

MASTER CATALOG 2018

VOLUME ONE | **TURNING TOOLS**



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

➤ Top Notch™

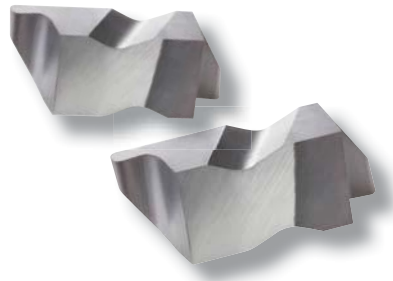
Grooving Tools and Beyond™ Inserts for
Your Shallow Groove and Turn Operations

Primary Application

Top Notch Grooving is the proven solution for high productivity. The Top Notch system provides consistent tool performance, accurate indexing, and superior clamping to provide excellent surface finishing and superior tool life.

Features and Benefits

- The Beyond PVD coated grades are designed to cut a variety of workpiece materials.
- Rigid clamping securely locks insert in place through the toughest cuts.
- Versatile design enables one system to handle O.D. and I.D. grooving, face grooving, back turning, undercutting, and even threading operations.
- Chip control inserts provide excellent chip evacuation in grooving, and offer better chip control in multidirectional turning.





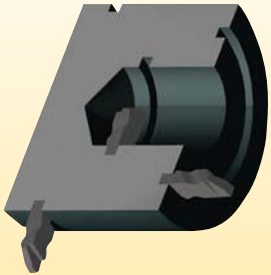
Our rigid clamping design prevents insert movement during high-feed rate applications. This benefit ensures excellent surface finish, improved productivity, and superior tool life and promotes perfect concentricity. The rugged bridge clamp generates locking forces in three directions to provide superior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

■ Step 1 • Select system based on the required groove depth

What you need to know

- Groove depth, width, and profile.
- Material to be machined.
- Application to be performed (face, O.D., or I.D. grooving).
- Toolholder requirements (e.g., KM™, square shank, right/left).

Top Notch™

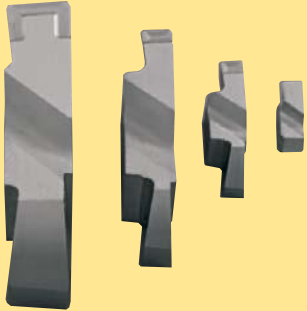


Grooving

For grooving depth $\leq 1.5 \times$ grooving width, review system capability chart and proceed to Step 2.

Top Notch Grooving for Internal, External, and Face Grooving Applications

system capabilities		minimum in (mm)	maximum in (mm)
O.D./I.D. grooving	width	0.31 (0,79)	.375 (9,53)
	depth	.050 (1,27)	.375 (9,53)
face grooving	width	.125 (3,18)	.375 (9,53)
	depth	.150 (3,81)	.250 (6,35)
internal grooving	diameter	.440 (11,2)	—
face grooving diameter	standard	.940 (23,9)	—
	deep	1.875 (47,6)	—
deep O.D./I.D. grooving	width	.062 (1,57)	.250 (6,35)
	depth	.125 (3,18)	.500 (12,70)
deep face grooving	width	.125 (3,18)	.250 (6,35)
	depth	.250 (6,35)	.500 (12,70)

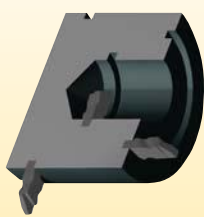


■ Step 2 • Select toolholder based on the application

NOTE: Toolholders are available as conventional square shank versions as well as Quick-Change versions.
The insert size must match the gage insert of your toolholder selection.

Step 3 • Select chipbreaker style and feed rate

Chipbreaker and Feed Rates • in/rev (mm/rev)

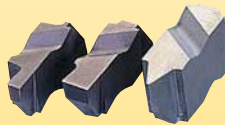


workpiece material and application	P	M	K	N	S	H
first choice	NG-K .003-.011 (0,08-0,28)	NG-K .0025-.008 (0,07-0,20)	NG .004-.012 (0,01-0,30)	NGP .004-.012 (0,01-0,30)	NG-K .0025-.008 (0,07-0,20)	NG-ST CBN tipped .002-.004 (0,05-0,10)
alternate choice	NG .004-.012 (0,10-0,30)	NGP .004-.009 (0,10-0,23)	NG-K .003-.011 (0,08-0,28)	NG-K .003-.012 (0,08-0,30)	NGP .004-.008 (0,10-0,20)	—

_K chipbreaker inserts



flat-top inserts



positive rake inserts



Step 4 • Select grade and speed

Recommendations for Grade

Starting speed chart shown under "Application Guide"

	workpiece material					
machining condition	P	M	K	N	S	H
high-performance for optimal conditions (clean cuts, good machine condition, higher speed capability)	KCP10B 400-1475 (120-450)	KCU10 400-850 (120-260)	KCK20B 500-1800 (150-550)	KD1425 500-5000 (150-1500)	KCU10 50-550 (15-170)	KB5625 150-760 (45-230)
general purpose (first choice for general machining)	KCP25B 350-1200 (110-365)	KCU25 400-800 (120-245)	KCU10 200-800 (60-245)	KCU10 400-3200 (120-975)	KCU10 50-450 (15-135)	KB5625 250-500 (80-150)
unfavorable conditions (roughing, poor machine condition, interrupted cuts, low speed, I.D. grooving)	KCU25 280-880 (85-270)	KCU25 300-700 (90-210)	KCU25 160-640 (50-195)	K313 120-2000 (40-610)	KCU25 25-350 (8-110)	KB1630 150-400 (45-120)

Step 5 • Select insert and holder from catalog page

NOTE: The insert size must match the gage insert size of your toolholder selection.

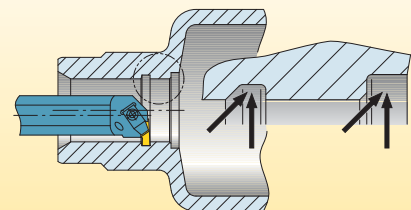
Example for Top Notch • Grooving

Material low-alloyed steel
Groove depth079" (2mm)
Groove width118" (3mm)
Operation..... I.D. cut, limited speed capability,
plunge groove and chamfer

Recommendation

Insert..... NG2M300RK
Grade KC5025
Insert width118" (3mm)
Insert size 2

Toolholder..... A20QNN20L2 (metric)
A12NEL2 (inch)
Gage insert..... N.2R



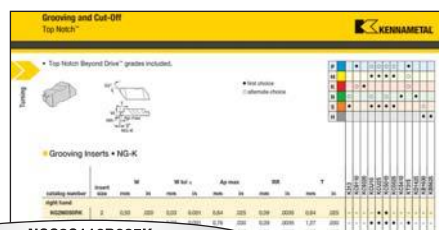
Speed: 400 SFM (120 m/min)
Feed: .006 in/rev (0,15 mm/rev)

Congratulations!

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

How Do Catalog Numbers Work?

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



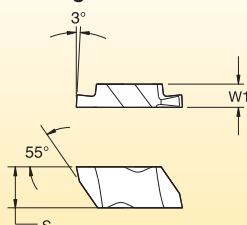
NGC2C110R035K

Inch																												
N	G	C	2	C	110	R	035	K																				
Type of Insert	Insert Style	Additional Information	Insert Size	Size Identification	Groove Size**	Hand of Insert	Cutting Depth	Chipbreaker Design	Definition of Inserts																			
N = Top Notch 		D = Deep grooving P = Positive C = Groove and chamfer		M = Metric insert groove width C = Circlip groove insert width is nominal circlip size ☐ = Blank indicates inch width insert		L = Left hand R = Right hand	Shown for groove and chamfer inserts in .0004" increments.	E = Hone only K = Standard chip control S = T Land and Hone ST = STD Tip (PcBN)	Groove size "J" or "L" for Poly-Vee inserts "I" indicates internal face grooving																			
B = Blank (for special forms) F = Face grooving G = Grooving P = Back R = Full radius U = Undercutting (or relieving) V = Poly-Vee				<table><tr><th>insert number</th><th>W1 (in)</th><th>W1 (mm)</th></tr><tr><td>1</td><td>.100</td><td>2,54</td></tr><tr><td>2</td><td>.150</td><td>3,81</td></tr><tr><td>3</td><td>.195</td><td>4,95</td></tr><tr><td>4</td><td>.255</td><td>6,98</td></tr><tr><td>5</td><td>.380</td><td>9,65</td></tr><tr><td>6</td><td>.383</td><td>9,73</td></tr></table>	insert number	W1 (in)	W1 (mm)	1	.100	2,54	2	.150	3,81	3	.195	4,95	4	.255	6,98	5	.380	9,65	6	.383	9,73	Position pertains to groove width for F-, G-, and U-style inserts, radii for R-style grooving inserts, and circlip size for groove and chamfer inserts. Dimension in .001" or 0,01mm. Inch example: 1/32" width groove or radius equals "031" catalog position number. Metric example: 3,25mm width groove or radius equals "325" catalog position number. Width Tolerance: ±.001" (±0,025mm) unless otherwise specified.		
insert number	W1 (in)	W1 (mm)																										
1	.100	2,54																										
2	.150	3,81																										
3	.195	4,95																										
4	.255	6,98																										
5	.380	9,65																										
6	.383	9,73																										

*Kennametal proprietary identification system.

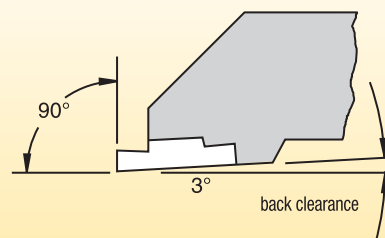
**Omit position for Top Notch NB-style blanks.

Top Notch Threading and Grooving Insert Dimensions



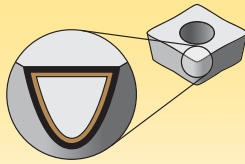
insert size	mm	S	inch	mm	W1	inch
1	2,54		.100	2,54		.100
2	5,56		.219	3,81		.150
3	8,74		.344	4,95		.195
4	11,51		.453	6,48		.255
5	17,48		.688	9,65		.380
6	11,51		.453	9,73		.383
8	7,93		.312	11,13		.438

Top Notch Holder Design



NOTE: Holders are designed to locate insert inclined to 3° to provide back clearance down open side.

Kennametal and Top Notch tooling technology combine to bring you the very best threading and grooving system available in the world today.



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

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

wear resistance ← → toughness

Grades

Coating	Grade Description		05	10	15	20	25	30	35	40	45
KCU10	 Composition: An advanced multilayer PVD coating over a very deformation-resistant unalloyed carbide substrate. The new and improved coating improves edge stability with wide range speed and feed capabilities. Application: The KCU10™ grade is ideal for finishing to general machining of most workpiece materials at a wide range of speed and feed capabilities. Excellent for machining most steels, stainless steels, cast irons, non-ferrous materials, and high-temp alloys with improved edge toughness, notch resistance, and higher cutting speed/feed capability.	P									
		M									
		K									
		N									
		S									
		H									
KCU25	 Composition: An advanced PVD grade with hard AlTiN coating and fine-grain unalloyed substrate. The new and improved coating improves edge stability with wide range speed and feed capabilities. Application: The KCU25™ grade is ideal for general machining of most steels, stainless steels, high-temp alloys, titanium, irons, and non-ferrous materials in a wide range of speeds and feeds with improved edge toughness for interrupted cut and high feed rates.	P									
		M									
		K									
		N									
		S									
		H									
KCP10B	 Composition: A specially engineered cobalt-enriched carbide grade with thick MTCVD TiCN-Al ₂ O ₃ -TiOCN coating for maximum wear resistance. Application: An excellent finishing to medium machining grade for a variety of workpiece materials, including most steels, ferritic, martensitic, and PH stainless steels, and cast irons. The cobalt-enriched substrate offers a balanced combination of deformation resistance and edge toughness, while the thick coating layers offer outstanding abrasion resistance and crater wear resistance for high-speed machining. Smooth coating provides resistance to edge build-up and microchipping and produces excellent surface finishes.	P									
		M									
		K									
		N									
		S									
		H									
KCP25B	 Composition: A tough cobalt-enriched carbide grade with a multilayer MTCVD TiCN-Al ₂ O 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									
		M									
		K									
		N									
		S									
		H									
KCK20B	 Composition: A specially toughened MTCVD TiCN-Al ₂ O ₃ -TiOCN coating over a wear-resistant substrate. Application: Specifically engineered to maximize coating adhesion and edge strength making this grade ideal in wet interrupted cutting of gray and ductile irons. It can be used in a wide range of applications from finishing to roughing to maximize productivity wherever strength and reliability are needed.	P									
		M									
		K									
		N									
		S									
		H									

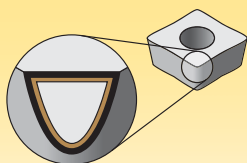
beyond

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beyond DRIVE™

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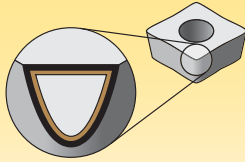
Coatings provide high-speed capability and are engineered for finishing to light roughing.

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

wear resistance ← → toughness

Grades

Coating	Grade Description		05	10	15	20	25	30	35	40	45
K313	 Composition: A hard, low binder content, unalloyed WC/Co fine-grain grade. Application: Exceptional edge wear resistance combined with very high strength for machining titanium, cast irons, austenitic stainless steels, non-ferrous metals, non-metals, and most high-temp alloys. Superior thermal deformation and depth-of-cut notch resistance. The grain structure is well controlled for minimal pits and flaws, which contributes to long, reliable service.										
		M									
		K									
		N									
		S									
KC5010	 Composition: An advanced PVD AlTiN coating over a very deformation-resistant unalloyed carbide substrate. Application: The KC5010™ grade is ideal for finishing to general machining of most workpiece materials at higher speeds. Excellent for machining most steels, stainless steels, cast irons, non-ferrous materials, and high-temp alloys under stable conditions. It also performs well machining hardened and short chipping materials.	P									
		M									
		K									
		N									
		S									
		H									
KC5025	 Composition: An advanced PVD-AlTiN-coated grade with a tough, ultra-fine-grain unalloyed substrate. Application: For general-purpose machining of most steels, stainless steels, high-temp alloys, titanium, irons, and non-ferrous materials. Speeds may vary from low to medium and will handle interruptions and high feed rates.	P									
		M									
		K									
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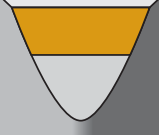


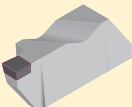
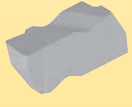
Coatings provide high-speed capability and are engineered for finishing to light roughing.

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

wear resistance ← → toughness

Grades

Coating	Grade Description		05	10	15	20	25	30	35	40	45
KT315	 Composition: A multilayer PVD TiN/TiCN/TiN-coated cermet turning grade. Application: Ideal for high-speed finishing to medium machining of most carbon and alloy steels and stainless steels. Performs very well in cast and ductile iron applications, too. Provides long and consistent tool life and will produce excellent workpiece finishes.	P									
		M									
		K									
		N									
KB1630	 Composition: An uncoated high content PcBN grade. PcBN tips are brazed onto a carbide insert. Application: Designed for roughing to finishing in interrupted cuts on hardened steels (>45 HRC). It can also be applied on gray cast iron, chilled irons, high chrome alloyed steels, high temp alloys and sintered powder metals. The tipped PcBN inserts are available in a wide range of insert styles, including Top Notch™ and Screw-On geometries.	K									
		S									
		H									
KB5625	 Composition: A medium content PcBN with a PVD-TiN/AlTiN coating for added wear resistance. Application: Designed for roughing to finishing of hardened steels (>45 HRC). Use on bearing steels, hot and cold work steels, die steels, case hardened steels, carburized and nitrided irons, and some hard coatings.	H									
KD1425	 Composition: A multimodal PCD grade with a range of grain sizes brazed onto a carbide substrate. Application: Engineered for extreme abrasion resistance, combined with good edge strength for demanding applications. An ideal choice for high-silicon aluminum alloys, bi-metallic (AL/GC) materials, MMC, carbon-fiber reinforced plastics, and other abrasive non-metallic materials.	N									

insert style	application	rake angle	page(s)
NG 	- General-purpose grooving. - O-ring grooving. - Circlip grooving.	neutral	C170
NG-K 	- Chip control geometry. - General-purpose grooving. - O-ring grooving. - Circlip grooving. - Light turning.	10° positive	C162
NG-ST 	Hard turning.	neutral	C170
NGC-K 	- Combined groove and chamfered edge break in one positive plunge with chip control. - Designed for DIN 471/472 standard circlip grooves.	10° positive	C168
NGD 	Deep grooving.	neutral	C171
NGD-K 	- Chip control geometry. - Deep grooving. - Light turning.	10° positive	C165
NGP 	- General-purpose grooving. - O-ring grooving. - Circlip grooving.	5° positive	C168
NF 	- Face grooving. - Additional side clearance.	neutral	C175
NF-K 	- Face grooving with chip control. - Additional side clearance.	10° positive	C173
NFD-K 	- Deep face grooving with chip control. - Additional side clearance.	10° positive	C174

insert style	application	rake angle	page(s)
NFD-KI 	- Internal deep face grooving with chip control. - For use in boring bars for internal face grooves.	10° positive	C174
NP-K NPD-K 	- Turning. - Back turning positive. - Profiling with chip control.	10° positive	C167
NR 	- Full radius grooving. - Turning and profiling.	neutral	C172
NR-K 	- Chip control geometry. - Full radius grooving, turning, and profiling.	10° positive	C166
NRD 	- Deep grooving. - Full radius end-form.	neutral	C173
NRP 	- Full radius grooving. - Light-turning profiling.	5° positive	C169
NU 	Undercutting.	neutral	C175
NV 	Poly-Vee grooving.	neutral	C176
NB/NBD 	- Blanks. - Blanks for deep grooving. - Available in uncoated grades only.	—	C176–C177

NOVO KNOWS CAD/CAM

With the addition of NOVO™ applications to your team, your CAD/CAM capabilities become much more accurate, streamlined, and productive.

Before NOVO: The programmer would be in their CAD/CAM software, programming a part. Using the tedious method of finding a tool in a catalog, and then manually inputting the tooling information from the catalog into the CAD/CAM software.

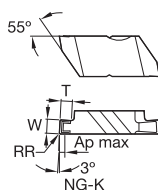
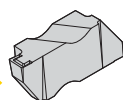
The concern is that assumptions are made, and only partial tooling information is entered.

With NOVO: The powerful digital intelligence of NOVO applications not only help the programmer find the right tool for the metalcutting job, but also automatically integrates all the tooling data into a complete CAD/CAM solution. The integration of all the tooling data increases the viability of the part being programmed, and is delivered quickly — saving you time.

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



Top Notch™ Groove and Turn Inserts



- first choice

- alternate choice

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

■ Groove and Turn • Chip Control

catalog number	insert size											KC U10	KC U25	KCP10B	KCP25B	KCK20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425
		W		W tol ±		Ap max		RR		T													
		mm	in	mm	in	mm	in	mm	in	mm	in												
right hand																							
NG2M050RK	2	0,50	.020	0,03	.001	0,64	.025	0,09	.0035	0,64	.025	●	●	-	●	-	-	●	-	-	-	-	-
NG2031RK	2	0,79	.031	0,03	.001	0,76	.030	0,09	.0035	1,27	.050	●	●	●	●	-	-	●	●	●	-	-	-
NG2M080RK	2	0,80	.032	0,03	.001	0,76	.030	0,09	.0035	1,27	.050	●	●	●	●	-	-	●	●	●	-	-	-
NG2M100RK	2	1,00	.039	0,03	.001	0,76	.030	0,09	.0035	1,28	.050	●	●	●	●	-	-	●	●	●	-	-	-
NG2047RK	2	1,19	.047	0,03	.001	0,76	.030	0,09	.0035	1,27	.050	●	●	●	●	-	-	●	●	●	-	-	-
NG2M120RK	2	1,20	.047	0,03	.001	0,76	.030	0,09	.0035	1,27	.050	●	●	●	●	-	-	●	●	●	-	-	-
NG2M140RK	2	1,40	.055	0,03	.001	0,76	.030	0,09	.0035	1,28	.050	●	●	●	●	-	-	●	●	●	-	-	-
NG2M150RK	2	1,50	.059	0,03	.001	1,09	.043	0,19	.0075	2,79	.110	-	●	-	●	-	-	-	●	-	-	-	-
NG2062RK	2	1,56	.062	0,03	.001	1,09	.043	0,19	.0075	2,79	.110	●	●	●	●	-	-	●	●	●	-	-	-
NG2M170RK	2	1,70	.067	0,03	.001	1,09	.043	0,19	.0075	2,79	.110	●	●	●	●	-	-	●	●	-	-	-	-
NG2M175RK	2	1,75	.069	0,03	.001	1,09	.043	0,19	.0075	2,81	.110	-	●	-	●	-	-	-	-	-	-	-	-
NG2M195RK	2	1,95	.077	0,03	.001	1,09	.043	0,19	.0075	2,79	.110	●	●	●	●	-	-	●	●	-	-	-	-
NG2M200RK	2	2,00	.079	0,03	.001	1,09	.043	0,19	.0075	2,79	.110	●	●	●	●	-	-	●	●	●	-	-	-
NG2M220RK	2	2,20	.087	0,03	.001	1,09	.043	0,19	.0075	2,79	.110	-	●	-	●	-	-	-	●	-	-	-	-
NG2M225RK	2	2,25	.088	0,03	.001	1,09	.043	0,19	.0075	2,81	.110	●	●	●	●	-	-	-	●	-	-	-	-
NG2094RK	2	2,39	.094	0,03	.001	1,09	.043	0,19	.0075	2,79	.110	●	●	●	●	-	-	●	●	●	-	-	-
NG2M250RK	2	2,50	.098	0,03	.001	1,09	.043	0,19	.0075	2,79	.110	-	●	-	●	-	-	-	●	-	-	-	-
NG2M275RK	2	2,75	.108	0,03	.001	1,09	.043	0,19	.0075	2,79	.110	●	●	●	●	-	-	-	●	-	-	-	-
NG2M300RK	2	3,00	.118	0,03	.001	1,09	.043	0,19	.0075	2,79	.110	●	●	●	●	-	-	●	●	-	-	-	-
NG2125RK	2	3,18	.125	0,03	.001	1,09	.043	0,19	.0075	2,79	.110	●	●	●	●	-	-	●	●	●	-	-	-
NG2M320RK	2	3,20	.126	0,03	.001	1,09	.043	0,19	.0075	2,79	.110	-	-	-	●	-	-	-	-	-	-	-	-
NG2M325RK	2	3,25	.128	0,03	.001	1,09	.043	0,19	.0075	2,79	.110	-	●	-	●	-	-	-	●	-	-	-	-
NG3M100RK	3	1,00	.039	0,03	.001	0,76	.030	0,20	.0080	1,91	.075	-	●	-	●	-	-	-	●	-	-	-	-
NG3047RK	3	1,19	.047	0,03	.001	0,76	.030	0,19	.0075	1,91	.075	●	●	●	●	-	-	●	●	-	-	-	-
NG3M120RK	3	1,20	.047	0,03	.001	0,76	.030	0,19	.0075	1,91	.075	●	●	●	●	-	-	-	-	-	-	-	-
NG3M150RK	3	1,50	.059	0,03	.001	1,02	.040	0,19	.0075	2,39	.094	-	●	-	●	-	-	-	●	-	-	-	-
NG3062RK	3	1,58	.062	0,03	.001	1,02	.040	0,19	.0075	2,39	.094	●	●	●	●	-	-	●	●	●	-	-	-
NG3M175RK	3	1,75	.069	0,03	.001	1,02	.040	0,19	.0075	2,39	.094	-	●	-	●	-	-	-	●	-	-	-	-
NG3072RK	3	1,83	.072	0,03	.001	1,02	.040	0,19	.0075	2,39	.094	●	●	●	●	-	-	●	●	-	-	-	-
NG3078RK	3	1,98	.078	0,03	.001	1,02	.040	0,19	.0075	2,39	.094	●	●	●	●	-	-	●	●	-	-	-	-
NG3M200RK	3	2,00	.079	0,03	.001	1,02	.040	0,19	.0075	2,39	.094	-	●	-	●	-	-	-	●	●	-	-	-
NG3M220RK	3	2,20	.087	0,03	.001	1,02	.040	0,19	.0075	2,39	.094	-	●	-	●	-	-	-	●	-	-	-	-
NG3M225RK	3	2,24	.088	0,03	.001	1,02	.040	0,19	.0075	2,39	.094	●	●	●	●	-	-	●	●	-	-	-	-
NG3094RK	3	2,39	.094	0,03	.001	1,02	.040	0,19	.0075	3,81	.150	●	●	●	-	-	-	●	●	●	-	-	-
NG3M250RK	3	2,50	.098	0,03	.001	1,02	.040	0,19	.0075	3,81	.150	-	●	-	●	-	-	-	●	-	-	-	-
NG3M275RK	3	2,75	.108	0,03	.001	1,02	.040	0,19	.0075	3,81	.150	●	●	●	●	-	-	●	●	-	-	-	-
NG3M300RK	3	3,00	.118	0,03	.001	1,02	.040	0,19	.0075	3,81	.150	●	●	●	●	-	-	●	●	-	-	-	-
NG3125RK	3	3,18	.125	0,03	.001	1,02	.040	0,19	.0075	3,81	.150	●	●	●	●	-	-	●	●	●	-	-	-
NG3M320RK	3	3,20	.126	0,03	.001	1,02	.040	0,19	.0075	3,81	.150	-	●	-	●	-	-	-	-	-	-	-	-
NG3M325RK	3	3,25	.128	0,03	.001	1,02	.040	0,19	.0075	3,81	.150	-	●	-	●	-	-	-	●	-	-	-	-
NG3M350RK	3	3,50	.138	0,03	.001	2,92	.115	0,32	.0125	3,81	.150	-	●	-	●	-	-	-	●	-	-	-	-
NG3156RK	3	3,96	.156	0,03	.001	2,92	.115	0,19	.0075	3,81	.150	●	●	●	●	-	-	●	●	-	-	-	-
NG3M400RK	3	4,00	.157	0,03	.001	2,92	.115	0,32	.0125	3,81	.150	●	●	●	●	-	-	●	●	-	-	-	-

(continued)

(Groove and Turn • Chip Control — continued)

- first choice
- alternate choice

[illegible]

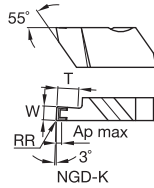
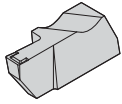
Grooving and Cut-Off

catalog number	insert size	W		W tol ±		Ap max		RR		T		KC10	KC25	KCP10B	KCP25B	KCK20B K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425	
		mm	in	mm	in	mm	in	mm	in	mm	in												
NG3M425RK	3	4,25	.167	0,03	.001	2,92	.115	0,32	.0125	3,81	.150	●	●	●	●	—	—	●	—	—	—	—	
NG3M450RK	3	4,50	.177	0,03	.001	2,92	.115	0,32	.0125	3,81	.150	—	●	—	●	—	—	—	—	—	—	—	
NG3189RK	3	4,80	.189	0,03	.001	2,92	.115	0,57	.0225	3,81	.150	●	●	●	●	—	●	●	—	—	—	—	
NG4M300RK	4	3,00	.118	0,03	.001	1,02	.040	0,19	.0075	3,81	.150	—	●	—	●	—	—	—	—	—	—	—	
NG4125RK	4	3,18	.125	0,03	.001	1,06	.040	0,19	.0075	3,81	.150	●	●	●	●	—	●	—	—	—	—	—	
NG4M350RK	4	3,50	.138	0,03	.001	2,92	.115	0,57	.0225	6,35	.250	—	●	—	●	—	—	—	—	—	—	—	
NG4M400RK	4	4,00	.158	0,03	.001	2,92	.115	0,57	.0225	6,35	.250	—	●	●	●	—	●	●	—	—	—	—	
NG4M450RK	4	4,50	.177	0,03	.001	2,92	.115	0,57	.0225	6,35	.250	—	●	—	●	—	—	—	—	—	—	—	
NG4189RK	4	4,80	.189	0,03	.001	2,92	.115	0,57	.0225	6,35	.250	●	●	●	●	—	●	●	—	—	—	—	
NG4M500RK	4	5,00	.197	0,03	.001	2,92	.115	0,32	.0125	6,35	.250	●	●	●	●	—	—	—	—	—	—	—	
NG4M550RK	4	5,50	.217	0,03	.001	3,81	.150	0,57	.0225	6,35	.250	—	—	—	●	—	—	—	—	—	—	—	
NG4M600RK	4	6,00	.236	0,03	.001	3,81	.150	0,57	.0225	6,35	.250	—	—	—	●	—	—	—	—	—	—	—	
NG4250RK	4	6,35	.250	0,03	.001	3,81	.150	0,57	.0225	6,35	.250	—	●	—	—	—	●	●	—	—	—	—	
left hand																							
NG2M050LK	2	0,50	.020	0,03	.001	0,64	.025	0,09	.0035	0,64	.025	●	●	—	●	—	—	●	—	—	—	—	
NG2031LK	2	0,79	.031	0,03	.001	0,76	.030	0,09	.0035	1,27	.050	●	●	—	●	—	—	●	—	—	—	—	
NG2M080LK	2	0,80	.032	0,03	.001	0,76	.030	0,09	.0035	1,27	.050	●	●	—	●	—	—	●	—	—	—	—	
NG2M100LK	2	1,00	.039	0,03	.001	0,76	.030	0,08	.0035	1,27	.050	●	●	—	●	—	—	●	—	—	—	—	
NG2047LK	2	1,19	.047	0,03	.001	0,76	.030	0,09	.0035	1,27	.050	●	●	—	●	—	—	●	—	—	—	—	
NG2M120LK	2	1,20	.047	0,03	.001	0,76	.030	0,09	.0035	1,27	.050	●	●	—	●	—	—	●	—	—	—	—	
NG2M140LK	2	1,40	.055	0,03	.001	0,76	.030	0,09	.0035	1,27	.050	●	●	—	●	—	—	●	—	—	—	—	
NG2M150LK	2	1,50	.059	0,03	.001	1,09	.043	0,19	.0075	2,79	.110	—	●	—	●	—	—	●	—	—	—	—	
NG2062LK	2	1,58	.062	0,03	.001	1,09	.043	0,19	.0075	2,79	.110	●	●	—	●	—	—	●	—	—	—	—	
NG2M170LK	2	1,70	.067	0,03	.001	1,09	.043	0,19	.0075	2,79	.110	—	●	—	●	—	—	●	—	—	—	—	
NG2M175LK	2	1,75	.069	0,03	.001	1,09	.043	0,19	.0075	2,79	.110	—	●	—	●	—	—	●	—	—	—	—	
NG2M195LK	2	1,95	.077	0,03	.001	1,09	.043	0,19	.0075	2,79	.110	—	●	—	●	—	—	●	—	—	—	—	
NG2M200LK	2	2,00	.079	0,03	.001	1,09	.043	0,19	.0075	2,79	.110	●	●	—	●	—	—	●	—	—	—	—	
NG2M220LK	2	2,20	.087	0,03	.001	1,09	.043	0,19	.0075	2,79	.110	—	●	—	●	—	—	—	—	—	—	—	
NG2M225LK	2	2,25	.088	0,03	.001	1,09	.043	0,19	.0075	2,79	.110	●	●	—	●	—	—	●	—	—	—	—	
NG2094LK	2	2,39	.094	0,03	.001	1,09	.043	0,19	.0075	2,79	.110	●	●	—	●	—	—	●	—	—	—	—	
NG2M250LK	2	2,50	.098	0,03	.001	1,09	.043	0,19	.0075	2,79	.110	—	●	—	●	—	—	●	—	—	—	—	
NG2M275LK	2	2,75	.108	0,03	.001	1,09	.043	0,19	.0075	2,79	.110	●	●	—	—	—	●	—	—	—	—	—	
NG2M300LK	2	3,00	.118	0,03	.001	1,09	.043	0,19	.0075	2,79	.110	●	●	—	—	—	●	—	—	—	—	—	
NG2125LK	2	3,18	.125	0,03	.001	1,09	.043	0,19	.0075	2,79	.110	●	●	—	—	—	●	—	—	—	—	—	
NG2M325LK	2	3,25	.128	0,03	.001	1,09	.043	0,19	.0075	2,79	.110	—	●	—	●	—	—	—	—	—	—	—	
NG3M100LK	3	1,00	.039	0,03	.001	0,76	.030	0,20	.0080	1,91	.075	—	●	—	●	—	—	●	—	—	—	—	
NG3047LK	3	1,19	.047	0,03	.001	0,76	.030	0,19	.0075	1,90	.075	●	●	—	—	—	●	—	—	—	—	—	
NG3M120LK	3	1,20	.047	0,03	.001	0,76	.030	0,19	.0075	1,91	.075	●	●	—	—	—	—	●	—	—	—	—	
NG3M150LK	3	1,50	.059	0,03	.001	1,02	.040	0,19	.0075	2,39	.094	—	●	—	—	—	—	●	—	—	—	—	
NG3062LK	3	1,58	.062	0,03	.001	1,02	.040	0,19	.0075	2,39	.094	●	●	—	—	—	—	●	—	—	—	—	
NG3M175LK	3	1,75	.069	0,03	.001	1,02	.040	0,19	.0075	2,39	.094	—	●	—	—	—	—	●	—	—	—	—	
NG3072LK	3	1,83	.072	0,03	.001	1,02	.040	0,19	.0075	2,39	.094	●	●	—	—	—	—	●	—	—	—	—	
NG3078LK	3	1,98	.078	0,03	.001	1,02	.040	0,19	.0075	2,39	.094	●	●	—	—	—	—	●	—	—	—	—	
NG3M200LK	3	2,00	.079	0,03	.001	1,02	.040	0,19	.0075	2,39	.094	—	●	—	—	—	—	●	—	—	—	—	

(continued)

- first choice
- alternate choice

[illegible]



- first choice

- alternate choice

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

■ Groove and Turn • Deep Grooving • Chip Control

catalog number	insert size	W		W tol ±		Ap max		RR		T		KC10	KC25	KCP10B	KCP25B	KCK20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425	
		mm	in	mm	in	mm	in	mm	in	mm	in													
right hand																								
NGD2M150RK	2	1,50	.059	0,03	0.001	1,09	.043	0,19	.0075	4,06	.160	●	●	-	-	-	-	●	●	-	-	-	-	-
NGD2M200RK	2	2,00	.079	0,03	0.001	1,09	.043	0,19	.0075	5,08	.200	●	●	-	-	-	-	●	●	-	-	-	-	-
NGD2M250RK	2	2,50	.098	0,03	0.001	1,09	.043	0,19	.0075	5,08	.200	●	●	-	-	-	-	●	●	-	-	-	-	-
NGD3062RK	3	1,58	.062	0,03	0.001	1,02	.040	0,19	.0075	3,18	.125	●	●	-	-	-	●	●	●	-	-	-	-	-
NGD3M200RK	3	2,00	.079	0,03	0.001	1,02	.040	0,19	.0075	4,06	.160	●	●	-	-	-	-	●	●	-	-	-	-	-
NGD3094RK	3	2,39	.094	0,03	0.001	1,02	.040	0,19	.0075	6,35	.250	●	●	-	-	-	●	●	●	-	-	-	-	-
NGD3M250RK	3	2,50	.098	0,03	0.001	1,02	.040	0,19	.0075	6,35	.250	-	●	-	-	-	-	●	●	-	-	-	-	-
NGD3M300RK	3	3,00	.118	0,03	0.001	1,02	.040	0,19	.0075	6,35	.250	●	●	-	-	-	-	●	●	-	-	-	-	-
NGD3125RK	3	3,18	.125	0,03	0.001	1,02	.040	0,19	.0075	6,35	.250	●	●	-	-	-	●	●	●	-	-	-	-	-
NGD3M400RK	3	4,00	.157	0,03	0.001	2,92	.115	0,32	.0125	6,35	.250	●	●	-	-	-	-	●	●	-	-	-	-	-
NGD3189RK	3	4,80	.189	0,03	0.001	2,92	.115	0,58	.0225	6,35	.250	●	●	-	-	-	-	●	●	-	-	-	-	-
NGD4125RK	4	3,18	.125	0,03	0.001	1,02	.040	0,19	.0075	6,35	.250	●	●	-	-	-	-	●	●	-	-	-	-	-
NGD4189RK	4	4,80	.189	0,03	0.001	2,92	.115	0,57	.0225	9,53	.375	●	●	-	-	-	-	●	●	-	-	-	-	-
NGD4M550RK	4	5,50	.217	0,03	0.001	3,81	.150	0,57	.0225	12,70	.500	-	●	-	-	-	-	-	-	-	-	-	-	-
NGD4250RK	4	6,35	.250	0,03	0.001	3,81	.150	0,57	.0225	12,70	.500	●	●	-	-	-	-	●	●	-	-	-	-	-
left hand																								
NGD2M150LK	2	1,50	.059	0,03	0.001	1,09	.043	0,19	.0075	4,06	.160	●	●	-	-	-	-	●	●	-	-	-	-	-
NGD2M200LK	2	2,00	.079	0,03	0.001	1,09	.043	0,19	.0075	5,08	.200	●	●	-	-	-	-	●	●	-	-	-	-	-
NGD2M250LK	2	2,50	.098	0,03	0.001	1,09	.043	0,19	.0075	5,08	.200	●	●	-	-	-	-	●	●	-	-	-	-	-
NGD3062LK	3	1,57	.062	0,03	0.001	1,02	.040	0,19	.0075	3,18	.125	●	●	-	-	-	-	●	●	-	-	-	-	-
NGD3M200LK	3	2,00	.079	0,03	0.001	1,02	.040	0,19	.0075	4,06	.160	-	●	-	-	-	-	●	●	-	-	-	-	-
NGD3094LK	3	2,39	.094	0,03	0.001	1,02	.040	0,19	.0075	6,34	.250	●	●	-	-	-	●	●	●	-	-	-	-	-
NGD3M250LK	3	2,50	.098	0,03	0.001	1,02	.040	0,19	.0075	6,35	.250	-	●	-	-	-	-	●	●	-	-	-	-	-
NGD3M300LK	3	3,00	.118	0,03	0.001	1,02	.040	0,19	.0075	6,35	.250	●	●	-	-	-	-	●	●	-	-	-	-	-
NGD3125LK	3	3,18	.125	0,03	0.001	1,02	.040	0,19	.0075	6,35	.250	●	●	-	-	-	●	●	●	-	-	-	-	-
NGD3M350LK	3	3,50	.138	0,03	0.001	2,92	.115	0,32	.0125	6,35	.250	-	●	-	-	-	-	●	●	-	-	-	-	-
NGD3M400LK	3	4,00	.157	0,03	0.001	2,92	.115	0,32	.0125	6,35	.250	●	●	-	-	-	-	●	●	-	-	-	-	-
NGD3189LK	3	4,80	.189	0,03	0.001	2,92	.115	0,57	.0225	6,35	.250	●	●	-	-	-	-	●	●	-	-	-	-	-
NGD4125LK	4	3,18	.125	0,03	0.001	1,02	.040	0,19	.0075	6,35	.250	●	●	-	-	-	-	●	●	-	-	-	-	-
NGD4M400LK	4	4,00	.157	0,03	0.001	2,92	.115	0,57	.0225	9,53	.375	-	●	-	-	-	-	-	-	-	-	-	-	-
NGD4189LK	4	4,80	.189	0,03	0.001	2,92	.115	0,57	.0225	9,53	.375	●	●	-	-	-	-	●	●	-	-	-	-	-
NGD4M500LK	4	5,00	.197	0,03	0.001	2,92	.115	0,57	.0225	12,70	.500	-	●	-	-	-	-	-	-	-	-	-	-	-
NGD4250LK	4	6,35	.250	0,03	0.001	3,80	.150	0,57	.0225	12,70	.500	●	●	-	-	-	-	●	●	-	-	-	-	-

NOTE: Inserts have one cutting edge. Right-hand insert shown; left-hand insert is mirror image.

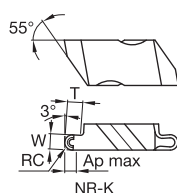
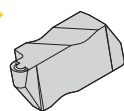
The following inserts are double ended: NGD3062RK, NGD4125RK, NGD3062LK, and NGD4125LK.

- Full radius inserts with chip control.

- first choice

- alternate choice

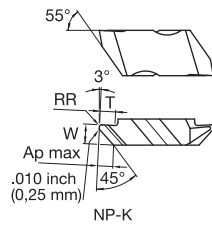
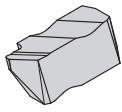
P													
M													
K													
N													
S													
H													



■ Groove and Turn • Full Radius • Chip Control

catalog number	insert size	W		Ap max		RC		T		KC10	KC25	KCP10B	KCP25B	KCK20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425
		mm	in	mm	in	mm	in	mm	in												
right hand																					
NR3031RK	3	1,57	.062	1,97	.078	0,79	.0310	2,39	.094	●	●	-	-	-	-	●	●	-	-	-	-
NR3047RK	3	2,39	.094	1,91	.075	1,19	.0470	3,81	.150	●	●	-	-	-	-	●	●	-	-	-	-
NR3062RK	3	3,18	.125	2,92	.115	1,59	.0625	3,81	.150	●	●	-	-	-	-	●	●	-	-	-	-
NR3078RK	3	3,97	.156	2,54	.100	1,98	.0780	3,81	.150	●	●	-	-	-	-	●	-	-	-	-	-
NR4062RK	4	3,18	.125	2,92	.115	1,59	.0625	3,81	.150	●	●	-	-	-	-	●	-	-	-	-	-
NR4094RK	4	4,79	.188	3,81	.150	2,39	.0940	6,35	.250	●	●	-	-	-	-	●	-	-	-	-	-
NR4125RK	4	6,35	.250	3,81	.150	3,18	.1250	6,35	.250	●	●	-	-	-	-	●	●	-	-	-	-
left hand																					
NR3031LK	3	1,58	.062	1,98	.078	0,79	.0310	2,39	.094	●	●	-	-	-	-	●	●	-	-	-	-
NR3047LK	3	2,39	.094	1,91	.075	1,19	.0470	3,81	.150	●	●	-	-	-	-	●	●	-	-	-	-
NR3062LK	3	3,18	.125	2,92	.115	1,59	.0625	3,81	.150	●	●	-	-	-	-	●	●	-	-	-	-
NR3078LK	3	3,96	.156	2,54	.100	1,98	.0780	3,81	.150	-	●	-	-	-	-	●	●	-	-	-	-
NR4062LK	4	3,18	.125	2,92	.115	1,59	.0625	3,81	.150	●	●	-	-	-	-	●	-	-	-	-	-
NR4094LK	4	4,79	.188	3,81	.150	2,39	.0940	6,35	.250	●	●	-	-	-	-	●	●	-	-	-	-
NR4125LK	4	6,36	.250	3,81	.150	3,18	.1250	6,35	.250	●	●	-	-	-	-	●	-	-	-	-	-

NOTE: Right-hand insert shown; left-hand insert is mirror image.



- first choice
- alternate choice

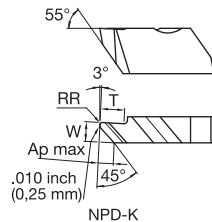
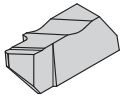
P	●	●	●	●	○		○	○	●			
M	■	●	●				○	●	○		■	
K	■	○	○	○	○	●	○	○	○	○	○	○
N	■	●	○					●	○			●
S	■	○	●				●	○	○		○	
H	■	○					○			●	●	

■ Groove and Profile • Chip Control

catalog number	insert size	W		W tol ±		Ap max		RR		T		KC10	KC25	KCP10B	KCP25B	KCK20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425	
		mm	in	mm	in	mm	in	mm	in	mm	in													
right hand																								
NP2002RK	2	3,82	.150	0,03	0.001	—	—	0,25	.0100	2,81	.110	●	●	—	—	—	—	●	●	—	—	—	—	—
NP2012RK	2	3,82	.150	0,03	0.001	—	—	0,25	.0100	2,81	.110	—	●	—	—	—	—	—	—	—	—	—	—	—
NP3002RK	3	4,95	.195	0,03	0.001	—	—	0,25	.0100	5,08	.200	●	●	—	—	—	—	●	—	—	—	—	—	—
NP3012RK	3	4,95	.195	0,03	0.001	—	—	0,25	.0100	5,08	.200	—	●	—	—	—	—	●	—	—	—	—	—	—

NOTE: Right-hand insert shown; left-hand insert is mirror image.
Tolerance on W $\pm .005$ " ($\pm 0,13\text{mm}$)

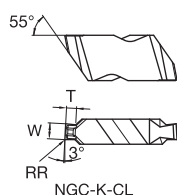
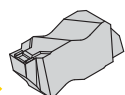
- Profiling deep positive inserts.



■ Groove and Profile • Deep Grooving • Chip Control

catalog number	insert size	W		W tol ±		Ap max		RR		T		KC10	KC25	KCP10B	KCP25B	KCK20B K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425	
		mm	in	mm	in	mm	in	mm	in	mm	in												
right hand																							
NPD2002RK	2	3,68	.145	0,13	0.005	—	—	0,09	.0035	5,08	.200	—	●	—	—	—	●	—	—	—	—	—	—
NPD3002RK	3	4,83	.190	0,13	0.005	—	—	0,09	.0035	6,35	.250	—	●	—	—	—	—	—	—	—	—	—	—
NPD3012RK	3	4,95	.195	0,03	0.001	—	—	0,25	.0100	6,35	.250	●	●	—	—	—	●	—	—	—	—	—	—

NOTE: Right-hand insert shown; left-hand insert is mirror image.
Tolerance on W $\pm .005$ " ($\pm 0,13\text{mm}$)



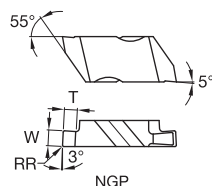
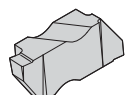
- first choice
- alternate choice

P																									
M																									
K																									
N																									
S																									
H																									

■ Groove and Chamfer • Chip Control

[illegible]

NOTE: Groove and chamfer inserts for circlip grooves to DIN 471/472 specification.
Right-hand insert shown: left-hand insert is mirror image.

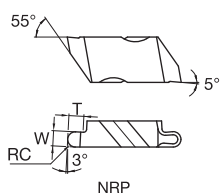
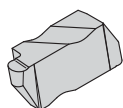


■ Groove and Turn • Positive

[illegible]

NOTE: All KD and KB grades are single-ended tipped inserts.
Right-hand insert shown; left-hand insert is mirror image.

- Full radius positive rake inserts.



- first choice

- alternate choice

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

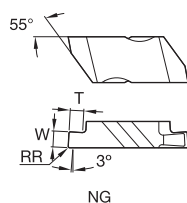
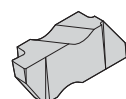
■ Groove and Turn • Full Radius • Positive

catalog number	insert size	W		Ap max		RC		T		KC10	KC125	KCP10B	KCP25B	KCK20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425
		mm	in	mm	in	mm	in	mm	in												
right hand																					
NRP3031R	3	1,58	.062	—	—	0,79	.0310	2,39	.094	●	—	—	—	—	—	●	—	—	—	—	—
NRP3047R	3	2,39	.094	—	—	1,19	.0470	3,81	.150	●	—	—	—	—	●	●	—	—	—	—	—
NRP3062R	3	3,18	.125	—	—	1,59	.0625	3,81	.150	●	—	—	—	—	—	●	—	—	—	—	—
NRP3094R	3	4,78	.188	—	—	2,39	.0940	3,81	.150	●	—	—	—	—	—	●	—	—	—	—	—
left hand																					
NRP3031L	3	1,58	.062	—	—	0,79	.0310	2,39	.094	●	—	—	—	—	—	●	—	—	—	—	—
NRP3047L	3	2,39	.094	—	—	1,19	.0470	3,81	.150	●	—	—	—	—	—	●	—	—	—	—	—
NRP3062L	3	3,18	.125	—	—	1,59	.0625	3,81	.150	—	—	—	—	—	—	●	—	—	—	—	—
NRP3094L	3	4,78	.188	—	—	2,39	.0940	3,81	.150	●	—	—	—	—	—	●	—	—	—	—	—

NOTE: Right-hand insert shown; left-hand insert is mirror image.

Grooving and Cut-Off

Top Notch™ Groove and Turn Inserts



- alternate choice

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

Grooving and Cut-Off

		W		W tol ±		Ap max		RR		T													
catalog number	insert size	mm	in	mm	in	mm	in	mm	in	mm	in	KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425
right hand																							
NG2031R	2	0,79	.031	0,03	.001	—	—	0,09	.0035	1,27	.050	●	●	-	-	●	●	●	●	-	-	-	-
NG2041R	2	1,04	.041	0,03	.001	—	—	0,09	.0035	1,27	.050	●	●	-	-	●	●	●	●	-	-	-	-
NG2047R	2	1,19	.047	0,03	.001	—	—	0,09	.0035	1,27	.050	●	●	-	-	●	●	●	●	-	-	-	-
NG2058R	2	1,47	.058	0,03	.001	—	—	0,19	.0075	1,27	.050	-	●	-	-	-	-	-	●	-	-	-	-
NG2062R	2	1,58	.062	0,03	.001	—	—	0,19	.0075	2,79	.110	●	●	-	-	●	●	●	●	-	-	-	-
NG2094R	2	2,39	.094	0,03	.001	—	—	0,19	.0075	2,79	.110	●	●	-	-	●	●	●	-	-	-	-	-
NG2125R	2	3,18	.125	0,03	.001	—	—	0,19	.0075	2,79	.110	●	●	-	-	-	-	●	-	-	-	-	-
NG3047R	3	1,19	.047	0,03	.001	—	—	0,19	.0075	1,91	.075	●	●	-	-	●	●	●	●	-	-	-	-
NG3062R	3	1,58	.062	0,03	.001	—	—	0,19	.0075	2,39	.094	●	●	-	-	-	-	●	●	-	-	-	-
NG3072R	3	1,83	.072	0,03	.001	—	—	0,19	.0075	2,39	.094	●	-	-	-	●	-	●	-	-	-	-	-
NG3078R	3	1,98	.078	0,03	.001	—	—	0,19	.0075	2,39	.094	●	-	-	-	●	-	●	-	-	-	-	-
NG3088R	3	2,24	.088	0,03	.001	—	—	0,19	.0075	2,39	.094	●	●	-	-	●	-	●	-	-	-	-	-
NG3094R	3	2,39	.094	0,03	.001	—	—	0,19	.0075	3,81	.150	●	●	-	-	●	●	●	●	-	-	-	-
NG3097R	3	2,46	.097	0,03	.001	—	—	0,32	.0125	3,81	.150	●	●	-	-	●	-	●	-	-	-	-	-
NG3105R	3	2,67	.105	0,03	.001	—	—	0,19	.0075	3,81	.150	●	●	-	-	-	-	●	●	-	-	-	-
NG3110R	3	2,79	.110	0,03	.001	—	—	0,32	.0125	3,81	.150	-	●	-	-	-	-	-	●	-	-	-	-
NG3122R	3	3,10	.122	0,03	.001	—	—	0,19	.0075	3,81	.150	-	●	-	-	-	-	-	-	-	-	-	-
NG3125R	3	3,18	.125	0,03	.001	—	—	0,19	.0075	3,81	.150	●	●	-	-	●	●	●	●	-	-	-	-
NG3142R	3	3,61	.142	0,03	.001	—	—	0,32	.0125	3,81	.150	-	●	-	-	-	-	●	-	-	-	-	-
NG3156R	3	3,96	.156	0,03	.001	—	—	0,19	.0075	3,81	.150	●	●	-	-	●	-	●	●	-	-	-	-
NG3178R	3	4,52	.178	0,03	.001	—	—	0,19	.0075	3,81	.150	-	-	-	-	-	-	-	●	-	-	-	-
NG3185R	3	4,70	.185	0,03	.001	—	—	0,57	.0225	3,81	.150	-	●	-	-	-	-	-	-	-	-	-	-
NG3189R	3	4,80	.189	0,03	.001	—	—	0,57	.0225	3,81	.150	●	●	-	-	●	●	●	●	-	-	-	-
NG4125R	4	3,18	.125	0,03	.001	—	—	0,19	.0075	3,81	.150	●	●	-	-	●	●	-	-	-	-	-	-
NG4189R	4	4,80	.189	0,03	.001	—	—	0,57	.0225	6,35	.250	●	●	-	-	●	●	●	●	-	-	-	-
NG4213R	4	5,41	.213	0,03	.001	—	—	0,19	.0075	6,35	.250	-	●	-	-	-	-	-	-	-	-	-	-
NG4250R	4	6,35	.250	0,03	.001	—	—	0,57	.0225	6,35	.250	●	●	-	-	●	-	●	●	-	-	-	-
NG5312R	5	7,93	.312	0,03	.001	—	—	0,83	.0325	9,52	.375	-	●	-	-	-	-	-	-	-	-	-	-
NG6375R	6	9,53	.375	0,03	.001	—	—	0,83	.0325	6,35	.250	-	●	-	-	-	-	-	-	-	-	-	-
left hand																							
NG1031L	1	0,79	.031	0,08	.003	—	—	0,19	.0075	1,27	.050	-	●	-	-	-	-	-	-	-	-	-	-
NG1047L	1	1,19	.047	0,08	.003	—	—	0,19	.0075	1,91	.075	-	●	-	-	-	-	-	●	-	-	-	-
NG1062L	1	1,58	.062	0,08	.003	—	—	0,19	.0075	1,91	.075	-	●	-	-	-	-	-	-	-	-	-	-
NG1094L	1	2,39	.094	0,08	.003	—	—	0,19	.0075	1,91	.075	-	●	-	-	-	-	-	●	-	-	-	-
NG2031L	2	0,79	.031	0,03	.001	—	—	0,09	.0035	1,27	.050	●	●	-	-	●	●	●	-	-	-	-	-
NG2041L	2	1,04	.041	0,03	.001	—	—	0,09	.0035	1,27	.050	-	●	-	-	●	-	●	●	-	-	-	-
NG2047L	2	1,19	.047	0,03	.001	—	—	0,09	.0035	1,27	.050	●	●	-	-	-	-	●	-	-	-	-	-
NG2058L	2	1,47	.058	0,03	.001	—	—	0,19	.0075	1,27	.050	-	●	-	-	-	-	-	-	-	-	-	-
NG2062L	2	1,58	.062	0,03	.001	—	—	0,19	.0075	2,79	.110	●	●	-	-	●	●	●	●	-	-	-	-
NG2094L	2	2,39	.094	0,03	.001	—	—	0,19	.0075	2,79	.110	●	●	-	-	●	●	●	-	-	-	-	-
NG2125L	2	3,18	.125	0,03	.001	—	—	0,19	.0075	2,79	.110	●	●	-	-	●	-	●	-	-	-	-	-
NG3047L	3	1,19	.047	0,03	.001	—	—	0,19	.0075	1,91	.075	●	●	-	-	●	●	●	-	-	-	-	-
NG3062L	3	1,57	.062	0,03	.001	—	—	0,19	.0075	2,38	.094	●	●	-	-	●	●	●	●	-	-	-	-
NG3072L	3	1,83	.072	0,03	.001	—	—	0,19	.0075	2,39	.094	●	-	-	-	-	-	●	-	-	-	-	-
NG3078L	3	1,98	.078	0,03	.001	—	—	0,19	.0075	2,39	.094	●	-	-	-	-	-	-	-	-	-	-	-
NG3088L	3	2,24	.088	0,03	.001	—	—	0,19	.0075	2,39	.094	●	●	-	-	-	-	●	-	-	-	-	-
NG3094L	3	2,39	.094	0,03	.001	—	—	0,19	.0075	3,81	.150	●	●	-	-	●	●	●	●	-	-	-	-



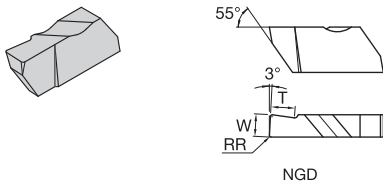
(Groove and Turn • Flat Top — continued)

- first choice
- alternate choice

P												
M												
K												
N												
S												
H												

catalog number	insert size	W		W tol ±		Ap max		RR		T		KC101	KC125	KCP10B	KCP25B	KCP20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425
		mm	in	mm	in	mm	in	mm	in	mm	in												
NG3097L	3	2,46	.097	0,03	.001	—	—	0,32	.0125	3,81	.150	●	●	—	—	—	—	—	—	—	—	—	—
NG3105L	3	2,67	.105	0,03	.001	—	—	0,19	.0075	3,81	.150	●	●	—	—	—	—	●	—	—	—	—	—
NG3110L	3	2,79	.110	0,03	.001	—	—	0,32	.0125	3,81	.150	—	●	—	—	—	—	—	●	—	—	—	—
NG3122L	3	3,10	.122	0,03	.001	—	—	0,19	.0075	3,81	.150	—	●	—	—	—	—	—	—	—	—	—	—
NG3125L	3	3,18	.125	0,03	.001	—	—	0,19	.0075	3,81	.150	●	●	—	—	●	●	●	—	—	—	—	—
NG3142L	3	3,61	.142	0,03	.001	—	—	0,32	.0125	3,81	.150	●	●	—	—	—	—	—	—	—	—	—	—
NG3156L	3	3,96	.156	0,03	.001	—	—	0,19	.0075	3,81	.150	—	●	—	—	—	—	—	●	—	—	—	—
NG3178L	3	4,52	.178	—	.001	—	—	0,19	.0075	3,81	.150	—	—	—	—	—	—	—	—	—	—	—	—
NG3185L	3	4,70	.185	0,03	.001	—	—	0,57	.0225	3,81	.150	—	—	—	—	—	—	—	●	—	—	—	—
NG3189L	3	4,80	.189	0,03	.001	—	—	0,57	.0225	3,81	.150	●	●	—	—	●	●	●	—	—	—	—	—
NG4125L	4	3,18	.125	0,03	.001	—	—	0,19	.0075	3,81	.150	●	●	—	—	—	●	—	—	—	—	—	—
NG4189L	4	4,80	.189	0,03	.001	—	—	0,57	.0225	6,35	.250	●	●	—	—	●	—	—	—	—	—	—	—
NG4189LEST	4	4,80	.189	0,03	.001	—	—	0,57	.0225	6,35	.250	—	—	—	—	—	—	—	—	●	—	—	—
NG4250L	4	6,35	.250	0,03	.001	—	—	0,57	.0225	6,35	.250	●	●	—	—	●	—	●	—	—	—	—	—

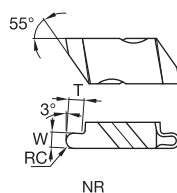
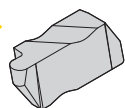
NOTE: All KD and KB grades are single-ended tipped inserts.
Right-hand insert shown; left-hand insert is mirror image.



■ Groove and Turn • Deep Grooving • Flat Top

catalog number	insert size	W		W tol ±		Ap max		RR		T		KC10	KC25	KCP10B	KCP25B	KCP20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425
		mm	in	mm	in	mm	in	mm	in	mm	in												
right hand																							
NGD3189R	3	4,80	.189	0,03	0.001	—	—	0,57	.0225	6,35	.250	●	-	-	-	-	●	-	-	-	-	-	-
NGD4250R	4	6,35	.250	0,03	0.001	—	—	0,57	.0225	12,70	.500	●	-	-	-	-	●	-	-	-	-	-	-
left hand																							
NGD3189L	3	4,80	.189	0,03	0.001	—	—	0,57	.0225	6,35	.250	●	-	-	-	-	●	●	-	-	-	-	-
NGD4250L	4	6,35	.250	0,03	0.001	—	—	0,57	.0225	12,70	.500	●	-	-	-	-	●	●	-	-	-	-	-

NOTE: Inserts have one cutting edge.
Right-hand insert shown; left-hand insert is mirror image.



- first choice

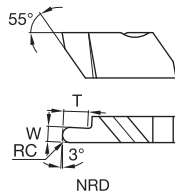
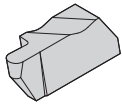
- alternate choice

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

■ Groove and Turn • Full Radius • Flat Top

catalog number	insert size	W		Ap max		RC		T		KCU10	KCU25	KCP10B	KCP25B	KCK20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425
		mm	in	mm	in	mm	in	mm	in												
right hand																					
NR2M050R	2	1,00	.039	—	—	0,50	.0197	1,27	.050	●	●	—	—	—	—	●	●	—	—	—	
NR2M075R	2	1,50	.059	—	—	0,75	.0295	2,79	.110	●	—	—	—	—	—	●	—	—	—	—	
NR2031R	2	1,58	.062	—	—	0,79	.0310	2,79	.110	●	●	—	—	—	—	●	●	—	—	—	
NR2M100R	2	2,00	.079	—	—	1,00	.0394	2,79	.110	●	—	—	—	—	—	●	●	—	—	—	
NR2047R	2	2,39	.094	—	—	1,19	.0470	2,79	.110	—	●	—	—	—	—	—	—	—	—	—	
NR2M125R	2	2,50	.098	—	—	1,25	.0492	2,79	.110	—	—	—	—	—	—	—	●	—	—	—	
NR2M150R	2	3,00	.118	—	—	1,50	.0591	2,79	.110	—	—	—	—	—	—	—	●	—	—	—	
NR2062R	2	3,18	.125	—	—	1,59	.0625	2,79	.110	●	●	—	—	—	—	●	—	—	—	—	
NR2M175R	2	3,50	.138	—	—	1,75	.0689	2,79	.110	—	—	—	—	—	—	—	●	—	—	—	
NR3031R	3	1,58	.062	—	—	0,79	.0310	2,39	.094	●	●	—	—	—	●	●	●	—	—	—	
NR3M100R	3	2,00	.079	—	—	1,00	.0394	2,39	.094	—	—	—	—	—	—	●	—	—	—	—	
NR3047R	3	2,39	.094	—	—	1,19	.0470	3,81	.150	●	●	—	—	—	●	●	—	—	—	—	
NR3M150R	3	3,00	.118	—	—	1,50	.0591	3,81	.150	—	—	—	—	—	—	●	—	—	—	—	
NR3062R	3	3,18	.125	—	—	1,59	.0625	3,81	.150	●	●	—	—	—	●	●	●	—	—	—	
NR3078R	3	3,96	.156	—	—	1,98	.0780	3,81	.150	—	—	—	—	—	●	—	—	—	—	—	
NR3M200R	3	4,00	.157	—	—	2,00	.0787	3,81	.150	—	—	—	—	—	—	●	—	—	—	—	
NR3094R	3	4,78	.188	—	—	2,39	.0940	3,81	.150	●	●	—	—	—	—	●	●	—	—	—	
NR4094R	4	4,78	.188	—	—	2,39	.0940	6,35	.250	—	—	—	—	—	●	—	—	—	—	—	
NR4125R	4	6,35	.250	—	—	3,18	.1250	6,35	.250	●	●	—	—	—	—	●	—	—	—	—	
left hand																					
NR2M050L	2	1,00	.039	—	—	0,50	.0197	1,27	.050	●	●	—	—	—	—	●	—	—	—	—	
NR2031L	2	1,58	.062	—	—	0,79	.0310	2,79	.110	●	●	—	—	—	—	●	●	—	—	—	
NR2M100L	2	2,00	.079	—	—	1,00	.0394	2,79	.110	—	—	—	—	—	—	—	●	—	—	—	
NR2047L	2	2,39	.094	—	—	1,19	.0470	2,79	.110	—	●	—	—	—	—	—	—	—	—	—	
NR2M150L	2	3,00	.118	—	—	1,50	.0591	2,79	.110	—	—	—	—	—	—	—	●	—	—	—	
NR2062L	2	3,18	.125	—	—	1,59	.0625	2,79	.110	●	●	—	—	—	—	●	—	—	—	—	
NR3031L	3	1,58	.062	—	—	0,79	.0310	2,39	.094	●	●	—	—	—	●	●	●	—	—	—	
NR3M100L	3	2,00	.079	—	—	1,00	.0394	2,39	.094	—	—	—	—	—	—	—	●	—	—	—	
NR3047L	3	2,39	.094	—	—	1,19	.0470	3,81	.150	●	●	—	—	—	—	●	—	—	—	—	
NR3M150L	3	3,00	.118	—	—	1,50	.0591	3,81	.150	●	—	—	—	—	—	●	●	—	—	—	
NR3062L	3	3,18	.125	—	—	1,59	.0625	3,81	.150	●	●	—	—	—	—	●	●	—	—	—	
NR3M200L	3	4,00	.157	—	—	2,00	.0787	3,81	.150	—	—	—	—	—	—	—	●	—	—	—	
NR3094L	3	4,78	.188	—	—	2,39	.0940	3,81	.150	—	●	—	—	—	—	●	●	—	—	—	
NR4125L	4	6,35	.250	—	—	3,18	.1250	6,35	.250	—	●	—	—	—	—	●	—	—	—	—	

NOTE: Right-hand insert shown; left-hand insert is mirror image.



- first choice
- alternate choice

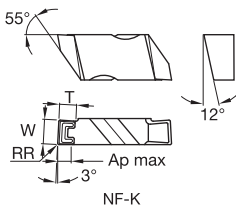
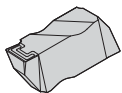
P		●	●	●	○	○	○	●		
M		●	●			○	●	○		
K		○	○	○	○	●	○	○	○	
N		●	○				●	○		●
S		○	●			●	○	○	○	
H		○				○			●	●

Grooving and Cut-Off

■ Groove and Turn • Deep Grooving • Full Radius • Flat Top

	W									Ap max		RC		T		KC U10	KC U25	KCP10B	KCP25B	KCK20B K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425				
catalog number	insert size	mm	in	mm	in	mm	in	mm	in																					
right hand																														
NRD3031R	3	1,58	.062	—	—	0,79	.0310	3,18	.125	●	●	-	-	-	-	●	●	-	-	-	-	-	-	-	-	-				
NRD3062R	3	3,17	.125	—	—	1,59	.0625	6,35	.250	●	●	-	-	-	-	●	●	-	-	-	-	-	-	-	-	-				
NRD4062R	4	3,18	.125	—	—	1,59	.0625	6,35	.250	●	●	-	-	-	-	●	-	-	-	-	-	-	-	-	-	-				
NRD4094R	4	4,78	.188	—	—	2,39	.0940	12,70	.500	●	-	-	-	-	-	●	-	-	-	-	-	-	-	-	-	-				
NRD4125R	4	6,35	.250	—	—	3,18	.1250	12,70	.500	-	●	-	-	-	-	●	-	-	-	-	-	-	-	-	-	-				
left hand																														
NRD3031L	3	1,58	.062	—	—	0,79	.0310	3,18	.125	●	●	-	-	-	-	●	●	-	-	-	-	-	-	-	-	-				
NRD3062L	3	3,17	.125	—	—	1,59	.0625	6,35	.250	●	●	-	-	-	-	●	●	-	-	-	-	-	-	-	-	-				
NRD4062L	4	3,18	.125	—	—	1,59	.0625	6,35	.250	●	●	-	-	-	-	●	●	-	-	-	-	-	-	-	-	-				
NRD4094L	4	4,78	.188	—	—	2,39	.0940	12,70	.500	●	●	-	-	-	-	●	-	-	-	-	-	-	-	-	-	-				
NRD4125L	4	6,35	.250	—	—	3,18	.1250	12,70	.500	●	●	-	-	-	-	●	●	-	-	-	-	-	-	-	-	-				

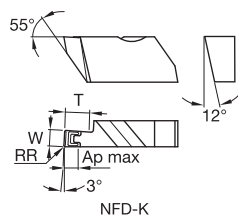
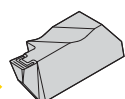
NOTE: Inserts have one cutting edge.
Right-hand insert shown; left-hand insert is mirror image.



■ Face Grooving • Chip Control

catalog number	insert size	W		W tol ±		Ap max		RR		T		KC10	KC25	KCP10B	KCP25B	KCK20B K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425	
		mm	in	mm	in	mm	in	mm	in	mm	in												
right hand																							
NF3M200RK	3	2,00	.079	0,03	0.001	1,02	.040	0,19	.0075	1,78	.070	–	–	–	–	–	–	●	–	–	–	–	
NF3M300RK	3	3,00	.118	0,03	0.001	1,02	.040	0,19	.0075	3,81	.150	–	–	–	–	–	–	●	–	–	–	–	
NF3125RK	3	3,18	.125	0,03	0.001	1,02	.040	0,19	.0075	3,81	.150	–	●	–	–	–	–	●	–	–	–	–	
NF3156RK	3	3,96	.156	0,03	0.001	2,92	.115	0,19	.0075	3,81	.150	–	●	–	–	–	–	–	–	–	–	–	
left hand																							
NF3M200LK	3	2,00	.079	0,03	0.001	1,02	.040	0,19	.0075	1,78	.070	–	–	–	–	–	–	●	–	–	–	–	
NF3M300LK	3	3,00	.118	0,03	0.001	1,02	.040	0,19	.0075	3,81	.150	–	–	–	–	–	–	●	–	–	–	–	
NF3125LK	3	3,18	.125	0,03	0.001	1,02	.040	0,19	.0075	3,81	.150	–	●	–	–	–	–	●	–	–	–	–	
NF3156LK	3	3.96	.156	0,03	0.001	2.92	.115	0.19	.0075	3.81	.150	–	●	–	–	–	–	–	–	–	–	–	

NOTE: Right-hand insert shown; left-hand insert is mirror image.



- first choice

- alternate choice

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

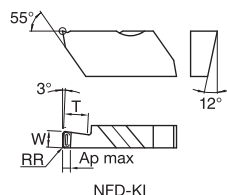
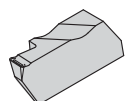
■ Face Grooving • Deep Grooving • Chip Control

catalog number	insert size	W		W tol ±		Ap max		RR		T		KC100	KC125	KCP10B	KCP25B	KC120B	K313	KC5010	KT315	KB1630	KB5625	KB425
		mm	in	mm	in	mm	in	mm	in	mm	in											
right hand																						
NFD3M300RK	3	3,00	.118	0,03	0.001	1,02	.040	0,19	.0075	6,35	.250	-	-	-	-	-	-	-	●	-	-	-
NFD3125RK	3	3,18	.125	0,03	0.001	1,02	.040	0,19	.0075	6,35	.250	-	●	-	-	-	-	-	●	-	-	-
NFD4189RK	4	4,80	.189	0,03	0.001	2,92	.115	0,57	.0225	9,53	.375	-	●	-	-	-	-	-	-	-	-	-
NFD4250RK	4	6,35	.250	0,03	0.001	3,81	.150	0,57	.0225	12,70	.500	-	●	-	-	-	-	-	-	-	-	-
left hand																						
NFD3M300LK	3	3,00	.118	0,03	0.001	1,02	.040	0,19	.0075	6,35	.250	-	-	-	-	-	-	-	●	-	-	-
NFD3125LK	3	3,18	.125	0,03	0.001	1,02	.040	0,19	.0075	6,35	.250	-	●	-	-	-	-	-	●	-	-	-
NFD4189LK	4	4,80	.189	0,03	0.001	2,92	.115	0,57	.0225	9,53	.375	-	●	-	-	-	-	-	●	-	-	-
NFD4250LK	4	6,35	.250	0,03	0.001	3,81	.150	0,57	.0225	12,70	.500	-	●	-	-	-	-	-	-	-	-	-

NOTE: Inserts have one cutting edge.

Right-hand insert shown; left-hand insert is mirror image.

- Face grooving deep grooving inserts.



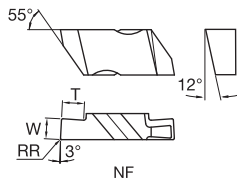
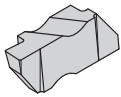
■ Face Grooving • Internal Deep Grooving • Chip Control

[illegible]

NOTE: Inserts have one cutting edge.

NFD-KI inserts are compatible with NS-style boring bars only.

Right-hand insert shown; left-hand insert is mirror image.



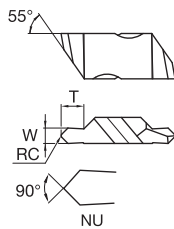
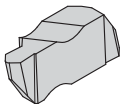
- first choice
- alternate choice

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

■ Face Grooving • Flat Top

[illegible]

NOTE: Right-hand insert shown; left-hand insert is mirror image.

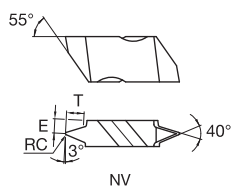
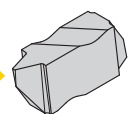


■ Groove and Turn • Flat Top • 90°

catalog number	insert size	W		Ap max		RC		T		KC10	KC25	KCP10B	KCP25B	KCK20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425
		mm	in	mm	in	mm	in	mm	in												
right hand																					
NU3094R	3	2,39	.094	—	—	0,51	.0200	3,18	.125	-	-	-	-	-	-	-	●	-	-	-	-
NU3125R	3	3,18	.125	—	—	1,19	.0470	4,78	.188	-	●	-	-	-	-	-	-	-	-	-	-
left hand																					
NU3094L	3	2,39	.094	—	—	0,51	.0200	3,18	.125	-	●	-	-	-	-	-	●	-	-	-	-
NU3125L	3	3,18	.125	—	—	1,19	.0470	4,78	.188	-	-	-	-	-	-	-	●	-	-	-	-
NU3156L	3	3,96	.156	—	—	1,19	.0470	4,78	.188	-	-	-	-	-	-	-	●	-	-	-	-

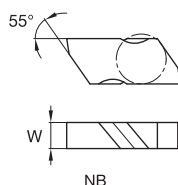
NOTE: Tolerance on W $\pm .005$ " ($\pm 0,13\text{mm}$).
Right-hand insert shown; left-hand insert is mirror image.
NU inserts compatible with NR-style inserts.

- ## Grooving and Cut-Off



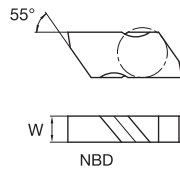
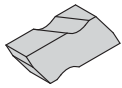
P														
M														
K														
N														
S														
H														

catalog number	insert size	E		RC		T		KCU10	KCU25	KCP10B	KCP25B	KCK20B	KC313	KC5010	KT315	KB1630	KB5625
		mm	in	mm	in	mm	in										
right hand																	
NV3RJ	3	3,18	.125	0,32	.0125	2,21	.087	-	●	-	-	-	-	-	-	-	-
NV4RL	4	3,00	.118	0,32	.0125	5,11	.201	-	●	-	-	-	-	-	-	-	-
left hand																	
NV4LL	4	3,00	.118	0,32	.0125	5,11	.201	-	●	-	-	-	-	-	-	-	-



catalog number	insert size	W		W tol ±		Ap max		RR		T		KC10	KC125	KCP10B	KCP25B	KCK20B	K313	KC5010	KT315	KB1630	KB5625	KC1425
		mm	in	mm	in	mm	in	mm	in	mm	in											
right hand																						
NB2R	2	3,84	.151	—	—	—	—	—	—	—	—	—	—	—	—	—	●	—	—	—	—	—
NB3R	3	4,95	.195	—	—	—	—	—	—	—	—	—	—	—	—	—	●	—	—	—	—	—
NB4R	4	6,48	.255	—	—	—	—	—	—	—	—	—	—	—	—	—	●	—	—	—	—	—
left hand																						
NB2L	2	3,84	.151	—	—	—	—	—	—	—	—	—	—	—	—	—	●	—	—	—	—	—
NB3L	3	4,95	.195	—	—	—	—	—	—	—	—	—	—	—	—	—	●	—	—	—	—	—
NB4L	4	6,48	.255	—	—	—	—	—	—	—	—	—	—	—	—	—	●	—	—	—	—	—

C176



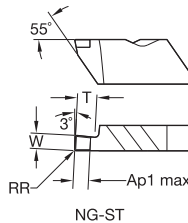
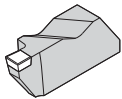
- first choice
- alternate choice

P											
M											
K											
N											
S											
H											

■ Groove and Turn • Deep Grooving • Blank

catalog number	insert size	W		W tol ±		Ap max		RR		T		KCU10	KCU25	KCP10B	KCP25B	KCP20B	K313	KC5010	KC5025	KT315	KB1630	KB5625	KD1425
		mm	in	mm	in	mm	in	mm	in	mm	in												
right hand																							
NBD2R	2	3,81	.150	—	—	—	—	—	—	—	—	-	-	-	-	-	●	-	-	-	-	-	-
NBD3R	3	4,95	.195	—	—	—	—	—	—	—	—	-	-	-	-	-	●	-	-	-	-	-	-
left hand																							
NBD3L	3	4,95	.195	—	—	—	—	—	—	—	—	-	-	-	-	-	●	-	-	-	-	-	-

NOTE: NB and NBD blanks are designed to allow modification of the W-dimension and end form.
W-dimension is provided to indicate maximum possible width. Available only in uncoated grades.
Right-hand insert shown; left-hand insert is mirror image.



■ Groove and Turn • Flat Top • PcBN

[illegible]

NOTE: All KB grades are single-ended tipped inserts.
Right-hand insert shown; left-hand insert is mirror image.

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.

[illegible]

NSR164D

N

Insert Holding Method



N =
Top Notch*

S

Insert
Mounting
Location

R

Hand
of Tool



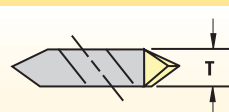
DH =
Drop Head

16

Shank
Size

4

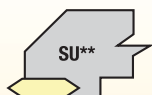
Insert
Size



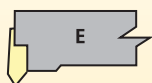
insert size	T	
	in	mm
2	.150	3,81
3	.195	4,95
4	.255	6,98
5	.380	9,65
6	.383	9,73
8	.438	11,13

D

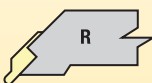
Qualified
Surface and
Length



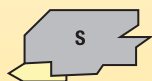
SU = Side mount utility**



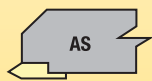
E = End



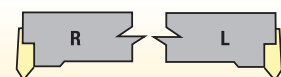
R = Undercut



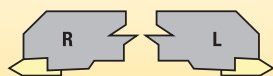
S = Side mount, offset



AS = Side mount, no offset



End mount



Side mount

inch:

This position will show a significant two-digit number that indicates the holder cross section. For shanks 5/8" square and larger, the number will represent the number of sixteenths of width and height. For shanks under 5/8" square, the number of sixteenths of cross section will be preceded by a zero. For rectangular holders, the first digit represents the number of eighths of width and the second digit the number of quarters of height, except for a toolholder 1-1/4" x 1-1/2", which is given the number 91.

metric:

Shank height and width in millimeters and holder length according to ISO standard.

- A** = Qualified back and end, 4" long
B = Qualified back and end, 4.5" long
C = Qualified back and end, 5" long
D = Qualified back and end, 6" long
E = Qualified back and end, 7" long
V = Qualified back and end, 3.5" long*
Q = Qualified metric holder

* Kennametal proprietary standard only.

** Side mount utility holder can only use NTU inserts.

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.

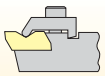
Top Notch™ Integral Toolholders

Integral Design	Shank Size	Shank Length	Shank Material	Shank Finish	Shank Tolerance	Shank Hardness	Shank Strength	Shank Weight	Shank Price
NSR2525M4	25	25	15	15	15	15	15	15	15

NSR2525M4

N

Insert Holding Method



N = Top Notch

S

Insert Mounting Location

R

Hand of Tool

Drop Head

2525

Shank size

M

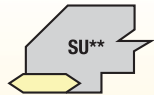
Tool Length

4

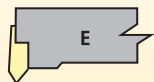
Insert Size

Qualified Surface and Length

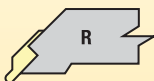
Q = Qualified metric holder



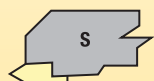
SU = Side mount utility



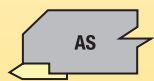
E = End



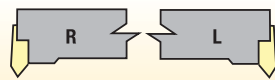
R = Undercut



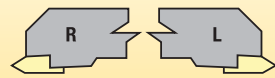
S = Side mount, offset



AS = Side mount, no offset



End mount



Side mount

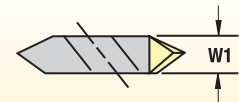
inch:

This position will show a significant two-digit number that indicates the holder cross section. For shanks 5/8" square and larger, the number will represent the number of sixteenths of width and height. For shanks under 5/8" square, the number of sixteenths of cross section will be preceded by a zero. For rectangular holders, the first digit represents the number of eighths of width and the second digit the number of quarters of height, except for a toolholder 1-1/4" x 1-1/2", which is given the number 91.

metric:

Shank height and width in millimeter and holder length according to ISO standard.

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



insert size	W1	
	in	mm
2	.150	3,81
3	.195	4,95
4	.255	6,98
5	.380	9,65
6	.383	9,73
8	.438	11,13

* Kennametal proprietary standard only.

** Side mount utility holder can only use NTU inserts.



KENDAMEI

Grooving and Cut-Off
The "Multi" Integral Grooving Bar



Steel Grooving Bar






order number	cutting material	3/4"	1"	1 1/4"	1 1/2"	1 3/4"	2"	3"	4"	5"	6"	7"	8"	9"	10"	12"	15"	18"	20"	24"	30"	36"	42"	48"	54"	60"	72"	84"	96"	108"	120"	144"	168"	192"	216"	240"	264"	288"	312"	336"	360"	384"	408"	432"	456"	480"	504"	528"	552"	576"	600"	624"	648"	672"	696"	720"	744"	768"	792"	816"	840"	864"	888"	912"	936"	960"	984"	1008"	1032"	1056"	1080"	1104"	1128"	1152"	1176"	1200"	1224"	1248"	1272"	1296"	1320"	1344"	1368"	1392"	1416"	1440"	1464"	1488"	1512"	1536"	1560"	1584"	1608"	1632"	1656"	1680"	1704"	1728"	1752"	1776"	1800"	1824"	1848"	1872"	1896"	1920"	1944"	1968"	1992"	2016"	2040"	2064"	2088"	2112"	2136"	2160"	2184"	2208"	2232"	2256"	2280"	2304"	2328"	2352"	2376"	2400"	2424"	2448"	2472"	2496"	2520"	2544"	2568"	2592"	2616"	2640"	2664"	2688"	2712"	2736"	2760"	2784"	2808"	2832"	2856"	2880"	2904"	2928"	2952"	2976"	3000"	3024"	3048"	3072"	3096"	3120"	3144"	3168"	3192"	3216"	3240"	3264"	3288"	3312"	3336"	3360"	3384"	3408"	3432"	3456"	3480"	3504"	3528"	3552"	3576"	3600"	3624"	3648"	3672"	3696"	3720"	3744"	3768"	3792"	3816"	3840"	3864"	3888"	3912"	3936"	3960"	3984"	4008"	4032"	4056"	4080"	4104"	4128"	4152"	4176"	4200"	4224"	4248"	4272"	4296"	4320"	4344"	4368"	4392"	4416"	4440"	4464"	4488"	4512"	4536"	4560"	4584"	4608"	4632"	4656"	4680"	4704"	4728"	4752"	4776"	4800"	4824"	4848"	4872"	4896"	4920"	4944"	4968"	4992"	5016"	5040"	5064"	5088"	5112"	5136"	5160"	5184"	5208"	5232"	5256"	5280"	5304"	5328"	5352"	5376"	5400"	5424"	5448"	5472"	5496"	5520"	5544"	5568"	5592"	5616"	5640"	5664"	5688"	5712"	5736"	5760"	5784"	5808"	5832"	5856"	5880"	5904"	5928"	5952"	5976"	6000"	6024"	6048"	6072"	6096"	6120"	6144"	6168"	6192"	6216"	6240"	6264"	6288"	6312"	6336"	6360"	6384"	6408"	6432"	6456"	6480"	6504"	6528"	6552"	6576"	6600"	6624"	6648"	6672"	6696"	6720"	6744"	6768"	6792"	6816"	6840"	6864"	6888"	6912"	6936"	6960"	6984"	7008"	7032"	7056"	7080"	7104"	7128"	7152"	7176"	7200"	7224"	7248"	7272"	7296"	7320"	7344"	7368"	7392"	7416"	7440"	7464"	7488"	7512"	7536"	7560"	7584"	7608"	7632"	7656"	7680"	7704"	7728"	7752"	7776"	7800"	7824"	7848"	7872"	7896"	7920"	7944"	7968"	7992"	8016"	8040"	8064"	8088"	8112"	8136"	8160"	8184"	8208"	8232"	8256"	8280"	8304"	8328"	8352"
--------------	------------------	------	----	--------	--------	--------	----	----	----	----	----	----	----	----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------

A32NER3

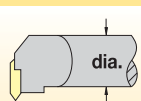
Inch

A

Bar
Type

32

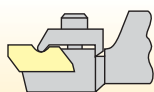
Bar
Diameter



Bar diameter in millimeters

N

Insert Holding Method



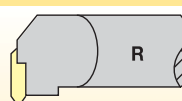
$N^* =$
Top Notch

E

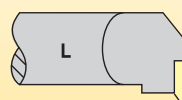
Insert
Location

R

Hand
of Bar



R = Right hand

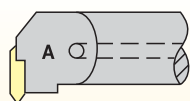


L = Left hand

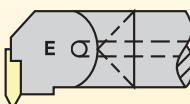
3

Insert
Size

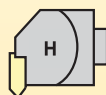
Additional Information



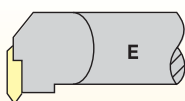
A = Steel with coolant



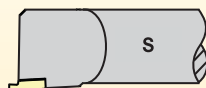
E = Carbide with coolant



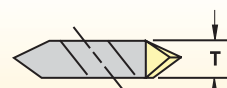
H = Interchangeable head



E = End mount

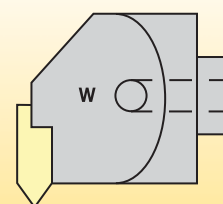


S = Straight mount



insert size	T	
	mm	in
1	3,54	.100
2	3,81	.150
3	5,35	.195
4	6,40	.255
5	9,65	.380
6	9,73	.383
8	11,13	.438

through coolant
interchangeable head



*Kennametal standard only.

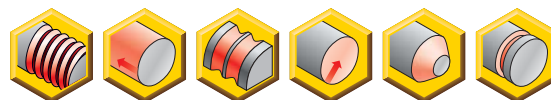
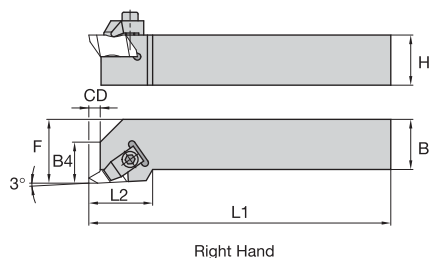
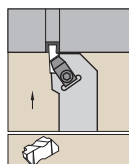
How Do Catalog Numbers Work?

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.

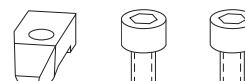
A25RNNNTOR2

Metric								
A	25	R	N	N	T	0	R	2
Bar Type	Bar Diameter	Bar Length	Insert Holding Method	Insert Shape	Insert Location	Rake Angle	Hand of Bar	Insert Size
Bar diameter in millimeters	N* = Top Notch	R = Right hand L = Left hand	End mount Straight mount	A = Steel with coolant E = Carbide with coolant H = Interchangeable head	metric bars: K = 125mm M = 150mm Q = 180mm R = 200mm S = 250mm T = 300mm U = 350mm	N* = Top Notch	R = Right hand L = Left hand	N* = Top Notch

*Kennametal standard only.

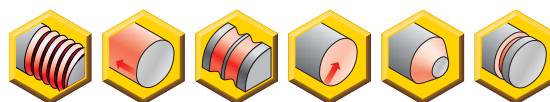
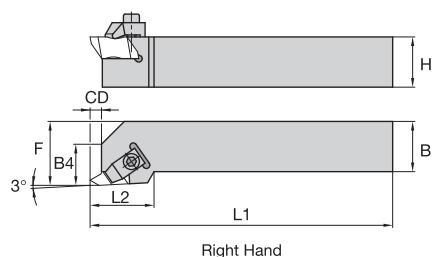
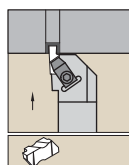


■ Integral Straight • Inch

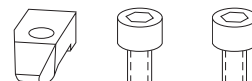


order number	catalog number	H	B	F	L1	LH	B4	CD	gage insert	clamp	clamp screw	clamp screw	hex/Torx Plus
right hand													
1095583	NSR062	.375	.375	.562	2.50	.75	.35	.138	N.2R	CM74	—	S310	7/64
1097608	NSR082V	.500	.500	.750	3.50	.75	.35	.138	N.2R	CM74	—	S310	7/64
1097609	NSR102B	.625	.625	.875	4.50	.75	.35	.138	N.2R	CM74	—	S310	7/64
1097584	NSR122B	.750	.750	1.000	4.50	.75	.35	.138	N.2R	CM74	—	S310	7/64
1097585	NSR162C	1.000	1.000	1.250	5.00	.75	.35	.138	N.2R	CM74	—	S310	7/64
1097590	NSR123A	.750	.750	1.000	4.00	1.25	.50	.210	N.3R	CM72LP	S2112	—	25 IP
1097586	NSR123B	.750	.750	1.000	4.50	1.25	.50	.210	N.3R	CM72LP	S2112	—	25 IP
1097587	NSR163C	1.000	1.000	1.250	5.00	1.25	.50	.210	N.3R	CM72LP	S2112	—	25 IP
1016462	NSR163D	1.000	1.000	1.250	6.00	1.25	.50	.210	N.3R	CM72LP	S2112	—	25 IP
1097588	NSR203D	1.250	1.250	1.500	6.00	1.25	.50	.210	N.3R	CM72LP	S2112	—	25 IP
1097589	NSR243D	1.500	1.500	2.000	6.00	1.38	.50	.210	N.3R	CM72LP	S2112	—	25 IP
1097596	NSR243E	1.500	1.500	2.000	7.00	1.38	.50	.210	N.3R	CM72LP	S2112	—	25 IP
1097591	NSR853D	1.250	1.000	1.250	6.00	1.25	.50	.210	N.3R	CM72LP	S2112	—	25 IP
1097601	NSR205D	1.250	1.250	1.500	6.00	2.00	.61	.415	N.5R	CM80	—	S352	1/4
1016474	NSR245D	1.500	1.500	2.000	6.00	2.00	.61	.415	N.5R	CM80	—	S352	1/4
left hand													
1095582	NSL062	.375	.375	.562	2.50	.75	.35	.138	N.2L	CM75	—	S310	7/64
1097278	NSL082V	.500	.500	.750	3.50	.75	.35	.138	N.2L	CM75	—	S310	7/64
1097279	NSL102B	.625	.625	.875	4.50	.75	.35	.138	N.2L	CM75	—	S310	7/64
1097254	NSL122B	.750	.750	1.000	4.50	.75	.35	.138	N.2L	CM75	—	S310	7/64
1097255	NSL162C	1.000	1.000	1.250	5.00	.75	.35	.138	N.2L	CM75	—	S310	7/64
1097261	NSL123A	.750	.750	1.000	4.00	1.25	.50	.210	N.3L	CM73LP	S2112	—	25 IP
1097256	NSL123B	.750	.750	1.000	4.50	1.25	.50	.210	N.3L	CM73LP	S2112	—	25 IP
1097257	NSL163C	1.000	1.000	1.250	5.00	1.25	.50	.210	N.3L	CM73LP	S2112	—	25 IP
1097260	NSL163D	1.000	1.000	1.250	6.00	1.25	.50	.210	N.3L	CM73LP	S2112	—	25 IP
1097258	NSL203D	1.250	1.250	1.500	6.00	1.25	.50	.210	N.3L	CM73LP	S2112	—	25 IP
1097259	NSL243D	1.500	1.500	2.000	6.00	1.38	.50	.210	N.3L	CM73LP	S2112	—	25 IP
1097267	NSL243E	1.500	1.500	2.000	7.00	1.38	.50	.210	N.3L	CM73LP	S2112	—	25 IP
1097262	NSL853D	1.250	1.000	1.250	6.00	1.25	.50	.210	N.3L	CM73LP	S2112	—	25 IP
1097272	NSL205D	1.250	1.250	1.500	6.00	2.00	.61	.415	N.5L	CM81	—	S352	1/4

NOTE: F dimension measured over sharp point of N-style threading insert.

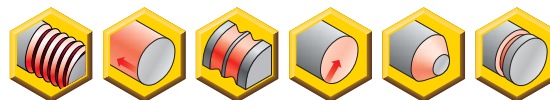
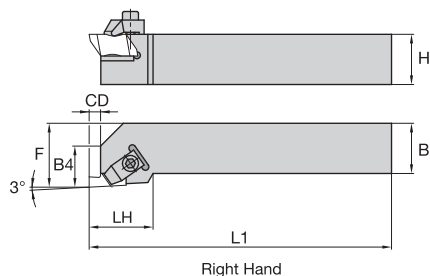
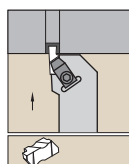


■ Integral Straight • Metric



order number	catalog number	H	B	F	L1	LH	B4	CD	gage insert	clamp	clamp screw	clamp screw	hex (mm)/ Torx Plus
right hand													
1098790	NSR1010E2	10	10	14	70	19	9	3,5	N.2R	CM74	MS1200	—	T10
1098791	NSR1212F2	12	12	16	80	19	9	3,5	N.2R	CM74	MS1200	—	T10
1098792	NSR1616H2	16	16	20	100	19	9	3,5	N.2R	CM74	MS1200	—	T10
1098793	NSR2020K2	20	20	25	125	19	9	3,5	N.2R	CM74	MS1200	—	T10
1098794	NSR2525M2	25	25	32	150	19	9	3,5	N.2R	CM74	MS1200	—	T10
1098795	NSR2020K3	20	20	25	125	32	13	5,3	N.3R	CM72LP	—	MS2111	25 IP
1098796	NSR2525M3	25	25	32	150	32	13	5,3	N.3R	CM72LP	—	MS2111	25 IP
1098797	NSR3225P3	32	25	32	170	32	13	5,3	N.3R	CM72LP	—	MS2111	25 IP
1098798	NSR3232P3	32	32	40	170	32	13	5,3	N.3R	CM72LP	—	MS2111	25 IP
1098799	NSR2525M4	25	25	32	150	35	14	7,5	N.4R	CM72LP	—	MS2111	25 IP
1098800	NSR3225P4	32	25	32	170	35	14	7,5	N.4R	CM72LP	—	MS2111	25 IP
1098801	NSR3232P4	32	32	40	170	35	14	7,5	N.4R	CM72LP	—	MS2111	25 IP
left hand													
1098861	NSL1010E2	10	10	14	70	19	9	3,5	N.2L	CM75	MS1200	—	T10
1098862	NSL1212F2	12	12	16	80	19	9	3,5	N.2L	CM75	MS1200	—	T10
1098863	NSL1616H2	16	16	20	100	19	9	3,5	N.2L	CM75	MS1200	—	T10
1098864	NSL2020K2	20	20	25	125	19	9	3,5	N.2L	CM75	MS1200	—	T10
1098865	NSL2525M2	25	25	32	150	19	9	3,5	N.2L	CM75	MS1200	—	T10
1098866	NSL2020K3	20	20	25	125	32	13	5,3	N.3L	CM73LP	—	MS2111	25 IP
1098867	NSL2525M3	25	25	32	150	32	13	5,3	N.3L	CM73LP	—	MS2111	25 IP
1098868	NSL3225P3	32	25	32	170	32	13	5,3	N.3L	CM73LP	—	MS2111	25 IP
1098869	NSL3232P3	32	32	40	170	32	13	5,3	N.3L	CM73LP	—	MS2111	25 IP
1098870	NSL2525M4	25	25	32	150	35	14	7,5	N.4L	CM73LP	—	MS2111	25 IP
1098871	NSL3225P4	32	25	32	170	35	14	7,5	N.4L	CM73LP	—	MS2111	25 IP
1098872	NSL3232P4	32	32	40	170	35	14	7,5	N.4L	CM73LP	—	MS2111	25 IP

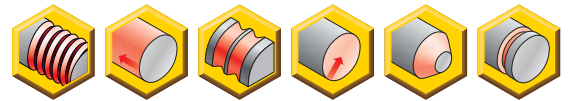
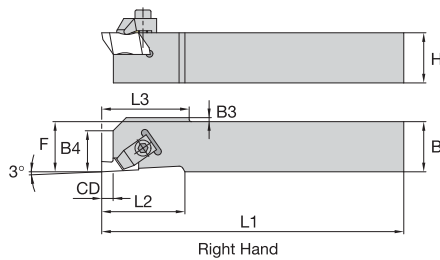
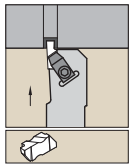
NOTE: F dimension measured over sharp point of N-style threading insert.



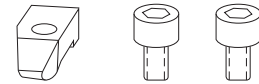
■ Integral Straight w/ Shim • Inch



order number	catalog number	H	B	F	L1	LH	B4	CD	gage insert	shim	shim screw	wrench size shim screw	clamp	socket-head cap screw	button-head cap screw	hex/Torx Plus
right hand																
1097592	NSR164C	1.000	1.000	1.250	5.00	1.38	.54	.294	N.4R	SM420	SL344	—	CM72LP	—	S2112	25 IP
1097595	NSR164D	1.000	1.000	1.250	6.00	1.38	.54	.294	N.4R	SM420	SL344	—	CM72LP	—	S2112	25 IP
1097600	NSR204C	1.250	1.250	1.500	5.00	1.38	.54	.294	N.4R	SM420	SL344	—	CM72LP	—	S2112	25 IP
1097593	NSR204D	1.250	1.250	1.500	6.00	1.38	.54	.294	N.4R	SM420	SL344	—	CM72LP	—	S2112	25 IP
1097594	NSR244D	1.500	1.500	2.000	6.00	1.50	.54	.294	N.4R	SM420	SL344	—	CM72LP	—	S2112	25 IP
1097597	NSR244E	1.500	1.500	2.000	7.00	1.50	.54	.294	N.4R	SM420	SL344	—	CM72LP	—	S2112	25 IP
1097598	NSR854D	1.250	1.000	1.250	6.00	1.38	.54	.294	N.4R	SM420	SL344	—	CM72LP	—	S2112	25 IP
1097599	NSR864E	1.500	1.000	1.250	7.00	1.38	.54	.294	N.4R	SM420	SL344	—	CM72LP	—	S2112	25 IP
1097604	NSR166D	1.000	1.000	1.250	6.00	1.38	.67	.334	N.6R	SM416	S111	1/16	CM120	S412	—	5/32
1097602	NSR206D	1.250	1.250	1.500	6.00	1.38	.67	.334	N.6R	SM416	S111	1/16	CM120	S412	—	5/32
1097603	NSR246D	1.500	1.500	2.000	6.00	1.50	.67	.334	N.6R	SM416	S111	1/16	CM120	S412	—	5/32
1097605	NSR168D	1.000	1.000	1.250	6.00	1.25	.72	.225	N.8R	SM419	S112	1/16	CM144	S422	—	3/16
left hand																
1097263	NSL164C	1.000	1.000	1.250	5.00	1.38	.54	.294	N.4L	SM420	SL344	—	CM73LP	—	S2112	25 IP
1097266	NSL164D	1.000	1.000	1.250	6.00	1.38	.54	.294	N.4L	SM420	SL344	—	CM73LP	—	S2112	25 IP
1097271	NSL204C	1.250	1.250	1.500	5.00	1.38	.54	.294	N.4L	SM420	SL344	—	CM73LP	—	S2112	25 IP
1097264	NSL204D	1.250	1.250	1.500	6.00	1.38	.54	.294	N.4L	SM420	SL344	—	CM73LP	—	S2112	25 IP
1097265	NSL244D	1.500	1.500	2.000	6.00	1.50	.54	.294	N.4L	SM420	SL344	—	CM73LP	—	S2112	25 IP
1097268	NSL244E	1.500	1.500	2.000	7.00	1.50	.54	.294	N.4L	SM420	SL344	—	CM73LP	—	S2112	25 IP
1097269	NSL854D	1.250	1.000	1.250	6.00	1.38	.54	.294	N.4L	SM420	SL344	—	CM73LP	—	S2112	25 IP
1097275	NSL166D	1.000	1.000	1.250	6.00	1.38	.67	.334	N.6L	SM416	S111	1/16	CM121	S412	—	5/32
1097273	NSL206D	1.250	1.250	1.500	6.00	1.38	.67	.334	N.6L	SM416	S111	1/16	CM121	S412	—	5/32
1097274	NSL246D	1.500	1.500	2.000	6.00	1.50	.67	.334	N.6L	SM416	S111	1/16	CM121	S412	—	5/32

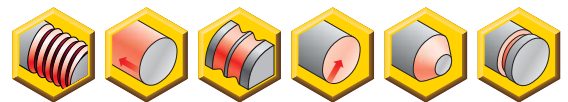
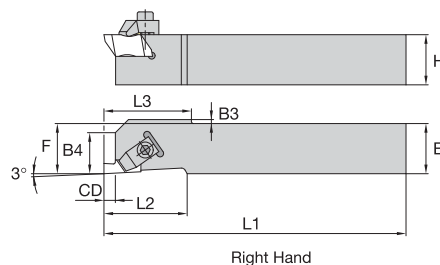
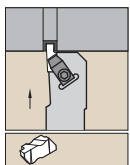


■ Integral Straight • No Offset • Inch

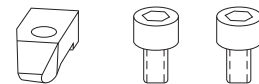


order number	catalog number	H	B	F	L1	LH	B4	CD	B3	L3	gage insert	clamp	clamp screw	clamp screw	hex/Torx Plus
right hand															
1095671	NASR062D	.375	.375	.375	6.00	.75	.35	.700	.070	.875	N.2R	CM182	—	S310	7/64
1095670	NASR082D	.500	.500	.500	6.00	.75	.35	.138	—	—	N.2R	CM182	—	S310	7/64
1095576	NASR102B	.625	.625	.625	4.50	.75	.35	.138	—	—	N.2R	CM74	—	S310	7/64
1095574	NASR083D	.500	.500	.500	6.00	1.25	.50	.210	.125	1.324	N.3R	CM184LP	S2112	—	25 IP
1095668	NASR103B	.625	.625	.625	4.50	1.30	—	.210	—	—	N.3R	CM184LP	S2112	—	25 IP
left hand															
1095675	NASL062D	.375	.375	.375	6.00	.75	.35	.700	.070	.875	N.2L	CM183	—	S310	7/64
1095674	NASL082D	.500	.500	.500	6.00	.75	.35	.138	—	—	N.2L	CM183	—	S310	7/64
1095577	NASL102B	.625	.625	.625	4.50	.75	.35	.138	—	—	N.2L	CM75	—	S310	7/64
1095575	NASL083D	.500	.500	.500	6.00	1.25	.50	.210	.125	1.324	N.3L	CM185LP	S2112	—	25 IP
1095672	NASL103B	.625	.625	.625	4.50	1.30	—	.210	—	—	N.3L	CM185LP	S2112	—	25 IP

NOTE: F dimension measured over sharp point of N-style threading insert.

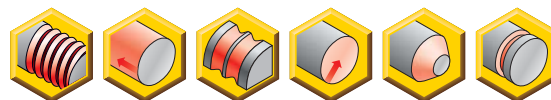
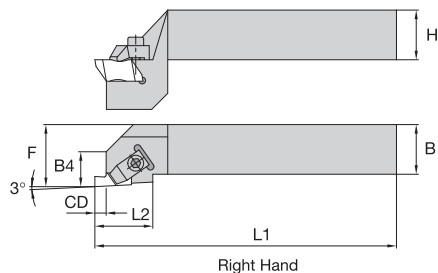
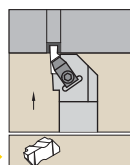


■ Integral Straight • No Offset • Metric

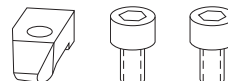


order number	catalog number	H	B	F	L1	LH	B4	CD	B3	L3	gage insert	clamp	clamp screw	clamp screw	hex (mm)/Torx Plus
right hand															
1098788	NASR1010M2Q	10	10	10	150	19	9	3,5	2,03	19	N.2R	CM182	MS1200	—	T10
1098789	NASR1212M2Q	12	12	12	150	19	9	3,5	—	—	N.2R	CM182	MS1200	—	T10
1098786	NASR1616K3Q	16	16	16	125	32	13	5,3	—	—	N.3R	CM184LP	—	MS2111	25 IP
left hand															
1098859	NASL1010M2Q	10	10	10	150	19	9	3,5	2,03	19	N.2L	CM183	MS1200	—	T10
1098860	NASL1212M2Q	12	12	12	150	19	9	6,9	—	—	N.2L	CM183	MS1200	—	T10
1098857	NASL1616K3Q	16	16	16	125	32	13	5,3	—	—	N.3L	CM185LP	—	MS2111	25 IP

NOTE: F dimension measured over sharp point of N-style threading insert.

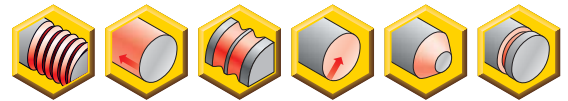
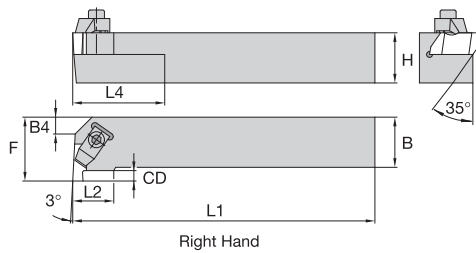
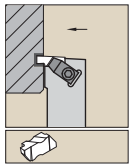


■ Integral Straight • Drop Head • Inch

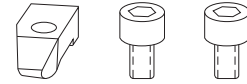


order number	catalog number	H	B	F	L1	LH	B4	CD	gage insert	clamp	clamp screw	clamp screw	hex/Torx Plus	wrench size jack screw
right hand														
1097644	NSRDH122B	.750	.750	1.000	4.50	.75	.40	.130	N.2R	CM74	—	S310	7/64	1/8
1097645	NSRDH162C	1.000	1.000	1.250	5.00	.75	.40	.138	N.2R	CM74	—	S310	7/64	1/8
1097649	NSRDH123A	.750	.750	1.250	4.00	1.25	.58	.210	N.3R	CM72LP	S2112	—	25 IP	—
1097646	NSRDH163C	1.000	1.000	1.250	5.00	1.25	.58	.210	N.3R	CM72LP	S2112	—	25 IP	—
1097648	NSRDH163D	1.000	1.000	1.250	6.00	1.25	.58	.210	N.3R	CM72LP	S2112	—	25 IP	—
1097647	NSRDH203D	1.250	1.250	1.500	6.00	1.25	.62	.210	N.3R	CM72LP	S2112	—	25 IP	3/16
1097650	NSRDH204D	1.250	1.250	1.500	6.00	1.38	.62	.294	N.4R	CM72LP	S2112	—	25 IP	3/16
left hand														
1097681	NSLDH203D	1.250	1.250	1.500	6.00	1.25	.62	.210	N.3L	CM73LP	S2112	—	25 IP	3/16

NOTE: F dimension measured over sharp point of N-style threading insert.

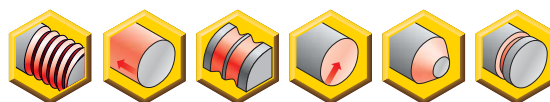
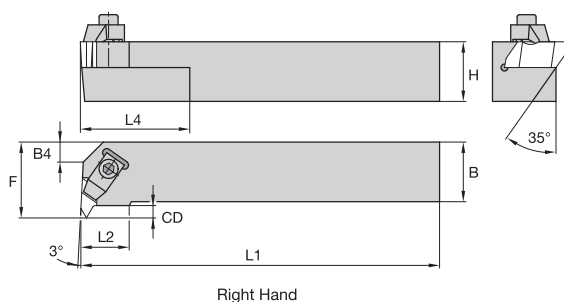
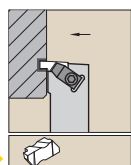


Integral End Mount • Inch

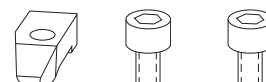


order number	catalog number	H	B	F	L1	LH	B4	CD	L4	gage insert	clamp	clamp screw	clamp screw	hex/Torx Plus
right hand														
1095581	NER062	.375	.375	.750	2.50	.50	—	.138	1.0	N.2L	CM75	—	S310	7/64
1097577	NER082V	.500	.500	.750	3.50	.50	—	.138	1.0	N.2L	CM75	—	S310	7/64
1097578	NER102B	.625	.625	.750	4.50	—	—	.138	1.0	N.2L	CM75	—	S310	7/64
1097559	NER122B	.750	.750	1.000	4.50	.50	.29	.138	1.0	N.2L	CM75	—	S310	7/64
1097560	NER162C	1.000	1.000	1.250	5.00	.50	.41	.138	1.0	N.2L	CM75	—	S310	7/64
1097561	NER123B	.750	.750	1.125	4.50	.75	—	.210	2.0	N.3L	CM73LP	S2112	—	25 IP
1097562	NER163C	1.000	1.000	1.250	5.00	.75	—	.210	2.0	N.3L	CM73LP	S2112	—	25 IP
1097565	NER163D	1.000	1.000	1.250	6.00	.75	—	.210	2.0	N.3L	CM73LP	S2112	—	25 IP
1097563	NER203D	1.250	1.250	1.500	6.00	.75	.26	.210	2.0	N.3L	CM73LP	S2112	—	25 IP
1097564	NER243D	1.500	1.500	2.000	6.00	.75	.76	.210	2.0	N.3L	CM73LP	S2112	—	25 IP
1097566	NER853D	1.250	1.000	1.250	6.00	.75	—	.210	2.0	N.3L	CM73LP	S2112	—	25 IP
1097567	NER164C	1.000	1.000	1.375	5.00	.75	—	.294	2.0	N.4L	CM73LP	S2112	—	25 IP
1097570	NER164D	1.000	1.000	1.375	6.00	.75	—	.294	2.0	N.4L	CM73LP	S2112	—	25 IP
1097568	NER204D	1.250	1.250	1.625	6.00	.75	.27	.294	2.0	N.4L	CM73LP	S2112	—	25 IP
1097569	NER244D	1.500	1.500	2.000	6.00	.75	.65	.294	2.0	N.4L	CM73LP	S2112	—	25 IP
1097575	NER205D	1.250	1.250	2.000	6.00	1.44	—	.415	2.0	N.5L	CM81	—	S352	1/4
1097571	NER206D	1.250	1.250	1.625	6.00	.75	.27	.300	2.0	N.6L	CM121	—	S412	5/32
left hand														
1095580	NEL062	.375	.375	.750	2.50	.50	—	.138	1.0	N.2R	CM74	—	S310	7/64
1097247	NEL082V	.500	.500	.750	3.50	.50	—	.138	1.0	N.2R	CM74	—	S310	7/64
1097248	NEL102B	.625	.625	.750	4.50	—	—	.138	1.0	N.2R	CM74	—	S310	7/64
1097231	NEL122B	.750	.750	1.000	4.50	.50	.29	.138	1.0	N.2R	CM74	—	S310	7/64
1097232	NEL162C	1.000	1.000	1.250	5.00	.50	.41	.138	1.0	N.2R	CM74	—	S310	7/64
1097233	NEL123B	.750	.750	1.125	4.50	.75	—	.210	2.0	N.3R	CM72LP	S2112	—	25 IP
1097234	NEL163C	1.000	1.000	1.250	5.00	.75	—	.210	2.0	N.3R	CM72LP	S2112	—	25 IP
1097237	NEL163D	1.000	1.000	1.250	6.00	.75	—	.210	2.0	N.3R	CM72LP	S2112	—	25 IP
1097235	NEL203D	1.250	1.250	1.500	6.00	.75	.26	.210	2.0	N.3R	CM72LP	S2112	—	25 IP
1097236	NEL243D	1.500	1.500	2.000	6.00	.75	.76	.210	2.0	N.3R	CM72LP	S2112	—	25 IP
1097238	NEL853D	1.250	1.000	1.250	6.00	.75	—	.210	2.0	N.3R	CM72LP	S2112	—	25 IP
1097239	NEL164C	1.000	1.000	1.375	5.00	.75	—	.294	2.0	N.4R	CM72LP	S2112	—	25 IP
1097242	NEL164D	1.000	1.000	1.375	6.00	.75	—	.294	2.0	N.4R	CM72LP	S2112	—	25 IP
1097240	NEL204D	1.250	1.250	1.625	6.00	.75	.27	.294	2.0	N.4R	CM72LP	S2112	—	25 IP
1097241	NEL244D	1.500	1.500	2.000	6.00	.75	.65	.294	2.0	N.4R	CM72LP	S2112	—	25 IP
1097246	NEL205D	1.250	1.250	2.000	6.00	1.44	—	.415	2.0	N.5R	CM80	—	S352	1/4
1097243	NEL206D	1.250	1.250	1.625	6.00	.75	.27	.300	2.0	N.6R	CM120	—	S412	5/32

NOTE: F dimension measured over sharp point of N-style threading insert.

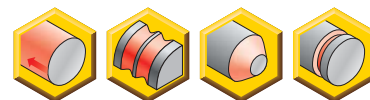
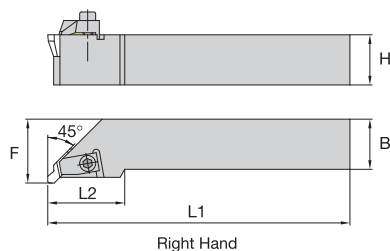
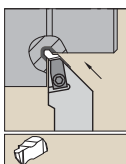


■ Integral End Mount • Metric

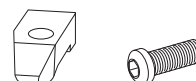


order number	catalog number	H	B	F	L1	LH	CD	gage insert	clamp	clamp screw	clamp screw	Torx/ Torx Plus
right hand												
1098803	NER1616H2	16	16	20	100	15	3,5	N.2L	CM75	MS1200	—	T10
1098804	NER2020K2	20	20	25	125	15	3,5	N.2L	CM75	MS1200	—	T10
1098805	NER2525M2	25	25	32	150	15	3,5	N.2L	CM75	MS1200	—	T10
1098806	NER2525M3	25	25	32	150	22	5,3	N.3L	CM73LP	—	MS2111	25 IP
1098807	NER3225P3	32	25	32	170	22	3,8	N.3L	CM73LP	—	MS2111	25 IP
1098808	NER2525M4	25	25	35	150	24	6,4	N.4L	CM73LP	—	MS2111	25 IP
1098809	NER3225P4	32	25	35	170	24	6,4	N.4L	CM73LP	—	MS2111	25 IP
1098810	NER3232P4	32	32	40	170	24	6,4	N.4L	CM73LP	—	MS2111	25 IP
left hand												
1098874	NEL1616H2	16	16	20	100	15	3,5	N.2R	CM74	MS1200	—	T10
1098875	NEL2020K2	20	20	25	125	15	3,5	N.2R	CM74	MS1200	—	T10
1098876	NEL2525M2	25	25	32	150	15	3,5	N.2R	CM74	MS1200	—	T10
1098877	NEL2525M3	25	25	32	150	22	5,3	N.3R	CM72LP	—	MS2111	25 IP
1098878	NEL3225P3	32	25	32	170	22	3,8	N.3R	CM72LP	—	MS2111	25 IP
1098879	NEL2525M4	25	25	35	150	24	6,4	N.4R	CM72LP	—	MS2111	25 IP
1098880	NEL3225P4	32	25	35	170	24	6,4	N.4R	CM72LP	—	MS2111	25 IP
1098881	NEL3232P4	32	32	40	170	24	6,4	N.4R	CM72LP	—	MS2111	25 IP

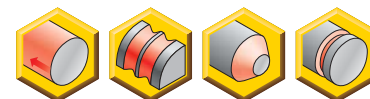
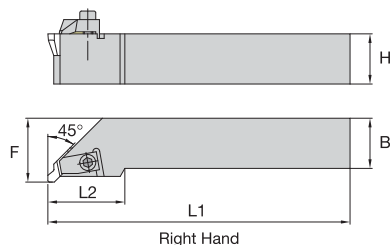
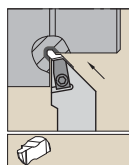
NOTE: F dimension measured over sharp point of N-style threading insert.



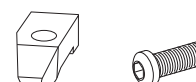
Integral 45° Undercut • Inch



order number	catalog number	H	B	F	L1	LH	gage insert	clamp	button-head cap screw	hex/Torx Plus
right hand										
1097579	NRR123B	.750	.750	1.000	4.50	1.25	NU3L	CM73LP	S2112	25 IP
1097580	NRR163C	1.000	1.000	1.250	5.00	1.25	NU3L	CM73LP	S2112	25 IP
1097583	NRR163D	1.000	1.000	1.250	6.00	1.25	NU3L	CM73LP	S2112	25 IP
1097581	NRR203D	1.250	1.250	1.500	6.00	1.25	NU3L	CM73LP	S2112	25 IP
1097582	NRR243D	1.500	1.500	2.000	6.00	1.38	NU3L	CM73LP	S2112	25 IP
left hand										
1097249	NRL123B	.750	.750	1.000	4.50	1.25	NU3R	CM72LP	S2112	25 IP
1097250	NRL163C	1.000	1.000	1.250	5.00	1.25	NU3R	CM72LP	S2112	25 IP
1097253	NRL163D	1.000	1.000	1.250	6.00	1.25	NU3R	CM72LP	S2112	25 IP
1097251	NRL203D	1.250	1.250	1.500	6.00	1.25	NU3R	CM72LP	S2112	25 IP

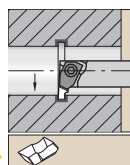


Integral 45° Undercut • Metric

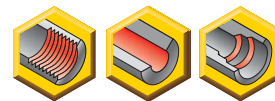
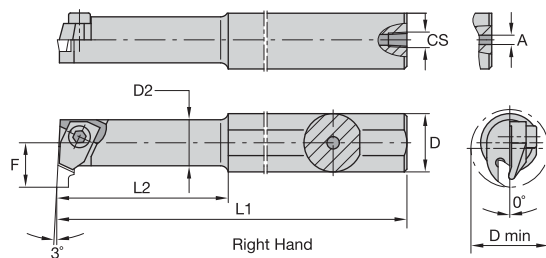


order number	catalog number	H	B	F	L1	LH	gage insert	clamp	clamp screw	hex (mm)/Torx Plus
right hand										
1098812	NRR2020K3	20	20	25	125	32	NU3125L	CM73LP	MS2111	25 IP
1098813	NRR2525M3	25	25	32	150	32	NU3125L	CM73LP	MS2111	25 IP
1098814	NRR3225P3	32	25	32	170	32	NU3125L	CM73LP	MS2111	25 IP
left hand										
1098883	NRL2020K3	20	20	25	125	32	NU3125R	CM72LP	MS2111	25 IP
1098884	NRL2525M3	25	25	32	150	32	NU3125R	CM72LP	MS2111	25 IP
1098885	NRL3225P3	32	25	32	170	32	NU3125R	CM72LP	MS2111	25 IP

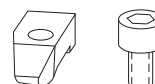
NOTE: NR-style toolholders are compatible with "NU" style inserts only.



Necked steel shank with through coolant.

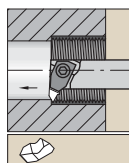


■ Steel Boring Bar • Small ID • Inch

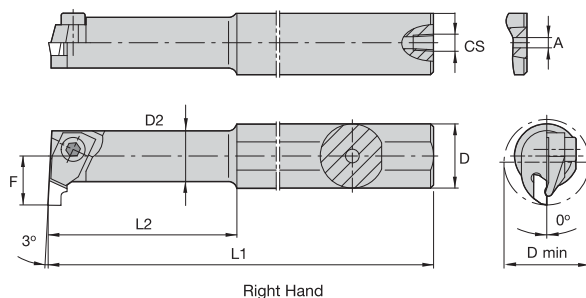


order number	catalog number	D min	D	L1	L2	F	A	CS	gage insert	clamp	clamp screw	hex (inch)/ Torx Plus
right hand												
1094826	A06NER1	.440	.38	6.00	1.250	.26	.13	—	N.1L	CM109	S304	5/64
1094827	A08NER1	.440	.50	8.00	1.290	.26	.09	1/16-27 NPT	N.1L	CM109	S304	5/64
1094828	A10NER1	.800	.63	10.00	—	.41	—	1/8-27 NPT	N.1L	CM109	S304	5/64

NOTE: Minimum bore capability varies with depth of groove. See page C197 for details.



Necked steel shank with through coolant.

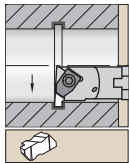


■ Steel Boring Bar • Small ID • Metric

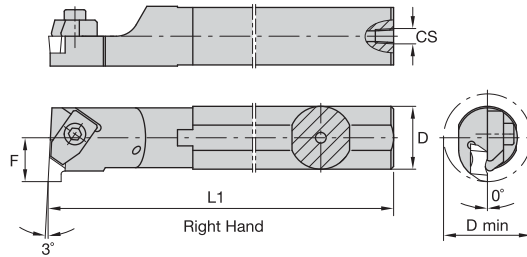


order number	catalog number	D min	D	D2	L1	L2	F	A	CS	gage insert	clamp	clamp screw	hex (mm)
right hand													
1098944	A12MNNTOR1	11,5	12	10,0	150	31,30	7	4,0	1/16-27 NPT	N.1L	CM109	MS1034	1.5 mm
1098943	A10KNNTOR1	11,5	10	10,0	125	—	7	3,2	—	NG1L	CM109	MS1034	1.5 mm

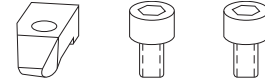
NOTE: Minimum bore capability varies with depth of groove. See page C197 for details.



Steel shank with through coolant.

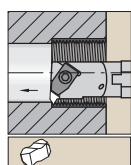


■ Steel Boring Bar • Inch

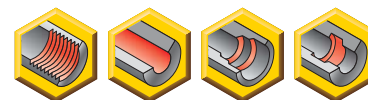
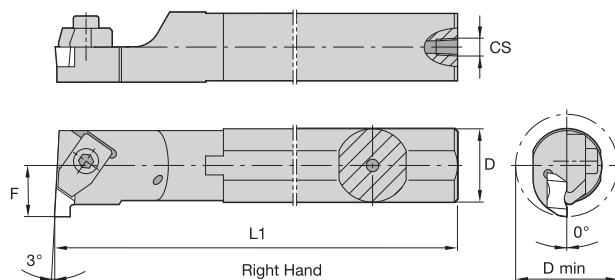


order number	catalog number	D min	D	L1	F	CS	gage insert	clamp	clamp screw	clamp screw	hex (inch)/ Torx Plus
right hand											
1094824	A08NER2	.730	.500	8	.437	1/16-27 NPT	N.2L	CM147	—	S39	7/64
1094829	A10SNER2	1.000	.625	10	.500	1/8-27 NPT	N.2L	CM75	—	S310	7/64
1094831	A12SNER2	1.125	.750	10	.562	1/8-27 NPT	N.2L	CM75	—	S310	7/64
1094833	A16TNER2	1.375	1.000	12	.688	1/4-18 NPT	N.2L	CM75	—	S310	7/64
1094835	A16NER3	1.375	1.000	12	.688	1/4-18 NPT	N.3L	CM73LP	S2112	—	25 IP
1094837	A20NER3	1.750	1.250	14	.875	1/4-18 NPT	N.3L	CM73LP	S2112	—	25 IP
1094839	A24NER3	2.000	1.500	14	1.000	1/4-18 NPT	N.3L	CM73LP	S2112	—	25 IP
1094841	A28NER3	2.250	1.750	14	1.125	1/4-18 NPT	N.3L	CM73LP	S2112	—	25 IP
1094843	A32NER3	2.500	2.000	16	1.250	1/4-18 NPT	N.3L	CM73LP	S2112	—	25 IP
1094845	A40NER3	3.000	2.500	16	1.500	1/4-18 NPT	N.3L	CM73LP	S2112	—	25 IP
1094847	A28NER4	2.500	1.750	14	1.250	1/4-18 NPT	N.4L	CM73LP	S2112	—	25 IP
1094849	A32NER4	2.750	2.000	16	1.375	1/4-18 NPT	N.4L	CM73LP	S2112	—	25 IP
1094853	A40NER4	3.250	2.500	16	1.625	1/4-18 NPT	N.4L	CM73LP	S2112	—	25 IP
1094859	A32NER6	2.750	2.000	16	1.375	1/4-18 NPT	N.6L	CM121	S2112	—	5/32
left hand											
1094825	A08NEL2	.730	.500	8	.437	1/16-27 NPT	N.2R	CM146	—	S39	7/64
1094830	A10SNEL2	1.000	.625	10	.500	1/8-27 NPT	N.2R	CM74	—	S310	7/64
1094832	A12NEL2	1.125	.750	10	.562	1/8-27 NPT	N.2R	CM74	—	S310	7/64
1094834	A16TNEL2	1.375	1.000	12	.688	1/4-18 NPT	N.2R	CM74	—	S310	7/64
1094836	A16NEL3	1.375	1.000	12	.688	1/4-18 NPT	N.3R	CM72LP	S2112	—	25 IP
1094838	A20NEL3	1.750	1.250	14	.875	1/4-18 NPT	N.3R	CM72LP	S2112	—	25 IP
1094840	A24NEL3	2.000	1.500	14	1.000	1/4-18 NPT	N.3R	CM72LP	S2112	—	25 IP
1094842	A28NEL3	2.250	1.750	14	1.125	1/4-18 NPT	N.3R	CM72LP	S2112	—	25 IP
1094844	A32NEL3	2.500	2.000	16	1.250	1/4-18 NPT	N.3R	CM72LP	S2112	—	25 IP
1094846	A40NEL3	3.000	2.500	16	1.500	1/4-18 NPT	N.3R	CM72LP	S2112	—	25 IP
1094848	A28NEL4	2.500	1.750	14	1.250	1/4-18 NPT	N.4R	CM72LP	S2112	—	25 IP
1094850	A32NEL4	2.750	2.000	16	1.375	1/4-18 NPT	N.4R	CM72LP	S2112	—	25 IP
1094856	A32NEL5	2.812	2.000	16	1.406	1/4-18 NPT	N.5R	CM80	—	S352	1/4
1094860	A32NEL6	2.750	2.000	16	1.375	1/4-18 NPT	N.6R	CM120	S2112	—	5/32

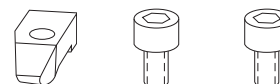
NOTE: Minimum bore capability varies with depth of groove. See page C197 for details.



Steel shank with through coolant.

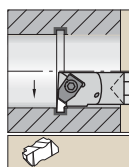


■ **Steel Boring Bar • Metric**

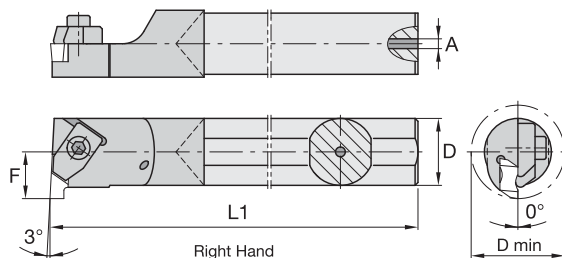


order number	catalog number	D min	D	L1	F	CS	gage insert	clamp	clamp screw	clamp screw	hex (mm)/ Torx Plus
right hand											
1098945	A12MNNTOR2	18,5	12	150	11	1/16-27 NPT	—	CM147	—	MS1200	2.5 mm
1098947	A16MNNTOR2	22,0	16	150	11	1/8-27 NPT	N.2L	CM75	—	MS1200	T10
1098949	A20QNNTOR2	26,0	20	180	13	1/8-27 NPT	N.2L	CM75	—	MS1200	2.5 mm
1098951	A25RNNTOR2	34,0	25	200	17	1/4-18 NPT	N.2L	CM75	—	MS1200	2.5 mm
1098953	A25RNNTOR3	34,0	25	200	17	1/8 - 27 NPT	N.3L	CM73LP	MS2111	—	25 IP
1098955	A32SNNTOR3	44,0	32	250	22	1/4-18 NPT	N.3L	CM73LP	MS2111	—	25 IP
1098957	A40TNNTOR3	54,0	40	300	27	1/4-18 NPT	N.3L	CM73LP	MS2111	—	25 IP
1099001	A40TNNTOR4	54,0	40	300	27	1/4-18 NPT	N.4L	CM73LP	MS2111	—	25 IP
1099003	A50UNNTOR4	70,0	50	350	35	1/4-18 NPT	N.4L	CM73LP	MS2111	—	25 IP
left hand											
1098946	A12MNNTOL2	18,5	12	150	11	1/16-27 NPT	NG2R	CM146	—	MS1200	2.5 mm
1098948	A16MNNTOL2	22,0	16	150	11	1/8-27 NPT	N.2R	CM74	—	MS1200	T10
1098950	A20QNNTOL2	26,0	20	180	13	1/8-27 NPT	NG2R	CM74	—	MS1200	2.5 mm
1098952	A25RNNTOL2	34,0	25	200	17	1/4-18 NPT	N.2R	CM74	—	MS1200	2.5 mm
1098954	A25RNNTOL3	34,0	25	200	17	1/4-18 NPT	N.3R	CM72LP	MS2111	—	25 IP
1098956	A32SNNTOL3	44,0	32	250	22	1/4-18 NPT	N.3R	CM72LP	MS2111	—	25 IP
1098958	A40TNNTOL3	54,0	40	300	27	1/4-18 NPT	N.3R	CM72LP	MS2111	—	25 IP
1099002	A40TNNTOL4	54,0	40	300	27	1/4-18 NPT	N.4R	CM72LP	MS2111	—	25 IP

NOTE: Minimum bore capability varies with depth of groove. See page C197 for details.



Carbide shank with through coolant.



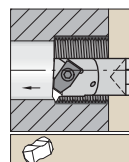
Grooving and Cut-Off

■ Carbide Boring Bar • Inch

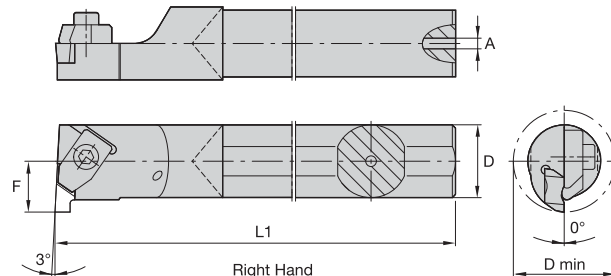


order number	catalog number	D min	D	L1	F	A	gage insert	clamp	clamp screw	hex (inch)/ Torx Plus
right hand										
1152688	E08NER2	.730	.500	8	.437	.19	N.2L	CM147	S39	7/64
1152606	E10NER2	1.000	.625	10	.500	.22	N.2L	CM75	S310	7/64
1152608	E12NER2	1.125	.750	10	.562	.28	N.2L	CM75	S310	7/64
1152610	E16NER3	1.375	1.000	12	.688	.31	N.3L	CM73	S412	25 IP
left hand										
1152689	E08NEL2	.730	.500	8	.437	.19	N.2R	CM146	S39	7/64
1152607	E10NEL2	1.000	.625	10	.500	.22	N.2R	CM74	S310	7/64
1152609	E12NEL2	1.125	.750	10	.562	.28	N.2R	CM74	S310	7/64
1152611	E16NEL3	1.375	1.000	12	.688	.31	N.3R	CM-72	S412	25 IP

NOTE: Minimum bore capability varies with depth of groove. See page C197 for details.



Carbide shank with through coolant.

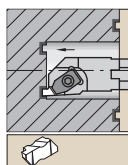


■ Carbide Boring Bar • Metric

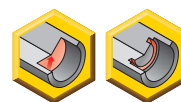
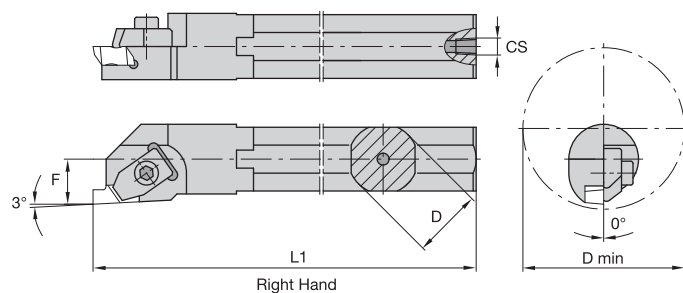


order number	catalog number	D min	D	L1	F	A	gage insert	clamp	clamp screw	Torx/ Torx Plus
right hand										
1152834	E16RNNTOR2	22,0	16	200	11	5,537	N.2L	CM75	MS1200	T10
1152836	E20SNNTOR2	26,0	20	250	13	7,137	N.2L	CM75	MS1200	T10
left hand										
1152835	E16RNNTOL2	22,0	16	200	11	5,537	N.2R	CM74	MS1200	T10

NOTE: Minimum bore capability varies with depth of groove. See page C197 for details.



Steel shank with through coolant.

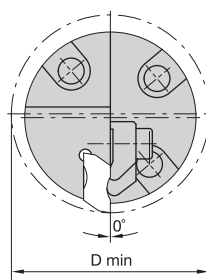
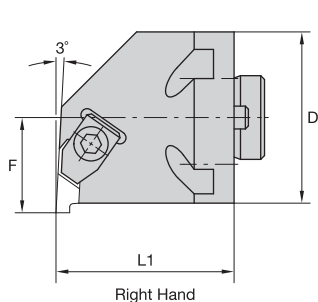
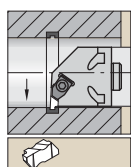


■ Steel Face Grooving Boring Bar • Inch

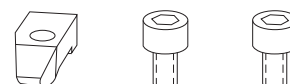


order number	catalog number	D min	D	L1	F	CS	gage insert	clamp	clamp screw	hex (inch)/ Torx Plus
right hand										
1094911	A16TNSR3	2.250	1.000	12	.640	1/4-18 NPT	N.3R	CM72LP	S2112	25 IP
1094913	A20UNSR3	2.250	1.250	14	.765	1/4-18 NPT	N.3R	CM72LP	S2112	25 IP
1094915	A24UNSR3	2.250	1.500	14	.890	1/4-18 NPT	N.3R	CM72LP	S2112	25 IP
1094919	A32VNSR3	2.375	2.000	16	1.281	1/4-18 NPT	N.3R	CM72LP	S2112	25 IP
1094921	A40VNSR3	2.875	2.500	16	1.531	1/4-18 NPT	N.3R	CM72LP	S2112	25 IP
left hand										
1094912	A16TNSL3	2.250	1.000	12	.640	1/4-18 NPT	N.3L	CM73LP	S2112	25 IP
1094916	A24UNSL3	2.250	1.500	14	.890	1/4-18 NPT	N.3L	CM73LP	S2112	25 IP
1094920	A32VNSL3	2.375	2.000	16	1.281	1/4-18 NPT	N.3L	CM73LP	S2112	25 IP

NOTE: Minimum bore applicable only when used with NFD-KI inserts on internal face grooves. See page C197 for machining guidelines when face grooving.



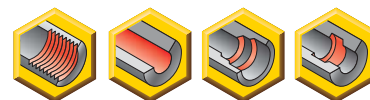
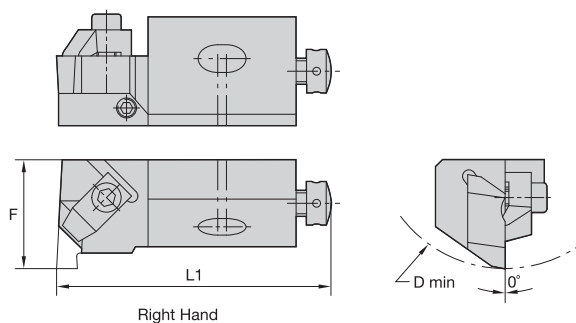
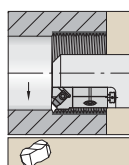
■ Steel Boring Head • Inch



order number	catalog number	D	D min	F	L1	gage insert	clamp	clamp screw	clamp screw	Torx Plus
right hand										
1095314	H20NER3W	1.250	1.750	.875	1.625	N.3L	CM73LP	S2112	—	25 IP
1095362	H24NER3W	1.500	2.000	1.000	1.625	N.3L	CM73LP	S2112	—	25 IP
1095418	H28NER3W	1.750	2.250	1.125	1.625	N.3L	CM73LP	S2112	—	25 IP
1095456	H32NER3W	2.000	2.500	1.250	1.625	N.3L	CM73LP	S2112	—	25 IP
1095533	H40NER3W	2.500	3.000	1.500	1.625	N.3L	CM73LP	S2112	—	25 IP
1095421	H28NER4W	1.750	2.500	1.250	1.625	N.4L	CM73LP	S2112	—	25 IP
1095458	H32NER4W	2.000	2.750	1.375	1.625	N.4L	CM73LP	S2112	—	25 IP
1095516	H36NER4W	2.250	3.000	1.500	1.625	N.4L	CM73LP	S2112	—	25 IP
1095535	H40NER4W	2.500	3.250	1.625	1.625	N.4L	CM73LP	S2112	—	25 IP
1095452	H28NER6W	1.750	2.500	1.250	1.625	N.6L	CM121	—	S412	5/32
1095512	H32NER6W	2.000	2.750	1.375	1.625	N.6L	CM121	—	S412	5/32
1095571	H40NER6W	2.500	3.250	1.625	1.625	N.6L	CM121	—	S412	5/32
1095367	H24NER8W	1.500	2.000	1.000	1.625	N.8L	CM145	—	S422	3/16
left hand										
1095315	H20NEL3W	1.250	1.750	.875	1.625	N.3R	CM72LP	S2112	—	25 IP
1095363	H24NEL3W	1.500	2.000	1.000	1.625	N.3R	CM72LP	S2112	—	25 IP
1095419	H28NEL3W	1.750	2.250	1.125	1.625	N.3R	CM72LP	S2112	—	25 IP
1095457	H32NEL3W	2.000	2.500	1.250	1.625	N.3R	CM72LP	S2112	—	25 IP
1095534	H40NEL3W	2.500	3.000	1.500	1.625	N.3R	CM72LP	S2112	—	25 IP
1095459	H32NEL4W	2.000	2.750	1.375	1.625	N.4R	CM72LP	S2112	—	25 IP
1095536	H40NEL4W	2.500	3.250	1.625	1.625	N.4R	CM72LP	S2112	—	25 IP

NOTE: For boring adapters, see pages B406–B409.

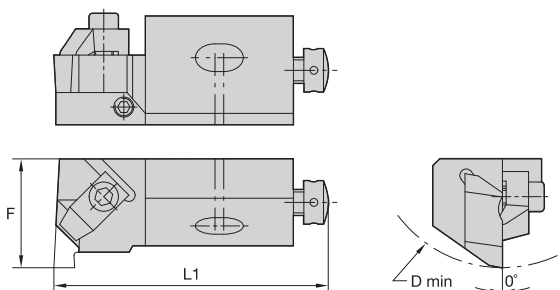
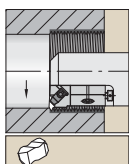
Minimum bore capability varies with depth of groove. See page C197 for details.



Steel Boring Cartridge • Inch

order number	catalog number	D min	F	L1	gage insert	clamp	clamp screw	hex	radial adjusting screw	hex	axial adjusting screw	hex	washer	hold down screw
right hand														
1098380	NER12CA2	1.969	.787	2.19	N.2L	CM75	MS1025	2.5 mm	KUAM23	2.5 mm	KUAM31	4 mm	CSWM 060 050	191.406
left hand														
1098624	NEL12CA2	1.969	.787	2.17	N.2R	CM74	MS1025	2.5 mm	KUAM23	2.5 mm	KUAM31	4 mm	CSWM 060 050	191.406
1098626	NEL25CA3	3.937	1.260	3.94	N.3R	CM72LP	MS412	4 mm	KUAM26	4 mm	KUAM33	6 mm	CSWM 100 080	—

NOTE: Minimum bore capability varies with depth of groove. See page C197 for details.



Steel Boring Cartridge • Metric

order number	catalog number	D min	F	L1	gage insert	clamp	clamp screw	hex (mm)	radial adjusting screw	hex (mm)	axial screw	hex (mm)	washer
right hand													
1098380	NER12CA2	50	20	55,7	N.2L	CM75	MS1025	2.5 mm	KUAM23	2.5 mm	KUAM31	2.5 mm	CSWM 060 050
left hand													
1098624	NEL12CA2	50	20	55,0	N.2R	CM74	MS1025	2.5 mm	KUAM23	2.5 mm	KUAM31	2.5 mm	CSWM 060 050
1098626	NEL25CA3	100	32	100,0	N.3R	CM72LP	MS412	4 mm	KUAM26	4 mm	KUAM33	4 mm	CSWM 100 080

NOTE: Minimum bore diameter (D min) capability varies with thread type and pitch. See page C197 for details.
F dimension measured over sharp point of Top Notch-style threading insert.

■ Machining Guidelines for Chip Control • Grooving

When the proper cutter diameter is not available, proper cutter positioning will provide positive results.

- Center height of insert should be positioned at the center of the workpiece or up to .005" (0,13mm) above.
- Dwell time in the bottom of the groove (more than three revolutions) is not recommended.
- Chip control is feed rate related and should be adjusted to fit the particular situation. Recommended feed range is .003–.012 IPR (0,08–0,3 mm/rev).

■ Groove Limits (Maximum Internal Groove Depth vs. Minimum Bore Diameter)

insert catalog number	maximum internal groove depth		minimum bore diameter	
	inch	mm	inch	mm
NG-1094L	.075	1,91	.800	20,32
—	.040	1,02	.440	11,18
NG-2031R/L	.050	1,27	.730	18,54
NG-2041R/L	—	—	—	—
NG-2047R/L	—	—	—	—
NG-2058R/L	—	—	—	—
—	.110	2,79	2.500	63,50
NG-2062R/L	.102	2,59	1.750	44,45
NG-2094R/L	.098	2,49	1.500	38,10
NG-2125R/L	.080	2,03	1.000	25,40
—	.055	1,40	.730	18,54
NG-3047R/L	—	—	—	—
NG-3062R/L	.094	2,39	1.750	44,45
NG-3072R/L	.090	2,29	1.625	41,28
NG-3078R/L	.075	1,91	1.375	34,93
NG-3088R/L	—	—	—	—
NG-3094R/L	—	—	—	—
NG-3097R/L	.150	3,81	2.375	60,33
NG-3105R/L	—	—	—	—
NG-3110R/L	.145	3,68	2.125	53,98
NG-3122R/L	—	—	—	—
NG-3125R/L	.138	3,51	1.875	47,63
NG-3142R/L	—	—	—	—
NG-3156R/L	.125	3,18	1.625	41,28
NG-3178R/L	—	—	—	—
NG-3185R/L	.110	2,79	1.375	34,93
NG-3189R/L	—	—	—	—
NG-4125R/L	.150	3,81	2.750	69,85
—	.250	6,35	5.750	146,05
NG-4189R/L	.245	6,22	5.000	127,00
NG-4213R/L	.240	6,10	4.500	114,30
NG-4219R/L	.218	5,54	3.250	82,55
NG-4250R/L	.200	5,08	2.500	63,50

NOTE: The same maximum groove depth and minimum bore diameter values also apply to metric, NG-K (chip control), and NR (full radius) inserts of similar size.

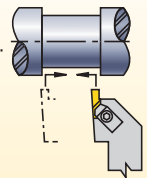
■ Machining Guidelines for Chip Control • Turning/Profiling

Maximum depth of cut for side cutting (turning/profiling) depends on the material being cut and the width of the tool.

- .031–.062" (0,79–1,6mm) wide insert can cut up to .025" (0,6mm) deep.
- .067–.128" (1,7–3,3mm) wide insert can cut up to .040" (1mm) deep.
- .138–.189" (3,5–4,8mm) wide insert can cut up to .080" (2mm) deep.
- .197–.250" (5–6,35mm) wide insert can cut up to .120" (3mm) deep.

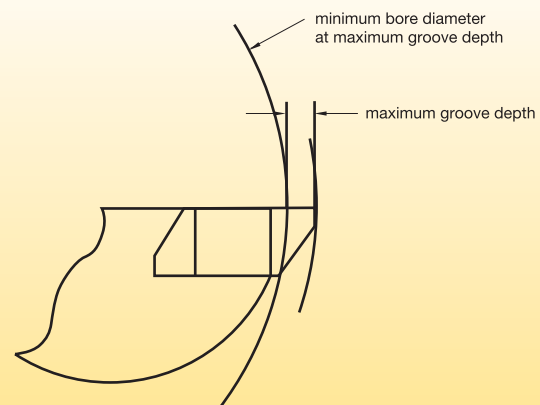
■ Finish Turning the Groove

1. Plunge both sides of groove width.
2. Plunge center area to remove web of material remaining.
3. To avoid insert chipping and to achieve groove wall perpendicularity, follow the tool path outlined.
4. Use the lightest depth of cut that still allows good chipbreaking, tool life, and surface finish.



insert catalog number	maximum internal groove depth		minimum bore diameter	
	inch	mm	inch	mm
—	.375	9,53	28.812	731,82
NG-5250R/L	.361	9,17	15.812	401,62
NG-5281R/L	.344	8,74	10.812	274,62
NG-5312R/L	.327	8,31	7.312	185,72
NG-5344R/L	.294	7,47	4.812	122,22
NG-5375R/L	.257	6,53	3.562	90,47
—	.215	5,46	2.812	71,42
NG-6250R/L	.250	6,35	5.750	146,05
NG-6281R/L	.245	6,22	5.000	127,00
NG-6312R/L	.240	6,10	4.500	114,30
NG-6344R/L	.218	5,54	3.250	82,55
NG-6375R/L	.200	5,08	2.500	63,50

■ Internal Groove Depth versus Bar Interference



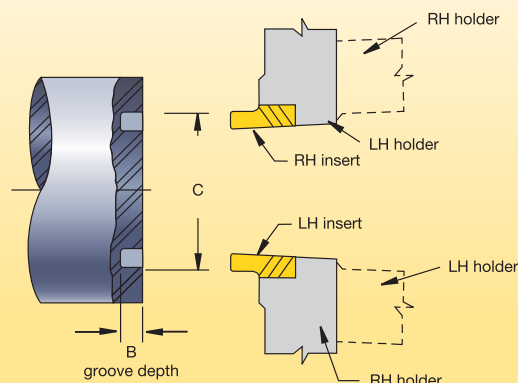
NOTE: Internal grooving depth limits are a function of bar clearance versus bore diameters.

■ Machining Guidelines for Face Grooving Operations • External

Standard NF/NDF Inserts

insert family	maximum groove depth "B"		minimum groove diameter "C"	
	inch	mm	inch	mm
NF-3	.060	1,52	.940	23,90
NF-3	.094	2,39	1.200	30,50
NF-3	.125	3,18	1.420	36,10
NF-3	.150	3,81	1.630	41,30
NFD-3	.250	6,35	1.880	47,60
NF-4/6	.060	1,52	.940	23,90
NF-4/6	.094	2,39	1.200	30,50
NF-4/6	.125	3,18	1.420	36,10
NF-4/6	.150	3,81	1.630	41,30
NF-4/6	.188	4,78	1.880	47,60
NF-4/6	.250	6,35	2.250	57,20
NFD-4	.375	9,53	2.250	57,20
NFD-4	.500	12,70	2.250	57,20

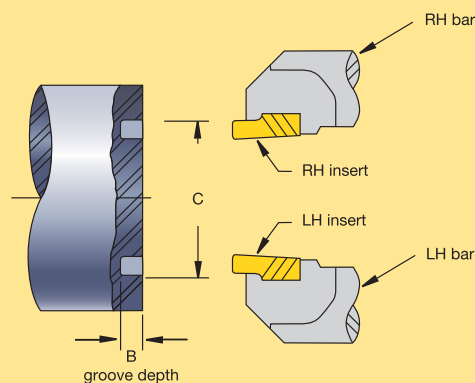
Toolholders



Standard NG/NGD Inserts

insert family	maximum groove depth "B"		minimum groove diameter "C"	
	inch	mm	inch	mm
NG-2	.050	1,27	2.13	54,0
NG-2	.110	2,79	3.50	88,9
NG-3	.094	2,39	4.00	101,6
NG-3	.125	3,18	5.00	127,0
NG-3	.150	3,81	5.50	139,7
NGD-3	.250	6,35	6.88	174,6
NG-4	.150	3,81	6.00	152,4
NG-4	.250	6,35	8.25	209,6
NGD-4	.375	9,53	8.75	222,3
NGD-4	.500	12,70	8.75	222,3
NG-5	.375	9,53	13.00	333,0

Boring Bars

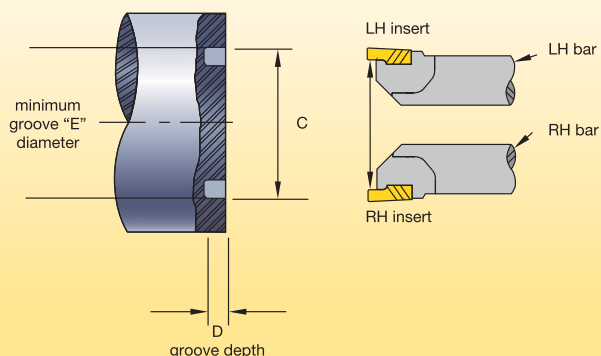


■ Machining Guidelines for Face Grooving Operations • Internal

insert family	maximum groove depth "D"		minimum groove diameter "E"	
	inch	mm	inch	mm
NFD-3-KI	.250	6,35	2.250	57,2

NOTE: For internal applications, use only NFD-KI inserts.

Boring Bars



■ Tool Application Guidelines

- Always use good general machining practices.
- Make the machine and workpiece setup as rigid as possible.
- Integral shank toolholders offer the best rigidity. They should be your first toolholder choice, when possible.
- Use the toolholder with the shortest possible depth of cut for the application ("CD" dimension).
- When changing inserts, make sure the new insert locates securely against the toolholder's positive stop.
- Never tighten the clamping screw without an insert in the pocket.
- Toolholder projection out of the tool block should be as short as possible.
- Inserts should cut as close to 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.

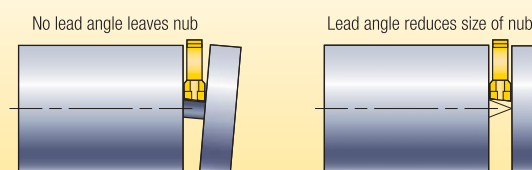
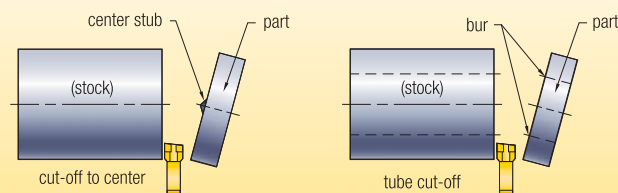


Figure 1

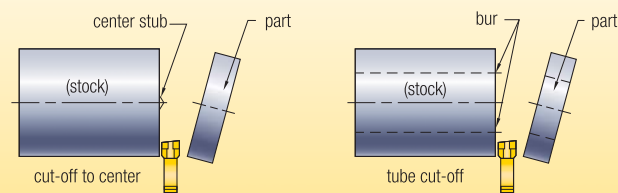
Insert selection left-hand lead



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

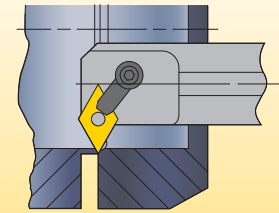
Right-hand lead insert leaves center stub or bur on stock and produces clean part surface.

- Check total height and maintain on center with part diameter.
- The cutting edge height should be within ± 0.004 " (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

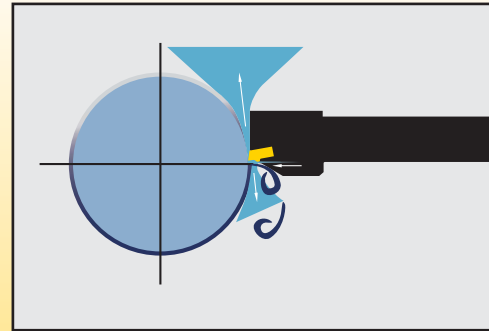


Internal chamfer line up

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

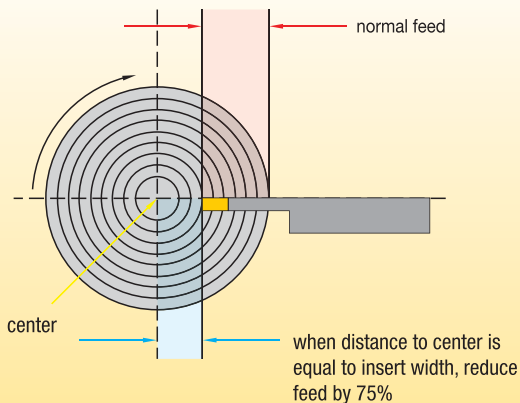


Preferred method for applying coolant

- 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

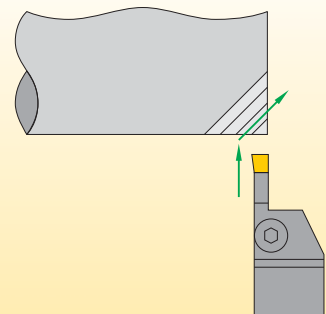
Feed reduction in cut-off



Feed reduction when approaching center = longer tool life

Chamfering

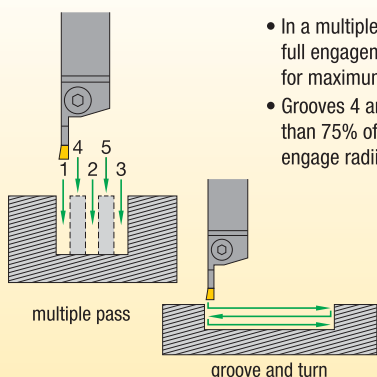
Chamfering with a grooving tool reduced machine index time and tool stations.



(continued)

■ Programming Guidelines (continued)

Pocketing



- In a multiple-pass operation, generate full engagement grooves in 1, 2, and 3 for maximum stability.
- Grooves 4 and 5 should be no more than 75% of insert width, so as not to engage radii.

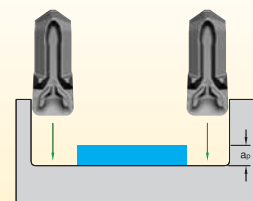
If pocket is deeper than wide = multiple pass

If pocket is wider than deep = groove and turn

Square Pocket

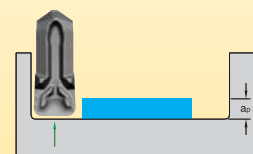
Steps 1 and 2

Plunge the radius and wall on each side to open up two grooves.



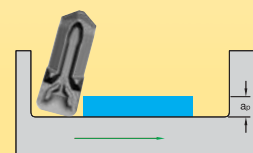
Step 3

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



Step 4

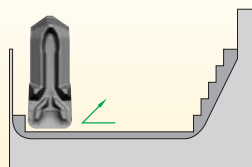
Side turn. This tool is designed to deflect, creating the necessary front clearance.



Profile Pocket

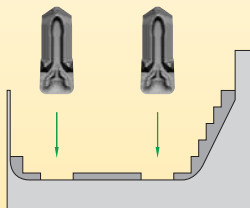
Step 1

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



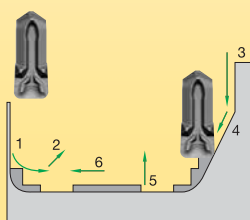
Step 2

Open up two grooves away from wall and radius.



Step 3

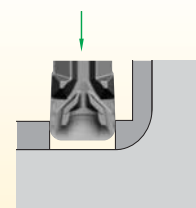
(1 and 2) Finish wall and radius.
(3 and 4) Finish wall, angle, and radius on opposite side of pocket.
(5) Retract tool .004" (0,1mm).
(6) Side turn to finish the floor of the pocket.



Generating a Radius

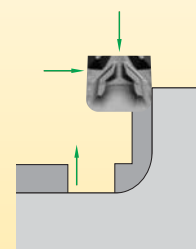
Step 1

Open up a groove away from the radius.



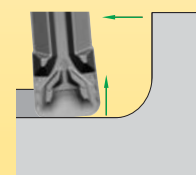
Step 2

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.



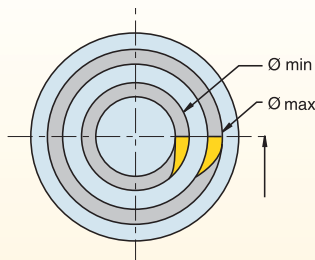
Step 3

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

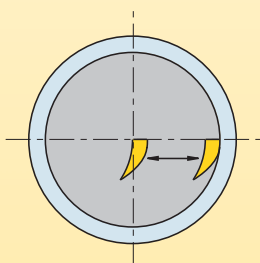
- The outside diameter of the first groove must be between the diameter minimum and diameter maximum capability of the face grooving tool (see illustration above). This creates clearance for the toolholder.

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

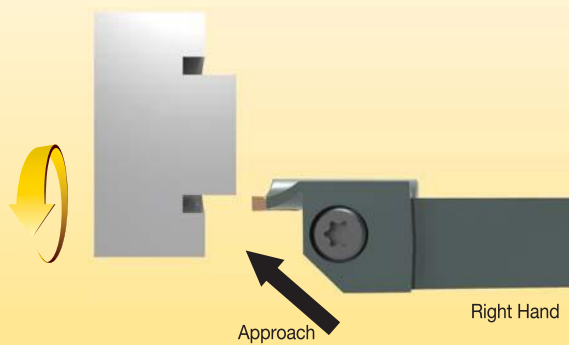
problem	remedy
bur	1. Verify tool center height. 2. Use sharp tools (index more often). 3. Use positive rake PVD coated insert. 4. Use correct grade for workpiece material. 5. Use correct geometry (e.g., positive rake for workhardening material). 6. Change tool path.
poor surface finish	1. Increase speed. 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).

Steps to proper face grooving tool selection

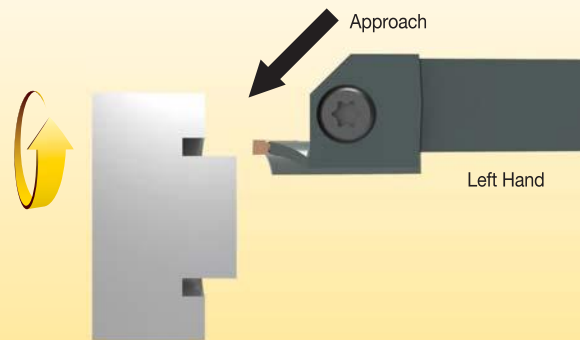
- Step 1: Select your spindle rotation
- Step 2: Select your angle of approach and toolholder orientation

Integral Tooling

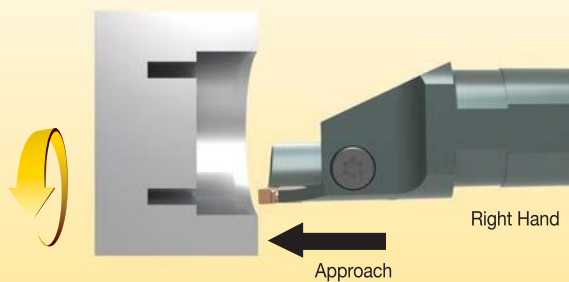
Counter-Clockwise Rotation
Square Shank



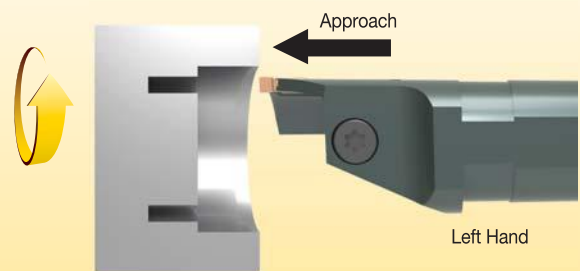
Clockwise Rotation
Square Shank



Boring Bar



Boring Bar



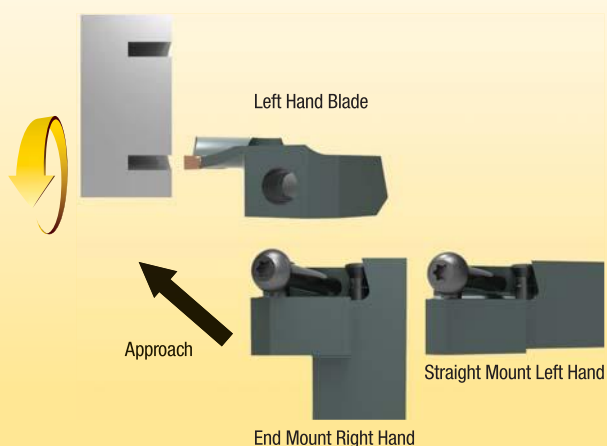
Steps to proper modular face grooving tool selection

- Step 1: Select your spindle rotation
- Step 2: Select your angle of approach and toolholder orientation
- Step 3: Identify combination of blade and shank tool

Modular Tooling

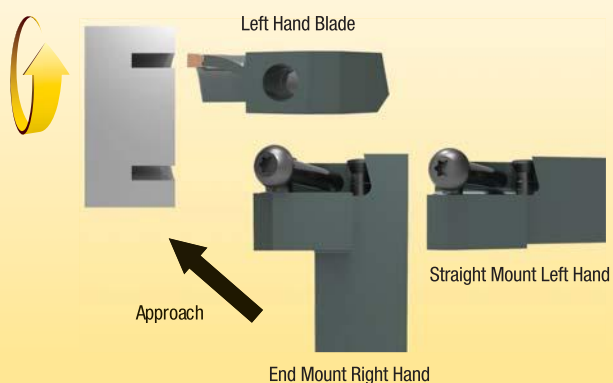
Counter-Clockwise Rotation

Left Hand Outboard Sweep

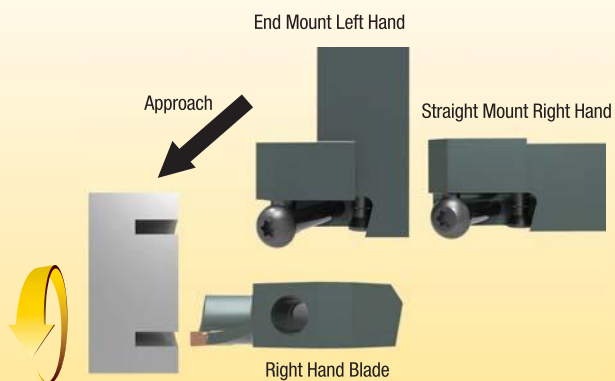


Clockwise Rotation

Left Hand Inboard Sweep



Right Hand Inboard Sweep



Right Hand Outboard Sweep

