - 27 NPTF	138,50	1.74	—	50	MS1162	T25	MS2002	T25
5979750	KGMSL3232P65C	32	32	32	170,00	20,00	1/8 - 27 NPTF	1/8 - 27 NPTF	142,00	2.12	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.).



Turning



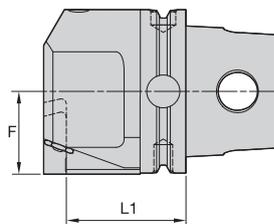
■ KGME-C • Metric

order number	catalogue number	B	H	H1	L1	F	LS	H2	H3	blade size	blade screw	Torx	clamping screw	Torx
<b>right hand</b>														
5979765	KGMER2525M65C	25	25	25	138,15	35,00	117,00	2.13	14,00	65	MS1163	T30	—	—
5979192	KGMER2525M50C	25	25	25	139,25	40,00	125,25	1.67	7,00	50	MS1162	T25	MS2002	T25
5979767	KGMER3232P65C	32	32	32	158,15	35,00	137,00	2.13	7,00	65	MS1163	T30	—	—
5979766	KGMER3232P50C	32	32	32	159,25	40,00	145,25	1.67	—	50	MS1162	T25	MS2002	T25
<b>left hand</b>														
5979768	KGME2525M65C	25	25	25	138,15	35,00	117,00	2.13	14,00	65	MS1163	T30	—	—
5979193	KGME2525M50C	25	25	25	139,25	40,00	125,25	1.67	7,00	50	MS1162	T25	MS2002	T25
5979770	KGME3232P65C	32	32	32	158,15	35,00	137,00	2.13	7,00	65	MS1163	T30	—	—
5979769	KGME3232P50C	32	32	32	159,25	40,00	145,25	1.67	—	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.).



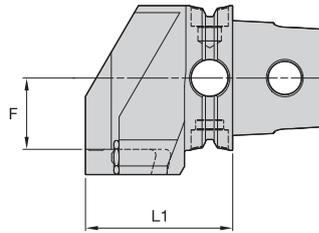
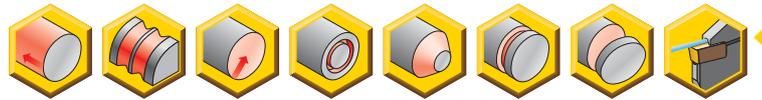
Turning



### ■ Modular End Mount KM System with Coolant

order number	catalogue number	CSMS system size	L1	F	blade size	blade screw	Torx	clamp screw	Torx
<b>right hand</b>									
5999788	KM40TSKGMER50C	KM40TS	28,0	20,5	50	MS1162	T25	MS2002	T25
5999862	KM50TSKGMER50C	KM50TS	38,0	25,5	50	MS1162	T25	MS2002	T25
5999946	KM63TSKGMER50C	KM63TS	48,0	32,5	50	MS1162	T25	MS2002	T25
5999950	KM63XMZKGMER50CY	KM63XMZ	48,0	32,5	50	MS1162	T25	MS2002	T25
6000016	KM80ATCKGMER50C	KM80ATC	58,0	40,5	50	MS1162	T25	MS2002	T25
6000012	KM80TSKGMER50C	KM80TS	58,0	40,5	50	MS1162	T25	MS2002	T25
<b>left hand</b>									
5999789	KM40TSKGMEL50C	KM40TS	28,0	20,5	50	MS1162	T25	MS2002	T25
5999863	KM50TSKGMEL50C	KM50TS	38,0	25,5	50	MS1162	T25	MS2002	T25
5999947	KM63TSKGMEL50C	KM63TS	48,0	32,5	50	MS1162	T25	MS2002	T25
5999971	KM63XMZKGMELF50CY	KM63XMZ	48,0	32,5	50	MS1162	T25	MS2002	T25
6000017	KM80ATCKGMEL50C	KM80ATC	58,0	40,5	50	MS1162	T25	MS2002	T25
6000013	KM80TSKGMEL50C	KM80TS	58,0	40,5	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.).



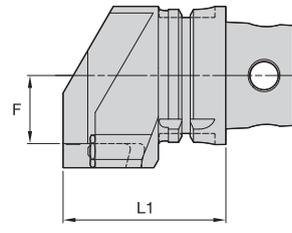
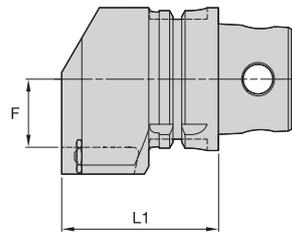
■ Modular Straight KM System with Coolant

order number	catalogue number	CSMS system size	L1	F	blade size	blade screw	Torx	clamp screw	Torx
<b>right hand</b>									
5999790	KM40TSKGMSR50C	KM40TS	53,5	15,0	50	MS1162	T25	MS2002	T25
5999864	KM50TSKGMSR50C	KM50TS	58,5	23,0	50	MS1162	T25	MS2002	T25
5999948	KM63TSKGMSR50C	KM63TS	63,5	31,0	50	MS1162	T25	MS2002	T25
5999972	KM63XMZKGMSR50CY	KM63XMZ	63,5	31,0	50	MS1162	T25	MS2002	T25
6000018	KM80ATCKGMSR50C	KM80ATC	66,5	41,0	50	MS1162	T25	MS2002	T25
6000014	KM80TSKGMSR50C	KM80TS	66,5	41,0	50	MS1162	T25	MS2002	T25
<b>left hand</b>									
5999861	KM40TSKGMSL50C	KM40TS	53,5	15,0	50	MS1162	T25	MS2002	T25
5999865	KM50TSKGMSL50C	KM50TS	58,5	23,0	50	MS1162	T25	MS2002	T25
5999949	KM63TSKGMSL50C	KM63TS	63,5	31,0	50	MS1162	T25	MS2002	T25
5999973	KM63XMZKGMSLF50CY	KM63XMZ	63,5	31,0	50	MS1162	T25	MS2002	T25
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.).



Turning

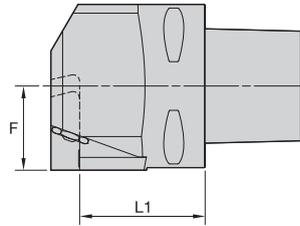
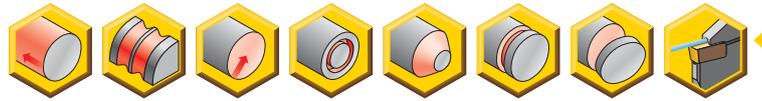


### ■ Modular Straight KM4X™ System with Coolant



order number	catalogue number	CSMS system size	L1	F	blade size	blade screw	Torx
<b>right hand</b>							
5543560	KM4X63KGMSR65C	KM4X63	68,5	30,0	65	MS1163	T30
<b>left hand</b>							
5543558	KM4X63KGMSL65C	KM4X63	68,5	30,0	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.).



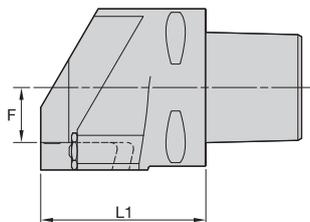
■ Modular End Mount PSC System with Coolant

order number	catalogue number	CSMS system size	L1	F	blade size	blade screw	Torx	clamp screw	Torx
<b>right hand</b>									
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
6000214	PSC80KGMER50C	PSC80	58,0	40,5	50	MS1162	T25	MS2002	T25
<b>left hand</b>									
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
6000215	PSC80KGMEL50C	PSC80	58,0	40,5	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.).



Turning



## ■ Modular Straight PSC System with Coolant

order number	catalogue number	CSMS system size	L1	F	blade size	blade screw	Torx	clamp screw	Torx
<b>right hand</b>									
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
6000211	PSC63KGMSR50C	PSC63	65,5	22,0	50	MS1162	T25	MS2002	T25
6000216	PSC80KGMSR50C	PSC80	73,5	30,0	50	MS1162	T25	MS2002	T25
<b>left hand</b>									
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
6000213	PSC63KGMSL50C	PSC63	65,5	22,0	50	MS1162	T25	MS2002	T25
6000217	PSC80KGMSL50C	PSC80	73,5	30,0	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.).

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Turning

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## 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.

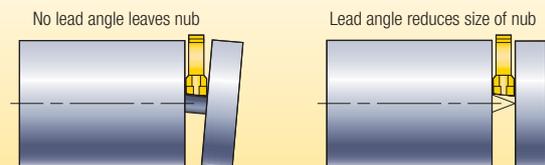
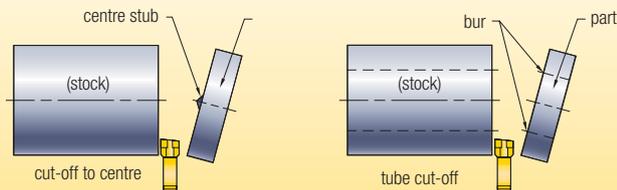


Figure 1

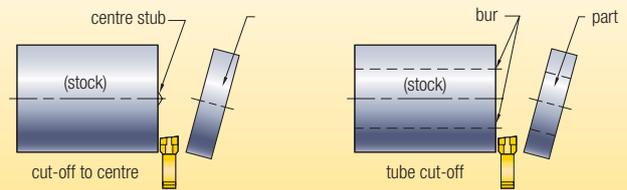
Insert selection **left-hand lead**



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

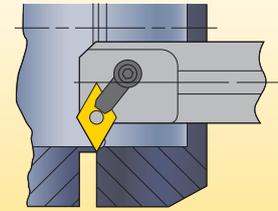
Right-hand lead insert leaves centre stub or bur on stock and produces clean part surface.

- 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

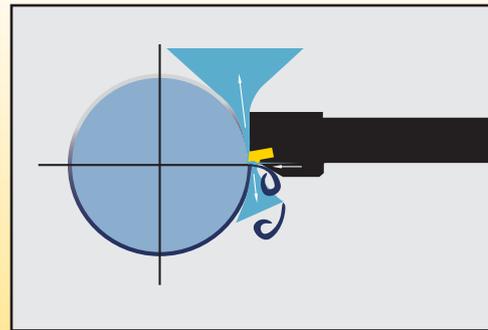


Internal chamfer line up

### 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

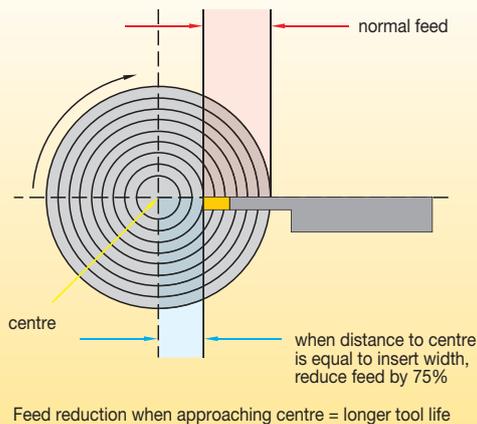


Preferred method for applying coolant

- 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.

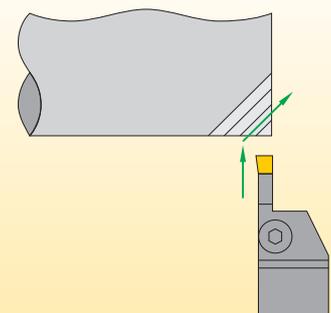
## Programming Guidelines

### Feed reduction in cut-off

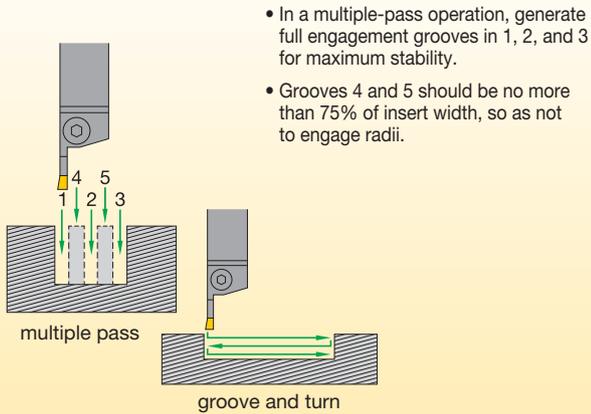


### Chamfering

Chamfering with a grooving tool reduced machine index time and tool stations



### 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.

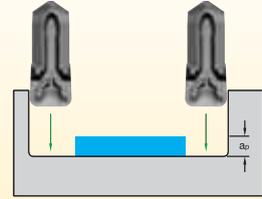
If pocket is deeper than wide = multiple pass

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

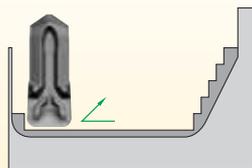
Side turn. This tool is designed to deflect, creating the necessary front clearance.



### Profile Pocket

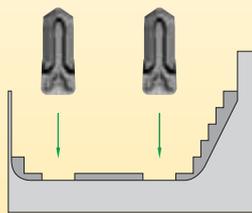
#### Step 1

Rough to have about the same amount of stock left on all surfaces for finish.



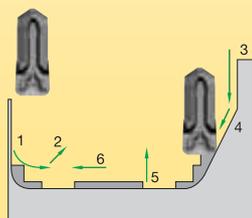
#### Step 2

Open up two grooves away from wall and radius.



#### Step 3

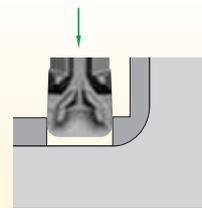
(1 and 2) Finish wall and radius.  
(3 and 4) Finish wall, angle, and radius on opposite side of pocket.  
(5) Retract tool 0,1mm. (6) Side turn to finish the floor of the pocket.



### Generating a Radius

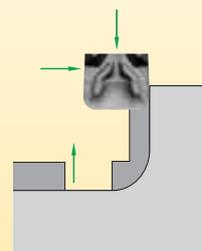
#### Step 1

Open up a groove away from the radius.



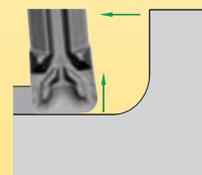
#### Step 2

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.



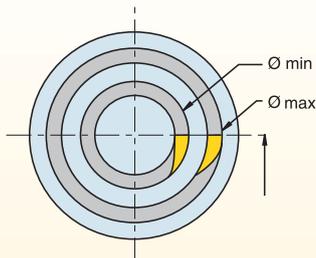
#### Step 3

Retract the tool 0,1mm 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

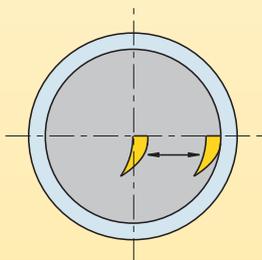
- The outside diameter of the first groove must be between the diameter minimum and diameter maximum capability of the face grooving tool (see illustration above). This creates clearance for the toolholder.

#### 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 center as possible to avoid extreme formation of burs.
- 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"> <li>1. Verify tool centre height.</li> <li>2. Use sharp tools (index more often).</li> <li>3. Use positive rake PVD coated insert.</li> <li>4. Use correct grade for workpiece material.</li> <li>5. Use correct geometry (e.g., positive rake for workhardening material).</li> <li>6. Change tool path.</li> </ol>
poor surface finish	<ol style="list-style-type: none"> <li>1. Increase speed.</li> <li>2. Use sharp tools (index more often).</li> <li>3. Dwell time in bottom 1–3 revolutions (max).</li> <li>4. Use proper chip control geometry.</li> <li>5. Increase coolant flow.</li> <li>6. Verify proper setup (overhang, shank size).</li> <li>7. Use correct geometry (e.g., positive rake for workhardening material).</li> </ol>
groove bottom not flat	<ol style="list-style-type: none"> <li>1. Use sharp tools (index more often).</li> <li>2. Dwell time in bottom 1–3 revolutions (max).</li> <li>3. Reduce tool overhang (increase rigidity).</li> <li>4. Reduce feed rate at groove bottom.</li> <li>5. Use a wider insert.</li> <li>6. Verify tool center height.</li> </ol>
poor chip control	<ol style="list-style-type: none"> <li>1. Use sharp tools (index more often).</li> <li>2. Increase coolant concentration.</li> <li>3. Adjust feed rate (usually increase first).</li> </ol>
chatter	<ol style="list-style-type: none"> <li>1. Reduce tool and workpiece overhang.</li> <li>2. Adjust speed (usually increase first).</li> <li>3. Adjust feed (usually increase first).</li> <li>4. Verify tool centre height.</li> </ol>
insert chipping	<ol style="list-style-type: none"> <li>1. Use correct grade for workpiece material.</li> <li>2. Increase speed.</li> <li>3. Reduce feed.</li> <li>4. Use a stronger grade.</li> <li>5. Increase tool and setup rigidity.</li> </ol>
built-up edge	<ol style="list-style-type: none"> <li>1. Use positive rake PVD coated insert.</li> <li>2. Increase speed.</li> <li>3. Reduce feed.</li> <li>4. Increase coolant flow/concentration.</li> <li>5. Use cermets.</li> </ol>
side walls not straight	<ol style="list-style-type: none"> <li>1. Check tool alignment for square.</li> <li>2. Reduce workpiece and tool overhang.</li> <li>3. Use sharp inserts (index more often).</li> </ol>

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