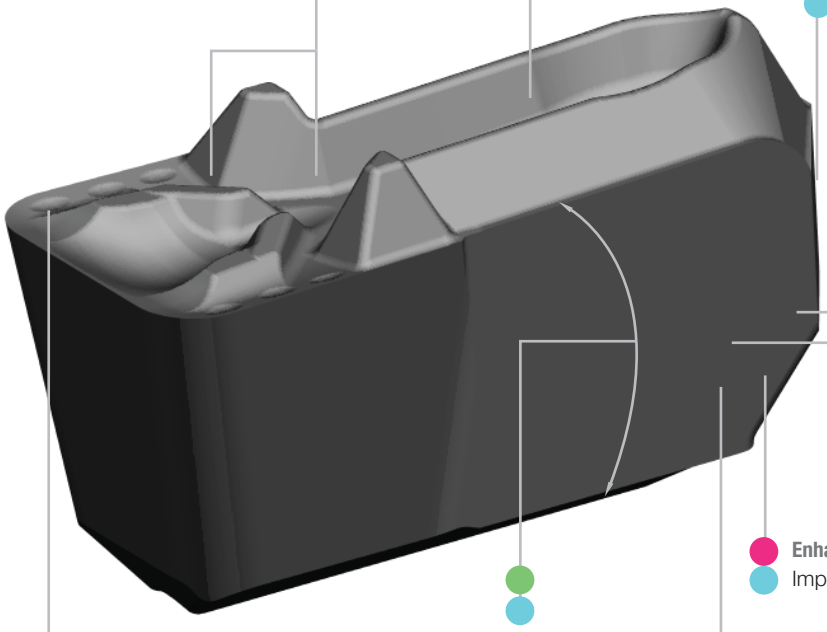
beyond™ EVOLUTION™

INNOVATIONS CATALOG 2016

KENNAMETAL®

One versatile grooving and cut-off system



Coolant channel on rake and pocket
First system on the market with active coolant distribution, providing coolant directly to the minor edge and radius.

Proprietary negative chip geometry
Added chip control in steel, cast, stainless, and hardened materials.

Single-ended design
Deeper grooving capability than double-ended systems.

Proprietary V back seating design
Provides high side load stability comparable to longer double-ended inserts.

Positive back stop
Enables easy indexing.

Triple-V feature
High stability for grooving, cut-off, side turning, deep grooving, face grooving, and profiling applications.

Enhanced body edge design
Improved seating stability.

Angle between top and bottom V
Creates a pull-in effect, securing the insert tighter in the pocket.

Wide range of insert offering
.055–.394" (1,4–10mm)
PVD, CVD, and uncoated.

Industry-leading grade technologies
Proven performance in all materials.

Full range of holders
Use one system to select the right tooling for all grooving and cut-off applications.

that reduces inventory.

If you are a **Various Component Producer**

Challenge
- Reduce setup time.
- Selecting the right tool for the job.
- Using fewer tools to complete the job.
- Reduce tooling inventory.

Solution
- Versatility:
  - Holders, inserts, chipbreakers, and grades.
  - Same pocket for many operations.
- Choose from one system.
- Indexability.

If you are a **High Volume Production Shop**

Challenge
- Increase machine uptime.
- Reduce setup time.
- Lower cost per part.
- Freeing up production capacity.

Solution
- Functional stability.
- Grade, chip control, coolant — MRR and automation.
- Clean and consistent cutting tool edge.
- Indexability.
- Versatility — more operations with the same pocket.

If **Workpiece Finish and Accuracy** is most important to you

Challenge
- Better surface finish.
- Tool consistency.
- Machining accuracy.
- Selecting the right tool.

Solution
- Functional stability — Triple V clamping and three-point contact.
- Process stability — chipbreaker, grade, and coolant.
- Easy to index — clamping and positive back stop.
- Easy to choose from one system — full range of widths and holder styles, chipbreakers, grades, and radii.

One system capable of all grooving and cut-off applications —

beyond™ EVOLUTION™

Insert Offering with ultimate flexibility —

GUP — Grooving Universal Positive
- Positive chipbreaker lowers cutting forces.
- Engineered geometry for chip control in side turning.
- High performance in all materials.

GUN — Grooving Universal Negative
- Negative rake face for strongest cutting edge.
- More aggressive applications.
- Advantages in low-feed and depth-of-cut applications.

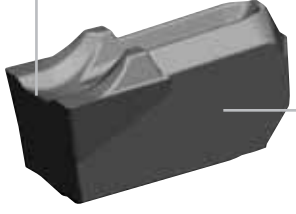
Full Radius
- First choice in profiling.
- >180° cutting edge.
- High performance in all materials.

CL — Cut-Off Low Speed
- Most aggressive chipbreaker.
- For use in long chipping materials.
- Problem solver.

CF — Cut-Off Fine
- Positive chipbreaker lowers cutting forces.
- First choice for steel and stainless steel.
- Excellent surface finish.

CM — Cut-Off Medium
- Ultimate solution in edge stability.
- Leverage for interrupted cuts or hardened skin.
- First choice for cast iron.

CR — Cut-Off Rough
- Strong chip control due to concave edge.
- First choice in steel when additional stability is required.
- Can apply most aggressive feed rates.



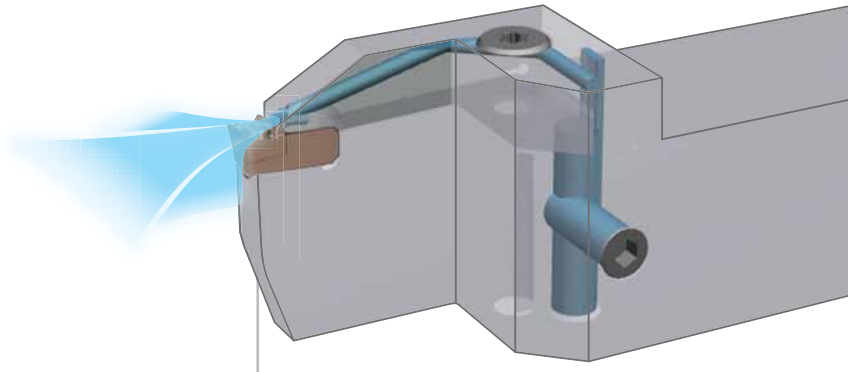
Any insert in any holder by simply matching the seat size.

Up to 35% less tooling vs. the competition

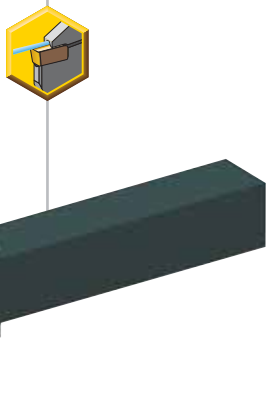
beyond™ EVOLUTION™

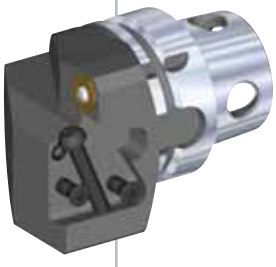
Easy-to-choose, easy-to-use —

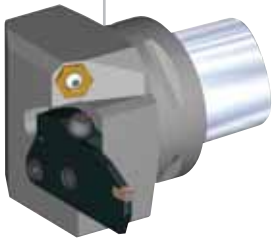
Efficient coolant delivery



Modular with through coolant



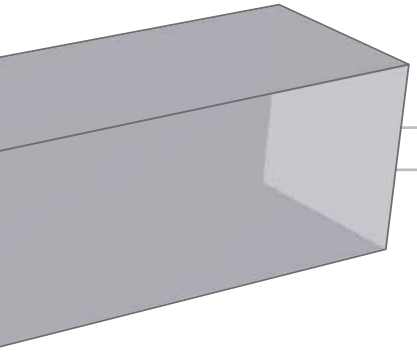




Coming Soon

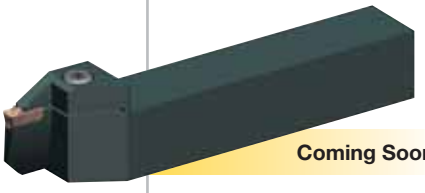
beyond™ EVOLUTION™

high-performance system.



Face grooving
with through coolant

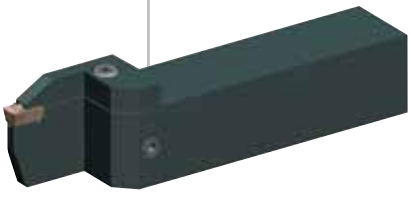
I.D. Boring Bar

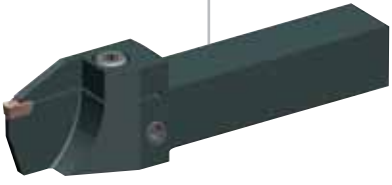


Coming Soon

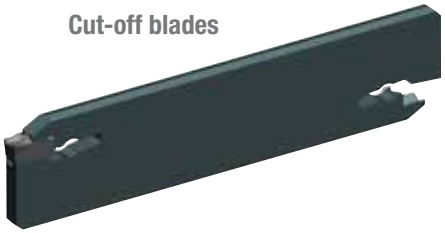
Coming Soon

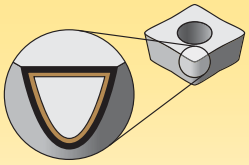
Square shank
with through coolant





Cut-off blades

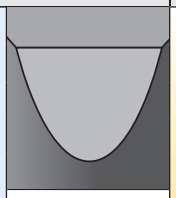
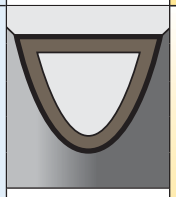
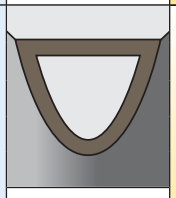


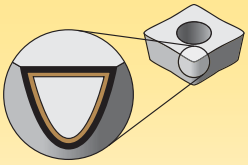


Coatings provide high-speed capability and are engineered for finishing to light roughing.

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

Grade

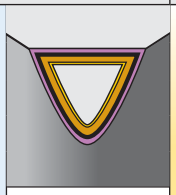
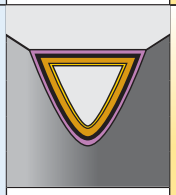
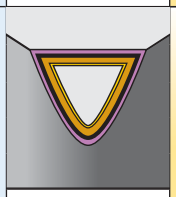
Coating	Grade Description	wear resistance ← → toughness	05	10	15	20	25	30	35	40	45
K313  **C3–C4**	**Composition:** A hard, low binder content, unalloyed WC/Co fine-grain grade. **Application:** Exceptional edge wear resistance combined with very high strength for machining titanium, cast irons, austenitic stainless steels, non-ferrous metals, non-metals, and most high-temp alloys. Superior thermal deformation and depth-of-cut notch resistance. The grain structure is well controlled for minimal pits and flaws, which contributes to long, reliable service.	M K N S									
KCU10  **C3–C4**	**Composition:** An advanced multilayer PVD coating over a very deformation-resistant unalloyed carbide substrate. The new and improved coating improves edge stability with wide range speed and feed capabilities. **Application:** The KCU10™ grade is ideal for finishing to general machining of most workpiece materials at a wide range of speed and feed capabilities. Excellent for machining most steels, stainless steels, cast irons, non-ferrous materials, and super alloys with improved edge toughness and higher cutting speed/feed capability.	P M K N S H									
KCU25  **C2, C6**	**Composition:** An advanced PVD grade with hard AlTiN coating and fine-grain unalloyed substrate. The new and improved coating improves edge stability with wide range speed and feed capabilities. **Application:** The KCU25™ grade is ideal for general machining of most steels, stainless steels, high-temp alloys, titanium, irons, and non-ferrous materials in a wide range of speeds and feeds with improved edge toughness for interrupted cuts and high feed rates.	P M K N S									



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

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

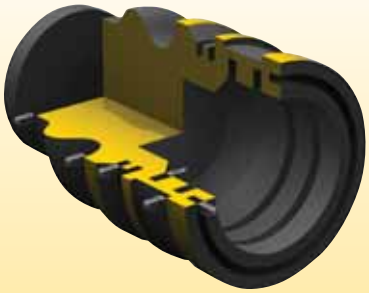
wear resistance ⟷ toughness

Grade	Coating	Grade Description	05	10	15	20	25	30	35	40	45
KCP10B	 C3, C7	**Composition:** A specially engineered wear-resistant carbide grade with a newly designed multilayer MTCVD-TiCN-Al_2O_3-TiOCN coating with superior interlayer adhesion. **Application:** An excellent finishing to medium machining grade for a variety of workpiece materials, including most steels, ferritic, martensitic, and PH stainless steels, and cast irons. The cobalt-enriched substrate offers a balanced combination of deformation resistance and edge toughness, while the thick coating layers offer outstanding abrasion resistance and crater wear resistance for high-speed machining. Smooth coating provides resistance to edge build-up and microchipping and produces excellent surface finishes.	P									
KCP25B	 C2-C3, C6-C7	**Composition:** A tough cobalt-enriched carbide grade with a newly designed multilayer MTCVD-TiCN-Al_2O_3-TiOCN coating with superior interlayer adhesion. **Application:** Best general-purpose turning grade for most steels and ferritic and martensitic stainless steels. The substrate design ensures adequate deformation resistance with excellent insert edge strength. Coating layers offer good wear resistance over a wide range of machining conditions and the post-coat treatment minimizes microchipping and improves coating adhesion to substrate leading to long tool life and improved workpiece finishes.	P									
KCK20B	 C3, C4	**Composition:** A multilayered coating with thick MTCVD TiCN-Al_2O_3-TiOCN layers applied over a carbide substrate specifically engineered for cast irons. **Application:** Delivers consistent performance in high-speed machining of gray and ductile irons. The substrate design permits the insert to stay in the cut for a long time at high speeds with minimum deformation. The thick CVD coating and post-coat treatment provide superior wear resistance ensuring long and consistent tool life. Can be applied both in straight and lightly interrupted cuts.	P									

Step 1 • Identify your grooving or cut-off application

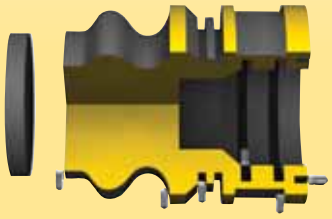
What you need to know:

- 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.



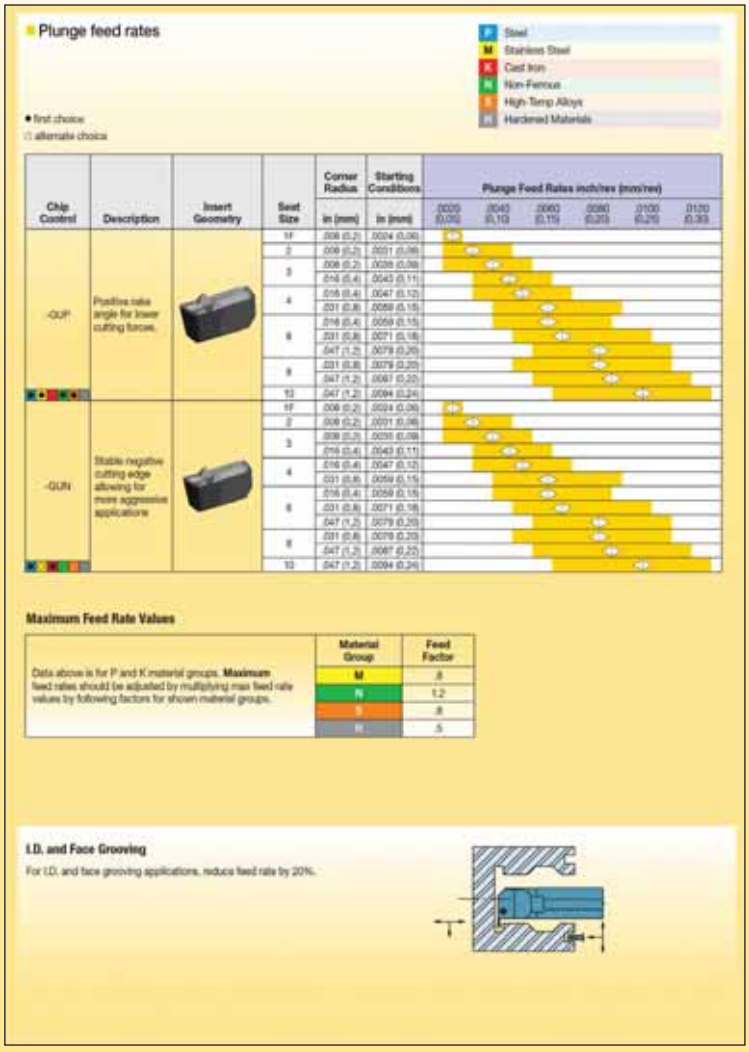
General Recommendation to Select the Insert Size

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

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 in (mm)	Starting Conditions in (mm)	Plunge Feed Rates inch/rev (mm/rev) .0020 (0.05)	.0040 (0.10)	.0060 (0.15)	.0080 (0.20)	.0100 (0.25)	.0120 (0.30)
-GUP	Positive rake angle for lower cutting forces.		1F	.008 (0.2)	.0024 (0.06)	•					
			2	.008 (0.2)	.0031 (0.08)		•				
			3	.008 (0.2)	.0035 (0.09)		•				
				.016 (0.4)	.0043 (0.11)		•				
			4	.016 (0.4)	.0047 (0.12)		•				
				.031 (0.8)	.0059 (0.15)			•			
			6	.016 (0.4)	.0059 (0.15)		•				
				.031 (0.8)	.0071 (0.18)			•			
				.047 (1.2)	.0079 (0.20)			•			
			8	.031 (0.8)	.0079 (0.20)			•			
				.047 (1.2)	.0087 (0.22)				•		
			10	.047 (1.2)	.0094 (0.24)				•		
-GUN	Stable negative cutting edge allowing for more aggressive applications		1F	.008 (0.2)	.0024 (0.06)	•					
			2	.008 (0.2)	.0031 (0.08)		•				
			3	.008 (0.2)	.0035 (0.09)		•				
				.016 (0.4)	.0043 (0.11)		•				
			4	.016 (0.4)	.0047 (0.12)		•				
				.031 (0.8)	.0059 (0.15)			•			
			6	.016 (0.4)	.0059 (0.15)		•				
				.031 (0.8)	.0071 (0.18)			•			
				.047 (1.2)	.0079 (0.20)			•			
			8	.031 (0.8)	.0079 (0.20)			•			
				.047 (1.2)	.0087 (0.22)				•		
			10	.047 (1.2)	.0094 (0.24)				•		

Maximum Feed Rate Values

Data above is for P and K material groups. **Maximum** feed rates should be adjusted by multiplying max feed rate values by following factors for shown material groups.

Material Group	Feed Factor
M	.8
N	1.2
S	.8
H	.5

I.D. and Face Grooving

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

Step 3 • Select the starting speed

Based on material and grade, identify starting speed (vc). First choice is in **bold** type.

Recommended Starting Speeds [SFM]

Material Group		K313			KCU10			KCU25			KCP10B			KCP25B			KCK20B		
P	1	–	–	–	450	**925**	1100	360	**740**	880	600	**1320**	1475	475	**925**	1200	–	–	–
	2	–	–	–	450	**650**	800	360	**520**	640	600	**880**	1150	475	**650**	1000	–	–	–
	3	–	–	–	450	**510**	800	360	**410**	640	550	**630**	850	450	**510**	800	–	–	–
	4	–	–	–	250	**360**	550	200	**290**	440	300	**480**	650	250	**360**	600	–	–	–
	5	–	–	–	400	**660**	850	320	**530**	680	500	**720**	1000	400	**650**	875	–	–	–
	6	–	–	–	350	**500**	750	280	**400**	600	400	**600**	900	300	**500**	750	–	–	–
M	1	200	**300**	400	450	**700**	850	300	**550**	800	–	–	–	–	–	–	–	–	–
	2	150	**250**	300	400	**650**	800	300	**500**	800	–	–	–	–	–	B –	–	–	–
	3	120	**220**	320	400	**600**	800	300	**450**	700	–	–	–	–	–	–	–	–	–
K	1	100	**250**	400	400	**600**	800	320	**480**	640	560	**800**	1440	455	**650**	1170	700	**1000**	1800
	2	75	**225**	350	300	**500**	700	240	**400**	560	400	**640**	1120	325	**520**	910	500	**800**	1400
	3	65	**190**	300	200	**350**	500	160	**280**	400	400	**560**	880	325	**455**	715	500	**700**	1100

A

Step 4 • Select toolholder based on application

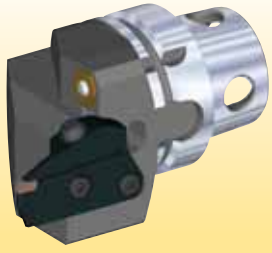
Choose the high-performance holder based on your specific grooving or cut-off application, with the corresponding seat size.

Style		Application
	**Boring Bar**	• For use in I.D. grooving applications.
	**Cut-Off Blade**	• Allows user to vary the depth of cut.
	**Toolholder — Integral**	• Offers the most stability over other styles.
	**Toolholder — Modular**	• Interchangeable blades for versatility.
	**KM™ — Modular** **KM4X™ — Modular**	• Best-in-class KM Quick Change platform.
	**PSC — Modular**	• The modular system in the PSC Quick Change platform.

Step 5 • Select the insert and holder from catalog page

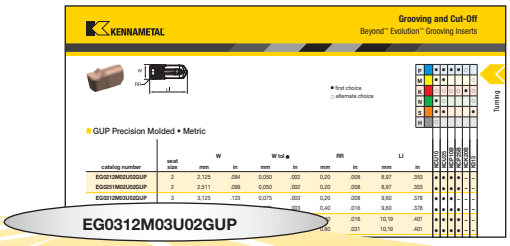
Congratulations!

You have successfully maximized your productivity by selecting the best insert geometry, grade, and cutting specifications for your application!



How Do Catalog Numbers Work?

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



E	G	0312	M	03	U	02	GUP
Family Name	Insert Type	Groove Width	Unit	Seat Size	Tolerance	Corner Radius	Chipbreaker/ Edge Condition
Beyond™ Evolution™	**G** = Square **R** = Full Radius	**Metric** = 1/100mm **Inch** = 1/1000"	**M** = Metric **I** = Inch		**U** = Precision Molded **P** = Precision Ground		**GUP** = Groove-Turn Universal Positive **GUN** = Groove-Turn Universal Negative **FB** = Flat Top Blank **PB** = Positive Chip Control Blank

seat size	groove width mm	groove width inch
1B	1,40	.055
1F	1,60–1,99	.063–.078
02	2,00–2,99	.079–.117
03	3,00–3,99	.118–.156
04	4,00–4,99	.157–.196
05	5,00–5,99	.197–.235
06	6,00–7,99	.236–.314
08	8,00–8,99	.315–.353
10	9,00–10,12	.354–.398

*.312" = seat size 08

mm	
00	full radius
01	0,1
02	0,2
04	0,4
08	0,8
12	1,2

inch	
00	full radius
05	.008
1	.016
2	.032
3	.047

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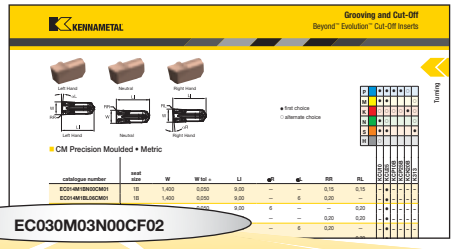


EC030M03N00CF02

E	C	030	M	03	N	00	CF	02
Family Name	Insert Type	Cutting Edge Width	Unit	Seat Size	Hand of Insert	Approach Angle	Chipbreaker	Corner Radius
Beyond™ Evolution™	**C** = Cut-Off		**M** = Metric **I** = Inch		**N** = Neutral **L** = Left hand **R** = Right hand	**00** = Neutral **06** = 6°	**CL** = Cut-Off Low Feed **CF** = Cut-Off Fine **CM** = Cut-Off Medium **CR** = Cut-Off Rough	

	mm	inch
014	1,4	.055
020	2,0	.079
030	3,0	.118
040	4,0	.157
050	5,0	.197
060	6,0	.236
070	7,0	.279
080	8,0	.315

	mm	inch
014	1,4	.055
020	2,0	.079
030	3,0	.118
040	4,0	.157
050	5,0	.197
060	6,0	.236
070	7,0	.279
080	8,0	.315

	mm	inch
01	0,1	.004
02	0,2	.008
04	0,4	.016

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 in (mm)	Starting Conditions in (mm)	Plunge Feed Rates inch/rev (mm/rev) .0020 (0,05)	.0040 (0,10)	.0060 (0,15)	.0080 (0,20)	.0100 (0,25)	.0120 (0,30)
-GUP	Positive rake angle for lower cutting forces.		1F	.008 (0,2)	.0024 (0,06)						
			2	.008 (0,2)	.0031 (0,08)						
			3	.008 (0,2)	.0035 (0,09)						
				.016 (0,4)	.0043 (0,11)						
			4	.016 (0,4)	.0047 (0,12)						
				.031 (0,8)	.0059 (0,15)						

Pictorial View of Insert

Corner Radius

Recommended Starting Feed Rate

Plunge Feed Rates

Seat Size

Recommended 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

	Material Group	Feed Factor
Data above is for P and K material groups. **Maximum** feed rates should be adjusted by multiplying max feed rate values by following factors for shown material groups.	M	.8
	N	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 in (mm)	Starting Conditions in (mm)	Plunge Feed Rates inch/rev (mm/rev) .0020 (0,05)	.0040 (0,10)	.0060 (0,15)	.0080 (0,20)	.0100 (0,25)	.0120 (0,30)
-GUP	Positive rake angle for lower cutting forces.		1F	.008 (0,2)	.0024 (0,06)						
			2	.008 (0,2)	.0031 (0,08)						
			3	.008 (0,2)	.0035 (0,09)						
				.016 (0,4)	.0043 (0,11)						
			4	.016 (0,4)	.0047 (0,12)						
				.031 (0,8)	.0059 (0,15)						
			6	.016 (0,4)	.0059 (0,15)						
				.031 (0,8)	.0071 (0,18)						
				.047 (1,2)	.0079 (0,20)						
			8	.031 (0,8)	.0079 (0,20)						
				.047 (1,2)	.0087 (0,22)						
			10	.047 (1,2)	.0094 (0,24)						
-GUN	Stable negative cutting edge allowing for more aggressive applications		1F	.008 (0,2)	.0024 (0,06)						
			2	.008 (0,2)	.0031 (0,08)						
			3	.008 (0,2)	.0035 (0,09)						
				.016 (0,4)	.0043 (0,11)						
			4	.016 (0,4)	.0047 (0,12)						
				.031 (0,8)	.0059 (0,15)						
			6	.016 (0,4)	.0059 (0,15)						
				.031 (0,8)	.0071 (0,18)						
				.047 (1,2)	.0079 (0,20)						
			8	.031 (0,8)	.0079 (0,20)						
				.047 (1,2)	.0087 (0,22)						
			10	.047 (1,2)	.0094 (0,24)						

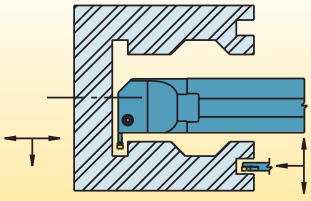
Maximum Feed Rate Values

Data above is for P and K material groups. **Maximum** feed rates should be adjusted by multiplying max feed rate values by following factors for shown material groups.

Material Group	Feed Factor
M	.8
N	1.2
S	.8
H	.5

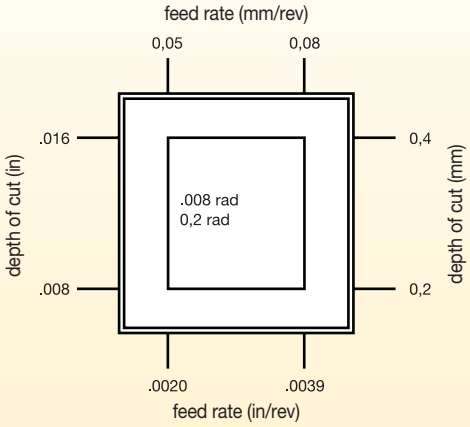
I.D. and Face Grooving

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

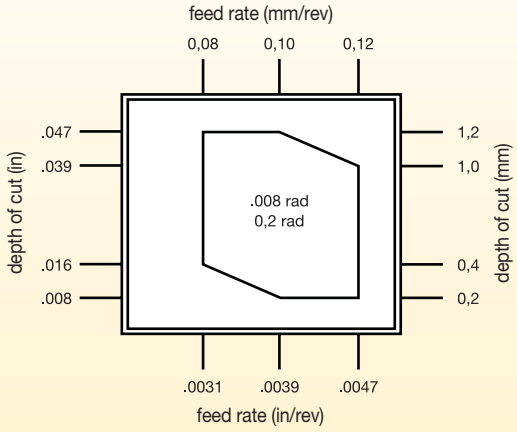


Turn and profile feed rates

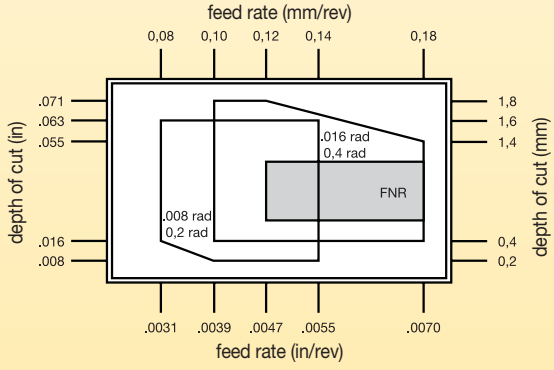
Seat Size 1F



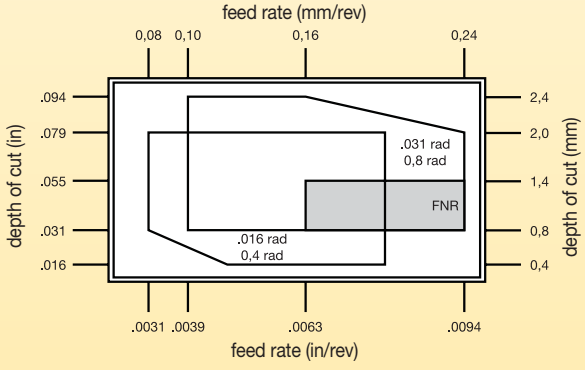
Seat Size 2



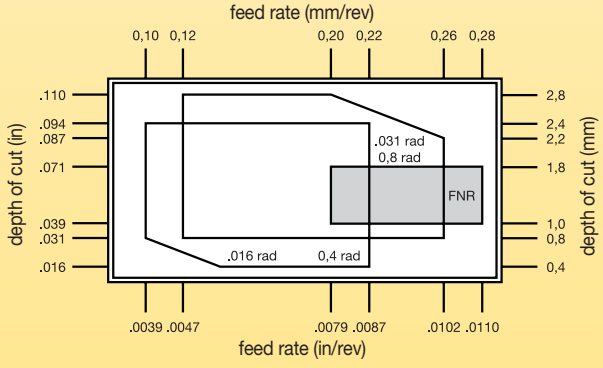
Seat Size 3



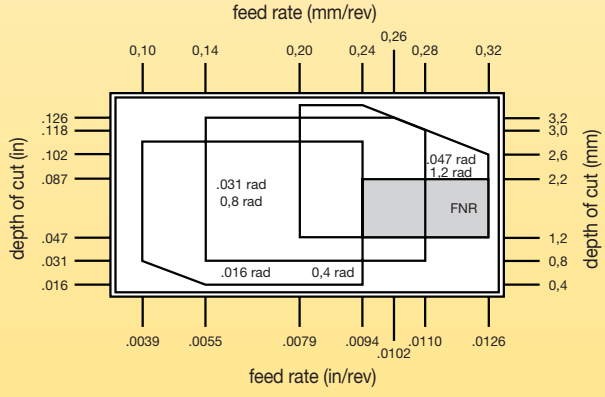
Seat Size 4



Seat Size 5



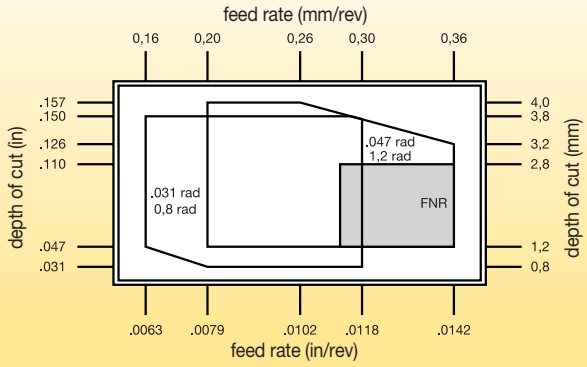
Seat Size 6



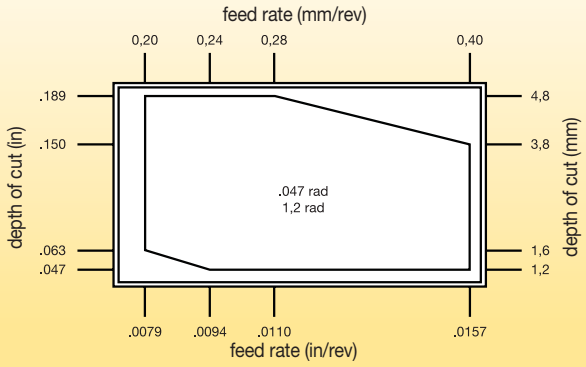
(continued)

(Turn and profile feed rates — continued)

Seat Size 8



Seat Size 10



Cut-Off Feed Rates

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	Starting Conditions in (mm)	Cut-Off Feed Rates inch/rev (mm/rev) .0020 (0,05) – .0120 (0,30)
-CL	Aggressive geometry for hard to break chips.		1B	.0024 (0,06)	
			2	.0028 (0,07)	
			3	.0031 (0,08)	
			4	.0035 (0,09)	
-CF	Positive geometry for reduced cutting forces.		1B	.0024 (0,06)	
			2	.0028 (0,07)	
			3	.0035 (0,09)	
			4	.0043 (0,11)	
			5	.0051 (0,13)	
-CM	Stable cutting edge for aggressive feed rates. Primarily in cast iron.		1B	.0024 (0,06)	
			2	.0028 (0,07)	
			3	.0035 (0,09)	
			4	.0043 (0,11)	
			5	.0055 (0,14)	
-CR	Most stable cutting edge for steel.		2	.0039 (0,10)	
			3	.0055 (0,14)	
			4	.0063 (0,16)	
			5	.0075 (0,19)	

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

Maximum Feed Rate Values

Data above is for P and K material groups. **Maximum** feed rates should be adjusted by multiplying max feed rate values by following factors for shown material groups.

Material Group	Feed Factor
M	.8
N	1.2
S	.8
H	.5

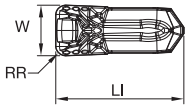
Recommended Starting Speeds [SFM]

Material Group		K313			KCU10			KCU25			KCP10B			KCP25B			KCK20B		
P	0–1	–	–	–	450	**925**	1100	360	**740**	880	600	**1320**	1475	475	**925**	1200	660	**1450**	1620
	2	–	–	–	450	**650**	800	360	**520**	640	600	**880**	1150	475	**650**	1000	660	**970**	1260
	3	–	–	–	450	**510**	800	360	**410**	640	550	**630**	850	450	**510**	800	600	**700**	920
	4	–	–	–	250	**360**	550	200	**290**	440	300	**480**	650	250	**360**	600	330	**530**	710
	5	–	–	–	400	**660**	850	320	**530**	680	500	**720**	1000	400	**650**	875	550	**800**	1100
	6	–	–	–	350	**500**	750	280	**400**	600	400	**600**	900	350	**500**	750	440	**660**	990
M	1	200	**300**	400	450	**700**	850	300	**550**	800	–	–	–	–	–	–	–	–	–
	2	150	**250**	350	400	**650**	800	300	**500**	800	–	–	–	–	–	–	–	–	–
	3	120	**220**	320	400	**600**	800	300	**450**	700	–	–	–	–	–	–	–	–	–
K	1	100	**250**	400	400	**600**	800	320	**480**	640	560	**800**	1440	455	**650**	1170	700	**1000**	1800
	2	75	**225**	350	300	**500**	700	240	**400**	560	400	**640**	1120	325	**520**	910	500	**800**	1400
	3	65	**190**	300	200	**350**	500	160	**280**	400	400	**560**	880	325	**455**	715	500	**700**	1100
N	1–2	500	**1200**	2000	500	**1800**	3200	400	**1440**	2560	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	4	400	**900**	1400	400	**1200**	2000	320	**960**	1600	–	–	–	–	–	–	–	–	–
	5	150	**300**	500	300	**550**	800	240	**440**	640	–	–	–	–	–	–	–	–	–
	6	120	**250**	500	400	**700**	1000	320	**560**	800	–	–	–	–	–	–	–	–	–
S	1	25	**100**	250	50	**180**	450	25	**125**	200	–	–	–	–	–	–	–	–	–
	2	25	**110**	250	50	**195**	450	25	**100**	250	–	–	–	–	–	–	–	–	–
	3	25	**125**	250	50	**225**	450	50	**125**	250	–	–	–	–	–	–	–	–	–
	4	25	**150**	250	50	**225**	550	25	**175**	350	–	–	–	–	–	–	–	–	–
H	1	–	–	–	100	**150**	200	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	50	**100**	150	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

Recommended Starting Speeds [m/min]

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

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

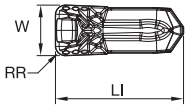


● first choice
○ alternate choice

		KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313
P		●	●	●	●	○	
M		●	●				○
K		○	○	○	○	●	○
N		●	○				○
S		●	●				●
H		○					

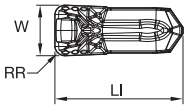
GUP Precision Molded • Metric

catalog number	seat size	W mm	W in	W tol ± mm	W tol ± in	RR mm	RR in	LI mm	LI in	KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313
EG0212M02U02GUP	2	2,125	.084	0,050	.002	0,20	.008	8,97	.353	●	●	●	●	–	–
EG0251M02U02GUP	2	2,511	.099	0,050	.002	0,20	.008	8,97	.353	●	●	●	●	–	–
EG0312M03U02GUP	3	3,125	.123	0,075	.003	0,20	.008	9,60	.378	●	●	●	–	–	–
EG0312M03U04GUP	3	3,125	.123	0,075	.003	0,40	.016	9,60	.378	●	●	●	●	–	–
EG0412M04U04GUP	4	4,125	.162	0,075	.003	0,40	.016	10,19	.401	●	●	●	●	–	–
EG0412M04U08GUP	4	4,125	.162	0,075	.003	0,80	.031	10,19	.401	●	●	●	●	–	–
EG0512M05U04GUP	5	5,125	.202	0,075	.003	0,40	.016	12,25	.482	●	●	●	●	–	–
EG0512M05U08GUP	5	5,125	.202	0,075	.003	0,80	.031	12,25	.482	●	●	●	●	–	–
EG0612M06U04GUP	6	6,125	.241	0,075	.003	0,40	.016	14,60	.575	●	●	●	●	–	–
EG0612M06U08GUP	6	6,125	.241	0,075	.003	0,80	.031	14,60	.574	●	●	●	●	–	–
EG0712M06U08GUP	6	7,125	.281	0,075	.003	0,80	.031	14,60	.574	●	●	●	●	–	–
EG0812M08U08GUP	8	8,125	.320	0,075	.003	0,80	.031	17,47	.688	●	●	●	●	–	–
EG0812M08U12GUP	8	8,125	.320	0,075	.003	1,18	.046	17,45	.687	●	●	●	●	–	–
EG1012M10U12GUP	10	10,125	.399	0,075	.003	1,20	.047	20,80	.817	●	●	●	●	–	–



GUP Precision Ground • Metric

catalog number	seat size	W mm	W in	W tol ± mm	W tol ± in	RR mm	RR in	LI mm	LI in	KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313
EG0200M02P02GUP	2	2,000	.079	0,025	.001	0,20	.008	8,80	.347	●	●	–	–	–	●
EG0300M03P02GUP	3	3,000	.118	0,025	.001	0,20	.008	9,40	.372	●	●	–	–	–	●
EG0300M03P04GUP	3	3,000	.118	0,025	.001	0,40	.016	9,60	.376	●	●	–	–	–	●
EG0400M04P04GUP	4	4,000	.157	0,025	.001	0,40	.016	10,10	.399	●	●	–	–	–	●
EG0400M04P08GUP	4	4,000	.158	0,025	.001	0,80	.032	10,10	.399	●	●	–	–	–	●
EG0500M05P04GUP	5	5,000	.197	0,025	.001	0,40	.016	12,20	.480	●	●	–	–	–	●
EG0500M05P08GUP	5	5,000	.197	0,025	.001	0,80	.032	12,20	.480	●	●	–	–	–	●
EG0600M06P04GUP	6	6,000	.236	0,025	.001	0,40	.016	14,50	.572	●	●	–	–	–	●
EG0600M06P08GUP	6	6,000	.236	0,025	.001	0,80	.031	14,50	.572	●	●	–	–	–	●
EG0700M06P08GUP	6	7,000	.276	0,025	.001	0,80	.031	14,50	.572	●	●	–	–	–	●
EG0800M08P08GUP	8	8,000	.315	0,025	.001	0,80	.031	17,40	.685	●	●	–	–	–	●
EG0800M08P12GUP	8	8,000	.350	0,025	.001	1,20	.047	17,40	.685	●	●	–	–	–	●
EG1000M10P12GUP	10	10,000	.394	0,025	.001	1,20	.047	20,70	.815	●	●	–	–	–	●

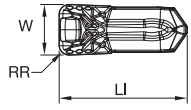


● first choice
○ alternate choice

		KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313
P		●	●	●	●	○	
M		●	●				○
K		○	○	○	○	●	○
N		●	○				○
S		●	●				●
H		○					

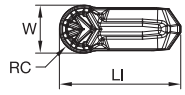
GUP Precision Molded • Inch

catalog number	seat size	W mm	W in	W tol ± mm	W tol ± in	RR mm	RR in	LI mm	LI in	KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313
EG130I03U05GUP	3	3,301	.130	0,075	.003	0,20	.008	9,60	.378	●	●	●	●	–	–
EG130I03U1GUP	3	3,301	.130	0,075	.003	0,40	.016	9,60	.378	●	●	●	●	–	–
EG192I04U1GUP	4	4,877	.192	0,075	.003	0,40	.016	10,19	.401	●	●	●	●	–	–
EG192I04U2GUP	4	4,877	.192	0,075	.003	0,79	.031	10,19	.401	●	●	●	●	–	–
EG255I06U1GUP	6	6,478	.255	0,075	.003	0,40	.016	14,58	.574	●	●	●	●	–	–
EG255I06U2GUP	6	6,478	.255	0,075	.003	0,80	.031	14,58	.574	●	●	●	●	–	–
EG317I08U3GUP	8	8,051	.317	0,075	.003	1,19	.047	17,46	.687	●	●	●	●	–	–
EG380I10U3GUP	10	9,651	.380	0,075	.003	1,19	.047	20,80	.817	●	●	●	●	–	–



GUP Precision Ground • Inch

catalog number	seat size	W mm	W in	W tol ± mm	W tol ± in	RR mm	RR in	LI mm	LI in	KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313
EG063I1FP05GUP	1F	1,600	.063	0,025	.001	0,20	.008	9,00	.353	●	●	–	–	–	●
EG094I02P05GUP	2	2,388	.094	0,025	.001	0,20	.008	8,90	.351	●	●	–	–	–	●
EG125I03P05GUP	3	3,175	.125	0,025	.001	0,20	.008	9,40	.371	●	●	–	–	–	●
EG125I03P1GUP	3	3,175	.125	0,025	.001	0,40	.016	9,40	.372	●	●	–	–	–	●
EG187I04P1GUP	4	4,760	.188	0,025	.001	0,40	.016	10,10	.399	●	●	–	–	–	●
EG187I04P2GUP	4	4,762	.188	0,025	.001	0,79	.031	10,10	.399	●	●	–	–	–	●
EG250I06P1GUP	6	6,350	.250	0,025	.001	0,40	.016	14,50	.572	●	●	–	–	–	●
EG250I06P2GUP	6	6,350	.250	0,025	.001	0,80	.031	14,50	.572	●	●	–	–	–	●
EG312I08P3GUP	8	7,920	.312	0,025	.001	1,20	.047	17,40	.685	●	●	–	–	–	●
EG375I10P3GUP	10	9,525	.375	0,025	.001	1,20	.047	20,70	.815	●	●	–	–	–	●

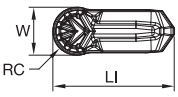



● first choice
○ alternate choice

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

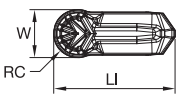
GUP Full Radius Precision Molded • Metric

catalog number	seat size	W mm	W in	W tol ± mm	W tol ± in	RC mm	RC in	LI mm	LI in	KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313
ER0312M03U00GUP	3	3,125	.123	0,075	.003	1,560	.06	9,60	.378	●	●	●	●	–	–
ER0412M04U00GUP	4	4,125	.162	0,075	.003	2,060	.08	10,20	.401	●	●	●	●	–	–
ER0512M05U00GUP	5	5,125	.202	0,075	.003	2,560	.10	12,20	.482	●	●	●	●	–	–
ER0612M06U00GUP	6	6,125	.241	0,075	.003	3,060	.12	14,60	.575	●	●	●	●	–	–
ER0812M08U00GUP	8	8,125	.320	0,075	.003	4,060	.16	17,50	.688	●	●	●	●	–	–

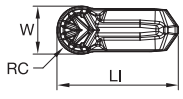
GUP Full Radius Precision Ground • Metric

catalog number	seat size	W mm	W in	W tol ± mm	W tol ± in	RC mm	RC in	LI mm	LI in	KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313
ER0300M03P00GUP	3	3,000	.118	0,025	.001	1,500	.06	9,50	.376	●	●	–	–	–	●
ER0400M04P00GUP	4	4,000	.157	0,025	.001	2,000	.08	10,10	.399	●	●	–	–	–	●
ER0500M05P00GUP	5	5,000	.197	0,025	.001	2,500	.10	12,20	.480	●	●	–	–	–	●
ER0600M06P00GUP	6	6,000	.236	0,025	.001	3,000	.12	14,50	.572	●	●	–	–	–	●
ER0800M08P00GUP	8	8,000	.315	0,025	.001	4,000	.16	17,40	.685	●	●	–	–	–	●

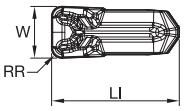
GUP Full Radius Precision Molded • Inch

catalog number	seat size	W mm	W in	W tol ± mm	W tol ± in	RC mm	RC in	LI mm	LI in	KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313
ER130I03U00GUP	3	3,302	.130	0,075	.003	1,650	.07	9,60	.378	●	●	●	●	–	–
ER192I04U00GUP	4	4,878	.192	0,075	.003	2,440	.10	10,20	.401	●	●	●	●	–	–
ER255I06U00GUP	6	6,478	.255	0,075	.003	3,240	.13	14,60	.575	●	●	●	●	–	–
ER317I08U00GUP	8	8,052	.317	0,075	.003	4,030	.16	17,50	.688	●	●	●	●	–	–

GUP Full Radius Precision Ground • Inch

catalog number	seat size	W mm	W in	W tol ± mm	W tol ± in	RC mm	RC in	LI mm	LI in	KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313
ER125I03P00GUP	3	3,175	.125	0,025	.001	1,590	.06	9,50	.376	●	●	–	–	–	●
ER187I04P00GUP	4	4,762	.187	0,025	.001	2,380	.09	10,10	.399	●	●	–	–	–	●
ER250I06P00GUP	6	6,350	.250	0,025	.001	3,170	.13	14,50	.572	●	●	–	–	–	●
	8	7,920	.312	0,025	.001	3,960	.16	17,40	.685	●	●	–	–	–	●

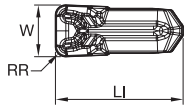


● first choice
○ alternate choice

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

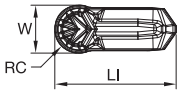
GUN Precision Molded • Metric

catalog number	seat size	W mm	W in	W tol ± mm	W tol ± in	RC mm	RC in	LI mm	LI in	KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313
EG0212M02U02GUN	2	2,125	.084	0,050	.002	0,20	.008	8,97	.353	●	●	●	●	–	–
EG0251M02U02GUN	2	2,510	.099	0,050	.002	0,20	.008	8,97	.353	●	●	●	●	–	–
EG0312M03U02GUN	3	3,125	.123	0,075	.003	0,20	.008	9,60	.378	●	●	●	●	–	–
EG0312M03U04GUN	3	3,125	.123	0,075	.003	0,40	.016	9,60	.378	●	●	●	●	–	–
EG0412M04U04GUN	4	4,125	.162	0,075	.003	0,40	.016	10,19	.401	●	●	●	●	–	–
EG0412M04U08GUN	4	4,125	.162	0,075	.003	0,80	.031	10,19	.401	●	●	●	●	–	–
EG0512M05U04GUN	5	5,125	.202	0,075	.003	0,40	.016	12,20	.481	●	●	●	●	–	–
EG0512M05U08GUN	5	5,125	.202	0,075	.003	0,80	.031	12,20	.481	●	●	●	●	–	–
EG0612M06U04GUN	6	6,125	.241	0,075	.003	0,40	.016	14,60	.575	●	●	●	–	–	–
EG0612M06U08GUN	6	6,125	.241	0,075	.003	0,80	.031	14,60	.574	●	●	–	●	–	–
EG0812M08U08GUN	8	8,125	.320	0,075	.003	0,80	.031	17,50	.687	●	●	●	●	–	–
EG0812M08U12GUN	8	8,125	.320	0,075	.003	1,20	.047	17,50	.687	●	●	●	●	–	–
EG1012M10U12GUN	10	10,125	.399	0,075	.003	1,20	.047	20,80	.817	●	●	●	●	–	–



GUN Precision Molded • Inch

catalog number	seat size	W mm	W in	W tol ± mm	W tol ± in	RR mm	RR in	LI mm	LI in	KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313
EG063I1FU05GUN	1F	1,600	.063	0,050	.002	0,20	.008	9,00	.355	●	●	●	●	–	–
EG130I03U05GUN	3	3,302	.130	0,075	.003	0,20	.008	9,60	.378	●	●	●	●	–	–
EG130I03U1GUN	3	3,302	.130	0,075	.003	0,40	.016	9,60	.378	●	●	●	●	–	–
EG192I04U1GUN	4	4,877	.192	0,075	.003	0,40	.016	10,19	.401	●	●	●	●	–	–
EG192I04U2GUN	4	4,878	.192	0,075	.003	0,79	.031	10,19	.401	●	●	●	●	–	–
EG255I06U1GUN	6	6,477	.255	0,075	.003	0,40	.016	14,58	.574	●	●	●	●	–	–
EG255I06U2GUN	6	6,477	.255	0,075	.003	0,80	.031	14,58	.574	●	●	●	●	–	–
EG317I08U3GUN	8	8,052	.317	0,075	.003	1,19	.047	17,46	.687	●	●	●	●	–	–
EG380I10U3GUN	10	9,651	.380	0,075	.003	1,20	.047	20,80	.817	●	●	●	●	–	–

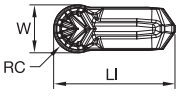


● first choice
○ alternate choice

		KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313
P		●	●	●	●	○	
M		●	●				○
K		○	○	○	○	●	○
N		●	○				○
S		●	●				●
H		○					

GUN Full Radius Precision Molded • Metric

catalog number	seat size	W mm	W in	W tol ± mm	W tol ± in	RC mm	RC in	LI mm	LI in	KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313
ER0312M03U00GUN	3	3,125	.123	0,075	.003	1,560	.06	9,60	.378	●	●	●	●	–	–
ER0412M04U00GUN	4	4,125	.162	0,075	.003	2,060	.08	10,20	.401	●	●	●	●	–	–
ER0512M05U00GUN	5	5,125	.202	0,075	.003	2,560	.10	12,20	.482	●	●	●	●	–	–
ER0612M06U00GUN	6	6,125	.241	0,075	.003	3,060	.12	14,60	.575	●	●	●	●	–	–
ER0812M08U00GUN	8	8,125	.320	0,075	.003	4,060	.16	17,47	.688	●	●	●	●	–	–



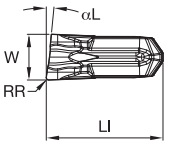
GUN Full Radius Precision Molded • Inch

catalog number	seat size	W mm	W in	W tol ± mm	W tol ± in	RR mm	RR in	LI mm	LI in	KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313
ER130I03U00GUN	3	3,302	.130	0,075	.003	1,650	.07	9,60	.378	●	●	●	●	–	–
ER192I04U00GUN	4	4,873	.192	0,075	.003	2,440	.10	10,20	.401	●	●	●	●	–	–
ER255I06U00GUN	6	6,473	.255	0,075	.003	3,240	.13	14,60	.575	●	●	●	●	–	–
ER317I08U00GUN	8	8,052	.317	0,075	.003	4,030	.16	17,50	.688	●	●	●	●	–	–

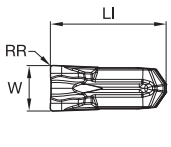

Left Hand


Neutral

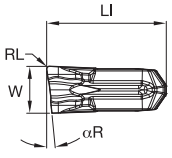

Right Hand



Left Hand



Neutral



Right Hand

● first choice
○ alternate choice

		KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313
P		●	●	●	●	○	
M		●	●				○
K		○	○	○	○	●	○
N		●	○				○
S		●	●				●
H		○					

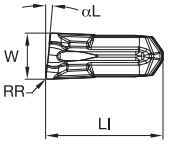
CF Precision Molded • Metric

catalog number	seat size	W mm	W in	W tol ± mm	W tol ± in	LI mm	LI in	αR	αL	RR mm	RR in	RL mm	RL in	KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313
EC014M1BL06CF01	1B	1,400	.055	0,050	.002	9,00	.355	–	6	0,15	.006	–	–	–	●	–	–	–	–
EC014M1BN00CF01	1B	1,400	.055	0,050	.002	9,00	.355	–	–	0,15	.006	0,15	.006	–	●	–	–	–	–
EC014M1BR06CF01	1B	1,400	.055	0,050	.003	9,00	.355	6	–	–	–	0,15	.006	–	●	–	–	–	–
EC020M02L06CF02	2	2,000	.079	0,050	.002	8,97	.353	–	6	0,20	.008	–	–	–	●	–	–	–	–
EC020M02N00CF02	2	2,000	.079	0,050	.002	8,97	.353	–	–	0,20	.008	0,20	.008	–	●	–	–	–	–
EC020M02R06CF02	2	2,000	.079	0,050	.002	8,97	.353	6	–	–	–	0,20	.008	–	●	–	–	–	–
EC030M03L06CF02	3	3,000	.118	0,075	.003	9,60	.378	–	6	0,20	.008	–	–	–	●	–	–	–	–
EC030M03N00CF02	3	3,000	.118	0,075	.003	9,60	.378	–	–	0,20	.008	0,20	.008	–	●	–	–	–	–
EC030M03R06CF02	3	3,000	.118	0,075	.003	9,60	.378	6	–	–	–	0,20	.008	–	●	–	–	–	–
EC040M04L06CF02	4	4,000	.157	0,075	.003	10,19	.401	–	6	0,20	.008	–	–	–	●	–	–	–	–
EC040M04N00CF02	4	4,000	.158	0,075	.003	10,19	.401	–	–	0,20	.008	0,20	.008	–	●	–	–	–	–
EC040M04R06CF02	4	4,000	.158	0,075	.003	10,19	.401	6	–	–	–	0,20	.008	–	●	–	–	–	–
EC050M05N00CF03	5	5,000	.197	0,075	.003	12,20	.482	–	–	0,30	.012	0,30	.012	–	●	–	–	–	–

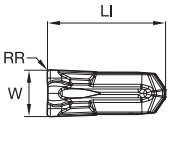

Left Hand


Neutral

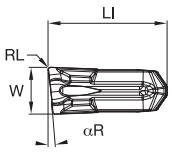

Right Hand



Left Hand



Neutral



Right Hand

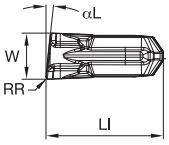
CL Precision Molded • Metric

catalog number	seat size	W mm	W in	W tol ± mm	W tol ± in	LI mm	LI in	αR	αL	RR mm	RR in	RL mm	RL in	KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313
EC014M1BL06CL01	1B	1,400	.055	0,050	.002	9,00	.355	–	6	0,15	.006	–	–	–	●	–	–	–	–
EC014M1BN00CL01	1B	1,400	.055	0,050	.002	9,00	.355	–	–	0,15	.006	0,15	.006	–	●	–	–	–	–
EC014M1BR06CL01	1B	1,400	.055	0,050	.002	9,00	.355	6	–	–	–	0,15	.006	–	●	–	–	–	–
EC020M02L06CL02	2	2,000	.079	0,050	.002	8,96	.353	–	6	0,20	.008	–	–	–	●	–	–	–	–
EC020M02N00CL02	2	2,000	.079	0,050	.002	8,97	.353	–	–	0,20	.008	0,20	.008	–	●	–	–	–	–
EC020M02R06CL02	2	2,000	.079	0,050	.002	8,96	.353	6	–	–	–	0,20	.005	–	●	–	–	–	–
EC030M03L06CL02	3	3,000	.118	0,075	.003	9,59	.378	–	6	0,20	.008	–	–	–	●	–	–	–	–
EC030M03N00CL02	3	3,000	.118	0,075	.003	9,60	.378	–	–	0,20	.008	0,20	.008	–	●	–	–	–	–
EC030M03R06CL02	3	3,000	.118	0,075	.003	9,59	.378	6	–	–	–	0,20	.008	–	●	–	–	–	–
EC040M04L06CL02	4	4,000	.158	0,075	.003	10,19	.401	–	6	0,20	.008	–	–	–	●	–	–	–	–
EC040M04N00CL02	4	4,000	.157	0,075	.003	10,20	.401	–	–	0,20	.008	0,20	.008	–	●	–	–	–	–
EC040M04R06CL02	4	4,000	.158	0,075	.003	10,19	.401	6	–	–	–	0,20	.008	–	●	–	–	–	–

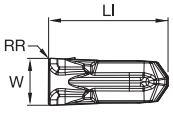

Left Hand


Neutral

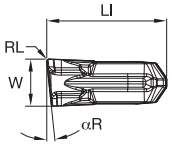

Right Hand



Left Hand



Neutral



Right Hand

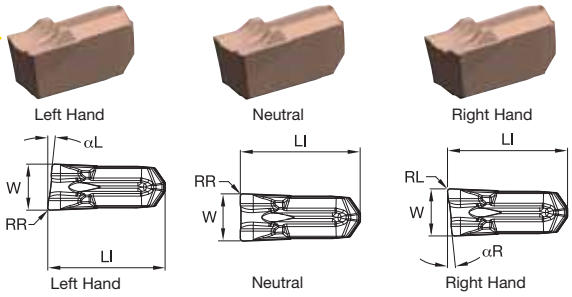
● first choice
○ alternate choice

		KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313
P		●	●	●	●	○	
M		●	●				○
K		○	○	○	○	●	○
N		●	○				○
S		●	●				●
H		○					

CM Precision Molded • Metric

catalog number	seat size	W mm	W in	W tol ± mm	W tol ± in	LI mm	LI in	αR	αL	RR mm	RR in	RL mm	RL in	KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313
EC014M1BN00CM01	1B	1,400	.055	0,050	.002	9,00	.355	–	–	0,15	.006	0,15	.006	–	●	–	–	–	–
EC014M1BL06CM01	1B	1,400	.055	0,050	.002	9,00	.355	–	6	0,20	.008	–	–	–	●	–	–	–	–
EC014M1BR06CM01	1B	1,400	.055	0,050	.002	9,00	.355	6	–	–	–	0,20	.008	–	●	–	–	–	–
EC020M02N00CM02	2	2,000	.079	0,050	.002	8,98	.353	–	–	0,20	.008	0,20	.008	–	●	–	–	–	–
EC020M02L06CM02	2	2,000	.079	0,050	.002	9,00	.353	–	6	0,20	.008	–	–	–	●	–	–	–	–
EC020M02R06CM02	2	2,000	.079	0,050	.002	9,00	.353	6	–	–	–	0,20	.008	–	●	–	–	–	–
EC030M03L06CM02	3	3,000	.118	0,075	.003	9,60	.378	–	6	0,20	.008	–	–	–	●	–	–	–	–
EC030M03N00CM02	3	3,000	.118	0,075	.003	9,60	.378	–	–	0,20	.008	0,20	.008	–	●	–	–	–	–
EC030M03R06CM02	3	3,000	.118	0,075	.003	9,60	.378	6	–	–	–	0,20	.008	–	●	–	–	–	–
EC040M04L06CM02	4	4,000	.157	0,075	.003	10,20	.401	–	6	0,20	.008	–	–	–	●	–	–	–	–
EC040M04N00CM02	4	4,000	.158	0,075	.003	10,20	.402	–	–	0,20	.008	0,20	.008	–	●	–	–	–	–
EC040M04R06CM02	4	4,000	.157	0,075	.003	10,20	.401	6	–	–	–	0,20	.008	–	●	–	–	–	–
EC050M05N00CM03	5	5,000	.197	0,075	.003	12,20	.482	–	–	0,30	.012	0,30	.012	–	●	–	–	–	–
EC060M06N00CM03	6	6,000	.236	0,075	.003	14,59	.574	–	–	0,30	.012	0,30	.012	–	●	–	–	–	–
EC070M06N00CM04	6	7,000	.276	0,075	.003	14,60	.574	–	–	0,40	.016	0,40	.016	–	●	–	–	–	–
EC080M08N00CM04	8	8,000	.315	0,075	.003	17,50	.688	–	–	0,40	.016	0,40	.016	–	●	–	–	–	–

Turning



● first choice
○ alternate choice

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

CR Precision Molded • Metric

catalog number	seat size	W mm	W in	W tol ± mm	W tol ± in	LI mm	LI in	αR	αL	RR mm	RR in	RL mm	RL in	KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313
EC020M02N00CR02	2	2,000	.079	0,050	.002	8,98	.353	–	–	0,20	.008	0,20	.008	–	●	–	–	–	–
EC020M02L06CR02	2	2,000	.079	0,050	.002	9,00	.353	–	6	0,20	.008	–	–	–	●	–	–	–	–
EC020M02R06CR02	2	2,000	.079	0,050	.002	9,00	.353	6	–	–	–	0,20	.008	–	●	–	–	–	–
EC030M03L06CR02	3	3,000	.118	0,075	.003	9,60	.378	–	6	0,20	.008	–	–	–	●	–	–	–	–
EC030M03N00CR02	3	3,000	.118	0,075	.003	9,60	.378	–	–	0,20	.008	0,20	.008	–	●	–	–	–	–
EC030M03R06CR02	3	3,000	.118	0,075	.003	9,60	.378	6	–	–	–	0,20	.008	–	●	–	–	–	–
EC040M04L06CR02	4	4,000	.157	0,075	.003	10,20	.402	–	6	0,20	.008	–	–	–	●	–	–	–	–
EC040M04N00CR02	4	4,000	.158	0,075	.003	10,20	.402	–	–	0,20	.008	0,20	.008	–	●	–	–	–	–
EC040M04R06CR02	4	4,000	.157	0,075	.003	10,20	.402	6	–	–	–	0,20	.008	–	●	–	–	–	–
EC050M05N00CR03	5	5,000	.197	0,075	.003	12,25	.482	–	–	0,30	.012	0,30	.012	–	●	–	–	–	–
EC060M06N00CR03	6	6,000	.236	0,075	.003	14,59	.574	–	–	0,30	.012	0,30	.012	–	●	–	–	–	–
EC060M06L06CR04	6	6,000	.236	0,075	.003	14,59	.574	–	6	0,40	.016	–	–	–	●	–	–	–	–
EC060M06R06CR04	6	6,000	.236	0,075	.003	14,59	.574	6	–	–	–	0,40	.016	–	●	–	–	–	–
EC070M06N00CR04	6	7,000	.276	0,075	.003	14,60	.574	–	–	0,40	.016	0,40	.016	–	●	–	–	–	–
EC080M08L06CR04	8	8,000	.315	0,075	.003	17,50	.687	–	6	0,40	.016	–	–	–	●	–	–	–	–
EC080M08N00CR04	8	8,000	.315	0,075	.003	17,50	.687	–	–	0,40	.016	0,40	.016	–	●	–	–	–	–
EC080M08R06CR04	8	8,000	.315	0,075	.003	17,50	.687	6	–	–	–	0,40	.016	–	●	–	–	–	–

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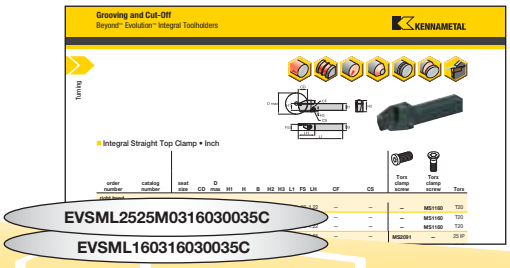
How Do Catalog Numbers Work?

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



Metric

EV	S	M	L	2525M	03	16	030035	C

Inch

EV	S	M	L	16	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 millimeters	**030** = Minimum diameter in mm **035** = Maximum diameter in mm	**C** = Through the pocket coolant capable

M = Maximum support for specific groove width and straight clearance for unlimited workpiece diameter

A = Face grooving-inboard sweep

B = Face grooving-outboard sweep

Metric = Height x Width in mm letter indicates tool length according to ISO

Inch = Height x Width in 1/16" increments

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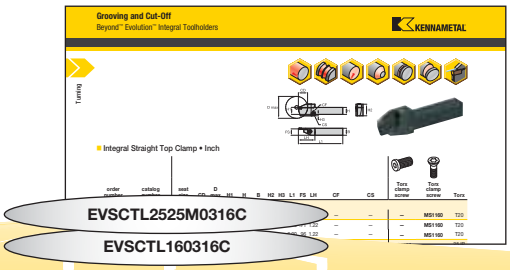

Metric								
EV	**S**	**C**	**T**	**L**	**2525M**	**03**	**16**	**C**
Inch								
EV	**S**	**C**	**T**	**L**	**16**	**03**	**16**	**C**
Family Name	Tool Style	Support Type	Clamping Screw Position	Hand	Shank Size	Seat Size	Max Groove Depth	Coolant
Beyond™ Evolution™	**S** = Straight mount		**T** = Top **F** = Front **S** = Self-clamping	**L** = Left hand **R** = Right hand		**1B** **1F** **02** **03** **04** **05** **06** **08** **10**	in millimeters	**C** = Through the pocket coolant capable

M = Maximum support and straight clearance

E = No steel support for face grooving

Metric = Height x Width in mm letter indicates tool length according to ISO

Inch = Height x Width in 1/16" increments

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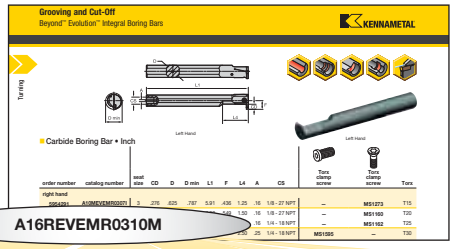

A	16	R	EV	E	M	R	03	10	M
Steel Bar with Coolant	Bar Diameter	Bar Length	Platform	Tool Type	Support Type	Hand of Tool	Insert Seat Size	Max Cutting Depth	Tool Units
Steel boring bar with through coolant capability.			Beyond™ Evolution™	**E** = End mount (90°)	**M** = Maximum support	**R** = Right hand **L**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

Metric = Diameter in mm

Inch = Diameter in 1/16" increments

symbol	mm	inch
K	125	5
M	150	6
Q	180	7
R	200	8
S	250	10
T	300	12

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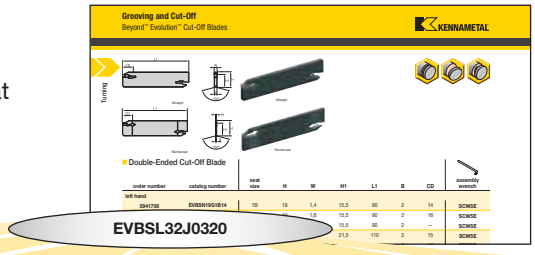

EV	B	S	L	32	J	03	20
Family Name	Tool Style	Support Type	Hand	Blade Height	Overall Length	Seat Size	Max Cutting Depth
Beyond™ Evolution™	**B** = 2 pocket blade	**S** = Standard **C** = Reinforced	**N** = Neutral **L** = Left hand **R** = Right hand	in millimeters	According to ISO **G** = 90mm **J** =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

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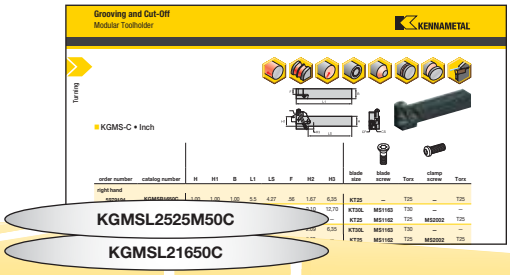

Metric

KGM	S	L	2525M	50	C
Family Name	Tool Style	Hand	Shank Size	Blade Size	Coolant
Grooving Modular System	**S** = Straight mount **E** = End mount (90°)	**L** = Left hand **R** = Right hand	**Metric** = Height x Width in mm letter indicates tool length according to ISO **Inch** = Height x Width in 1/16" increments	**50** **65**	**C** = Through coolant capable

Inch

KGM	S	L	16	50	C
Family Name	Tool Style	Hand	Shank Size	Blade Size	Coolant
Grooving Modular System	**S** = Straight mount **E** = End mount (90°)	**L** = Left hand **R** = Right hand	**Metric** = Height x Width in mm letter indicates tool length according to ISO **Inch** = Height x Width in 1/16" increments	**50** **65**	**C** = Through coolant capable

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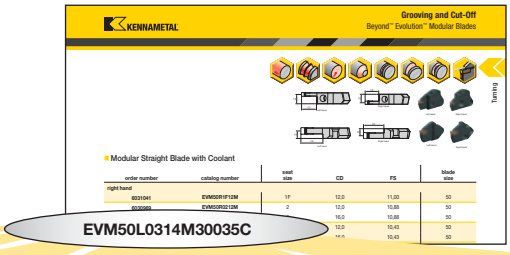

EVM	50	L	03	14	M	30035	C
Family Name	Blade Size	Hand	Seat Size	Max Groove Depth	Support Type	Face Grooving Diameters	Coolant
Beyond™ Evolution™ Modular Blade	**50** **65**	**L** = Left hand **R** = Right hand	**1B** **1F** **02** **03** **04** **05** **06** **08** **10**	in millimeters	**M** = Maximum support for specific groove width and straight clearance for unlimited diameter **A** = Face grooving-inboard sweep **B** = Face grooving-outboard sweep	**030** = Minimum diameter in mm **035** = Maximum diameter in mm	**C** = Through the pocket coolant capable

How Do Catalog Numbers Work?

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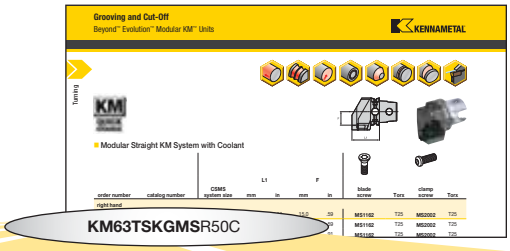
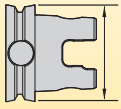
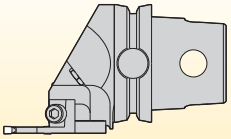
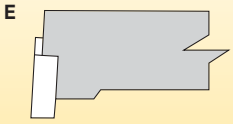
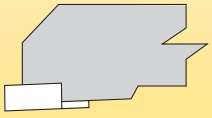


KM	63	TS	KGM	S
KM Quick Change	System Size	Feature	Insert Holding Method	Insert Location
KM **KM4X™** **PSC**	**40** = 40mm **50** = 50mm **63** = 63mm **80** = 80mm **100** = 100mm	**TS** **XMZ**	**KGM** **Beyond™ Evolution™ Modular Grooving**	**E** = End mount **S** = Side mount

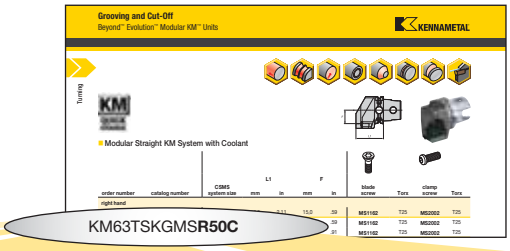








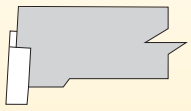
By referencing this easy-to-use guide, you can identify the correct product to meet your needs.



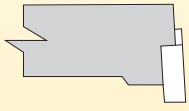
R	50	C	
Hand of Tool	Blade Size	Coolant	Special Features
R = Right hand **L** = Left hand	**50** **60**	**C** = Through the pocket coolant capable	**Y** = Mazak® INTEGREX®

End Mount

R

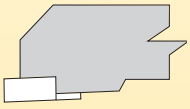


L

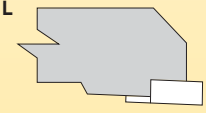


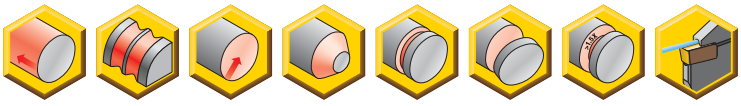
Side Mount

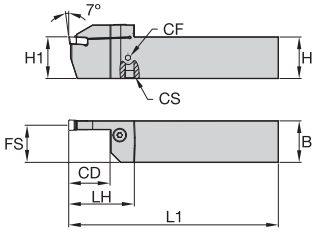
R



L







Integral Straight • Inch

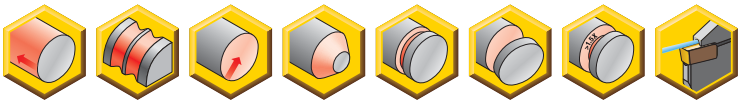
order number	catalog number	seat size	CD	H1	H	B	H2	L1	FS	LH	CF	CS	Torx clamp screw	Torx clamp screw	Torx
right hand															
5956542	EVSMR120216	2	.63	.750	.750	.750	1.03	4.50	.71	1.22	–	–	–	MS1160	T20
5956450	EVSMR160216	2	.63	1.000	1.000	1.000	1.28	6.00	.96	1.22	–	–	–	MS1160	T20
5956541	EVSMR120222	2	.87	.750	.750	.750	1.10	4.50	.71	1.50	–	–	MS2091	–	25 IP
5956449	EVSMR160226	2	1.02	1.000	1.000	1.000	1.35	6.00	.96	1.65	–	–	MS2091	–	25 IP
5939462	EVSMR120316C	3	.63	.750	.750	.750	1.09	4.50	.69	1.46	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	–	T30
5939458	EVSMR160316C	3	.63	1.000	1.000	1.000	1.34	6.00	.94	1.46	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1595	–	T30
5939461	EVSMR120322C	3	.87	.750	.750	.750	1.10	4.50	.69	1.69	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	–	T30
5939457	EVSMR160326C	3	1.02	1.000	1.000	1.000	1.35	6.00	.94	1.85	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1595	–	T30
5939460	EVSMR120416C	4	.63	.750	.750	.750	1.09	4.50	.68	1.46	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	–	T30
5939456	EVSMR160416C	4	.63	1.000	1.000	1.000	1.34	6.00	.93	1.46	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1595	–	T30
5939459	EVSMR120422C	4	.87	.750	.750	.750	1.10	4.50	.68	1.69	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	–	T30
5939455	EVSMR160426C	4	1.02	1.000	1.000	1.000	1.35	6.00	.93	1.85	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1595	–	T30
5939454	EVSMR200426C	4	1.02	1.250	1.250	1.250	1.62	6.00	1.18	1.85	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	–	T30
5939463	EVSMR200432C	4	1.26	1.250	1.250	1.250	1.62	6.00	1.18	2.09	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	–	T30
5955445	EVSMR120516C	5	.63	.750	.750	.750	1.09	4.50	.66	1.46	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	–	T30
5955441	EVSMR160516C	5	.63	1.000	1.000	1.000	1.34	6.00	.91	1.46	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	–	T30
5955444	EVSMR120522C	5	.87	.750	.750	.750	1.10	4.50	.66	1.69	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	–	T30
5955430	EVSMR160526C	5	1.02	1.000	1.000	1.000	1.35	6.00	.91	1.85	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	–	T30
5955446	EVSMR200526C	5	1.02	1.250	1.250	1.250	1.62	6.00	1.16	1.85	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	–	T30
5955447	EVSMR200532C	5	1.26	1.250	1.250	1.250	1.62	6.00	1.16	2.09	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	–	T30
5955443	EVSMR120616C	6	.63	.750	.750	.750	1.09	4.50	.64	1.46	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	–	T30
5955429	EVSMR160616C	6	.63	1.000	1.000	1.000	1.34	6.00	.89	1.46	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	–	T30
5955442	EVSMR120622C	6	.87	.750	.750	.750	1.10	4.50	.64	1.69	1/16 - 27 NPTF	1/16 - 27 NPTF	MS1595	–	T30
5955428	EVSMR160626C	6	1.02	1.000	1.000	1.000	1.35	6.00	.89	1.85	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	–	T30
5955448	EVSMR200626C	6	1.02	1.250	1.250	1.250	1.62	6.00	1.14	1.85	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1970	–	T30
5955449	EVSMR200632C	6	1.26	1.250	1.250	1.250	1.66	6.00	1.14	2.17	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	–	T45
5955450	EVSMR240640C	6	1.58	1.500	1.500	1.500	1.93	7.00	1.39	2.48	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	–	T45
5955427	EVSMR160826C	8	1.02	1.000	1.000	1.000	1.39	6.00	.86	1.93	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	–	T45
5955451	EVSMR200826C	8	1.02	1.250	1.250	1.250	1.66	6.00	1.11	1.93	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	–	T45
5955452	EVSMR200832C	8	1.26	1.250	1.250	1.250	1.66	6.00	1.11	2.17	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	–	T45
5955453	EVSMR240840C	8	1.58	1.500	1.500	1.500	1.93	7.00	1.36	2.48	1/8 - 27 NPTF	1/8 - 27 NPTF	MS1490	–	T45

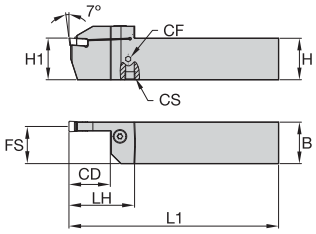
(continued)

(Integral Straight • Inch — continued)

order number	catalog number	seat size	CD	H1	H	B	H2	L1	FS	LH	CF	CS	 Torx clamp screw	 Torx clamp screw	Torx
5955454	**EVSMR201032C**	10	1.26	1.250	1.250	1.250	1.69	6.00	1.08	2.17	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1490**	—	T45
5955455	**EVSMR241040C**	10	1.58	1.500	1.500	1.500	1.94	7.00	1.33	2.48	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1490**	—	T45
left hand															
5956543	**EVSML120216**	2	.63	.750	.750	.750	1.03	4.50	.71	1.22	—	—	—	**MS1160**	T20
5956545	**EVSML160216**	2	.63	1.000	1.000	1.000	1.28	6.00	.96	1.22	—	—	—	**MS1160**	T20
5956544	**EVSML120222**	2	.87	.750	.750	.750	1.10	4.50	.71	1.50	—	—	**MS2091**	—	25 IP
5956546	**EVSML160226**	2	1.02	1.000	1.000	1.000	1.35	6.00	.96	1.65	—	—	**MS2091**	—	25 IP
5939464	**EVSML120316C**	3	.63	.750	.750	.750	1.09	4.50	.69	1.46	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS1595**	—	T30
5939466	**EVSML160316C**	3	.63	1.000	1.000	1.000	1.34	6.00	.94	1.46	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1595**	—	T30
5939465	**EVSML120322C**	3	.87	.750	.750	.750	1.10	4.50	.69	1.69	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS1595**	—	T30
5939467	**EVSML160326C**	3	1.02	1.000	1.000	1.000	1.35	6.00	.94	1.85	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1595**	—	T30
5939468	**EVSML120416C**	4	.63	.750	.750	.750	1.09	4.50	.68	1.46	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS1595**	—	T30
5939470	**EVSML160416C**	4	.63	1.000	1.000	1.000	1.34	6.00	.93	1.46	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1595**	—	T30
5939469	**EVSML120422C**	4	.87	.750	.750	.750	1.10	4.50	.68	1.69	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS1595**	—	T30
5939471	**EVSML160426C**	4	1.02	1.000	1.000	1.000	1.35	6.00	.93	1.85	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1595**	—	T30
5939472	**EVSML200426C**	4	1.02	1.250	1.250	1.250	1.62	6.00	1.18	1.85	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1970**	—	T30
5939453	**EVSML200432C**	4	1.26	1.250	1.250	1.250	1.62	6.00	1.18	2.09	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1970**	—	T30
5955456	**EVSML120516C**	5	.63	.750	.750	.750	1.09	4.50	.66	1.46	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS1595**	—	T30
5955459	**EVSML160516C**	5	.63	1.000	1.000	1.000	1.34	6.00	.91	1.46	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1970**	—	T30
5955457	**EVSML120522C**	5	.87	.750	.750	.750	1.10	4.50	.66	1.69	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS1595**	—	T30
5955460	**EVSML160526C**	5	1.02	1.000	1.000	1.000	1.35	6.00	.91	1.85	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1970**	—	T30
5955426	**EVSML200526C**	5	1.02	1.250	1.250	1.250	1.62	6.00	1.16	1.85	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1970**	—	T30
5955461	**EVSML200532C**	5	1.26	1.250	1.250	1.250	1.62	6.00	1.16	2.09	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1970**	—	T30
5955462	**EVSML120616C**	6	.63	.750	.750	.750	1.09	4.50	.64	1.46	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS1595**	—	T30
5955464	**EVSML160616C**	6	.63	1.000	1.000	1.000	1.34	6.00	.89	1.46	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1970**	—	T30
5955463	**EVSML120622C**	6	.87	.750	.750	.750	1.10	4.50	.64	1.69	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS1595**	—	T30
5955465	**EVSML160626C**	6	1.02	1.000	1.000	1.000	1.35	6.00	.89	1.85	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1970**	—	T30
5955466	**EVSML200626C**	6	1.02	1.250	1.250	1.250	1.62	6.00	1.14	1.85	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1970**	—	T30
5955467	**EVSML200632C**	6	1.26	1.250	1.250	1.250	1.66	6.00	1.14	2.17	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1490**	—	T45
5955468	**EVSML240640C**	6	1.58	1.500	1.500	1.500	1.93	7.00	1.39	2.48	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1490**	—	T45
5955469	**EVSML160826C**	8	1.02	1.000	1.000	1.000	1.39	6.00	.86	1.93	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1490**	—	T45
5955470	**EVSML200826C**	8	1.02	1.250	1.250	1.250	1.66	6.00	1.11	1.93	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1490**	—	T45
5955471	**EVSML200832C**	8	1.26	1.250	1.250	1.250	1.66	6.00	1.11	2.17	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1490**	—	T45
5955472	**EVSML240840C**	8	1.58	1.500	1.500	1.500	1.93	7.00	1.36	2.48	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1490**	—	T45
5955473	**EVSML201032C**	10	1.26	1.250	1.250	1.250	1.69	6.00	1.08	2.17	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1490**	—	T45
5955474	**EVSML241040C**	10	1.58	1.500	1.500	1.500	1.94	7.00	1.33	2.48	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1490**	—	T45

screw	screw	torque				wrench	wrench
catalog number	order number	Nm	in. lbs.	thread	socket	catalog 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**





Integral Straight • Metric

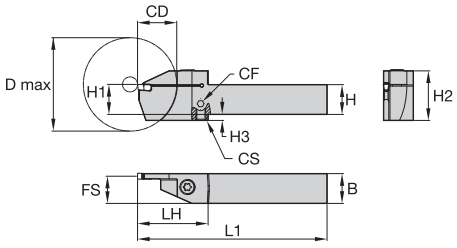
order number	catalog number	seat size	CD	H1	H	B	H2	L1	FS	LH	CF	CS	Torx clamp screw	Torx clamp screw	Torx
right hand															
5953960	**EVSMR2020K0216**	2	16	20	20	20	27	125	19	31	–	–	**–**	**MS1160**	T20
5953958	**EVSMR2525M0216**	2	16	25	25	25	32	150	24	31	–	–	**–**	**MS1160**	T20
5953959	**EVSMR2020K0222**	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	catalog number	seat size	CD	H1	H	B	H2	L1	FS	LH	CF	CS	 Torx clamp screw	 Torx clamp screw	Torx
left hand															
5953956	**EVSML2020K0216**	2	16	20	20	20	27	125	19	31	–	–	**–**	**MS1160**	T20
5953954	**EVSML2525M0216**	2	16	25	25	25	32	150	24	31	–	–	**–**	**MS1160**	T20
5953955	**EVSML2020K0222**	2	22	20	20	20	29	125	19	38	–	–	**MS2091**	**–**	25 IP
5953953	**EVSML2525M0226**	2	26	25	25	25	34	150	24	42	–	–	**MS2091**	**–**	25 IP
5939442	**EVSML2020K0316C**	3	16	20	20	20	29	125	19	37	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS1595**	**–**	T30
5939438	**EVSML2525M0316C**	3	16	25	25	25	34	150	24	37	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1595**	**–**	T30
5939441	**EVSML2020K0322C**	3	22	20	20	20	29	125	19	43	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS1595**	**–**	T30
5939437	**EVSML2525M0326C**	3	26	25	25	25	34	150	24	47	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1595**	**–**	T30
5939440	**EVSML2020K0416C**	4	16	20	20	20	29	125	18	37	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS1595**	**–**	T30
5939436	**EVSML2525M0416C**	4	16	25	25	25	34	150	23	37	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1595**	**–**	T30
5939439	**EVSML2020K0422C**	4	22	20	20	20	29	125	18	43	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS1595**	**–**	T30
5939435	**EVSML2525M0426C**	4	26	25	25	25	34	150	23	47	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1595**	**–**	T30
5939433	**EVSML3232P0426C**	4	26	32	32	32	42	170	30	47	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1970**	**–**	T30
5939432	**EVSML3232P0432C**	4	32	32	32	32	42	170	30	53	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1970**	**–**	T30
5954239	**EVSML2020K0516C**	5	16	20	20	20	29	125	18	37	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS1595**	**–**	T30
5954235	**EVSML2525M0516C**	5	16	25	25	25	34	150	23	37	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1970**	**–**	T30
5954238	**EVSML2020K0522C**	5	22	20	20	20	29	125	18	43	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS1595**	**–**	T30
5954234	**EVSML2525M0526C**	5	26	25	25	25	34	150	23	47	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1970**	**–**	T30
5954220	**EVSML3232P0526C**	5	26	32	32	32	42	170	30	47	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1970**	**–**	T30
5954219	**EVSML3232P0532C**	5	32	32	32	32	42	170	30	53	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1970**	**–**	T30
5954237	**EVSML2020K0616C**	6	16	20	20	20	29	125	17	37	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS1595**	**–**	T30
5954233	**EVSML2525M0616C**	6	16	25	25	25	34	150	22	37	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1970**	**–**	T30
5954236	**EVSML2020K0622C**	6	22	20	20	20	29	125	17	43	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS1595**	**–**	T30
5954232	**EVSML2525M0626C**	6	26	25	25	25	34	150	22	47	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1970**	**–**	T30
5954218	**EVSML3232P0626C**	6	26	32	32	32	42	170	29	47	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1970**	**–**	T30
5954217	**EVSML3232P0632C**	6	32	32	32	32	43	170	29	55	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1490**	**–**	T45
5954213	**EVSML4040P0640C**	6	40	40	40	40	51	200	37	63	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1490**	**–**	T45
5954231	**EVSML2525M0826C**	8	26	25	25	25	35	150	21	49	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1490**	**–**	T45
5954216	**EVSML3232P0826C**	8	26	32	32	32	43	170	28	49	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1490**	**–**	T45
5954215	**EVSML3232P0832C**	8	32	32	32	32	43	170	28	55	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1490**	**–**	T45
5954212	**EVSML4040P0840C**	8	40	40	40	40	51	200	36	63	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1490**	**–**	T45
5954214	**EVSML3232P1032C**	10	32	32	32	32	43	170	28	55	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1490**	**–**	T45
5954211	**EVSML4040P1040C**	10	40	40	40	40	51	200	36	63	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1490**	**–**	T45

screw	screw	torque				wrench	wrench
catalog number	order number	Nm	in. lbs.	thread	socket	catalog 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**



Integral Straight Top Clamp • Inch

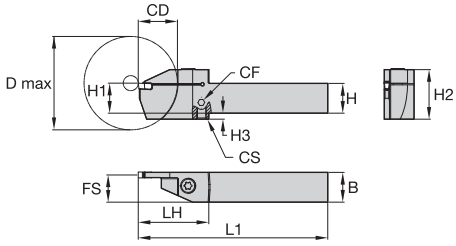
order number	catalog number	seat size	CD	D max	H1	H	B	H2	H3	L1	FS	LH	CF	CS	Torx clamp screw	Torx clamp screw	Torx
right hand																	
5980815	**EVSCTR100216**	2	.63	1.654	.625	.625	.625	.90	—	4.50	.59	1.22	—	—	**—**	**MS1160**	T20
5980818	**EVSCTR120216**	2	.63	1.654	.750	.750	.750	1.03	—	4.50	.71	1.22	—	—	**—**	**MS1160**	T20
5980913	**EVSCTR160216**	2	.63	1.654	1.000	1.000	1.000	1.28	—	6.00	.96	1.22	—	—	**—**	**MS1160**	T20
5980914	**EVSCTR160226**	2	1.02	2.441	1.000	1.000	1.000	1.35	—	6.00	.96	1.65	—	—	**MS2091**	**—**	25 IP
5980816	**EVSCTR100316C**	3	.63	2.047	.625	.625	.625	.92	—	4.50	.57	1.42	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS2091**	**—**	25 IP
5980819	**EVSCTR120316C**	3	.63	2.047	.750	.750	.750	1.09	—	4.50	.69	1.46	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS1595**	**—**	T30
5980915	**EVSCTR160316C**	3	.63	2.441	1.000	1.000	1.000	1.34	—	6.00	.94	1.46	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1595**	**—**	T30
5980820	**EVSCTR120326C**	3	1.02	2.441	.750	.750	.750	1.26	.16	4.50	.69	1.85	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS1595**	**—**	T30
5980916	**EVSCTR160326C**	3	1.02	2.441	1.000	1.000	1.000	1.35	—	6.00	.94	1.85	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1595**	**—**	T30
5980817	**EVSCTR100416C**	4	.63	2.047	.625	.625	.625	.92	—	4.50	.55	1.42	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS2091**	**—**	25 IP
5980911	**EVSCTR120416C**	4	.63	2.047	.750	.750	.750	1.09	—	4.50	.68	1.46	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS1595**	**—**	T30
5980912	**EVSCTR120426C**	4	1.02	2.441	.750	.750	.750	1.26	.16	4.50	.70	1.85	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS1595**	**—**	T30
5980917	**EVSCTR160426C**	4	1.02	2.441	1.000	1.000	1.000	1.35	—	6.00	.92	1.85	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1595**	**—**	T30
5980918	**EVSCTR160432C**	4	1.26	2.520	1.000	1.000	1.000	1.51	.16	6.00	.92	2.09	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1595**	**—**	T30
5980932	**EVSCTR200432C**	4	1.26	2.520	1.250	1.250	1.250	1.62	—	6.00	1.25	2.09	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1970**	**—**	T30
5980919	**EVSCTR160526C**	5	1.02	2.441	1.000	1.000	1.000	1.35	—	6.00	.91	1.85	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1970**	**—**	T30
5980920	**EVSCTR160532C**	5	1.26	2.441	1.000	1.000	1.000	1.53	.16	6.00	.91	2.09	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1970**	**—**	T30
5980933	**EVSCTR200540C**	5	1.58	3.228	1.250	1.250	1.250	1.82	.16	6.00	1.25	2.48	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1490**	**—**	T45

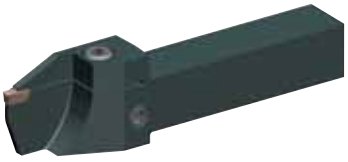
(continued)

(Integral Straight Top Clamp • Inch — continued)


order number	catalog number	seat size	CD	D max	H1	H	B	H2	H3	L1	FS	LH	CF	CS	Torx clamp screw	Torx clamp screw	Torx
left hand																	
5980938	**EVSCTL100216**	2	.63	1.654	.625	.625	.625	.90	—	4.50	.59	1.22	—	—	**—**	**MS1160**	T20
5981011	**EVSCTL120216**	2	.63	1.654	.750	.750	.750	1.03	—	4.50	.71	1.22	—	—	**—**	**MS1160**	T20
5981016	**EVSCTL160216**	2	.63	1.654	1.000	1.000	1.000	1.28	—	6.00	.96	1.22	—	—	**—**	**MS1160**	T20
5981017	**EVSCTL160226**	2	1.02	2.441	1.000	1.000	1.000	1.35	—	6.00	.96	1.65	—	—	**MS2091**	**—**	25 IP
5980939	**EVSCTL100316C**	3	.63	2.047	.625	.625	.625	.92	—	4.50	.57	1.42	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS2091**	**—**	25 IP
5981012	**EVSCTL120316C**	3	.63	2.047	.750	.750	.750	1.09	—	4.50	.69	1.46	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS1595**	**—**	T30
5981018	**EVSCTL160316C**	3	.63	2.441	1.000	1.000	1.000	1.34	—	6.00	.94	1.46	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1595**	**—**	T30
5981013	**EVSCTL120326C**	3	1.02	2.441	.750	.750	.750	1.26	.16	4.50	.69	1.85	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS1595**	**—**	T30
5981019	**EVSCTL160326C**	3	1.02	2.441	1.000	1.000	1.000	1.35	—	6.00	.94	1.85	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1595**	**—**	T30
5980940	**EVSCTL100416C**	4	.63	2.047	.625	.625	.625	.92	—	4.50	.55	1.42	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS2091**	**—**	25 IP
5981014	**EVSCTL120416C**	4	.63	2.047	.750	.750	.750	1.09	—	4.50	.68	1.46	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS1595**	**—**	T30
5981015	**EVSCTL120426C**	4	1.02	2.441	.750	.750	.750	1.26	.16	4.50	.70	1.85	1/16 - 27 NPTF	1/16 - 27 NPTF	**MS1595**	**—**	T30
5981020	**EVSCTL160426C**	4	1.02	2.441	1.000	1.000	1.000	1.35	—	6.00	.92	1.85	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1595**	**—**	T30
5981021	**EVSCTL160432C**	4	1.26	2.520	1.000	1.000	1.000	1.51	.16	6.00	.92	2.09	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1595**	**—**	T30
5981024	**EVSCTL200432C**	4	1.26	2.520	1.250	1.250	1.250	1.62	—	6.00	1.25	2.09	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1970**	**—**	T30
5981022	**EVSCTL160526C**	5	1.02	2.441	1.000	1.000	1.000	1.35	—	6.00	.91	1.85	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1970**	**—**	T30
5981023	**EVSCTL160532C**	5	1.26	2.520	1.000	1.000	1.000	1.53	.16	6.00	.91	2.09	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1970**	**—**	T30
5981025	**EVSCTL200540C**	5	1.58	3.228	1.250	1.250	1.250	1.82	.16	6.00	1.25	2.48	1/8 - 27 NPTF	1/8 - 27 NPTF	**MS1490**	**—**	T45

screw	screw	torque				wrench	wrench
catalog number	order number	Nm	in. lbs.	thread	socket	catalog 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**





Integral Straight Top Clamp • Metric

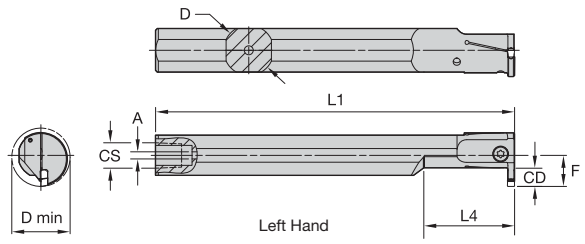
order number	catalog number	seat size	CD	D max	H1	H	B	H2	H3	L1	FS	LH	CF	CS	Torx clamp screw	Torx clamp screw	Torx
right hand																	
5980139	**EVSCTR1616K0216**	2	16	42	16	16	16	23	—	125	15	31	—	—	**—**	**MS1160**	T20
5980762	**EVSCTR2020K0216**	2	16	42	20	20	20	27	—	125	19	31	—	—	**—**	**MS1160**	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

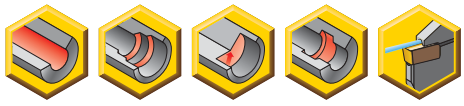
(continued)

(Integral Straight Top Clamp • Metric — continued)

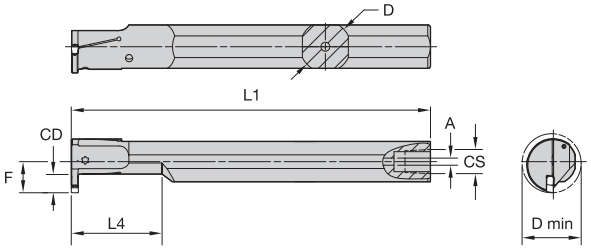
order number	catalog number	seat size	CD	D max	H1	H	B	H2	H3	L1	FS	LH	CF	CS	 Torx clamp screw	 Torx clamp screw	Torx
left hand																	
5980777	**EVSCTL1616K0216**	2	16	42	16	16	16	23	—	125	15	31	—	—	**—**	**MS1160**	T20
5980780	**EVSCTL2020K0216**	2	16	42	20	20	20	27	—	125	19	31	—	—	**—**	**MS1160**	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	screw	torque				wrench	wrench
catalog number	order number	Nm	in. lbs.	thread	socket	catalog 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**





Left Hand



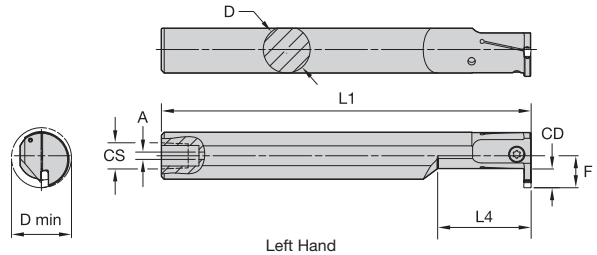
Right Hand

Right Hand

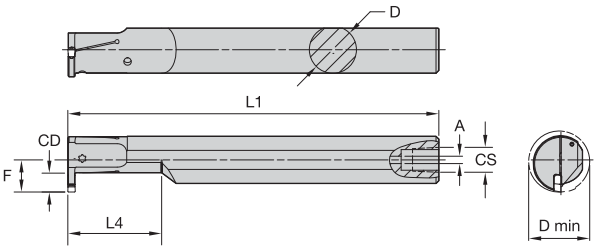
Carbide Boring Bar • Inch

order number	catalog number	seat size	CD	D	D min	L1	F	L4	A	CS	Torx clamp screw	Torx clamp screw	Torx
right hand													
5954291	**A10MEVEMR0307I**	3	.276	.625	.787	5.91	.436	1.25	.16	1/8 - 27 NPT	–	**MS1273**	T15
5954292	**A12QEVEMR0307I**	3	.276	.750	.984	7.09	.549	1.50	.16	1/8 - 27 NPT	–	**MS1160**	T20
5954293	**A16REVEMR0310I**	3	.394	1.000	1.250	7.87	.681	2.00	.16	1/4 - 18 NPT	–	**MS1162**	T25
5954294	**A16REVEMR0410I**	3	.472	1.250	1.500	9.84	.681	2.50	.25	1/4 - 18 NPT	**MS1595**	–	T30
5954295	**A20SEVEMR0312I**	4	.394	1.000	1.250	7.87	.681	2.00	.16	1/4 - 18 NPT	–	**MS1162**	T25
5954296	**A20SEVEMR0412I**	4	.472	1.250	1.500	9.84	.832	2.50	.25	1/4 - 18 NPT	**MS1595**	–	T30
left hand													
5954297	**A10MEVEML0307I**	3	.276	.625	.787	5.91	.436	1.25	.16	1/8 - 27 NPT	–	**MS1273**	T15
5954298	**A12QEVEML0307I**	3	.276	.750	.984	7.09	.549	1.50	.16	1/8 - 27 NPT	–	**MS1160**	T20
5954299	**A16REVEML0310I**	3	.394	1.250	1.250	7.87	.681	2.00	.16	1/4 - 18 NPT	–	**MS1162**	T25
5954301	**A20SEVEML0312I**	3	.472	1.250	1.500	9.84	.832	2.50	.25	1/4 - 18 NPT	**MS1595**	–	T30
5954300	**A16REVEML0410I**	4	.394	1.000	1.250	7.87	.681	2.00	.16	1/4 - 18 NPT	–	**MS1162**	T25
5954302	**A20SEVEML0410I**	4	.472	1.250	1.500	9.84	.832	2.50	.25	1/4 - 18 NPT	**MS1595**	–	T30

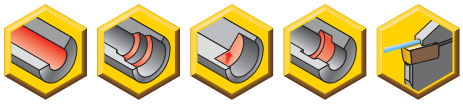
screw	screw	torque				wrench	wrench
catalog number	order number	Nm	in. lbs.	thread	socket	catalog number	order number
MS1160	**1099645**	7	62	M5	T20	**KT20**	**1022703**
MS1162	**1127019**	9	80	M6	T25	**KT25**	**1022725**
MS1163	**1124104**	18	159	M8	T30	**KT30L**	**1099676**
MS1273	**1020977**	4	35.4	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**



Left Hand



Right Hand



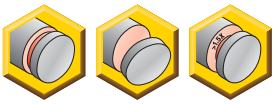

Left Hand

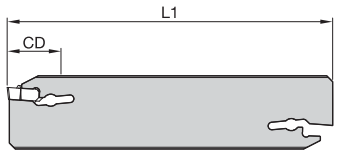

Right Hand

Carbide Boring Bar • Metric

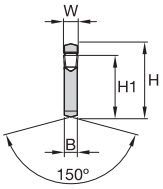
order number	catalog number	seat size	CD	D	D min	L1	F	L4	A	CS	Torx clamp screw	Torx clamp screw	Torx
right hand													
5954259	**A16MEVEMR0307M**	3	7,00	16	20	150	11	40,3	4,00	1/8 - 27 NPT	–	**MS1273**	T15
5954260	**A20QEVEMR0307M**	3	7,00	20	25	180	13	40,3	4,00	1/8 - 27 NPT	–	**MS1160**	T20
5954281	**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
left hand													
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

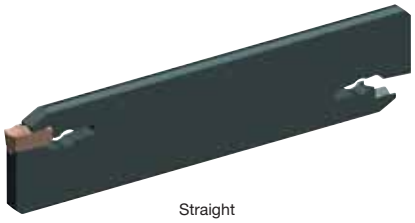
screw	screw	torque				wrench	wrench
catalog number	order number	Nm	in. lbs.	thread	socket	catalog number	order number
MS1160	**1099645**	7	62	M5	T20	**KT20**	**1022703**
MS1162	**1127019**	9	80	M6	T25	**KT25**	**1022725**
MS1163	**1124104**	18	159	M8	T30	**KT30L**	**1099676**
MS1273	**1020977**	4	35.4	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**



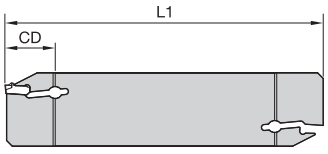


Straight

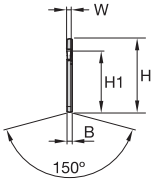


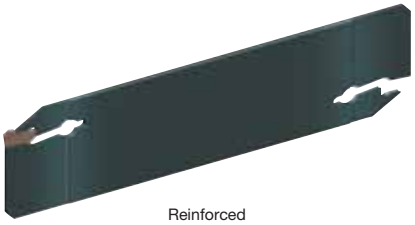


Straight



Reinforced

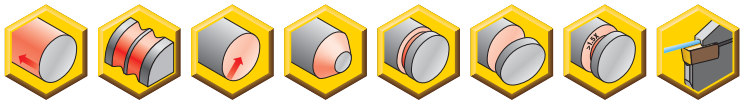


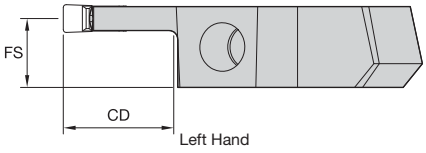


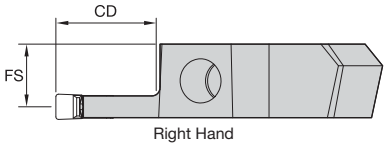
Reinforced

Double-Ended Cut-Off Blade

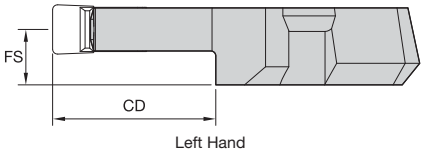
order number	catalog number	seat size	H	W	H1	L1	B	CD	assembly wrench
left hand									
5941706	**EVBSN19G1B14**	1B	19	1,4	15,5	90	2	14	**SCW5E**
5955391	**EVBSN19G1F16**	1F	19	1,6	15,5	90	2	16	**SCW5E**
5941707	**EVBSN19G0220**	2	19	2,0	15,5	90	2	–	**SCW5E**
5941708	**EVBSN26J1B15**	1B	26	1,4	21,5	110	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**

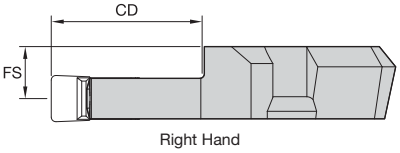


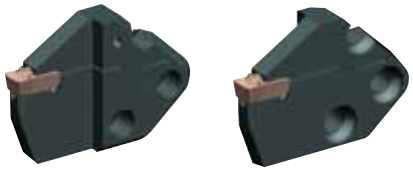




(50 blade size shown)







(65 blade size shown)

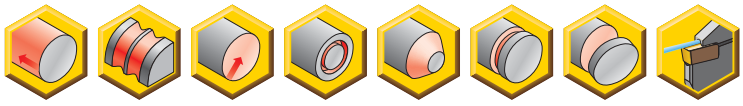
Modular Straight Blade with Coolant

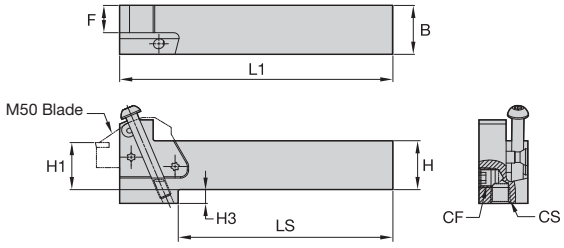
order number	catalog number	seat size	CD	FS	blade size
right hand					
6031041	**EVM50R1F12M**	1F	12,0	11,00	50
6030969	**EVM50R0212M**	2	12,0	10,88	50
5955423	**EVM50R0216MC**	2	16,0	10,88	50
5979200	**EVM50R0312MC**	3	12,0	10,43	50
5979010	**EVM50R0316MC**	3	16,0	10,43	50
5979181	**EVM50R0322MC**	3	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	catalog number	seat size	CD	FS	blade size
left hand					
6031042	**EVM50L1F12M**	1F	12,0	11,00	50
6030970	**EVM50L0212M**	2	12,0	10,88	50
5955424	**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

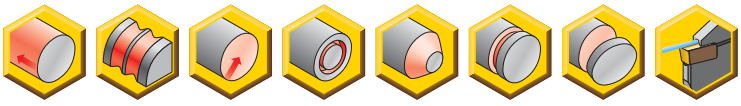


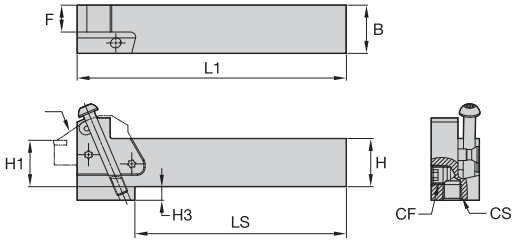


KGMS-C • Metric

order number	catalog number	B	H	H1	L1	F	CS	CF	LS	H2	H3	blade size	blade screw	Torx	clamping screw	Torx
right hand																
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	**–**	–
left hand																
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 71–88 in. lbs. (8–10 Nm).
M65 blade and clamp screw torque equals 159–177 in. lbs. (18–20 Nm).

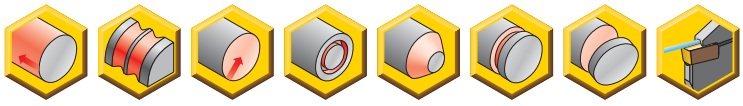


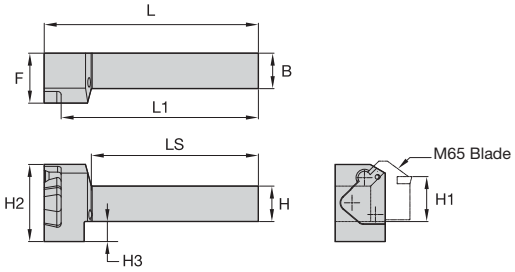


KGMS-C • Inch

order number	catalog number	H	H1	B	L1	LS	F	CS	CF	H2	H3	blade size	blade screw	Torx	clamp screw	Torx
right hand																
5979194	**KGMSR1650C**	1.00	1.00	1.00	5.5	4.27	.56	1/8 - 27 NPTF	1/8 - 27 NPTF	1.67	6,35	50	–	T25	–	T25
5979801	**KGMSR1665C**	1.00	1.00	1.00	6.0	4.62	.53	1/8 - 27 NPTF	1/8 - 27 NPTF	2.10	12,70	65	**MS1163**	T30	–	–
5979802	**KGMSR2050C**	1.25	1.25	1.25	5.5	4.72	.81	1/8 - 27 NPTF	1/8 - 27 NPTF	1.78	–	50	**MS1162**	T25	**MS2002**	T25
5979803	**KGMSR2065C**	1.25	1.25	1.25	6.0	4.88	.78	1/8 - 27 NPTF	1/8 - 27 NPTF	2.09	6,35	65	**MS1163**	T30	–	–
5979804	**KGMSR2450C**	1.50	1.50	1.50	5.5	4.72	1.06	1/8 - 27 NPTF	1/8 - 27 NPTF	2.03	–	50	**MS1162**	T25	**MS2002**	T25
5979805	**KGMSR2465C**	1.50	1.50	1.50	7.0	5.90	1.03	1/8 - 27 NPTF	1/8 - 27 NPTF	2.09	–	65	**MS1163**	T30	–	–
left hand																
5979195	**KGMSL1650C**	1.00	1.00	1.00	5.5	4.27	.56	1/8 - 27 NPTF	1/8 - 27 NPTF	1.67	6,35	50	–	T25	–	T25
5979806	**KGMSL1665C**	1.00	1.00	1.00	6.0	4.62	.52	1/8 - 27 NPTF	1/8 - 27 NPTF	2.10	12,70	65	**MS1163**	T30	–	–
5979807	**KGMSL2050C**	1.25	1.25	1.25	5.5	4.72	.81	1/8 - 27 NPTF	1/8 - 27 NPTF	1.78	–	50	**MS1162**	T25	**MS2002**	T25
5979808	**KGMSL2065C**	1.25	1.25	1.25	6.0	4.88	.78	1/8 - 27 NPTF	1/8 - 27 NPTF	2.09	6,35	65	**MS1163**	T30	–	–
5979809	**KGMSL2450C**	1.50	1.50	1.50	5.5	4.74	1.06	1/8 - 27 NPTF	1/8 - 27 NPTF	2.03	–	50	**MS1162**	T25	**MS2002**	T25
5979810	**KGMSL2465C**	1.50	1.50	1.50	7.0	5.90	1.03	1/8 - 27 NPTF	1/8 - 27 NPTF	2.09	–	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 71–88 in. lbs. (8–10 Nm).
M65 blade and clamp screw torque equals 159–177 in. lbs. (18–20 Nm).

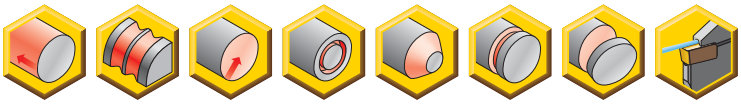


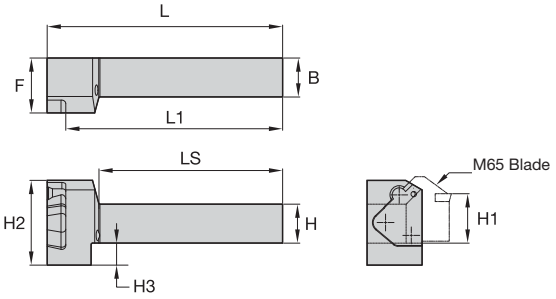


KGME-C • Metric

order number	catalog number	B	H	H1	L1	F	LS	H2	H3	blade size	blade screw	Torx	clamping screw	Torx
right hand														
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
left hand														
5979768	**KGMEL2525M65C**	25	25	25	138,15	35,00	117,00	2.13	14,00	65	**MS1163**	T30	**–**	–
5979193	**KGMEL2525M50C**	25	25	25	139,25	40,00	125,25	1.67	7,00	50	**MS1162**	T25	**MS2002**	T25
5979770	**KGMEL3232P65C**	32	32	32	158,15	35,00	137,00	2.13	7,00	65	**MS1163**	T30	**–**	–
5979769	**KGMEL3232P50C**	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 71–88 in. lbs. (8–10 Nm).
M65 blade and clamp screw torque equals 159–177 in. lbs. (18–20 Nm).

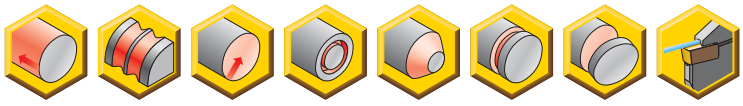


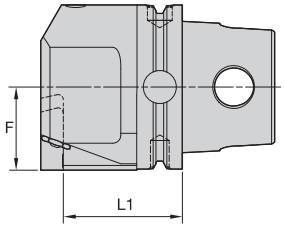


KGME-C • Inch

order number	catalog number	H	H1	B	L1	LS	F	H2	H3	blade size	blade screw	Torx	clamp screw	Torx
right hand														
5979196	**KGMER1650C**	1.00	1.00	1.00	5.5	4.96	1.58	1.67	6,35	50	–	T25	–	T25
5979814	**KGMER1665C**	1.00	1.00	1.00	5.5	4.70	1.38	2.09	12,70	65	**MS1163**	T30	–	–
5979815	**KGMER2050C**	1.25	1.25	1.25	5.5	4.96	1.58	1.67	–	50	–	T25	–	T25
5979816	**KGMER2065C**	1.25	1.25	1.25	5.5	4.70	1.38	2.09	6,35	65	**MS1163**	T30	–	–
5979817	**KGMER2450C**	1.50	1.50	1.50	5.5	4.96	1.58	1.92	–	50	**MS1162**	T25	**MS2002**	T25
5979818	**KGMER2465C**	1.50	1.50	1.50	6.5	5.70	1.49	2.09	–	65	**MS1163**	T30	–	–
left hand														
5979197	**KGMEL1650C**	1.00	1.00	1.00	5.5	4.96	1.58	1.67	6,35	50	–	T25	–	T25
5979819	**KGMEL1665C**	1.00	1.00	1.00	5.5	4.70	1.38	2.09	12,70	65	**MS1163**	T30	–	–
5979820	**KGMEL2050C**	1.25	1.25	1.25	5.5	4.96	1.58	1.67	–	50	–	T25	–	T25
5979881	**KGMEL2065C**	1.25	1.25	1.25	5.5	4.70	1.38	2.09	6,35	65	**MS1163**	T30	–	–
5979882	**KGMEL2450C**	1.50	1.50	1.50	5.5	4.96	1.58	1.92	–	50	**MS1162**	T25	**MS2002**	T25
5979883	**KGMEL2465C**	1.50	1.50	1.50	6.5	5.70	1.49	2.09	–	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 71–88 in. lbs. (8–10 Nm).
M65 blade and clamp screw torque equals 159–177 in. lbs. (18–20 Nm).

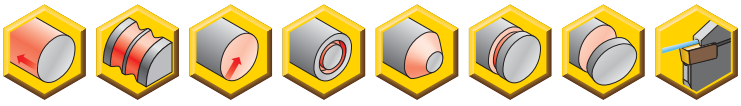


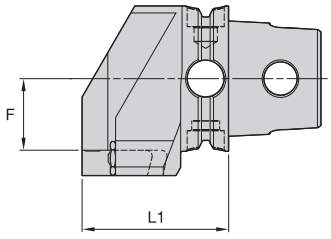


Modular End Mount KM System with Coolant

order number	catalog number	CSMS system size	L1 mm	L1 in	F mm	F in	blade size	blade screw	Torx	clamp screw	Torx
right hand											
5999788	**KM40TSKGMER50C**	KM40TS	28,0	1.10	20,5	.81	50	**MS1162**	T25	**MS2002**	T25
5999862	**KM50TSKGMER50C**	KM50TS	38,0	1.50	25,5	1.00	50	**MS1162**	T25	**MS2002**	T25
5999946	**KM63TSKGMER50C**	KM63TS	48,0	1.89	32,5	1.28	50	**MS1162**	T25	**MS2002**	T25
5999950	**KM63XMZKGMER50CY**	KM63XMZ	48,0	1.89	32,5	1.28	50	**MS1162**	T25	**MS2002**	T25
6000016	**KM80ATCKGMER50C**	KM80ATC	58,0	2.28	40,5	1.59	50	**MS1162**	T25	**MS2002**	T25
6000012	**KM80TSKGMER50C**	KM80TS	58,0	2.28	40,5	1.59	50	**MS1162**	T25	**MS2002**	T25
left hand											
5999789	**KM40TSKGMEL50C**	KM40TS	28,0	1.10	20,5	.81	50	**MS1162**	T25	**MS2002**	T25
5999863	**KM50TSKGMEL50C**	KM50TS	38,0	1.50	25,5	1.00	50	**MS1162**	T25	**MS2002**	T25
5999947	**KM63TSKGMEL50C**	KM63TS	48,0	1.89	32,5	1.28	50	**MS1162**	T25	**MS2002**	T25
5999971	**KM63XMZKGMELF50CY**	KM63XMZ	48,0	1.89	32,5	1.28	50	**MS1162**	T25	**MS2002**	T25
6000017	**KM80ATCKGMEL50C**	KM80ATC	58,0	2.28	40,5	1.59	50	**MS1162**	T25	**MS2002**	T25
6000013	**KM80TSKGMEL50C**	KM80TS	58,0	2.28	40,5	1.59	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 71–88 in. lbs. (8–10 Nm).
M65 blade and clamp screw torque equals 159–177 in. lbs. (18–20 Nm).



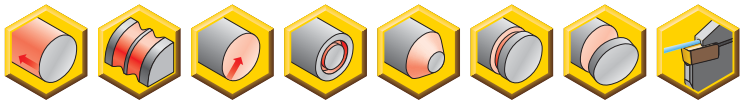


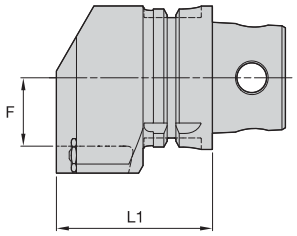
KM QUICK CHANGE

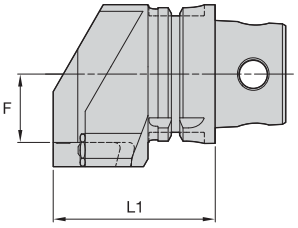
Modular Straight KM System with Coolant

order number	catalog number	CSMS system size	L1 mm	L1 in	F mm	F in	blade size	blade screw	Torx	clamp screw	Torx
right hand											
5999790	**KM40TSKGMSR50C**	KM40TS	53,5	2.11	15,0	.59	50	**MS1162**	T25	**MS2002**	T25
5999864	**KM50TSKGMSR50C**	KM50TS	58,5	2.30	23,0	.91	50	**MS1162**	T25	**MS2002**	T25
5999948	**KM63TSKGMSR50C**	KM63TS	63,5	2.50	31,0	1.22	50	**MS1162**	T25	**MS2002**	T25
5999972	**KM63XMZKGMSR50CY**	KM63XMZ	63,5	2.50	31,0	1.22	50	**MS1162**	T25	**MS2002**	T25
6000018	**KM80ATCKGMSR50C**	KM80ATC	66,5	2.62	41,0	1.61	50	**MS1162**	T25	**MS2002**	T25
6000014	**KM80TSKGMSR50C**	KM80TS	66,5	2.62	41,0	1.61	50	**MS1162**	T25	**MS2002**	T25
left hand											
5999861	**KM40TSKGMSL50C**	KM40TS	53,5	2.11	15,0	.59	50	**MS1162**	T25	**MS2002**	T25
5999865	**KM50TSKGMSL50C**	KM50TS	58,5	2.30	23,0	.91	50	**MS1162**	T25	**MS2002**	T25
5999949	**KM63TSKGMSL50C**	KM63TS	63,5	2.50	31,0	1.22	50	**MS1162**	T25	**MS2002**	T25
5999973	**KM63XMZKGMSLF50CY**	KM63XMZ	63,5	2.50	31,0	1.22	50	**MS1162**	T25	**MS2002**	T25
6000019	**KM80ATCKGMSL50C**	KM80ATC	66,5	2.62	41,0	1.61	50	**MS1162**	T25	**MS2002**	T25
6000015	**KM80TSKGMSL50C**	KM80TS	66,5	2.62	41,0	1.61	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 71–88 in. lbs. (8–10 Nm).
M65 blade and clamp screw torque equals 159–177 in. lbs. (18–20 Nm).





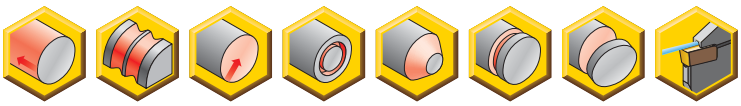


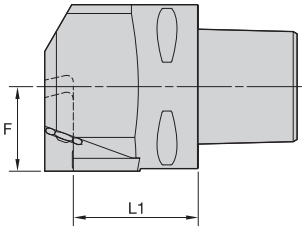
KM QUICK CHANGE

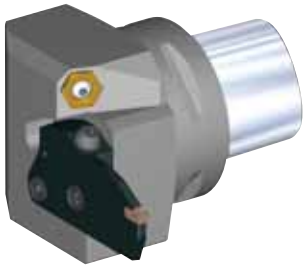
Modular Straight KM4X™ System with Coolant

order number	catalog number	CSMS system size	L1 mm	L1 in	F mm	F in	blade size	blade screw	Torx
right hand									
5543560	**KM4X63KGMSR65C**	KM4X63	68,5	2.70	30,0	1.18	65	**MS1163**	T30
left hand									
5543558	**KM4X63KGMSL65C**	KM4X63	68,5	2.70	30,0	1.18	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 71–88 in. lbs. (8–10 Nm).
M65 blade and clamp screw torque equals 159–177 in. lbs. (18–20 Nm).



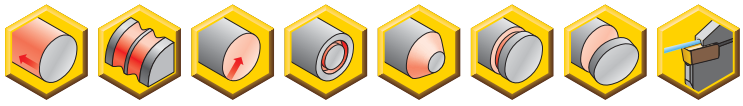


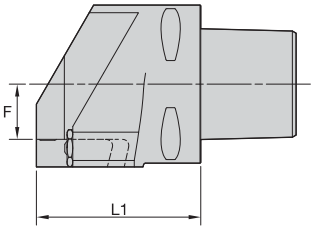


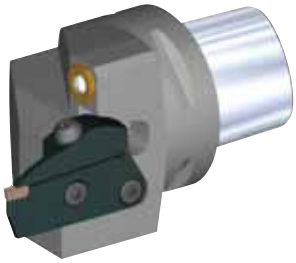
Modular End Mount PSC System with Coolant

order number	catalog number	CSMS system size	L1 mm	L1 in	F mm	F in	blade size	blade screw	Torx	clamp screw	Torx
right hand											
6000026	**PSC40KGMER50C**	PSC40	33,0	1.30	20,5	.81	50	**MS1162**	T25	**MS2002**	T25
6000030	**PSC50KGMER50C**	PSC50	43,0	1.69	25,5	1.00	50	**MS1162**	T25	**MS2002**	T25
5405652	**PSC50KGMER65C**	PSC50	55,5	2.19	22,0	.87	65	**MS1163**	T30	**—**	—
6000159	**PSC63KGMER50C**	PSC63	48,0	1.89	32,5	1.28	50	**MS1162**	T25	**MS2002**	T25
6000214	**PSC80KGMER50C**	PSC80	58,0	2.28	40,5	1.59	50	**MS1162**	T25	**MS2002**	T25
left hand											
6000027	**PSC40KGMEL50C**	PSC40	33,0	1.30	20,5	.81	50	**MS1162**	T25	**MS2002**	T25
6000151	**PSC50KGMEL50C**	PSC50	43,0	1.69	25,5	1.00	50	**MS1162**	T25	**MS2002**	T25
5405653	**PSC50KGMEL65C**	PSC50	55,5	2.19	22,0	.87	65	**MS1163**	T30	**—**	—
6000160	**PSC63KGMEL50C**	PSC63	48,0	1.89	32,5	1.28	50	**MS1162**	T25	**MS2002**	T25
6000215	**PSC80KGMEL50C**	PSC80	58,0	2.28	40,5	1.59	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 71–88 in. lbs. (8–10 Nm).
M65 blade and clamp screw torque equals 159–177 in. lbs. (18–20 Nm).







Modular Straight PSC System with Coolant

order number	catalog number	CSMS system size	L1 mm	L1 in	F mm	F in	blade size	blade screw	Torx	clamp screw	Torx
right hand											
6000028	**PSC40KGMSR50C**	PSC40	63,5	2.50	10,0	.39	50	**MS1162**	T25	**MS2002**	T25
5405654	**PSC50KGMSR65C**	PSC50	49,0	1.93	25,5	1.00	65	**MS1163**	T30	**–**	–
6000152	**PSC50KGMSR50C**	PSC50	63,5	2.50	15,0	.59	50	**MS1162**	T25	**MS2002**	T25
6000211	**PSC63KGMSR50C**	PSC63	65,5	2.58	22,0	.87	50	**MS1162**	T25	**MS2002**	T25
6000216	**PSC80KGMSR50C**	PSC80	73,5	2.89	30,0	1.18	50	**MS1162**	T25	**MS2002**	T25
left hand											
6000029	**PSC40KGMSL50C**	PSC40	63,5	2.50	10,0	.39	50	**MS1162**	T25	**MS2002**	T25
5405655	**PSC50KGMSL65C**	PSC50	49,0	1.93	25,5	1.00	65	**MS1163**	T30	**–**	–
6000153	**PSC50KGMSL50C**	PSC50	63,5	2.50	15,0	.59	50	**MS1162**	T25	**MS2002**	T25
6000213	**PSC63KGMSL50C**	PSC63	65,5	2.58	22,0	.87	50	**MS1162**	T25	**MS2002**	T25
6000217	**PSC80KGMSL50C**	PSC80	73,5	2.89	30,0	1.18	50	**MS1162**	T25	**MS2002**	T25

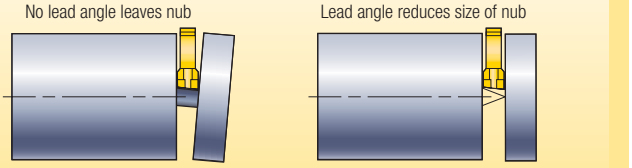
NOTE: KGMS..: Right-hand holder uses right-hand blades.
KGME..: Right-hand holder uses left-hand blades.
M50 blade and clamp screw torque equals 71–88 in. lbs. (8–10 Nm).
M65 blade and clamp screw torque equals 159–177 in. lbs. (18–20 Nm).

Tool Application Guidelines

- Always use good general machining practices.
- Make the machine and workpiece setup as rigid as possible.
- Integral shank toolholders offer the best rigidity. They should be your first toolholder choice, when possible.
- Use the toolholder with the shortest possible depth of cut for the application ("CD" dimension).
- When changing inserts, make sure the new insert locates securely against the toolholder's positive stop.
- Never tighten the clamping screw without an insert in the pocket.
- Toolholder projection out of the tool block should be as short as possible.
- Inserts should cut as close to center as possible.
- Dwell time in bottom of groove should be less than three revolutions.
- Recommended cutting speed and feeds are a starting point. Adjust, as necessary, for optimum tool life and chip control.

Definitions and Guidelines

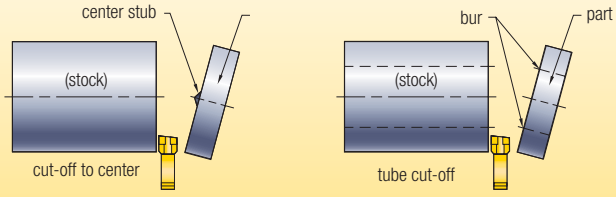
1. Width of cut (W) = width of the insert.
2. Lead angle = 0° (neutral); 6° (RH or LH).



Reduce bur of cut-off faces:

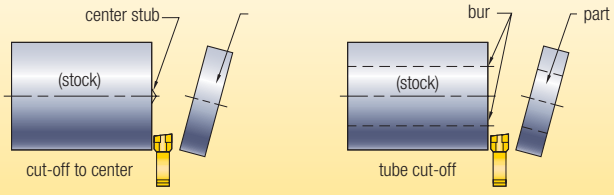
- Use lead angle-type inserts (Figures 1 and 2). Lead angle on a cut-off insert reduces the bur that remains on the part but decreases tool life and increases tool side deflection and possibly cycle time.
- If 0° lead angle is mandatory, use the narrowest possible cut-off insert and blade. This will minimize the center stub or cut-off bur length.

Figure 1
Insert selection **left-hand lead**



Left-hand lead insert leaves center 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

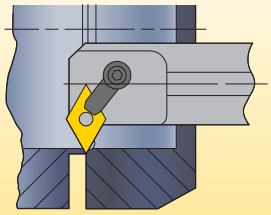
Right-hand lead insert leaves center stub or bur on stock and produces clean part surface.

- Check total height and maintain on center with part diameter.
- The cutting edge height should be within ±.004" (0,1mm) to the center; recommended cutting position is .002" (0,05mm) above center.

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

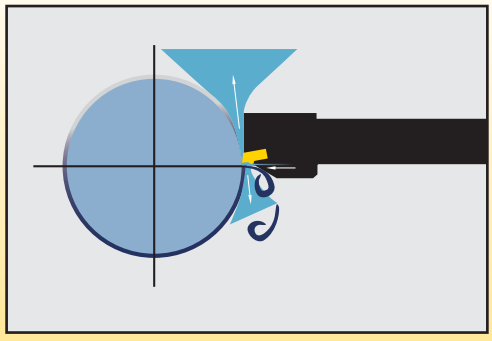


Internal chamfer line up

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

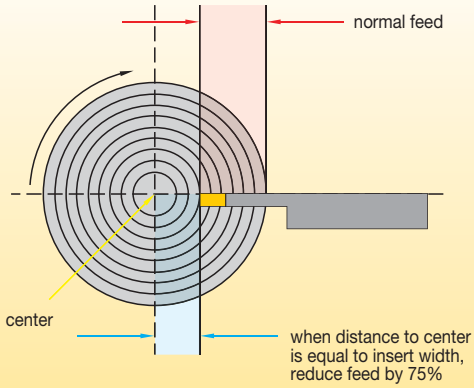


Preferred method for applying coolant

- 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

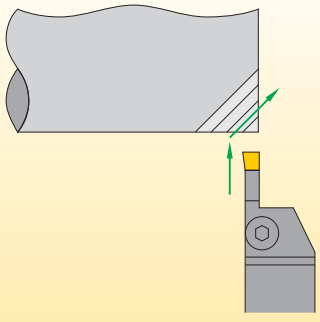
Feed reduction in cut-off



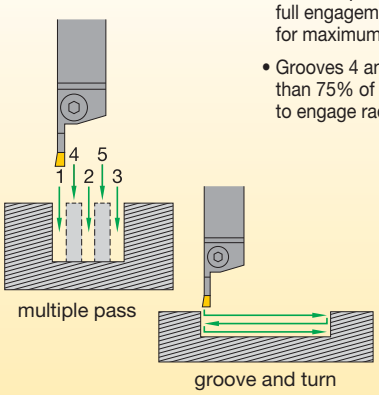
Feed reduction when approaching center = longer tool life

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.

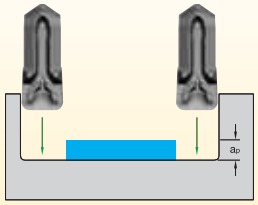
If pocket is deeper than wide = multiple pass

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.

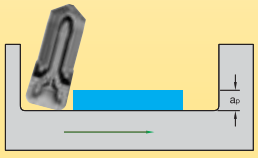


Step 3

Retract tool .004" (0,1mm); this is necessary to create a flat bottom.

Step 4

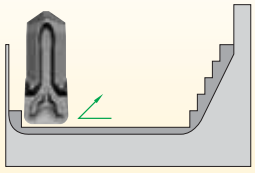
Side turn. This tool is designed to deflect, creating the necessary front clearance.



Profile Pocket

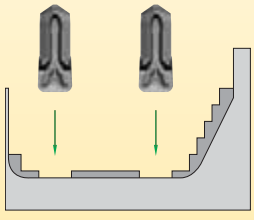
Step 1

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



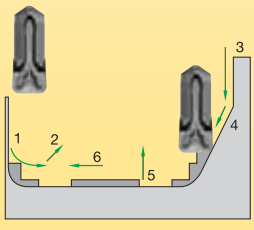
Step 2

Open up two grooves away from wall and radius.



Step 3

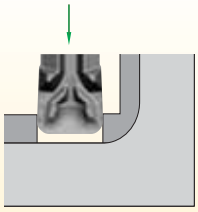
(1 and 2) Finish wall and radius.
(3 and 4) Finish wall, angle, and radius on opposite side of pocket.
(5) Retract tool .004" (0,1mm).
(6) Side turn to finish the floor of the pocket.



Generating a Radius

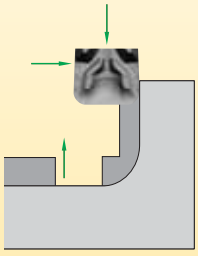
Step 1

Open up a groove away from the radius.



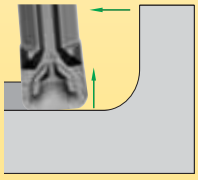
Step 2

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.



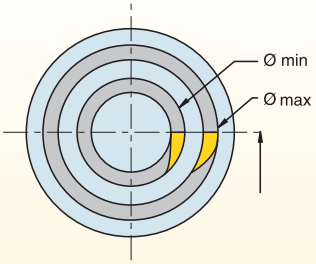
Step 3

Retract the tool .004" (0,1mm) and then side turn.



Grooving Tool Failure and Solution Guide

Face Grooving Application Guidelines

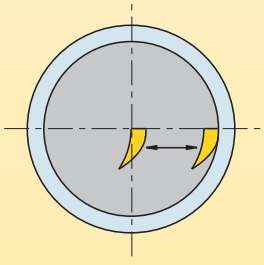


Tool Selection
- When selecting the toolholder, always start at the largest diameter possible and work toward the smaller diameter. This will allow the strongest tool to be used.

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	1. Verify tool center height. 2. Use sharp tools (index more often). 3. Use positive rake PVD coated insert. 4. Use correct grade for workpiece material. 5. Use correct geometry (e.g., positive rake for workhardening material). 6. Change tool path.
poor surface finish	1. Increase speed. 2. Use sharp tools (index more often). 3. Dwell time in bottom 1–3 revolutions (max). 4. Use proper chip control geometry. 5. Increase coolant flow. 6. Verify proper setup (overhang, shank size). 7. Use correct geometry (e.g., positive rake for workhardening material).
groove bottom not flat	1. Use sharp tools (index more often). 2. Dwell time in bottom 1–3 revolutions (max). 3. Reduce tool overhang (increase rigidity). 4. Reduce feed rate at groove bottom. 5. Use a wider insert. 6. Verify tool center height.
poor chip control	1. Use sharp tools (index more often). 2. Increase coolant concentration. 3. Adjust feed rate (usually increase first).
chatter	1. Reduce tool and workpiece overhang. 2. Adjust speed (usually increase first). 3. Adjust feed (usually increase first). 4. Verify tool center height.
insert chipping	1. Use correct grade for workpiece material. 2. Increase speed. 3. Reduce feed. 4. Use a stronger grade. 5. Increase tool and setup rigidity.
built-up edge	1. Use positive rake PVD coated insert. 2. Increase speed. 3. Reduce feed. 4. Increase coolant flow/concentration. 5. Use cermets.
side walls not straight	1. Check tool alignment for square. 2. Reduce workpiece and tool overhang. 3. Use sharp inserts (index more often).

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